



**United States Environmental Protection Agency  
Region 9 Laboratory**

1337 S. 46th Street Building 201  
Richmond, CA 94804

**Date:** 11/27/2017  
**Subject:** Analytical Testing Results - Project R18U01  
SDG: 17298E  
**From:** Peter Husby, Director  
EPA Region 9 Laboratory  
EMD-3-1  
**To:** Lyndsey Tu  
Underground Storage Tanks Program Office  
LND-4-3

Attached are the results from the analysis of samples from the **Red Hill Tank Farm October 2017 Split Sampling** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Bob Pallarino, UST Section  
Roxanne Kwan, Hawaii DOH

**Analyses included in this report:**

---

PAHs by GC/MS SIM

PAHs by GC/MS SIM

Extractable Petroleum Hydrocarbons by  
GC/FID

Extractable Petroleum Hydrocarbons (w/silica  
gel)



United States Environmental Protection Agency  
**Region 9 Laboratory**

1337 S. 46th Street, Building 201, Richmond, CA 94804  
Phone:(510) 412-2300 Fax:(510) 412-2302

**Project Manager:** Lyndsey Tu

**Project Number:** R18U01

**Project:** Red Hill Tank Farm October 2017 Split  
Sampling

**Underground Storage Tanks Program Office**

75 Hawthorne Street  
San Francisco CA, 94105

**SDG:** 17298E

**Reported:** 11/27/17 16:12

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
ERH415	1710075-01	Water	10/23/17 12:20	10/25/17 09:56
ERH418	1710075-02	Water	10/23/17 12:30	10/25/17 09:56



**United States Environmental Protection Agency  
Region 9 Laboratory**

1337 S. 46th Street, Building 201, Richmond, CA 94804  
Phone:(510) 412-2300 Fax:(510) 412-2302

<b>Project Manager:</b> Lyndsey Tu	<b>Underground Storage Tanks Program Office</b>	<b>SDG:</b> 17298E
<b>Project Number:</b> R18U01	<b>75 Hawthorne Street</b>	<b>Reported:</b> 11/27/17 16:12
<b>Project:</b> Red Hill Tank Farm October 2017 Split Sampling	<b>San Francisco CA, 94105</b>	

**Sample Results**

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
---------	----------------------	--------	-----------------------	--------------------	-------	-------	----------	----------	--------

**Lab ID:** 1710075-01

**Water - Sampled: 10/23/17 12:20**

**Sample ID:** ERH415

**Extractable Petroleum Hydrocarbons**

TPH - Diesel Range Organics	RE1	3,300	F13	160	ug/L	B17J147	10/27/17	11/03/17	8015C
TPH - Oil Range Organics	RE1	ND	U	640	"	"	"	"	8015C
<i>Surrogate: Hexacosane</i>	<i>RE1</i>		58 %	47-130%		"	"	"	

**Sample ID:** ERH415

**Extractable Petroleum Hydrocarbons with Silica Gel Cleanup**

TPH - Diesel Range Organics		550	F3	160	"	"	"	11/02/17	8015C
TPH - Oil Range Organics		ND	U	640	"	"	"	"	8015C
<i>Surrogate: Hexacosane</i>			73 %	47-130%		"	"	"	

**Sample ID:** ERH415

**Semivolatile Organic Compounds by EPA Method 8270D**

Naphthalene	RE1	50,000		500	ng/L	B17J145	10/27/17	11/20/17	8270D (SIM)
2-Methylnaphthalene	RE1	13,000		500	"	"	"	"	8270D (SIM)
1-Methylnaphthalene	RE1	19,000		500	"	"	"	"	8270D (SIM)
Acenaphthylene		ND	U	50	"	"	"	11/16/17	8270D (SIM)
Acenaphthene		610		50	"	"	"	"	8270D (SIM)
Fluorene		370		50	"	"	"	"	8270D (SIM)
Phenanthrene		ND	U	50	"	"	"	"	8270D (SIM)
Anthracene		ND	U	50	"	"	"	"	8270D (SIM)
Fluoranthene		ND	U	50	"	"	"	"	8270D (SIM)
Pyrene		ND	U	50	"	"	"	"	8270D (SIM)
Benzo(a)anthracene		ND	U	50	"	"	"	"	8270D (SIM)
Chrysene		ND	U	50	"	"	"	"	8270D (SIM)
Benzo(b)fluoranthene		ND	U	50	"	"	"	"	8270D (SIM)
Benzo(k)fluoranthene		ND	U	50	"	"	"	"	8270D (SIM)
Benzo(a)pyrene		ND	U	50	"	"	"	"	8270D (SIM)
Indeno(1,2,3-cd)pyrene		ND	U	50	"	"	"	"	8270D (SIM)
Dibenz(a,h)anthracene		ND	U	50	"	"	"	"	8270D (SIM)
Benzo(g,h,i)perylene		ND	U	50	"	"	"	"	8270D (SIM)
<i>Surrogate: 2-Fluorobiphenyl</i>			96 %	32-110%		"	"	"	
<i>Surrogate: Terphenyl-d14</i>			86 %	39-136%		"	"	"	

**Lab ID:** 1710075-02

**Water - Sampled: 10/23/17 12:30**

**Sample ID:** ERH418

**Extractable Petroleum Hydrocarbons**

TPH - Diesel Range Organics		180	F6	150	ug/L	B17J147	10/27/17	11/02/17	8015C
TPH - Oil Range Organics		ND	U	600	"	"	"	"	8015C
<i>Surrogate: Hexacosane</i>			61 %	47-130%		"	"	"	

**Sample ID:** ERH418

**Extractable Petroleum Hydrocarbons with Silica Gel Cleanup**

TPH - Diesel Range Organics		ND	U	150	"	"	"	11/02/17	8015C
TPH - Oil Range Organics		ND	U	600	"	"	"	"	8015C



**United States Environmental Protection Agency  
Region 9 Laboratory**

1337 S. 46th Street, Building 201, Richmond, CA 94804  
Phone:(510) 412-2300 Fax:(510) 412-2302

<b>Project Manager:</b> Lyndsey Tu	<b>Underground Storage Tanks Program Office</b>	<b>SDG:</b> 17298E
<b>Project Number:</b> R18U01	<b>75 Hawthorne Street</b>	<b>Reported:</b> 11/27/17 16:12
<b>Project:</b> Red Hill Tank Farm October 2017 Split Sampling	<b>San Francisco CA, 94105</b>	

**Sample Results**

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
---------	-------------------------	--------	--------------------------	-----------------------	-------	-------	----------	----------	--------

**Lab ID:** 1710075-02

**Water - Sampled: 10/23/17 12:30**

**Sample ID:** ERH418

**Extractable Petroleum Hydrocarbons with Silica Gel Cleanup**

*Surrogate: Hexacosane*

77 %

47-130%

*B17J147*

*10/27/17*

*11/02/17*

**Sample ID:** ERH418

**Semivolatile Organic Compounds by EPA Method 8270D**

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Naphthalene	ND	U	50	ng/L	B17J145	10/27/17	11/16/17	8270D (SIM)
2-Methylnaphthalene	ND	U	50	"	"	"	"	8270D (SIM)
1-Methylnaphthalene	ND	U	50	"	"	"	"	8270D (SIM)
Acenaphthylene	ND	U	50	"	"	"	"	8270D (SIM)
Acenaphthene	ND	U	50	"	"	"	"	8270D (SIM)
Fluorene	ND	U	50	"	"	"	"	8270D (SIM)
Phenanthrene	ND	U	50	"	"	"	"	8270D (SIM)
Anthracene	ND	U	50	"	"	"	"	8270D (SIM)
Fluoranthene	ND	U	50	"	"	"	"	8270D (SIM)
Pyrene	ND	U	50	"	"	"	"	8270D (SIM)
Benzo(a)anthracene	ND	U	50	"	"	"	"	8270D (SIM)
Chrysene	ND	U	50	"	"	"	"	8270D (SIM)
Benzo(b)fluoranthene	ND	U	50	"	"	"	"	8270D (SIM)
Benzo(k)fluoranthene	ND	U	50	"	"	"	"	8270D (SIM)
Benzo(a)pyrene	ND	U	50	"	"	"	"	8270D (SIM)
Indeno(1,2,3-cd)pyrene	ND	U	50	"	"	"	"	8270D (SIM)
Dibenz(a,h)anthracene	ND	U	50	"	"	"	"	8270D (SIM)
Benzo(g,h,i)perylene	ND	U	50	"	"	"	"	8270D (SIM)

*Surrogate: 2-Fluorobiphenyl*

76 %

32-110%

"

"

"

*Surrogate: Terphenyl-d14*

99 %

39-136%

"

"

"



# United States Environmental Protection Agency Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804  
Phone: (510) 412-2300 Fax: (510) 412-2302

<b>Project Manager:</b> Lyndsey Tu	<b>Underground Storage Tanks Program Office</b>	<b>SDG:</b> 17298E
<b>Project Number:</b> R18U01	<b>75 Hawthorne Street</b>	<b>Reported:</b> 11/27/17 16:12
<b>Project:</b> Red Hill Tank Farm October 2017 Split Sampling	<b>San Francisco CA, 94105</b>	

## Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
---------	--------	-----------------------	--------------------	-------	-------------	---------------	------	-------------	-----	-----------

Batch B17J145 - 3520C CLLE - PAH-Low

Prepared: 10/27/17 Analyzed: 11/16/17

Semivolatile Organic Compounds by EPA Method 8270D - Quality Control

### Blank (B17J145-BLK1)

Naphthalene	ND	U	50	ng/L						
2-Methylnaphthalene	ND	U	50	"						
1-Methylnaphthalene	ND	U	50	"						
Acenaphthylene	ND	U	50	"						
Acenaphthene	ND	U	50	"						
Fluorene	ND	U	50	"						
Phenanthrene	ND	U	50	"						
Anthracene	ND	U	50	"						
Fluoranthene	ND	U	50	"						
Pyrene	ND	U	50	"						
Benzo(a)anthracene	ND	U	50	"						
Chrysene	ND	U	50	"						
Benzo(b)fluoranthene	ND	U	50	"						
Benzo(k)fluoranthene	ND	U	50	"						
Benzo(a)pyrene	ND	U	50	"						
Indeno(1,2,3-cd)pyrene	ND	U	50	"						
Dibenz(a,h)anthracene	ND	U	50	"						
Benzo(g,h,i)perylene	ND	U	50	"						

Surrogate: 2-Fluorobiphenyl	4250	U	5000	"	5000	85	32-110
Surrogate: Terphenyl-d14	5490	U	5000	"	5000	110	39-136

### LCS (B17J145-BS1)

Naphthalene	846		50	ng/L	1000	85	20-110
2-Methylnaphthalene	784		50	"	1000	78	20-110
1-Methylnaphthalene	765		50	"	1000	77	20-110
Acenaphthylene	793		50	"	1000	79	35-110
Acenaphthene	830		50	"	1000	83	25-110
Fluorene	852		50	"	1000	85	36-110
Phenanthrene	871		50	"	1000	87	49-110
Anthracene	821		50	"	1000	82	56-110
Fluoranthene	864		50	"	1000	86	65-110
Pyrene	903		50	"	1000	90	57-114
Benzo(a)anthracene	909		50	"	1000	91	70-125
Chrysene	906		50	"	1000	91	64-110
Benzo(b)fluoranthene	977		50	"	1000	98	63-111
Benzo(k)fluoranthene	1,010		50	"	1000	101	63-116
Benzo(a)pyrene	826		50	"	1000	83	62-110
Indeno(1,2,3-cd)pyrene	912		50	"	1000	91	60-116
Dibenz(a,h)anthracene	934		50	"	1000	93	60-121
Benzo(g,h,i)perylene	911		50	"	1000	91	59-110



**United States Environmental Protection Agency  
Region 9 Laboratory**

1337 S. 46th Street, Building 201, Richmond, CA 94804  
Phone:(510) 412-2300 Fax:(510) 412-2302

<b>Project Manager:</b> Lyndsey Tu	<b>Underground Storage Tanks Program Office</b>	<b>SDG:</b> 17298E
<b>Project Number:</b> R18U01	<b>75 Hawthorne Street</b>	<b>Reported:</b> 11/27/17 16:12
<b>Project:</b> Red Hill Tank Farm October 2017 Split Sampling	<b>San Francisco CA, 94105</b>	

**Quality Control**

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
---------	--------	-----------------------	--------------------	-------	-------------	---------------	------	-------------	-----	-----------

**Batch B17J145 - 3520C CLLE - PAH-Low**

**Prepared: 10/27/17 Analyzed: 11/16/17**  
**Semivolatile Organic Compounds by EPA Method 8270D - Quality Control**

**LCS (B17J145-BS1)**

<i>Surrogate: 2-Fluorobiphenyl</i>	4010			"	5000		80	32-110		
<i>Surrogate: Terphenyl-d14</i>	5120			"	5000		102	39-136		

**Batch B17J147 - 3520C CLLE - TPH - Extractable**

**Prepared: 10/27/17 Analyzed: 11/02/17**  
**Extractable Petroleum Hydrocarbons - Quality Control**

**Blank (B17J147-BLK1)**

TPH - Diesel Range Organics	160				150 ug/L					
TPH - Oil Range Organics	ND	U			600 "					

<i>Surrogate: Hexacosane</i>	131			"	150		87	47-130		
------------------------------	-----	--	--	---	-----	--	----	--------	--	--

**LCS (B17J147-BS1)**

TPH - Diesel Range Organics	1,290				150 ug/L		1500	86	59-109	
-----------------------------	-------	--	--	--	----------	--	------	----	--------	--

<i>Surrogate: Hexacosane</i>	123			"	150		82	47-130		
------------------------------	-----	--	--	---	-----	--	----	--------	--	--

**Batch B17J147 - 3520C CLLE - TPH-Extractable SGC**

**Prepared: 10/27/17 Analyzed: 11/02/17**  
**Extractable Petroleum Hydrocarbons with Silica Gel Cleanup - Quality Control**

**Blank (B17J147-BLK1)**

TPH - Diesel Range Organics	ND	U			150 ug/L					
TPH - Oil Range Organics	ND	U			600 "					

<i>Surrogate: Hexacosane</i>	115			"	150		77	47-130		
------------------------------	-----	--	--	---	-----	--	----	--------	--	--

**LCS (B17J147-BS1)**

TPH - Diesel Range Organics	969				150 ug/L		1500	65	59-109	
-----------------------------	-----	--	--	--	----------	--	------	----	--------	--

<i>Surrogate: Hexacosane</i>	110			"	150		74	47-130		
------------------------------	-----	--	--	---	-----	--	----	--------	--	--



United States Environmental Protection Agency  
**Region 9 Laboratory**

1337 S. 46th Street, Building 201, Richmond, CA 94804  
Phone:(510) 412-2300 Fax:(510) 412-2302

**Project Manager:** Lyndsey Tu

**Project Number:** R18U01

**Project:** Red Hill Tank Farm October 2017 Split  
Sampling

**Underground Storage Tanks Program Office**

75 Hawthorne Street  
San Francisco CA, 94105

**SDG:** 17298E

**Reported:** 11/27/17 16:12

**Qualifiers and Comments**

F6 Product Type: Hydraulic Fluid

F3 Fuel Type: Kerosene or Jet Fuel

F13 Fuel or Product Type: mixed or unknown

U Not Detected

NR Not Reported

RE1, RE2, etc: Result is from a sample re-analysis.