

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

Attn: Terri Choy
AECOM

1001 Bishop Street
Honolulu, Hawaii 96813

Generated 3/30/2023 12:32:46 PM

JOB DESCRIPTION

Red Hill - AFFF Assessment Sampling

JOB NUMBER

580-125177-1

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: 580-125177-1

Job ID: 580-125177-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Red Hill - AFFF Assessment Sampling

Report Number: 580-125177-1

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

Three samples were received on 3/23/2023 1:00 PM. 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-2303W3 (580-125177-1), AF-RHMW10-WGN01LF-2303W3 (580-125177-2) and AF-RHMW225401-WGN01B-2303W3 (580-125177-3) were analyzed for glycols in accordance with EPA SW-846 Method 8015B - DAI. The samples were analyzed on 03/28/2023.

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

Definitions/Glossary

Client: AECOM

Job ID: 580-125177-1

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: 580-125177-1

Client Sample ID: AF-HDMW225303-WGN01LF-2303W3

Lab Sample ID: 580-125177-1

Date Collected: 03/21/23 10:00

Matrix: Water

Date Received: 03/23/23 13:00

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			03/28/23 20:30	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11

Client Sample Results

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

Job ID: 580-125177-1

Client Sample ID: AF-RHMW10-WGN01LF-2303W3

Lab Sample ID: 580-125177-2

Date Collected: 03/21/23 12:55

Matrix: Water

Date Received: 03/23/23 13:00

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	5.0	1.1	mg/L			03/28/23 20:54	1

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

Client Sample Results

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

Job ID: 580-125177-1

Client Sample ID: AF-RHMW225401-WGN01B-2303W3

Lab Sample ID: 580-125177-3

Date Collected: 03/22/23 10:15

Matrix: Water

Date Received: 03/23/23 13:00

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	5.0	1.1	mg/L			03/28/23 21:17	1

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QC Sample Results

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

Job ID: 580-125177-1

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

Lab Sample ID: MB 680-770129/10
Matrix: Water
Analysis Batch: 770129

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			03/28/23 20:07	1

Lab Sample ID: LCS 680-770129/1006
Matrix: Water
Analysis Batch: 770129

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	20.1		mg/L		101	50 - 150

Lab Sample ID: LCSD 680-770129/7
Matrix: Water
Analysis Batch: 770129

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	22.4		mg/L		112	50 - 150	11	50

Lab Sample ID: 580-125177-3 MS
Matrix: Water
Analysis Batch: 770129

Client Sample ID: AF-RHMW225401-WGN01B-2303W3
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	20.0	29.8		mg/L		149	50 - 150

Lab Sample ID: 580-125177-3 MSD
Matrix: Water
Analysis Batch: 770129

Client Sample ID: AF-RHMW225401-WGN01B-2303W3
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	20.0	23.5		mg/L		117	50 - 150	24	50

Lab Chronicle

Client: AECOM

Job ID: 580-125177-1

Project/Site: Red Hill - AFFF Assessment Sampling

Client Sample ID: AF-HDMW225303-WGN01LF-2303W3

Lab Sample ID: 580-125177-1

Date Collected: 03/21/23 10:00

Matrix: Water

Date Received: 03/23/23 13:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	770129	JCK	EET SAV	03/28/23 20:30

Client Sample ID: AF-RHMW10-WGN01LF-2303W3

Lab Sample ID: 580-125177-2

Date Collected: 03/21/23 12:55

Matrix: Water

Date Received: 03/23/23 13:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	770129	JCK	EET SAV	03/28/23 20:54

Client Sample ID: AF-RHMW225401-WGN01B-2303W3

Lab Sample ID: 580-125177-3

Date Collected: 03/22/23 10:15

Matrix: Water

Date Received: 03/23/23 13:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	770129	JCK	EET SAV	03/28/23 21:17

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: 580-125177-1

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
Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-125177-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-125177-1	AF-HDMW225303-WGN01LF-2303W3	Water	03/21/23 10:00	03/23/23 13:00
580-125177-2	AF-RHMW10-WGN01LF-2303W3	Water	03/21/23 12:55	03/23/23 13:00
580-125177-3	AF-RHMW225401-WGN01B-2303W3	Water	03/22/23 10:15	03/23/23 13:00

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Chain of Custody Record

Client Information		Sampler: <i>Andy Young</i>	Lab PM: Elaine Walker	Carrier Tracking No(s): 2303W3AFE04	COC No: 2303W3AFE04
Client Contact:		Phone: <i>60697810</i>	E-Mail: M.Elaime.Walker@EurofinsET.com	FedEX	Page: Page 1 of 1
Company: AECOM		PWSID		Job #:	
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		Analysis Requested	
City: Honolulu		TAT Requested (days): Rush - ASAP		State of Origin: Hawaii	
State Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Preservation Codes: M - Hexane N - None O - AsNaO2 P - Na2OAS Q - Na2SO3 R - Na2S2O3 S - H2SO4 G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Z - other (specify)	
Phone: 808-954-4512 / 770-331-0794		PO #:		Total Number of Containers: <input checked="" type="checkbox"/> 3	
Email: Watson.Tanji@aeocom.com / Mark.Kromis@aeocom.com		WO #:		Special Instructions/Note:	
Project Name: CTO N6274223F0104		Project #: 60697810		15015 DAL GL DS/2-(2-butoxyethoxy)-ethanol	
Site: RH5F		SSOW#:		18015 DAL GL DS/2-(2-butoxyethoxy)-ethanol	
Sample Identification		AF-HDMW225303-WGN01LF-2303W3		Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> A	
Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=soil, B=biological)	Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> A	Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> A
<i>3/21/23</i>	<i>1300</i>	<i>G</i>	<i>W</i>	<i>N</i>	<i>N</i>
 580-125177 Chain of Custody					
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) _____ Prelim data (Level 1 or 2) - see TAT above DoD Stage 4 report standard TAT - AECOM EQUIS EDD.					
Empty Kit Relinquished by _____ Date: _____ Time: _____ Relinquished by <i>Andy Young as of S</i> Date/Time: <i>3/21/23 1354</i> Company: AECOM Relinquished by <i>Alex Edwards</i> Date/Time: <i>3/22/23 1315</i> Company: AECOM Relinquished by _____ Date/Time: _____ Company: _____					
Relinquished by _____ Date/Time: _____ Company: _____ Relinquished by <i>Alex Edwards</i> Date/Time: <i>3/21/23 1354</i> Company: AECOM Relinquished by _____ Date/Time: _____ Company: _____					
Custody Seals Intact: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Cooler Temperature(s) °C and Other Remarks: <i>5.9/5.9</i>					



Chain of Custody Record

Client Information Client Contact: Tessa Murrephy Phone: 938-582-5207 PWSID:		Lab Pkt: Elaine Walker E-Mail: Elaine.Walker@EurofinsET.com Carrier Tracking No(s): FedEx State of Origin: Hawaii		COC No: 2303W3AFE03 Page: Page 1 of 1 Job #:	
Due Date Requested: see subcontract TAT Requested (days): Rush - ASAP Compliance Project: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No PO #: WO #: Project #: 60697810 SSO#:		Analysis Requested 8015C_DAI_GL_D5/2-(2-butoxyethoxy)-ethanol Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> A Field Filled Sample (Yes or No) <input checked="" type="checkbox"/> N Total Number of Containers <input checked="" type="checkbox"/> 3			
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		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:			
Sample Identification AF-RHMW10-WGN01LF-2303W3 Sample Date: 3/21/23 Sample Time: 1255 Sample Type (C=Comp, G=grab): G Matrix (W=Water, S=solid, O=wateroil, BI=tissue, AA=AI)		Special Instructions/Note: 7/22/23 21123			
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"/> Radiological		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			
Deliverable Requested I II III IV Other (specify)		Prelim data (Level 1 or 2) = see TAT above DoD Stage Special Instructions/QC Requirements DOD GSM project 4 report standard IAT_AECOM_EQUIS_EDD			
Empty Kit Relinquished by:		Method of Shipment:			
Relinquished by: Tessa Murrephy Date/Time: 3/21/23 1354 Company: AECOM		Received by: Alex Edwards Date/Time: 3/21/23 1354 Company: AECOM			
Relinquished by: Alex Edwards Date/Time: 3/22/23 1315 Company: AECOM		Received by: [Signature] Date/Time: 3/22/23 1300 Company:			
Relinquished by:		Received by:			
Custody Seals Intact: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Custody Seal No:		Cooler Temperature(s) °C and Other Remarks: 5.9/5.9			



Chain of Custody Record



Client Information		Sampler: <u>Andy Young</u>		Lab PM: <u>Elaine Walker</u>		Carrier Tracking No(s): <u>2303W3AFE07</u>	
Client Contact:		Phone: <u>402 871-5712</u>		E-Mail: <u>M.Elaine.Walker@EurofinsEI.com</u>		FedEx State of Origin: <u>Hawaii</u>	
Company: <u>AECOM</u>		PWSID:		Analysis Requested		COC No: <u>2303W3AFE07</u>	
Address: <u>1001 Bishop St. Suite 1600</u>		Due Date Requested: <u>See subcontract</u>		8015C_DAL_GL_DS/2-(2-butoxyethoxy)-ethanol		Page 1 of 1	
City: <u>Honolulu</u>		TAT Requested (days): <u>Rush - ASAP</u>		Perform MS/MSD (Yes or No)		Job #:	
State, Zip: <u>Hawaii 96813</u>		Compliance Project: <u>Yes</u> <input type="checkbox"/> <u>No</u> <input type="checkbox"/>		Field Filtered Sample (Yes or No)		Preservation Codes:	
Phone: <u>808-954-4512 / 770-331-0794</u>		PO #:		A <input checked="" type="checkbox"/> N <input type="checkbox"/> X <input type="checkbox"/>		A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other	
Email: <u>Watson.Tanji@aeocom.com / Mark.Kromis@aeocom.com</u>		WO #:		N <input checked="" type="checkbox"/> X <input type="checkbox"/>		Total Number of containers	
Project Name: <u>CTO N6274223F0104</u>		Project #:		W <input type="checkbox"/>		3	
Site: <u>RHSF</u>		SSOW#:		Preservation Code:		Special Instructions/Note:	
Sample Identification		Sample Date		Sample Type (C=Comp, G=grab)			
<u>AF-RHMW225401-WGN01B-2303W3</u>		<u>3/22/23</u>		<u>G</u>			
Possible Hazard Identification		Sample Time		Matrix (Water, Soil, Swab, Tissue, A, etc)			
<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		<u>3/22/23</u>		<u>W</u>			
Deliverable Requested I II III IV Other (specify)		Date		Date/Time			
<u>4 report standard TAT, AECOM, EQUIS, EDD</u>		<u>3/22/23</u>		<u>1250</u>			
Empty Kit Relinquished by		Date/Time		Date/Time			
<u>Andy Young ASyfs</u>		<u>3/22/23</u>		<u>1250</u>			
Relinquished by <u>James Mason</u>		Date/Time		Date/Time			
<u>James Mason</u>		<u>3/22/23</u>		<u>1315</u>			
Relinquished by		Date/Time		Date/Time			
				<u>1300</u>			
Custody Seals Intact: <u>Yes</u> <input type="checkbox"/> <u>No</u> <input type="checkbox"/>		Custody Seal No		Cooler Temperature(s) °C and Other Remarks			
				<u>5.9/5.9</u>			
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For <u>Months</u>		Special Instructions/QC Requirements <u>DOD QSM project</u>			
Method of Shipment:		Received by <u>James Mason</u>		Date/Time: <u>3/22/23</u>		Company: <u>AECOM</u>	
		Received by <u>James Mason</u>		Date/Time: <u>3/22/23</u>		Company: <u>AECOM</u>	
		Received by		Date/Time:		Company:	



Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-125177-1

Login Number: 125177

List Number: 2

Creator: Johnson, Corey M

List Source: Eurofins Savannah

List Creation: 03/27/23 04:45 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	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	
Is the Field Sampler's name present on COC?	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	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

