

JUN 02 2008

**UNDERGROUND STORAGE TANK
CLOSURE REPORT**
Aircraft Rescue Fire Fighting Training Facility
Lihue Airport
Facility ID 9-702403

Prepared for:
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ETC Project No. 06-2028

March 2007

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1.0 CERTIFICATIONS AND LIMITATIONS

EnviroServices & Training Center, LLC (ETC) has completed this Underground Storage Tank (UST) Closure 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.

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Reviewed By:

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Project Manager

Date:

2.0 EXECUTIVE SUMMARY

ETC was contracted by M. Nakai Repair Service, Ltd. (M. Nakai) to perform environmental sampling activities and document UST closure activities at the Aircraft Rescue Fire Fighting Training Facility (ARFF), located at the Lihue Airport, in Lihue, Kauai, Hawaii. This report presents the results of the UST closure activities.

The Hawaii Department of Transportation –Airports Division (DOTA) retained M. Nakai as the prime contractor to remove and decommission one UST at the site. DOTA also hired Innovative Technical Solutions, Inc (ITSI) to oversee the ARFF Training Facility demolition and UST closure. M. Nakai subcontracted Pacific Concrete Cutting (PCC) to assist with earthwork activities, and Philip Services Hawaii (Philip Services) to clean, remove, and dispose of the UST system, and to package and dispose of the tank's residual contents and rinsate. ETC submitted all soil samples to Environmental Service Network-Pacific (ESN) for analysis.

The 6,000-gallon, double-walled, fiberglass-reinforced plastic (FRP) UST was used to store jet fuel. The fuel was transported to the Burn Pit via subsurface piping, where fire fighting training took place. Note that the removal and closure of the Burn Pit, Holding Pond, and fuel/water separator were documented in a separate report. Additionally, a 6,000-gallon, double-walled, FRP UST used to store water was also removed and decommissioned.

The UST system was listed in the January 2006 Department of Health (DOH) UST Database as a "temporarily out of use, 6,000-gallon other" UST that was installed on April 30, 1991. The facility was assigned the UST Facility Identification Number 9-702403.

On November 16, 2006, M. Nakai commenced excavation of the Jet Fuel UST. The top of the tank was encountered at a depth of approximately 4 feet below ground surface (bgs). Product feed and return piping (FRP construction) were observed at a depth of approximately 3 feet bgs. All of the piping was flushed with a water/detergent solution by Philip Services and removed.

Philip Services personnel vented, monitored, and then cut the UST with a compressor and Venturi blower. A portable gas detector was used to monitor combustible gas and oxygen concentrations inside the tank. Philip Services personnel then used a pressure washer with a water/detergent mixture to clean the tank interior, and collected the rinsate and residual product using a vacuum pump truck. Residual product and rinsate generated during UST decommissioning was transported by Philip Services under non-hazardous waste manifest documentation to Philip Services' oil and water recycling facility in Kapolei, Hawaii.

PCC personnel removed the decommissioned UST from the excavation and placed the FRP tank, along with ancillary piping, into a roll-off bin. The tank and piping were then crushed with the excavator and hauled to the Kekaha Landfill.

Visual and olfactory field screening activities performed by ETC personnel indicated that there were no indications of a petroleum release. A total of thirty two soil samples were collected during UST closure activities. Eight soil stockpile samples were collected from stockpiled soil representative of the soil above the high-density polyethylene (HDPE) liner located along the UST piping. Nine soil stockpile samples were collected from stockpiles representative of the soil from the UST excavation. Thirteen soil samples were collected by ETC from soil beneath the HDPE liner located along the UST piping. ETC also collected two soil samples from beneath the UST containing jet fuel, at a depth of 15 feet bgs. The samples were collected and submitted by ETC to ESN in Honolulu, Hawaii for analysis of total petroleum hydrocarbons as jet fuel (TPH-J). Soil samples collected below the HDPE liner and UST containing jet fuel were analyzed on a 24-hour turn around time. Stockpile soil samples were analyzed on a 5-day turn around time. Analytical results for all of the soil samples indicated that TPH-J concentrations were below the practical quantitation limit.

Based on field observations and analytical data, ETC concludes that no release has occurred from the UST system and recommends that no further action associated with the 6,000-gallon Jet A fuel UST system be performed at the project site.

3.0 INTRODUCTION/PURPOSE

This report presents the results of ETC's findings during closure activities for one 6,000-gallon, double walled, fiberglass-reinforced plastic (FRP) underground storage tank (UST) system. The UST previously contained jet fuel used for live fire training. M. Nakai Repair Service Ltd. (M. Nakai), contracted ETC to perform environmental sampling activities, document UST closure activities, and prepare this report.

The Hawaii Department of Transportation-Airports Division (DOTA) retained M. Nakai as the prime contractor to remove and decommission a UST at the site located at the Lihue Airport, in Lihue, Kauai, Hawaii (Figure 1). The DOTA also retained Innovative Technical Solutions Inc. (ITSI) to oversee the Aircraft Rescue Fire Fighting Training Facility (ARFF) demolition and UST closure. M. Nakai subcontracted Pacific Concrete Cutting (PCC) to assist with earthwork activities, and Philip Services Hawaii (Philip Services) to decommission and dispose of the UST system, and to package and dispose of the tank's residual contents and rinsate. ETC submitted all soil samples to Environmental Service Network-Pacific (ESN) for analysis.

The purpose of this report is to document closure activities and the conditions of the subsurface soils with respect to the presence or absence of petroleum hydrocarbons. The activities were performed in general accordance with the Technical Guidance Manual for UST Closure and Release Response Activities, 2nd Edition, DOH, March 2000. Specifically, ETC completed the following tasks:

- Examined the soil within the excavation for visual and olfactory signs of contamination.
- Collected two samples from soil beneath the Jet Fuel UST and nine samples excavated during UST removal activities.
- Collected thirteen samples of the soil beneath the liner within the fuel line trench at locations spaced approximately 20 feet apart, from beneath the pipe joint and elbows, as shown on the plans, and eight samples from the soil located above the liner along the trenchline.
- Prepared this closure report documenting the field activities and the results of the investigation including figures, photographs, analytical results, and conclusions.

4.0 BACKGROUND

4.1 Site Description

The project site is the former ARFF, located at the Lihue Airport. The UST was located in the northeastern portion of the site between the Burn Pit and the Holding Pond (Appendix I, Figure 2).

The project site is situated at an elevation of approximately 110 feet above mean sea level (msl). Topographic map coverage of the site vicinity is provided by the United States Geological Survey (USGS) 7.5-minute series topographic map, Lihue quadrangle, 1981.

4.2 Tank History

The UST system is listed in the August 2006 DOH UST Database as a “temporarily out of use, 6,000-gallon other” UST that was installed on April 30, 1991. The facility was assigned the UST Facility Identification Number 9-702403.

4.3 Geology and Hydrogeology

4.3.1 Regional Geology

The island of Kauai consists of a single shield volcano, which has a caldera, the largest in the Hawaiian Islands. The southern side of the shield collapsed, forming a fault-bounded depression known as Makaweli graben. The eruption of lavas in the caldera occurred, gradually filling it and spilling over its low southern rim into the graben and eventually the sea. A smaller caldera, Haupu caldera, formed on the southern flank of the shield and filled with lava flows. During a later stage another collapse occurred on the eastern flank forming a subcircular caldera known as the Lihue basin.

The rocks of the Kauai shield volcano are named the Waimea Canyon Volcanic Series, and the portion of them that built the main mass of the shield outside the caldera are called the Napili Formation. The formation consists of thin flows of theolitic basalt, olivine basalt, and oceanic pahoehoe and a’a sloping gently outward in all directions from the summit area. Because of the great amount of erosion of the surface of the shield, very few vents of the Napili Formation are preserved, although the lavas are cut by hundreds of dikes, most of which probably fed flows.

The lavas that filled the main caldera make up the old Olokele Formation, and those that accumulated in the Makaweli graben are called the Makaweli Formation. Both of these formations are predominantly theolitic, but alkalic olivine basalts and hawaiite appear among the latest flows (MacDonald, et al., 1983).

4.3.2 Site Geology

The soil at the project site is mapped as Lihue silty clay, 0 to 8 percent slopes (LhB). This soil is on the tops of broad interfluvies in the uplands. In a representative profile the surface layer is dusky-red silty clay about 12 inches thick. The subsoil, more than 48 inches thick, is dark-red and dark reddish-brown, compact silty clay that has subangular blocky structure. The substratum is soft, weathered rock. Permeability is moderately rapid. Runoff is slow, and the erosion hazard is no more than slight. The average annual rainfall is 40 to 60 inches. The available water capacity is about 1.5 inches per foot of soil. In places roots penetrate to a depth of 5 feet or more (USDA, 1972).

4.3.3 Regional Hydrogeology

Basal groundwater is formed by rainwater percolating down through the residual soils and permeable volcanic rock. All 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 Hanamaulu Aquifer System, which is part of the Lihue Aquifer Sector on the Island of Kauai. The aquifer is classified by Mink and Lau, 1990, with the system identification number 20102116 (21111). This system includes an unconfined basal aquifer in sedimentary (nonvolcanic) lithology. The groundwater in this aquifer is described as having potential use as a drinking water source and containing fresh salinity (<250 mg/l Cl⁻). It is also described as irreplaceable and has a high vulnerability to contamination. The site is further underlain by a second aquifer of the same system. The lower aquifer is an unconfined, basal aquifer in a flank system, and is classified with the system identification number 20102111 (21212). The groundwater in this aquifer is described as having a potential use as a drinking water source. The groundwater contains a low salinity (250-1,000 mg/l Cl⁻) and is considered irreplaceable with a moderate vulnerability to contamination (Mink and Lau, 1990).

5.0 UST CLOSURE ACTIVITIES

On November 16, 2006, UST closure activities commenced with M. Nakai personnel removing the asphalt pavement situated above the UST and around the tank access way using an excavator.

5.1 UST Excavation

M. Nakai personnel used the excavator to expose the top of the UST at a depth of approximately 4 feet bgs. Product feed and return piping (FRP construction) were observed at a depth of approximately 3 feet bgs, running south-southwest, turning south towards the line trench, and turning south-southwest into the line trench for approximately 100 feet, before turning north-northwest into the Burn Pit. All of the piping was flushed with a water/detergent mixture by Philip Services and removed.

Fill piping was observed at a depth of approximately 3 feet bgs. The fill piping was uncovered, completely removed, and placed adjacent to the UST excavation pending disposal.

Fuel line piping was observed at a depth of approximately 3 feet bgs. The fuel line piping was uncovered, completely removed, and placed adjacent to the fuel line excavation pending disposal. Approximately 100 linear feet of fuel line piping was removed.

M. Nakai personnel continued UST excavation activities by removing soil adjacent to both sides of the UST. Soil removed from the top of the UST and the side of the UST was stockpiled adjacent to the excavation.

5.2 UST Decommissioning

The 6,000-gallon UST system was cleaned in place by Philip Services personnel on November 27, 2006. Philip Services personnel vented the tank using a compressor and Venturi blower. A portable gas detector was then used to determine whether combustible gas concentrations inside the tank were below 10% of the lower explosive limit (LEL). Two access ways were then cut into the tanks using a pneumatic impact hammer with cutting tip. The portable gas detector was again used to ensure oxygen concentrations were sufficient for entrance into the tanks.

Philip Services personnel used a pressure washer and water/detergent mixture to clean the tank interior and to flush the associated piping. A vacuum pump truck was then used to remove residual product and rinsate from the tank. The waste was transported to Philip Services' oil and water recycling facility in Kapolei, Hawaii for recovery of petroleum product and disposal of wastewater. A copy of the non-hazardous waste manifest is provided in Appendix IV.

5.3 UST Removal

The double-wall, FRP UST had a diameter of approximately 8 feet and a length of approximately 19 feet. The UST was surrounded by a sandy gravel material and was anchored by fiberglass-reinforced plastic straps to an approximate 24-inch thick concrete slab, which was

situated at a depth of approximately 15 feet bgs (Appendix I, Figure 3).

On November 27, 2006, PCC personnel cut the fiberglass-reinforced straps used to anchor the tank to the concrete slab. PCC personnel used the excavator to remove the tank from the excavation.

The UST appeared to be in good condition, with no apparent perforations.

PCC personnel crushed the FRP tanks in a roll-off bin. The bin containing the crushed FRP UST and ancillary piping was transported to Kekaha Landfill for disposal. Disposal documentation for the tank carcass is available in Appendix IV.

The final excavation measured approximately 27 feet long by 25 feet wide by 15 feet deep. Visual and olfactory observations of the excavation did not indicate the presence of a petroleum release. Note that the concrete slab used to anchor the UST was left in place and soil samples for the release assessment were collected from native soil adjacent to each end of the tank previously containing jet fuel.

In addition to the jet fuel UST, a 6000-gallon FRP UST used to contain water was also removed and disposed. No release assessment was performed for the water UST.

6.0 SAMPLING AND LABORATORY ANALYSIS

6.1 UST Closure Sampling and Laboratory Analysis

A total of thirty two soil samples were collected by ETC personnel during UST closure activities. Line trench samples FL.1 through FL.10, BP.36, BP.30, and BP.23 were collected from soil beneath the high-density polyethylene (HDPE) liner, located approximately 27 feet southwest of the tank, at a depth of 3.5 feet below ground surface. Note that the line trench samples were also taken and used as part of the Burn Pit investigation as the piping was located within the Burn Pit. Sample UST.JF.1 was collected from native soil in the southwest excavation wall, just below the subsurface concrete slab used to anchor the tank, at a depth of 15 feet bgs. Sample UST.JF.2 was collected from native soil in the northeast excavation wall, just below the subsurface concrete slab used to anchor the tank, at a depth of 15 feet bgs. Soil samples SP. 8 through SP. 16 were collected from stockpiled soil from the UST excavation. Soil stockpile samples SP.17 through SP.24 were collected from soil above the HDPE liner that had been stockpiled. Soil sample locations are available in Appendix I, Figure 4.

Twenty nine of the thirty two soil samples were collected by ETC directly from the ground using new, laboratory-provided glass jars. The two soil samples from the UST excavation pit were collected by using the excavator bucket and the samples were collected directly from the bucket. The sample containers were then sealed with Teflon-lined plastic caps, labeled with the client name, sample ID number, date/time of sampling, and analyses, and then stored in a cooler with chemical ice pending delivery to the laboratory. Samples were delivered to ESN along with chain-of-custody documentation. ETC instructed ESN to analyze the samples for TPH-J via EPA Method 8015 Modified on a 24-hour turn around time.

Review of the chain-of-custody documents indicates that the samples were extracted and analyzed within the recommended maximum allowable holding time. The chain-of-custody together with the corresponding laboratory reports are presented in Appendix II. Analytical data was compared to the Department of Health Tier 1 Action Levels for soil where a drinking water source is not threatened and where rainfall amounts to less than 200cm/year. Analytical data are presented in the tables below.

Analytical Data-Below HDPE liner/Below UST

Sample ID	Sample Depth (ft bgs)	TPH-J (mg/kg)
FL.1	3.5	nd
FL.2	3.5	nd
FL.3	3.5	nd
FL.4	3.5	nd
FL.5	3.5	nd
FL.6	3.5	nd
FL.7	3.5	nd
FL.8	3.5	nd
FL.9	3.5	nd
FL.10	3.5	nd
BP.36	3.5	nd
BP.30	3.5	nd
BP.23	3.5	nd
UST.JF.1	15	nd
UST.JF.2	15	nd
Practical Quantitation Limit		20
Method Detection Limit		10
DOH Tier 1 Action Level		5,000

Notes: All results in mg/kg.
nd = not detected above practical quantitation limit.
Line trench samples were also collected and documented as part of the Burn Pit investigation.
DOH Tier 1 Action Level = DOH Tier 1 Action Level for soil where a drinking water source is not threatened and where rainfall amounts to less than or equal to 200cm/year.

Analytical Data-Fuel Line Trench and UST Stockpile

Sample ID	TPH-J (mg/kg)
SP.8	nd
SP.9	nd
SP.10	nd
SP.11	nd
SP.12	nd
SP.13	nd
SP.14	nd
SP.15	nd
SP.16	nd
SP.17	nd
SP.18	nd
SP.19	nd
SP.20	nd
SP.21	nd
SP.22	nd
SP.23	nd
SP.24	nd
Practical Quantitation Limit	20
Method Detection Limit	10
DOH Tier 1 Action Level	5,000

Notes: All results in mg/kg.
nd = not detected above practical quantitation limit.
DOH Tier 1 Action Level = DOH Tier 1 Action Level for soil where a drinking water source is not threatened and where rainfall amounts to less than or equal to 200cm/year.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Visual and olfactory field screening activities performed by ETC personnel indicated that there were no indications of a petroleum release. A total of thirty two soil samples were collected by ETC during UST closure activities. Analytical results for soil samples located above and below the HDPE liner indicated that TPH-J concentrations were below the practical quantitation limit of 20 mg/kg.

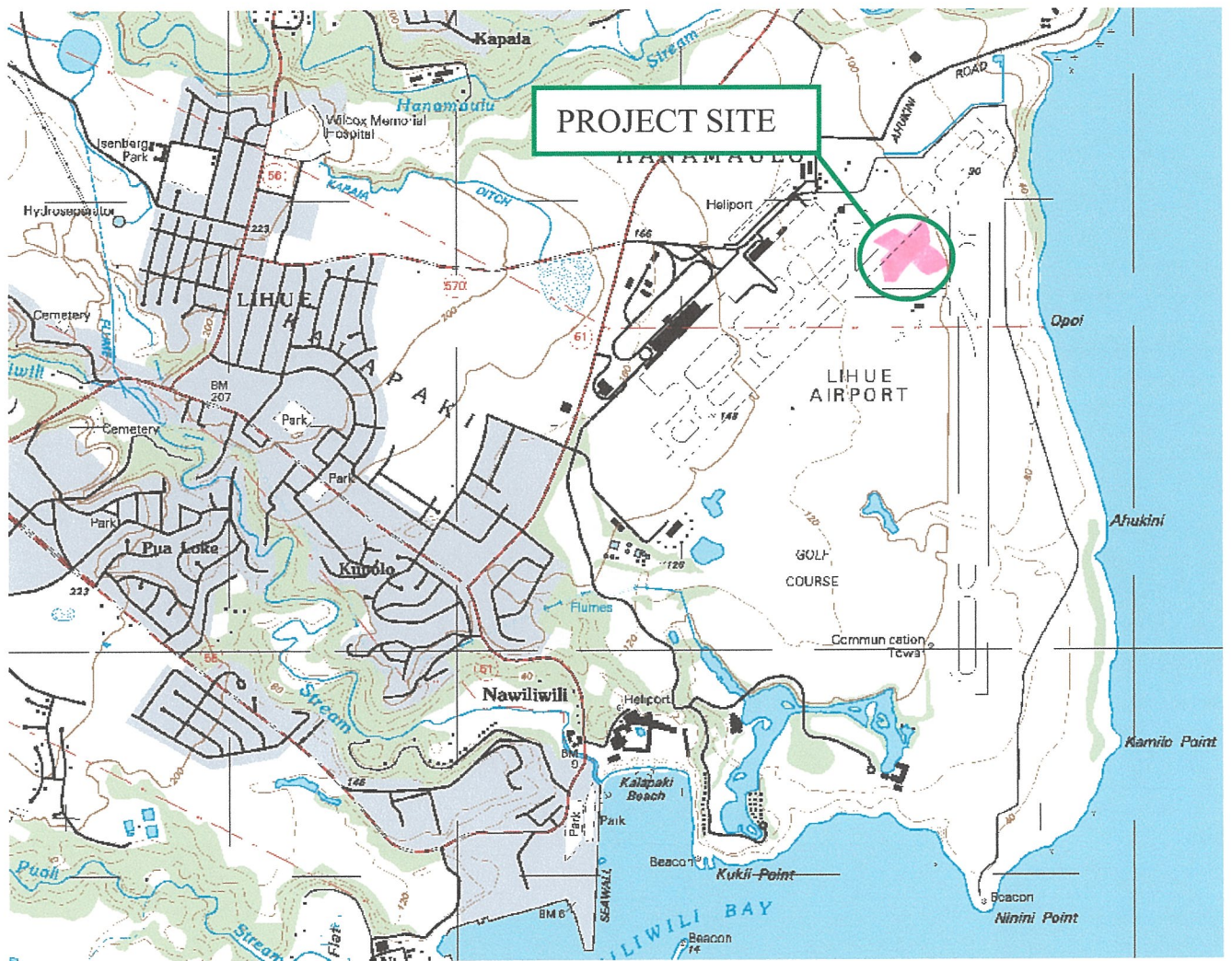
Based on field observations and analytical data, ETC concludes that no release has occurred from the UST system and recommends that no further action associated with the 6,000-gallon Jet A fuel UST system be performed at the project site.

8.0 REFERENCES

- American Petroleum Institute Recommended Practice 1604, "Removal and Disposal of Used Underground Storage Tanks," December 1987.
- 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 Kauai: Groundwater Protection Strategy for Hawaii," September 1992.
- State of Hawaii Department of Health. Technical Guidance Manual for Underground Storage Tank Closure and Release Response, 2nd Edition. March 2000.
- State of Hawaii, Hawaii Administrative Rules, Chapter 11-281, Underground Storage Tanks.
- State of Hawaii, Department of Transportation Airports Division. Special Provisions, Specifications, and Proposal for Removal of Underground Storage Tanks (USTs) and Demolition of the Aircraft Rescue and Fire Fighting (ARFF) Training Area at Lihue Airport Lihue, Kauai, Hawaii. State Project No. CK 1606-63. March 2006.
- 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. 1981. Lihue, Hawaii Quadrangle, Island of Kauai, 7.5 Minute Series (Topographic Map).
- US Environmental Protection Agency Title 40 Code of Federal Regulations Part 280. Underground Storage Tank Regulations. July 1, 1996.

APPENDIX I

FIGURES



Source:
 Image Peak Systems Corporation 2003
 U.S. Department Of Geological Services
 Lihue Quadrangle, Island of Kauai, 7.5 Minute Series, 1981



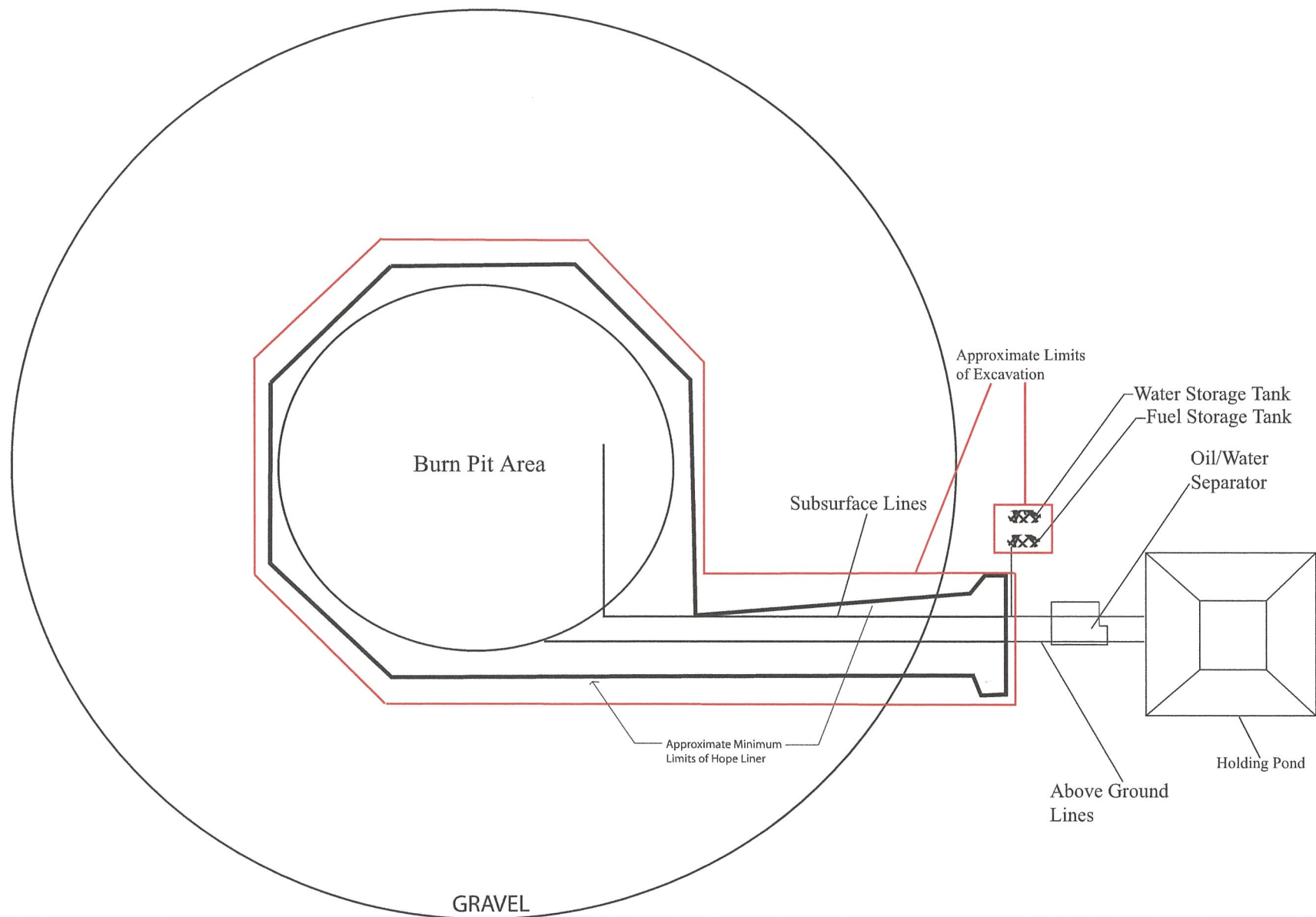
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Not to Scale

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Figure 1 - Site Location Map
 ARFF Training Facility
 UST Closure
 Lihue, Kauai, Hawaii



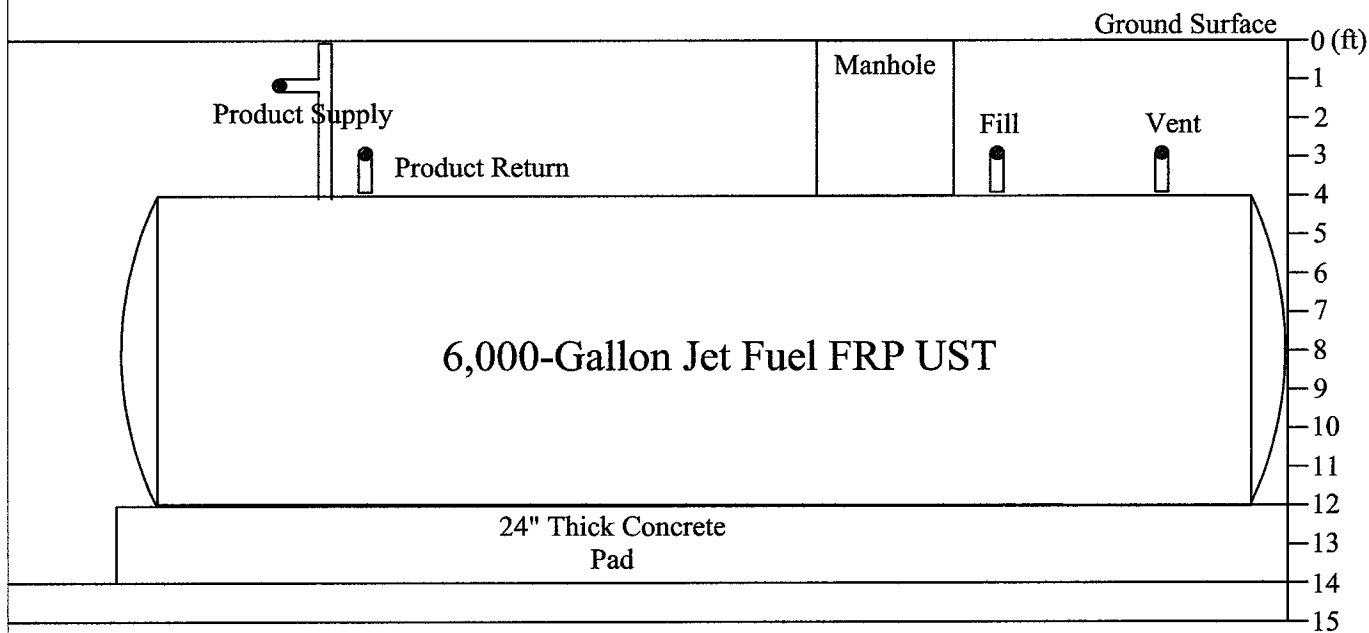
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1 inch = 32.5 feet

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Figure 2-Site Layout Map
ARFF Training Facility
UST Closure
Lihue Airport, Kauai, Hawaii



Horizontal scale same as vertical



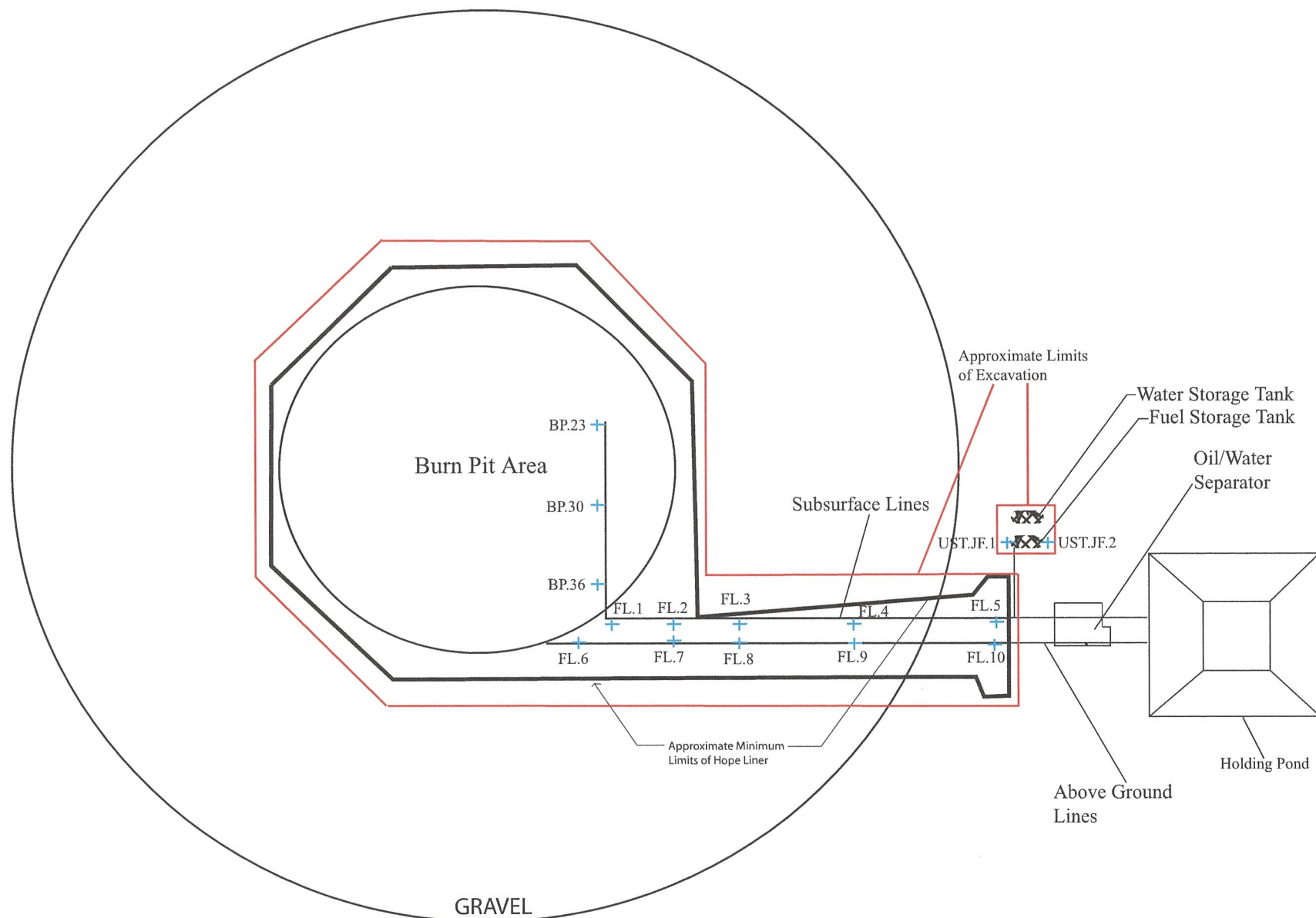
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Figure 3

Cross-Sectional View
UST Closure Report
Aircraft Rescue Fire Fighting Training Facility
Lihue Airport, Kauai, Hawaii



+ Soil Sample Location



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Figure 4 -Soil Sample Location Map
ARFF Training Facility
UST Closure
Lihue Airport, Kauai, Hawaii


APPENDIX II
PHOTOGRAPHIC DOCUMENTATION



Photograph 1: View of ground cover in the vicinity of the USTs.



Photograph 2: Manhole accessway for fill pipe.

	 EnviroServices & Training Center, LLC	Project: 06-2028 March 2007	Photographic Documentation ARFF Training Facility UST Closure Lihue Airport, Kauai, Hawaii
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Photograph 3: Trenchline of UST piping to burn pit area.



Photograph 4: Trenchline excavation stockpile.



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Photographic Documentation
ARFF Training Facility
UST Closure
Lihue Airport, Kauai, Hawaii

APPENDIX III

LABORATORY REPORT AND CHAIN-OF-CUSTODY



ESN Pacific, Inc.

ETC - EnviroServices Training Center PROJECT #06-2028

Lihue ARFF

ESN Project #D612070304

TPH ANALYSES OF SOILS BY EPA 8015-MOD.

SAMPLE NUMBER	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	TPH-DIESEL		FLAGS
				C12-C24 (mg/kg)	SURROGATE RECOVERY (%)	
Method Blank	-	12/8/2006	12/8/2006	nd	99%	
Method Blank	-	12/8/2006	12/11/2006	nd	103%	
UST.JF.1	12/7/2006	12/8/2006	12/8/2006	nd	109%	
UST.JF.1 Dup	12/7/2006	12/8/2006	12/8/2006	nd	102%	
UST.JF.2	12/7/2006	12/8/2006	12/8/2006	nd	105%	
SP.17	12/7/2006	12/8/2006	12/8/2006	nd	94%	
SP.18	12/7/2006	12/8/2006	12/8/2006	nd	102%	
SP.19	12/7/2006	12/8/2006	12/8/2006	nd	102%	
SP.20	12/7/2006	12/8/2006	12/8/2006	nd	104%	
SP.21	12/7/2006	12/8/2006	12/8/2006	nd	100%	
SP.22	12/7/2006	12/8/2006	12/8/2006	nd	105%	
SP.23	12/7/2006	12/8/2006	12/8/2006	nd	100%	
SP.24	12/7/2006	12/8/2006	12/8/2006	nd	95%	
BP.1	12/7/2006	12/8/2006	12/11/2006	nd	100%	
BP.1 Dup	12/7/2006	12/8/2006	12/11/2006	nd	100%	
BP.2	12/7/2006	12/8/2006	12/11/2006	nd	107%	
BP.3	12/7/2006	12/8/2006	12/11/2006	nd	98%	
BP.4	12/7/2006	12/8/2006	12/11/2006	nd	96%	
BP.5	12/7/2006	12/8/2006	12/11/2006	nd	99%	
BP.6	12/7/2006	12/8/2006	12/11/2006	nd	94%	
BP.7	12/7/2006	12/8/2006	12/11/2006	nd	100%	
BP.8	12/7/2006	12/8/2006	12/11/2006	nd	101%	
BP.9	12/7/2006	12/8/2006	12/11/2006	nd	94%	
PQL				20		
MDL				10		
2005 HI DOH EAL (Nuisance/Potential Leachate Concerns)				500/5000		

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (4-BFB): 65% TO 135%

QA/QC DATA - LABORATORY CONTROL SPIKE ANALYSES

Spike Added	500
Measured Conc.	546
% Recovery	109.1%

QA/QC DATA - MATRIX SPIKE ANALYSES

Sample Name: UST.JF.1

Spike Added	500
Measured Conc.	521
% Recovery	104.2%

Spike Added	500
Measured Conc.	486
% Recovery	97.3%

RPD	6.9%
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% Recovery LIMITS: 85% TO 115%

RPD LIMIT: 20%

ANALYSES PERFORMED BY: K. Carvallo

DATA REVIEWED BY: B. Capps



ESN Pacific, Inc.

ETC - EnviroServices Training Center PROJECT #06-2028

Lihue ARFF

ESN Project #D612070304

TPH ANALYSES OF SOILS BY EPA 8015-MOD.

SAMPLE NUMBER	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	TPH-DIESEL		FLAGS
				C12-C24 (mg/kg)	SURROGATE RECOVERY (%)	
Method Blank	-	12/8/2006	12/11/2006	nd	103%	
Method Blank	-	12/8/2006	12/12/2006	nd	102%	
Method Blank	-	12/8/2006	12/13/2006	nd	103%	
BP.10	12/7/2006	12/8/2006	12/11/2006	nd	95%	
BP.11	12/7/2006	12/8/2006	12/12/2006	nd	92%	
BP.11 Dup	12/7/2006	12/8/2006	12/12/2006	nd	106%	
BP.12	12/7/2006	12/8/2006	12/11/2006	nd	97%	
BP.13	12/7/2006	12/8/2006	12/11/2006	nd	105%	
BP.14	12/7/2006	12/8/2006	12/11/2006	nd	99%	
BP.15	12/7/2006	12/8/2006	12/11/2006	nd	105%	
BP.16	12/7/2006	12/8/2006	12/11/2006	nd	105%	
BP.17	12/7/2006	12/8/2006	12/12/2006	nd	86%	
BP.18	12/7/2006	12/8/2006	12/12/2006	nd	97%	
BP.19	12/7/2006	12/8/2006	12/13/2006	nd	92%	
BP.20	12/7/2006	12/8/2006	12/13/2006	nd	94%	
BP.21	12/7/2006	12/8/2006	12/13/2006	nd	93%	
BP.21 Dup	12/7/2006	12/8/2006	12/13/2006	nd	96%	
BP.22	12/7/2006	12/8/2006	12/13/2006	nd	101%	
BP.23	12/7/2006	12/8/2006	12/13/2006	nd	88%	
BP.24	12/7/2006	12/8/2006	12/13/2006	nd	89%	
BP.25	12/7/2006	12/8/2006	12/13/2006	nd	97%	
BP.26	12/7/2006	12/8/2006	12/13/2006	nd	96%	
BP.27	12/7/2006	12/8/2006	12/13/2006	nd	94%	
BP.28	12/7/2006	12/8/2006	12/12/2006	nd	96%	

PQL	20
MDL	10
2005 HI DOH EAL (Nuisance/Potential Leachate Concerns)	500/5000

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (4-BFB): 65% TO 135%

QA/QC DATA - LABORATORY CONTROL SPIKE ANALYSES

Spike Added	500
Measured Conc.	561
% Recovery	112.2%

QA/QC DATA - MATRIX SPIKE ANALYSES

Sample Name: BP.11

Spike Added	500
Measured Conc.	492
% Recovery	98.4%

Spike Added	500
Measured Conc.	543
% Recovery	108.6%

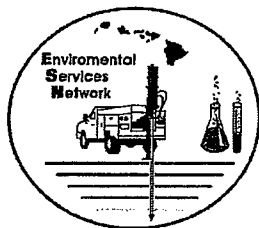
RPD	9.9%
-----	------

% Recovery LIMITS: 85% TO 115%

RPD LIMIT: 20%

ANALYSES PERFORMED BY: B. Capps, K. Carvallo

DATA REVIEWED BY: D. Davis *DD*



ESN Pacific, Inc.

ETC - EnviroServices Training Center PROJECT #06.2028

Lihue ARFF

ESN Project #D612220324

TPH ANALYSES OF SOILS BY EPA 8015-MOD.

SAMPLE NUMBER	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	TPH-DIESEL C12-C24 (mg/kg)	SURROGATE RECOVERY (%)	FLAGS
Method Blank	-	12/22/2006	12/26/2006	nd	81%	
FL.1	12/22/2006	12/22/2006	12/26/2006	nd	101%	
FL.1 Dup	12/22/2006	12/22/2006	12/26/2006	nd	91%	
FL.2	12/22/2006	12/22/2006	12/26/2006	nd	96%	
FL.3	12/22/2006	12/22/2006	12/26/2006	nd	90%	
FL.4	12/22/2006	12/22/2006	12/26/2006	nd	95%	
FL.5	12/22/2006	12/22/2006	12/26/2006	nd	93%	
FL.6	12/22/2006	12/22/2006	12/26/2006	nd	96%	
FL.7	12/22/2006	12/22/2006	12/26/2006	nd	114%	
FL.8	12/22/2006	12/22/2006	12/26/2006	nd	91%	
FL.9	12/22/2006	12/22/2006	12/26/2006	nd	104%	
FL.10	12/22/2006	12/22/2006	12/26/2006	nd	106%	

PQL

20

MDL

10

2005 HI DOH EAL (Nuisance/Potential Leachate Concerns)

500/5000

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-FBP/4-BFB): 65% TO 135%

QA/QC DATA - LABORATORY CONTROL SPIKE ANALYSES

Spike Added	500
Measured Conc.	573
% Recovery	114.5%

QA/QC DATA - MATRIX SPIKE ANALYSES

Sample Name: FL.1

Spike Added	500
Measured Conc.	564
% Recovery	112.8%

Spike Added	500
Measured Conc.	571
% Recovery	114.3%

RPD	1.3%
-----	------

% Recovery LIMITS: 85% TO 115%

RPD LIMIT: 20%

ANALYSES PERFORMED BY : K. Carvallo

DATA REVIEWED BY: B. Capps

BC

Environmental Services Network- Honolulu, Hawaii

ESN PACIFIC

ETC - EnviroServices Training Center PROJECT #06-2028

Lihue ARFF

ESN Project #D612120314

TPH ANALYSES OF SOILS BY EPA 8015-MOD.

SAMPLE NUMBER	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	TPH-DIESEL C12-C24 (mg/kg)	SURROGATE RECOVERY (%)	FLAGS
Method Blank	-	12/14/2006	12/18/2006	nd	92%	
BP.29	12/12/2006	12/14/2006	12/18/2006	nd	90%	
BP.29 Dup	12/12/2006	12/14/2006	12/18/2006	nd	81%	
BP.30	12/12/2006	12/14/2006	12/18/2006	nd	108%	
BP.31	12/12/2006	12/14/2006	12/18/2006	nd	85%	
BP.32	12/12/2006	12/14/2006	12/18/2006	nd	83%	
BP.33	12/12/2006	12/14/2006	12/18/2006	nd	94%	
BP.34	12/12/2006	12/14/2006	12/18/2006	nd	95%	
BP.35	12/12/2006	12/14/2006	12/18/2006	nd	89%	
BP.36	12/12/2006	12/14/2006	12/18/2006	nd	106%	
BP.37	12/12/2006	12/14/2006	12/18/2006	nd	73%	
BP.38	12/12/2006	12/14/2006	12/18/2006	nd	99%	
BP.39	12/12/2006	12/14/2006	12/18/2006	nd	86%	
BP.40	12/12/2006	12/14/2006	12/18/2006	nd	90%	
BP.40 Dup	12/12/2006	12/14/2006	12/18/2006	nd	97%	

PQL

20

MDL

10

2005 HI DOH EAL (Nuisance/Potential Leachate Concerns)

500/5000

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (4-BFB): 65% TO 135%

QA/QC DATA - LABORATORY CONTROL SPIKE ANALYSES

Spike Added	500
Measured Conc.	550
% Recovery	110.1%

QA/QC DATA - MATRIX SPIKE ANALYSES

Sample Name: 0314 BP.29

Spike Added	500
Measured Conc.	489
% Recovery	97.9%

Spike Added	500
Measured Conc.	508
% Recovery	101.6%

RPD	3.7%
-----	------

% Recovery LIMITS: 85% TO 115%

RPD LIMIT: 20%

ANALYSES PERFORMED BY : B. Capps
DATA REVIEWED BY: K. Carvallo

Environmental Services Network

ESN PACIFIC'S CHAIN-OF-CUSTODY RECORD

CLIENT: <u>ETC</u>				TAT (circle one): <u>24-hr.</u> 48-hr. <u>5-day</u> or Other: _____																	
ADDRESS: <u>2850 Pac St.</u>				DATE: <u>12/7/06</u> PAGE <u>1</u> OF <u>2</u>																	
PHONE: <u>832-7222</u> FAX: <u>833-4433</u>				ESN PROJECT #: <u>D612070304</u>																	
EMAIL: <u>Tim@gotrocks.com</u>				LOCATION/PROJECT NAME: <u>Lihue ARFF</u>																	
CLIENT PROJECT #: <u>06-2028</u> Project Manager: <u>Tim T.</u>				COLLECTOR: <u>Tim T.</u> DATE COLLECTED: <u>12/7/06</u>																	
Sample ID#	Depth	Time	Sample Type	Container Type	HVOC 8021b or 8280	VOC 8021b or 8280	BTEX 8021b or 8280	MIBE 8021b or 8280	8015 Fuel Scan only	8015 TPH-Gas ext 5035	8015 TPH-Diesel <u>100A</u>	8081 Chlor. Pesticides	8082 PCB	PAH (DOH 4) 8100 or 8270	1010 FlashPoint (Ignitability)	RCRA 8 Metals	Total: Pb Cd Cr As Hg or	TCLP	Comments	# of Containers	
1	U.S.T. JF. 1	13	Surf	4oz Jar						X										24 hr	1
2	U.S.T. JF. 2	13								X										24 hr	1
3	SP. 17	Surface																		5 day	1
4	SP. 18																				
5	SP. 19																				
6	SP. 20																				
7	SP. 21																				
8	SP. 22																				
9	SP. 23																				
10	SP. 24																				
11	SP. 1																				
12	SP. 2																				
13	SP. 3																				
14	SP. 4																				
15	SP. 5																				
16	SP. 6																				
17	SP. 7																				
18	SP. 8																				
19	SP. 9																				
20	SP. 10																				
RELINQUISHED BY: (Signature) _____ DATE/TIME <u>12/7/06 1530</u>				RECEIVED BY (Signature) <u>[Signature]</u> DATE/TIME <u>12/7/06 1532</u>				SAMPLE RECEIPT:				LABORATORY NOTES:									
RELINQUISHED BY: (Signature) _____ DATE/TIME _____				RECEIVED BY (Signature) _____ DATE/TIME _____				TOTAL # OF CONTAINERS <u>20</u>													
								COC SEALS Y / N / NA													
								SEALS INTACT Y / N / NA													
SAMPLE DISPOSAL INSTRUCTIONS: <u>✓</u> ESN @ \$3.50/sample or _____ Return to Client								RECEIVED TEMP: <u>4°C</u>													

ESN PACIFIC'S CHAIN-OF-CUSTODY RECORD

[illegible]

RELINQUISHED BY: (Signature)	DATE/TIME
SAMPLE DISPOSAL INSTRUCTIONS:	<u>X</u> EST

ESN PACIFIC'S CHAIN-OF-CUSTODY RECORD

[illegible]