Final
Fourth Quarter 2013 - Quarterly Groundwater Monitoring Report Inside Tunnel Wells

Red Hill Bulk Fuel Storage Facility
Joint Base Pearl Harbor-Hickam, Oahu, Hawaii

DOH Facility ID: 9-102271
DOH Release ID: 990051, 010011, and 020028

January 2014

Department of the Navy
Naval Facilities Engineering Command, Hawaii
400 Marshall Road
JBPHH HI 96860-3139

Contract Number N62742-12-D-1853, CTO 0002

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Prepared for:

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400 Marshall Road
JBPHH, HI 96860-3139

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Prepared under:

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FINAL
FOURTH QUARTER 2013 - QUARTERLY GROUNDWATER MONITORING REPORT INSIDE TUNNEL WELLS RED HILL BULK FUEL STORAGE FACILITY

Long-Term Groundwater and Soil Vapor Monitoring
Red Hill Bulk Fuel Storage Facility
Joint-Base Pearl Harbor-Hickam, Oahu, Hawaii

Prepared for:
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Contract Task Order: 0002

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ACRONYMS AND ABBREVIATIONS

ACRONYMS/ ABBREVIATIONS	DEFINITION/MEANING
%	percent
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
COPC	Contaminant of Potential Concern
DLNR	State of Hawaii Department of Land and Natural Resources
DOH	State of Hawaii Department of Health
DON	Department of the Navy
EAL	Environmental Action Level
EPA	Environmental Protection Agency
ESI	Environmental Science International
F-76	Marine Diesel Fuel
ID	Identification
JBPHH	Joint Base Pearl Harbor-Hickam
JP-5	Jet Fuel Propellant-5
JP-8	Jet Fuel Propellant-8
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection
LOQ	Limit of Quantitation
µg/L	micrograms per liter
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NAVFAC	Naval Facilities Engineering Command
NAVSUP FLC	Naval Supply Systems Command Fleet Logistics Center
PAH	Polycyclic Aromatic Hydrocarbons
PARCCS	Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity
pH	hydrogen activity
RHSF	Red Hill Bulk Fuel Storage Facility
RPD	Relative Percent Difference
SAP	Sampling and Analysis Plan
TEC	The Environmental Company, Inc.
TPH	Total Petroleum Hydrocarbons
TPH-d	Total Petroleum Hydrocarbons as diesel
TPH-g	Total Petroleum Hydrocarbons as gasoline
U.S.	United States of America
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WP	Work Plan

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EXECUTIVE SUMMARY

This quarterly groundwater monitoring report presents the results of the fourth quarter 2013 groundwater sampling conducted on October 21 and 22, 2013, at the Red Hill Bulk Fuel Storage Facility [RHSF], Joint Base Pearl Harbor-Hickam [JBPHH], Hawaii. The RHSF is located in Halawa Heights on the Island of Oahu. There are 18 active and 2 inactive Underground Storage Tanks [USTs] located at the RHSF. The State of Hawaii Department of Health [DOH] Facility Identification [ID] number is 9-102271. The DOH Release ID numbers are 990051, 010011, and 020028.

The groundwater sampling was conducted as part of the long-term groundwater and soil vapor monitoring at the RHSF, under Naval Facilities Engineering Command [NAVFAC] Contract Number N62742-12-D-1853. The sampling was conducted in accordance with the approved Work Plan [WP]/Sampling and Analysis Plan [SAP] prepared by Environmental Science International [ESI].

On October 21 and 22, 2013, ESI personnel collected groundwater samples from five monitoring wells at the RHSF (wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01). A summary of the analytical results is provided below.

- **RHMW01** – Total Petroleum Hydrocarbons as diesel [TPH-d] (92 micrograms per liter [µg/L]), Total Petroleum Hydrocarbons as gasoline [TPH-g] (15 µg/L), pyrene (0.027 µg/L) and dissolved lead (2.06 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH Environmental Action Levels [EALs].

- **RHMW02** – TPH-d (2,400 µg/L), TPH-g (48 µg/L), acenaphthene (0.54 µg/L), fluorene (0.27 µg/L), 1-methylnaphthalene (9.0 µg/L), 2-methylnaphthalene (9.0 µg/L), naphthalene (30 µg/L), ethylbenzene (0.14 µg/L), and xylenes (0.37 µg/L) were detected. TPH-d and naphthalene were detected at concentrations above the DOH EALs for both drinking water toxicity and gross contamination. 1-methylnaphthalene was detected at a concentration above the DOH EAL for drinking water toxicity.

- **RHMW03** – TPH-d (54 µg/L) and TPH-g (23 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

- **RHMW05** – TPH-g (17 µg/L) and naphthalene (0.17 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

- **RHMW2254-01** – TPH-g (13 µg/L) and naphthalene (0.036 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

TPH-g was detected in the method and trip blanks at concentrations of 21 and 15 µg/L, respectively. Because of this, it is likely that the TPH-g concentrations detected in the groundwater samples are all biased high.

Since the wells were last sampled (July 2013), groundwater contaminant concentrations in four wells (RHMW01, RHMW03, RHMW05, and RHMW2254-01) remained at low concentrations and did not change significantly, or were not detected. Only the groundwater samples from RHMW02 showed concentrations of contaminants of potential concern [COPCs] exceeding the DOH EALs. TPH-d, 1-methylnaphthalene, and naphthalene concentrations in RHMW02 decreased slightly from the last event in July 2013 but remained above the DOH EALs.

Based on the results of the groundwater monitoring, continuing the groundwater monitoring program at the RHSF is recommended.

SECTION 1 – INTRODUCTION

This quarterly groundwater monitoring report presents the results of the fourth quarter 2013 groundwater sampling conducted on October 21 and 22, 2013, at the RHSF, JBPHH. The RHSF is located in Halawa Heights on the Island of Oahu. The purpose of the sampling is to (1) assess the condition of groundwater beneath the RHSF with respect to chemical constituents associated with jet fuel propellant and marine diesel fuel, and (2) to ensure the Navy remains in compliance with DOH UST release response requirements as described in Hawaii Administrative Rules 11-281 Subchapter 7, Release Response Action. The DOH Facility ID number for the RHSF is 9-102271. The DOH Release ID numbers are 990051, 010011, and 020028.

The groundwater sampling was conducted as part of the long-term groundwater and soil vapor monitoring at the RHSF, under NAVFAC Contract Number N62742-12-D-1853. The sampling was conducted in accordance with the approved WP/SAP prepared by ESI (ESI, 2012).

1.1 SITE DESCRIPTION

The RHSF is located on federal government land (zoned F1- Military and Federal), located in Halawa Heights, approximately 2.5 miles northeast of Pearl Harbor (Figure 1). It is located on a low ridge on the western edge of the Koolau Mountain Range that divides Halawa Valley from Moanalua Valley. The RHSF is bordered on the north by Halawa Correctional Facility and private businesses, on the west by the United States of America [U.S.] Coast Guard reservation, on the south by residential neighborhoods, and on the east by Moanalua Valley. A quarry is located less than a quarter mile away to the northwest. The RHSF occupies 144 acres of land and the majority of the site is at an elevation of approximately 200 to 500 feet above mean sea level.

The RHSF contains 18 active and 2 inactive USTs that are operated by Naval Supply Systems Command Fleet Logistics Center [NAVSUP FLC] Pearl Harbor (formerly Fleet and Industrial Supply Center). Each UST has a capacity of approximately 12.5 million gallons. The RHSF is located approximately 100 feet above the basal aquifer. The USTs contain Jet Fuel Propellant-5 [JP-5], Jet Fuel Propellant-8 [JP-8], and Marine Diesel Fuel [F-76]. The current status of the USTs are summarized in Table 1.1.

Five groundwater monitoring wells (wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01) are located within the RHSF lower access tunnel (Figure 2). Two groundwater monitoring wells (wells HDMW2253-03 and OWDFMW01) are located outside of the RHSF tunnel system. Monitoring data for the two wells located outside the tunnel are included in a separate report.

Monitoring wells RHMW01, RHMW02, RHMW03, and RHMW05 are located inside the underground tunnels. Monitoring well RHMW2254-01 is located inside the infiltration gallery of the Department of the Navy [DON] Well 2254-01. The DON Well 2254-01 is located

approximately 2,400 feet downgradient of the USTs and provides approximately 24 percent [%] of the potable water to the Pearl Harbor System, which serves approximately 52,200 military customers. NAVFAC Public Works Department operates the infiltration gallery and DON Well 2254-01.

TABLE 1.1
Current Status of the USTs
Red Hill Bulk Fuel Storage Facility
July 2013 Quarterly Monitoring Report

Tank Identification	Fuel Type	Status	Capacity
F-1	None	Inactive	12.5 million gallons
F-2	JP-8	Active	12.5 million gallons
F-3	JP-8	Active	12.5 million gallons
F-4	JP-8	Active	12.5 million gallons
F-5	JP-8	Active	12.5 million gallons
F-6	JP-8	Active	12.5 million gallons
F-7	JP-5	Active	12.5 million gallons
F-8	JP-5	Active	12.5 million gallons
F-9	JP-5	Active	12.5 million gallons
F-10	JP-5	Active	12.5 million gallons
F-11	JP-5	Active	12.5 million gallons
F-12	JP-5	Active	12.5 million gallons
F-13	F-76	Active	12.5 million gallons
F-14	F-76	Active	12.5 million gallons
F-15	F-76	Active	12.5 million gallons
F-16	F-76	Active	12.5 million gallons
F-17	JP-5	Active	12.5 million gallons
F-18	JP-5	Active	12.5 million gallons
F-19	None	Inactive	12.5 million gallons
F-20	JP-5	Active	12.5 million gallons

F-76 Marine Diesel Fuel
JP-5 Jet Fuel Propellant-5
JP-8 Jet Fuel Propellant-8

1.2 PHYSICAL SETTING

Climatological conditions in the area of the RHSF consist of warm to moderate temperatures and low to moderate rainfall. The RHSF is leeward of the prevailing northeasterly trade winds. The average annual precipitation is approximately 40 inches, which occurs mainly between November and April (State of Hawaii Department of Land and Natural Resources [DLNR], 1986). Annual pan evaporation is approximately 75 inches (DLNR, 1985). Average temperatures range from the low 60's to high 80's (degrees Fahrenheit) (Atlas of Hawaii, 1983).

Oahu consists of the eroded remnants of two shield volcanoes, Waianae and Koolau. The RHSF is located on the southwest flank of the Koolau volcanic shield. Lavas erupted during the shield-building phase of the volcano belong to the *Koolau Volcanic Series* (Stearns and Vaksvik, 1935). Following formation of the Koolau shield, a long period of volcanic quiescence occurred, during which the shield was deeply eroded. Following this erosional period, eruptive activity resumed. Lavas and pyroclastic material erupted during this period belong to the *Honolulu*

Volcanic Series (Stearns and Vaksvik, 1935).

In the immediate area of the RHSF, Koolau Volcanic Series lavas dominate, although there are consolidated and unconsolidated non-calcareous deposits in the vicinity that consist of alluvium generated during erosion of the Koolau volcanic shield. South-southwest of the RHSF, and in isolated exposures to the west, are pyroclastic deposits formed during eruptions from three Honolulu Volcanic Series vents, Salt Lake, Aliamanu, and Makalapa (Stearns and Vaksvik, 1935). Based on established geology and records of the drilled wells (Stearns and Vaksvik, 1938), the RHSF is underlain by Koolau Volcanic Series basalts. The area of the RHSF is classified as *Rock Land*, where 25-90% of the land surface is covered by exposed rock and there are only shallow soils (Foote, et al., 1972).

Groundwater in Hawaii exists in two principal types of aquifers. The first and most important type, in terms of drinking water resources, is the basal aquifer. The basal aquifer exists as a lens of fresh water floating on and displacing seawater within the pore spaces, fractures, and voids of the basalt that forms the underlying mass of each Hawaiian island. In parts of Oahu, groundwater in the basal aquifer is confined by the overlying caprock and is under pressure. Waters that flow freely to the surface from wells that tap the basal aquifer are referred to as *artesian*.

The second type of aquifer is the caprock aquifer, which consists of various kinds of unconfined and semi-confined groundwater. Commonly, the caprock consists of a thick sequence of nearly impermeable clays, coral, and basalt, which separates the caprock aquifer from the basal aquifer. The impermeable nature of these materials and the artesian nature of the basal aquifer severely restrict the downward migration of groundwater from the upper caprock aquifer. In the area of the RHSF, there is no discernible caprock.

Groundwater in the area of the RHSF is part of the *Waimalu Aquifer System* of the *Pearl Harbor Aquifer Sector.* The aquifer is classified as a basal, unconfined, flank-type; and is currently used as a drinking water source. The aquifer is considered fresh with less than 250 milligrams per liter of chloride and is considered an irreplaceable resource with a high vulnerability to contamination (Mink and Lau, 1990).

The nearest drinking water supply well is DON Well 2254-01, located in the infiltration gallery within the RHSF. The DON Well 2254-01 is located approximately 2,400 feet downgradient of the USTs (Figure 2).

1.3 BACKGROUND

The RHSF was constructed by the U.S. Government in the early 1940s. Twenty USTs and a series of tunnels were constructed. The USTs were constructed of steel and they currently contain JP-5, JP-8, and F-76. Several tanks in the past have stored DON special fuel oil, DON distillate, aviation gasoline, and motor gasoline (Environet, 2010). The fueling system is a self-contained underground unit that was installed into native rock comprised primarily of basalt with

some interbedded tuffs and breccias (Environet, 2010). Each UST measures approximately 245 feet in height and 100 feet in diameter. The upper domes of the tanks lie at a depth varying between 100 feet and 200 feet below ground surface [bgs].

In 1998, Earth Tech conducted a Phase II remedial investigation/feasibility study for the Oily Waste Disposal Facility located within the RHSF. The study involved installing well OWDFMW01 (which was originally MW08) (Earth Tech, 1999).

In February 2001, the DON installed groundwater monitoring well RHMW01 to monitor for contamination in the basal aquifer beneath the RHSF. Well RHMW01 was installed approximately 100 feet below grade within the lower access tunnel. The depth to water was measured at 86 feet below grade at the time of the well completion. In February 2001, a groundwater sample was collected from the well. Total Petroleum Hydrocarbons [TPH] and lead were detected in the samples. Lead was detected at a concentration above the DOH EAL (The Environmental Company, Inc. [TEC], 2009; DOH, 2000).

In 2005, the RHSF groundwater monitoring program was initiated. It involved routine groundwater sampling of wells RHMW01 and RHMW2254-01. Samples were collected in February, June, September, and December of 2005. Lead was detected at concentrations above the DOH EAL in samples collected in February and June. The samples collected in February and June were not filtered prior to analysis, whereas the samples collected in September and December were filtered prior to analysis. Since the samples collected in February and June were not filtered prior to analysis, the lead results were not considered appropriate for a risk assessment (TEC, 2008).

Between June and September 2005, TEC installed three groundwater monitoring wells (wells RHMW02, RHMW03, and RHMW04) within the RHSF (TEC, 2008). Well RHMW04 was installed upgradient of the USTs to provide background geochemistry information for water moving through the basal aquifer beneath the RHSF. Wells RHMW02 and RHMW03 were installed approximately 125 feet below grade within the RHSF lower tunnel and well RHMW04 was installed to a depth of approximately 300 feet bgs outside of the RHSF tunnels. In September 2005, groundwater samples were collected from the three newly installed groundwater monitoring wells (wells RHMW02, RHMW03, and RHMW04) along with the two existing wells (wells RHMW01 and RHMW2254-01). The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-g, TPH-d, naphthalene, trichloroethylene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs.
- **RHMW03** – TPH-d was detected at concentrations above the DOH EAL.

In 2006, TEC installed dedicated sampling pumps in the five wells (wells RHWM01, RHWM02, RHMW03, RHWM04,and RHMW2254-01). In July and December of 2006, groundwater

samples were collected from the five wells. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d and naphthalene were detected at concentrations above the DOH EALs.
- **RHMW02** – TPH-g, TPH-d, and naphthalene were detected at concentrations above the DOH EALs.
- **RHMW03** – TPH-d was detected at concentrations above the DOH EAL.

In 2007, groundwater samples were collected from the four wells RHWM01, RHWM02, RHMW03, and RHMW2254-01. Samples were collected in March, June, and September of 2007. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-g, TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs.
- **RHMW03** – TPH-d was detected at concentrations above the DOH EAL.

In 2008, groundwater samples were collected from wells RHWM01, RHWM02, RHMW03, and RHMW2254-01. Samples were collected in January, April, July, and October of 2008. The COPCs with concentrations exceeding DOH EALs are summarized below. In addition, a groundwater protection plan (TEC, 2008) was prepared.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs.
- **RHMW03** – TPH-d was detected at concentrations above the DOH EAL.

In April 2009, groundwater monitoring well RHMW05 was installed downgradient of the USTs, within the lower access tunnel between RHMW01 and RHMW2254-01. It was installed to identify the extent of contamination downgradient of the USTs. Well RHMW05 was added to the quarterly groundwater sampling program. In 2009, quarterly groundwater samples were collect from wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01. Samples were collected in February, May, July, and October of 2009. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d and 1-methylnaphthalene were detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs.
- **RHMW03** – TPH-d was detected at a concentration above the DOH EAL.
- **RHMW05** – TPH-d was detected at a concentration above the DOH EAL.

In 2010, groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01. Samples were collected in January, April, July, and October. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-g, TPH-d, naphthalene, and 1-methylnaphthalene were detected at concentrations above the DOH EALs.
- **RHMW03** – TPH-d was detected at a concentration above the DOH EAL.
- **RHMW05** – TPH-d was detected at a concentration above the DOH EAL.

In 2011, quarterly groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01. Samples were collected in January, April, July, and October. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-d, naphthalene, indeno[1,2,3-cd]pyrene, and 1-methylnaphthalene were detected at concentrations above the DOH EALs.

In 2012, quarterly groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01. Samples were collected in February, April, July, and November. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-d, TPH-g, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs.

In January 2013, quarterly groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW02** – TPH-d, TPH-g, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs.

In April 2013, quarterly groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs.

In July 2013, quarterly groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW02** – TPH-d, naphthalene, and 1-methylnaphthalene were detected at concentrations above the DOH EALs.

1.3.1 Previous Reports

The following groundwater monitoring reports were previously submitted to the DOH:

1. Groundwater Sampling Report, First Quarter 2005 (submitted April 2005).
2. Groundwater Sampling Report, Second Quarter 2005 (submitted August 2005).
3. Groundwater Sampling Report, Third Quarter 2005 (submitted November 2005).
4. Groundwater Sampling Report, Fourth Quarter 2005 (submitted February 2006).
5. Groundwater Monitoring Results, July 2006 (submitted September 2006).
6. Groundwater Monitoring Results, December 2006 (submitted January 2007).
7. Groundwater Monitoring Results, March 2007 (submitted May 2007).
8. Groundwater Monitoring Results, June 2007 (submitted August 2007).
9. Groundwater Monitoring Results, September 2007 (submitted October 2007).
10. Groundwater Monitoring Report, January 2008 (submitted March 2008).
11. Groundwater Monitoring Report, April 2008 (submitted May 2008).
12. Groundwater Monitoring Report, July 2008 (submitted October 2008).
13. Groundwater Monitoring Report, October and December 2008 (submitted February 2009).
14. Groundwater Monitoring Report, February 2009 (submitted May 2009).
15. Groundwater Monitoring Report, May 2009 (submitted July 2009).
16. Groundwater Monitoring Report, July 2009 (submitted September 2009).
17. Groundwater Monitoring Report, October 2009 (submitted December 2009).
18. Groundwater Monitoring Report, January, February, and March 2010 (submitted April 2010).
19. Groundwater Monitoring Report, April 2010 (submitted May 2010).
20. Groundwater Monitoring Report, July 2010 (submitted August 2010).

21. Groundwater Monitoring Report, October 2010 (submitted December 2010).

22. Groundwater Monitoring Report, January 2011 (submitted March 2011).

23. Groundwater Monitoring Report, April 2011 (submitted June 2011).

24. Groundwater Monitoring Report, July 2011 (submitted September 2011).

25. Groundwater Monitoring Report, October 2011 (submitted December 2011).

26. Groundwater Monitoring Report, January-February 2012 (submitted March 2012).

27. Groundwater Monitoring Report, April 2012 (Submitted July 2012).

28. Groundwater Monitoring Report, October 2012 (Submitted in January 2013).

29. Groundwater Monitoring Report, January 2013 (Submitted in April 2013).

30. Groundwater Monitoring Report, April 2013 (Submitted in July 2013).

31. Groundwater Monitoring Report, July 2013 (Submitted in September 2013).

SECTION 2 – GROUNDWATER SAMPLING

On October 21 and 22, 2013, ESI personnel collected groundwater samples from five monitoring wells at the RHSF (wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01). The samples were collected in accordance with DOH UST release response requirements (DOH, 2000) and the RHSF Groundwater Protection Plan (TEC, 2008). Prior to purging and sampling, the depth to groundwater and the depth to the bottoms of the wells were measured using a Geotech oil/water interface probe. No measurable product, sheen, or petroleum hydrocarbon odor was detected in any of the wells with the exception of RHMW02. A slight petroleum hydrocarbon odor was noticed when collecting groundwater samples from RHMW02.

2.1 GROUNDWATER SAMPLING

Prior to collecting groundwater samples, the monitoring wells were purged of water in the well casings. Each well contains a dedicated bladder pump which was used to purge the well and to collect samples. To operate the pump, a portable air compressor with an in-line filter was connected to a QED MP50 MicroPurge Basics Controller box, which was then connected to the pump. The compressor was turned on to power the pump and the controller was used to adjust the pumping rate to less than one liter of water per minute.

Water quality parameters were monitored on a periodic basis during well purging. The water quality parameters that were measured included hydrogen activity [pH], temperature, conductivity, dissolved oxygen, and oxidation reduction potential. The water quality parameters were evaluated to assess whether the natural characteristics of the aquifer formation water were present within the monitoring wells before collecting the samples. At least four readings were collected during the purging process. Purging was considered complete when at least three consecutive water quality measurements stabilized within approximately 10%. The readings were recorded on groundwater monitoring logs. The groundwater monitoring logs are included in Appendix A. In addition, field notes were taken to document the sampling event. The field notes are included in Appendix B.

When the water quality parameters stabilized, groundwater samples were collected from the wells using the bladder pumps. The groundwater samples were collected no more than two hours after purging was completed to decrease groundwater interaction with the monitoring well casing and atmosphere. Prior to collecting the sample, the water level in the monitoring wells was measured and recorded to ensure that water was not drawn down. The groundwater samples were collected at flow rates of approximately 0.10 to 0.33 liters per minute. Samples collected for dissolved lead analysis were filtered in the field using 0.45 micron filters.

2.2 ANALYTICAL RESULTS

The samples were analyzed for TPH-d using U.S. Environmental Protection Agency [EPA] Method 8015M, TPH-g and Volatile Organic Compounds [VOCs] using EPA Method 8260B,

Polycyclic Aromatic Hydrocarbons [PAHs] using EPA Method 8270C SIM, dissolved lead using EPA Method 6020, and total lead using EPA Method 200.8. The sample collected from well RHMW2254-01 was analyzed for total lead (unfiltered) as DON Well 2254-01 is a drinking water supply well. The analytical results are summarized below and in Table 2.1. A copy of the laboratory report is included in Appendix C.

- **RHMW01** – TPH-d (92 µg/L), TPH-g (15 µg/L), pyrene (0.027 µg/L) and dissolved lead (2.06 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

- **RHMW02** – TPH-d (2,400 µg/L), TPH-g (48 µg/L), acenaphthene (0.54 µg/L), fluorene (0.27 µg/L), 1-methylnaphthalene (9.0 µg/L), 2-methylnaphthalene (9.0 µg/L), naphthalene (30 µg/L), ethylbenzene (0.14 µg/L), and xylenes (0.37 µg/L) were detected. TPH-d and naphthalene were detected at concentrations above the DOH EALs for both drinking water toxicity and gross contamination. 1-methylnaphthalene was detected at a concentration above the DOH EAL for drinking water toxicity.

- **RHMW03** – TPH-d (54 µg/L) and TPH-g (23 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

- **RHMW05** – TPH-g (17 µg/L) and naphthalene (0.17 µg/L) was detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

- **RHMW2254-01** – TPH-g (13 µg/L) and naphthalene (0.036 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

TPH-g was detected in the method and trip blanks at concentrations of 21 and 15 µg/L, respectively. Because of this, it is likely that the TPH-g concentrations detected in the groundwater samples are all biased high.

2.3 GROUNDWATER CONTAMINANT TRENDS

Historical groundwater contaminant concentration trends of COPCs that exceeded the DOH EALs are presented in Appendix D. A summary of groundwater contaminant trends is provided below.

- **RHMW01** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-d has historically been detected at concentrations above the DOH EAL for both drinking water toxicity and gross contamination. TPH-d concentrations have shown a decreasing trend from a high of 1,500 µg/L in February 2005. Other than a concentration of 340 µg/L detected in April 2013, TPH-d concentrations have remained below both DOH EALs since April 2012.

- **RHMW02** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-g, TPH-d, trichloroethylene, 1-methylnaphthalene,

2-methylnaphthalene, and naphthalene have historically been detected at concentrations above the DOH EALs. TPH-d and naphthalene concentrations decreased from the last event in July 2013 but remained above the DOH EALs. 1-methylnaphthalene concentrations fell below the DOH EAL for gross contamination but remained above the drinking water toxicity EAL. The concentrations of 2-methylnaphthalene and TPH-g remained below both DOH EALs. Trichloroethylene has not been detected in RHMW02 since September 2005.

- **RHMW03** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-d has historically been detected at concentrations above the DOH EALs; however, it has not been detected at concentrations above the DOH EALs since October 2010.

- **RHMW05** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-d has historically been detected at concentrations above the DOH EAL for both drinking water toxicity and gross contamination; however, it has not been detected at concentrations above the DOH EALs since January 2010.

- **RHMW2254-01** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-d was last detected at a concentration above the DOH EAL for gross contamination in January 2008. Although the method reporting limits for TPH-d exceeded one or both DOH EALs between May 2009 and July 2010, TPH-d has not been detected at concentrations above the DOH EALs since January 2008.

Historical groundwater contaminants concentrations above the DOH EALs for both drinking water toxicity and gross contamination are presented in Appendix D.

2.4 WASTE DISPOSAL

The purged groundwater and decontamination water generated during sampling of the inside tunnel wells was stored in a 55-gallon drum along with the purged water and decontamination water from the outside tunnel wells. The drum was stored onsite at ADIT 3. On December 11, 2013, the drum of water was picked up by Pacific Commercial Services, LLC and disposed at Unitek Solvent Services, Inc. The waste disposal manifest is included in Appendix E.

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TABLE 2.1
Analytical Results for Groundwater Sampling (October 21 and 22, 2013)
Red Hill Bulk Fuel Storage Facility
October 2013 Quarterly Monitoring Report

Method	Chemical	DOH EALs		RHMW2254-01 (ES041)					RHWM01 (ES037)					RHWM02 (ES038)					RHWM03 (ES040)					RHMW05 (ES042)				
		Drinking Water Toxicity	Gross Contamination	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL
EPA 8015B	TPH-d	190	100	N.D.	U	50	20	15	92	HD	50	20	15	**2,400**	HD	52	21	15	54	HD	50	20	15	N.D.	U	50	20	15
EPA 8260B	TPH-g	100	100	13	B,J	50	30	13	15	B,J	50	30	13	48	B,J	50	30	13	23	B,J	50	30	13	17	B,J	50	30	13
EPA 8270C	Acenaphthene	370	20	N.D.	U	0.2	0.05	0.021	N.D.	U	0.21	0.052	0.021	0.54		0.21	0.053	0.022	N.D.	U	0.2	0.05	0.021	N.D.	U	0.2	0.051	0.021
	Acenaphthylene	240	2,000	N.D.	U	0.2	0.05	0.018	N.D.	U	0.21	0.052	0.019	N.D.	U	0.21	0.053	0.019	N.D.	U	0.2	0.05	0.018	N.D.	U	0.2	0.051	0.018
	Anthracene	1,800	22	N.D.	U	0.2	0.05	0.034	N.D.	U	0.21	0.052	0.035	N.D.	U	0.21	0.053	0.036	N.D.	U	0.2	0.05	0.034	N.D.	U	0.2	0.051	0.035
	Benzo[a]anthracene	0.092	4.7	N.D.	U	0.2	0.05	0.024	N.D.	U	0.21	0.052	0.025	N.D.	U	0.21	0.053	0.025	N.D.	U	0.2	0.05	0.024	N.D.	U	0.2	0.051	0.024
	Benzo[g,h,i]perylene	1,500	0.13	N.D.	U	0.2	0.05	0.022	N.D.	U	0.21	0.052	0.023	N.D.	U	0.21	0.053	0.023	N.D.	U	0.2	0.05	0.022	N.D.	U	0.2	0.051	0.022
	Benzo[a]pyrene	0.2	0.81	N.D.	U	0.2	0.05	0.037	N.D.	U	0.21	0.052	0.038	N.D.	U	0.21	0.053	0.038	N.D.	U	0.2	0.05	0.037	N.D.	U	0.2	0.051	0.037
	Benzo[b]fluoranthene	0.092	0.75	N.D.	U	0.2	0.05	0.025	N.D.	U	0.21	0.052	0.026	N.D.	U	0.21	0.053	0.026	N.D.	U	0.2	0.05	0.025	N.D.	U	0.2	0.051	0.025
	Benzo[k]fluoranthene	0.92	0.4	N.D.	U	0.2	0.05	0.023	N.D.	U	0.21	0.052	0.024	N.D.	U	0.21	0.0533	0.025	N.D.	U	0.2	0.05	0.024	N.D.	U	0.2	0.051	0.024
	Chrysene	9.2	1	N.D.	U	0.2	0.05	0.019	N.D.	U	0.21	0.052	0.020	N.D.	U	0.21	0.053	0.020	N.D.	U	0.2	0.05	0.019	N.D.	U	0.2	0.051	0.019
	Dibenzo[a,h]anthracene	0.0092	0.52	N.D.	U	0.2	0.05	0.027	N.D.	U	0.21	0.052	0.028	N.D.	U	0.21	0.053	0.028	N.D.	U	0.2	0.05	0.027	N.D.	U	0.2	0.051	0.027
	Fluoranthene	1,500	130	N.D.	U	0.2	0.05	0.027	N.D.	U	0.21	0.052	0.028	N.D.	U	0.21	0.053	0.029	N.D.	U	0.2	0.05	0.027	N.D.	U	0.2	0.051	0.028
	Fluorene	240	950	N.D.	U	0.2	0.05	0.025	N.D.	U	0.21	0.052	0.025	0.27		0.21	0.053	0.026	N.D.	U	0.2	0.05	0.025	N.D.	U	0.2	0.051	0.025
	Indeno[1,2,3-cd]pyrene	0.092	0.095	N.D.	U	0.2	0.05	0.022	N.D.	U	0.21	0.052	0.023	N.D.	U	0.21	0.053	0.023	N.D.	U	0.2	0.05	0.022	N.D.	U	0.2	0.051	0.022
	1-Methylnaphthalene	4.7	10	N.D.	U	0.2	0.05	0.028	N.D.	U	0.21	0.052	0.029	**9.0**		0.21	0.53	0.030	N.D.	U	0.2	0.05	0.029	N.D.	U	0.2	0.051	0.029
	2-Methylnaphthalene	24	10	N.D.	U	0.2	0.05	0.027	N.D.	U	0.21	0.052	0.027	9.0		0.21	0.053	0.028	N.D.	U	0.2	0.05	0.027	N.D.	U	0.2	0.051	0.027
	Naphthalene	17	21	0.036	J	0.2	0.05	0.023	N.D.	U	0.21	0.052	0.024	**30**		2.1	0.53	0.24	N.D.	U	0.2	0.05	0.023	0.17	J	0.2	0.051	0.023
	Phenanthrene	240	410	N.D.	U	0.2	0.05	0.031	N.D.	U	0.21	0.052	0.031	N.D.	U	0.21	0.053	0.032	N.D.	U	0.2	0.05	0.031	N.D.	U	0.2	0.051	0.031
	Pyrene	180	68	N.D.	U	0.2	0.05	0.025	0.027	J	0.21	0.052	0.025	N.D.	U	0.21	0.053	0.026	N.D.	U	0.2	0.05	0.025	N.D.	U	0.2	0.051	0.025
EPA 8260B	1,1,1-Trichloroethane	200	970	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3
	1,1,2-Trichloroethane	5	50,000	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38
	1,1-Dichloroethane	2.4	50,000	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28
	1,1-Dichloroethylene	7	1,500	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43
	1,2,3-Trichloropropane	0.6	50,000	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64
	1,2,4-Trichlorobenzene	70	3,000	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5
	1,2-Dibromo-3- chloropropane	0.04	10	N.D.	U	10	2	1.2	N.D.	U	10	2	1.2	N.D.	U	10	2	1.2	N.D.	U	10	2	1.2	N.D.	U	10	2	1.2
	1,2-Dibromoethane	0.04	50,000	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24
	1,2-Dichlorobenzene	600	10	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46
	1,2-Dichloroethane	0.15	7,000	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24
	1,2-Dichloropropane	5	10	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42
	1,3-Dichlorobenzene	180	5	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4
	1,3-Dichloropropene (total of cis/trans)	0.43	50,000	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25
	1,4-Dichlorobenzene	75	5	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43
	Acetone	22,000	20,000	N.D.	U,ICH	20	10	6	N.D.	U,ICH	20	10	6	N.D.	U,ICH	20	10	6	N.D.	U,ICH	20	10	6	N.D.	U,ICH	20	10	6
	Benzene	5	170	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14
	Bromodichloromethane	0.12	50,000	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21
	Bromoform	80	510	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5
	Bromomethane	8.7	50,000	N.D.	U	20	5	3.9	N.D.	U	20	5	3.9	N.D.	U	20	5	3.9	N.D.	U	20	5	3.9	N.D.	U	20	5	3.9
	Carbon Tetrachloride	5	520	N.D.	U	1	0.5	0.23	N.D.	U	1	0.5	0.23	N.D.	U	1	0.5	0.23	N.D.	U	1	0.5	0.23	N.D.	U	1	0.5	0.23
	Chlorobenzene	100	50	N.D.	U	5	0.5	0.17	N.D.	U	5	0.5	0.17	N.D.	U	5	0.5	0.17	N.D.	U	5	0.5	0.17	N.D.	U	5	0.5	0.17
	Chloroethane	21,000	16	N.D.	U	10	5	2.3	N.D.	U	10	5	2.3	N.D.	U	10	5	2.3	N.D.	U	10	5	2.3	N.D.	U	10	5	2.3
	Chloroform	70	2,400	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5	0.46
	Chloromethane	1.8	50,000	N.D.	U,IJ	10	2	1.8	N.D.	U,IJ	10	2	1.8	N.D.	U,IJ	10	2	1.8	N.D.	U,IJ	10	2	1.8	N.D.	U,IJ	10	2	1.8
	cis-1,2-Dichloroethylene	70	50,000	N.D.	U	1	0.5	0.48	N.D.	U	1	0.5	0.48	N.D.	U	1	0.5	0.48	N.D.	U	1	0.5	0.48	N.D.	U	1	0.5	0.48
	Dibromochloromethane	0.16	50,000	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25
	Ethylbenzene	700	30	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	0.14	J	1	0.5	0.14	N.D.	J	1	0.5	0.14	N.D.	J	1	0.5	0.14
	Hexachlorobutadiene	0.86	6	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5	0.32
	Methyl ethyl ketone (2-Butanone)	7,100	8,400	N.D.	U,ICH	10	5.0	2.2	N.D.	U,ICH	10	5.0	2.2	N.D.	U,ICH	10	5.0	2.2	N.D.	U,ICH	10	5.0	2.2	N.D.	U,ICH	10	5.0	2.2
	Methyl isobutyl ketone (4-Methyl-2-Pentanone)	2,000	1300	N.D.	U	10	5.0	4.4	N.D.	U	10	5.0	4.4	N.D.	U	10	5.0	4.4	N.D.	U	10	5.0	4.4	N.D.	U	10	5.0	4.4
	Methyl tert-butyl Ether	12	5	N.D.	U	1	0.5	0.31	N.D.	U	1	0.5	0.31	N.D.	U	1	0.5	0.31	N.D.	U	1	0.5	0.31	N.D.	U	1	0.5	0.31
	Methylene chloride	4.8	9,100	N.D.	U	5	1.0	0.64	N.D.	U	5	1.0	0.64	N.D.	U	5	1.0	0.64	N.D.	U	5	1.0	0.64	N.D.	U	5	1.0	0.64
	Styrene	100	10	N.D.	U	1	0.5	0.17	N.D.	U	1	0.5	0.17	N.D.	U	1	0.5	0.17	N.D.	U	1	0.5	0.17	N.D.	U	1	0.5	0.17
	Tetrachloroethane, 1,1,1,2-	0.52	50,000	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4
	Tetrachloroethane, 1,1,2,2-	0.067	500	N.D.	U	1	0.5	0.41	N.D.	U	1	0.5	0.41	N.D.	U	1	0.5	0.41	N.D.	U	1	0.5	0.41	N.D.	U	1	0.5	0.41
	Tetrachloroethylene	5	170	N.D.	U	5	0.5	0.39	N.D.	U	5	0.5	0.39	N.D.	U	5	0.5	0.39	N.D.	U	5	0.5	0.39	N.D.	U	5	0.5	0.39
	Toluene	1,000	40	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24
	trans-1,2- Dichloroethylene	100	260	N.D.	U	1	0.5	0.37	N.D.	U	1	0.5	0.37	N.D.	U	1	0.5	0.37	N.D.	U	1	0.5	0.37	N.D.	U	1	0.5	0.37
	Trichloroethylene	5	310	N.D.	U	1	0.5	0.37	N.D.	U	1	0.5	0.37	N.D.	U	1	0.5	0.37	N.D.	U	1	0.5	0.37	N.D.	U	1	0.5	0.37
	Vinyl chloride	2	3,400	N.D.	U	1	0.5	0.3	N.D.	U	1	0.5	0.3	N.D.	U	1	0.5	0.3	N.D.	U	1	0.5	0.3	N.D.	U	1	0.5	0.3
	Xylenes	10,000	20	N.D.	U	11	1.5	0.23	N.D.	U	11	1.5	0.23	0.37	J	11	1.5	0.23	N.D.	U	11	1.5	0.23	N.D.	U	11	1.5	0.23
EPA 6020	Dissolved Lead	15	50,000	-	-	-	-	-	2.06		1	0.2	0.0898	N.D.	U	1	0.2	0.0898	N.D.	U	1	0.2	0.0898	N.D.	U	1	0.2	0.0898
EPA 200.8	Total Lead	15	50,000	N.D.	U	1.0	-	0.0898	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The data are in micrograms per liter (µg/L). Shaded values exceeded the DOH EALs.

- Not Analyzed
- * This sample was analyzed by EPA Method 200.8 and therefore does not have an LOD
- B Analyte was present in the associated method blank.
- DL Detection Limit or Method Detection Limit (MDL)
- DOH EALs DOH Tier 1 Environmental Action Levels for groundwater where groundwater is a current drinking water source and surface water is greater than 150 meters from the site (DOH, Fall 2011).
- EPA Environmental Protection Agency
- HD The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
- ICH Initial calibration verification recovery is above the control limit for this analyte.
- IJ Calibration verification recovery is below the control limit for this analyte.
- J Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.
- LOD Limit of Detection
- LOQ Limit of Quantitation
- N.D. Not Detected
- Q Qualifiers
- TPH-d Total Petroleum Hydrocarbons as diesel
- TPH-g Total Petroleum Hydrocarbons as gasoline
- U Undetected at DL and is reported as less than the LOD.

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SECTION 3 – DATA QUALITY ASSESSMENT

A data quality assessment, which consists of a review of the overall groundwater sample collection and analysis process, was performed in order to determine whether the analytical data generated meets the quality objectives for the project. The data quality assessment was performed in accordance with the approved WP/SAP prepared by ESI (ESI, 2012). The field quality control program consisted of standardized sample collection and management procedures, and the collection of field duplicate samples, matrix spike samples, and trip blank samples. The laboratory quality assurance program consisted of the use of standard analytical methods and the preparation and analyses of Matrix Spike [MS]/Matrix Spike Duplicate [MSD] samples, surrogate spikes, blanks, and Laboratory Control Samples [LCSs].

3.1 Data Validation and Assessment

The objective of data validation is to provide data of known quality for project decisions. Data quality is judged in terms of Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity [PARCCS]. A number of factors may affect the quality of data, including: sample collection methods, sample analysis methods, and adherence to established procedures for sample collection, preservation, management, shipment, and analysis.

Precision

Precision is defined as the reproducibility of replicate measurements. Precision is evaluated by Relative Percentage Difference [RPD] of field duplicates and laboratory LCS/Laboratory Control Sample Duplicates [LCSDs] or MS/MSD results. Field duplicate and MS/MSD samples were collected at a rate of approximately 10% of primary samples. Field duplicates were sent to the laboratory along with the primary samples.

The RPDs of primary and field duplicate samples are provided in Table 3.1. With the exception of TPH-g, all duplicate RPDs are less than 20% (below 50% as recommended in the NAVFAC Project Procedures Manual [DON 2007]), and therefore, the data precision is considered acceptable. The concentrations of TPH-g detected in the primary and duplicate samples were both well below the DOH EALs; therefore, the slightly high RPD is unlikely to affect data usability. Additionally, ethylbenzene was detected in the primary sample but not the duplicated sample; however, the concentration detected in the primary sample was equal to the detection limit and well below the DOH EALs, so this is unlikely to affect data usability.

All RPDs for MS/MSD and LCS/LCSD pairs were within the acceptance range.

Accuracy

Accuracy is defined as the degree of conformity of a measurement to a standard or true value. Accuracy is evaluated through measurement of the percent recovery of an analyte in a reference standard or spiked sample. Accuracy limits for surrogates, laboratory control spike, MS, and MSD samples are established by the individual laboratory.

Between July 2006 and July 2010, naphthalene was analyzed for by both EPA Methods 8260B and 8270C, and both results were reported. In September 2005 and in all data beginning in October 2010, only results using EPA Method 8270C were reported. Naphthalene has historically only been detected at concentrations above the DOH EALs in well RHMW02. In this well, concentrations of naphthalene detected in each sample by EPA Method 8260B were generally two to three times higher than those detected by EPA Method 8270C. We assume this is due to the better preservation of VOCs associated with the use of EPA Method 8260B. This suggests that the naphthalene results provided by EPA Method 8270C may be biased low. Since October 2012, naphthalene concentrations in RHMW02 have exceeded DOH EALs for both gross contamination and drinking water toxicity. The naphthalene concentration detected in July 2012 (17 µg/L) was equal to the DOH EAL for drinking water (17 µg/L) but below the DOH EAL for gross contamination (21 µg/L); it is possible that accounting for the low bias, the actual naphthalene concentration detected during this event exceeded both EALs. Naphthalene concentrations between April 2011 and April 2012 were all an order of magnitude below both EALs, and it is unlikely that decisions based on these data are significantly affected by the low bias

Results for TPH-d in samples ES037, ES038, ES039, and ES040 were flagged “HD.” The laboratory indicated a mismatch between the calibration standard and the TPH-d chromatographic profile. Mismatches of this type are not uncommon. The chromatograms are not part of the standard laboratory package and were not reviewed by ESI.

All surrogate spike recoveries for analyzed constituents were within acceptable percent recovery limits. All LCS recoveries were within recovery limits. Naphthalene, 2-methylnaphthalene and 1-methylnaphthalene concentrations for ES038, the primary sample on which the MS/MSD were performed, were significantly higher than the added spike concentration, which prevented an accurate evaluation of the MS/MSD recovery for these analytes.

All other MS and MSD recoveries were within acceptable recovery limits, therefore, the data accuracy for this monitoring event is considered acceptable.

Representativeness

Representativeness is the degree that data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness was achieved by conducting sampling in compliance with the sample collection procedures described in the WP/SAP (ESI, 2012).

Representativeness is also evaluated via compliance with established sample holding time and sample preservation, and through the analysis of blank samples, including method blank and trip blank samples. All sample holding time and sample preservation were in compliance with EPA guidance.

For this sampling event, one trip blank was collected. TPH-g was detected in the trip blank (15 µg/L) and method blank (21 µg/L) at concentrations below the limit of detection [LOD]. TPH-g was detected in all field samples at concentrations below the DOH EALs. It is likely that TPH-g concentrations in the samples have been affected by laboratory contamination and are biased high; however, because the concentrations are all well below the DOH EALs, this is unlikely to affect data usability. Therefore, the groundwater sample data are considered representative of the groundwater quality on site. The trip blank results are provided in Table 3.1.

Completeness

Completeness is defined as the overall percentage of valid analytical results (including estimated results) compared to the total number of analytical results reported by the analytical laboratory. No data were rejected for this project, and therefore the completeness goal for this project (90%), was successfully met.

Comparability

Comparability expresses the confidence with which one data set can be compared to another data set. Comparability can be related to accuracy and precision because these quantities are measures of data reliability. Data, with acceptable precision and accuracy, are considered comparable if collection techniques, analytical procedures, methods and reporting are equivalent.

Between July 2006 and July 2010, naphthalene was analyzed for by both EPA Methods 8260B and 8270C, and both results were reported. In September 2005 and in all data beginning in October 2010, only results using EPA Method 8270C were reported. In general, EPA Method 8260B resulted in higher, and as discussed above likely more accurate, results than EPA Method 8270C. However, for the sake of comparability with results from recent events, EPA Method 8270C was used for naphthalene analysis in this event. Consequently, the low bias associated with Method 8270C should be considered when making project decisions.

All TPH-g data through July 2010 were analyzed by EPA Method 8015; beginning in October 2010, EPA Method 8260B was used. There was no event where both methods were used; consequently, there is no way to directly compare the results obtained by method and to assess potential bias. However, there is no reason to believe that using either method should bias the data, and the TPH-g data for all events should be comparable.

Other than the naphthalene bias discussed above, no issues with comparability were identified. The results are considered comparable within this data set and with the data collected from recent sampling events.

Sensitivity

The limits of quantitation [LOQs] are established by the laboratory based on the LODs or instrument detection limits, historical data, and EPA limits established for the methods. The LOQs for samples may require adjustment due to matrix interference or if high levels of target

analytes necessitate dilution before analysis. Matrix interference and sample dilutions have the effect of increasing the LOQs. Laboratory LODs and LOQs for several analytes differed from the LODs and LOQs in the WP/SAP because the laboratory updates them quarterly and in some cases, dilution was necessary due to the presence of high concentrations of analytes.

LODs and LOQs for several analytes were greater than the DOH EALs (as stated in the WP/SAP), and therefore it is not possible to determine whether the analytes are present at concentrations greater than or equal to the DOH EALs. As suggested by the DOH Technical Guidance Manual, when the LOQ exceeds the DOH EAL, the project action level will be the LOQ for these analytes. The affected analytes for this monitoring event are 1,1-dichloroethane, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane, 1,2-dichloroethane, 1,3-dichloropropene, bromodichloromethane, bromomethane, chloromethane, dibromochloromethane, hexachlorobutadiene, methylene chloride, 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, benzo[a]anthracene, benzo[g,h,i]perylene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene.

3.2 Data Assessment and Usability Conclusions

The PARCCS criteria were evaluated, and with a few exceptions, all criteria were met. TPH-g contamination in the trip and method blanks shows that there may be a slight high bias in the TPH-g groundwater sample results; however, it is unlikely that this affects the usability of the data for making project decisions. The data assessment concludes that all data generated during this event are usable for the intended purpose.

TABLE 3.1
Quality Control Results for Groundwater Sampling (October 21, 2013)
Red Hill Bulk Fuel Storage Facility
October 2013 Quarterly Monitoring Report

Method	Chemical Constituent	DOH EALs		RHMW02 (ES038)					RHMW02 (ES039) (DUP)					RPD Duplicate (%)	ES Trip				
		Drinking Water Toxicity	Gross Contamination	Result	Q	LOQ	LOD	DL	Result	Q	LOQ	LOD	DL		Result	Q	LOQ	LOD	DL
EPA 8015B	TPH-d	190	100	**2,400**	HD	52	21	15	**2,400**	HD	50	21	15	0	-	-	-	-	-
EPA 8260B	TPH-g	100	100	48	B,J	50	30	13	63	B	50	30	13	27.03	15	B,J	50	30	13
EPA 8270C	Acenaphthene	370	20	0.54		0.21	0.053	0.022	0.57		0.21	0.052	0.021	5.41	-	-	-	-	-
	Acenaphthylene	240	2,000	N.D.	U	0.21	0.053	0.019	N.D.	U	0.21	0.052	0.019	NA	-	-	-	-	-
	Anthracene	1,800	22	N.D.	U	0.21	0.053	0.036	N.D.	U	0.21	0.052	0.035	NA	-	-	-	-	-
	Benzo[a]anthracene	0.092	4.7	N.D.	U	0.21	0.053	0.025	N.D.	U	0.21	0.052	0.025	NA	-	-	-	-	-
	Benzo[g,h,i]perylene	1,500	0.13	N.D.	U	0.21	0.053	0.023	N.D.	U	0.21	0.052	0.023	NA	-	-	-	-	-
	Benzo[a]pyrene	0.2	0.81	N.D.	U	0.21	0.053	0.038	N.D.	U	0.21	0.052	0.038	NA	-	-	-	-	-
	Benzo[b]fluoranthene	0.092	0.75	N.D.	U	0.21	0.053	0.026	N.D.	U	0.21	0.052	0.026	NA	-	-	-	-	-
	Benzo[k]fluoranthene	0.92	0.4	N.D.	U	0.21	0.0533	0.025	N.D.	U	0.21	0.052	0.024	NA	-	-	-	-	-
	Chrysene	9.2	1	N.D.	U	0.21	0.053	0.020	N.D.	U	0.21	0.052	0.020	NA	-	-	-	-	-
	Dibenzo[a,h]anthracene	0.0092	0.52	N.D.	U	0.21	0.053	0.028	N.D.	U	0.21	0.052	0.028	NA	-	-	-	-	-
	Fluoranthene	1,500	130	N.D.	U	0.21	0.053	0.029	N.D.	U	0.21	0.052	0.028	NA	-	-	-	-	-
	Fluorene	240	950	0.27		0.21	0.053	0.026	0.31		0.21	0.052	0.025	13.79	-	-	-	-	-
	Indeno[1,2,3-cd]pyrene	0.092	0.095	N.D.	U	0.21	0.053	0.023	N.D.	U	0.21	0.052	0.023	NA	-	-	-	-	-
	1-Methylnaphthalene	4.7	10	**9.0**		0.21	0.53	0.030	**7.5**		0.21	0.052	0.029	18.18	-	-	-	-	-
	2-Methylnaphthalene	24	10	9.0		0.21	0.053	0.028	7.5		0.21	0.052	0.027	18.18	-	-	-	-	-
	Naphthalene	17	21	**30**		2.1	0.53	0.24	**25**		2.1	0.52	0.24	18.18	-	-	-	-	-
	Phenanthrene	240	410	N.D.	U	0.21	0.053	0.032	N.D.	U	0.21	0.052	0.032	NA	-	-	-	-	-
	Pyrene	180	68	N.D.	U	0.21	0.053	0.026	N.D.	U	0.21	0.052	0.026	NA	-	-	-	-	-
EPA 8260B	1,1,1-Trichloroethane	200	970	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3	NA	N.D.	U	5	0.5	0.3
	1,1,2-Trichloroethane	5	50,000	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	NA	N.D.	U	1	0.5	0.38
	1,1-Dichloroethane	2.4	50,000	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28	NA	N.D.	U	5	0.5	0.28
	1,1-Dichloroethylene	7	1,500	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	NA	N.D.	U	1	0.5	0.43
	1,2,3-Trichloropropane	0.6	50,000	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64	NA	N.D.	U	5	1	0.64
	1,2,4-Trichlorobenzene	70	3,000	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5	NA	N.D.	U	5	1	0.5
	1,2-Dibromo-3- chloropropane	0.04	10	N.D.	U	10	2	1.2	N.D.	U	10	2	1.2	NA	N.D.	U	10	2	1.2
	1,2-Dibromoethane	0.04	50,000	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	NA	N.D.	U	1	0.5	0.24
	1,2-Dichlorobenzene	600	10	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	NA	N.D.	U	1	0.5	0.46
	1,2-Dichloroethane	0.15	7,000	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	NA	N.D.	U	1	0.5	0.24
	1,2-Dichloropropane	5	10	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42	NA	N.D.	U	5	0.5	0.42
	1,3-Dichlorobenzene	180	5	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	NA	N.D.	U	1	0.5	0.4
	1,3-Dichloropropene (total of cis/trans)	0.43	50,000	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	NA	N.D.	U	1	0.5	0.25
	1,4-Dichlorobenzene	75	5	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	NA	N.D.	U	1	0.5	0.43
	Acetone	22,000	20,000	N.D.	U,ICH	20	10	6	N.D.	U,ICH	20	10	6	NA	N.D.	U	20	10	6
	Benzene	5	170	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	NA	N.D.	U	1	0.5	0.14
	Bromodichloromethane	0.12	50,000	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	NA	N.D.	U	5	0.5	0.21
	Bromoform	80	510	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5	NA	N.D.	U	10	1	0.5
	Bromomethane	8.7	50,000	N.D.	U	20	5	3.9	N.D.	U	20	5	3.9	NA	N.D.	U	20	5	3.9
	Carbon Tetrachloride	5	520	N.D.	U	1	0.5	0.23	N.D.	U	1	0.5	0.23	NA	N.D.	U	1	0.5	0.23
	Chlorobenzene	100	50	N.D.	U	5	0.5	0.17	N.D.	U	5	0.5	0.17	NA	N.D.	U	5	0.5	0.17
	Chloroethane	21,000	16	N.D.	U	10	5	2.3	N.D.	U	10	5	2.3	NA	N.D.	U	10	5	2.3
	Chloroform	70	2,400	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5	0.46	NA	N.D.	U	5	0.5	0.46
	Chloromethane	1.8	50,000	N.D.	U,IJ	10	2	1.8	N.D.	U,IJ	10	2	1.8	NA	N.D.	U	10	2	1.8
	cis-1,2-Dichloroethylene	70	50,000	N.D.	U	1	0.5	0.48	N.D.	U	1	0.5	0.48	NA	N.D.	U	1	0.5	0.48
	Dibromochloromethane	0.16	50,000	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	NA	N.D.	U	1	0.5	0.25
	Ethylbenzene	700	30	0.14	J	1	0.5	0.14	N.D.	J	1	0.5	0.14	NA	N.D.	U	1	0.5	0.14
	Hexachlorobutadiene	0.86	6	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5	0.32	NA	N.D.	U	1	0.5	0.32
	Methyl ethyl ketone (2-Butanone)	7,100	8,400	N.D.	U,ICH	10	5.0	2.2	N.D.	U,ICH	10	5.0	2.2	NA	N.D.	U	10	5.0	2.2
	Methyl isobutyl ketone (4-Methyl-2-Pentanone)	2,000	1300	N.D.	U	10	5.0	4.4	N.D.	U	10	5.0	4.4	NA	N.D.	U	10	5.0	4.4
	Methyl tert-butyl Ether	12	5	N.D.	U	1	0.5	0.31	N.D.	U	1	0.5	0.31	NA	N.D.	U	1	0.5	0.31
	Methylene chloride	4.8	9,100	N.D.	U	5	1.0	0.64	N.D.	U	5	1.0	0.64	NA	N.D.	U	5	1.0	0.64
	Styrene	100	10	N.D.	U	1	0.5	0.17	N.D.	U	1	0.5	0.17	NA	N.D.	U	1	0.5	0.17
	Tetrachloroethane, 1,1,1,2-	0.52	50,000	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	NA	N.D.	U	1	0.5	0.4
	Tetrachloroethane, 1,1,2,2-	0.067	500	N.D.	U	1	0.5	0.41	N.D.	U	1	0.5	0.41	NA	N.D.	U	1	0.5	0.41
	Tetrachloroethylene	5	170	N.D.	U	5	0.5	0.39	N.D.	U	5	0.5	0.39	NA	N.D.	U	5	0.5	0.39
	Toluene	1,000	40	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	NA	N.D.	U	1	0.5	0.24
	trans-1,2- Dichloroethylene	100	260	N.D.	U	1	0.5	0.37	N.D.	U	1	0.5	0.37	NA	N.D.	U	1	0.5	0.37
	Trichloroethylene	5	310	N.D.	U	1	0.5	0.37	N.D.	U	1	0.5	0.37	NA	N.D.	U	1	0.5	0.37
	Vinyl chloride	2	3,400	N.D.	U	1	0.5	0.3	N.D.	U	1	0.5	0.3	NA	N.D.	U	1	0.5	0.3
	Xylenes	10,000	20	0.37	J	11	1.5	0.23	0.37	J	11	1.5	0.23	0	N.D.	U	11	1.5	0.23
EPA 6020	Lead	15	50,000	N.D.	U	1	0.2	0.0898	N.D.	U	1	0.2	0.0898	NA	-	-	-	-	-

The data are in micrograms per liter (µg/L). Shaded values exceeded the DOH EALs.

- Not Analyzed
B Analyte was present in the associated method blank.
DOH EALs DOH Tier 1 Environmental Action Levels for groundwater where groundwater is a current drinking water source and surface water is greater than 150 meters from the site (DOH, Fall 2011).
DL Detection Limit or Method Detection Limit (MDL)
EPA Environmental Protection Agency
HD The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
ICH Initial calibration verification recovery is above the control limit for this analyte.
IJ Calibration verification recovery is below the control limit for this analyte.
J Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.
LOD Limit of Detection
LOQ Limit of Quantitation
NA Both results for duplicate pair were non-detect, no RPD calculations
N.D. Not Detected
Q Qualifiers
TPH-g Total Petroleum Hydrocarbons as gasoline
TPH-d Total Petroleum Hydrocarbons as diesel
U Undetected at DL and is reported as less than the LOD.

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SECTION 4 – SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

On October 21 and 22, 2013, ESI personnel collected groundwater samples from five monitoring wells at the RHSF (wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01).

The groundwater sampling was conducted as part of the long-term groundwater and soil vapor monitoring at the RHSF, under NAVFAC Contract Number N62742-12-D-1853. The sampling was conducted in accordance with the approved WP/SAP prepared by ESI. A summary of the analytical results is provided below.

- **RHMW01** – TPH-d (92 µg/L), TPH-g (15 µg/L), pyrene (0.027 µg/L) and dissolved lead (2.06 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

- **RHMW02** – TPH-d (2,400 µg/L), TPH-g (48 µg/L), acenaphthene (0.54 µg/L), fluorene (0.27 µg/L), 1-methylnaphthalene (9.0 µg/L), 2-methylnaphthalene (9.0 µg/L), naphthalene (30 µg/L), ethylbenzene (0.14 µg/L), and xylenes (0.37 µg/L) were detected. TPH-d and naphthalene were detected at concentrations above the DOH EALs for both drinking water toxicity and gross contamination. 1-methylnaphthalene was detected at a concentration above the DOH EAL for drinking water toxicity.

- **RHMW03** – TPH-d (54 µg/L) and TPH-g (23 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

- **RHMW05** – TPH-g (17 µg/L) and naphthalene (0.17 µg/L) was detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

- **RHMW2254-01** – TPH-g (13 µg/L) and naphthalene (0.036 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

TPH-g was detected in the method and trip blanks at concentrations of 21 and 15 µg/L, respectively. Because of this, it is likely that the TPH-g concentrations detected in the groundwater samples are all biased high.

Groundwater Contaminant Trends

- **RHMW01** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-d has historically been detected at concentrations above the DOH EAL for both drinking water toxicity and gross contamination. TPH-d concentrations have shown a decreasing trend from a high of 1,500 µg/L in February 2005. Other than a concentration of 340 µg/L detected in April 2013, TPH-d concentrations have remained below both DOH EALs since April 2012.

- **RHMW02** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-g, TPH-d, trichloroethylene, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene have historically been detected at concentrations above the DOH EALs. TPH-d and naphthalene concentrations decreased from the last event in July 2013 but remained above the DOH EALs. 1-methylnaphthalene concentrations fell below the DOH EAL for gross contamination but remained above the drinking water toxicity EAL. The concentrations of 2-methylnaphthalene and TPH-g remained below both DOH EALs. Trichloroethylene has not been detected in RHMW02 since September 2005.

- **RHMW03** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-d has historically been detected at concentrations above the DOH EALs; however, it has not been detected at concentrations above the DOH EALs since October 2010.

- **RHMW05** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-d has historically been detected at concentrations above the DOH EAL for both drinking water toxicity and gross contamination; however, it has not been detected at concentrations above the DOH EALs since January 2010.

- **RHMW2254-01** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-d was last detected at a concentration above the DOH EAL for gross contamination in January 2008. Although the method reporting limits for TPH-d exceeded one or both DOH EALs between May 2009 and July 2010, TPH-d has not been detected at concentrations above the DOH EALs since January 2008.

Conclusions and Recommendations

Since the wells were last sampled (July 2013), groundwater contaminant concentrations in four wells (RHMW01, RHMW03, RHMW05, and RHMW2254-01) remained at low concentrations and did not change significantly, or were not detected. Only the groundwater samples from RHMW02 had concentrations of COPCs exceeding the DOH EALs. TPH-d, 1-methylnaphthalene, and naphthalene concentrations in RHMW02 decreased slightly from the last event in July 2013 but remained above the DOH EALs.

Based on the results of the groundwater monitoring, continuing the groundwater monitoring program at the RHSF is recommended.

SECTION 5 – FUTURE WORK

GROUNDWATER SAMPLING

Future work includes the first quarter 2014 groundwater monitoring which is scheduled for January 2014. It is anticipated that the quarterly groundwater monitoring status report will be submitted in March 2014.

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SECTION 6 – REFERENCES

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FIGURES

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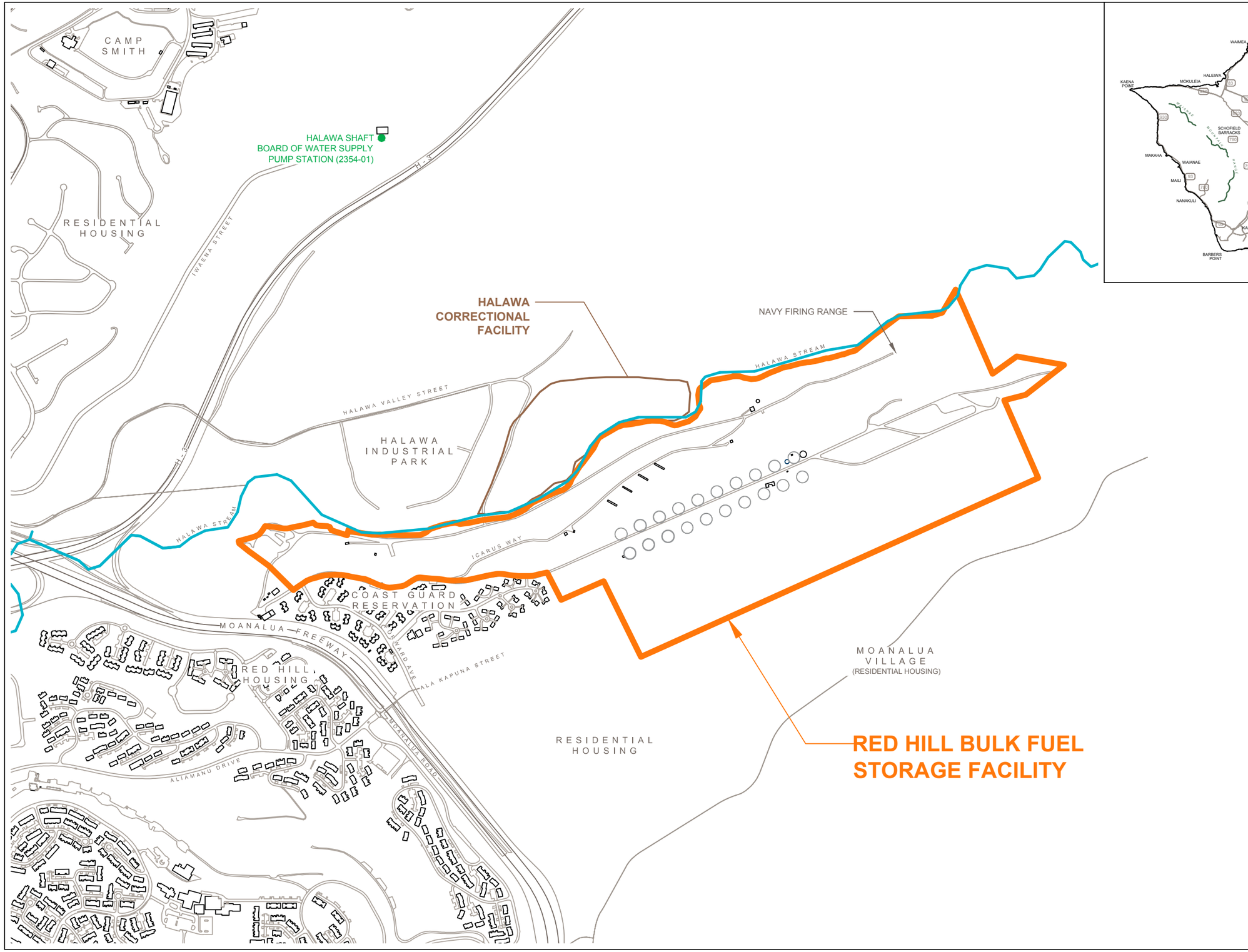

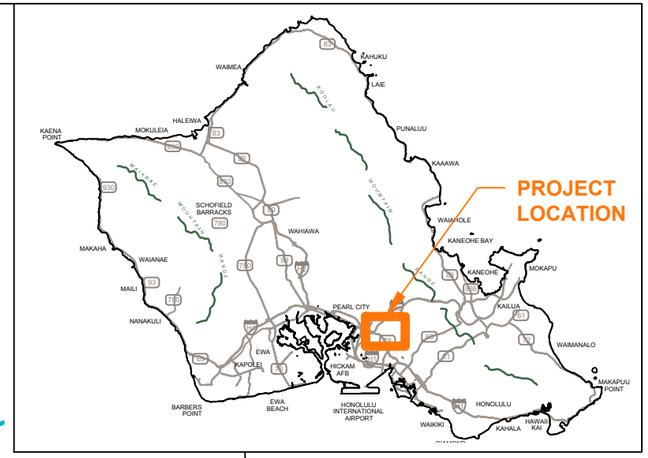

NOTES

The accuracy of this document is limited to the quality and scale of the source information. This document is not a legal representation of an engineered survey.

SOURCES

Pearl Harbor Base Map

Navy GIS files

NORTH

GRAPHIC SCALE

900 0 900

Scale in Feet

FIGURE 1

SITE LOCATION

GROUNDWATER MONITORING
RED HILL BULK FUEL STORAGE FACILITY
NAVAL SUPPLY SYSTEM COMMAND (NAVSUP)
FLEET LOGISTICS CENTER
JBPHH, OAHU, HAWAII

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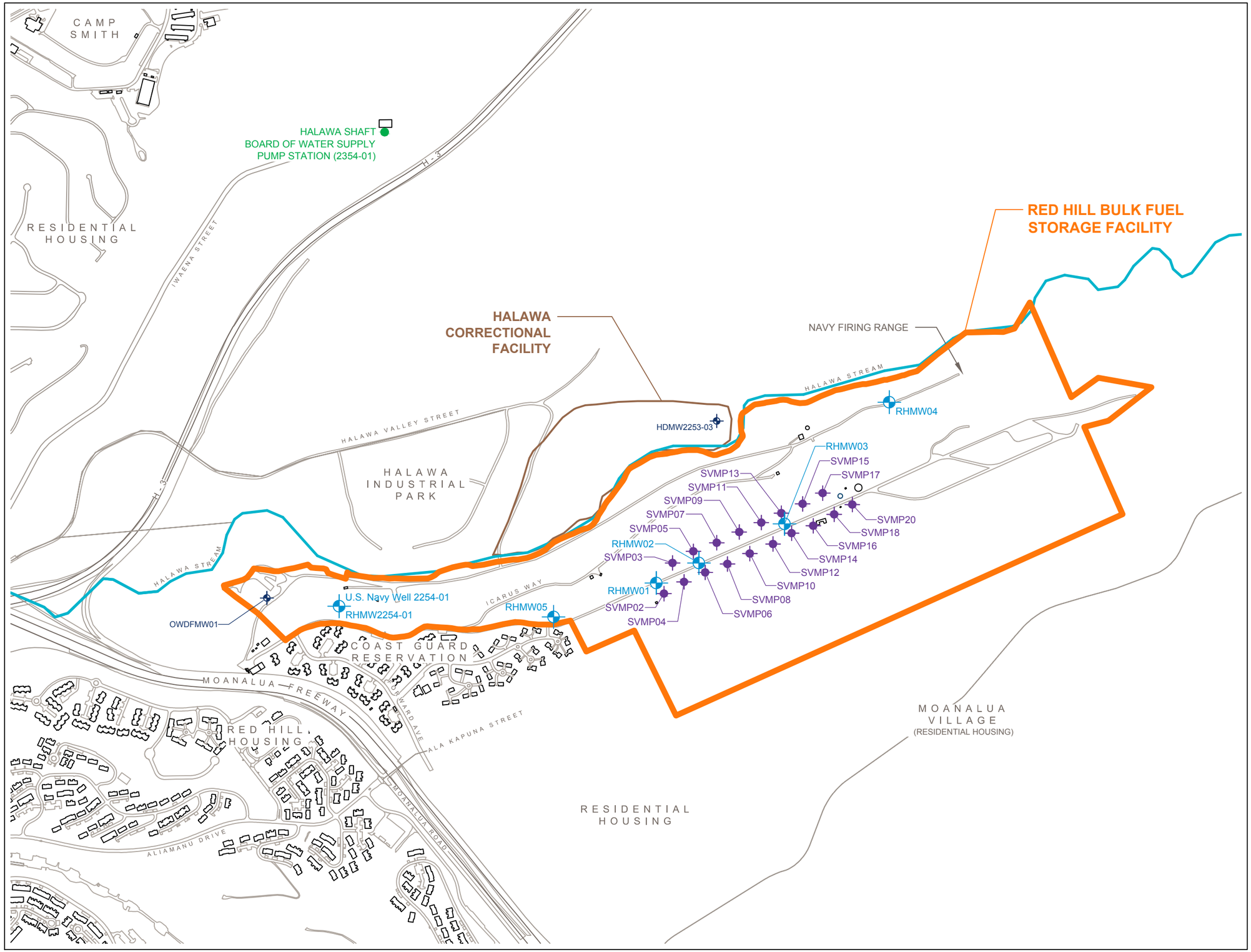

LEGEND

- RED HILL BULK FUEL STORAGE FACILITY
- HALAWA CORRECTIONAL FACILITY
- HALAWA STREAM
- BUILDING
- ROAD
- ABOVEGROUND STORAGE TANK
- WATER TANK
- SOIL VAPOR MONITORING POINT
- GROUNDWATER MONITORING WELL LOCATED INSIDE TUNNEL
- GROUNDWATER MONITORING WELL LOCATED OUTSIDE TUNNEL
- BOARD OF WATER SUPPLY PUMP STATION

NOTES

The accuracy of this document is limited to the quality and scale of the source information. This document is not a legal representation of an engineered survey.

SOURCES

Pearl Harbor Base Map

Navy GIS files

NORTH

GRAPHIC SCALE

1,200 0 1,200

Scale in Feet

FIGURE 2

SITE LAYOUT

GROUNDWATER MONITORING
RED HILL BULK FUEL STORAGE FACILITY
NAVAL SUPPLY SYSTEM COMMAND (NAVSUP)
FLEET LOGISTICS CENTER
JBPHH, OAHU, HAWAII

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APPENDIX A

Groundwater Sampling Logs

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Groundwater Sampling Log

Well ID: RHMW01 Location: Red Hill Bulk Fuel Storage Facility Project No.: 112066

Initial Water Level: 84.47 ft Date: 10/21/2013 Time: 920

Total Depth of Well: 97.40 ft Personnel Involved: Branden Ibara, Jeff Harttemer

Length of Saturated Zone: - Weather Conditions: -

Volume of Water to be Removed: - Method of Removal: Bladder Pump

Water Level After Purging: 84.47 ft Pumping Rate: 0.11 L/min

Well Purge Data:

Time	Volume Removed	pH	Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
952	0.0 L	7.05	0.296	8.35	26.25	-	18.6
1005	1.0 L	7.11	0.368	2.83	24.85	-	-55.9
1013	2.0 L	7.10	0.364	1.07	24.84	-	-43.6
1025	3.0 L	7.09	0.363	0.91	24.75	-	-41.4
1035	4.0 L	7.05	0.359	0.76	24.74	-	-40.0
1044	5.0 L	7.00	0.355	0.74	24.68	-	-34.7

Sample Withdrawal Method: Bladder Pump

Appearance of Sample:

Color: Clear

Turbidity: Low

Sediment: None

Other: None

Laboratory Analysis Parameters and Preservatives: TPH-d - 8015; TPH-g, VOCs - 8260; PAHs - 8270c sim; lead - 6020

Number and Types of Sample Containers: 6 - 40ml VOAs, 2 - 1L amber jar, 1 - 500ml amber jar, 1 - 250ml HDPE

Sample Identification Numbers: ES037 [1030]

Decontamination Procedures: Triple Rinsed

Notes: YSI did not have salinity parameter.

Sampled by: Branden Ibara, Jeff Harttemer

Sampled Delivered to: Calscience Environmental Lab Transporters: FedEx

Date: 10/22/2013 Time: 1200

Capacity of Casing (Gallons/Linear Feet)

2"-0.16• 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87

Groundwater Sampling Log

Well ID: RHMW02 Location: Red Hill Bulk Fuel Storage Facility Project No.: 112066

Initial Water Level: 87.08 ft Date: 10/21/2013 Time: 1105

Total Depth of Well: 94.35 ft Personnel Involved: Branden Ibara, Jeff Harttemer

Length of Saturated Zone: - Weather Conditions: -

Volume of Water to be Removed: 5.0 L Method of Removal: Bladder Pump

Water Level After Purging: 87.08 ft Pumping Rate: 0.45 L/min

Well Purge Data:

Time	Volume Removed	pH	Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
1107	0.0 L	7.89	0.562	8.20	25.57	-	24.3
1110	1.0 L	6.72	0.608	1.24	24.25	-	-95.7
1112	2.0 L	6.60	0.612	0.50	23.84	-	-108.5
1114	3.0 L	6.57	0.613	0.35	23.72	-	-105.1
1116	4.0 L	6.56	0.614	0.38	23.69	-	-102.8
1118	5.0 L	6.53	0.614	0.39	23.79	-	-96.1

Sample Withdrawal Method: Bladder Pump

Appearance of Sample:

Color: Clear

Turbidity: Low

Sediment: None

Other: Slight PHC Odor

Laboratory Analysis Parameters and Preservatives: TPH-d - 8015; TPH-g, VOCs - 8260; PAHs - 8270c sim; lead - 6020

Number and Types of Sample Containers: 16 - 40ml VOAs, 6 - 1L amber jar, 4 - 500ml amber jar, 4 - 500ml HDPE

Sample Identification Numbers: ES038 [1125], ES038 MS/MSD [1125], ES039 (Dup) [1200]

Decontamination Procedures: Triple Rinsed

Notes: YSI did not have salinity parameter.

Sampled by: Branden Ibara, Jeff Harttemer

Sampled Delivered to: Calscience Environmental Lab Transporters: FedEx

Date: 10/22/2013 Time: 1200

Capacity of Casing (Gallons/Linear Feet)

2"-0.16• 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87

Groundwater Sampling Log

Well ID: RHMW03 Location: Red Hill Bulk Fuel Storage Facility Project No.: 112066

Initial Water Level: 103.31 ft Date: 10/21/2013 Time: 1217

Total Depth of Well: 110.12 ft Personnel Involved: Branden Ibara, Jeff Harttemer

Length of Saturated Zone: - Weather Conditions: -

Volume of Water to be Removed: 6.0 L Method of Removal: Bladder Pump

Water Level After Purging: 103.59 ft Pumping Rate: 0.3 L/min

Well Purge Data:

Time	Volume Removed	pH	Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
1219	0.0 L	8.70	0.752	7.40	27.66	-	29.8
1223	1.0 L	6.97	0.773	5.12	26.84	-	31.4
1226	2.0 L	6.82	0.775	2.53	26.45	-	24.4
1229	3.0 L	6.81	0.770	2.17	26.39	-	21.6
1232	4.0 L	6.82	0.769	2.29	26.39	-	20.5
1236	5.0 L	6.85	0.769	2.13	26.42	-	19.2
1239	6.0 L	6.85	0.769	2.15	26.44	-	18.9

Sample Withdrawal Method: Bladder Pump

Appearance of Sample:

Color: Clear

Turbidity: Low

Sediment: None

Other: None

Laboratory Analysis Parameters and Preservatives: TPH-d - 8015; TPH-g, VOCs - 8260; PAHs - 8270c sim; lead - 6020

Number and Types of Sample Containers: 6 - 40ml VOAs, 2 - 1L amber jar, 1 - 500ml amber jar, 1 - 250ml HDPE

Sample Identification Numbers: ES040 [1300]

Decontamination Procedures: Triple Rinsed

Notes: YSI did not have salinity parameter.

Sampled by: Branden Ibara, Jeff Harttemer

Sampled Delivered to: Calscience Environmental Lab Transporters: FedEx

Date: 10/22/2013 Time: 1200

Capacity of Casing (Gallons/Linear Feet)

2"-0.16• 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87

Groundwater Sampling Log

Well ID: RHMW05 Location: Red Hill Bulk Fuel Storage Facility Project No.: 112066

Initial Water Level: 83.80 ft Date: 10/22/2013 Time: 940

Total Depth of Well: - Personnel Involved: Branden Ibara, Jeff Harttemer

Length of Saturated Zone: - Weather Conditions: -

Volume of Water to be Removed: - Method of Removal: Bladder Pump

Water Level After Purging: 83.81 ft Pumping Rate: 0.33 L/min

Well Purge Data:

Time	Volume Removed	pH	Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
947	0.0 L	8.17	0.954	9.51	24.24	-	-134.0
950	1.0 L	7.7	0.935	8.55	23.18	-	-125.5
954	2.0 L	7.51	0.924	8.22	22.94	-	-119.4
958	3.0 L	7.25	0.935	8.52	22.36	-	-108.3
1000	4.0 L	7.16	0.944	8.51	22.33	-	-105.3
1002	5.0 L	7.16	0.946	8.47	22.34	-	-105.6

Sample Withdrawal Method: Bladder Pump

Appearance of Sample:

Color: Clear

Turbidity: Clear

Sediment: None

Other: None

Laboratory Analysis Parameters and Preservatives: TPH-d - 8015; TPH-g, VOCs - 8260; PAHs - 8270c sim; lead - 6020

Number and Types of Sample Containers: 6 - 40ml VOAs, 2 - 1L amber jar, 1 - 500ml amber jar, 1 - 250ml HDPE

Sample Identification Numbers: ES042 [1015]

Decontamination Procedures: Triple Rinsed

Notes: YSI did not have salinity parameter.

Sampled by: Branden Ibara, Jeff Harttemer

Sampled Delivered to: Calscience Environmental Lab Transporters: FedEx

Date: 10/22/2013 Time: 1200

Capacity of Casing (Gallons/Linear Feet)

2"-0.16• 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87

Groundwater Sampling Log

Well ID: RHMW2254-01 Location: Red Hill Bulk Fuel Storage Facility Project No.: 112066

Initial Water Level: - Date: 10/22/2013 Time: 845

Total Depth of Well: - Personnel Involved: Branden Ibara, Jeff Harttemer

Length of Saturated Zone: - Weather Conditions: -

Volume of Water to be Removed: - Method of Removal: Bladder Pump

Water Level After Purging: - Pumping Rate: 0.33 L/min

Well Purge Data:

Time	Volume Removed	pH	Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
847	0.0 L	7.26	0.607	8.66	23.88	-	-113.9
850	1.0 L	7.49	0.608	8.55	22.33	-	-123.8
853	2.0 L	7.30	0.606	8.48	22.13	-	-110.0
856	3.0 L	7.04	0.606	8.5	22.04	-	-99.4
859	4.0 L	7.14	0.607	8.45	22.01	-	-105.2

Sample Withdrawal Method: Bladder Pump

Appearance of Sample:

Color: Clear

Turbidity: Clear

Sediment: None

Other: None

Laboratory Analysis Parameters and Preservatives: TPH-d - 8015; TPH-g, VOCs - 8260; PAHs - 8270c sim; lead - 200.8

Number and Types of Sample Containers: 6 - 40ml VOAs, 2 - 1L amber jar, 1 - 500ml amber jar, 1 - 250ml HDPE

Sample Identification Numbers: ES041, ES041 UF [0900]

Decontamination Procedures: Triple Rinsed

Notes: YSI did not have salinity parameter.

Sampled by: Branden Ibara, Jeff Harttemer

Sampled Delivered to: Calscience Environmental Lab Transporters: FedEx

Date: 10/22/2013 Time: 1200

Capacity of Casing (Gallons/Linear Feet)

2"-0.16• 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87

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APPENDIX B

Field Notes

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100

Location Red Hill Date 10/21/13

Project / Client NAVFAC

Purpose: GW samplings
Personnel: JH, BI
0730 Meet @ office, Load equipment
0800 @ Red Hill, H&S meeting
0805 Calibrate YSI.
0810 Drop off drum and pallet, waiting for TA to bring extention cords
0900 Entered Red Hill Tunnels
0920 Gauge RHMW01 - DTW: 84.47' btoc.
0925 Begin purging RHMW01
1030 Collected ES037 from RHMW01
1100 RHMW02 DTW: 87.08'
1107 Start purging RHMW02
1125 Collected ES036, ES036MS/MSD & ES039 (Dup) from RHMW02
1217 RHMW03 DTW: 103.31
1220 Start purging RHMW03
1300 Collected ES040 from RHMW03
1335 Dropped off IDW and depart site.

JH 10/21/13

101

Location Red Hill Date 10/22/13

Project / Client NAVFAC

Purpose: Groundwater Samplings
Personnel: JH, BI
0700 Meet @ office. Load equipment
0800 Entered Red Hill tunnels
830 Arrived at Pump House
845 Started purging RHMW2254-01
0900 Collected ES041 & ES041 DUP from RHMW2254-01
0940 RHMW-05
DTW 83.80
0944 Start to purge RHMW05
1015 Collected ES042 from RHMW05
1100 Exited tunnels, Drop off IDW Exit Site
1200 Meet Ann Dang. Drop off three coolers at Fed Ex to ship to Calscience.
1215 Depart Fed Ex.

JH 10/21/13

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APPENDIX C

Laboratory Reports

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Calscience Environmental Laboratories, Inc.

CALSCIENCE

WORK ORDER NUMBER: 13-10-1794

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Environmental Science International, Inc.

Client Project Name: Red Hill LTM 112066

Attention: Robert Chong
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Approved for release on 10/31/2013 by:
Richard Villafania
Project Manager

ResultLink

Email your PM

Calscience Environmental Laboratories, Inc.

Contents

Client Project Name: Red Hill LTM 112066
Work Order Number: 13-10-1794

Calscience Environmental Laboratories, Inc.

Work Order Narrative

Condition Upon Receipt:

Samples were received under Chain of Custody (COC) on 10/24/13. They were assigned to Work Order 13-10-1794.

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

Holding Times:

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

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

Quality Control:

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

Additional Comments:

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

Subcontractor Information:

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

Return to Contents

Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 3510C
Method: EPA 8015B (M)
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES037	**13-10-1794-2-G**	**10/21/13 10:30**	**Aqueous**	**GC 45**	**10/25/13**	**10/25/13 19:30**	**131025B03**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- TPH as Diesel is quantified in the carbon range C10-C28.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
TPH as Diesel	92	15	20	50	1	HD

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	139	51-141	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES038	**13-10-1794-3-G**	**10/21/13 11:25**	**Aqueous**	**GC 45**	**10/25/13**	**10/25/13 19:59**	**131025B03**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- TPH as Diesel is quantified in the carbon range C10-C28.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
TPH as Diesel	2400	15	21	52	1.04	HD

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	122	51-141	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES039	**13-10-1794-4-G**	**10/21/13 12:00**	**Aqueous**	**GC 45**	**10/25/13**	**10/25/13 20:16**	**131025B03**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- TPH as Diesel is quantified in the carbon range C10-C28.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
TPH as Diesel	2400	15	21	52	1.04	HD

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	137	51-141	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES040	**13-10-1794-5-G**	**10/21/13 13:00**	**Aqueous**	**GC 45**	**10/25/13**	**10/25/13 20:34**	**131025B03**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- TPH as Diesel is quantified in the carbon range C10-C28.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
TPH as Diesel	54	15	20	50	1	HD

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	139	51-141	

Return to Contents

Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 3510C
Method: EPA 8015B (M)
Units: ug/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES041	**13-10-1794-6-G**	**10/21/13 09:00**	**Aqueous**	**GC 45**	**10/25/13**	**10/25/13 20:51**	**131025B03**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- TPH as Diesel is quantified in the carbon range C10-C28.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
TPH as Diesel	<20	15	20	50	1	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	137	51-141	

ES042	**13-10-1794-8-G**	**10/21/13 10:15**	**Aqueous**	**GC 45**	**10/25/13**	**10/25/13 21:08**	**131025B03**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- TPH as Diesel is quantified in the carbon range C10-C28.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
TPH as Diesel	<20	15	20	50	1	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	121	51-141	

Method Blank	**099-15-516-64**	**N/A**	**Aqueous**	**GC 45**	**10/25/13**	**10/25/13 13:21**	**131025B03**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
TPH as Diesel	<20	15	20	50	1	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	129	51-141	

Return to Contents

Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 3020A Total
Method: EPA 6020
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES037	**13-10-1794-2-J**	**10/21/13 10:30**	**Aqueous**	**ICP/MS 04**	**10/24/13**	**10/25/13 16:20**	**131024L04D**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Lead	2.06	0.0898	0.200	1.00	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES038	**13-10-1794-3-J**	**10/21/13 11:25**	**Aqueous**	**ICP/MS 04**	**10/24/13**	**10/25/13 16:17**	**131024L04D**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Lead	<0.200	0.0898	0.200	1.00	1	U

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES039	**13-10-1794-4-J**	**10/21/13 12:00**	**Aqueous**	**ICP/MS 04**	**10/24/13**	**10/25/13 16:23**	**131024L04D**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Lead	<0.200	0.0898	0.200	1.00	1	U

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES040	**13-10-1794-5-J**	**10/21/13 13:00**	**Aqueous**	**ICP/MS 04**	**10/24/13**	**10/25/13 16:27**	**131024L04D**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Lead	<0.200	0.0898	0.200	1.00	1	U

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES042	**13-10-1794-8-J**	**10/21/13 10:15**	**Aqueous**	**ICP/MS 04**	**10/24/13**	**10/25/13 16:30**	**131024L04D**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Lead	<0.200	0.0898	0.200	1.00	1	U

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-497-46**	**N/A**	**Aqueous**	**ICP/MS 04**	**10/24/13**	**10/25/13 15:47**	**131024L04D**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Lead	<0.200	0.0898	0.200	1.00	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES037	**13-10-1794-2-H**	**10/21/13 10:30**	**Aqueous**	**GC/MS AAA**	**10/24/13**	**10/25/13 14:38**	**131024L06**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	<0.052	0.024	0.052	0.21	1.03	U
2-Methylnaphthalene	<0.052	0.027	0.052	0.21	1.03	U
1-Methylnaphthalene	<0.052	0.029	0.052	0.21	1.03	U
Acenaphthylene	<0.052	0.019	0.052	0.21	1.03	U
Acenaphthene	<0.052	0.021	0.052	0.21	1.03	U
Fluorene	<0.052	0.025	0.052	0.21	1.03	U
Phenanthrene	<0.052	0.032	0.052	0.21	1.03	U
Anthracene	<0.052	0.035	0.052	0.21	1.03	U
Fluoranthene	<0.052	0.028	0.052	0.21	1.03	U
Pyrene	0.027	0.026	0.052	0.21	1.03	J
Benzo (a) Anthracene	<0.052	0.025	0.052	0.21	1.03	U
Chrysene	<0.052	0.020	0.052	0.21	1.03	U
Benzo (k) Fluoranthene	<0.052	0.024	0.052	0.21	1.03	U
Benzo (b) Fluoranthene	<0.052	0.026	0.052	0.21	1.03	U
Benzo (a) Pyrene	<0.052	0.038	0.052	0.21	1.03	U
Indeno (1,2,3-c,d) Pyrene	<0.052	0.023	0.052	0.21	1.03	U
Dibenz (a,h) Anthracene	<0.052	0.028	0.052	0.21	1.03	U
Benzo (g,h,i) Perylene	<0.052	0.023	0.052	0.21	1.03	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	60	28-139	
2-Fluorobiphenyl	72	33-144	
p-Terphenyl-d14	95	23-160	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES038	**13-10-1794-3-H**	**10/21/13 11:25**	**Aqueous**	**GC/MS AAA**	**10/24/13**	**10/25/13 15:02**	**131024L06**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
2-Methylnaphthalene	9.0	0.028	0.053	0.21	1.06	
1-Methylnaphthalene	9.0	0.030	0.053	0.21	1.06	
Acenaphthylene	<0.053	0.019	0.053	0.21	1.06	U
Acenaphthene	0.54	0.022	0.053	0.21	1.06	
Fluorene	0.27	0.026	0.053	0.21	1.06	
Phenanthrene	<0.053	0.032	0.053	0.21	1.06	U
Anthracene	<0.053	0.036	0.053	0.21	1.06	U
Fluoranthene	<0.053	0.029	0.053	0.21	1.06	U
Pyrene	<0.053	0.026	0.053	0.21	1.06	U
Benzo (a) Anthracene	<0.053	0.025	0.053	0.21	1.06	U
Chrysene	<0.053	0.020	0.053	0.21	1.06	U
Benzo (k) Fluoranthene	<0.053	0.025	0.053	0.21	1.06	U
Benzo (b) Fluoranthene	<0.053	0.026	0.053	0.21	1.06	U
Benzo (a) Pyrene	<0.053	0.038	0.053	0.21	1.06	U
Indeno (1,2,3-c,d) Pyrene	<0.053	0.023	0.053	0.21	1.06	U
Dibenz (a,h) Anthracene	<0.053	0.028	0.053	0.21	1.06	U
Benzo (g,h,i) Perylene	<0.053	0.023	0.053	0.21	1.06	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	66	28-139	
2-Fluorobiphenyl	68	33-144	
p-Terphenyl-d14	87	23-160	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES038	**13-10-1794-3-H**	**10/21/13 11:25**	**Aqueous**	**GC/MS AAA**	**10/24/13**	**10/25/13 16:58**	**131024L06**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	30	0.24	0.53	2.1	10.6	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	35	28-139	
2-Fluorobiphenyl	69	33-144	
p-Terphenyl-d14	81	23-160	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES039	**13-10-1794-4-H**	**10/21/13 12:00**	**Aqueous**	**GC/MS AAA**	**10/24/13**	**10/25/13 15:25**	**131024L06**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
2-Methylnaphthalene	7.5	0.027	0.052	0.21	1.03	
1-Methylnaphthalene	7.5	0.029	0.052	0.21	1.03	
Acenaphthylene	<0.052	0.019	0.052	0.21	1.03	U
Acenaphthene	0.57	0.021	0.052	0.21	1.03	
Fluorene	0.31	0.025	0.052	0.21	1.03	
Phenanthrene	<0.052	0.032	0.052	0.21	1.03	U
Anthracene	<0.052	0.035	0.052	0.21	1.03	U
Fluoranthene	<0.052	0.028	0.052	0.21	1.03	U
Pyrene	<0.052	0.026	0.052	0.21	1.03	U
Benzo (a) Anthracene	<0.052	0.025	0.052	0.21	1.03	U
Chrysene	<0.052	0.020	0.052	0.21	1.03	U
Benzo (k) Fluoranthene	<0.052	0.024	0.052	0.21	1.03	U
Benzo (b) Fluoranthene	<0.052	0.026	0.052	0.21	1.03	U
Benzo (a) Pyrene	<0.052	0.038	0.052	0.21	1.03	U
Indeno (1,2,3-c,d) Pyrene	<0.052	0.023	0.052	0.21	1.03	U
Dibenz (a,h) Anthracene	<0.052	0.028	0.052	0.21	1.03	U
Benzo (g,h,i) Perylene	<0.052	0.023	0.052	0.21	1.03	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	76	28-139	
2-Fluorobiphenyl	79	33-144	
p-Terphenyl-d14	101	23-160	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES039	**13-10-1794-4-H**	**10/21/13 12:00**	**Aqueous**	**GC/MS AAA**	**10/24/13**	**10/25/13 18:07**	**131024L06**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	25	0.24	0.52	2.1	10.4	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	35	28-139	
2-Fluorobiphenyl	76	33-144	
p-Terphenyl-d14	90	23-160	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES040	**13-10-1794-5-H**	**10/21/13 13:00**	**Aqueous**	**GC/MS AAA**	**10/24/13**	**10/25/13 15:48**	**131024L06**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	<0.050	0.023	0.050	0.20	1.01	U
2-Methylnaphthalene	<0.050	0.027	0.050	0.20	1.01	U
1-Methylnaphthalene	<0.050	0.029	0.050	0.20	1.01	U
Acenaphthylene	<0.050	0.018	0.050	0.20	1.01	U
Acenaphthene	<0.050	0.021	0.050	0.20	1.01	U
Fluorene	<0.050	0.025	0.050	0.20	1.01	U
Phenanthrene	<0.050	0.031	0.050	0.20	1.01	U
Anthracene	<0.050	0.034	0.050	0.20	1.01	U
Fluoranthene	<0.050	0.027	0.050	0.20	1.01	U
Pyrene	<0.050	0.025	0.050	0.20	1.01	U
Benzo (a) Anthracene	<0.050	0.024	0.050	0.20	1.01	U
Chrysene	<0.050	0.019	0.050	0.20	1.01	U
Benzo (k) Fluoranthene	<0.050	0.024	0.050	0.20	1.01	U
Benzo (b) Fluoranthene	<0.050	0.025	0.050	0.20	1.01	U
Benzo (a) Pyrene	<0.050	0.037	0.050	0.20	1.01	U
Indeno (1,2,3-c,d) Pyrene	<0.050	0.022	0.050	0.20	1.01	U
Dibenz (a,h) Anthracene	<0.050	0.027	0.050	0.20	1.01	U
Benzo (g,h,i) Perylene	<0.050	0.022	0.050	0.20	1.01	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	69	28-139	
2-Fluorobiphenyl	73	33-144	
p-Terphenyl-d14	87	23-160	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES041	**13-10-1794-6-H**	**10/21/13 09:00**	**Aqueous**	**GC/MS AAA**	**10/24/13**	**10/25/13 16:11**	**131024L06**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	0.036	0.023	0.050	0.20	1	J
2-Methylnaphthalene	<0.050	0.027	0.050	0.20	1	U
1-Methylnaphthalene	<0.050	0.028	0.050	0.20	1	U
Acenaphthylene	<0.050	0.018	0.050	0.20	1	U
Acenaphthene	<0.050	0.021	0.050	0.20	1	U
Fluorene	<0.050	0.025	0.050	0.20	1	U
Phenanthrene	<0.050	0.031	0.050	0.20	1	U
Anthracene	<0.050	0.034	0.050	0.20	1	U
Fluoranthene	<0.050	0.027	0.050	0.20	1	U
Pyrene	<0.050	0.025	0.050	0.20	1	U
Benzo (a) Anthracene	<0.050	0.024	0.050	0.20	1	U
Chrysene	<0.050	0.019	0.050	0.20	1	U
Benzo (k) Fluoranthene	<0.050	0.023	0.050	0.20	1	U
Benzo (b) Fluoranthene	<0.050	0.025	0.050	0.20	1	U
Benzo (a) Pyrene	<0.050	0.037	0.050	0.20	1	U
Indeno (1,2,3-c,d) Pyrene	<0.050	0.022	0.050	0.20	1	U
Dibenz (a,h) Anthracene	<0.050	0.027	0.050	0.20	1	U
Benzo (g,h,i) Perylene	<0.050	0.022	0.050	0.20	1	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	83	28-139	
2-Fluorobiphenyl	86	33-144	
p-Terphenyl-d14	99	23-160	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES042	**13-10-1794-8-H**	**10/21/13 10:15**	**Aqueous**	**GC/MS AAA**	**10/24/13**	**10/25/13 16:35**	**131024L06**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	0.17	0.023	0.051	0.20	1.02	J
2-Methylnaphthalene	<0.051	0.027	0.051	0.20	1.02	U
1-Methylnaphthalene	<0.051	0.029	0.051	0.20	1.02	U
Acenaphthylene	<0.051	0.018	0.051	0.20	1.02	U
Acenaphthene	<0.051	0.021	0.051	0.20	1.02	U
Fluorene	<0.051	0.025	0.051	0.20	1.02	U
Phenanthrene	<0.051	0.031	0.051	0.20	1.02	U
Anthracene	<0.051	0.035	0.051	0.20	1.02	U
Fluoranthene	<0.051	0.028	0.051	0.20	1.02	U
Pyrene	<0.051	0.025	0.051	0.20	1.02	U
Benzo (a) Anthracene	<0.051	0.024	0.051	0.20	1.02	U
Chrysene	<0.051	0.019	0.051	0.20	1.02	U
Benzo (k) Fluoranthene	<0.051	0.024	0.051	0.20	1.02	U
Benzo (b) Fluoranthene	<0.051	0.025	0.051	0.20	1.02	U
Benzo (a) Pyrene	<0.051	0.037	0.051	0.20	1.02	U
Indeno (1,2,3-c,d) Pyrene	<0.051	0.022	0.051	0.20	1.02	U
Dibenz (a,h) Anthracene	<0.051	0.027	0.051	0.20	1.02	U
Benzo (g,h,i) Perylene	<0.051	0.022	0.051	0.20	1.02	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	71	28-139	
2-Fluorobiphenyl	73	33-144	
p-Terphenyl-d14	88	23-160	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-15-148-19**	**N/A**	**Aqueous**	**GC/MS AAA**	**10/24/13**	**10/25/13 13:52**	**131024L06**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	<0.050	0.023	0.050	0.20	1	U
2-Methylnaphthalene	<0.050	0.026	0.050	0.20	1	U
1-Methylnaphthalene	<0.050	0.028	0.050	0.20	1	U
Acenaphthylene	<0.050	0.018	0.050	0.20	1	U
Acenaphthene	<0.050	0.021	0.050	0.20	1	U
Fluorene	<0.050	0.024	0.050	0.20	1	U
Phenanthrene	<0.050	0.031	0.050	0.20	1	U
Anthracene	<0.050	0.034	0.050	0.20	1	U
Fluoranthene	<0.050	0.027	0.050	0.20	1	U
Pyrene	<0.050	0.025	0.050	0.20	1	U
Benzo (a) Anthracene	<0.050	0.024	0.050	0.20	1	U
Chrysene	<0.050	0.019	0.050	0.20	1	U
Benzo (k) Fluoranthene	<0.050	0.023	0.050	0.20	1	U
Benzo (b) Fluoranthene	<0.050	0.025	0.050	0.20	1	U
Benzo (a) Pyrene	<0.050	0.036	0.050	0.20	1	U
Indeno (1,2,3-c,d) Pyrene	<0.050	0.022	0.050	0.20	1	U
Dibenz (a,h) Anthracene	<0.050	0.027	0.050	0.20	1	U
Benzo (g,h,i) Perylene	<0.050	0.022	0.050	0.20	1	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	77	28-139	
2-Fluorobiphenyl	66	33-144	
p-Terphenyl-d14	95	23-160	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES Trip	**13-10-1794-1-A**	**10/21/13 08:00**	**Aqueous**	**GC/MS LL**	**10/26/13**	**10/26/13 14:44**	**131026L01**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1	U
Bromoform	<1.0	0.50	1.0	10	1	U
Bromomethane	<5.0	3.9	5.0	20	1	U
2-Butanone	<5.0	2.2	5.0	10	1	U,ICH
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1	U
Chloroethane	<5.0	2.3	5.0	10	1	U
Chloroform	<0.50	0.46	0.50	5.0	1	U
Chloromethane	<2.0	1.8	2.0	10	1	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1	U
Styrene	<0.50	0.17	0.50	1.0	1	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1	U
Toluene	<0.50	0.24	0.50	1.0	1	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1	U
Trichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1	U
p/m-Xylene	<1.0	0.30	1.0	10	1	U
o-Xylene	<0.50	0.23	0.50	1.0	1	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1	U
Gasoline Range Organics	15	13	30	50	1	B,J

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	102	80-126	
1,2-Dichloroethane-d4	101	80-134	
Toluene-d8	97	80-120	
Toluene-d8-TPPH	98	88-112	
1,4-Bromofluorobenzene	87	80-120	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES037	**13-10-1794-2-A**	**10/21/13 10:30**	**Aqueous**	**GC/MS LL**	**10/26/13**	**10/26/13 17:26**	**131026L01**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1	U
Bromoform	<1.0	0.50	1.0	10	1	U
Bromomethane	<5.0	3.9	5.0	20	1	U
2-Butanone	<5.0	2.2	5.0	10	1	U,ICH
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1	U
Chloroethane	<5.0	2.3	5.0	10	1	U
Chloroform	<0.50	0.46	0.50	5.0	1	U
Chloromethane	<2.0	1.8	2.0	10	1	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1	U
Styrene	<0.50	0.17	0.50	1.0	1	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1	U
Toluene	<0.50	0.24	0.50	1.0	1	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received:	10/24/13
Work Order:	13-10-1794
Preparation:	EPA 5030C
Method:	GC/MS / EPA 8260B
Units:	ug/L

Project: Red Hill LTM 112066

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1	U
Trichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1	U
p/m-Xylene	<1.0	0.30	1.0	10	1	U
o-Xylene	<0.50	0.23	0.50	1.0	1	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1	U
Gasoline Range Organics	15	13	30	50	1	B,J

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	99	80-126	
1,2-Dichloroethane-d4	95	80-134	
Toluene-d8	93	80-120	
Toluene-d8-TPPH	91	88-112	
1,4-Bromofluorobenzene	93	80-120	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES038	**13-10-1794-3-A**	**10/21/13 11:25**	**Aqueous**	**GC/MS LL**	**10/26/13**	**10/26/13 15:11**	**131026L01**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1	U
Bromoform	<1.0	0.50	1.0	10	1	U
Bromomethane	<5.0	3.9	5.0	20	1	U
2-Butanone	<5.0	2.2	5.0	10	1	U,ICH
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1	U
Chloroethane	<5.0	2.3	5.0	10	1	U
Chloroform	<0.50	0.46	0.50	5.0	1	U
Chloromethane	<2.0	1.8	2.0	10	1	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
Ethylbenzene	0.14	0.14	0.50	1.0	1	J
Methylene Chloride	<1.0	0.64	1.0	5.0	1	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1	U
Styrene	<0.50	0.17	0.50	1.0	1	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1	U
Toluene	<0.50	0.24	0.50	1.0	1	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1	U
Trichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1	U
p/m-Xylene	<1.0	0.30	1.0	10	1	U
o-Xylene	0.37	0.23	0.50	1.0	1	J
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1	U
Gasoline Range Organics	48	13	30	50	1	B,J

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	106	80-126	
1,2-Dichloroethane-d4	103	80-134	
Toluene-d8	97	80-120	
Toluene-d8-TPPH	98	88-112	
1,4-Bromofluorobenzene	97	80-120	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES039	**13-10-1794-4-A**	**10/21/13 12:00**	**Aqueous**	**GC/MS LL**	**10/26/13**	**10/26/13 15:38**	**131026L01**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1	U
Bromoform	<1.0	0.50	1.0	10	1	U
Bromomethane	<5.0	3.9	5.0	20	1	U
2-Butanone	<5.0	2.2	5.0	10	1	U,ICH
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1	U
Chloroethane	<5.0	2.3	5.0	10	1	U
Chloroform	<0.50	0.46	0.50	5.0	1	U
Chloromethane	<2.0	1.8	2.0	10	1	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1	U
Styrene	<0.50	0.17	0.50	1.0	1	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1	U
Toluene	<0.50	0.24	0.50	1.0	1	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1	U
Trichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1	U
p/m-Xylene	<1.0	0.30	1.0	10	1	U
o-Xylene	0.37	0.23	0.50	1.0	1	J
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1	U
Gasoline Range Organics	63	13	30	50	1	B

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	101	80-126	
1,2-Dichloroethane-d4	99	80-134	
Toluene-d8	95	80-120	
Toluene-d8-TPPH	98	88-112	
1,4-Bromofluorobenzene	97	80-120	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES040	**13-10-1794-5-A**	**10/21/13 13:00**	**Aqueous**	**GC/MS LL**	**10/26/13**	**10/26/13 17:52**	**131026L01**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1	U
Bromoform	<1.0	0.50	1.0	10	1	U
Bromomethane	<5.0	3.9	5.0	20	1	U
2-Butanone	<5.0	2.2	5.0	10	1	U,ICH
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1	U
Chloroethane	<5.0	2.3	5.0	10	1	U
Chloroform	<0.50	0.46	0.50	5.0	1	U
Chloromethane	<2.0	1.8	2.0	10	1	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1	U
Styrene	<0.50	0.17	0.50	1.0	1	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1	U
Toluene	<0.50	0.24	0.50	1.0	1	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1	U
Trichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1	U
p/m-Xylene	<1.0	0.30	1.0	10	1	U
o-Xylene	<0.50	0.23	0.50	1.0	1	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1	U
Gasoline Range Organics	23	13	30	50	1	B,J

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	97	80-126	
1,2-Dichloroethane-d4	95	80-134	
Toluene-d8	98	80-120	
Toluene-d8-TPPH	99	88-112	
1,4-Bromofluorobenzene	91	80-120	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES041	**13-10-1794-6-A**	**10/21/13 09:00**	**Aqueous**	**GC/MS LL**	**10/26/13**	**10/26/13 18:19**	**131026L01**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1	U
Bromoform	<1.0	0.50	1.0	10	1	U
Bromomethane	<5.0	3.9	5.0	20	1	U
2-Butanone	<5.0	2.2	5.0	10	1	U,ICH
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1	U
Chloroethane	<5.0	2.3	5.0	10	1	U
Chloroform	<0.50	0.46	0.50	5.0	1	U
Chloromethane	<2.0	1.8	2.0	10	1	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1	U
Styrene	<0.50	0.17	0.50	1.0	1	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1	U
Toluene	<0.50	0.24	0.50	1.0	1	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1	U
Trichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1	U
p/m-Xylene	<1.0	0.30	1.0	10	1	U
o-Xylene	<0.50	0.23	0.50	1.0	1	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1	U
Gasoline Range Organics	13	13	30	50	1	B,J

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	101	80-126	
1,2-Dichloroethane-d4	97	80-134	
Toluene-d8	99	80-120	
Toluene-d8-TPPH	100	88-112	
1,4-Bromofluorobenzene	90	80-120	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES042	**13-10-1794-8-A**	**10/21/13 10:15**	**Aqueous**	**GC/MS LL**	**10/26/13**	**10/26/13 18:46**	**131026L01**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1	U
Bromoform	<1.0	0.50	1.0	10	1	U
Bromomethane	<5.0	3.9	5.0	20	1	U
2-Butanone	<5.0	2.2	5.0	10	1	U,ICH
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1	U
Chloroethane	<5.0	2.3	5.0	10	1	U
Chloroform	<0.50	0.46	0.50	5.0	1	U
Chloromethane	<2.0	1.8	2.0	10	1	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1	U
Styrene	<0.50	0.17	0.50	1.0	1	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1	U
Toluene	<0.50	0.24	0.50	1.0	1	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1	U
Trichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1	U
p/m-Xylene	<1.0	0.30	1.0	10	1	U
o-Xylene	<0.50	0.23	0.50	1.0	1	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1	U
Gasoline Range Organics	17	13	30	50	1	B,J

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	103	80-126	
1,2-Dichloroethane-d4	103	80-134	
Toluene-d8	93	80-120	
Toluene-d8-TPPH	94	88-112	
1,4-Bromofluorobenzene	88	80-120	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-13-057-27**	**N/A**	**Aqueous**	**GC/MS LL**	**10/26/13**	**10/26/13 14:17**	**131026L01**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1	U
Benzene	<0.50	0.14	0.50	1.0	1	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1	U
Bromoform	<1.0	0.50	1.0	10	1	U
Bromomethane	<5.0	3.9	5.0	20	1	U
2-Butanone	<5.0	2.2	5.0	10	1	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1	U
Chloroethane	<5.0	2.3	5.0	10	1	U
Chloroform	<0.50	0.46	0.50	5.0	1	U
Chloromethane	<2.0	1.8	2.0	10	1	U
Dibromochloromethane	<0.50	0.25	0.50	1.0	1	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1	U
Styrene	<0.50	0.17	0.50	1.0	1	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1	U
Toluene	<0.50	0.24	0.50	1.0	1	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1	U
Trichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1	U
p/m-Xylene	<1.0	0.30	1.0	10	1	U
o-Xylene	<0.50	0.23	0.50	1.0	1	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1	U
Gasoline Range Organics	21	13	30	50	1	J

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	100	80-126	
1,2-Dichloroethane-d4	97	80-134	
Toluene-d8	98	80-120	
Toluene-d8-TPPH	98	88-112	
1,4-Bromofluorobenzene	90	80-120	

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.		Date Received:	10/24/13
354 Uluniu Street, Suite 304		Work Order:	13-10-1794
Kailua, HI 96734-2500		Preparation:	EPA 3510C
		Method:	EPA 8015B (M)
Project: Red Hill LTM 112066			Page 1 of 5

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES038	**Aqueous**	**GC 45**	**10/25/13**	**10/25/13 18:55**	**131025S03**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TPH as Diesel	2389	4000	7414	126	7601	130	55-133	2	0-30	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.		Date Received:	10/24/13
354 Uluniu Street, Suite 304		Work Order:	13-10-1794
Kailua, HI 96734-2500		Preparation:	EPA 3020A Total
		Method:	EPA 6020
Project: Red Hill LTM 112066			Page 2 of 5

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES038	**Aqueous**	**ICP/MS 04**	**10/24/13**	**10/25/13 16:00**	**131024S04**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Lead	ND	100.0	107.9	108	108.8	109	80-120	1	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
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Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES038	**Aqueous**	**GC/MS AAA**	**10/24/13**	**10/25/13 17:21**	**131024S06**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Naphthalene	29.69	2.000	22.52	0	21.60	0	21-133	4	0-25	3
2-Methylnaphthalene	8.963	2.000	9.366	20	9.337	19	21-140	0	0-25	3
1-Methylnaphthalene	8.994	2.000	9.057	3	8.921	0	20-140	2	0-25	3
Acenaphthylene	ND	2.000	1.693	85	1.658	83	33-145	2	0-25	
Acenaphthene	0.5368	2.000	2.078	77	2.049	76	49-121	1	0-25	
Fluorene	0.2697	2.000	1.813	77	1.788	76	59-121	1	0-25	
Phenanthrene	ND	2.000	1.714	86	1.689	84	54-120	1	0-25	
Anthracene	ND	2.000	1.466	73	1.456	73	27-133	1	0-25	
Fluoranthene	ND	2.000	1.835	92	1.765	88	26-137	4	0-25	
Pyrene	ND	2.000	1.581	79	1.574	79	18-168	0	0-25	
Benzo (a) Anthracene	ND	2.000	1.579	79	1.571	79	33-143	0	0-25	
Chrysene	ND	2.000	1.530	77	1.519	76	17-168	1	0-25	
Benzo (k) Fluoranthene	ND	2.000	1.682	84	1.598	80	24-159	5	0-25	
Benzo (b) Fluoranthene	ND	2.000	1.474	74	1.549	77	24-159	5	0-25	
Benzo (a) Pyrene	ND	2.000	1.659	83	1.649	82	17-163	1	0-25	
Indeno (1,2,3-c,d) Pyrene	ND	2.000	1.436	72	1.428	71	10-171	1	0-25	
Dibenz (a,h) Anthracene	ND	2.000	1.265	63	1.276	64	10-219	1	0-25	
Benzo (g,h,i) Perylene	ND	2.000	1.148	57	1.149	57	10-227	0	0-25	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
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Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES038	**Aqueous**	**GC/MS LL**	**10/26/13**	**10/26/13 16:05**	**131026S01**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Acetone	ND	50.00	58.71	117	67.34	135	40-140	14	0-20	
Benzene	ND	50.00	40.15	80	41.76	84	80-120	4	0-20	
Bromodichloromethane	ND	50.00	42.25	84	44.22	88	75-120	5	0-20	
Bromoform	ND	50.00	45.28	91	47.76	96	70-130	5	0-20	
Bromomethane	ND	50.00	48.95	98	53.61	107	30-145	9	0-20	
2-Butanone	ND	50.00	46.35	93	46.38	93	30-150	0	0-20	
Carbon Tetrachloride	ND	50.00	41.46	83	43.92	88	65-140	6	0-20	
Chlorobenzene	ND	50.00	39.98	80	42.29	85	80-120	6	0-20	
Chloroethane	ND	50.00	39.93	80	46.89	94	60-135	16	0-20	
Chloroform	ND	50.00	41.30	83	43.72	87	65-135	6	0-20	
Chloromethane	ND	50.00	35.23	70	42.21	84	40-125	18	0-20	
Dibromochloromethane	ND	50.00	45.30	91	47.56	95	60-135	5	0-20	
1,2-Dibromo-3-Chloropropane	ND	50.00	50.93	102	55.79	112	50-130	9	0-20	
1,2-Dibromoethane	ND	50.00	43.97	88	44.87	90	80-120	2	0-20	
1,2-Dichlorobenzene	ND	50.00	45.07	90	48.27	97	70-120	7	0-20	
1,3-Dichlorobenzene	ND	50.00	43.07	86	46.54	93	75-125	8	0-20	
1,4-Dichlorobenzene	ND	50.00	42.90	86	46.44	93	75-125	8	0-20	
1,1-Dichloroethane	ND	50.00	42.21	84	45.39	91	70-135	7	0-20	
1,2-Dichloroethane	ND	50.00	41.64	83	44.21	88	70-130	6	0-20	
1,1-Dichloroethene	ND	50.00	40.00	80	44.48	89	70-130	11	0-20	
c-1,2-Dichloroethene	ND	50.00	42.31	85	44.45	89	70-125	5	0-20	
t-1,2-Dichloroethene	ND	50.00	40.50	81	44.18	88	60-140	9	0-20	
1,2-Dichloropropane	ND	50.00	39.71	79	41.95	84	75-125	5	0-20	
c-1,3-Dichloropropene	ND	50.00	48.51	97	51.56	103	70-130	6	0-20	
t-1,3-Dichloropropene	ND	50.00	38.46	77	40.40	81	55-140	5	0-20	
Ethylbenzene	ND	50.00	46.51	93	48.94	98	75-125	5	0-20	
Methylene Chloride	ND	50.00	42.80	86	46.94	94	55-140	9	0-20	
4-Methyl-2-Pentanone	ND	50.00	43.74	87	46.09	92	60-135	5	0-20	
Styrene	ND	50.00	43.53	87	45.57	91	65-135	5	0-20	
1,1,1,2-Tetrachloroethane	ND	50.00	43.44	87	46.01	92	80-130	6	0-20	
1,1,2,2-Tetrachloroethane	ND	50.00	38.58	77	41.17	82	65-130	6	0-20	
Tetrachloroethene	ND	50.00	48.38	97	50.83	102	45-150	5	0-20	
Toluene	ND	50.00	44.14	88	45.24	90	75-120	2	0-20	
1,2,4-Trichlorobenzene	ND	50.00	54.63	109	61.18	122	65-135	11	0-20	
1,1,1-Trichloroethane	ND	50.00	43.20	86	45.59	91	65-130	5	0-20	
Hexachloro-1,3-Butadiene	ND	50.00	47.46	95	52.00	104	50-140	9	0-20	
1,1,2-Trichloroethane	ND	50.00	40.68	81	41.83	84	75-125	3	0-20	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Page 5 of 5

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Trichloroethene	ND	50.00	44.18	88	46.95	94	70-125	6	0-20	
1,2,3-Trichloropropane	ND	50.00	43.25	86	43.89	88	75-125	1	0-20	
Vinyl Chloride	ND	50.00	41.05	82	47.84	96	50-145	15	0-20	
p/m-Xylene	ND	100.0	96.06	96	98.25	98	75-130	2	0-20	
o-Xylene	ND	50.00	48.42	97	50.94	102	80-120	5	0-20	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	44.69	89	49.97	100	65-125	11	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - PDS/PDSD

Environmental Science International, Inc.		Date Received:	10/24/13
354 Uluniu Street, Suite 304		Work Order:	13-10-1794
Kailua, HI 96734-2500		Preparation:	EPA 3020A Total
		Method:	EPA 6020
Project: Red Hill LTM 112066			Page 1 of 1

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS/PDSD Batch Number
ES038	**Aqueous**	**ICP/MS 04**	**10/24/13 00:00**	**10/25/13 16:07**	**131024S04**

Parameter	Sample Conc.	Spike Added	PDS Conc.	PDS %Rec.	%Rec. CL	Qualifiers
Lead	ND	100.0	105.1	105	75-125	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 3510C
Method: EPA 8015B (M)
Page 1 of 5

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-15-516-64	**Aqueous**	**GC 45**	**10/25/13**	**10/25/13 13:39**	**131025B03**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TPH as Diesel	4000	4250	106	4403	110	60-132	4	0-11	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

Environmental Science International, Inc.	Date Received:	10/24/13
354 Uluniu Street, Suite 304	Work Order:	13-10-1794
Kailua, HI 96734-2500	Preparation:	EPA 3020A Total
	Method:	EPA 6020
Project: Red Hill LTM 112066		Page 2 of 5

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-14-497-46	**Aqueous**	**ICP/MS 04**	**10/25/13 15:51**	**131024L04D**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Lead	100.0	101.3	101	80-120	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-15-148-19	**Aqueous**	**GC/MS AAA**	**10/25/13 14:15**	**131024L06**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Naphthalene	2.000	1.701	85	21-133	
2-Methylnaphthalene	2.000	1.799	90	21-140	
1-Methylnaphthalene	2.000	1.662	83	20-140	
Acenaphthylene	2.000	1.765	88	33-145	
Acenaphthene	2.000	1.771	89	55-121	
Fluorene	2.000	1.805	90	59-121	
Phenanthrene	2.000	1.791	90	54-120	
Anthracene	2.000	1.717	86	27-133	
Fluoranthene	2.000	1.926	96	26-137	
Pyrene	2.000	1.787	89	45-129	
Benzo (a) Anthracene	2.000	1.756	88	33-143	
Chrysene	2.000	1.711	86	17-168	
Benzo (k) Fluoranthene	2.000	1.947	97	24-159	
Benzo (b) Fluoranthene	2.000	1.635	82	24-159	
Benzo (a) Pyrene	2.000	1.841	92	17-163	
Indeno (1,2,3-c,d) Pyrene	2.000	1.597	80	25-175	
Dibenz (a,h) Anthracene	2.000	1.378	69	25-175	
Benzo (g,h,i) Perylene	2.000	1.274	64	25-157	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-13-057-27	**Aqueous**	**GC/MS LL**	**10/26/13**	**10/26/13 12:55**	**131026L01**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Acetone	50.00	64.44	129	N/A	N/A	40-140	N/A	0-20	
Benzene	50.00	43.29	87	N/A	N/A	80-120	N/A	0-20	
Bromodichloromethane	50.00	43.40	87	N/A	N/A	75-120	N/A	0-20	
Bromoform	50.00	46.58	93	N/A	N/A	70-130	N/A	0-20	
Bromomethane	50.00	52.24	104	N/A	N/A	30-145	N/A	0-20	
2-Butanone	50.00	53.70	107	N/A	N/A	30-150	N/A	0-20	
Carbon Tetrachloride	50.00	44.68	89	N/A	N/A	65-140	N/A	0-20	
Chlorobenzene	50.00	41.74	83	N/A	N/A	80-120	N/A	0-20	
Chloroethane	50.00	42.64	85	N/A	N/A	60-135	N/A	0-20	
Chloroform	50.00	44.47	89	N/A	N/A	65-135	N/A	0-20	
Chloromethane	50.00	37.91	76	N/A	N/A	40-125	N/A	0-20	
Dibromochloromethane	50.00	45.85	92	N/A	N/A	60-135	N/A	0-20	
1,2-Dibromo-3-Chloropropane	50.00	47.48	95	N/A	N/A	50-130	N/A	0-20	
1,2-Dibromoethane	50.00	43.52	87	N/A	N/A	80-120	N/A	0-20	
1,2-Dichlorobenzene	50.00	43.54	87	N/A	N/A	70-120	N/A	0-20	
1,3-Dichlorobenzene	50.00	44.16	88	N/A	N/A	75-125	N/A	0-20	
1,4-Dichlorobenzene	50.00	44.28	89	N/A	N/A	75-125	N/A	0-20	
1,1-Dichloroethane	50.00	46.99	94	N/A	N/A	70-135	N/A	0-20	
1,2-Dichloroethane	50.00	43.84	88	N/A	N/A	70-130	N/A	0-20	
1,1-Dichloroethene	50.00	41.87	84	N/A	N/A	70-130	N/A	0-20	
c-1,2-Dichloroethene	50.00	45.17	90	N/A	N/A	70-125	N/A	0-20	
t-1,2-Dichloroethene	50.00	43.39	87	N/A	N/A	60-140	N/A	0-20	
1,2-Dichloropropane	50.00	43.00	86	N/A	N/A	75-125	N/A	0-20	
c-1,3-Dichloropropene	50.00	52.08	104	N/A	N/A	70-130	N/A	0-20	
t-1,3-Dichloropropene	50.00	40.53	81	N/A	N/A	55-140	N/A	0-20	
Ethylbenzene	50.00	49.12	98	N/A	N/A	75-125	N/A	0-20	
Methylene Chloride	50.00	46.60	93	N/A	N/A	55-140	N/A	0-20	
4-Methyl-2-Pentanone	50.00	48.20	96	N/A	N/A	60-135	N/A	0-20	
Styrene	50.00	45.75	92	N/A	N/A	65-135	N/A	0-20	
1,1,1,2-Tetrachloroethane	50.00	45.15	90	N/A	N/A	80-130	N/A	0-20	
1,1,2,2-Tetrachloroethane	50.00	42.63	85	N/A	N/A	65-130	N/A	0-20	
Tetrachloroethene	50.00	46.11	92	N/A	N/A	45-150	N/A	0-20	
Toluene	50.00	47.22	94	N/A	N/A	75-120	N/A	0-20	
1,2,4-Trichlorobenzene	50.00	48.26	97	N/A	N/A	65-135	N/A	0-20	
1,1,1-Trichloroethane	50.00	45.68	91	N/A	N/A	65-130	N/A	0-20	
Hexachloro-1,3-Butadiene	50.00	44.51	89	N/A	N/A	50-140	N/A	0-20	
1,1,2-Trichloroethane	50.00	45.53	91	N/A	N/A	75-125	N/A	0-20	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Trichloroethene	50.00	45.17	90	N/A	N/A	70-125	N/A	0-20	
1,2,3-Trichloropropane	50.00	43.40	87	N/A	N/A	75-125	N/A	0-20	
Vinyl Chloride	50.00	43.84	88	N/A	N/A	50-145	N/A	0-20	
p/m-Xylene	100.0	99.58	100	N/A	N/A	75-130	N/A	0-20	
o-Xylene	50.00	49.39	99	N/A	N/A	80-120	N/A	0-20	
Methyl-t-Butyl Ether (MTBE)	50.00	46.52	93	N/A	N/A	65-125	N/A	0-20	
Gasoline Range Organics	1000	1058	106	1093	109	80-120	3	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Sample Analysis Summary Report

Work Order: 13-10-1794

Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 6020	EPA 3020A Total	598	ICP/MS 04	1
EPA 8015B (M)	EPA 3510C	682	GC 45	1
EPA 8270C SIM PAHs	EPA 3510C	773	GC/MS AAA	1
GC/MS / EPA 8260B	EPA 5030C	486	GC/MS LL	2

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Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order: 13-10-1794 Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
DL	The Detection Limit (DL) is the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
ICH	Initial calibration verification recovery is above the control limit for this analyte.
ICJ	Initial calibration verification recovery is below the control limit for this analyte.
IH	Calibration verification recovery is above the control limit for this analyte.
IJ	Calibration verification recovery is below the control limit for this analyte.
J	Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
LOD	The Limit of Detection (LOD) is the smallest amount or concentration of a substance that must be present in a sample in order to be detected at 99% confidence level.
LOQ	The Limit of Quantitation (LOQ) is the lowest concentration of a substance that produces a quantitative result within specified limits of precision and bias.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
U	Undetected at Detection Limit (DL) and is reported as less than the Limit of Detection (LOD).
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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Calscience Environmental Laboratories, Inc.

7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494
Other CA office locations: Concord and San Luis Obispo
For courier service / sample drop off information,
contact sales@calscience.com or call us.

CHAIN OF CUSTODY RECORD

WO # / LAB USE ONLY
13-10-1794

Date 10/21/13
Page 1 of 1

LABORATORY CLIENT: Environmental Science International
ADDRESS: 354 Uluniu St #304
CITY: Kailua STATE: Hi ZIP: 96734
TEL: 808-261-0740 E-MAIL: RCHONG@ESCIENCEI.com; DFEHER@ESCIENCEI.com

CLIENT PROJECT NAME / NUMBER: Red Hill LTM 112066
PROJECT CONTACT: Robert Chong
P.O. NO.:
SAMPLER(S): (PRINT) BI, JH

TURNAROUND TIME:
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ STANDARD

☐ COELT EDF GLOBAL ID LOG CODE

SPECIAL INSTRUCTIONS:

REQUESTED ANALYSES

Please check box or fill in blank as needed.

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	TPH(g) ☒ GRO 8260	TPH(d) ☒ DRO 8015B	TPH ☐ C6-C36 ☐ C6-C44	TPH	BTEX / MTBE ☐ 8260 ☐	VOCs (8260)	Oxygenates (8260)	Prep (5035) ☐ En Core ☐ Terra Core	SVOCs (8270)	Pesticides (8081)	PCBs (8082)	PAHs ☐ 8270 ☒ 8270 SIM	T22 Metals ☐ 6010/747X ☐ 6020/747X	Cr(VI) ☐ 7196 ☐ 7199 ☐ 218.6	lead 6020	lead 200.8		
1	ES Trip	10/21/13	800	water	3		X		X					X												
2	ES037	10/21/13	1030	water	10	X	X	X	X	X				X						X			X			
3	ES038	10/21/13	1125	water	10	X	X	X	X	X				X						X			X			
	ES038 MS/MSD	10/21/13	1125	water	10	X	X	X	X	X				X						X			X			
4	ES039	10/21/13	1200	water	10	X	X	X	X	X				X						X			X			
5	ES040	10/21/13	1300	water	10	X	X	X	X	X				X						X			X			
6	ES041	10/22/13	0930*	water	9	X	X	X	X	X				X						X						
7	ES041 UF	10/22/13	0930*	water	1		X																	X		
8	ES042	10/22/13	1015	water	10	X	X	X	X	X				X						X			X			
				water																						

Relinquished by: (Signature)	1145 10/22/13	Received by: (Signature/Affiliation)	Date: / Time:
Relinquished by: (Signature) (Fedex)		Received by: (Signature/Affiliation)	Date: 10/24/13 Time: 1030
Relinquished by: (Signature)		Received by: (Signature/Affiliation)	Date: / Time:

DISTRIBUTION: White with final report, Green and Yellow to Client.
Please note that pages 1 and 2 of 2 of our T/Cs are printed on the reverse side of the Green and Yellow copies respectively.

11/01/12 Revision

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FedEx Express US Airbill 8531 6209 1928 0200 Form ID No. FedEx Re

1 From

Date 11/22/13 Sender's FedEx Account Number 136853945

Sender's Name Brandon Haia Phone 808 261-6740

Company Environmental Science International

Address 354 Uluniu St Suite 304

Dept./Floor/Suite/Room

96734

4a Express Package Service

1 FedEx Priority Overnight Next business morning* 5 FedEx Standard Overnight Next business afternoon* 6

3 [X] FedEx 2Day Second business day* 20 FedEx Express Saver Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service

7 FedEx 1Day Freight* Next business day** 8 FedEx 2Day Freight Second business day** 83

* Call for Confirmation:

5 Packaging

6 FedEx Envelope* 2 FedEx Pak* Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak 3 FedEx Box 4

6 Special Handling

3 SATURDAY Delivery Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1 HOLD Weekday at FedEx Location

3 of 3

MPS# 0681 7969 7550 3159

Mstr# 8531 6209 1928 0200

VZ APVA

THU - 24 OCT AA

** 2DAY **

92841

CA-US SNA

2 of 3

MPS# 0681 7969 7550 3148

Mstr# 8531 6209 1928 0200

VZ APVA

THU

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Calscience Environmental Laboratories, Inc.

WORK ORDER #: 13-10-[1][7][9][4]

SAMPLE RECEIPT FORM

Cooler 1 of 3

CLIENT: ESI

DATE: 10/24/13

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.5 °C - 0.2 °C (CF) = 2.3 °C ☐ Blank ☑ Sample

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

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

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter **Checked by:** 836

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A **Checked by:** 836

☑ Sample ☐_____ ☐ No (Not Intact) ☐ Not Present **Checked by:** 895

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Aqueous samples received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfides ☐ Dissolved Oxygen	☐	☐	☑
Proper preservation noted on COC or sample container	☑	☐	☐
☑ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☑	☐	☐
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

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

Aqueous: ☑VOA[16] ☑VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☑1AGB[2] ☐1AGB**na$_2$** ☐1AGB**s**

☐500AGB ☑500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐1PB**na** ☐500PB

☐250PB ☑250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:** 131057B **Labeled/Checked by:** 895

Container: **C:** Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** 802

Preservative: **h:** HCL **n:** HNO_3 **na$_2$:** $Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:** 802

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Calscience Environmental Laboratories, Inc.

WORK ORDER #: 13-10-1794

SAMPLE RECEIPT FORM

Cooler 2 of 3

CLIENT: ESI DATE: 10/ /13

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.8 °C - 0.2 °C (CF) = 2.6 °C ☐ Blank ☑ Sample

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

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

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter Checked by: 836

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☐ Not Present ☐ N/A Checked by: 836

☑ Sample ☐_____ ☐ No (Not Intact) ☐ Not Present Checked by: 895

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Aqueous samples received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfides ☐ Dissolved Oxygen	☐	☐	☑
Proper preservation noted on COC or sample container	☑	☐	☐
☑ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☑	☐	☐
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

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

Aqueous: ☑VOA(10) ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☑1AGB(4) ☐1AGB**na$_2$** ☐1AGB**s**

☑500AGB(3) ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐1PB**na** ☐500PB

☐250PB ☑250PB**n**(3) ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** 895

Container: **C:** Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** 802

Preservative: **h:** HCL **n:** HNO_3 **na$_2$:** $Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:** 802

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Calscience Environmental Laboratories, Inc.

Supplemental Report 1

CALSCIENCE

WORK ORDER NUMBER: 13-10-1794

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Environmental Science International, Inc.

Client Project Name: Red Hill LTM 112066

Attention: Robert Chong
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Approved for release on 10/31/2013 by:
Richard Villafania
Project Manager

ResultLink

Email your PM

Calscience Environmental Laboratories, Inc.

Contents

Client Project Name: Red Hill LTM 112066
Work Order Number: 13-10-1794

Calscience Environmental Laboratories, Inc.

Work Order Narrative

Work Order: 13-10-1794 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain of Custody (COC) on 10/24/13. They were assigned to Work Order 13-10-1794.

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

Holding Times:

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

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

Quality Control:

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

Additional Comments:

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

Subcontractor Information:

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

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: N/A
Method: EPA 200.8
Units: ug/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES041UF	**13-10-1794-7-A**	**10/21/13 09:00**	**Aqueous**	**ICP/MS 04**	**10/24/13**	**10/25/13 20:58**	**131024L02D**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Lead	<0.0898	1.00	0.0898	1	U

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-16-094-51**	**N/A**	**Aqueous**	**ICP/MS 04**	**10/24/13**	**10/25/13 20:38**	**131024L02D**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Lead	<0.0898	1.00	0.0898	1	U

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

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 10/24/13
Work Order: 13-10-1794
Preparation: N/A
Method: EPA 200.8

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES041UF	**Aqueous**	**ICP/MS 04**	**10/24/13**	**10/25/13 20:48**	**131024S02D**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Lead	ND	100.0	99.99	100	82.72	83	80-120	19	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

Environmental Science International, Inc.	Date Received:	10/24/13
354 Uluniu Street, Suite 304	Work Order:	13-10-1794
Kailua, HI 96734-2500	Preparation:	N/A
	Method:	EPA 200.8
Project: Red Hill LTM 112066		Page 1 of 1

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-16-094-51	**Aqueous**	**ICP/MS 04**	**10/25/13 20:44**	**131024L02D**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Lead	100.0	109.9	110	80-120	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Sample Analysis Summary Report

Work Order: 13-10-1794

Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 200.8	N/A	598	ICP/MS 04	1

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Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order: 13-10-1794 Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
DL	The Detection Limit (DL) is the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
ICH	Initial calibration verification recovery is above the control limit for this analyte.
ICJ	Initial calibration verification recovery is below the control limit for this analyte.
IH	Calibration verification recovery is above the control limit for this analyte.
IJ	Calibration verification recovery is below the control limit for this analyte.
J	Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
LOD	The Limit of Detection (LOD) is the smallest amount or concentration of a substance that must be present in a sample in order to be detected at 99% confidence level.
LOQ	The Limit of Quantitation (LOQ) is the lowest concentration of a substance that produces a quantitative result within specified limits of precision and bias.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
U	Undetected at Detection Limit (DL) and is reported as less than the Limit of Detection (LOD).
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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Calscience Environmental Laboratories, Inc.

7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494
Other CA office locations: Concord and San Luis Obispo
For courier service / sample drop off information,
contact sales@calscience.com or call us.

CHAIN OF CUSTODY RECORD

WO # / LAB USE ONLY: **13-10-1794**

Date: 10/21/13

Page: 1 of 1

LABORATORY CLIENT: Environmental Science International

ADDRESS: 354 Uluniu St. #304

CITY: Kailua STATE: Hi ZIP: 96734

TEL: 808-261-0740 E-MAIL: RCHONG@ESCIENCEI.COM; DFEHER@ESCIENCEI.com

CLIENT PROJECT NAME / NUMBER: Red Hill LTM 112066

PROJECT CONTACT: Robert Chong

P.O. NO.:

SAMPLER(S): (PRINT) BI, JH

TURNAROUND TIME: ☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ STANDARD

☐ COELT EDF GLOBAL ID LOG CODE

SPECIAL INSTRUCTIONS:

REQUESTED ANALYSES

Please check box or fill in blank as needed.

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	TPH(g) ☒ GRO 8260	TPH(d) ☒ DRO 8015B	TPH ☐ C6-C36 ☐ C6-C44	TPH	BTEX / MTBE ☐ 8260 ☐	VOCs (8260)	Oxygenates (8260)	Prep (5035) ☐ En Core ☐ Terra Core	SVOCs (8270)	Pesticides (8081)	PCBs (8082)	PAHs ☐ 8270 ☒ 8270 SIM	T22 Metals ☐ 6010/747X ☐ 6020/747X	Cr(VI) ☐ 7196 ☐ 7199 ☐ 218.6	lead 6020	lead 200.8		
1	ES Trip	10/21/13	800	water	3		X		X					X												
2	ES037	10/21/13	1030	water	10	X	X	X	X	X				X						X			X			
3	ES038	10/21/13	1125	water	10	X	X	X	X	X				X						X			X			
	ES038 MS/MSD	10/21/13	1125	water	10	X	X	X	X	X				X						X			X			
4	ES039	10/21/13	1200	water	10	X	X	X	X	X				X						X			X			
5	ES040	10/21/13	1300	water	10	X	X	X	X	X				X						X			X			
6	ES041	10/22/13	0930*	water	9	X	X	X	X	X				X						X						
7	ES041 UF	10/22/13	0930*	water	1		X																	X		
8	ES042	10/22/13	1015	water	10	X	X	X	X	X				X						X			X			
				water																						

Relinquished by: (Signature)	1145 10/22/13	Received by: (Signature/Affiliation)	Date: / Time:
Relinquished by: (Signature) (Fedex)		Received by: (Signature/Affiliation)	Date: 10/24/13 Time: 1030
Relinquished by: (Signature)		Received by: (Signature/Affiliation)	Date: / Time:

DISTRIBUTION: White with final report, Green and Yellow to Client.
Please note that pages 1 and 2 of 2 of our T/Cs are printed on the reverse side of the Green and Yellow copies respectively.

11/01/12 Revision

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1794

FedEx Express US Airbill 8531 6209 1928 0200 Form ID No. FedEx Re

1 From
Date 11/22/13 Sender's FedEx Account Number 136853945
Sender's Name Brandon Haia Phone 808 261-6740
Company Environmental Science International
Address 354 Uluniu St Suite 304
Dept./Floor/Suite/Room
96734

4a Express Package Service
1 FedEx Priority Overnight Next business morning* 5 FedEx Standard Overnight Next business afternoon* 6
3 [X] FedEx 2Day Second business day* 20 FedEx Express Saver Third business day*
FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service
7 FedEx 1Day Freight* Next business day** 8 FedEx 2Day Freight Second business day** 83
* Call for Confirmation:

5 Packaging
6 FedEx Envelope* 2 FedEx Pak* Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak 3 FedEx Box 4

6 Special Handling
3 SATURDAY Delivery Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1 HOLD Weekday at FedEx Location Not available for *Include FedEx address in S 31

3 of 3
MPS# 0681 7969 7550 3159
Mstr# 8531 6209 1928 0200
VZ APVA
THU - 24 OCT AA
** 2DAY **
92841
CA-US SNA

2 of 3
MPS# 0681 7969 7550 3148
Mstr# 8531 6209 1928 0200
VZ APVA
THU

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Calscience Environmental Laboratories, Inc.

WORK ORDER #: 13-10-[1][7][9][4]

SAMPLE RECEIPT FORM

Cooler 1 of 3

CLIENT: ESI

DATE: 10/24/13

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.5 °C - 0.2 °C (CF) = 2.3 °C ☐ Blank ☑ Sample

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

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

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter **Checked by:** 836

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A **Checked by:** 836

☑ Sample ☐_____ ☐ No (Not Intact) ☐ Not Present **Checked by:** 895

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Aqueous samples received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfides ☐ Dissolved Oxygen	☐	☐	☑
Proper preservation noted on COC or sample container	☑	☐	☐
☑ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☑	☐	☐
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

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

Aqueous: ☑VOA (16) ☑VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☑1AGB (2) ☐1AGB**na$_2$** ☐1AGB**s**

☐500AGB ☑500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐1PB**na** ☐500PB

☐250PB ☑250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:** 131057B **Labeled/Checked by:** 895

Container: **C:** Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** 802

Preservative: **h:** HCL **n:** HNO_3 **na$_2$:** $Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:** 802

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Calscience Environmental Laboratories, Inc.

WORK ORDER #: 13-10-1794

SAMPLE RECEIPT FORM

Cooler 2 of 3

CLIENT: ESI DATE: 10/ /13

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.8 °C - 0.2 °C (CF) = 2.6 °C ☐ Blank ☑ Sample

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

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

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter Checked by: 836

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☐ Not Present ☐ N/A Checked by: 836

☑ Sample ☐_____ ☐ No (Not Intact) ☐ Not Present Checked by: 895

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Aqueous samples received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfides ☐ Dissolved Oxygen	☐	☐	☑
Proper preservation noted on COC or sample container	☑	☐	☐
☑ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☑	☐	☐
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

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

Aqueous: ☑VOA(10) ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☑1AGB(4) ☐1AGB**na$_2$** ☐1AGB**s**

☑500AGB(3) ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐1PB**na** ☐500PB

☐250PB ☑250PB**n**(3) ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** 895

Container: **C:** Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** 802

Preservative: **h:** HCL **n:** HNO_3 **na$_2$:** $Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:** 802

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Calscience Environmental Laboratories, Inc.

WORK ORDER #: 13-10-1794

SAMPLE RECEIPT FORM

Cooler 3 of 3

CLIENT: ESI DATE: 10/24/13

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.2 °C - 0.2 °C (CF) = 2.0 °C ☐ Blank ☑ Sample

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

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

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter **Checked by:** 836

CUSTODY SEALS INTACT:

☐ Cooler	☐_____	☐ No (Not Intact)	☑ Not Present	☐ N/A	Checked by: 836
☑ Sample	☐_____	☐ No (Not Intact)	☐ Not Present		Checked by: 895

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Aqueous samples received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfides ☐ Dissolved Oxygen	☐	☐	☑
Proper preservation noted on COC or sample container	☑	☐	☐
☑ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☑	☐	☐
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

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

Aqueous: ☑VOA ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☑1AGB ☐1AGB**na$_2$** ☐1AGB**s**

☐500AGB ☑500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐1PB**na** ☐500PB

☐250PB ☑250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** 895

Container: **C:** Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** 802

Preservative: **h:** HCL **n:** HNO_3 **na$_2$:** $Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:** 802

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Calscience Environmental Laboratories, Inc.

WORK ORDER #: 13-10-1794

SAMPLE RECEIPT FORM

Cooler 3 of 3

CLIENT: ESI DATE: 10/24/13

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.2 °C - 0.2 °C (CF) = 2.0 °C ☐ Blank ☑ Sample

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

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

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter **Checked by:** 836

CUSTODY SEALS INTACT:

☐ Cooler	☐_____	☐ No (Not Intact)	☑ Not Present	☐ N/A	Checked by: 836
☑ Sample	☐_____	☐ No (Not Intact)	☐ Not Present		Checked by: 895

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Aqueous samples received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfides ☐ Dissolved Oxygen	☐	☐	☑
Proper preservation noted on COC or sample container	☑	☐	☐
☑ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☑	☐	☐
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

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

Aqueous: ☑VOA ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☑1AGB ☐1AGB**na$_2$** ☐1AGB**s**

☐500AGB ☑500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐1PB**na** ☐500PB

☐250PB ☑250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** 895

Container: **C:** Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** 802

Preservative: **h:** HCL **n:** HNO_3 **na$_2$:** $Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:** 802

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APPENDIX D

Historical Groundwater Exceedance Trends

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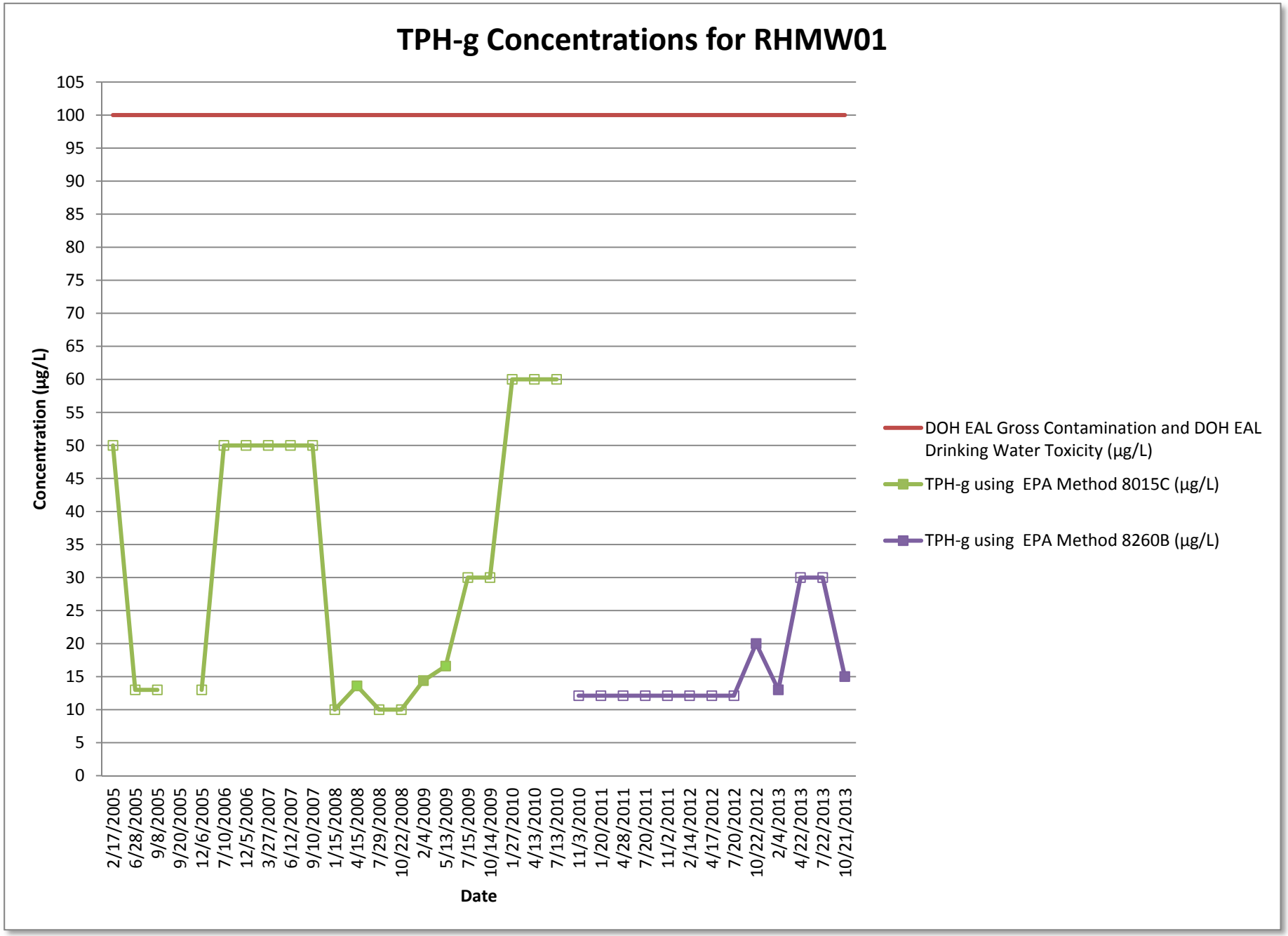

Data points for 2/17/2005 through 9/8/2005 and 12/6/2005 are the average of the primary and duplicate samples.
Unfilled boxes indicate non-detections. Method detection limits are shown.

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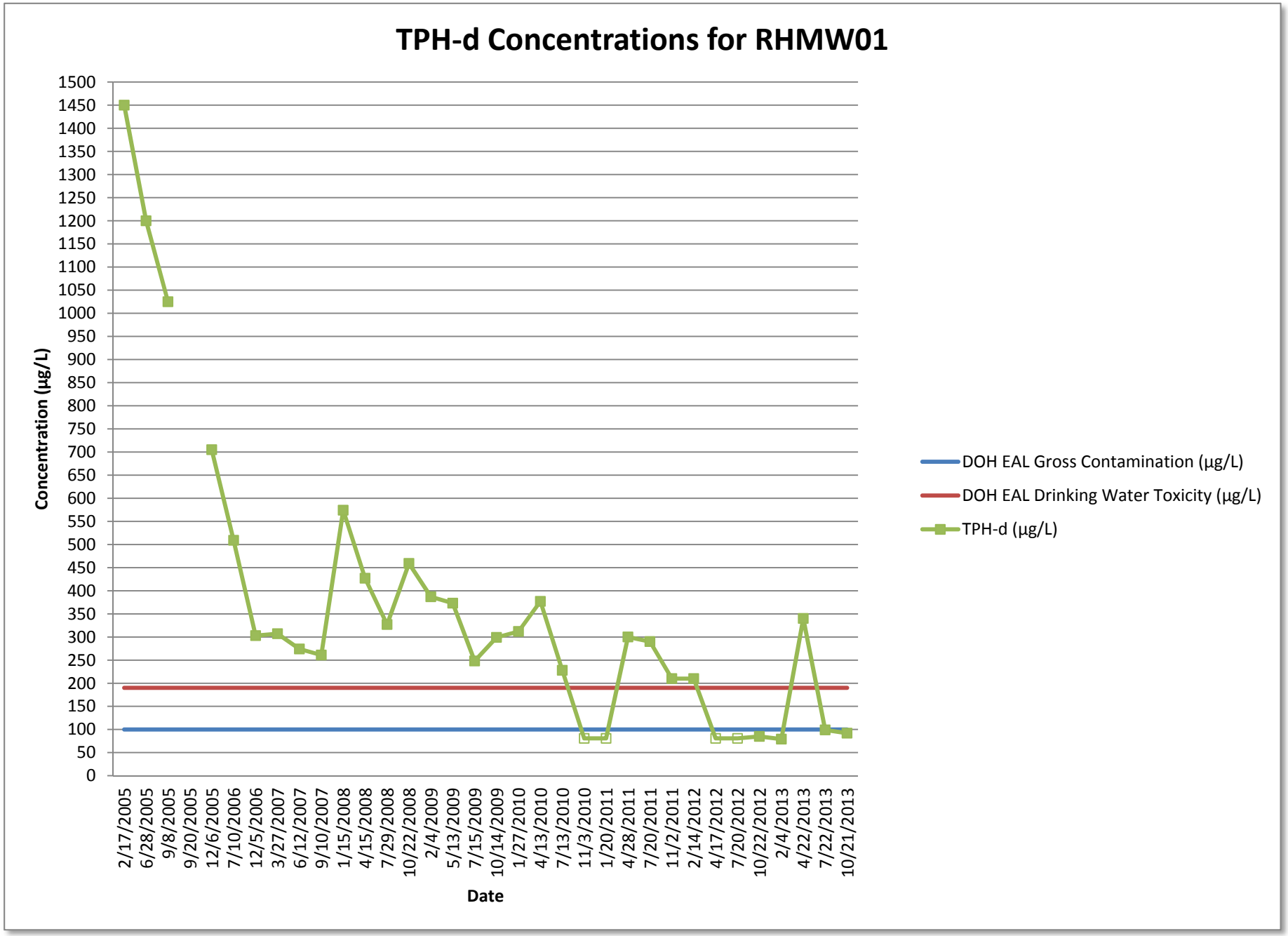

Data points for 2/17/2005 through 9/8/2005 and 12/6/2005 are the average of the primary and duplicate samples.
Unfilled boxes indicate non-detections. Method detection limits are shown.

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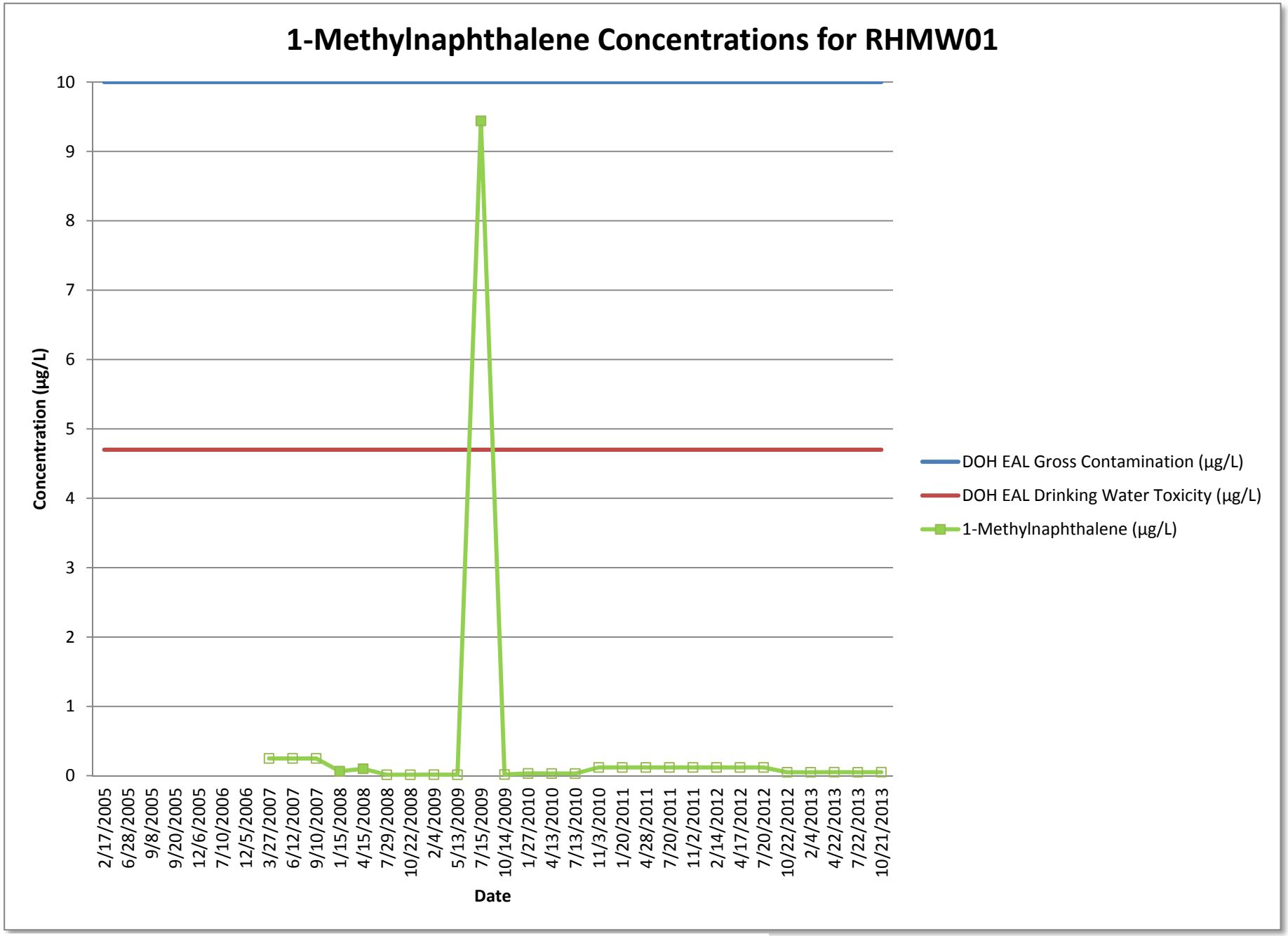

Unfilled boxes indicate non-detections. Method detection limits are shown.

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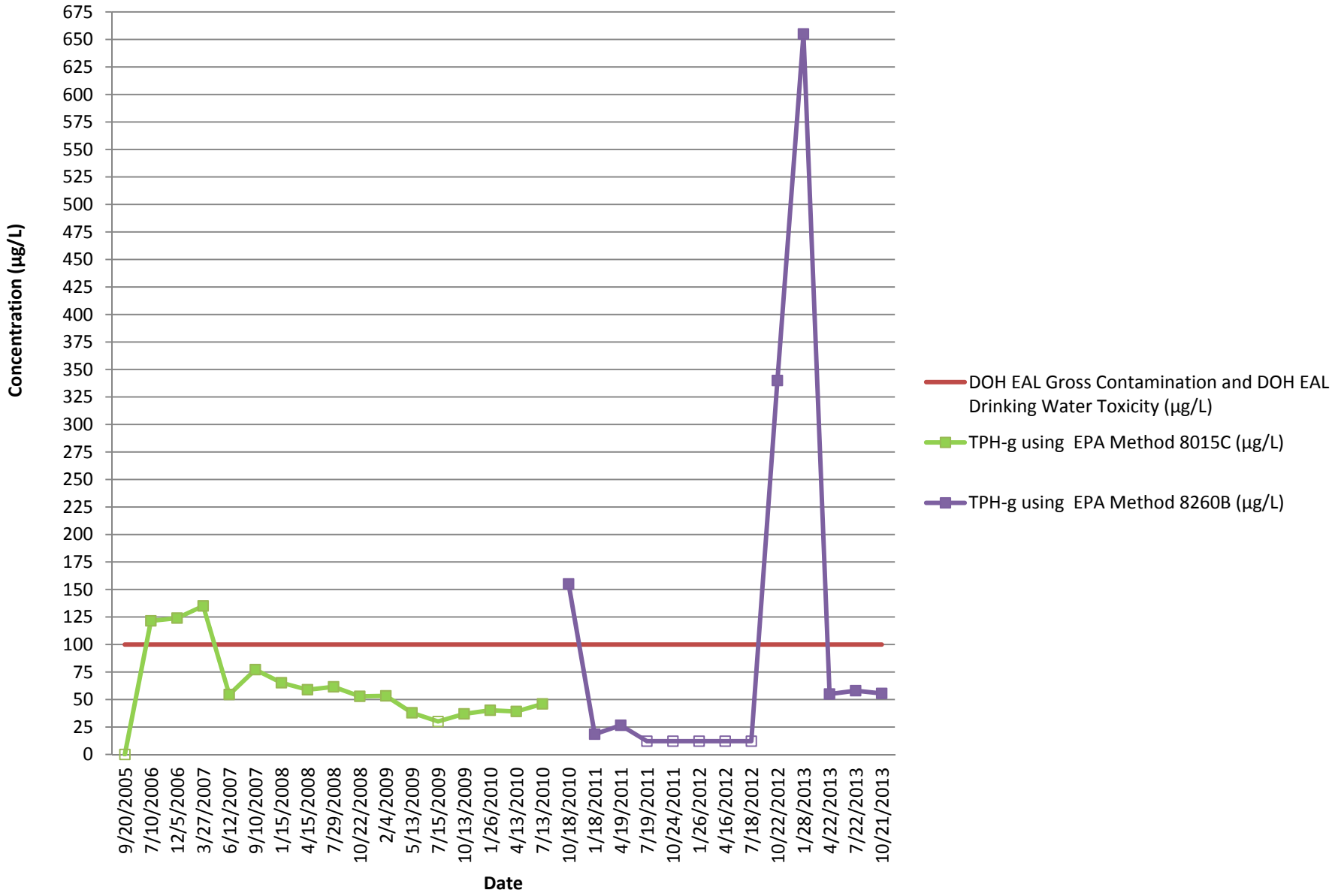
TPH-g Concentrations for RHMW02



Data points for 9/20/2005 through 10/21/2013 are the average of the primary and duplicate samples.

Unfilled boxes indicate non-detections. Method detection limits are shown.

Primary sample results are shown for 1/26/2012 and 7/18/2012; all other concentrations are the average of the primary and duplicate sample results.

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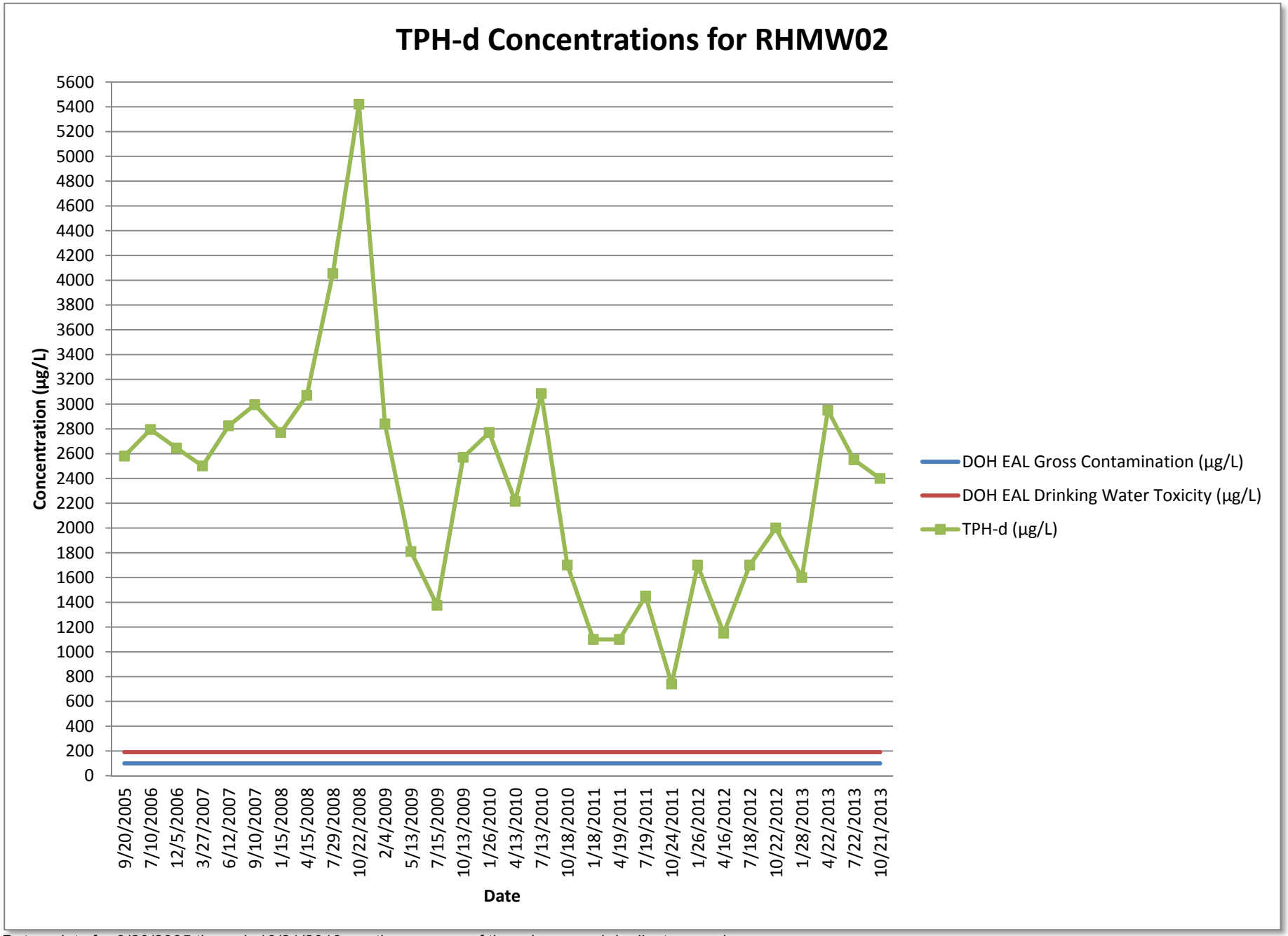

Data points for 9/20/2005 through 10/21/2013 are the average of the primary and duplicate samples.
Unfilled boxes indicate non-detections. Method detection limits are shown.

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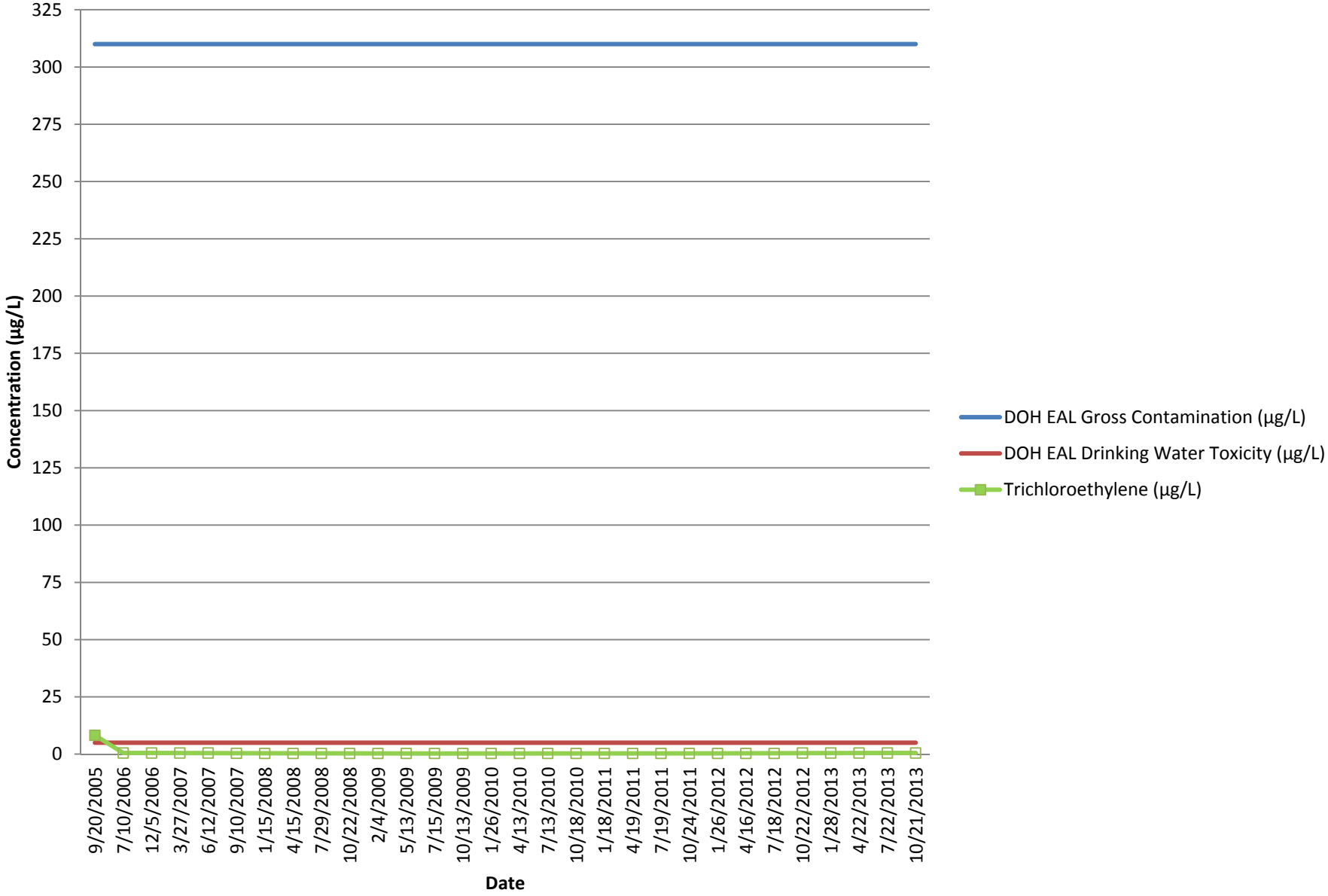
Trichloroethylene Concentrations for RHMW02



Data points for 9/20/2005 through 10/21/2013 are the average of the primary and duplicate samples.
Unfilled boxes indicate non-detections. Method detection limits are shown.

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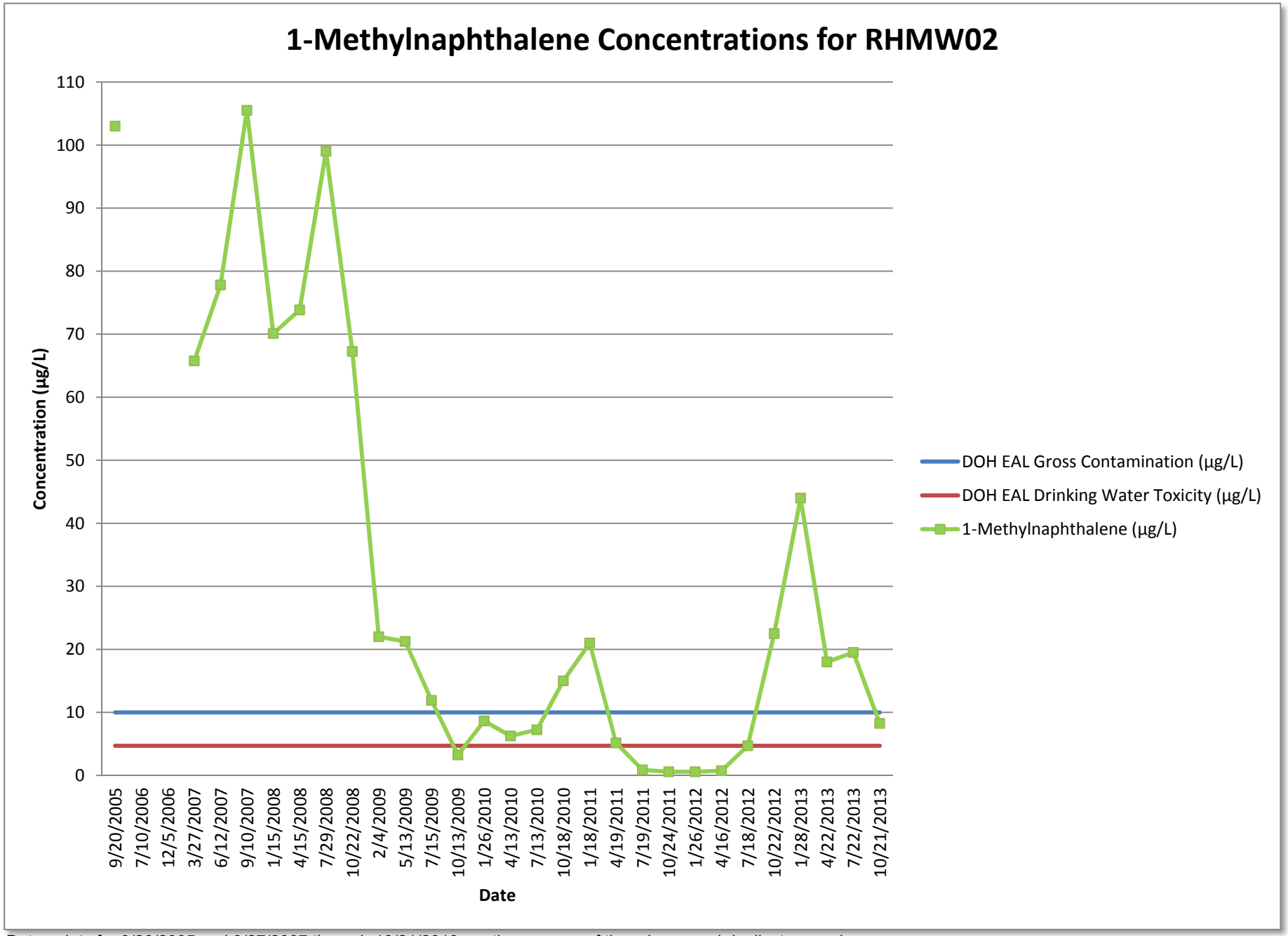

Data points for 9/20/2005 and 3/27/2007 through 10/21/2013 are the average of the primary and duplicate samples.
Unfilled boxes indicate non-detections. Method detection limits are shown.

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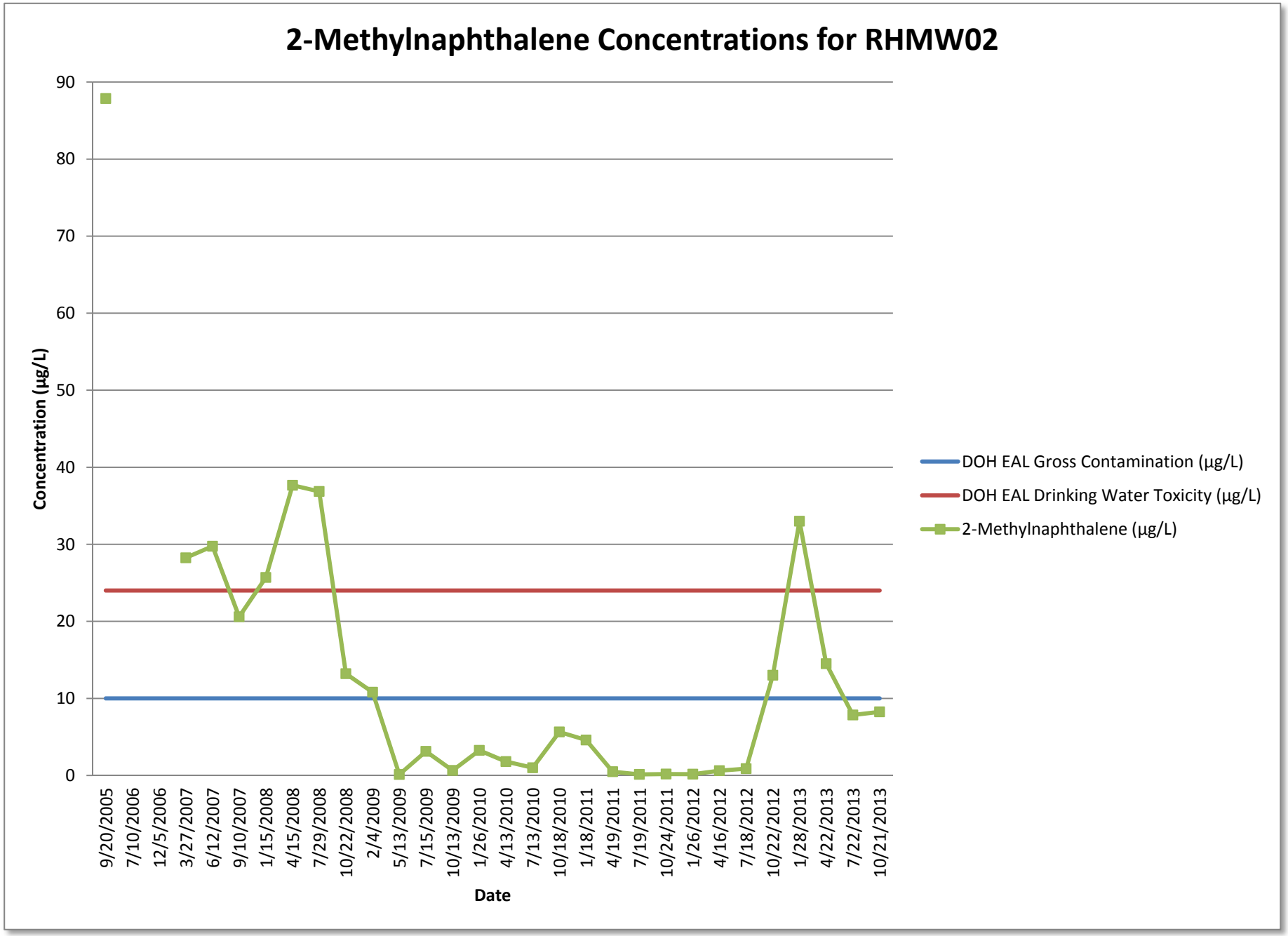

Data points for 9/20/2005 and 3/27/2007 through 10/21/2013 are the average of the primary and duplicate samples.
Unfilled boxes indicate non-detections. Method detection limits are shown.

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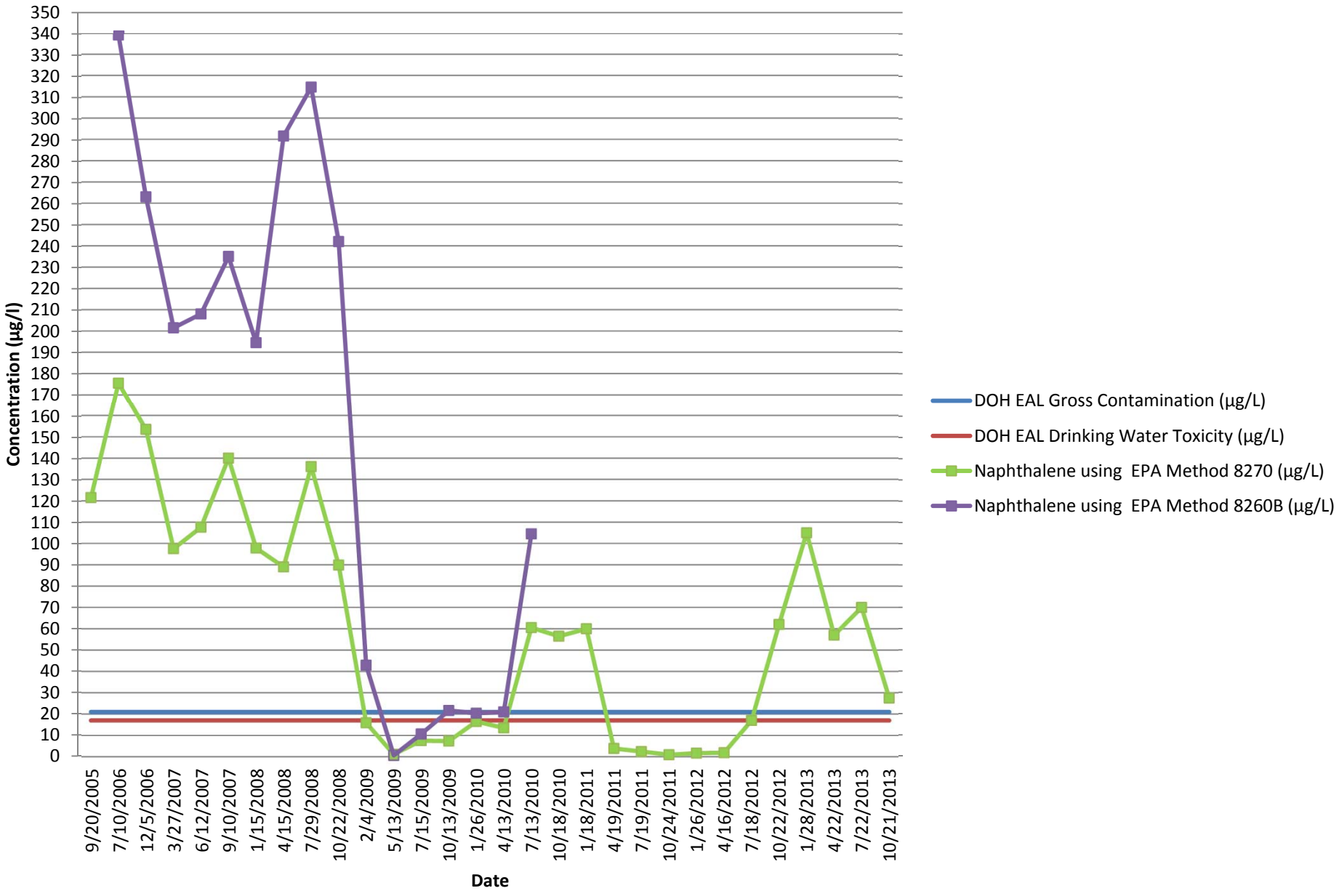
Naphthalene Concentrations for RHMW02



Primary sample results are shown for 1/26/2012 and 10/21/2012; all other concentrations are the average of the primary and duplicate sample results.
Unfilled boxes indicate non-detections. Method detection limits are shown.

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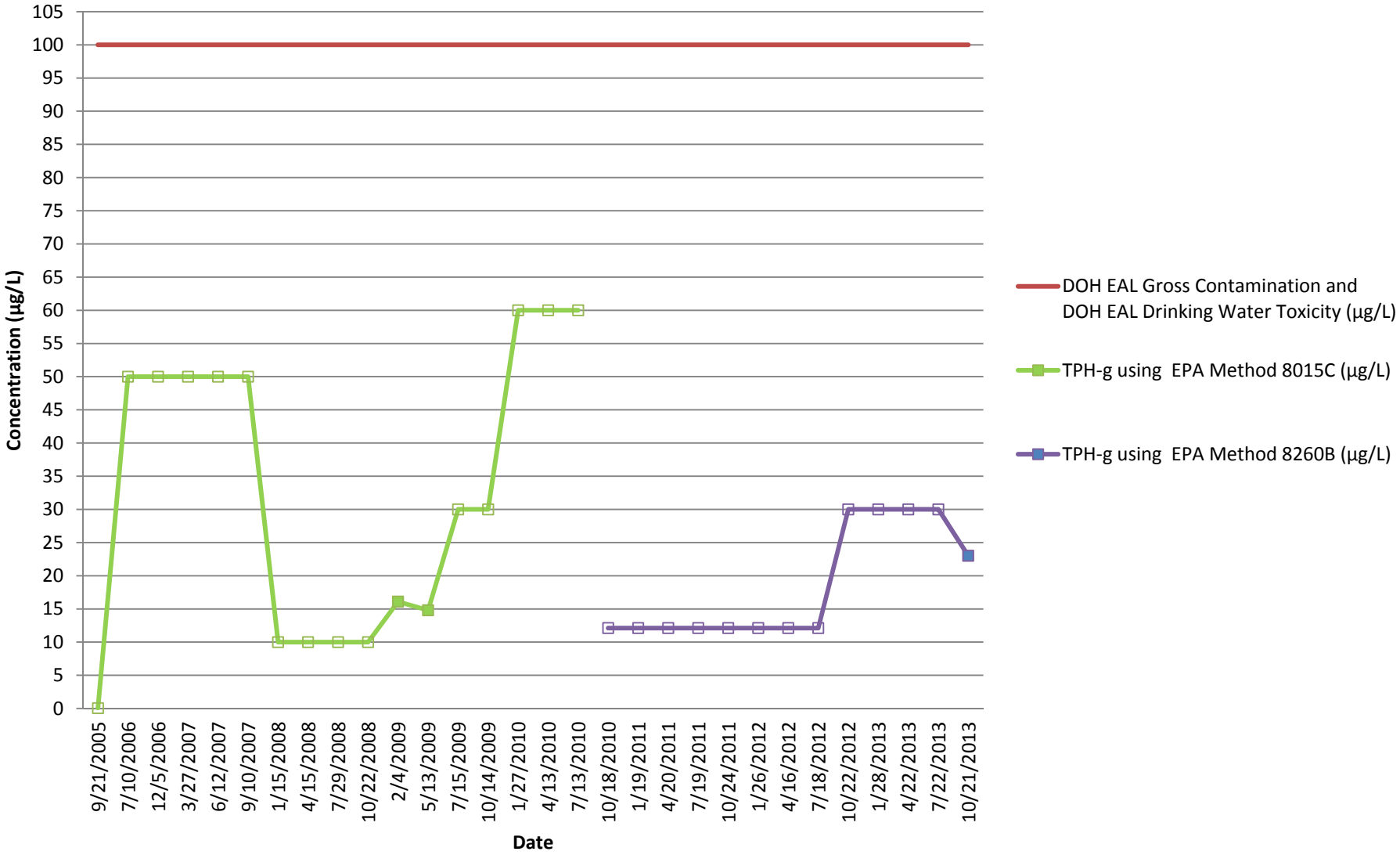
TPH-g Concentrations for RHMW03



Unfilled boxes indicate non-detections. Method detection limits are shown.

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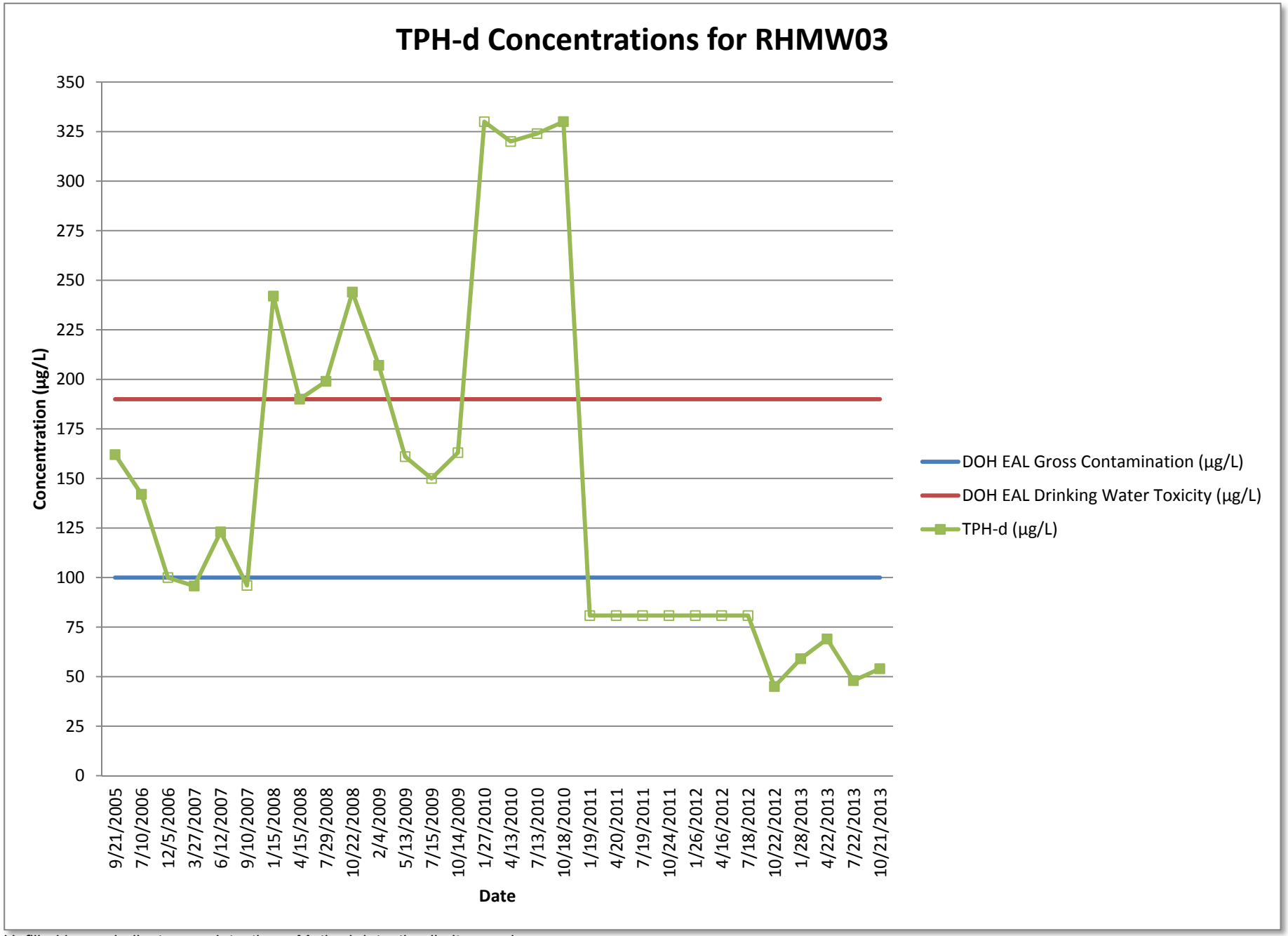

Unfilled boxes indicate non-detections. Method detection limits are shown.

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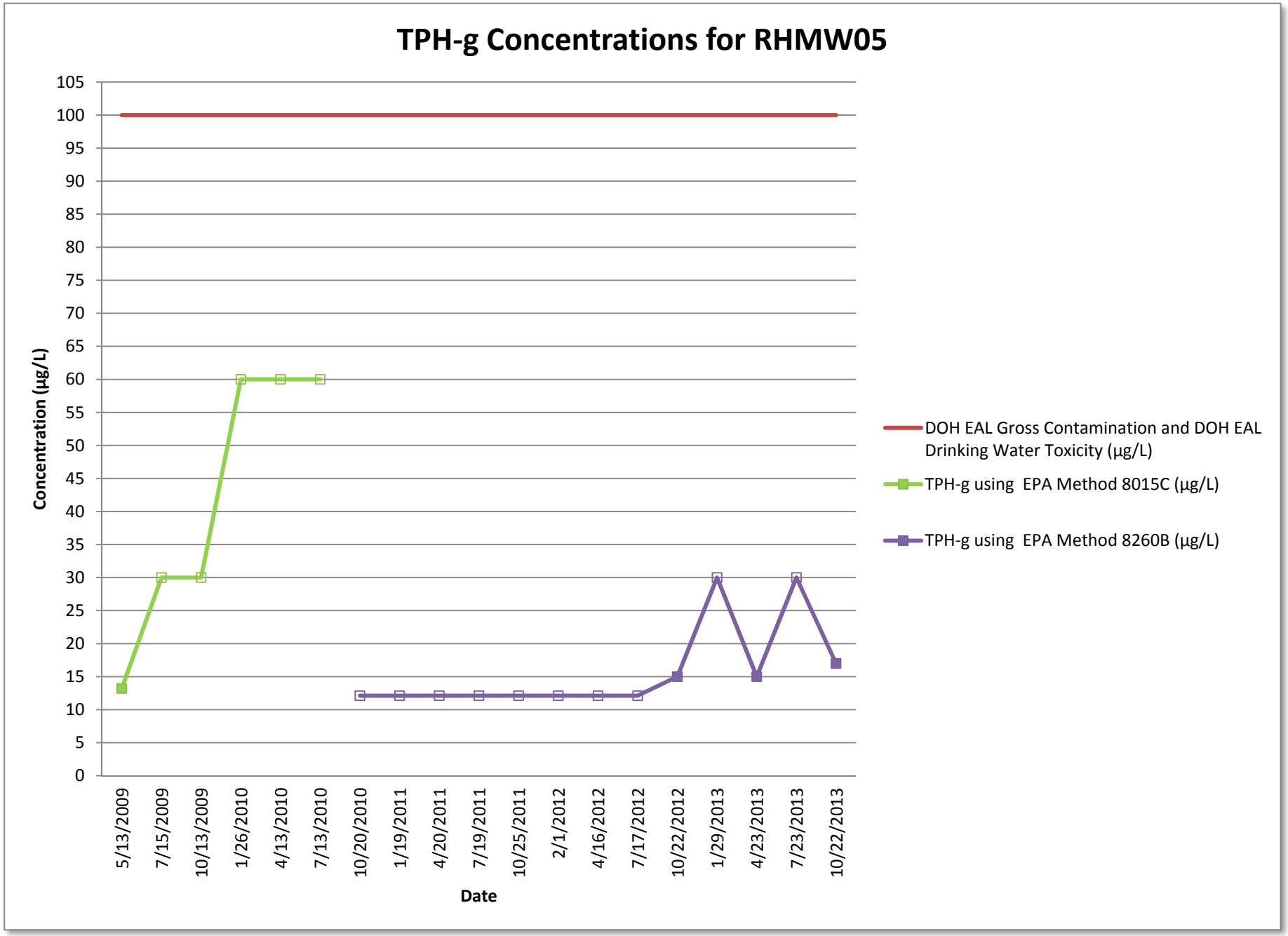

Data point for 7/17/2012 is the average of the primary and duplicate samples.
Unfilled boxes indicate non-detections. Method detection limits are shown.
Possible laboratory contamination for 10/23/2012 and 11/22/2013 sampling event.

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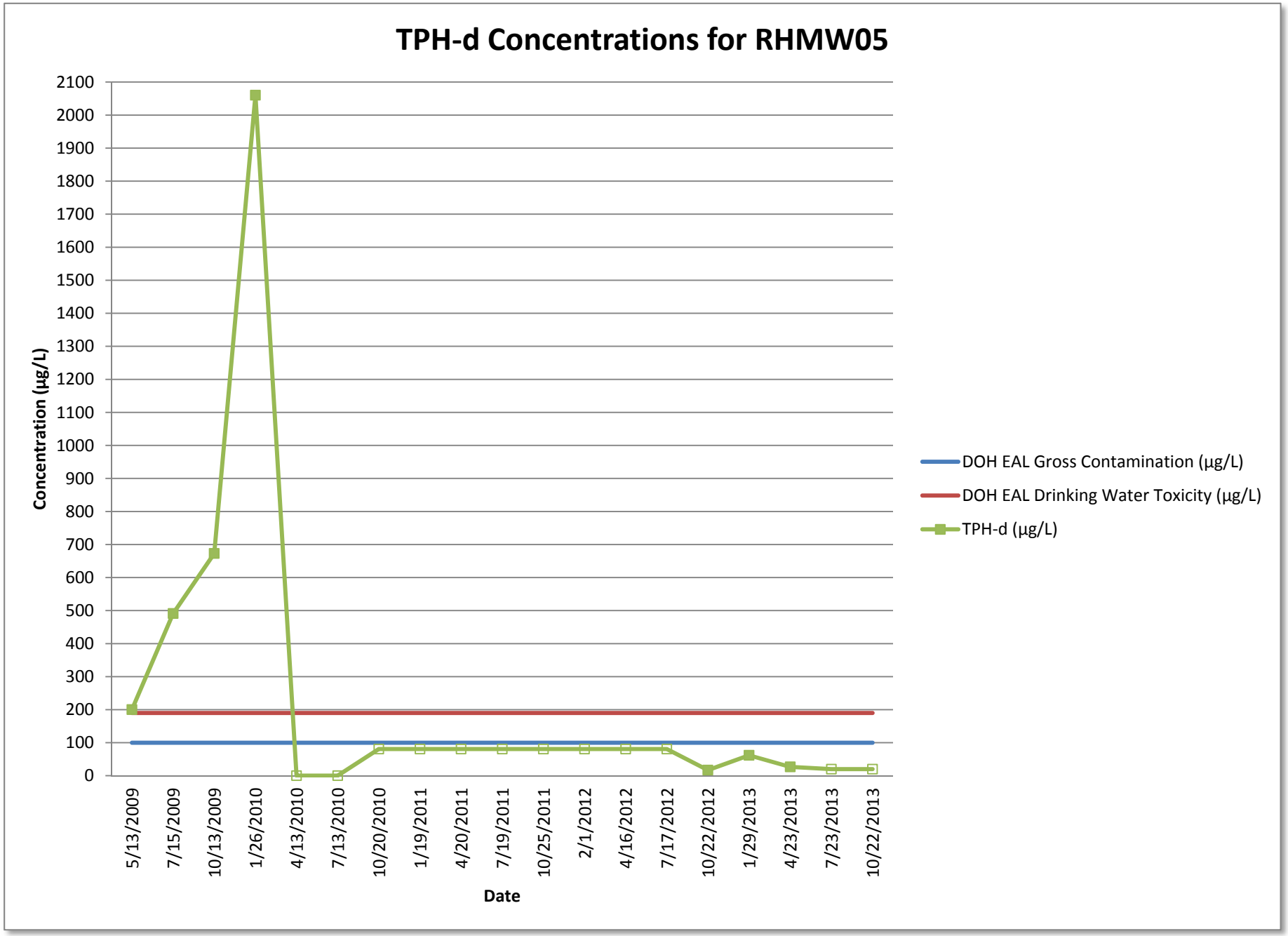

Data point for 7/17/2012 is the average of the primary and duplicate samples.
Unfilled boxes indicate non-detections. Method detection limits are shown.

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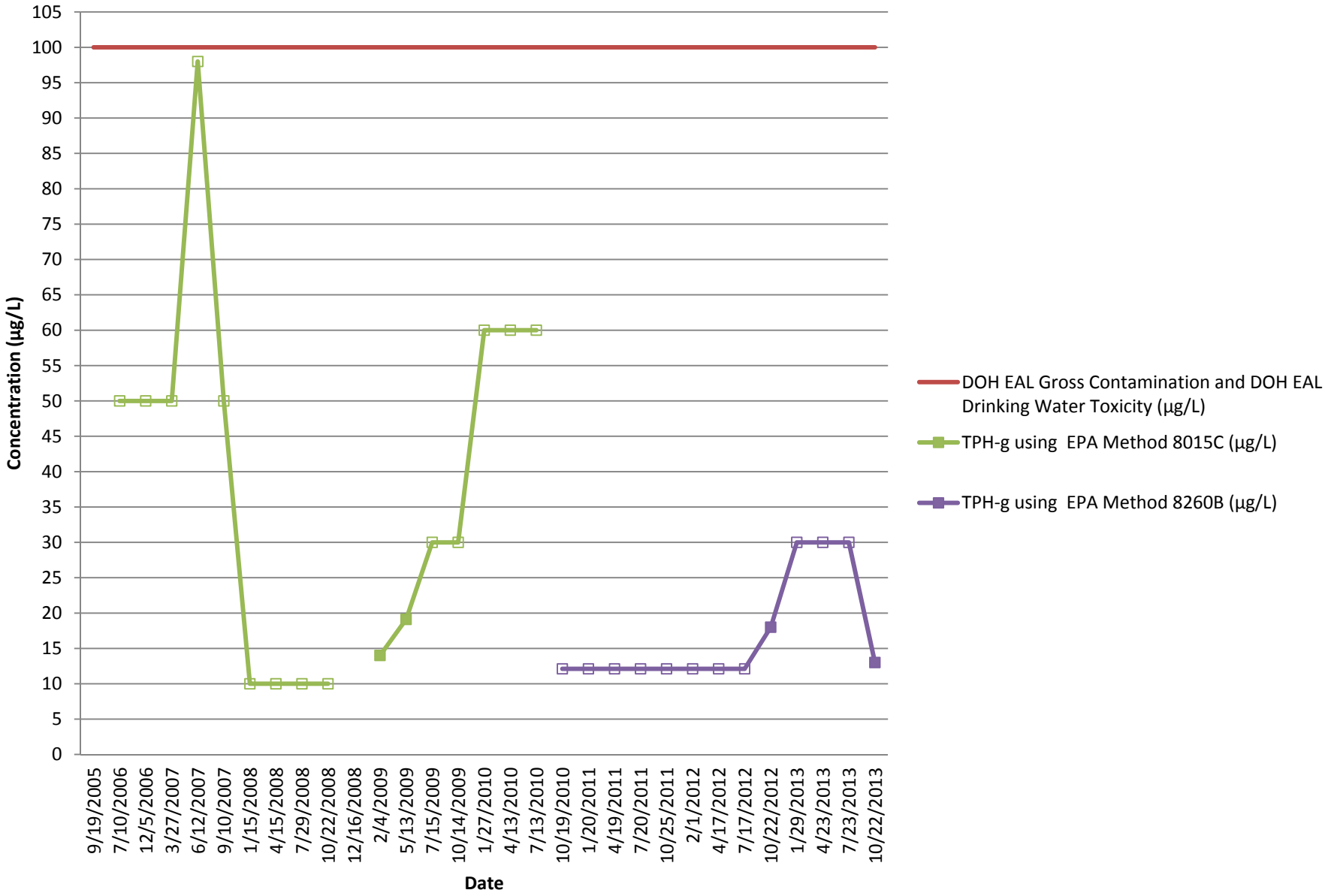
TPH-g Concentrations for RHMW2254-01



Unfilled boxes indicate non-detections. Method detection limits are shown.

Possible laboratory contamination for 10/23/2012 and 10/22/2013 sampling event.

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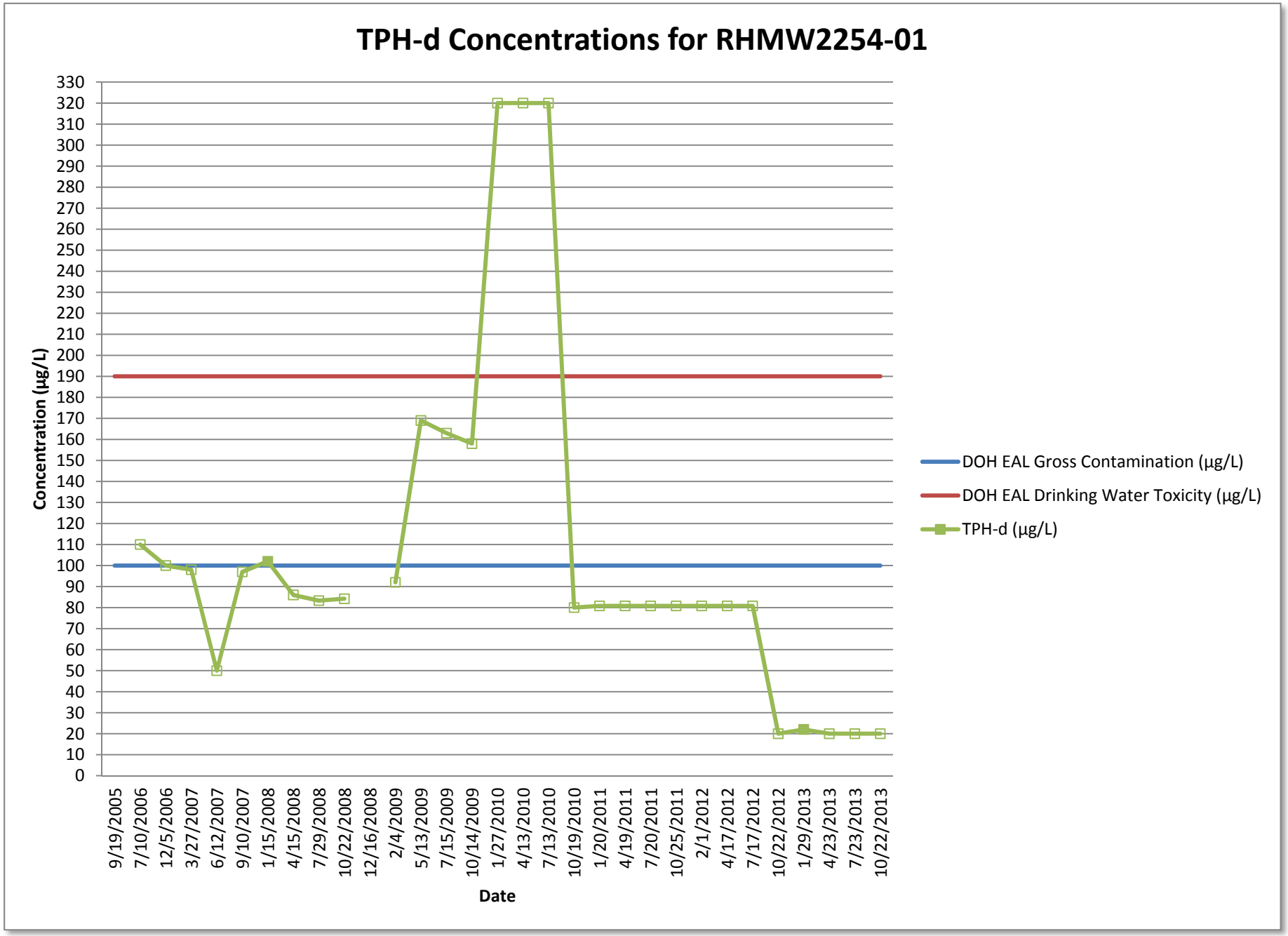

Unfilled boxes indicate non-detections. Method detection limits are shown.
Laboratory data rejected for 1/15/2008 sampling event.

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APPENDIX E

Waste Disposal Manifest

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6 12/11. . . .

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	HIR 000 050 401	1	808-206-9989	000021584

5. Generator's Name and Mailing Address
COMNAVREG HAWAII, C/O NAVFAC HAWAII, CODE PRJ42
400 MARSHALL ROAD, ATTN: ESTRELITA HIGA
JBPHH, HI 96860-3139
Generator's Phone: 808-471-4216

Generator's Site Address (if different than mailing address)
HIC8553-05
RED HILL BULK FUEL STORAGE FACILITY
AIEA, HI 96701

6. Transporter 1 Company Name: PACIFIC COMMERCIAL SERVICES, LLC. — 808-545-4599 — U.S. EPA ID Number: HIR000097824

7. Transporter 2 Company Name: UNITEK SOLVENT SERVICES, INC.-OAHU — 808-682-8284 — U.S. EPA ID Number: HID982443715

8. Designated Facility Name and Site Address
UNITEK SOLVENT SERVICES, INC.
91-125 KAOMI LOOP
KAPOLEI, HI 96707
Facility's Phone: 808-682-8284
U.S. EPA ID Number: HID982443715

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	MATERIAL NOT REGULATED BY DOT (WELL PURGE AND DECONTAMINATION WATER)	001	DM	00020	G	NON-RCRA
2.						
3.						
4.	HQ300 PPM PH-6					

13. Special Handling Instructions and Additional Information
9b1: NR 2008 9b1: TOTAL HALOGEN: PPM 400

GENERATOR'S CERTIFICATION: I HEREBY DECLARE THAT THE CONTENTS OF THIS CONSIGNMENT ARE FULLY AND ACCURATELY DESCRIBED ABOVE BY PROPER SHIPPING NAME (WHERE APPLICABLE) AND ARE CLASSIFIED, PACKED, MARKED , AND LABELED AND ARE IN ALL RESPECTS IN PROPER CONDITION FOR TRANSPORT BY HIGHWAY ACCORDING TO APPLICABLE GOVERNMNET REGULATIONS. I FURTHER CERTIFY THAT IF THIS IS USED OIL IT IS SUBJECT TO REGULATION UNDER 40 CFR PART 279; THAT IT DOES NOT CONTAIN PCBS GREATER THAN OR EQUAL TO 2 PPM; AND THAT IT HAS NOT BEEN CONTAMINATED WITH CARBURATOR CLEANERS, BRAKE SPRAY, FREON, HALOGENATED SOLVENTS, OR OTHER HAZARDOUS MATERIALS AND/OR HAZARDOUS WASTES.

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

GENERATOR

Generator's/Offeror's Printed/Typed Name: Scott Simmons for COMNAVREG — Signature: [signature] — Month: 12 Day: 11 Year: 13

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Russell Castellano — Signature: [signature] — Month: 12 Day: 11 Year: 13

Transporter 2 Printed/Typed Name: S. J. Lemaila — Signature: [signature] — Month: 12 Day: 18 Year: 13

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month: Day: Year:

PCS PROVIDED THE KIT
SEE CONSOLIDATED MANIFEST MW1342

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name: P. ALHAMBRA — Signature: [signature] — Month: 12 Day: 19 Year: 2013

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