

 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Terri Choy
AECOM
1001 Bishop Street
Honolulu, Hawaii 96813
Generated 3/2/2023 4:58:02 PM

JOB DESCRIPTION

Red Hill - AFFF Assessment Sampling

JOB NUMBER

580-123903-1

Job Notes

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The data in the report relate to the field sample(s) as received by the laboratory and associated QC. All results have been reviewed and have been found to be compliant with laboratory and accreditation requirements, with the exception of the noted deviation(s). For questions, please contact the Project Manager.

The test results in this report relate only to the samples as received by the laboratory and will 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 Environment Testing Northwest, LLC Project Manager.

Authorization



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Authorized for release by
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Case Narrative

Client: AECOM
Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-123903-1

Job ID: 580-123903-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Red Hill - AFFF Assessment Sampling

Report Number: 580-123903-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

Five samples were received on 2/23/2023 11:45 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 5.9° C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

GLYCOLS

Samples AF-HDMW225303-WGN01LF-2302W3 (580-123903-1), AF-RHMW10-WGN01LF-2302W3 (580-123903-2), AF-RHMW16-WGN01LF-2302W3 (580-123903-3), AF-RHMW12A-WGN01LF-2302W3 (580-123903-4) and AF-RHMW12A-WGFD01LF-2302W3 (580-123903-5) were analyzed for glycols in accordance with EPA SW-846 Method 8015B - DAI. The samples were analyzed on 02/28/2023 and 03/01/2023.

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

Definitions/Glossary

Client: AECOM

Job ID: 580-123903-1

Project/Site: Red Hill - AFFF Assessment Sampling

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

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

Client Sample Results

Client: AECOM
Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-123903-1

Client Sample ID: AF-HDMW225303-WGN01LF-2302W3

Lab Sample ID: 580-123903-1

Date Collected: 02/21/23 10:35

Matrix: Water

Date Received: 02/23/23 11:45

Method: SW846 8015C GLY - Glycols- Direct Injection (GC/FID)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-(2-Butoxyethoxy)ethanol	3.0	U M	5.0	1.1	mg/L			02/28/23 20:32	1

- 1
- 2
- 3
- 4
- 5
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- 8
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- 10
- 11

Client Sample Results

Client: AECOM
Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-123903-1

Client Sample ID: AF-RHMW10-WGN01LF-2302W3

Lab Sample ID: 580-123903-2

Date Collected: 02/21/23 12:45

Matrix: Water

Date Received: 02/23/23 11:45

Method: SW846 8015C GLY - Glycols- Direct Injection (GC/FID)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-(2-Butoxyethoxy)ethanol	3.0	U M	5.0	1.1	mg/L			02/28/23 21:42	1

1

2

3

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Client Sample Results

Client: AECOM
Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-123903-1

Client Sample ID: AF-RHMW16-WGN01LF-2302W3

Lab Sample ID: 580-123903-3

Date Collected: 02/21/23 14:55

Matrix: Water

Date Received: 02/23/23 11:45

Method: SW846 8015C GLY - Glycols- Direct Injection (GC/FID)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-(2-Butoxyethoxy)ethanol	3.0	U M	5.0	1.1	mg/L			02/28/23 22:06	1

- 1
- 2
- 3
- 4
- 5
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- 7
- 8
- 9
- 10
- 11

Client Sample Results

Client: AECOM

Job ID: 580-123903-1

Project/Site: Red Hill - AFFF Assessment Sampling

Client Sample ID: AF-RHMW12A-WGN01LF-2302W3

Lab Sample ID: 580-123903-4

Date Collected: 02/21/23 10:58

Matrix: Water

Date Received: 02/23/23 11:45

Method: SW846 8015C GLY - Glycols- Direct Injection (GC/FID)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-(2-Butoxyethoxy)ethanol	3.0	U M	5.0	1.1	mg/L			03/01/23 00:03	1

- 1
- 2
- 3
- 4
- 5
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- 7
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- 9
- 10
- 11

Client Sample Results

Client: AECOM
Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-123903-1

Client Sample ID: AF-RHMW12A-WGFD01LF-2302W3

Lab Sample ID: 580-123903-5

Date Collected: 02/21/23 10:58

Matrix: Water

Date Received: 02/23/23 11:45

Method: SW846 8015C GLY - Glycols- Direct Injection (GC/FID)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-(2-Butoxyethoxy)ethanol	3.0	U M	5.0	1.1	mg/L			03/01/23 00:26	1

- 1
- 2
- 3
- 4
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- 10
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QC Sample Results

Client: AECOM
 Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-123903-1

Method: 8015C GLY - Glycols- Direct Injection (GC/FID)

Lab Sample ID: MB 680-765364/10
Matrix: Water
Analysis Batch: 765364

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

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-(2-Butoxyethoxy)ethanol	3.0	U M	5.0	1.1	mg/L			02/28/23 16:37	1

Lab Sample ID: LCS 680-765364/6
Matrix: Water
Analysis Batch: 765364

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2-(2-Butoxyethoxy)ethanol	20.0	22.7		mg/L		114	50 - 150

Lab Sample ID: LCSD 680-765364/7
Matrix: Water
Analysis Batch: 765364

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2-(2-Butoxyethoxy)ethanol	20.0	20.0		mg/L		100	50 - 150	13	50

Lab Sample ID: 580-123903-1 MS
Matrix: Water
Analysis Batch: 765364

Client Sample ID: AF-HDMW225303-WGN01LF-2302W3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
2-(2-Butoxyethoxy)ethanol	3.0	U M	20.0	25.0		mg/L		125	50 - 150

Lab Sample ID: 580-123903-1 MSD
Matrix: Water
Analysis Batch: 765364

Client Sample ID: AF-HDMW225303-WGN01LF-2302W3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2-(2-Butoxyethoxy)ethanol	3.0	U M	20.0	23.2		mg/L		116	50 - 150	7	50

Lab Chronicle

Client: AECOM
Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-123903-1

Client Sample ID: AF-HDMW225303-WGN01LF-2302W3

Lab Sample ID: 580-123903-1

Date Collected: 02/21/23 10:35

Matrix: Water

Date Received: 02/23/23 11:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	765364	GEM	EET SAV	02/28/23 20:32

Client Sample ID: AF-RHMW10-WGN01LF-2302W3

Lab Sample ID: 580-123903-2

Date Collected: 02/21/23 12:45

Matrix: Water

Date Received: 02/23/23 11:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	765364	GEM	EET SAV	02/28/23 21:42

Client Sample ID: AF-RHMW16-WGN01LF-2302W3

Lab Sample ID: 580-123903-3

Date Collected: 02/21/23 14:55

Matrix: Water

Date Received: 02/23/23 11:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	765364	GEM	EET SAV	02/28/23 22:06

Client Sample ID: AF-RHMW12A-WGN01LF-2302W3

Lab Sample ID: 580-123903-4

Date Collected: 02/21/23 10:58

Matrix: Water

Date Received: 02/23/23 11:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	765364	GEM	EET SAV	03/01/23 00:03

Client Sample ID: AF-RHMW12A-WGFD01LF-2302W3

Lab Sample ID: 580-123903-5

Date Collected: 02/21/23 10:58

Matrix: Water

Date Received: 02/23/23 11:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	765364	GEM	EET SAV	03/01/23 00:26

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: AECOM
Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-123903-1

Laboratory: Eurofins Savannah

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

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
8015C GLY		Water	2-(2-Butoxyethoxy)ethanol



Sample Summary

Client: AECOM

Job ID: 580-123903-1

Project/Site: Red Hill - AFFF Assessment Sampling

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-123903-1	AF-HDMW225303-WGN01LF-2302W3	Water	02/21/23 10:35	02/23/23 11:45
580-123903-2	AF-RHMW10-WGN01LF-2302W3	Water	02/21/23 12:45	02/23/23 11:45
580-123903-3	AF-RHMW16-WGN01LF-2302W3	Water	02/21/23 14:55	02/23/23 11:45
580-123903-4	AF-RHMW12A-WGN01LF-2302W3	Water	02/21/23 10:58	02/23/23 11:45
580-123903-5	AF-RHMW12A-WGFD01LF-2302W3	Water	02/21/23 10:58	02/23/23 11:45

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Chain of Custody Record

Client Information Client Contact: Andy Young Phone: 402-871-5712 Lab Pmt: Elaine Walker E-Mail: M.Elaine.Walker@EurofinsET.com Carrier Tracking No(s): FedEX State of Origin: Hawaii		COC No: 2302W3AFE04 Page: Page 1 of 1 Job #:	
Company: AECOM Address: 1001 Bishop St. Suite 1600 City: Honolulu State/Zip: Hawaii 96813 Phone: 808-954-4512 / 770-331-0794 Email: Watson.Tanji@aeacom.com / Mark.Kromis@aeacom.com Project Name: CTO N6274223F0104 Site: RHSF		FWSID: Due Date Requested: see subcontract TAT Requested (days): Rush - ASAP Compliance Project: Δ Yes Δ No PO #: WO #: Project #: 60697810 SOW #:	
Sample Identification AF-HDMW225303-WGN01LF-2302W3		Matrix (W=water, S=solid, O=on-site, A=lab) Sample Type (C=comp, G=grab) Sample Date: 2/21/23 Sample Time: 1035 Preservation Code: G W	
Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> X Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> X 8015C_DAI_GL_DS/2-(2-butylethoxy)-ethanol A		Total Number of Containers: 3 Special Instructions/Note: United AWB	
Analysis Requested: Analysis Requested Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - MeOH S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - PH 4-5 X - other (specify)			
Possible Hazard Identification <input checked="" 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 Deliverable Requested: I, II, III, IV, Other (specify) 4 report standard TAT, AECOM EQUIS EDD			
Empty Kit Relinquished by: _____ Relinquished by: Andy Young 2/21/23 1515 Relinquished by: James Mason 2/21/23 11:45 Relinquished by: _____ Custody Seals Intact: Δ Yes Δ No Cooler Temperature(s) °C and Other Remarks: 5.9 Method of Shipment:			
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months Special Instructions/QC Requirements: DOD QSM project			



Chain of Custody Record

Client Information		Sampler: NAH TURNER		Lab PM: Elaine Walker		Carrier Tracking No(s): 2302W3AFE03	
Client Contact:		Phone: 754-366-4777		E-Mail: M.Elaine.Walker@EurofinsET.com		Page: Page 1 of 1	
Company: AECOM		Address: 1001 Bishop St. Suite 1600		City: Honolulu		Job #:	
State: HI		City: Honolulu		State of Origin: Hawaii		Preservation Codes:	
State: HI		City: Honolulu		State of Origin: Hawaii		M - Hexane	
State: HI		City: Honolulu		State of Origin: Hawaii		N - None	
State: HI		City: Honolulu		State of Origin: Hawaii		O - AsNaO2	
State: HI		City: Honolulu		State of Origin: Hawaii		P - Na2O4S	
State: HI		City: Honolulu		State of Origin: Hawaii		Q - Na2SO3	
State: HI		City: Honolulu		State of Origin: Hawaii		R - NaHSO4	
State: HI		City: Honolulu		State of Origin: Hawaii		S - H2SO4	
State: HI		City: Honolulu		State of Origin: Hawaii		T - TSP Dodecahydrate	
State: HI		City: Honolulu		State of Origin: Hawaii		U - Acetone	
State: HI		City: Honolulu		State of Origin: Hawaii		V - MCAA	
State: HI		City: Honolulu		State of Origin: Hawaii		W - pH 4-5	
State: HI		City: Honolulu		State of Origin: Hawaii		X - EDTA	
State: HI		City: Honolulu		State of Origin: Hawaii		Y - EDTA	
State: HI		City: Honolulu		State of Origin: Hawaii		Z - other (specify)	
State: HI		City: Honolulu		State of Origin: Hawaii		Other:	
State: HI		City: Honolulu		State of Origin: Hawaii		Total Number of containers	
State: HI		City: Honolulu		State of Origin: Hawaii		Special Instructions/Note:	
State: HI		City: Honolulu		State of Origin: Hawaii		8015C_DAL_GL_DS/2-(2-butoxyethoxy)-ethanol	
State: HI		City: Honolulu		State of Origin: Hawaii		Field Filtered Sample (Yes or No)	
State: HI		City: Honolulu		State of Origin: Hawaii		Perform MS/MSD (Yes or No)	
State: HI		City: Honolulu		State of Origin: Hawaii		Sample Date	
State: HI		City: Honolulu		State of Origin: Hawaii		Sample Time	
State: HI		City: Honolulu		State of Origin: Hawaii		Sample Type	
State: HI		City: Honolulu		State of Origin: Hawaii		Matrix	
State: HI		City: Honolulu		State of Origin: Hawaii		Preservation Code	
State: HI		City: Honolulu		State of Origin: Hawaii		Due Date Requested:	
State: HI		City: Honolulu		State of Origin: Hawaii		TAT Requested (days):	
State: HI		City: Honolulu		State of Origin: Hawaii		Compliance Project:	
State: HI		City: Honolulu		State of Origin: Hawaii		PO #:	
State: HI		City: Honolulu		State of Origin: Hawaii		WO #:	
State: HI		City: Honolulu		State of Origin: Hawaii		Project #:	
State: HI		City: Honolulu		State of Origin: Hawaii		SSOW#:	
State: HI		City: Honolulu		State of Origin: Hawaii		Sample Identification	
State: HI		City: Honolulu		State of Origin: Hawaii		AF-RHMW10-WGN01LF-2302W3	
State: HI		City: Honolulu		State of Origin: Hawaii		Possible Hazard Identification	
State: HI		City: Honolulu		State of Origin: Hawaii		Deliverable Requested: I, II, III, IV, Other (specify)	
State: HI		City: Honolulu		State of Origin: Hawaii		Empty Kit Relinquished by:	
State: HI		City: Honolulu		State of Origin: Hawaii		Relinquished by: NAH TURNER	
State: HI		City: Honolulu		State of Origin: Hawaii		Relinquished by: James Mason	
State: HI		City: Honolulu		State of Origin: Hawaii		Relinquished by:	
State: HI		City: Honolulu		State of Origin: Hawaii		Custody Seals Intact:	
State: HI		City: Honolulu		State of Origin: Hawaii		Custody Seal No.:	



Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-123903-1

Login Number: 123903

List Number: 2

Creator: Meincke, Griffin E

List Source: Eurofins Savannah

List Creation: 02/28/23 12:15 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.		
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Residual Chlorine Checked.		