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ANALYTICAL REPORT

PREPARED FOR

Attn: Mr. Erwin Kawata
City & County of Honolulu
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JOB DESCRIPTION

RED-HILL
RUSH Weekly Red Hill

JOB NUMBER

380-55680-1

Eurofins Eaton Analytical Pomona

Job Notes

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The test results in this report relate only to the samples as received by the laboratory and meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Eaton Analytical, LLC Project Manager.

Compliance Statement

1. Laboratory is accredited in accordance with TNI 2016 Standards and ISO/IEC 17025:2017.
2. Laboratory certifies that the test results meet all TNI 2016 and ISO/IEC 17025:2017 requirements unless noted under the individual analysis
3. Test results relate only to the sample(s) tested.
4. This report shall not be reproduced except in full, without the written approval of the laboratory.
5. Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below. (DW, Water matrices)

Authorization



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Definitions/Glossary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
^3+	Reporting Limit Check Standard is outside acceptance limits, high biased
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

LCMS

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Job ID: 380-55680-1

Laboratory: Eurofins Eaton Analytical Pomona

Narrative

Job Narrative 380-55680-1

Comments

EPA 537.1 and EPA 533 are two distinct methods for the analysis of PFAS in drinking water. The analyses are conducted on differing instrumentation, with calibrations, extraction solvents and sample preservatives being dissimilar among the two methods. Therefore it is probable and not unexpected to see the methods having slight variations in analytical results.

No additional comments.

Receipt

The samples were received on 7/20/2023 10:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.3° C and 1.6° C.

GC/MS Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

LCMS

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.



Detection Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Client Sample ID: HALAWA WELLS UNITS 1 & 2
PWSID Number: HI0000331

Lab Sample ID: 380-55680-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	2.5		2.0	ng/L	1		533	Total/NA
Perfluorohexanoic acid (PFHxA)	2.1		2.0	ng/L	1		533	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.2		2.0	ng/L	1		533	Total/NA
Perfluoropentanoic acid (PFPeA)	2.6		2.0	ng/L	1		533	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.2		2.0	ng/L	1		537.1	Total/NA

Client Sample ID: FB: HALAWA WELLS UNITS 1 & 2

Lab Sample ID: 380-55680-3

No Detections.

This Detection Summary does not include radiochemical test results.

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Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Client Sample ID: HALAWA WELLS UNITS 1 & 2

Lab Sample ID: 380-55680-1

Date Collected: 07/18/23 09:00

Matrix: Drinking Water

Date Received: 07/20/23 10:15

PWSID Number: HI0000331

Method: EPA 525.2 - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
2,4'-DDD	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
2,4'-DDE	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
2,4'-DDT	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
2,4-Dinitrotoluene	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
2,6-Dinitrotoluene	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
2-Methylnaphthalene	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
4,4'-DDD	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
4,4'-DDE	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
4,4'-DDT	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Acenaphthene	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Acenaphthylene	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Acetochlor	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Alachlor	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
alpha-BHC	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
alpha-Chlordane	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Anthracene	<0.020		0.020	ug/L		07/25/23 16:50	07/26/23 20:09	1
Atrazine	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Benz(a)anthracene	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Benzo[a]pyrene	<0.020		0.020	ug/L		07/25/23 16:50	07/26/23 20:09	1
Benzo[b]fluoranthene	<0.020		0.020	ug/L		07/25/23 16:50	07/26/23 20:09	1
Benzo[g,h,i]perylene	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Benzo[k]fluoranthene	<0.020		0.020	ug/L		07/25/23 16:50	07/26/23 20:09	1
beta-BHC	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Bis(2-ethylhexyl) phthalate	<0.60		0.60	ug/L		07/25/23 16:50	07/26/23 20:09	1
Bromacil	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Butachlor	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Butylbenzylphthalate	<0.50		0.50	ug/L		07/25/23 16:50	07/26/23 20:09	1
Chlorobenzilate	<0.099	^3+	0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Chloroneb	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Chlorothalonil (Draconil, Bravo)	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Chlorpyrifos	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Chrysene	<0.020		0.020	ug/L		07/25/23 16:50	07/26/23 20:09	1
delta-BHC	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Di(2-ethylhexyl)adipate	<0.60		0.60	ug/L		07/25/23 16:50	07/26/23 20:09	1
Dibenz(a,h)anthracene	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Diclorvos (DDVP)	<0.050	^3+ *+	0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Dieldrin	<0.20		0.20	ug/L		07/25/23 16:50	07/26/23 20:09	1
Diethylphthalate	<0.50		0.50	ug/L		07/25/23 16:50	07/26/23 20:09	1
Dimethylphthalate	<0.50		0.50	ug/L		07/25/23 16:50	07/26/23 20:09	1
Di-n-butyl phthalate	<0.99		0.99	ug/L		07/25/23 16:50	07/26/23 20:09	1
Di-n-octyl phthalate	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Endosulfan I (Alpha)	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Endosulfan II (Beta)	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Endosulfan sulfate	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Endrin	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Endrin aldehyde	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
EPTC	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Fluoranthene	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1

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Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Client Sample ID: HALAWA WELLS UNITS 1 & 2

Lab Sample ID: 380-55680-1

Date Collected: 07/18/23 09:00

Matrix: Drinking Water

Date Received: 07/20/23 10:15

PWSID Number: HI0000331

Method: EPA 525.2 - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fluorene	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
gamma-Chlordane	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Heptachlor	<0.040		0.040	ug/L		07/25/23 16:50	07/26/23 20:09	1
Heptachlor epoxide (isomer B)	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Hexachlorobenzene	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Hexachlorocyclopentadiene	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Indeno[1,2,3-cd]pyrene	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Isophorone	<0.50		0.50	ug/L		07/25/23 16:50	07/26/23 20:09	1
Lindane	<0.040		0.040	ug/L		07/25/23 16:50	07/26/23 20:09	1
Malathion	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Methoxychlor	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Metolachlor	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Molinate	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Naphthalene	<0.30		0.30	ug/L		07/25/23 16:50	07/26/23 20:09	1
Parathion	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Pendimethalin (Penoxaline)	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Phenanthrene	<0.040		0.040	ug/L		07/25/23 16:50	07/26/23 20:09	1
Propachlor	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Pyrene	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Simazine	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Terbacil	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Terbutylazine	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1
Thiobencarb	<0.20		0.20	ug/L		07/25/23 16:50	07/26/23 20:09	1
Total Permethrin (mixed isomers)	<0.20		0.20	ug/L		07/25/23 16:50	07/26/23 20:09	1
trans-Nonachlor	<0.050		0.050	ug/L		07/25/23 16:50	07/26/23 20:09	1
Trifluralin	<0.099		0.099	ug/L		07/25/23 16:50	07/26/23 20:09	1

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L			N/A	07/25/23 16:50	07/26/23 20:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Nitro-m-xylene	98		70 - 130	07/25/23 16:50	07/26/23 20:09	1
Perylene-d12	92		70 - 130	07/25/23 16:50	07/26/23 20:09	1
Triphenylphosphate	101		70 - 130	07/25/23 16:50	07/26/23 20:09	1

Method: EPA 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecan e-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
9-Chlorohexadecafluoro-3-oxanonan e-1-sulfonic acid(9Cl-PF3ONS)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluorohexanesulfonic acid (PFHxS)	2.5		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1

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Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Client Sample ID: HALAWA WELLS UNITS 1 & 2

Lab Sample ID: 380-55680-1

Date Collected: 07/18/23 09:00

Matrix: Drinking Water

Date Received: 07/20/23 10:15

PWSID Number: HI0000331

Method: EPA 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	2.1		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluorooctanesulfonic acid (PFOS)	2.2		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluorobutanoic acid (PFBA)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluoropentanoic acid (PFPeA)	2.6		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1
Perfluoropentanesulfonic acid (PFPeS)	<2.0		2.0	ng/L		08/01/23 17:55	08/07/23 15:20	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	84		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C6 PFDA	91		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C5 PFHxA	93		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C4 PFHpA	98		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C8 PFOA	96		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C9 PFNA	98		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C7 PFUnA	91		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C2 PFDoA	90		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C4 PFBA	95		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C5 PFPeA	116		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C3 PFBS	99		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C3 PFHxS	97		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C8 PFOS	97		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C2-4:2-FTS	123		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C2-6:2-FTS	111		50 - 200	08/01/23 17:55	08/07/23 15:20	1
13C2-8:2-FTS	106		50 - 200	08/01/23 17:55	08/07/23 15:20	1

Method: EPA 537.1 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
N-methylperfluorooctanesulfonamideacetic acid (NMeFOSAA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1

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Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Client Sample ID: HALAWA WELLS UNITS 1 & 2

Lab Sample ID: 380-55680-1

Date Collected: 07/18/23 09:00

Matrix: Drinking Water

Date Received: 07/20/23 10:15

PWSID Number: HI0000331

Method: EPA 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
Perfluorohexanesulfonic acid (PFHxS)	2.2		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
Perfluorotetradecanoic acid (PFTA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
Perfluorotridecanoic acid (PFTrDA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:13	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	108		70 - 130			07/25/23 06:38	07/26/23 14:13	1
13C2 PFHxA	99		70 - 130			07/25/23 06:38	07/26/23 14:13	1
13C2 PFDA	103		70 - 130			07/25/23 06:38	07/26/23 14:13	1
13C3-GenX	100		70 - 130			07/25/23 06:38	07/26/23 14:13	1

Client Sample ID: FB: HALAWA WELLS UNITS 1 & 2

Lab Sample ID: 380-55680-3

Date Collected: 07/18/23 09:00

Matrix: Water

Date Received: 07/20/23 10:15

Method: EPA 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluorobutanoic acid (PFBA)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1

Eurofins Eaton Analytical Pomona

Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Client Sample ID: FB: HALAWA WELLS UNITS 1 & 2

Lab Sample ID: 380-55680-3

Date Collected: 07/18/23 09:00

Matrix: Water

Date Received: 07/20/23 10:15

Method: EPA 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluoropentanoic acid (PFPeA)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Perfluoropentanesulfonic acid (PFPeS)	<2.0		2.0	ng/L		08/03/23 05:45	08/09/23 08:35	1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	86		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C6 PFDA	93		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C5 PFHxA	95		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C4 PFHpA	93		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C8 PFOA	91		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C9 PFNA	93		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C7 PFUnA	90		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C2 PFDoA	96		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C4 PFBA	95		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C5 PFPeA	95		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C3 PFBS	99		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C3 PFHxS	96		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C8 PFOS	96		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C2-4:2-FTS	99		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C2-6:2-FTS	100		50 - 200			08/03/23 05:45	08/09/23 08:35	1
13C2-8:2-FTS	107		50 - 200			08/03/23 05:45	08/09/23 08:35	1

Method: EPA 537.1 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
N-methylperfluorooctanesulfonamideacetic acid (NMeFOSAA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
N-ethylperfluorooctanesulfonamideacetic acid (NEtFOSAA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1

Eurofins Eaton Analytical Pomona

Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Client Sample ID: FB: HALAWA WELLS UNITS 1 & 2

Lab Sample ID: 380-55680-3

Date Collected: 07/18/23 09:00

Matrix: Water

Date Received: 07/20/23 10:15

Method: EPA 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
Perfluorotetradecanoic acid (PFTA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
Perfluorotridecanoic acid (PFTrDA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
9-Chlorohexadecafluoro-3-oxanonan e-1-sulfonic acid(9Cl-PF3ONS)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
11-Chloroeicosafuoro-3-oxaundecan e-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	ng/L		07/25/23 06:38	07/26/23 14:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	108		70 - 130	07/25/23 06:38	07/26/23 14:22	1
13C2 PFHxA	108		70 - 130	07/25/23 06:38	07/26/23 14:22	1
13C2 PFDA	106		70 - 130	07/25/23 06:38	07/26/23 14:22	1
13C3-GenX	96		70 - 130	07/25/23 06:38	07/26/23 14:22	1

Action Limit Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Client Sample ID: HALAWA WELLS UNITS 1 & 2
PWSID Number: HI0000331

Lab Sample ID: 380-55680-1

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits have been highlighted for your convenience.

Analyte	Result	Qualifier	Unit	EPAMCL	RL	Method	Prep Type
				Limit			
Alachlor	<0.050		ug/L	2	0.050	525.2	Total/NA
Atrazine	<0.050		ug/L	3	0.050	525.2	Total/NA
Benzo[a]pyrene	<0.020		ug/L	0.2	0.020	525.2	Total/NA
Bis(2-ethylhexyl) phthalate	<0.60		ug/L	6	0.60	525.2	Total/NA
Di(2-ethylhexyl)adipate	<0.60		ug/L	400	0.60	525.2	Total/NA
Endrin	<0.099		ug/L	2	0.099	525.2	Total/NA
Heptachlor	<0.040		ug/L	0.4	0.040	525.2	Total/NA
Heptachlor epoxide (isomer B)	<0.050		ug/L	0.2	0.050	525.2	Total/NA
Hexachlorobenzene	<0.050		ug/L	1	0.050	525.2	Total/NA
Hexachlorocyclopentadiene	<0.050		ug/L	50	0.050	525.2	Total/NA
Lindane	<0.040		ug/L	0.2	0.040	525.2	Total/NA
Methoxychlor	<0.099		ug/L	40	0.099	525.2	Total/NA
Simazine	<0.050		ug/L	4	0.050	525.2	Total/NA

Surrogate Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 525.2 - Semivolatile Organic Compounds (GC/MS)

Matrix: Drinking Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		2NMX (70-130)	PRY (70-130)	TPP (70-130)
380-55680-1	HALAWA WELLS UNITS 1 & 2	98	92	101

Surrogate Legend
 2NMX = 2-Nitro-m-xylene
 PRY = Perylene-d12
 TPP = Triphenylphosphate

Method: 525.2 - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		2NMX (70-130)	PRY (70-130)	TPP (70-130)
380-55614-AI-1-A MS	Matrix Spike	97	91	103
380-55774-AK-3-A DU	Duplicate	96	90	101
LCS 380-48728/23-A	Lab Control Sample	95	93	104
LCSD 380-48728/24-A	Lab Control Sample Dup	98	94	104
MB 380-48728/21-A	Method Blank	100	88	98
MRL 380-48728/22-A	Lab Control Sample	99	90	98

Surrogate Legend
 2NMX = 2-Nitro-m-xylene
 PRY = Perylene-d12
 TPP = Triphenylphosphate

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS)

Matrix: Drinking Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		d5NEFOS (70-130)	PFHxA (70-130)	PFDA (70-130)	GenX (70-130)
380-55680-1	HALAWA WELLS UNITS 1 & 2	108	99	103	100

Surrogate Legend
 d5NEFOS = d5-NEtFOSAA
 PFHxA = 13C2 PFHxA
 PFDA = 13C2 PFDA
 GenX = 13C3-GenX

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		d5NEFOS (70-130)	PFHxA (70-130)	PFDA (70-130)	GenX (70-130)
380-55680-3	FB: HALAWA WELLS UNITS 1 & 2	108	108	106	96
380-55755-A-1-B MS	Matrix Spike	111	118	109	115
380-55755-A-1-C MSD	Matrix Spike Duplicate	117	128	119	121
LCS 380-48682/25-A	Lab Control Sample	106	121	110	109
LCSD 380-48682/26-A	Lab Control Sample Dup	98	113	106	102
MBL 380-48682/23-A	Method Blank	110	116	105	106
MRL 380-48682/24-A	Lab Control Sample	105	122	108	107

Surrogate Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Surrogate Legend

d5NEFOS = d5-NEtFOSAA

PFHxA = 13C2 PFHxA

PFDA = 13C2 PFDA

GenX = 13C3-GenX

1

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Isotope Dilution Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water

Matrix: Drinking Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	HFPODA (50-200)	C6PFDA (50-200)	13C5PHA (50-200)	C4PFHA (50-200)	C8PFOA (50-200)	C9PFNA (50-200)	13C7PUA (50-200)	PFDaA (50-200)
380-55680-1	HALAWA WELLS UNITS 1 & 2	84	91	93	98	96	98	91	90
380-55680-1 MS	HALAWA WELLS UNITS 1 & 2	108	103	101	105	104	104	107	101
380-55680-1 MSD	HALAWA WELLS UNITS 1 & 2	92	95	92	95	96	98	96	93

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFBA (50-200)	PFPeA (50-200)	C3PFBS (50-200)	C3PFHS (50-200)	C8PFOS (50-200)	42FTS (50-200)	62FTS (50-200)	82FTS (50-200)
380-55680-1	HALAWA WELLS UNITS 1 & 2	95	116	99	97	97	123	111	106
380-55680-1 MS	HALAWA WELLS UNITS 1 & 2	106	117	103	102	101	117	112	105
380-55680-1 MSD	HALAWA WELLS UNITS 1 & 2	98	112	99	98	101	115	110	104

Surrogate Legend

- HFPODA = 13C3 HFPO-DA
- C6PFDA = 13C6 PFDA
- 13C5PHA = 13C5 PFHxA
- C4PFHA = 13C4 PFHpA
- C8PFOA = 13C8 PFOA
- C9PFNA = 13C9 PFNA
- 13C7PUA = 13C7 PFUnA
- PFDaA = 13C2 PFDoA
- PFBA = 13C4 PFBA
- PFPeA = 13C5 PFPeA
- C3PFBS = 13C3 PFBS
- C3PFHS = 13C3 PFHxS
- C8PFOS = 13C8 PFOS
- 42FTS = 13C2-4:2-FTS
- 62FTS = 13C2-6:2-FTS
- 82FTS = 13C2-8:2-FTS

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	HFPODA (50-200)	C6PFDA (50-200)	13C5PHA (50-200)	C4PFHA (50-200)	C8PFOA (50-200)	C9PFNA (50-200)	13C7PUA (50-200)	PFDaA (50-200)
380-55680-3	FB: HALAWA WELLS UNITS 1 & 2	86	93	95	93	91	93	90	96
380-55755-D-1-B MS	Matrix Spike	100	94	99	92	95	92	93	94
380-55755-D-1-C MSD	Matrix Spike Duplicate	97	99	94	97	92	97	97	100
LCS 380-49895/23-A	Lab Control Sample	97	98	95	94	98	98	100	95
LCS 380-50123/21-A	Lab Control Sample	91	94	91	93	91	91	97	101
LCSD 380-49895/24-A	Lab Control Sample Dup	83	99	88	87	90	95	97	93
LCSD 380-50123/22-A	Lab Control Sample Dup	100	98	100	102	93	98	99	97
MBL 380-49895/21-A	Method Blank	68	96	77	84	91	95	97	101
MBL 380-50123/19-A	Method Blank	89	96	90	97	97	97	94	99
MRL 380-49895/22-A	Lab Control Sample	78	93	88	93	93	96	83	91
MRL 380-50123/20-A	Lab Control Sample	84	92	95	96	95	93	88	93

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFBA (50-200)	PFPeA (50-200)	C3PFBS (50-200)	C3PFHS (50-200)	C8PFOS (50-200)	42FTS (50-200)	62FTS (50-200)	82FTS (50-200)
380-55680-3	FB: HALAWA WELLS UNITS 1 & 2	95	95	99	96	96	99	100	107
380-55755-D-1-B MS	Matrix Spike	96	102	100	96	96	96	97	96

Eurofins Eaton Analytical Pomona

Isotope Dilution Summary

Client: City & County of Honolulu
 Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFBA (50-200)	PFPeA (50-200)	C3PFBS (50-200)	C3PFHS (50-200)	C8PFOS (50-200)	42FTS (50-200)	62FTS (50-200)	82FTS (50-200)
380-55755-D-1-C MSD	Matrix Spike Duplicate	93	98	108	96	98	95	98	98
LCS 380-49895/23-A	Lab Control Sample	92	97	102	99	99	119	112	107
LCS 380-50123/21-A	Lab Control Sample	89	94	103	98	97	94	100	98
LCSD 380-49895/24-A	Lab Control Sample Dup	88	104	102	105	102	119	116	109
LCSD 380-50123/22-A	Lab Control Sample Dup	95	99	101	99	98	95	97	100
MBL 380-49895/21-A	Method Blank	80	92	98	100	101	152	138	130
MBL 380-50123/19-A	Method Blank	98	100	99	100	97	104	101	121
MRL 380-49895/22-A	Lab Control Sample	95	108	101	101	100	131	117	146
MRL 380-50123/20-A	Lab Control Sample	98	104	105	99	98	111	104	109

Surrogate Legend

HFPODA = 13C3 HFPO-DA
 C6PFDA = 13C6 PFDA
 13C5PHA = 13C5 PFHxA
 C4PFHA = 13C4 PFHpA
 C8PFOA = 13C8 PFOA
 C9PFNA = 13C9 PFNA
 13C7PUA = 13C7 PFUnA
 PFDaA = 13C2 PFDaA
 PFBA = 13C4 PFBA
 PFPeA = 13C5 PFPeA
 C3PFBS = 13C3 PFBS
 C3PFHS = 13C3 PFHxS
 C8PFOS = 13C8 PFOS
 42FTS = 13C2-4:2-FTS
 62FTS = 13C2-6:2-FTS
 82FTS = 13C2-8:2-FTS

QC Sample Results

Client: City & County of Honolulu
 Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 525.2 - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 380-48728/21-A
Matrix: Water
Analysis Batch: 48954

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 48728

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
2,4'-DDD	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
2,4'-DDE	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
2,4'-DDT	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
2,4-Dinitrotoluene	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
2,6-Dinitrotoluene	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
2-Methylnaphthalene	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
4,4'-DDD	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
4,4'-DDE	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
4,4'-DDT	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Acenaphthene	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Acenaphthylene	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Acetochlor	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Alachlor	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
alpha-BHC	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
alpha-Chlordane	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Anthracene	<0.020		0.020	ug/L		07/25/23 15:40	07/26/23 16:42	1
Atrazine	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Benz(a)anthracene	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Benzo[a]pyrene	<0.020		0.020	ug/L		07/25/23 15:40	07/26/23 16:42	1
Benzo[b]fluoranthene	<0.020		0.020	ug/L		07/25/23 15:40	07/26/23 16:42	1
Benzo[g,h,i]perylene	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Benzo[k]fluoranthene	<0.020		0.020	ug/L		07/25/23 15:40	07/26/23 16:42	1
beta-BHC	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Bis(2-ethylhexyl) phthalate	<0.60		0.60	ug/L		07/25/23 15:40	07/26/23 16:42	1
Bromacil	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Butachlor	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Butylbenzylphthalate	<0.50		0.50	ug/L		07/25/23 15:40	07/26/23 16:42	1
Chlorobenzilate	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Chloroneb	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Chlorothalonil (Draconil, Bravo)	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Chlorpyrifos	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Chrysene	<0.020		0.020	ug/L		07/25/23 15:40	07/26/23 16:42	1
delta-BHC	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Di(2-ethylhexyl)adipate	<0.60		0.60	ug/L		07/25/23 15:40	07/26/23 16:42	1
Dibenz(a,h)anthracene	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Diclorvos (DDVP)	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Dieldrin	<0.20		0.20	ug/L		07/25/23 15:40	07/26/23 16:42	1
Diethylphthalate	<0.50		0.50	ug/L		07/25/23 15:40	07/26/23 16:42	1
Dimethylphthalate	<0.50		0.50	ug/L		07/25/23 15:40	07/26/23 16:42	1
Di-n-butyl phthalate	<0.99		0.99	ug/L		07/25/23 15:40	07/26/23 16:42	1
Di-n-octyl phthalate	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Endosulfan I (Alpha)	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Endosulfan II (Beta)	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Endosulfan sulfate	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Endrin	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Endrin aldehyde	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
EPTC	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 525.2 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 380-48728/21-A
Matrix: Water
Analysis Batch: 48954

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 48728

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoranthene	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Fluorene	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
gamma-Chlordane	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Heptachlor	<0.040		0.040	ug/L		07/25/23 15:40	07/26/23 16:42	1
Heptachlor epoxide (isomer B)	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Hexachlorobenzene	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Hexachlorocyclopentadiene	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Indeno[1,2,3-cd]pyrene	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Isophorone	<0.50		0.50	ug/L		07/25/23 15:40	07/26/23 16:42	1
Lindane	<0.040		0.040	ug/L		07/25/23 15:40	07/26/23 16:42	1
Malathion	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Methoxychlor	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Metolachlor	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Molinate	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Naphthalene	<0.30		0.30	ug/L		07/25/23 15:40	07/26/23 16:42	1
Parathion	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Pendimethalin (Penoxaline)	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Phenanthrene	<0.040		0.040	ug/L		07/25/23 15:40	07/26/23 16:42	1
Propachlor	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Pyrene	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Simazine	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Terbacil	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Terbutylazine	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1
Thiobencarb	<0.20		0.20	ug/L		07/25/23 15:40	07/26/23 16:42	1
Total Permethrin (mixed isomers)	<0.20		0.20	ug/L		07/25/23 15:40	07/26/23 16:42	1
trans-Nonachlor	<0.050		0.050	ug/L		07/25/23 15:40	07/26/23 16:42	1
Trifluralin	<0.099		0.099	ug/L		07/25/23 15:40	07/26/23 16:42	1

Tentatively Identified Compound	MB Est. Result	MB Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Sulfurous acid, cyclohexylmethyl heptadecyl ester	0.762	T J N	ug/L		2.35	1000309-22-5	07/25/23 15:40	07/26/23 16:42	1
Decane	2.65	T J N	ug/L		2.45	124-18-5	07/25/23 15:40	07/26/23 16:42	1
Decane, 2-methyl-	0.511	T J N	ug/L		2.63	6975-98-0	07/25/23 15:40	07/26/23 16:42	1
2,4,7,9-Tetramethyl-5-decyn-4,7-diol	0.525	T J N	ug/L		3.86	126-86-3	07/25/23 15:40	07/26/23 16:42	1
Tridecanoic acid	0.697	T J N	ug/L		5.84	638-53-9	07/25/23 15:40	07/26/23 16:42	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Nitro-m-xylene	100		70 - 130	07/25/23 15:40	07/26/23 16:42	1
Perylene-d12	88		70 - 130	07/25/23 15:40	07/26/23 16:42	1
Triphenylphosphate	98		70 - 130	07/25/23 15:40	07/26/23 16:42	1

Lab Sample ID: LCS 380-48728/23-A
Matrix: Water
Analysis Batch: 48954

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 48728

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	1.98	2.05		ug/L		104	70 - 130
2,4'-DDD	1.98	2.16		ug/L		109	70 - 130

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 525.2 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 380-48728/23-A
Matrix: Water
Analysis Batch: 48954

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 48728

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2,4'-DDE	1.98	2.04		ug/L		103	70 - 130
2,4'-DDT	1.98	2.17		ug/L		110	70 - 130
2,4-Dinitrotoluene	1.98	2.00		ug/L		101	70 - 130
2,6-Dinitrotoluene	1.98	2.00		ug/L		101	70 - 130
2-Methylnaphthalene	1.98	2.07		ug/L		105	70 - 130
4,4'-DDD	1.98	2.17		ug/L		110	70 - 130
4,4'-DDE	1.98	2.08		ug/L		105	70 - 130
4,4'-DDT	1.98	2.06		ug/L		104	70 - 130
Acenaphthene	1.98	2.05		ug/L		103	70 - 130
Acenaphthylene	1.98	1.93		ug/L		98	70 - 130
Acetochlor	1.98	2.51		ug/L		127	70 - 130
Alachlor	1.98	2.13		ug/L		108	70 - 130
alpha-BHC	1.98	2.10		ug/L		106	70 - 130
alpha-Chlordane	1.98	1.96		ug/L		99	70 - 130
Anthracene	1.98	2.01		ug/L		101	70 - 130
Atrazine	1.98	2.40		ug/L		121	70 - 130
Benz(a)anthracene	1.98	2.20		ug/L		111	70 - 130
Benzo[a]pyrene	1.98	1.97		ug/L		100	70 - 130
Benzo[b]fluoranthene	1.98	2.13		ug/L		107	70 - 130
Benzo[g,h,i]perylene	1.98	2.10		ug/L		106	70 - 130
Benzo[k]fluoranthene	1.98	2.22		ug/L		112	70 - 130
beta-BHC	1.98	2.16		ug/L		109	70 - 130
Bis(2-ethylhexyl) phthalate	1.98	1.98		ug/L		100	70 - 130
Bromacil	1.98	2.11		ug/L		106	70 - 130
Butachlor	1.98	2.39		ug/L		121	70 - 130
Butylbenzylphthalate	1.98	2.35		ug/L		119	70 - 130
Chlorobenzilate	1.98	2.50		ug/L		126	70 - 130
Chloroneb	1.98	2.05		ug/L		103	70 - 130
Chlorothalonil (Draconil, Bravo)	1.98	2.08		ug/L		105	70 - 130
Chlorpyrifos	1.98	2.22		ug/L		112	70 - 130
Chrysene	1.98	2.07		ug/L		104	70 - 130
delta-BHC	1.98	2.03		ug/L		103	70 - 130
Di(2-ethylhexyl)adipate	1.98	2.22		ug/L		112	70 - 130
Dibenz(a,h)anthracene	1.98	2.20		ug/L		111	70 - 130
Diclorvos (DDVP)	1.98	2.48		ug/L		125	70 - 130
Dieldrin	1.98	2.10		ug/L		106	70 - 130
Diethylphthalate	1.98	2.17		ug/L		109	70 - 130
Dimethylphthalate	1.98	2.16		ug/L		109	70 - 130
Di-n-butyl phthalate	3.96	4.24		ug/L		107	70 - 130
Di-n-octyl phthalate	1.98	1.99		ug/L		101	70 - 130
Endosulfan I (Alpha)	1.98	2.03		ug/L		102	70 - 130
Endosulfan II (Beta)	1.98	2.20		ug/L		111	70 - 130
Endosulfan sulfate	1.98	2.26		ug/L		114	70 - 130
Endrin	1.98	2.39		ug/L		121	70 - 130
Endrin aldehyde	1.98	1.98		ug/L		100	70 - 130
EPTC	1.98	2.08		ug/L		105	70 - 130
Fluoranthene	1.98	2.23		ug/L		113	70 - 130
Fluorene	1.98	2.16		ug/L		109	70 - 130
gamma-Chlordane	1.98	1.95		ug/L		99	70 - 130

Eurofins Eaton Analytical Pomona

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 525.2 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 380-48728/23-A
Matrix: Water
Analysis Batch: 48954

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 48728

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Heptachlor	1.98	2.14		ug/L		108	70 - 130
Heptachlor epoxide (isomer B)	1.98	2.09		ug/L		105	70 - 130
Hexachlorobenzene	1.98	1.92		ug/L		97	70 - 130
Hexachlorocyclopentadiene	1.98	2.01		ug/L		101	70 - 130
Indeno[1,2,3-cd]pyrene	1.98	2.22		ug/L		112	70 - 130
Isophorone	1.98	2.06		ug/L		104	70 - 130
Lindane	1.98	2.15		ug/L		109	70 - 130
Malathion	1.98	2.26		ug/L		114	70 - 130
Methoxychlor	1.98	2.15		ug/L		109	70 - 130
Metolachlor	1.98	2.33		ug/L		117	70 - 130
Molinate	1.98	2.27		ug/L		115	70 - 130
Naphthalene	1.98	1.96		ug/L		99	70 - 130
Parathion	1.98	2.38		ug/L		120	70 - 130
Pendimethalin (Penoxaline)	1.98	2.14		ug/L		108	70 - 130
Phenanthrene	1.98	2.05		ug/L		104	70 - 130
Propachlor	1.98	2.31		ug/L		116	70 - 130
Pyrene	1.98	2.25		ug/L		113	70 - 130
Simazine	1.98	2.32		ug/L		117	70 - 130
Terbacil	1.98	2.35		ug/L		119	70 - 130
Terbutylazine	1.98	2.27		ug/L		115	70 - 130
Thiobencarb	1.98	2.38		ug/L		120	70 - 130
trans-Nonachlor	1.98	1.97		ug/L		100	70 - 130
Trifluralin	1.98	2.05		ug/L		103	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Nitro-m-xylene	95		70 - 130
Perylene-d12	93		70 - 130
Triphenylphosphate	104		70 - 130

Lab Sample ID: LCSD 380-48728/24-A
Matrix: Water
Analysis Batch: 48954

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 48728

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1-Methylnaphthalene	1.99	2.10		ug/L		106	70 - 130	2	20
2,4'-DDD	1.99	2.19		ug/L		110	70 - 130	1	20
2,4'-DDE	1.99	2.06		ug/L		104	70 - 130	1	20
2,4'-DDT	1.99	2.17		ug/L		109	70 - 130	0	20
2,4-Dinitrotoluene	1.99	2.07		ug/L		104	70 - 130	3	20
2,6-Dinitrotoluene	1.99	2.08		ug/L		105	70 - 130	4	20
2-Methylnaphthalene	1.99	2.13		ug/L		107	70 - 130	3	20
4,4'-DDD	1.99	2.20		ug/L		111	70 - 130	1	20
4,4'-DDE	1.99	2.08		ug/L		105	70 - 130	0	20
4,4'-DDT	1.99	2.08		ug/L		105	70 - 130	1	20
Acenaphthene	1.99	2.09		ug/L		105	70 - 130	2	20
Acenaphthylene	1.99	2.00		ug/L		101	70 - 130	4	20
Acetochlor	1.99	2.55		ug/L		128	70 - 130	1	20
Alachlor	1.99	2.18		ug/L		110	70 - 130	2	20

Eurofins Eaton Analytical Pomona

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 525.2 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 380-48728/24-A
Matrix: Water
Analysis Batch: 48954

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 48728

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec		RPD	RPD Limit
							Limits	RPD		
alpha-BHC	1.99	2.13		ug/L		107	70 - 130	1	20	
alpha-Chlordane	1.99	2.00		ug/L		101	70 - 130	2	20	
Anthracene	1.99	2.05		ug/L		103	70 - 130	2	20	
Atrazine	1.99	2.43		ug/L		123	70 - 130	1	20	
Benz(a)anthracene	1.99	2.25		ug/L		113	70 - 130	2	20	
Benzo[a]pyrene	1.99	2.01		ug/L		101	70 - 130	2	20	
Benzo[b]fluoranthene	1.99	2.15		ug/L		108	70 - 130	1	20	
Benzo[g,h,i]perylene	1.99	2.14		ug/L		108	70 - 130	2	20	
Benzo[k]fluoranthene	1.99	2.19		ug/L		110	70 - 130	1	20	
beta-BHC	1.99	2.17		ug/L		109	70 - 130	0	20	
Bis(2-ethylhexyl) phthalate	1.99	1.98		ug/L		100	70 - 130	0	20	
Bromacil	1.99	2.22		ug/L		112	70 - 130	5	20	
Butachlor	1.99	2.44		ug/L		123	70 - 130	2	20	
Butylbenzylphthalate	1.99	2.37		ug/L		119	70 - 130	1	20	
Chlorobenzilate	1.99	2.56		ug/L		129	70 - 130	3	20	
Chloroneb	1.99	2.08		ug/L		105	70 - 130	1	20	
Chlorothalonil (Draconil, Bravo)	1.99	2.10		ug/L		106	70 - 130	1	20	
Chlorpyrifos	1.99	2.25		ug/L		113	70 - 130	1	20	
Chrysene	1.99	2.13		ug/L		107	70 - 130	3	20	
delta-BHC	1.99	2.07		ug/L		104	70 - 130	2	20	
Di(2-ethylhexyl)adipate	1.99	2.18		ug/L		110	70 - 130	2	20	
Dibenz(a,h)anthracene	1.99	2.26		ug/L		114	70 - 130	3	20	
Diclorvos (DDVP)	1.99	2.61	*+	ug/L		131	70 - 130	5	20	
Dieldrin	1.99	2.15		ug/L		108	70 - 130	2	20	
Diethylphthalate	1.99	2.21		ug/L		112	70 - 130	2	20	
Dimethylphthalate	1.99	2.22		ug/L		112	70 - 130	3	20	
Di-n-butyl phthalate	3.97	4.31		ug/L		109	70 - 130	2	20	
Di-n-octyl phthalate	1.99	1.97		ug/L		99	70 - 130	1	20	
Endosulfan I (Alpha)	1.99	2.08		ug/L		105	70 - 130	2	20	
Endosulfan II (Beta)	1.99	2.20		ug/L		111	70 - 130	0	20	
Endosulfan sulfate	1.99	2.29		ug/L		116	70 - 130	1	20	
Endrin	1.99	2.31		ug/L		117	70 - 130	3	20	
Endrin aldehyde	1.99	2.04		ug/L		103	70 - 130	3	20	
EPTC	1.99	2.18		ug/L		110	70 - 130	5	20	
Fluoranthene	1.99	2.26		ug/L		114	70 - 130	1	20	
Fluorene	1.99	2.19		ug/L		110	70 - 130	1	20	
gamma-Chlordane	1.99	2.00		ug/L		101	70 - 130	3	20	
Heptachlor	1.99	2.21		ug/L		111	70 - 130	3	20	
Heptachlor epoxide (isomer B)	1.99	2.09		ug/L		105	70 - 130	0	20	
Hexachlorobenzene	1.99	2.00		ug/L		101	70 - 130	4	20	
Hexachlorocyclopentadiene	1.99	2.06		ug/L		104	70 - 130	3	20	
Indeno[1,2,3-cd]pyrene	1.99	2.28		ug/L		115	70 - 130	2	20	
Isophorone	1.99	2.19		ug/L		110	70 - 130	6	20	
Lindane	1.99	2.19		ug/L		110	70 - 130	2	20	
Malathion	1.99	2.30		ug/L		116	70 - 130	2	20	
Methoxychlor	1.99	2.18		ug/L		110	70 - 130	1	20	
Metolachlor	1.99	2.36		ug/L		119	70 - 130	2	20	
Molinate	1.99	2.33		ug/L		117	70 - 130	2	20	
Naphthalene	1.99	2.06		ug/L		104	70 - 130	5	20	

Eurofins Eaton Analytical Pomona

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 525.2 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 380-48728/24-A
Matrix: Water
Analysis Batch: 48954

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 48728

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Parathion	1.99	2.41		ug/L		121	70 - 130	1	20
Pendimethalin (Penoxaline)	1.99	2.19		ug/L		110	70 - 130	2	20
Phenanthrene	1.99	2.09		ug/L		105	70 - 130	2	20
Propachlor	1.99	2.35		ug/L		118	70 - 130	2	20
Pyrene	1.99	2.27		ug/L		114	70 - 130	1	20
Simazine	1.99	2.40		ug/L		121	70 - 130	4	20
Terbacil	1.99	2.43		ug/L		122	70 - 130	3	20
Terbutylazine	1.99	2.29		ug/L		116	70 - 130	1	20
Thiobencarb	1.99	2.38		ug/L		120	70 - 130	0	20
trans-Nonachlor	1.99	2.00		ug/L		101	70 - 130	2	20
Trifluralin	1.99	2.11		ug/L		107	70 - 130	3	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
2-Nitro-m-xylene	98		70 - 130
Perylene-d12	94		70 - 130
Triphenylphosphate	104		70 - 130

Lab Sample ID: MRL 380-48728/22-A
Matrix: Water
Analysis Batch: 48954

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 48728

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	0.0995	0.110		ug/L		111	50 - 150
2,4'-DDD	0.0995	0.121		ug/L		121	50 - 150
2,4'-DDE	0.0995	0.102		ug/L		103	50 - 150
2,4'-DDT	0.0995	0.0950	J	ug/L		96	50 - 150
2,4-Dinitrotoluene	0.0995	0.104		ug/L		105	50 - 150
2,6-Dinitrotoluene	0.0995	0.0925	J	ug/L		93	50 - 150
2-Methylnaphthalene	0.0995	0.109		ug/L		110	50 - 150
4,4'-DDD	0.0995	0.0935	J	ug/L		94	50 - 150
4,4'-DDE	0.0995	0.0918	J	ug/L		92	50 - 150
4,4'-DDT	0.0995	0.125		ug/L		125	50 - 150
Acenaphthene	0.0995	0.0986	J	ug/L		99	50 - 150
Acenaphthylene	0.0995	0.0866	J	ug/L		87	50 - 150
Acetochlor	0.0498	0.0494	J	ug/L		99	50 - 150
Alachlor	0.0498	0.0575		ug/L		116	50 - 150
alpha-BHC	0.0995	0.107		ug/L		107	50 - 150
alpha-Chlordane	0.0249	<0.029		ug/L		89	50 - 150
Anthracene	0.0199	<0.019		ug/L		88	50 - 150
Atrazine	0.0498	0.0555		ug/L		112	50 - 150
Benz(a)anthracene	0.0498	0.0468	J	ug/L		94	50 - 150
Benzo[a]pyrene	0.0199	0.0168	J	ug/L		84	50 - 150
Benzo[b]fluoranthene	0.0199	0.0202		ug/L		102	50 - 150
Benzo[g,h,i]perylene	0.0498	0.0480	J	ug/L		96	50 - 150
Benzo[k]fluoranthene	0.0199	0.0202		ug/L		102	50 - 150
beta-BHC	0.0995	0.115		ug/L		116	50 - 150
Bis(2-ethylhexyl) phthalate	0.597	0.597	J	ug/L		100	50 - 150
Bromacil	0.0995	0.131		ug/L		132	50 - 150

Eurofins Eaton Analytical Pomona

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 525.2 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MRL 380-48728/22-A
Matrix: Water
Analysis Batch: 48954

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 48728

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Butachlor	0.0498	0.0542		ug/L		109	50 - 150
Butylbenzylphthalate	0.149	0.147	J	ug/L		99	50 - 150
Chlorobenzilate	0.0995	0.169	^3+	ug/L		170	50 - 150
Chloroneb	0.0995	0.101		ug/L		102	50 - 150
Chlorothalonil (Draconil, Bravo)	0.0995	0.128		ug/L		128	50 - 150
Chlorpyrifos	0.0498	0.0557		ug/L		112	50 - 150
Chrysene	0.0199	0.0199	J	ug/L		100	50 - 150
delta-BHC	0.0995	0.119		ug/L		119	50 - 150
Di(2-ethylhexyl)adipate	0.299	0.326	J	ug/L		109	50 - 150
Dibenz(a,h)anthracene	0.0498	0.0415	J	ug/L		83	50 - 150
Diclorvos (DDVP)	0.0498	0.0916	^3+	ug/L		184	50 - 150
Dieldrin	0.0995	0.108	J	ug/L		109	50 - 150
Diethylphthalate	0.149	0.170	J	ug/L		114	50 - 150
Dimethylphthalate	0.299	0.306	J	ug/L		102	50 - 150
Di-n-butyl phthalate	0.299	0.337	J	ug/L		113	49 - 243
Di-n-octyl phthalate	0.0995	0.0798	J	ug/L		80	50 - 150
Endosulfan I (Alpha)	0.0995	0.0896	J	ug/L		90	50 - 150
Endosulfan II (Beta)	0.0995	0.126		ug/L		127	50 - 150
Endosulfan sulfate	0.0995	0.0958	J	ug/L		96	50 - 150
Endrin	0.0995	0.115		ug/L		116	50 - 150
Endrin aldehyde	0.0995	<0.084		ug/L		81	50 - 150
EPTC	0.0995	0.100		ug/L		101	50 - 150
Fluoranthene	0.0498	0.0554	J	ug/L		111	50 - 150
Fluorene	0.0498	0.0514		ug/L		103	50 - 150
gamma-Chlordane	0.0249	0.0236	J	ug/L		95	50 - 150
Heptachlor	0.0398	0.0412		ug/L		103	50 - 150
Heptachlor epoxide (isomer B)	0.0498	0.0478	J	ug/L		96	50 - 150
Hexachlorobenzene	0.0498	0.0462	J	ug/L		93	50 - 150
Hexachlorocyclopentadiene	0.0498	0.0389	J	ug/L		78	50 - 150
Indeno[1,2,3-cd]pyrene	0.0498	0.0462	J	ug/L		93	50 - 150
Isophorone	0.0995	0.108	J	ug/L		108	50 - 150
Lindane	0.0398	0.0452		ug/L		114	50 - 150
Malathion	0.0995	0.132		ug/L		133	50 - 150
Methoxychlor	0.0995	0.120		ug/L		120	50 - 150
Metolachlor	0.0498	0.0578		ug/L		116	50 - 150
Molinate	0.0995	0.109		ug/L		110	50 - 150
Naphthalene	0.0995	0.112	J	ug/L		112	50 - 150
Parathion	0.0995	0.130		ug/L		131	50 - 150
Pendimethalin (Penoxaline)	0.0995	0.126		ug/L		126	50 - 150
Phenanthrene	0.0199	0.0226	J	ug/L		113	50 - 150
Propachlor	0.0498	0.0496	J	ug/L		100	50 - 150
Pyrene	0.0498	0.0542		ug/L		109	50 - 150
Simazine	0.0498	0.0522		ug/L		105	50 - 150
Terbacil	0.0995	0.111		ug/L		111	50 - 150
Terbutylazine	0.0995	0.103		ug/L		104	50 - 150
Thiobencarb	0.0995	0.117	J	ug/L		118	50 - 150
trans-Nonachlor	0.0249	<0.026		ug/L		93	50 - 150
Trifluralin	0.0995	0.108		ug/L		109	50 - 150

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 525.2 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MRL 380-48728/22-A
Matrix: Water
Analysis Batch: 48954

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 48728

Surrogate	MRL %Recovery	MRL Qualifier	Limits
2-Nitro-m-xylene	99		70 - 130
Perylene-d12	90		70 - 130
Triphenylphosphate	98		70 - 130

Lab Sample ID: 380-55614-AI-1-A MS
Matrix: Water
Analysis Batch: 48954

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 48728

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	<0.098		1.98	2.06		ug/L		104	70 - 130
2,4'-DDD	<0.098		1.98	2.14		ug/L		108	70 - 130
2,4'-DDE	<0.098		1.98	2.05		ug/L		103	70 - 130
2,4'-DDT	<0.098		1.98	2.18		ug/L		110	70 - 130
2,4-Dinitrotoluene	<0.098		1.98	2.16		ug/L		109	70 - 130
2,6-Dinitrotoluene	<0.098		1.98	2.16		ug/L		109	70 - 130
2-Methylnaphthalene	<0.098		1.98	2.09		ug/L		105	70 - 130
4,4'-DDD	<0.098		1.98	2.18		ug/L		110	70 - 130
4,4'-DDE	<0.098		1.98	2.06		ug/L		104	70 - 130
4,4'-DDT	<0.098		1.98	2.06		ug/L		104	70 - 130
Acenaphthene	<0.098		1.98	2.04		ug/L		103	70 - 130
Acenaphthylene	<0.098		1.98	2.09		ug/L		105	70 - 130
Acetochlor	<0.098		1.98	2.49		ug/L		125	70 - 130
Alachlor	<0.049		1.98	2.12		ug/L		107	70 - 130
alpha-BHC	<0.098		1.98	2.18		ug/L		110	70 - 130
alpha-Chlordane	<0.049		1.98	1.95		ug/L		98	70 - 130
Anthracene	<0.020		1.98	2.07		ug/L		104	70 - 130
Atrazine	<0.049		1.98	2.30		ug/L		116	70 - 130
Benz(a)anthracene	<0.049		1.98	2.21		ug/L		111	70 - 130
Benzo[a]pyrene	<0.020		1.98	2.10		ug/L		106	70 - 130
Benzo[b]fluoranthene	<0.020		1.98	2.19		ug/L		110	70 - 130
Benzo[g,h,i]perylene	<0.049		1.98	2.02		ug/L		102	70 - 130
Benzo[k]fluoranthene	<0.020		1.98	2.19		ug/L		111	70 - 130
beta-BHC	<0.098		1.98	2.19		ug/L		110	70 - 130
Bis(2-ethylhexyl) phthalate	<0.59		1.98	2.02		ug/L		102	70 - 130
Bromacil	<0.098		1.98	2.22		ug/L		112	70 - 130
Butachlor	<0.049		1.98	2.33		ug/L		117	70 - 130
Butylbenzylphthalate	<0.49		1.98	2.34		ug/L		118	70 - 130
Chlorobenzilate	<0.098	^3+	1.98	2.56		ug/L		129	70 - 130
Chloroneb	<0.098		1.98	2.09		ug/L		105	70 - 130
Chlorothalonil (Draconil, Bravo)	<0.098		1.98	2.08		ug/L		105	70 - 130
Chlorpyrifos	<0.049		1.98	2.21		ug/L		112	70 - 130
Chrysene	<0.020		1.98	2.13		ug/L		108	70 - 130
delta-BHC	<0.098		1.98	2.07		ug/L		104	70 - 130
Di(2-ethylhexyl)adipate	<0.59		1.98	2.19		ug/L		110	70 - 130
Dibenz(a,h)anthracene	<0.049		1.98	2.16		ug/L		109	70 - 130
Diclorvos (DDVP)	<0.049	^3+ *+ F1	1.98	2.63	F1	ug/L		132	70 - 130
Dieldrin	<0.20		1.98	2.07		ug/L		104	70 - 130
Diethylphthalate	<0.49		1.98	2.27		ug/L		114	70 - 130

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 525.2 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 380-55614-AI-1-A MS

Matrix: Water

Analysis Batch: 48954

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 48728

Analyte	Sample	Sample Qualifier	Spike Added	MS	MS	Unit	D	%Rec	%Rec Limits
	Result			Result	Qualifier				
Dimethylphthalate	<0.49		1.98	2.23		ug/L		113	70 - 130
Di-n-butyl phthalate	<0.98		3.97	4.41		ug/L		111	70 - 130
Di-n-octyl phthalate	<0.098		1.98	2.00		ug/L		101	70 - 130
Endosulfan I (Alpha)	<0.098		1.98	2.05		ug/L		103	70 - 130
Endosulfan II (Beta)	<0.098		1.98	2.08		ug/L		105	70 - 130
Endosulfan sulfate	<0.098		1.98	2.11		ug/L		106	70 - 130
Endrin	<0.098		1.98	2.06		ug/L		104	70 - 130
Endrin aldehyde	<0.098		1.98	1.59		ug/L		80	70 - 130
EPTC	<0.098		1.98	2.15		ug/L		108	70 - 130
Fluoranthene	<0.098		1.98	2.26		ug/L		114	70 - 130
Fluorene	<0.049		1.98	2.18		ug/L		110	70 - 130
gamma-Chlordane	<0.049		1.98	1.94		ug/L		98	70 - 130
Heptachlor	<0.039		1.98	2.13		ug/L		107	70 - 130
Heptachlor epoxide (isomer B)	<0.049		1.98	2.07		ug/L		104	70 - 130
Hexachlorobenzene	<0.049		1.98	1.98		ug/L		100	70 - 130
Hexachlorocyclopentadiene	<0.049		1.98	2.03		ug/L		102	70 - 130
Indeno[1,2,3-cd]pyrene	<0.049		1.98	2.19		ug/L		110	70 - 130
Isophorone	<0.49		1.98	2.15		ug/L		108	70 - 130
Lindane	<0.039		1.98	2.20		ug/L		111	70 - 130
Malathion	<0.098		1.98	2.28		ug/L		115	70 - 130
Methoxychlor	<0.098		1.98	2.25		ug/L		113	70 - 130
Metolachlor	<0.049		1.98	2.34		ug/L		118	70 - 130
Molinate	<0.098		1.98	2.37		ug/L		120	70 - 130
Naphthalene	<0.30		1.98	2.01		ug/L		101	70 - 130
Parathion	<0.098		1.98	2.43		ug/L		123	70 - 130
Pendimethalin (Penoxaline)	<0.098		1.98	2.22		ug/L		112	70 - 130
Phenanthrene	<0.039		1.98	2.07		ug/L		104	70 - 130
Propachlor	<0.049		1.98	2.42		ug/L		122	70 - 130
Pyrene	<0.049		1.98	2.28		ug/L		115	70 - 130
Simazine	<0.049		1.98	2.30		ug/L		116	70 - 130
Terbacil	<0.098		1.98	2.21		ug/L		112	70 - 130
Terbutylazine	<0.098		1.98	2.19		ug/L		110	70 - 130
Thiobencarb	<0.20		1.98	2.39		ug/L		121	70 - 130
trans-Nonachlor	<0.049		1.98	1.94		ug/L		98	70 - 130
Trifluralin	<0.098		1.98	2.14		ug/L		108	70 - 130

Surrogate	MS	MS	Limits
	%Recovery	Qualifier	
2-Nitro-m-xylene	97		70 - 130
Perylene-d12	91		70 - 130
Triphenylphosphate	103		70 - 130

Lab Sample ID: 380-55774-AK-3-A DU

Matrix: Water

Analysis Batch: 48954

Client Sample ID: Duplicate

Prep Type: Total/NA

Prep Batch: 48728

Analyte	Sample Result	Sample Qualifier	DU	DU	Unit	D	RPD	RPD Limit
			Result	Qualifier				
1-Methylnaphthalene	<0.099		<0.098		ug/L		NC	20
2,4'-DDD	<0.099		<0.098		ug/L		NC	20

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QC Sample Results

Client: City & County of Honolulu
 Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 525.2 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 380-55774-AK-3-A DU
Matrix: Water
Analysis Batch: 48954

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 48728

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
2,4'-DDE	<0.099		<0.098		ug/L		NC	20
2,4'-DDT	<0.099		<0.098		ug/L		NC	20
2,4-Dinitrotoluene	<0.099		<0.098		ug/L		NC	20
2,6-Dinitrotoluene	<0.099		<0.098		ug/L		NC	20
2-Methylnaphthalene	<0.099		<0.098		ug/L		NC	20
4,4'-DDD	<0.099		<0.098		ug/L		NC	20
4,4'-DDE	<0.099		<0.098		ug/L		NC	20
4,4'-DDT	<0.099		<0.098		ug/L		NC	20
Acenaphthene	<0.099		<0.098		ug/L		NC	20
Acenaphthylene	<0.099		<0.098		ug/L		NC	20
Acetochlor	<0.099		<0.098		ug/L		NC	20
Alachlor	<0.049		<0.049		ug/L		NC	20
alpha-BHC	<0.099		<0.098		ug/L		NC	20
alpha-Chlordane	<0.049		<0.049		ug/L		NC	20
Anthracene	<0.020		<0.020		ug/L		NC	20
Atrazine	<0.049		<0.049		ug/L		NC	20
Benz(a)anthracene	<0.049		<0.049		ug/L		NC	20
Benzo[a]pyrene	<0.020		<0.020		ug/L		NC	20
Benzo[b]fluoranthene	<0.020		<0.020		ug/L		NC	20
Benzo[g,h,i]perylene	<0.049		<0.049		ug/L		NC	20
Benzo[k]fluoranthene	<0.020		<0.020		ug/L		NC	20
beta-BHC	<0.099		<0.098		ug/L		NC	20
Bis(2-ethylhexyl) phthalate	<0.59		<0.59		ug/L		NC	20
Bromacil	<0.099		<0.098		ug/L		NC	20
Butachlor	<0.049		<0.049		ug/L		NC	20
Butylbenzylphthalate	<0.49		<0.49		ug/L		NC	20
Chlorobenzilate	<0.099	^3+	<0.098		ug/L		NC	20
Chloroneb	<0.099		<0.098		ug/L		NC	20
Chlorothalonil (Draconil, Bravo)	<0.099		<0.098		ug/L		NC	20
Chlorpyrifos	<0.049		<0.049		ug/L		NC	20
Chrysene	<0.020		<0.020		ug/L		NC	20
delta-BHC	<0.099		<0.098		ug/L		NC	20
Di(2-ethylhexyl)adipate	<0.59		<0.59		ug/L		NC	20
Dibenz(a,h)anthracene	<0.049		<0.049		ug/L		NC	20
Diclorvos (DDVP)	<0.049	^3+ *+	<0.049	*+	ug/L		NC	20
Dieldrin	<0.20		<0.20		ug/L		NC	20
Diethylphthalate	<0.49		<0.49		ug/L		NC	20
Dimethylphthalate	<0.49		<0.49		ug/L		NC	20
Di-n-butyl phthalate	<0.99		<0.98		ug/L		NC	20
Di-n-octyl phthalate	<0.099		<0.098		ug/L		NC	20
Endosulfan I (Alpha)	<0.099		<0.098		ug/L		NC	20
Endosulfan II (Beta)	<0.099		<0.098		ug/L		NC	20
Endosulfan sulfate	<0.099		<0.098		ug/L		NC	20
Endrin	<0.099		<0.098		ug/L		NC	20
Endrin aldehyde	<0.099		<0.098		ug/L		NC	20
EPTC	<0.099		<0.098		ug/L		NC	20
Fluoranthene	<0.099		<0.098		ug/L		NC	20
Fluorene	<0.049		<0.049		ug/L		NC	20
gamma-Chlordane	<0.049		<0.049		ug/L		NC	20

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 525.2 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 380-55774-AK-3-A DU
Matrix: Water
Analysis Batch: 48954

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 48728

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Heptachlor	<0.039		<0.039		ug/L		NC	20
Heptachlor epoxide (isomer B)	<0.049		<0.049		ug/L		NC	20
Hexachlorobenzene	<0.049		<0.049		ug/L		NC	20
Hexachlorocyclopentadiene	<0.049		<0.049		ug/L		NC	20
Indeno[1,2,3-cd]pyrene	<0.049		<0.049		ug/L		NC	20
Isophorone	<0.49		<0.49		ug/L		NC	20
Lindane	<0.039		<0.039		ug/L		NC	20
Malathion	<0.099		<0.098		ug/L		NC	20
Methoxychlor	<0.099		<0.098		ug/L		NC	20
Metolachlor	<0.049		<0.049		ug/L		NC	20
Molinate	<0.099		<0.098		ug/L		NC	20
Naphthalene	<0.30		<0.29		ug/L		NC	20
Parathion	<0.099		<0.098		ug/L		NC	20
Pendimethalin (Penoxaline)	<0.099		<0.098		ug/L		NC	20
Phenanthrene	<0.039		<0.039		ug/L		NC	20
Propachlor	<0.049		<0.049		ug/L		NC	20
Pyrene	<0.049		<0.049		ug/L		NC	20
Simazine	<0.049		<0.049		ug/L		NC	20
Terbacil	<0.099		<0.098		ug/L		NC	20
Terbutylazine	<0.099		<0.098		ug/L		NC	20
Thiobencarb	<0.20		<0.20		ug/L		NC	20
Total Permethrin (mixed isomers)	<0.20		<0.20		ug/L		NC	20
trans-Nonachlor	<0.049		<0.049		ug/L		NC	20
Trifluralin	<0.099		<0.098		ug/L		NC	20
		DU	DU					
Surrogate	%Recovery	Qualifier	Limits					
2-Nitro-m-xylene	96		70 - 130					
Perylene-d12	90		70 - 130					
Triphenylphosphate	101		70 - 130					

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water

Lab Sample ID: MBL 380-49895/21-A
Matrix: Water
Analysis Batch: 50612

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 49895

Analyte	MBL	MBL	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
11-Chloroeicosafluoro-3-oxaundecan e-1-sulfonic acid (11Cl-PF3OUdS)	<0.30		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
9-Chlorohexadecafluoro-3-oxanonan e-1-sulfonic acid(9Cl-PF3ONS)	<0.30		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.60		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<1.0		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluorobutanesulfonic acid (PFBS)	<0.37		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluorodecanoic acid (PFDA)	<0.31		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluorododecanoic acid (PFDoA)	<0.54		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluoroheptanoic acid (PFHpA)	<0.39		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluorohexanesulfonic acid (PFHxS)	<0.32		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: MBL 380-49895/21-A
Matrix: Water
Analysis Batch: 50612

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 49895

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	<0.46		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluorononanoic acid (PFNA)	<0.40		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluorooctanesulfonic acid (PFOS)	<0.43		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluorooctanoic acid (PFOA)	<0.38		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluoroundecanoic acid (PFUnA)	<0.42		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluorobutanoic acid (PFBA)	<0.69		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<0.38		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<0.37		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<0.48		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<0.47		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	<0.25		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<0.46		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<0.15		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluoropentanoic acid (PFPeA)	<0.38		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluoroheptanesulfonic acid (PFHpS)	<0.36		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1
Perfluoropentanesulfonic acid (PFPeS)	<0.39		2.0	ng/L		08/01/23 17:55	08/07/23 14:42	1

Isotope Dilution	MBL %Recovery	MBL Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	68		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C6 PFDA	96		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C5 PFHxA	77		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C4 PFHpA	84		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C8 PFOA	91		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C9 PFNA	95		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C7 PFUnA	97		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C2 PFDoA	101		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C4 PFBA	80		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C5 PFPeA	92		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C3 PFBS	98		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C3 PFHxS	100		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C8 PFOS	101		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C2-4:2-FTS	152		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C2-6:2-FTS	138		50 - 200	08/01/23 17:55	08/07/23 14:42	1
13C2-8:2-FTS	130		50 - 200	08/01/23 17:55	08/07/23 14:42	1

Lab Sample ID: LCS 380-49895/23-A
Matrix: Water
Analysis Batch: 50612

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 49895

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS)	120	111		ng/L		92	70 - 130

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: LCS 380-49895/23-A
Matrix: Water
Analysis Batch: 50612

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 49895

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid(9Cl-PF3ONS)	120	112		ng/L		93	70 - 130
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	120	112		ng/L		93	70 - 130
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	120	116		ng/L		96	70 - 130
Perfluorobutanesulfonic acid (PFBS)	120	110		ng/L		92	70 - 130
Perfluorodecanoic acid (PFDA)	120	115		ng/L		95	70 - 130
Perfluorododecanoic acid (PFDoA)	120	116		ng/L		97	70 - 130
Perfluoroheptanoic acid (PFHpA)	120	117		ng/L		97	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	120	114		ng/L		95	70 - 130
Perfluorohexanoic acid (PFHxA)	120	116		ng/L		97	70 - 130
Perfluorononanoic acid (PFNA)	120	120		ng/L		99	70 - 130
Perfluorooctanesulfonic acid (PFOS)	120	111		ng/L		93	70 - 130
Perfluorooctanoic acid (PFOA)	120	112		ng/L		93	70 - 130
Perfluoroundecanoic acid (PFUnA)	120	109		ng/L		91	70 - 130
Perfluorobutanoic acid (PFBA)	120	118		ng/L		99	70 - 130
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	120	116		ng/L		96	70 - 130
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	120	111		ng/L		92	70 - 130
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	120	116		ng/L		96	70 - 130
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	120	95.5		ng/L		79	70 - 130
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	120	105		ng/L		87	70 - 130
Perfluoro-3-methoxypropanoic acid (PFMPA)	120	125		ng/L		104	70 - 130
Perfluoro-4-methoxybutanoic acid (PFMBA)	120	125		ng/L		104	70 - 130
Perfluoropentanoic acid (PFPeA)	120	118		ng/L		98	70 - 130
Perfluoroheptanesulfonic acid (PFHpS)	120	115		ng/L		96	70 - 130
Perfluoropentanesulfonic acid (PFPeS)	120	115		ng/L		96	70 - 130

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
13C3 HFPO-DA	97		50 - 200
13C6 PFDA	98		50 - 200
13C5 PFHxA	95		50 - 200
13C4 PFHpA	94		50 - 200
13C8 PFOA	98		50 - 200
13C9 PFNA	98		50 - 200
13C7 PFUnA	100		50 - 200
13C2 PFDoA	95		50 - 200
13C4 PFBA	92		50 - 200

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: LCS 380-49895/23-A
Matrix: Water
Analysis Batch: 50612

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 49895

<i>Isotope Dilution</i>	<i>LCS %Recovery</i>	<i>LCS Qualifier</i>	<i>Limits</i>
13C5 PFPeA	97		50 - 200
13C3 PFBS	102		50 - 200
13C3 PFHxS	99		50 - 200
13C8 PFOS	99		50 - 200
13C2-4:2-FTS	119		50 - 200
13C2-6:2-FTS	112		50 - 200
13C2-8:2-FTS	107		50 - 200

Lab Sample ID: LCSD 380-49895/24-A
Matrix: Water
Analysis Batch: 50612

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 49895

<i>Analyte</i>	<i>Spike Added</i>	<i>LCSD Result</i>	<i>LCSD Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec Limits</i>	<i>RPD</i>	<i>RPD Limit</i>
11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	120	115		ng/L		95	70 - 130	3	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	120	117		ng/L		97	70 - 130	4	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	120	110		ng/L		92	70 - 130	2	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	120	121		ng/L		100	70 - 130	4	30
Perfluorobutanesulfonic acid (PFBS)	120	119		ng/L		99	70 - 130	7	30
Perfluorodecanoic acid (PFDA)	120	113		ng/L		94	70 - 130	1	30
Perfluorododecanoic acid (PFDoA)	120	116		ng/L		96	70 - 130	0	30
Perfluoroheptanoic acid (PFHpA)	120	116		ng/L		96	70 - 130	1	30
Perfluorohexanesulfonic acid (PFHxS)	120	116		ng/L		96	70 - 130	1	30
Perfluorohexanoic acid (PFHxA)	120	117		ng/L		97	70 - 130	1	30
Perfluorononanoic acid (PFNA)	120	114		ng/L		95	70 - 130	4	30
Perfluorooctanesulfonic acid (PFOS)	120	116		ng/L		97	70 - 130	4	30
Perfluorooctanoic acid (PFOA)	120	116		ng/L		96	70 - 130	3	30
Perfluoroundecanoic acid (PFUnA)	120	116		ng/L		96	70 - 130	6	30
Perfluorobutanoic acid (PFBA)	120	113		ng/L		94	70 - 130	5	30
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	120	118		ng/L		98	70 - 130	2	30
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	120	109		ng/L		90	70 - 130	2	30
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	120	112		ng/L		93	70 - 130	3	30
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	120	102		ng/L		85	70 - 130	7	30
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	120	110		ng/L		91	70 - 130	5	30
Perfluoro-3-methoxypropanoic acid (PFMPA)	120	130		ng/L		108	70 - 130	4	30
Perfluoro-4-methoxybutanoic acid (PFMBA)	120	110		ng/L		91	70 - 130	12	30

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: LCSD 380-49895/24-A
Matrix: Water
Analysis Batch: 50612

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 49895

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)	120	119		ng/L		99	70 - 130	0	30
Perfluoroheptanesulfonic acid (PFHpS)	120	121		ng/L		100	70 - 130	4	30
Perfluoropentanesulfonic acid (PFPeS)	120	121		ng/L		100	70 - 130	4	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	LCSD Limits
13C3 HFPO-DA	83		50 - 200
13C6 PFDA	99		50 - 200
13C5 PFHxA	88		50 - 200
13C4 PFHpA	87		50 - 200
13C8 PFOA	90		50 - 200
13C9 PFNA	95		50 - 200
13C7 PFUnA	97		50 - 200
13C2 PFDoA	93		50 - 200
13C4 PFBA	88		50 - 200
13C5 PFPeA	104		50 - 200
13C3 PFBS	102		50 - 200
13C3 PFHxS	105		50 - 200
13C8 PFOS	102		50 - 200
13C2-4:2-FTS	119		50 - 200
13C2-6:2-FTS	116		50 - 200
13C2-8:2-FTS	109		50 - 200

Lab Sample ID: MRL 380-49895/22-A
Matrix: Water
Analysis Batch: 50612

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 49895

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	2.00	1.92	J	ng/L		96	50 - 150
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	2.00	2.28	J	ng/L		114	50 - 150
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	2.00	1.82	J	ng/L		91	50 - 150
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	2.00	2.09	J	ng/L		104	50 - 150
Perfluorobutanesulfonic acid (PFBS)	2.00	2.17	J	ng/L		108	50 - 150
Perfluorodecanoic acid (PFDA)	2.00	1.98	J	ng/L		99	50 - 150
Perfluorododecanoic acid (PFDoA)	2.00	2.04	J	ng/L		102	50 - 150
Perfluoroheptanoic acid (PFHpA)	2.00	2.10	J	ng/L		105	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	2.00	2.10	J	ng/L		105	50 - 150
Perfluorohexanoic acid (PFHxA)	2.00	2.08	J	ng/L		104	50 - 150
Perfluorononanoic acid (PFNA)	2.00	2.07	J	ng/L		103	50 - 150
Perfluorooctanesulfonic acid (PFOS)	2.00	1.90	J	ng/L		95	50 - 150
Perfluorooctanoic acid (PFOA)	2.00	2.01	J	ng/L		100	50 - 150

Eurofins Eaton Analytical Pomona

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: MRL 380-49895/22-A
Matrix: Water
Analysis Batch: 50612

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 49895

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoroundecanoic acid (PFUnA)	2.00	1.96	J	ng/L		98	50 - 150
Perfluorobutanoic acid (PFBA)	2.00	2.10	J	ng/L		105	50 - 150
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	2.00	2.07	J	ng/L		103	50 - 150
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	2.00	2.06	J	ng/L		103	50 - 150
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	2.00	2.20	J	ng/L		110	50 - 150
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	2.00	1.86	J	ng/L		93	50 - 150
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	2.00	1.85	J	ng/L		92	50 - 150
Perfluoro-3-methoxypropanoic acid (PFMPA)	2.00	2.30	J	ng/L		115	50 - 150
Perfluoro-4-methoxybutanoic acid (PFMBA)	2.00	1.96	J	ng/L		98	50 - 150
Perfluoropentanoic acid (PFPeA)	2.00	2.02	J	ng/L		101	50 - 150
Perfluoroheptanesulfonic acid (PFHpS)	2.00	2.02	J	ng/L		101	50 - 150
Perfluoropentanesulfonic acid (PFPeS)	2.00	1.96	J	ng/L		98	50 - 150

Isotope Dilution	MRL %Recovery	MRL Qualifier	Limits
13C3 HFPO-DA	78		50 - 200
13C6 PFDA	93		50 - 200
13C5 PFHxA	88		50 - 200
13C4 PFHpA	93		50 - 200
13C8 PFOA	93		50 - 200
13C9 PFNA	96		50 - 200
13C7 PFUnA	83		50 - 200
13C2 PFDoA	91		50 - 200
13C4 PFBA	95		50 - 200
13C5 PFPeA	108		50 - 200
13C3 PFBS	101		50 - 200
13C3 PFHxS	101		50 - 200
13C8 PFOS	100		50 - 200
13C2-4:2-FTS	131		50 - 200
13C2-6:2-FTS	117		50 - 200
13C2-8:2-FTS	146		50 - 200

Lab Sample ID: 380-55680-1 MS
Matrix: Drinking Water
Analysis Batch: 50612

Client Sample ID: HALAWA WELLS UNITS 1 & 2
Prep Type: Total/NA
Prep Batch: 49895

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		120	114		ng/L		95	70 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	<2.0		120	117		ng/L		98	70 - 130

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: 380-55680-1 MS

Client Sample ID: HALAWA WELLS UNITS 1 & 2

Matrix: Drinking Water

Prep Type: Total/NA

Analysis Batch: 50612

Prep Batch: 49895

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		120	112		ng/L		94	70 - 130
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		120	113		ng/L		94	70 - 130
Perfluorobutanesulfonic acid (PFBS)	<2.0		120	117		ng/L		96	70 - 130
Perfluorodecanoic acid (PFDA)	<2.0		120	115		ng/L		96	70 - 130
Perfluorododecanoic acid (PFDoA)	<2.0		120	114		ng/L		95	70 - 130
Perfluoroheptanoic acid (PFHpA)	<2.0		120	113		ng/L		93	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	2.5		120	120		ng/L		98	70 - 130
Perfluorohexanoic acid (PFHxA)	2.1		120	121		ng/L		99	70 - 130
Perfluorononanoic acid (PFNA)	<2.0		120	118		ng/L		98	70 - 130
Perfluorooctanesulfonic acid (PFOS)	2.2		120	118		ng/L		96	70 - 130
Perfluorooctanoic acid (PFOA)	<2.0		120	116		ng/L		95	70 - 130
Perfluoroundecanoic acid (PFUnA)	<2.0		120	112		ng/L		93	70 - 130
Perfluorobutanoic acid (PFBA)	<2.0		120	112		ng/L		93	70 - 130
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<2.0		120	113		ng/L		94	70 - 130
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<2.0		120	119		ng/L		99	70 - 130
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<2.0		120	113		ng/L		95	70 - 130
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<2.0		120	108		ng/L		90	70 - 130
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	<2.0		120	107		ng/L		89	70 - 130
Perfluoro-3-methoxypropanoic acid (PFMPA)	<2.0		120	128		ng/L		106	70 - 130
Perfluoro-4-methoxybutanoic acid (PFMBA)	<2.0		120	119		ng/L		99	70 - 130
Perfluoropentanoic acid (PFPeA)	2.6		120	114		ng/L		93	70 - 130
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		120	118		ng/L		98	70 - 130
Perfluoropentanesulfonic acid (PFPeS)	<2.0		120	119		ng/L		99	70 - 130

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
13C3 HFPO-DA	108		50 - 200
13C6 PFDA	103		50 - 200
13C5 PFHxA	101		50 - 200
13C4 PFHpA	105		50 - 200
13C8 PFOA	104		50 - 200
13C9 PFNA	104		50 - 200
13C7 PFUnA	107		50 - 200
13C2 PFDoA	101		50 - 200
13C4 PFBA	106		50 - 200
13C5 PFPeA	117		50 - 200
13C3 PFBS	103		50 - 200
13C3 PFHxS	102		50 - 200

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: 380-55680-1 MS
Matrix: Drinking Water
Analysis Batch: 50612

Client Sample ID: HALAWA WELLS UNITS 1 & 2
Prep Type: Total/NA
Prep Batch: 49895

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>MS MS Qualifier</i>	<i>Limits</i>
13C8 PFOS	101		50 - 200
13C2-4:2-FTS	117		50 - 200
13C2-6:2-FTS	112		50 - 200
13C2-8:2-FTS	105		50 - 200

Lab Sample ID: 380-55680-1 MSD
Matrix: Drinking Water
Analysis Batch: 50612

Client Sample ID: HALAWA WELLS UNITS 1 & 2
Prep Type: Total/NA
Prep Batch: 49895

<i>Analyte</i>	<i>Sample Result</i>	<i>Sample Qualifier</i>	<i>Spike Added</i>	<i>MSD Result</i>	<i>MSD Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec Limits</i>	<i>RPD</i>	<i>RPD Limit</i>
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		120	109		ng/L		91	70 - 130	4	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<2.0		120	115		ng/L		96	70 - 130	2	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		120	114		ng/L		95	70 - 130	2	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		120	114		ng/L		95	70 - 130	1	30
Perfluorobutanesulfonic acid (PFBS)	<2.0		120	114		ng/L		94	70 - 130	2	30
Perfluorodecanoic acid (PFDA)	<2.0		120	120		ng/L		99	70 - 130	4	30
Perfluorododecanoic acid (PFDoA)	<2.0		120	112		ng/L		93	70 - 130	2	30
Perfluoroheptanoic acid (PFHpA)	<2.0		120	115		ng/L		94	70 - 130	1	30
Perfluorohexanesulfonic acid (PFHxS)	2.5		120	119		ng/L		96	70 - 130	1	30
Perfluorohexanoic acid (PFHxA)	2.1		120	119		ng/L		97	70 - 130	1	30
Perfluorononanoic acid (PFNA)	<2.0		120	116		ng/L		96	70 - 130	2	30
Perfluorooctanesulfonic acid (PFOS)	2.2		120	114		ng/L		93	70 - 130	4	30
Perfluorooctanoic acid (PFOA)	<2.0		120	114		ng/L		93	70 - 130	1	30
Perfluoroundecanoic acid (PFUnA)	<2.0		120	116		ng/L		96	70 - 130	3	30
Perfluorobutanoic acid (PFBA)	<2.0		120	115		ng/L		95	70 - 130	2	30
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<2.0		120	113		ng/L		94	70 - 130	0	30
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<2.0		120	122		ng/L		102	70 - 130	3	30
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<2.0		120	111		ng/L		92	70 - 130	2	30
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<2.0		120	113		ng/L		93	70 - 130	4	30
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	<2.0		120	111		ng/L		92	70 - 130	3	30
Perfluoro-3-methoxypropanoic acid (PFMPA)	<2.0		120	126		ng/L		105	70 - 130	1	30
Perfluoro-4-methoxybutanoic acid (PFMBA)	<2.0		120	119		ng/L		99	70 - 130	0	30
Perfluoropentanoic acid (PFPeA)	2.6		120	118		ng/L		95	70 - 130	3	30
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		120	116		ng/L		96	70 - 130	2	30

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: 380-55680-1 MSD
Matrix: Drinking Water
Analysis Batch: 50612

Client Sample ID: HALAWA WELLS UNITS 1 & 2
Prep Type: Total/NA
Prep Batch: 49895

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluoropentanesulfonic acid (PFPeS)	<2.0		120	116		ng/L		96	70 - 130	2	30
MSD MSD											
Isotope Dilution	%Recovery	Qualifier	Limits								
13C3 HFPO-DA	92		50 - 200								
13C6 PFDA	95		50 - 200								
13C5 PFHxA	92		50 - 200								
13C4 PFHpA	95		50 - 200								
13C8 PFOA	96		50 - 200								
13C9 PFNA	98		50 - 200								
13C7 PFUnA	96		50 - 200								
13C2 PFDoA	93		50 - 200								
13C4 PFBA	98		50 - 200								
13C5 PFPeA	112		50 - 200								
13C3 PFBS	99		50 - 200								
13C3 PFHxS	98		50 - 200								
13C8 PFOS	101		50 - 200								
13C2-4:2-FTS	115		50 - 200								
13C2-6:2-FTS	110		50 - 200								
13C2-8:2-FTS	104		50 - 200								

Lab Sample ID: MBL 380-50123/19-A
Matrix: Water
Analysis Batch: 50837

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 50123

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafuoro-3-oxaundecan e-1-sulfonic acid (11Cl-PF3OUdS)	<0.30		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
9-Chlorohexadecafluoro-3-oxanonan e-1-sulfonic acid(9Cl-PF3ONS)	<0.30		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.60		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<1.0		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluorobutanesulfonic acid (PFBS)	<0.37		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluorodecanoic acid (PFDA)	<0.31		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluorododecanoic acid (PFDoA)	<0.54		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluoroheptanoic acid (PFHpA)	<0.39		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluorohexanesulfonic acid (PFHxS)	<0.32		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluorohexanoic acid (PFHxA)	<0.46		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluorononanoic acid (PFNA)	<0.40		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluorooctanesulfonic acid (PFOS)	<0.43		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluorooctanoic acid (PFOA)	<0.38		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluoroundecanoic acid (PFUnA)	<0.42		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluorobutanoic acid (PFBA)	<0.69		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<0.38		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<0.37		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<0.48		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: MBL 380-50123/19-A
Matrix: Water
Analysis Batch: 50837

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 50123

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<0.47		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	<0.25		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<0.46		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<0.15		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluoropentanoic acid (PFPeA)	<0.38		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluoroheptanesulfonic acid (PFHpS)	<0.36		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1
Perfluoropentanesulfonic acid (PFPeS)	<0.39		2.0	ng/L		08/03/23 05:45	08/09/23 07:08	1

Isotope Dilution	MBL %Recovery	MBL Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	89		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C6 PFDA	96		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C5 PFHxA	90		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C4 PFHpA	97		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C8 PFOA	97		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C9 PFNA	97		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C7 PFUnA	94		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C2 PFDoA	99		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C4 PFBA	98		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C5 PFPeA	100		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C3 PFBS	99		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C3 PFHxS	100		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C8 PFOS	97		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C2-4:2-FTS	104		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C2-6:2-FTS	101		50 - 200	08/03/23 05:45	08/09/23 07:08	1
13C2-8:2-FTS	121		50 - 200	08/03/23 05:45	08/09/23 07:08	1

Lab Sample ID: LCS 380-50123/21-A
Matrix: Water
Analysis Batch: 50837

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 50123

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	120	122		ng/L		101	70 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	120	120		ng/L		100	70 - 130
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	120	120		ng/L		100	70 - 130
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	120	131		ng/L		109	70 - 130
Perfluorobutanesulfonic acid (PFBS)	120	118		ng/L		98	70 - 130
Perfluorodecanoic acid (PFDA)	120	124		ng/L		103	70 - 130
Perfluorododecanoic acid (PFDoA)	120	120		ng/L		100	70 - 130

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: LCS 380-50123/21-A
Matrix: Water
Analysis Batch: 50837

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 50123

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoroheptanoic acid (PFHpA)	120	126		ng/L		105	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	120	126		ng/L		105	70 - 130
Perfluorohexanoic acid (PFHxA)	120	119		ng/L		99	70 - 130
Perfluorononanoic acid (PFNA)	120	130		ng/L		108	70 - 130
Perfluorooctanesulfonic acid (PFOS)	120	127		ng/L		105	70 - 130
Perfluorooctanoic acid (PFOA)	120	124		ng/L		103	70 - 130
Perfluoroundecanoic acid (PFUnA)	120	119		ng/L		99	70 - 130
Perfluorobutanoic acid (PFBA)	120	122		ng/L		101	70 - 130
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	120	126		ng/L		105	70 - 130
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	120	125		ng/L		104	70 - 130
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	120	118		ng/L		98	70 - 130
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	120	114		ng/L		95	70 - 130
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	120	121		ng/L		101	70 - 130
Perfluoro-3-methoxypropanoic acid (PFMPA)	120	117		ng/L		97	70 - 130
Perfluoro-4-methoxybutanoic acid (PFMBA)	120	120		ng/L		100	70 - 130
Perfluoropentanoic acid (PFPeA)	120	123		ng/L		102	70 - 130
Perfluoroheptanesulfonic acid (PFHpS)	120	126		ng/L		105	70 - 130
Perfluoropentanesulfonic acid (PFPeS)	120	127		ng/L		106	70 - 130

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
13C3 HFPO-DA	91		50 - 200
13C6 PFDA	94		50 - 200
13C5 PFHxA	91		50 - 200
13C4 PFHpA	93		50 - 200
13C8 PFOA	91		50 - 200
13C9 PFNA	91		50 - 200
13C7 PFUnA	97		50 - 200
13C2 PFDoA	101		50 - 200
13C4 PFBA	89		50 - 200
13C5 PFPeA	94		50 - 200
13C3 PFBS	103		50 - 200
13C3 PFHxS	98		50 - 200
13C8 PFOS	97		50 - 200
13C2-4:2-FTS	94		50 - 200
13C2-6:2-FTS	100		50 - 200
13C2-8:2-FTS	98		50 - 200

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: LCSD 380-50123/22-A
Matrix: Water
Analysis Batch: 50837

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 50123

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec		RPD	Limit
							Limits	RPD		
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	120	117		ng/L		97	70 - 130	4	30	
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	120	123		ng/L		102	70 - 130	2	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	120	120		ng/L		99	70 - 130	1	30	
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	120	133		ng/L		111	70 - 130	1	30	
Perfluorobutanesulfonic acid (PFBS)	120	120		ng/L		100	70 - 130	2	30	
Perfluorodecanoic acid (PFDA)	120	124		ng/L		103	70 - 130	0	30	
Perfluorododecanoic acid (PFDoA)	120	124		ng/L		103	70 - 130	4	30	
Perfluoroheptanoic acid (PFHpA)	120	124		ng/L		103	70 - 130	2	30	
Perfluorohexanesulfonic acid (PFHxS)	120	123		ng/L		102	70 - 130	2	30	
Perfluorohexanoic acid (PFHxA)	120	117		ng/L		98	70 - 130	1	30	
Perfluorononanoic acid (PFNA)	120	127		ng/L		106	70 - 130	2	30	
Perfluorooctanesulfonic acid (PFOS)	120	126		ng/L		105	70 - 130	0	30	
Perfluorooctanoic acid (PFOA)	120	129		ng/L		107	70 - 130	4	30	
Perfluoroundecanoic acid (PFUnA)	120	123		ng/L		103	70 - 130	4	30	
Perfluorobutanoic acid (PFBA)	120	122		ng/L		101	70 - 130	0	30	
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	120	124		ng/L		103	70 - 130	2	30	
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	120	133		ng/L		110	70 - 130	6	30	
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	120	121		ng/L		101	70 - 130	3	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	120	116		ng/L		96	70 - 130	1	30	
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	120	121		ng/L		100	70 - 130	0	30	
Perfluoro-3-methoxypropanoic acid (PFMPA)	120	117		ng/L		97	70 - 130	0	30	
Perfluoro-4-methoxybutanoic acid (PFMBA)	120	124		ng/L		103	70 - 130	3	30	
Perfluoropentanoic acid (PFPeA)	120	123		ng/L		103	70 - 130	1	30	
Perfluoroheptanesulfonic acid (PFHpS)	120	126		ng/L		105	70 - 130	0	30	
Perfluoropentanesulfonic acid (PFPeS)	120	124		ng/L		103	70 - 130	2	30	

Isotope Dilution	LCSD		Limits
	%Recovery	Qualifier	
13C3 HFPO-DA	100		50 - 200
13C6 PFDA	98		50 - 200
13C5 PFHxA	100		50 - 200
13C4 PFHpA	102		50 - 200
13C8 PFOA	93		50 - 200
13C9 PFNA	98		50 - 200

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: LCSD 380-50123/22-A
Matrix: Water
Analysis Batch: 50837

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 50123

Isotope Dilution	LCSD		Limits
	%Recovery	Qualifier	
13C7 PFUnA	99		50 - 200
13C2 PFDoA	97		50 - 200
13C4 PFBA	95		50 - 200
13C5 PFPeA	99		50 - 200
13C3 PFBS	101		50 - 200
13C3 PFHxS	99		50 - 200
13C8 PFOS	98		50 - 200
13C2-4:2-FTS	95		50 - 200
13C2-6:2-FTS	97		50 - 200
13C2-8:2-FTS	100		50 - 200

Lab Sample ID: MRL 380-50123/20-A
Matrix: Water
Analysis Batch: 50837

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 50123

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec
							Limits
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	2.00	1.96	J	ng/L		98	50 - 150
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	2.00	1.95	J	ng/L		97	50 - 150
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	2.00	1.88	J	ng/L		94	50 - 150
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	2.00	2.07	J	ng/L		103	50 - 150
Perfluorobutanesulfonic acid (PFBS)	2.00	1.83	J	ng/L		91	50 - 150
Perfluorodecanoic acid (PFDA)	2.00	2.00	J	ng/L		100	50 - 150
Perfluorododecanoic acid (PFDoA)	2.00	2.11	J	ng/L		105	50 - 150
Perfluoroheptanoic acid (PFHpA)	2.00	1.98	J	ng/L		99	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	2.00	2.03	J	ng/L		101	50 - 150
Perfluorohexanoic acid (PFHxA)	2.00	1.83	J	ng/L		92	50 - 150
Perfluorononanoic acid (PFNA)	2.00	2.06	J	ng/L		103	50 - 150
Perfluorooctanesulfonic acid (PFOS)	2.00	2.03	J	ng/L		102	50 - 150
Perfluorooctanoic acid (PFOA)	2.00	2.07	J	ng/L		103	50 - 150
Perfluoroundecanoic acid (PFUnA)	2.00	1.97	J	ng/L		98	50 - 150
Perfluorobutanoic acid (PFBA)	2.00	2.17	J	ng/L		108	50 - 150
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	2.00	2.13	J	ng/L		106	50 - 150
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	2.00	1.99	J	ng/L		99	50 - 150
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	2.00	2.15	J	ng/L		107	50 - 150
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	2.00	2.02	J	ng/L		101	50 - 150
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	2.00	1.81	J	ng/L		90	50 - 150

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: MRL 380-50123/20-A
Matrix: Water
Analysis Batch: 50837

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 50123

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoro-3-methoxypropanoic acid (PFMPA)	2.00	1.76	J	ng/L		88	50 - 150
Perfluoro-4-methoxybutanoic acid (PFMBA)	2.00	1.95	J	ng/L		97	50 - 150
Perfluoropentanoic acid (PFPeA)	2.00	2.04	J	ng/L		102	50 - 150
Perfluoroheptanesulfonic acid (PFHpS)	2.00	2.04	J	ng/L		102	50 - 150
Perfluoropentanesulfonic acid (PFPeS)	2.00	2.05	J	ng/L		102	50 - 150

Isotope Dilution	MRL %Recovery	MRL Qualifier	MRL Limits
13C3 HFPO-DA	84		50 - 200
13C6 PFDA	92		50 - 200
13C5 PFHxA	95		50 - 200
13C4 PFHpA	96		50 - 200
13C8 PFOA	95		50 - 200
13C9 PFNA	93		50 - 200
13C7 PFUnA	88		50 - 200
13C2 PFDoA	93		50 - 200
13C4 PFBA	98		50 - 200
13C5 PFPeA	104		50 - 200
13C3 PFBS	105		50 - 200
13C3 PFHxS	99		50 - 200
13C8 PFOS	98		50 - 200
13C2-4:2-FTS	111		50 - 200
13C2-6:2-FTS	104		50 - 200
13C2-8:2-FTS	109		50 - 200

Lab Sample ID: 380-55755-D-1-B MS
Matrix: Water
Analysis Batch: 50837

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 50123

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		120	120		ng/L		100	70 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<2.0		120	126		ng/L		105	70 - 130
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		120	128		ng/L		106	70 - 130
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		120	127		ng/L		105	70 - 130
Perfluorobutanesulfonic acid (PFBS)	<2.0		120	122		ng/L		101	70 - 130
Perfluorodecanoic acid (PFDA)	<2.0		120	126		ng/L		105	70 - 130
Perfluorododecanoic acid (PFDoA)	<2.0		120	122		ng/L		102	70 - 130
Perfluoroheptanoic acid (PFHpA)	<2.0		120	129		ng/L		107	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	<2.0		120	130		ng/L		108	70 - 130
Perfluorohexanoic acid (PFHxA)	<2.0		120	121		ng/L		100	70 - 130

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: 380-55755-D-1-B MS

Matrix: Water

Analysis Batch: 50837

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 50123

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorononanoic acid (PFNA)	<2.0		120	131		ng/L		109	70 - 130
Perfluorooctanesulfonic acid (PFOS)	<2.0		120	130		ng/L		108	70 - 130
Perfluorooctanoic acid (PFOA)	<2.0		120	129		ng/L		107	70 - 130
Perfluoroundecanoic acid (PFUnA)	<2.0		120	127		ng/L		106	70 - 130
Perfluorobutanoic acid (PFBA)	<2.0		120	124		ng/L		103	70 - 130
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<2.0		120	125		ng/L		104	70 - 130
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<2.0		120	133		ng/L		110	70 - 130
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<2.0		120	123		ng/L		103	70 - 130
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<2.0		120	117		ng/L		97	70 - 130
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	<2.0		120	125		ng/L		104	70 - 130
Perfluoro-3-methoxypropanoic acid (PFMPA)	<2.0		120	124		ng/L		103	70 - 130
Perfluoro-4-methoxybutanoic acid (PFMBA)	<2.0		120	123		ng/L		102	70 - 130
Perfluoropentanoic acid (PFPeA)	<2.0		120	125		ng/L		104	70 - 130
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		120	133		ng/L		111	70 - 130
Perfluoropentanesulfonic acid (PFPeS)	<2.0		120	131		ng/L		109	70 - 130
MS MS									
Isotope Dilution	%Recovery		Qualifier	Limits					
13C3 HFPO-DA	100			50 - 200					
13C6 PFDA	94			50 - 200					
13C5 PFHxA	99			50 - 200					
13C4 PFHpA	92			50 - 200					
13C8 PFOA	95			50 - 200					
13C9 PFNA	92			50 - 200					
13C7 PFUnA	93			50 - 200					
13C2 PFDoA	94			50 - 200					
13C4 PFBA	96			50 - 200					
13C5 PFPeA	102			50 - 200					
13C3 PFBS	100			50 - 200					
13C3 PFHxS	96			50 - 200					
13C8 PFOS	96			50 - 200					
13C2-4:2-FTS	96			50 - 200					
13C2-6:2-FTS	97			50 - 200					
13C2-8:2-FTS	96			50 - 200					

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: 380-55755-D-1-C MSD

Client Sample ID: Matrix Spike Duplicate

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 50837

Prep Batch: 50123

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits		
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		120	122		ng/L		102	70 - 130	2	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<2.0		120	125		ng/L		104	70 - 130	1	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		120	115		ng/L		96	70 - 130	10	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		120	153		ng/L		127	70 - 130	19	30
Perfluorobutanesulfonic acid (PFBS)	<2.0		120	120		ng/L		100	70 - 130	2	30
Perfluorodecanoic acid (PFDA)	<2.0		120	120		ng/L		100	70 - 130	5	30
Perfluorododecanoic acid (PFDoA)	<2.0		120	127		ng/L		106	70 - 130	4	30
Perfluoroheptanoic acid (PFHpA)	<2.0		120	122		ng/L		102	70 - 130	5	30
Perfluorohexanesulfonic acid (PFHxS)	<2.0		120	122		ng/L		101	70 - 130	7	30
Perfluorohexanoic acid (PFHxA)	<2.0		120	123		ng/L		102	70 - 130	2	30
Perfluorononanoic acid (PFNA)	<2.0		120	134		ng/L		111	70 - 130	2	30
Perfluorooctanesulfonic acid (PFOS)	<2.0		120	128		ng/L		107	70 - 130	2	30
Perfluorooctanoic acid (PFOA)	<2.0		120	128		ng/L		106	70 - 130	1	30
Perfluoroundecanoic acid (PFUnA)	<2.0		120	125		ng/L		104	70 - 130	2	30
Perfluorobutanoic acid (PFBA)	<2.0		120	123		ng/L		103	70 - 130	0	30
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<2.0		120	127		ng/L		106	70 - 130	1	30
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<2.0		120	130		ng/L		108	70 - 130	2	30
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<2.0		120	115		ng/L		96	70 - 130	7	30
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<2.0		120	125		ng/L		104	70 - 130	6	30
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	<2.0		120	116		ng/L		96	70 - 130	8	30
Perfluoro-3-methoxypropanoic acid (PFMPA)	<2.0		120	116		ng/L		96	70 - 130	7	30
Perfluoro-4-methoxybutanoic acid (PFMBA)	<2.0		120	122		ng/L		102	70 - 130	0	30
Perfluoropentanoic acid (PFPeA)	<2.0		120	130		ng/L		108	70 - 130	4	30
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		120	128		ng/L		106	70 - 130	4	30
Perfluoropentanesulfonic acid (PFPeS)	<2.0		120	130		ng/L		108	70 - 130	0	30

Isotope Dilution	MSD	MSD	Limits
	%Recovery	Qualifier	
13C3 HFPO-DA	97		50 - 200
13C6 PFDA	99		50 - 200
13C5 PFHxA	94		50 - 200
13C4 PFHpA	97		50 - 200
13C8 PFOA	92		50 - 200
13C9 PFNA	97		50 - 200

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 533 - Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water (Continued)

Lab Sample ID: 380-55755-D-1-C MSD
Matrix: Water
Analysis Batch: 50837

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 50123

Isotope Dilution	MSD MSD		Limits
	%Recovery	Qualifier	
13C7 PFUnA	97		50 - 200
13C2 PFDoA	100		50 - 200
13C4 PFBA	93		50 - 200
13C5 PFPeA	98		50 - 200
13C3 PFBS	108		50 - 200
13C3 PFHxS	96		50 - 200
13C8 PFOS	98		50 - 200
13C2-4:2-FTS	95		50 - 200
13C2-6:2-FTS	98		50 - 200
13C2-8:2-FTS	98		50 - 200

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS)

Lab Sample ID: MBL 380-48682/23-A
Matrix: Water
Analysis Batch: 48854

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 48682

Analyte	MBL MBL		RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<1.0		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
Perfluorooctanesulfonic acid (PFOS)	<0.43		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
Perfluoroundecanoic acid (PFUnA)	<0.42		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<0.58		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<0.42		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
Perfluorohexanoic acid (PFHxA)	<0.46		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
Perfluorododecanoic acid (PFDoA)	<0.54		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
Perfluorooctanoic acid (PFOA)	<0.38		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
Perfluorodecanoic acid (PFDA)	<0.31		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
Perfluorohexanesulfonic acid (PFHxS)	<0.32		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
Perfluorobutanesulfonic acid (PFBS)	<0.37		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
Perfluoroheptanoic acid (PFHpA)	<0.39		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
Perfluorononanoic acid (PFNA)	<0.40		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
Perfluorotetradecanoic acid (PFTA)	<0.54		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
Perfluorotridecanoic acid (PFTrDA)	<0.36		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<0.30		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<0.30		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.60		2.0	ng/L		07/25/23 06:38	07/26/23 11:01	1

Surrogate	MBL MBL		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
d5-NEtFOSAA	110		70 - 130	07/25/23 06:38	07/26/23 11:01	1
13C2 PFHxA	116		70 - 130	07/25/23 06:38	07/26/23 11:01	1
13C2 PFDA	105		70 - 130	07/25/23 06:38	07/26/23 11:01	1
13C3-GenX	106		70 - 130	07/25/23 06:38	07/26/23 11:01	1

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LCS 380-48682/25-A
Matrix: Water
Analysis Batch: 48854

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 48682

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	50.2	43.7		ng/L		87	70 - 130
Perfluorooctanesulfonic acid (PFOS)	46.5	45.7		ng/L		98	70 - 130
Perfluoroundecanoic acid (PFUnA)	50.2	45.4		ng/L		90	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	50.2	48.6		ng/L		97	70 - 130
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	50.2	44.8		ng/L		89	70 - 130
Perfluorohexanoic acid (PFHxA)	50.2	48.7		ng/L		97	70 - 130
Perfluorododecanoic acid (PFDoA)	50.2	43.4		ng/L		86	70 - 130
Perfluorooctanoic acid (PFOA)	50.2	48.4		ng/L		96	70 - 130
Perfluorodecanoic acid (PFDA)	50.2	46.1		ng/L		92	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	45.8	44.4		ng/L		97	70 - 130
Perfluorobutanesulfonic acid (PFBS)	44.4	42.3		ng/L		95	70 - 130
Perfluoroheptanoic acid (PFHpA)	50.2	48.8		ng/L		97	70 - 130
Perfluorononanoic acid (PFNA)	50.2	51.8		ng/L		103	70 - 130
Perfluorotetradecanoic acid (PFTA)	50.2	42.7		ng/L		85	70 - 130
Perfluorotridecanoic acid (PFTrDA)	50.2	42.5		ng/L		85	70 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	46.9	42.9		ng/L		91	70 - 130
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	47.4	39.6		ng/L		83	70 - 130
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	47.4	45.6		ng/L		96	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
d5-NEtFOSAA	106		70 - 130
13C2 PFHxA	121		70 - 130
13C2 PFDA	110		70 - 130
13C3-GenX	109		70 - 130

Lab Sample ID: LCSD 380-48682/26-A
Matrix: Water
Analysis Batch: 48854

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 48682

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	50.2	44.1		ng/L		88	70 - 130	1	30
Perfluorooctanesulfonic acid (PFOS)	46.5	46.7		ng/L		100	70 - 130	2	30
Perfluoroundecanoic acid (PFUnA)	50.2	47.5		ng/L		95	70 - 130	5	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	50.2	47.9		ng/L		95	70 - 130	2	30

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LCSD 380-48682/26-A
Matrix: Water
Analysis Batch: 48854

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 48682

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	50.2	46.5		ng/L		93	70 - 130	4	30
Perfluorohexanoic acid (PFHxA)	50.2	50.2		ng/L		100	70 - 130	3	30
Perfluorododecanoic acid (PFDoA)	50.2	45.4		ng/L		90	70 - 130	5	30
Perfluorooctanoic acid (PFOA)	50.2	50.8		ng/L		101	70 - 130	5	30
Perfluorodecanoic acid (PFDA)	50.2	48.6		ng/L		97	70 - 130	5	30
Perfluorohexanesulfonic acid (PFHxS)	45.8	44.9		ng/L		98	70 - 130	1	30
Perfluorobutanesulfonic acid (PFBS)	44.4	41.9		ng/L		94	70 - 130	1	30
Perfluoroheptanoic acid (PFHpA)	50.2	49.4		ng/L		98	70 - 130	1	30
Perfluorononanoic acid (PFNA)	50.2	53.9		ng/L		107	70 - 130	4	30
Perfluorotetradecanoic acid (PFTA)	50.2	43.5		ng/L		87	70 - 130	2	30
Perfluorotridecanoic acid (PFTrDA)	50.2	44.7		ng/L		89	70 - 130	5	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	46.9	43.1		ng/L		92	70 - 130	1	30
11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	47.4	40.5		ng/L		85	70 - 130	2	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	47.4	47.1		ng/L		99	70 - 130	3	30

Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits
d5-NEtFOSAA	98		70 - 130
13C2 PFHxA	113		70 - 130
13C2 PFDA	106		70 - 130
13C3-GenX	102		70 - 130

Lab Sample ID: MRL 380-48682/24-A
Matrix: Water
Analysis Batch: 48854

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 48682

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	2.01	1.85	J	ng/L		92	50 - 150
Perfluorooctanesulfonic acid (PFOS)	1.86	1.90	J	ng/L		102	50 - 150
Perfluoroundecanoic acid (PFUnA)	2.01	1.96	J	ng/L		97	50 - 150
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.01	1.90	J	ng/L		95	50 - 150
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.01	1.93	J	ng/L		96	50 - 150
Perfluorohexanoic acid (PFHxA)	2.01	2.31	J	ng/L		115	50 - 150
Perfluorododecanoic acid (PFDoA)	2.01	1.97	J	ng/L		98	50 - 150
Perfluorooctanoic acid (PFOA)	2.01	2.38	J	ng/L		119	50 - 150
Perfluorodecanoic acid (PFDA)	2.01	2.02	J	ng/L		100	50 - 150

Eurofins Eaton Analytical Pomona

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: MRL 380-48682/24-A
Matrix: Water
Analysis Batch: 48854

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 48682

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanesulfonic acid (PFHxS)	1.83	2.06	J	ng/L		112	50 - 150
Perfluorobutanesulfonic acid (PFBS)	1.78	1.78	J	ng/L		100	50 - 150
Perfluoroheptanoic acid (PFHpA)	2.01	2.56	J	ng/L		128	50 - 150
Perfluorononanoic acid (PFNA)	2.01	2.35	J	ng/L		117	50 - 150
Perfluorotetradecanoic acid (PFTA)	2.01	1.94	J	ng/L		97	50 - 150
Perfluorotridecanoic acid (PFTTrDA)	2.01	1.92	J	ng/L		96	50 - 150
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	1.88	1.85	J	ng/L		99	50 - 150
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	1.90	1.73	J	ng/L		91	50 - 150
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.90	2.12	J	ng/L		112	50 - 150
Surrogate	%Recovery	MRL	Qualifier	Limits			
d5-NEtFOSAA	105			70 - 130			
13C2 PFHxA	122			70 - 130			
13C2 PFDA	108			70 - 130			
13C3-GenX	107			70 - 130			

Lab Sample ID: 380-55755-A-1-B MS
Matrix: Water
Analysis Batch: 48854

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 48682

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		25.1	23.2		ng/L		93	70 - 130
Perfluorooctanesulfonic acid (PFOS)	<2.0		23.2	24.4		ng/L		105	70 - 130
Perfluoroundecanoic acid (PFUnA)	<2.0		25.1	24.6		ng/L		98	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.0		25.1	25.2		ng/L		101	70 - 130
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<2.0		25.1	25.4		ng/L		101	70 - 130
Perfluorohexanoic acid (PFHxA)	<2.0		25.1	27.1		ng/L		108	70 - 130
Perfluorododecanoic acid (PFDoA)	<2.0		25.1	23.9		ng/L		95	70 - 130
Perfluorooctanoic acid (PFOA)	<2.0		25.1	26.5		ng/L		106	70 - 130
Perfluorodecanoic acid (PFDA)	<2.0		25.1	24.2		ng/L		97	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	<2.0		22.9	23.3		ng/L		102	70 - 130
Perfluorobutanesulfonic acid (PFBS)	<2.0		22.2	23.4		ng/L		106	70 - 130
Perfluoroheptanoic acid (PFHpA)	<2.0		25.1	26.6		ng/L		106	70 - 130
Perfluorononanoic acid (PFNA)	<2.0		25.1	28.3		ng/L		113	70 - 130
Perfluorotetradecanoic acid (PFTA)	<2.0		25.1	23.3		ng/L		93	70 - 130

Eurofins Eaton Analytical Pomona

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: 380-55755-A-1-B MS
Matrix: Water
Analysis Batch: 48854

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 48682

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorotridecanoic acid (PFTrDA)	<2.0		25.1	23.7		ng/L		95	70 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<2.0		23.4	24.3		ng/L		104	70 - 130
11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		23.7	22.2		ng/L		94	70 - 130
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		23.7	25.7		ng/L		108	70 - 130
Surrogate		MS %Recovery	MS Qualifier		Limits				
d5-NEtFOSAA		111			70 - 130				
13C2 PFHxA		118			70 - 130				
13C2 PFDA		109			70 - 130				
13C3-GenX		115			70 - 130				

Lab Sample ID: 380-55755-A-1-C MSD
Matrix: Water
Analysis Batch: 48854

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 48682

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)	<2.0		25.1	25.5		ng/L		102	70 - 130	10	30
Perfluorooctanesulfonic acid (PFOS)	<2.0		23.2	24.3		ng/L		105	70 - 130	0	30
Perfluoroundecanoic acid (PFUnA)	<2.0		25.1	24.5		ng/L		98	70 - 130	0	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.0		25.1	27.3		ng/L		109	70 - 130	8	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<2.0		25.1	26.2		ng/L		105	70 - 130	3	30
Perfluorohexanoic acid (PFHxA)	<2.0		25.1	27.0		ng/L		108	70 - 130	0	30
Perfluorododecanoic acid (PFDoA)	<2.0		25.1	25.2		ng/L		100	70 - 130	5	30
Perfluorooctanoic acid (PFOA)	<2.0		25.1	27.2		ng/L		109	70 - 130	3	30
Perfluorodecanoic acid (PFDA)	<2.0		25.1	25.9		ng/L		103	70 - 130	7	30
Perfluorohexanesulfonic acid (PFHxS)	<2.0		22.9	24.2		ng/L		106	70 - 130	4	30
Perfluorobutanesulfonic acid (PFBS)	<2.0		22.2	23.6		ng/L		106	70 - 130	1	30
Perfluoroheptanoic acid (PFHpA)	<2.0		25.1	26.9		ng/L		107	70 - 130	1	30
Perfluorononanoic acid (PFNA)	<2.0		25.1	28.2		ng/L		112	70 - 130	0	30
Perfluorotetradecanoic acid (PFTA)	<2.0		25.1	23.6		ng/L		94	70 - 130	1	30
Perfluorotridecanoic acid (PFTrDA)	<2.0		25.1	23.6		ng/L		94	70 - 130	0	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	<2.0		23.5	25.5		ng/L		109	70 - 130	5	30
11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<2.0		23.7	23.0		ng/L		97	70 - 130	3	30

Eurofins Eaton Analytical Pomona

QC Sample Results

Client: City & County of Honolulu
 Project/Site: RED-HILL

Job ID: 380-55680-1

Method: 537.1 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: 380-55755-A-1-C MSD

Matrix: Water

Analysis Batch: 48854

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 48682

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		23.7	26.0		ng/L		110	70 - 130	1	30
Surrogate	%Recovery	MSD Qualifier	MSD Limits								
d5-NEtFOSAA	117		70 - 130								
13C2 PFHxA	128		70 - 130								
13C2 PFDA	119		70 - 130								
13C3-GenX	121		70 - 130								

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QC Association Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

GC/MS Semi VOA

Prep Batch: 48728

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-55680-1	HALAWA WELLS UNITS 1 & 2	Total/NA	Drinking Water	525.2	
MB 380-48728/21-A	Method Blank	Total/NA	Water	525.2	
LCS 380-48728/23-A	Lab Control Sample	Total/NA	Water	525.2	
LCSD 380-48728/24-A	Lab Control Sample Dup	Total/NA	Water	525.2	
MRL 380-48728/22-A	Lab Control Sample	Total/NA	Water	525.2	
380-55614-AI-1-A MS	Matrix Spike	Total/NA	Water	525.2	
380-55774-AK-3-A DU	Duplicate	Total/NA	Water	525.2	

Analysis Batch: 48954

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-55680-1	HALAWA WELLS UNITS 1 & 2	Total/NA	Drinking Water	525.2	48728
MB 380-48728/21-A	Method Blank	Total/NA	Water	525.2	48728
LCS 380-48728/23-A	Lab Control Sample	Total/NA	Water	525.2	48728
LCSD 380-48728/24-A	Lab Control Sample Dup	Total/NA	Water	525.2	48728
MRL 380-48728/22-A	Lab Control Sample	Total/NA	Water	525.2	48728
380-55614-AI-1-A MS	Matrix Spike	Total/NA	Water	525.2	48728
380-55774-AK-3-A DU	Duplicate	Total/NA	Water	525.2	48728

LCMS

Prep Batch: 48682

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-55680-1	HALAWA WELLS UNITS 1 & 2	Total/NA	Drinking Water	537.1 DW	
380-55680-3	FB: HALAWA WELLS UNITS 1 & 2	Total/NA	Water	537.1 DW	
MBL 380-48682/23-A	Method Blank	Total/NA	Water	537.1 DW	
LCS 380-48682/25-A	Lab Control Sample	Total/NA	Water	537.1 DW	
LCSD 380-48682/26-A	Lab Control Sample Dup	Total/NA	Water	537.1 DW	
MRL 380-48682/24-A	Lab Control Sample	Total/NA	Water	537.1 DW	
380-55755-A-1-B MS	Matrix Spike	Total/NA	Water	537.1 DW	
380-55755-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	537.1 DW	

Analysis Batch: 48854

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-55680-1	HALAWA WELLS UNITS 1 & 2	Total/NA	Drinking Water	537.1	48682
380-55680-3	FB: HALAWA WELLS UNITS 1 & 2	Total/NA	Water	537.1	48682
MBL 380-48682/23-A	Method Blank	Total/NA	Water	537.1	48682
LCS 380-48682/25-A	Lab Control Sample	Total/NA	Water	537.1	48682
LCSD 380-48682/26-A	Lab Control Sample Dup	Total/NA	Water	537.1	48682
MRL 380-48682/24-A	Lab Control Sample	Total/NA	Water	537.1	48682
380-55755-A-1-B MS	Matrix Spike	Total/NA	Water	537.1	48682
380-55755-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	537.1	48682

Prep Batch: 49895

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-55680-1	HALAWA WELLS UNITS 1 & 2	Total/NA	Drinking Water	533	
MBL 380-49895/21-A	Method Blank	Total/NA	Water	533	
LCS 380-49895/23-A	Lab Control Sample	Total/NA	Water	533	
LCSD 380-49895/24-A	Lab Control Sample Dup	Total/NA	Water	533	
MRL 380-49895/22-A	Lab Control Sample	Total/NA	Water	533	
380-55680-1 MS	HALAWA WELLS UNITS 1 & 2	Total/NA	Drinking Water	533	
380-55680-1 MSD	HALAWA WELLS UNITS 1 & 2	Total/NA	Drinking Water	533	

Eurofins Eaton Analytical Pomona

QC Association Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

LCMS

Prep Batch: 50123

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-55680-3	FB: HALAWA WELLS UNITS 1 & 2	Total/NA	Water	533	
MBL 380-50123/19-A	Method Blank	Total/NA	Water	533	
LCS 380-50123/21-A	Lab Control Sample	Total/NA	Water	533	
LCSD 380-50123/22-A	Lab Control Sample Dup	Total/NA	Water	533	
MRL 380-50123/20-A	Lab Control Sample	Total/NA	Water	533	
380-55755-D-1-B MS	Matrix Spike	Total/NA	Water	533	
380-55755-D-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	533	

Analysis Batch: 50612

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-55680-1	HALAWA WELLS UNITS 1 & 2	Total/NA	Drinking Water	533	49895
MBL 380-49895/21-A	Method Blank	Total/NA	Water	533	49895
LCS 380-49895/23-A	Lab Control Sample	Total/NA	Water	533	49895
LCSD 380-49895/24-A	Lab Control Sample Dup	Total/NA	Water	533	49895
MRL 380-49895/22-A	Lab Control Sample	Total/NA	Water	533	49895
380-55680-1 MS	HALAWA WELLS UNITS 1 & 2	Total/NA	Drinking Water	533	49895
380-55680-1 MSD	HALAWA WELLS UNITS 1 & 2	Total/NA	Drinking Water	533	49895

Analysis Batch: 50837

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-55680-3	FB: HALAWA WELLS UNITS 1 & 2	Total/NA	Water	533	50123
MBL 380-50123/19-A	Method Blank	Total/NA	Water	533	50123
LCS 380-50123/21-A	Lab Control Sample	Total/NA	Water	533	50123
LCSD 380-50123/22-A	Lab Control Sample Dup	Total/NA	Water	533	50123
MRL 380-50123/20-A	Lab Control Sample	Total/NA	Water	533	50123
380-55755-D-1-B MS	Matrix Spike	Total/NA	Water	533	50123
380-55755-D-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	533	50123

Lab Chronicle

Client: City & County of Honolulu
 Project/Site: RED-HILL

Job ID: 380-55680-1

Client Sample ID: HALAWA WELLS UNITS 1 & 2

Lab Sample ID: 380-55680-1

Date Collected: 07/18/23 09:00

Matrix: Drinking Water

Date Received: 07/20/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	525.2			48728	G9MN	EA POM	07/25/23 16:50
Total/NA	Analysis	525.2		1	48954	UPAC	EA POM	07/26/23 20:09
Total/NA	Prep	533			49895	T2EP	EA POM	08/01/23 17:55
Total/NA	Analysis	533		1	50612	Y7BM	EA POM	08/07/23 15:20
Total/NA	Prep	537.1 DW			48682	US1B	EA POM	07/25/23 06:38
Total/NA	Analysis	537.1		1	48854	UKDT	EA POM	07/26/23 14:13

Client Sample ID: FB: HALAWA WELLS UNITS 1 & 2

Lab Sample ID: 380-55680-3

Date Collected: 07/18/23 09:00

Matrix: Water

Date Received: 07/20/23 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	533			50123	XTD8	EA POM	08/03/23 05:45
Total/NA	Analysis	533		1	50837	UKDT	EA POM	08/09/23 08:35
Total/NA	Prep	537.1 DW			48682	US1B	EA POM	07/25/23 06:38
Total/NA	Analysis	537.1		1	48854	UKDT	EA POM	07/26/23 14:22

Laboratory References:

EA POM = Eurofins Eaton Analytical Pomona, 941 Corporate Center Drive, Pomona, CA 91768-2642, TEL (626)386-1100

Accreditation/Certification Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Laboratory: Eurofins Eaton Analytical Pomona

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Hawaii	State	CA00006	01-31-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
525.2	525.2	Drinking Water	1-Methylnaphthalene
525.2	525.2	Drinking Water	2,4'-DDD
525.2	525.2	Drinking Water	2,4'-DDE
525.2	525.2	Drinking Water	2,4'-DDT
525.2	525.2	Drinking Water	2,4-Dinitrotoluene
525.2	525.2	Drinking Water	2,6-Dinitrotoluene
525.2	525.2	Drinking Water	2-Methylnaphthalene
525.2	525.2	Drinking Water	4,4'-DDD
525.2	525.2	Drinking Water	4,4'-DDE
525.2	525.2	Drinking Water	4,4'-DDT
525.2	525.2	Drinking Water	Acenaphthene
525.2	525.2	Drinking Water	Acenaphthylene
525.2	525.2	Drinking Water	Acetochlor
525.2	525.2	Drinking Water	alpha-BHC
525.2	525.2	Drinking Water	alpha-Chlordane
525.2	525.2	Drinking Water	Anthracene
525.2	525.2	Drinking Water	Benz(a)anthracene
525.2	525.2	Drinking Water	Benzo[b]fluoranthene
525.2	525.2	Drinking Water	Benzo[g,h,i]perylene
525.2	525.2	Drinking Water	Benzo[k]fluoranthene
525.2	525.2	Drinking Water	beta-BHC
525.2	525.2	Drinking Water	Bromacil
525.2	525.2	Drinking Water	Butylbenzylphthalate
525.2	525.2	Drinking Water	Chlorobenzilate
525.2	525.2	Drinking Water	Chloroneb
525.2	525.2	Drinking Water	Chlorothalonil (Draconil, Bravo)
525.2	525.2	Drinking Water	Chlorpyrifos
525.2	525.2	Drinking Water	Chrysene
525.2	525.2	Drinking Water	delta-BHC
525.2	525.2	Drinking Water	Dibenz(a,h)anthracene
525.2	525.2	Drinking Water	Diclorvos (DDVP)
525.2	525.2	Drinking Water	Diethylphthalate
525.2	525.2	Drinking Water	Dimethylphthalate
525.2	525.2	Drinking Water	Di-n-butyl phthalate
525.2	525.2	Drinking Water	Di-n-octyl phthalate
525.2	525.2	Drinking Water	Endosulfan I (Alpha)
525.2	525.2	Drinking Water	Endosulfan II (Beta)
525.2	525.2	Drinking Water	Endosulfan sulfate
525.2	525.2	Drinking Water	Endrin aldehyde
525.2	525.2	Drinking Water	EPTC
525.2	525.2	Drinking Water	Fluoranthene
525.2	525.2	Drinking Water	Fluorene
525.2	525.2	Drinking Water	gamma-Chlordane
525.2	525.2	Drinking Water	Indeno[1,2,3-cd]pyrene
525.2	525.2	Drinking Water	Isophorone

Accreditation/Certification Summary

Client: City & County of Honolulu
 Project/Site: RED-HILL

Job ID: 380-55680-1

Laboratory: Eurofins Eaton Analytical Pomona (Continued)

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
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The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
525.2	525.2	Drinking Water	Malathion
525.2	525.2	Drinking Water	Molinate
525.2	525.2	Drinking Water	Naphthalene
525.2	525.2	Drinking Water	Parathion
525.2	525.2	Drinking Water	Pendimethalin (Penoxaline)
525.2	525.2	Drinking Water	Phenanthrene
525.2	525.2	Drinking Water	Pyrene
525.2	525.2	Drinking Water	Terbacil
525.2	525.2	Drinking Water	Terbutylazine
525.2	525.2	Drinking Water	Thiobencarb
525.2	525.2	Drinking Water	Total Permethrin (mixed isomers)
525.2	525.2	Drinking Water	trans-Nonachlor
525.2	525.2	Drinking Water	Trifluralin
533	533	Drinking Water	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)
533	533	Drinking Water	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)
533	533	Drinking Water	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)
533	533	Drinking Water	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)
533	533	Drinking Water	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
533	533	Drinking Water	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)
533	533	Drinking Water	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)
533	533	Drinking Water	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)
533	533	Drinking Water	Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)
533	533	Drinking Water	Perfluoro-3-methoxypropanoic acid (PFMPA)
533	533	Drinking Water	Perfluoro-4-methoxybutanoic acid (PFMBA)
533	533	Drinking Water	Perfluorobutanoic acid (PFBA)
533	533	Drinking Water	Perfluoroheptanesulfonic acid (PFHpS)
533	533	Drinking Water	Perfluoropentanesulfonic acid (PFPeS)
533	533	Drinking Water	Perfluoropentanoic acid (PFPeA)
533	533	Water	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)
533	533	Water	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)
533	533	Water	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)
533	533	Water	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)
533	533	Water	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
533	533	Water	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)

Accreditation/Certification Summary

Client: City & County of Honolulu
 Project/Site: RED-HILL

Job ID: 380-55680-1

Laboratory: Eurofins Eaton Analytical Pomona (Continued)

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.			
Analysis Method	Prep Method	Matrix	Analyte
533	533	Water	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)
533	533	Water	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)
533	533	Water	Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)
533	533	Water	Perfluoro-3-methoxypropanoic acid (PFMPA)
533	533	Water	Perfluoro-4-methoxybutanoic acid (PFMBA)
533	533	Water	Perfluorobutanoic acid (PFBA)
533	533	Water	Perfluoroheptanesulfonic acid (PFHpS)
533	533	Water	Perfluoropentanesulfonic acid (PFPeS)
533	533	Water	Perfluoropentanoic acid (PFPeA)
537.1	537.1 DW	Drinking Water	11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)
537.1	537.1 DW	Drinking Water	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
537.1	537.1 DW	Drinking Water	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)
537.1	537.1 DW	Drinking Water	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)
537.1	537.1 DW	Water	11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)
537.1	537.1 DW	Water	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
537.1	537.1 DW	Water	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)
537.1	537.1 DW	Water	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)

Method Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Method	Method Description	Protocol	Laboratory
525.2	Semivolatile Organic Compounds (GC/MS)	EPA	EA POM
533	Perfluorinated and Polyfluorinated Alkyl Substances in Drinking Water	EPA	EA POM
537.1	Perfluorinated Alkyl Acids (LC/MS)	EPA	EA POM
525.2	Extraction of Semivolatile Compounds	EPA	EA POM
533	Extraction of Perfluorinated and Polyfluorinated Alkyl Acids	EPA	EA POM
537.1 DW	Extraction of Perfluorinated Alkyl Acids	EPA	EA POM

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

EA POM = Eurofins Eaton Analytical Pomona, 941 Corporate Center Drive, Pomona, CA 91768-2642, TEL (626)386-1100



Sample Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-55680-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	PWSID Number
380-55680-1	HALAWA WELLS UNITS 1 & 2	Drinking Water	07/18/23 09:00	07/20/23 10:15	HI0000331
380-55680-3	FB: HALAWA WELLS UNITS 1 & 2	Water	07/18/23 09:00	07/20/23 10:15	

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August 02, 2023

Rachelle Arada
 Eurofins Eaton Analytical
 750 Royal Oaks Drive
 Suite 100
 Monrovia, CA 91016-

Project Name: RED-HILL Project # 38001111 Job # 380-55680-1
 Physis Project ID: 1407003-425

Dear Rachelle,

Enclosed are the analytical results for the sample submitted to PHYSIS Environmental Laboratories, Inc. (PHYSIS) on 7/21/2023. A total of 1 sample was received for analysis in accordance with the attached chain of custody (COC). Per the COC, the sample was analyzed for:

Organics
Polynuclear Aromatic Hydrocarbons by EPA 625.1
Disalicylidenepropanediamine by EPA 625.1
Dibenzo [a,l] Pyrene w/ PAHs by EPA 625.1

Analytical results in this report apply only to samples submitted to PHYSIS in accordance with the COC and are intended to be considered in their entirety.

Please feel free to contact me at any time with any questions. PHYSIS appreciates the opportunity to provide you with our analytical and support services.

Regards,

Misty Mercier
 714 602-5320
 Extension 202
 mistymercier@physislabs.com



PROJECT SAMPLE LIST

Eurofins Eaton Analytical

PHYSIS Project ID: 1407003-425

RED-HILL Project # 38001111 Job # 380-55680-1

Total Samples: 1

PHYSIS ID	Sample ID	Description	Date	Time	Matrix	Sample Type
108522	HALAWA WELLS UNITS 1 & 2	380-55680-1	7/18/2023	9:00	Samplewater	Not Specified

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ABBREVIATIONS and ACRONYMS

QM	Quality Manual
QA	Quality Assurance
QC	Quality Control
MDL	method detection limit
RL	reporting limit
R1	project sample
R2	project sample replicate
MS1	matrix spike
MS2	matrix spike replicate
B1	procedural blank
B2	procedural blank replicate
BS1	blank spike
BS2	blank spike replicate
LCS1	laboratory control spike
LCS2	laboratory control spike replicate
LCM1	laboratory control material
LCM2	laboratory control material replicate
CRM1	certified reference material
CRM2	certified reference material replicate
RPD	relative percent difference
LMW	low molecular weight
HMW	high molecular weight

QUALITY ASSURANCE SUMMARY

LABORATORY BATCH: Physis' QM defines a laboratory batch as a group of 20 or fewer project samples of similar matrix, processed together under the same conditions and with the same reagents. QC samples are associated with each batch and were used to assess the validity of the sample analyses.

PROCEDURAL BLANK: Laboratory contamination introduced during method use is assessed through the preparation and analysis of procedural blanks is provided at a minimum frequency of one per batch.

ACCURACY: Accuracy of analytical measurements is the degree of closeness based on percent recovery calculations between measured values and the actual or true value and includes a combination of reproducibility error and systematic bias due to sampling and analytical operations. Accuracy of the project data was indicated by analysis of MS, BS, LCS, LCM, CRM, and/or surrogate spikes on a minimum frequency of one per batch. Physis' QM requires that 95% of the target compounds greater than 10 times the MDL be within the specified acceptance limits.

PRECISION: Precision is the agreement among a set of replicate measurements without assumption of knowledge of the true value and is based on RPD calculations between repeated values. Precision of the project data was determined by analysis of replicate MS₁/MS₂, BS₁/BS₂, LCS₁/LCS₂, LCM₁/LCM₂, CRM₁/CRM₂, surrogate spikes and/or replicate project sample analysis (R₁/R₂) on a minimum frequency of one per batch. Physis' QM requires that for 95% of the compounds greater than 10 times the MDL, the percent RPD should be within the specified acceptance range.

BLANK SPIKES: BS is the introduction of a known concentration of analyte into the procedural blank. BS demonstrates performance of the preparation and analytical methods on a clean matrix void of potential matrix related interferences. The BS is performed in laboratory deionized water, making these recoveries a better indicator of the efficiency of the laboratory method per se.

MATRIX SPIKES: MS is the introduction of a known concentration of analyte into a sample. MS samples demonstrate the effect a particular project sample matrix has on the accuracy of a measurement. Individually, MS samples also indicate the bias of analytical measurements due to chemical interferences inherent in the in the specific project sample spiked. Intrinsic target analyte concentration in the specific project sample can also significantly impact MS recovery.

CERTIFIED REFERENCE MATERIALS: CRMs are materials of various matrices for which analytical information has been determined and certified by a recognized authority. These are used to provide a quantitative assessment of the accuracy of an analytical method. CRMs provide evidence that the laboratory preparation and analysis produces results that are comparable to those obtained by an independent organization.

LABORATORY CONTROL MATERIAL: LCM is provided because a suitable natural seawater CRM is not available and can be used to indicate accuracy of the method. Physis' internal LCM is seawater collected at ~800 meters in the Southern California San Pedro Basin and can be used as a reference for background concentrations in clean, natural seawater for comparison to project samples.

LABORATORY CONTROL SPIKES: LCS is the introduction of a known concentration of analyte into Physis' LCM. LCS samples were employed to assess the effect the seawater matrix has on the accuracy of a measurement. LCS also indicate the bias of this method due to chemical interferences inherent in the in the seawater matrix. Intrinsic LCM concentration can also significantly impact LCS recovery.

SURROGATES: A surrogate is a pure analyte unlikely to be found in any project sample, behaves similarly to

the target analyte and most often used with organic analytical procedures. Surrogates are added in known concentration to all samples and are measured to indicate overall efficiency of the method including processing and analyses.

HOLDING TIME: Method recommended holding times are the length of time a project sample can be stored under specific conditions after collection and prior to analysis without significantly affecting the analyte's concentration. Holding times can be extended if preservation techniques are employed to reduce biodegradation, volatilization, oxidation, sorption, precipitation, and other physical and chemical processes.

SAMPLE STORAGE/RETENTION: In order to maintain chemical integrity prior to analysis, all samples submitted to Physis are refrigerated (liquids) or frozen (solids) upon receipt unless otherwise recommended by applicable methods. Solid samples are retained for 1 year from collection while liquid samples are retained until method recommended holding times elapse.

TOTAL/DISSOLVED FRACTION: In some instances, the results for the dissolved fraction may be higher than the total fraction for a particular analyte (e.g. trace metals). This is typically caused by the analytical variation for each result and indicates that the target analyte is primarily in the dissolved phase, within the sample.

PHYSIS QUALIFIER CODES

CODE	DEFINITION
#	see Case Narrative
ND	analyte not detected at or above the MDL
B	analyte was detected in the procedural blank greater than 10 times the MDL
E	analyte concentration exceeds the upper limit of the linear calibration range, reported value is estimated
H	sample received and/or analyzed past the recommended holding time
J	analyte was detected at a concentration below the RL and above the MDL, reported value is estimated
N	insufficient sample, analysis could not be performed
M	analyte was outside the specified accuracy and/or precision acceptance limits due to matrix interference. The associated B/BS were within limits, therefore the sample data was reported without further clarification
SH	analyte concentration in the project sample exceeded the spike concentration, therefore accuracy and/or precision acceptance limits do not apply
SL	analyte results were lower than 10 times the MDL, therefore accuracy and/or precision acceptance limits do not apply
NH	project sample was heterogeneous and sample homogeneity could not be readily achieved using routine laboratory practices, therefore accuracy and/or precision acceptance limits do not apply
Q	analyte was outside the specified QAPP acceptance limits for precision and/or accuracy but within Physis derived acceptance limits, therefore the sample data was reported without further clarification
R	Physis' QM allows for 5% of the target compounds greater than 10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy. This is often due to random error and does not indicate any significant problems with the analysis of these project samples

CASE NARRATIVE

QUALIFIER NOTES

In addition to the use of analyte specific Physis Qualifier Codes where applicable, the following were also noted.

ND

MDL is listed due to report format restrictions; it is not used in reporting. Analytical results reported are ND at the RL.

BIANALYTICALS

REPORT

TERRA AURA
ENVIRONMENTAL LABORATORIES, INC.

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Base/Neutral Extractable Compounds

ANALYTE	Method	Units	RESULT	DF	MDL	RL	Fraction	QA CODE	Batch ID	Date Processed	Date Analyzed
Sample ID: 108522-R1	HALAWA WELLS UNITS 1 & 2 380-5 Matrix: Samplewater						Sampled:	18-Jul-23 9:00	Received:	21-Jul-23	
Disalicylidenepropanediamine	EPA 625.1	µg/L	ND	1	0.05	0.1	Total	O-42002	21-Jul-23	31-Jul-23	



Polynuclear Aromatic Hydrocarbons

ANALYTE	Method	Units	RESULT	DF	MDL	RL	Fraction	QA CODE	Batch ID	Date Processed	Date Analyzed	
Sample ID: 108522-R1	HALAWA WELLS UNITS 1 & 2 380-5 Matrix: Samplewater						Sampled:	18-Jul-23 9:00	Received:	21-Jul-23		
(d10-Acenaphthene)	EPA 625.1	% Recovery	69	1			Total		O-42002	21-Jul-23	31-Jul-23	
(d10-Phenanthrene)	EPA 625.1	% Recovery	109	1			Total		O-42002	21-Jul-23	31-Jul-23	
(d12-Chrysene)	EPA 625.1	% Recovery	111	1			Total		O-42002	21-Jul-23	31-Jul-23	
(d12-Perylene)	EPA 625.1	% Recovery	85	1			Total		O-42002	21-Jul-23	31-Jul-23	
(d8-Naphthalene)	EPA 625.1	% Recovery	70	1			Total		O-42002	21-Jul-23	31-Jul-23	
1-Methylnaphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
1-Methylphenanthrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
2,3,5-Trimethylnaphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
2,6-Dimethylnaphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
2-Methylnaphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
Acenaphthene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
Acenaphthylene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
Anthracene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
Benz[a]anthracene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
Benzo[a]pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
Benzo[b]fluoranthene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
Benzo[e]pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
Benzo[g,h,i]perylene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
Benzo[k]fluoranthene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
Biphenyl	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
Chrysene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
D benz[a,h]anthracene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
D benzo[a,l]pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	
D benzothiophene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23	

Polynuclear Aromatic Hydrocarbons

ANALYTE	Method	Units	RESULT	DF	MDL	RL	Fraction	QA CODE	Batch ID	Date Processed	Date Analyzed
Fluoranthene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23
Fluorene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23
Indeno[1,2,3-cd]pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23
Naphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23
Perylene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23
Phenanthrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23
Pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42002	21-Jul-23	31-Jul-23



QUALITY CONTROL REPORT

TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

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Base/Neutral Extractable Compounds

QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	DF	MDL	RL	UNITS	SPIKE SOURCE		ACCURACY		PRECISION		QA CODEc
							LEVEL	RESULT	%	LIMITS	%	LIMITS	
Sample ID: 108521-B1		QAQC Procedural Blank			Matrix: BlankMatrix			Sampled:		Received:			
		Method: EPA 625.1			Batch ID: O-42002			Prepared: 21-Jul-23		Analyzed: 31-Jul-23			
Disalicylideneprapanediamin	Total	ND	1	0.05	0.1	µg/L							
Sample ID: 108521-BS1		QAQC Procedural Blank			Matrix: BlankMatrix			Sampled:		Received:			
		Method: EPA 625.1			Batch ID: O-42002			Prepared: 21-Jul-23		Analyzed: 31-Jul-23			
Disalicylideneprapanediamin	Total	20.2	1	0.05	0.1	µg/L	25	0	81	50 - 150%	PASS		
Sample ID: 108521-BS2		QAQC Procedural Blank			Matrix: BlankMatrix			Sampled:		Received:			
		Method: EPA 625.1			Batch ID: O-42002			Prepared: 21-Jul-23		Analyzed: 31-Jul-23			
Disalicylideneprapanediamin	Total	16.8	1	0.05	0.1	µg/L	25	0	67	50 - 150%	PASS	19	30 PASS

Polynuclear Aromatic Hydrocarbons

QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	DF	MDL	RL	UNITS	SPIKE	SOURCE	ACCURACY	PRECISION	QA CODEc
							LEVEL	RESULT	% LIMITS	% LIMITS	
Sample ID: 108521-B1		QAQC Procedural Blank			Matrix: BlankMatrix		Sampled:		Received:		
		Method: EPA 625.1				Batch ID: O-42002	Prepared: 21-Jul-23		Analyzed: 31-Jul-23		
(d10-Acenaphthene)	Total	81	1			% Recovery	100	81	27 - 133%	PASS	
(d10-Phenanthrene)	Total	114	1			% Recovery	100	114	43 - 129%	PASS	
(d12-Chrysene)	Total	114	1			% Recovery	100	114	52 - 144%	PASS	
(d12-Perylene)	Total	97	1			% Recovery	100	97	36 - 161%	PASS	
(d8-Naphthalene)	Total	88	1			% Recovery	100	88	25 - 125%	PASS	
1-Methylnaphthalene	Total	ND	1	0.001	0.005						µg/L
1-Methylphenanthrene	Total	ND	1	0.001	0.005						µg/L
2,3,5-Trimethylnaphthalene	Total	ND	1	0.001	0.005						µg/L
2,6-Dimethylnaphthalene	Total	ND	1	0.001	0.005						µg/L
2-Methylnaphthalene	Total	ND	1	0.001	0.005						µg/L
Acenaphthene	Total	ND	1	0.001	0.005						µg/L
Acenaphthylene	Total	ND	1	0.001	0.005						µg/L
Anthracene	Total	ND	1	0.001	0.005						µg/L
Benz[a]anthracene	Total	ND	1	0.001	0.005						µg/L
Benzo[a]pyrene	Total	ND	1	0.001	0.005						µg/L
Benzo[b]fluoranthene	Total	ND	1	0.001	0.005						µg/L
Benzo[e]pyrene	Total	ND	1	0.001	0.005						µg/L
Benzo[g,h,i]perylene	Total	ND	1	0.001	0.005						µg/L
Benzo[k]fluoranthene	Total	ND	1	0.001	0.005						µg/L
Biphenyl	Total	ND	1	0.001	0.005						µg/L
Chrysene	Total	ND	1	0.001	0.005						µg/L
Dibenz[a,h]anthracene	Total	ND	1	0.001	0.005						µg/L
Dibenzo[a,l]pyrene	Total	ND	1	0.001	0.005						µg/L
Dibenzothiophene	Total	ND	1	0.001	0.005						µg/L

Polynuclear Aromatic Hydrocarbons

QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	DF	MDL	RL	UNITS	SPIKE	SOURCE	ACCURACY		PRECISION		QA CODE
							LEVEL	RESULT	%	LIMITS	%	LIMITS	
Fluoranthene	Total	ND	1	0.001	0.005	µg/L							
Fluorene	Total	ND	1	0.001	0.005	µg/L							
Indeno[1,2,3-cd]pyrene	Total	ND	1	0.001	0.005	µg/L							
Naphthalene	Total	ND	1	0.001	0.005	µg/L							
Perylene	Total	ND	1	0.001	0.005	µg/L							
Phenanthrene	Total	ND	1	0.001	0.005	µg/L							
Pyrene	Total	ND	1	0.001	0.005	µg/L							



Polynuclear Aromatic Hydrocarbons

QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	DF	MDL	RL	UNITS	SPIKE	SOURCE	ACCURACY		PRECISION	QA CODEc
							LEVEL	RESULT	%	LIMITS	%	LIMITS
Sample ID: 108521-BS1		QAQC Procedural Blank			Matrix: BlankMatrix			Sampled:		Received:		
Method: EPA 625.1		Batch ID: O-42002			Prepared: 21-Jul-23		Analyzed: 31-Jul-23					
(d10-Acenaphthene)	Total	62	1			% Recovery	100	0	62	27 - 133%	PASS	
(d10-Phenanthrene)	Total	88	1			% Recovery	100	0	88	43 - 129%	PASS	
(d12-Chrysene)	Total	108	1			% Recovery	100	0	108	52 - 144%	PASS	
(d12-Perylene)	Total	87	1			% Recovery	100	0	87	36 - 161%	PASS	
(d8-Naphthalene)	Total	57	1			% Recovery	100	0	57	25 - 125%	PASS	
1-Methylnaphthalene	Total	0.352	1	0.001	0.005	µg/L	0.5	0	70	31 - 128%	PASS	
1-Methylphenanthrene	Total	0.521	1	0.001	0.005	µg/L	0.5	0	104	66 - 127%	PASS	
2,3,5-Trimethylnaphthalene	Total	0.466	1	0.001	0.005	µg/L	0.5	0	93	55 - 122%	PASS	
2,6-Dimethylnaphthalene	Total	0.404	1	0.001	0.005	µg/L	0.5	0	81	48 - 120%	PASS	
2-Methylnaphthalene	Total	0.389	1	0.001	0.005	µg/L	0.5	0	78	47 - 130%	PASS	
Acenaphthene	Total	0.384	1	0.001	0.005	µg/L	0.5	0	77	53 - 131%	PASS	
Acenaphthylene	Total	0.451	1	0.001	0.005	µg/L	0.5	0	90	43 - 140%	PASS	
Anthracene	Total	0.455	1	0.001	0.005	µg/L	0.5	0	91	58 - 135%	PASS	
Benz[a]anthracene	Total	0.532	1	0.001	0.005	µg/L	0.5	0	106	55 - 145%	PASS	
Benzo[a]pyrene	Total	0.482	1	0.001	0.005	µg/L	0.5	0	96	51 - 143%	PASS	
Benzo[b]fluoranthene	Total	0.539	1	0.001	0.005	µg/L	0.5	0	108	46 - 165%	PASS	
Benzo[e]pyrene	Total	0.491	1	0.001	0.005	µg/L	0.5	0	98	42 - 152%	PASS	
Benzo[g,h,i]perylene	Total	0.5	1	0.001	0.005	µg/L	0.5	0	100	63 - 133%	PASS	
Benzo[k]fluoranthene	Total	0.524	1	0.001	0.005	µg/L	0.5	0	105	56 - 145%	PASS	
Biphenyl	Total	0.483	1	0.001	0.005	µg/L	0.5	0	97	56 - 119%	PASS	
Chrysene	Total	0.536	1	0.001	0.005	µg/L	0.5	0	107	56 - 141%	PASS	
Dibenz[a,h]anthracene	Total	0.48	1	0.001	0.005	µg/L	0.5	0	96	55 - 150%	PASS	
Dibenzo[a,l]pyrene	Total	0.352	1	0.001	0.005	µg/L	0.5	0	70	50 - 150%	PASS	
Dibenzothiophene	Total	0.499	1	0.001	0.005	µg/L	0.5	0	100	46 - 126%	PASS	

Polynuclear Aromatic Hydrocarbons

QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	DF	MDL	RL	UNITS	SPIKE	SOURCE	ACCURACY		PRECISION		QA CODE _c
							LEVEL	RESULT	%	LIMITS	%	LIMITS	
Fluoranthene	Total	0.61	1	0.001	0.005	µg/L	0.5	0	122	60 - 146%	PASS		
Fluorene	Total	0.442	1	0.001	0.005	µg/L	0.5	0	88	58 - 131%	PASS		
Indeno[1,2,3-cd]pyrene	Total	0.464	1	0.001	0.005	µg/L	0.5	0	93	50 - 151%	PASS		
Naphthalene	Total	0.345	1	0.001	0.005	µg/L	0.5	0	69	41 - 126%	PASS		
Perylene	Total	0.446	1	0.001	0.005	µg/L	0.5	0	89	48 - 141%	PASS		
Phenanthrene	Total	0.493	1	0.001	0.005	µg/L	0.5	0	99	67 - 127%	PASS		
Pyrene	Total	0.576	1	0.001	0.005	µg/L	0.5	0	115	54 - 156%	PASS		



Polynuclear Aromatic Hydrocarbons

QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	DF	MDL	RL	UNITS	SPIKE	SOURCE	ACCURACY		PRECISION		QA CODE _c	
							LEVEL	RESULT	%	LIMITS	%	LIMITS		
Sample ID: 108521-BS2		QAQC Procedural Blank			Matrix: BlankMatrix			Sampled:			Received:			
Method: EPA 625.1		Batch ID: O-42002			Prepared: 21-Jul-23			Analyzed: 31-Jul-23						
(d10-Acenaphthene)	Total	66	1			% Recovery	100	0	66	27 - 133%	PASS	6	30	PASS
(d10-Phenanthrene)	Total	95	1			% Recovery	100	0	95	43 - 129%	PASS	8	30	PASS
(d12-Chrysene)	Total	106	1			% Recovery	100	0	106	52 - 144%	PASS	2	30	PASS
(d12-Perylene)	Total	90	1			% Recovery	100	0	90	36 - 161%	PASS	3	30	PASS
(d8-Naphthalene)	Total	64	1			% Recovery	100	0	64	25 - 125%	PASS	12	30	PASS
1-Methylnaphthalene	Total	0.373	1	0.001	0.005	µg/L	0.5	0	75	31 - 128%	PASS	7	30	PASS
1-Methylphenanthrene	Total	0.556	1	0.001	0.005	µg/L	0.5	0	111	66 - 127%	PASS	7	30	PASS
2,3,5-Trimethylnaphthalene	Total	0.496	1	0.001	0.005	µg/L	0.5	0	99	55 - 122%	PASS	6	30	PASS
2,6-Dimethylnaphthalene	Total	0.423	1	0.001	0.005	µg/L	0.5	0	85	48 - 120%	PASS	5	30	PASS
2-Methylnaphthalene	Total	0.412	1	0.001	0.005	µg/L	0.5	0	82	47 - 130%	PASS	5	30	PASS
Acenaphthene	Total	0.409	1	0.001	0.005	µg/L	0.5	0	82	53 - 131%	PASS	6	30	PASS
Acenaphthylene	Total	0.479	1	0.001	0.005	µg/L	0.5	0	96	43 - 140%	PASS	6	30	PASS
Anthracene	Total	0.465	1	0.001	0.005	µg/L	0.5	0	93	58 - 135%	PASS	2	30	PASS
Benz[a]anthracene	Total	0.549	1	0.001	0.005	µg/L	0.5	0	110	55 - 145%	PASS	4	30	PASS
Benzo[a]pyrene	Total	0.486	1	0.001	0.005	µg/L	0.5	0	97	51 - 143%	PASS	1	30	PASS
Benzo[b]fluoranthene	Total	0.541	1	0.001	0.005	µg/L	0.5	0	108	46 - 165%	PASS	0	30	PASS
Benzo[e]pyrene	Total	0.472	1	0.001	0.005	µg/L	0.5	0	94	42 - 152%	PASS	4	30	PASS
Benzo[g,h,i]perylene	Total	0.509	1	0.001	0.005	µg/L	0.5	0	102	63 - 133%	PASS	2	30	PASS
Benzo[k]fluoranthene	Total	0.522	1	0.001	0.005	µg/L	0.5	0	104	56 - 145%	PASS	1	30	PASS
Biphenyl	Total	0.512	1	0.001	0.005	µg/L	0.5	0	102	56 - 119%	PASS	5	30	PASS
Chrysene	Total	0.528	1	0.001	0.005	µg/L	0.5	0	106	56 - 141%	PASS	1	30	PASS
Dibenz[a,h]anthracene	Total	0.471	1	0.001	0.005	µg/L	0.5	0	94	55 - 150%	PASS	2	30	PASS
Dibenzo[a,l]pyrene	Total	0.373	1	0.001	0.005	µg/L	0.5	0	75	50 - 150%	PASS	7	30	PASS
Dibenzothiophene	Total	0.538	1	0.001	0.005	µg/L	0.5	0	108	46 - 126%	PASS	8	30	PASS

Polynuclear Aromatic Hydrocarbons

QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	DF	MDL	RL	UNITS	SPIKE	SOURCE	ACCURACY		PRECISION		QA CODE _c	
							LEVEL	RESULT	%	LIMITS	%	LIMITS		
Fluoranthene	Total	0.624	1	0.001	0.005	µg/L	0.5	0	125	60 - 146%	PASS	2	30	PASS
Fluorene	Total	0.471	1	0.001	0.005	µg/L	0.5	0	94	58 - 131%	PASS	7	30	PASS
Indeno[1,2,3-cd]pyrene	Total	0.458	1	0.001	0.005	µg/L	0.5	0	92	50 - 151%	PASS	1	30	PASS
Naphthalene	Total	0.375	1	0.001	0.005	µg/L	0.5	0	75	41 - 126%	PASS	8	30	PASS
Perylene	Total	0.449	1	0.001	0.005	µg/L	0.5	0	90	48 - 141%	PASS	1	30	PASS
Phenanthrene	Total	0.484	1	0.001	0.005	µg/L	0.5	0	97	67 - 127%	PASS	2	30	PASS
Pyrene	Total	0.573	1	0.001	0.005	µg/L	0.5	0	115	54 - 156%	PASS	0	30	PASS

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PHYSIS

TENTATIVELY IDENTIFIED COMPOUNDS

ENVIRONMENTAL LABORATORIES, INC.

Innovative Solutions for Nature

Sample ID: Lab Blank B1_42002

Retention Time	Area (% of total)	Concentration (ng/L)	Library/ID	Cas Number	Match Quality (%)
34.8252	0.7753	1111	Anthracene-D10-	1719-06-8	90
10.1805	32.7253	46897	Cyclohexane, 1-methyl-2-propyl-	4291-79-6	94
10.2311	4.5384	6504	Octane, 3-methyl-6-methylene-	74630-07-2	87
10.0591	3.5477	5084	Sulfurous acid, di(cyclohexylmethyl) ester	1010309-22-7	89
16.1897	0.5736	822	1-Ethynylcyclododecanol	1000484-40-4	86
10.3852	0.4561	654	Cyclopentanone, 3-(3-hydroxy-1-propenyl)-	74473-08-8	87
11.2302	0.2970	426	2-Isopropenyl-5-methylhex-4-enal	75697-98-2	87
16.0114	0.2393	343	2-Dodecen-1-yl(-)succinic anhydride	19780-11-1	81
45.2984	0.1544	221	1,4-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	18699-48-4	87
60.9755	0.1318	189	Mono(2-ethylhexyl) phthalate	4376-20-9	81

Concentration estimated using the response for Anthracene-d10

Sample ID: 108522

Retention Time	Area (% of total)	Concentration (ng/L)	Library/ID	Cas Number	Match Quality (%)
34.8241	1.0299	1111	Anthracene-D10	1517-22-2	86
10.1802	28.7061	30971	Cyclohexane, 1-methyl-2-propyl-	4291-79-6	93
10.1233	20.0746	21658	Octane, 3-methyl-6-methylene-	74630-07-2	88
10.0604	3.9936	4309	Cyclohexane, 1-methyl-4-(1-methylethyl)-, cis-	6069-98-3	88
10.0604	3.9808	4295	Cyclohexane, 1-isopropyl-1-methyl-	16580-26-0	87
10.3855	0.7473	806	1,6-Octadiene, 5,7-dimethyl-, (R)-	85006-04-8	84
10.3855	0.7041	760	2H-Pyran, 3,4-dihydro-4-methyl-	2270-61-3	84
16.1845	0.5034	543	1-Ethynylcyclododecanol	1000484-40-4	82
10.0415	0.3230	348	1-Propoxypropan-2-yl 2-methylbutanoate	1000367-10-7	80
11.2245	0.1788	193	2-Isopropenyl-5-methylhex-4-enal	75697-98-2	84
10.7593	0.1740	188	Oxalic acid, cyclohexyl propyl ester	1000309-30-3	86
10.7593	0.1635	176	Cyclopropane, 2-bromo-1,1,3-trimethyl-	36617-00-2	85
45.2913	0.1375	148	1,4-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	18699-48-4	80

Concentration estimated using the response for Anthracene-d10

PERFORMANCE CHAIN OF CUSTODY

TERRA ENVIRONMENTAL LABORATORIES, INC.
AURA

Innovative Solutions for Nature

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Eurofins Eaton Analytical Pomona
 941 Corporate Center Drive
 Pomona, CA 91768-2642
 Phone: 626-386-1100

Chain of Custody Record



eurofins
 Environment Testing

Client Information (Sub Contract Lab)
 Client Contact: Sampler:
 Shipping/Receiving: Phone:
 Company: E-Mail:
 Physis Environmental Laboratories Rachelle.Arada@eurofins.com
 Address: Accreditations Required (See note):
 1904 Wright Circle, State - Hawaii
 City: TAT Requested (days):
 Anaheim 8/3/2023
 State, Zip: PO #:
 CA, 92806 MO #:
 Phone: Project #:
 Email: 38001111
 Project Name: SSOW#:
 RED-HILL SSOW#:
 Site: SSOW#:
 Honolulu BWS Sites

Analysis Requested
 Lab P/N: Arada, Rachelle
 Carrier Tracking No(s):
 State of Origin: Hawaii
 Job #: 380-64982-1
 Page: Page 1 of 1
 Job #: 380-55680-1
 Preservation Codes:
 A - HCl
 B - NaOH
 C - Zn Acetate
 D - Nitric Acid
 E - H2SO4
 F - MeOH
 G - Amherst
 H - Ascorbic Acid
 I - Iaa
 J - DI Water
 K - EDTA
 L - EDA
 M - Hexane
 N - None
 O - AsHA2
 P - Na2SO4
 Q - Na2S2O3
 R - Na2S2O3
 S - H2SO4
 T - TSP Dodecylsulfate
 U - Acetone
 V - MCAA
 W - pH 4.5
 Y - Tisma
 Z - other (specify)
 Other:

Sample Identification - Client ID (Lab ID)

Sample ID	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix (Numeric, Symbolic, Omnidial, B/T=Trace, AA#)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Total Number of containers	Special Instructions/Note:
HALAWA WELLS UNITS 1 & 2 (380-55680-1)	7/18/23	09:00	Water		X	SUB (625 PAH Physis LL (EAL) + TICs) 625 PAH Physis LL (EAL) + TICs	2	See Attached Instructions

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Possible Hazard Identification
 Unclassified

Empty Kit Relinquished by: _____ Date: _____

Relinquished by: _____ Date/Time: 7-21-23 13:10 _____ Company: _____

Relinquished by: _____ Date/Time: 8/21/23 13:38 _____ Company: _____

Relinquished by: _____ Date/Time: _____ _____ Company: _____

Custody Seals Intact: Yes No Custody Seal No.: _____

Relinquished by: _____ Date/Time: _____ _____ Company: _____

Relinquished by: _____ Date/Time: _____ _____ Company: _____

Cooler Temperature(s) °C and Other Remarks: _____

Special Instructions/QC Requirements: _____

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Dispose By Lab Archive For _____ Months

Method of Shipment: _____

Project Iteration ID: 1407003-425
 Client Name: Eurofins Eaton Analytical
 Project Name: RED-HILL Project # 38001111 Job # 380-55680-1
 COC Page Number: 2 of 2
 Bottle Label Color: NA

Sample Receipt Summary

Receiving Info

1. Initials Received By: AG
2. Date Received: 7/21/23
3. Time Received: 13:38
4. Client Name: Eurofins
5. Courier Information: (Please circle)
 - Client
 - UPS
 - Area Fast
 - DRS
 - FedEx
 - GSO/GLS
 - Ontrac
 - PAMS
 - PHYSIS Driver:
 - i. Start Time: _____
 - ii. End Time: _____
 - iii. Total Mileage: _____
 - iv. Number of Pickups: _____
6. Container Information: (Please put the # of containers or circle none)
 - Cooler
 - Styrofoam Cooler
 - Boxes
 - None
 - Carboy(s)
 - Carboy Trash Can(s)
 - Carboy Cap(s)
 - Other _____
7. What type of ice was used: (Please circle any that apply)
 - Wet Ice
 - Blue Ice
 - Dry Ice
 - Water
 - None
8. Randomly Selected Samples Temperature (°C): 4.1 Used I/R Thermometer # 1

Inspection Info

1. Initials Inspected By: RGH

Sample Integrity Upon Receipt:

1. COC(s) included and completely filled out..... Yes / No
2. All sample containers arrived intact..... Yes / No
3. All samples listed on COC(s) are present..... Yes / No
4. Information on containers consistent with information on COC(s)..... Yes / No
5. Correct containers and volume for all analyses indicated..... Yes / No
6. All samples received within method holding time..... Yes / No
7. Correct preservation used for all analyses indicated..... Yes / No
8. Name of sampler included on COC(s)..... Yes / No

Notes:

Monrovia, CA (Suite 100)

750 Royal Oaks Drive Suite 100
 Monrovia, CA 91016
 Phone (626) 386-1100

Chain of Custody Record



Client Information		Sampler: <u>Byron Nikanoto</u>		Lab PM: Arada, Rachele		Carrier Tracking No(s):		COC No: 380-27941-2757.2																							
Client Contact: Dr. Ron Fenstermacher		Phone: 808-748-5840		E-Mail: Rachele.Arada@et.euronisus.com		State of Origin:		Page: Page 2 of 2																							
Company: City & County of Honolulu		PWSID:		Analysis Requested						Job #:																					
Address: 630 South Beretania Street; Chemistry Lab		Due Date Requested:		<table border="1"> <tr> <td>Field Filtered Sample (Yes or No)</td> <td>Perform MS/MS (Yes or No)</td> <td>SUBCONTRACT - 625 PAH Physis LL (EAL) + TICs</td> <td>SUBCONTRACT - 8015 Gas (Purgable) LL (EAL)</td> <td>SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil</td> <td>525.2_PREC - (MOD) 625plus PLUS TICs</td> <td>SUBCONTRACT - 8015 Gas (Purgable) LL (EAL)</td> <td>537.1_DW_PREC - 537.1 Full List</td> <td>533 - All Analytes</td> <td>Total Number of containers</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						Field Filtered Sample (Yes or No)	Perform MS/MS (Yes or No)	SUBCONTRACT - 625 PAH Physis LL (EAL) + TICs	SUBCONTRACT - 8015 Gas (Purgable) LL (EAL)	SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil	525.2_PREC - (MOD) 625plus PLUS TICs	SUBCONTRACT - 8015 Gas (Purgable) LL (EAL)	537.1_DW_PREC - 537.1 Full List	533 - All Analytes	Total Number of containers											Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDTA Y - Trizma Z - other (specify)	
Field Filtered Sample (Yes or No)	Perform MS/MS (Yes or No)	SUBCONTRACT - 625 PAH Physis LL (EAL) + TICs	SUBCONTRACT - 8015 Gas (Purgable) LL (EAL)							SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil	525.2_PREC - (MOD) 625plus PLUS TICs	SUBCONTRACT - 8015 Gas (Purgable) LL (EAL)	537.1_DW_PREC - 537.1 Full List	533 - All Analytes	Total Number of containers																
City: Honolulu		TAT Requested (days):								Compliance Project: Δ No																					
State, Zip: HI, 96843		PO #: C20525101 exp 05312023								WO #:																					
Phone: 808-748-5091 (tel)		Project #: 38001111		SSOW#:																											
Email: rfenstermacher@hbws.org		Project Name: RED-HILL/HBWS sites Event Desc: RUSH Weekly Red Hill																													
Site:																															
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)		Special Instructions/Note:																					
MOANALUA WELLS								Water																							
AIEA GULCH WELLS PUMP2								Water																							
AIEA WELLS PUMPS 1&2 (260)								Water																							
HALAWA WELLS UNITS 1&2		7/16/23		0900		G		Water		2 2 2 4 Pump 1																					
FB MOANALUA WELLS								Water																							
FB AIEA GULCH WELLS PUMP2								Water																							
FB AIEA WELLS PUMPS 1&2 (260)								Water																							
FB HALAWA WELLS UNITS 1&2		7/18/23						Water		2 380-55680 COC																					
Possible Hazard Identification		<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)																											
Deliverable Requested: I, II, III, IV, Other (specify)										<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months																					
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment: <u>Fed Ex</u> <u>7727 8566 8400</u>																									
Relinquished by:		Date/Time: 7/18/23 1030		Company: HBWS		Received by: <u>G RETNER</u>		Date/Time: 07/20/2023 10:15		Company: <u>ESAP</u>																					
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:																					
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:																					
Custody Seals Intact:		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: <u>DEL-FROZEN (752A) 0.1.5°-0.2°-1.3°/0.1.8°-0.2°=16°</u>																											

Monrovia, CA (Suite 100)

750 Royal Oaks Drive Suite 100
 Monrovia, CA 91016
 Phone (626) 386-1100

Chain of Custody Record



Client Information		Sampler: <i>Byson Nakamoto</i>		Lab PM: Arada, Rachelle		Carrier Tracking No(s):		COC No: 380-27941-2757.2																																											
Client Contact: Dr. Ron Fenstermacher		Phone: 808-748-5840		E-Mail: Rachelle.Arada@et.euronisus.com		State of Origin:		Page: Page 2 of 2																																											
Company: City & County of Honolulu		PWSID:		Analysis Requested						Job #:																																									
Address: 630 South Beretania Street; Chemistry Lab		Due Date Requested:		<table border="1"> <tr> <td>Field Filtered Sample (Yes or No)</td> <td>Perform MS/MSD (Yes or No)</td> <td>SUBCONTRACT - 625 PAH Physis LL (EAL) + TICs</td> <td>SUBCONTRACT - 8015 Gas (Purgeable) LL (EAL)</td> <td>SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil</td> <td>525.2_PREC - (MOD) 525plus PLUS TICs</td> <td>SUBCONTRACT - 8015 Gas (Purgeable) LL (EAL)</td> <td>537.1_DW_PREC - 537.1 Full List</td> <td>533 - All Analytes</td> <td>Total Number of containers</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUBCONTRACT - 625 PAH Physis LL (EAL) + TICs	SUBCONTRACT - 8015 Gas (Purgeable) LL (EAL)	SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil	525.2_PREC - (MOD) 525plus PLUS TICs	SUBCONTRACT - 8015 Gas (Purgeable) LL (EAL)	537.1_DW_PREC - 537.1 Full List	533 - All Analytes	Total Number of containers																															Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Y - Trizma Z - other (specify)	
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City: Honolulu		TAT Requested (days):								Other:																																									
State, Zip: HI, 96843		Compliance Project: Δ No																																																	
Phone: 808-748-5091 (tel)		PO #: C20525101 exp 05312023																																																	
Email: rfenstermacher@hbws.org		WO #:																																																	
Project Name: RED-HILL/HBWS sites Event Desc: RUSH Weekly Red Hill		Project #: 38001111																																																	
Site:		SSOW#:																																																	
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=waste/soil, BT=Tissue, A=Air)		Special Instructions/Note:																																									
MOANALUA WELLS								Water																																											
AIEA GULCH WELLS PUMP2								Water																																											
AIEA WELLS PUMPS 1&2 (260)								Water																																											
HALAWA WELLS UNITS 1&2		7/18/23		0900		G		Water		3 3 Pump 1																																									
FB MOANALUA WELLS								Water																																											
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FB HALAWA WELLS UNITS 1&2		7/18/23						Water		1 1																																									
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)																																													
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months																																													
Deliverable Requested: I, II, III, IV, Other (specify)						Special Instructions/QC Requirements: ① 7727 8566 7621																																													
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment: FEN EX ② 7727 8566 8400																																													
Relinquished by: <i>Byson Nakamoto</i>		Date/Time: 7/18/23 10:30		Company: HBWS		Received by: <i>[Signature]</i>		Date/Time: 07/20/2023 10:15		Company: CEAP																																									
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:																																									
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:																																									
Custody Seals Intact:		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: GEL FROZEN (752A) ① 1.5°-0.2°=1.3° ② 1.8°-0.2°=1.6°																																															

Login Sample Receipt Checklist

Client: City & County of Honolulu

Job Number: 380-55680-1

Login Number: 55680
List Number: 1
Creator: Elyas, Matthew

List Source: Eurofins Eaton Analytical Pomona

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Samples do not require splitting or compositing.	True	
Container provided by EEA	True	