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ANALYTICAL REPORT

PREPARED FOR

Attn: Terri Choy AECOM 1001 Bishop Street Honolulu, Hawaii 96813 Generated 3/21/2023 4:58:51 PM

JOB DESCRIPTION

Red Hill - AFFF Assessment Sampling

JOB NUMBER

580-124582-1

Eurofins Seattle 5755 8th Street East Tacoma WA 98424



Eurofins Seattle

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

M. Elaine Walker

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Authorized for release by Marie Walker, Senior Project Manager M.Elaine.Walker@et.eurofinsus.com (253)248-4972

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Client: AECOM

Laboratory Job ID: 580-124582-1

Project/Site: Red Hill - AFFF Assessment Sampling

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Case Narrative

Client: AECOM Job ID: 580-124582-1

Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-124582-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE Client: AECOM

Project: Red Hill - AFFF Assessment Sampling Report Number: 580-124582-1

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

Two samples were received on 3/11/2023 10:30 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 4.6° 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-RHMW03-WGN01LF-2303W1 (580-124582-1) and AF-RHMW02-WGN01LF-2303W1 (580-124582-2) were analyzed for glycols in accordance with EPA SW-846 Method 8015B - DAI. The samples were analyzed on 03/18/2023 and 03/19/2023.

2-(2-Butoxyethoxy)ethanol failed the recovery criteria high for the MSD of sample AF-RHMW03-WGN01LF-2303W1MSD (580-124582-1) in batch 680-768387. The associated LCS/LCSD recoveries were in control.

The continuing calibration verification (CCV) associated with batch 680-768387 recovered above the upper control limit for 2-(2-Butoxyethoxy)ethanol. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data has been reported. The following samples are impacted: AF-RHMW03-WGN01LF-2303W1 (580-124582-1), AF-RHMW02-WGN01LF-2303W1 (580-124582-2), (CCV 680-768387/33), (580-124582-C-1 MS) and (580-124582-C-1 MSD).

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

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Definitions/Glossary

Client: AECOM Job ID: 580-124582-1

Project/Site: Red Hill - AFFF Assessment Sampling

Qualifiers

Qualifier

GC Semi VOA

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J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
\circ	One or more quality control criteria failed

Q One or more quality control criteria failed.
U Undetected at the Limit of Detection.

Qualifier Description

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	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

Eurofins Seattle

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Client Sample Results

Client: AECOM Job ID: 580-124582-1

Project/Site: Red Hill - AFFF Assessment Sampling

Client Sample ID: AF-RHMW03-WGN01LF-2303W1 Lab Sample ID: 580-124582-1

Date Collected: 03/09/23 12:05 Matrix: Water

Date Received: 03/11/23 10:30

Analyte	Result Qualifi		DL Unit	D	Prepared	Analyzed	Dil Fac
2-(2-Butoxyethoxy)ethanol	30 UMO	.11 5.0	1.1 mg/l			03/18/23 23:17	1

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Client Sample Results

Client: AECOM Job ID: 580-124582-1

Project/Site: Red Hill - AFFF Assessment Sampling

Client Sample ID: AF-RHMW02-WGN01LF-2303W1 Lab Sample ID: 580-124582-2

Date Received: 03/11/23 10:30

Analyte	Result	Qualifier	LOQ	DL Uni	t D	Prepared	Analyzed	Dil Fac
2-(2-Butoxyethoxy)ethanol	3.0	UMO	5.0	1 1 mg	<u> </u>		03/19/23 00:26	1

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QC Sample Results

Client: AECOM Job ID: 580-124582-1

Project/Site: Red Hill - AFFF Assessment Sampling

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

Lab Sample ID: MB 680-768387/17 Client Sample ID: Method Blank Prep Type: Total/NA

Matrix: Water

Analyte

Analysis Batch: 768387

2-(2-Butoxyethoxy)ethanol

MB MB Result Qualifier LOQ DL Unit Analyzed Dil Fac Prepared 5.0 1.1 mg/L 03/18/23 21:44 3.0 U M

Lab Sample ID: LCS 680-768387/13 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 768387

Spike LCS LCS %Rec Added Result Qualifier D %Rec Limits Unit 20.0 24.5 50 - 150 2-(2-Butoxyethoxy)ethanol mg/L 123

Lab Sample ID: LCSD 680-768387/14 Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

Matrix: Water

Analysis Batch: 768387

Spike LCSD LCSD %Rec RPD Added Result Qualifier Limits RPD Analyte Unit %Rec Limit 2-(2-Butoxyethoxy)ethanol 20.0 23.7 50 - 150 mg/L

Lab Sample ID: 580-124582-1 MS Client Sample ID: AF-RHMW03-WGN01LF-2303W1 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 768387

Spike MS MS %Rec Sample Sample Added Analyte Result Qualifier Result Qualifier Unit %Rec Limits 2-(2-Butoxyethoxy)ethanol 3.0 UMQJ1 20.0 28.0 mg/L 140 50 - 150

Lab Sample ID: 580-124582-1 MSD Client Sample ID: AF-RHMW03-WGN01LF-2303W1 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 768387

MSD MSD RPD Sample Sample Spike %Rec Analyte Result Qualifier Added Result Qualifier Limits RPD Unit %Rec Limit 50 - 150 2-(2-Butoxyethoxy)ethanol 3.0 U M Q J1 20.0 31.0 J1 155 mg/L 10 50

3/21/2023

Lab Chronicle

Client: AECOM Job ID: 580-124582-1

Project/Site: Red Hill - AFFF Assessment Sampling

Client Sample ID: AF-RHMW03-WGN01LF-2303W1

Lab Sample ID: 580-124582-1

Matrix: Water

Date Collected: 03/09/23 12:05 Date Received: 03/11/23 10:30

Batch Batch Dilution Batch **Prepared** Method Number Analyst or Analyzed **Prep Type** Type Run **Factor** Lab 03/18/23 23:17 Total/NA Analysis 8015C GLY 768387 JCK **EET SAV**

Client Sample ID: AF-RHMW02-WGN01LF-2303W1 Lab Sa

Lab Sample ID: 580-124582-2

Matrix: Water

Date Collected: 03/09/23 10:15 Date Received: 03/11/23 10:30

Batch Batch **Dilution** Batch Prepared **Prep Type** Type Method Run Factor **Number Analyst** Lab or Analyzed 03/19/23 00:26 Total/NA Analysis 8015C GLY 768387 JCK EET SAV

Laboratory References:

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

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Accreditation/Certification Summary

Client: AECOM Job ID: 580-124582-1

Project/Site: Red Hill - AFFF Assessment Sampling

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 analyte the agency does not		port, but the laboratory is not	certified by the governing authority.	This list may include analytes for which
Analysis Method	Prep Method	Matrix	Analyte	
8015C GLY		Water	2-(2-Butoxyethoxy)ethanol	

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Sample Summary

Client: AECOM Job ID: 580-124582-1

Project/Site: Red Hill - AFFF Assessment Sampling

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-124582-1	AF-RHMW03-WGN01LF-2303W1	Water	03/09/23 12:05	03/11/23 10:30
580-124582-2	AF-RHMW02-WGN01LF-2303W1	Water	03/09/23 10:15	03/11/23 10:30

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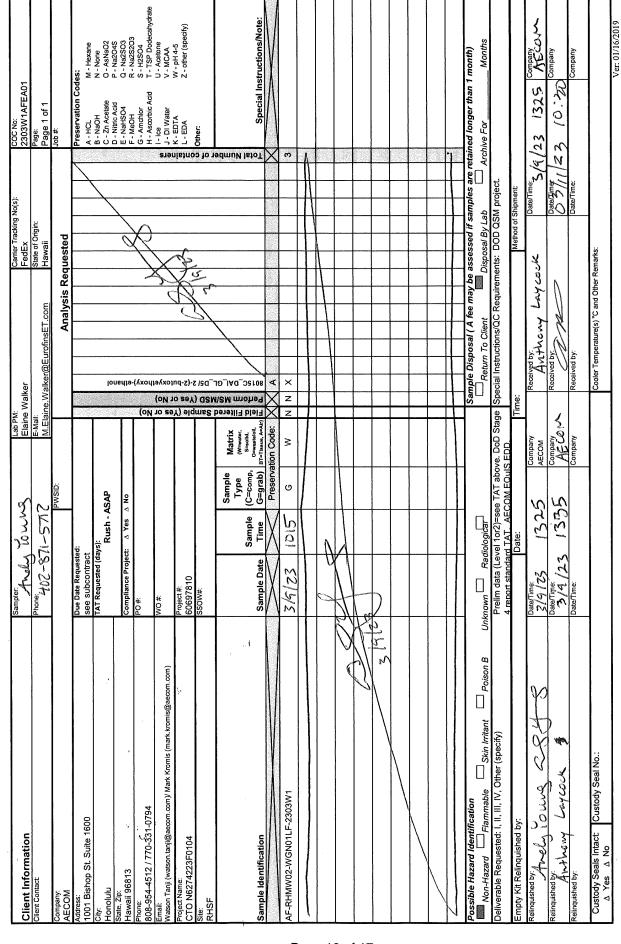
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Eurofins FGS, Seattle 5755 8th Street East Tacoma, WA 98424	Chain of	Chain of Custody Record	cord		*	💸 eurofins	Environment Testing America
Client Information	Sampler. And Towns	Lab PM Elaine	Lab PM: Elaine Walker	Carrier Tracking No(s): FedEx	2303	COC No: 2303W1AFEA02	
	Phone: 402-871-5712	E-Mail: M.Elai	ne.Walker@EurofinsET.com	State of Origin: Hawaii	Page: Page	Page: Page 1 of 1	
Company: AECOM		PWSID:	Analysis Requested	quested	;# gor		
Address: 1001 Bishop St. Suite 1600	Due Date Requested: see subcontract				Prese	ĕ	is: M - Hexane
City. Honolulu	TAT Requested (days): Rush - ASAP	a	Įc		27.	B - NaOH N- C - Zn Acetate 0 -	N - None O - AsnaO2
State, Zip: Hawaii 96813	Compliance Project: △ Yes △ No	0	onsite		2 2 2		Na2S03
Phone: 808-954-4512 / 770-331-0794	PO #:			Þ	G-A	7	H2SO4
gaecom.com)/ Mark Kromis (mark.kromis@aecom.com)	MO#:	10 86	(oN)	X			Acetone
	Project #: 60697810	(A) el	nq-z)-		427274400000000000000000000000000000000	K-EDTA W. L-EDA Z-	pH 4-5 other (specify)
	SSOW#:	imes) asv		o to t		
	Sample	Matrix (W=water, S=solid, O=waste/oli,	eld Filtered		edmuN letc	,	1
Sample Identification	Sample Date Time G-	T	a X		ът >	Special Instructions/Note:	ctions/Note:
AF-RHMW03-WGN01LF-2303W1	2/9/73 1705	N O	z		9		
	3		_				
	7/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2						
	100						
7	J.						
			Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	assessed if samples	are retained lo	nger than 1 m	onth)
Non-Hazard Hammable Skin Imtant Poison B Deliverable Requested: I, II, III, IV, Other (specify)	Unknown Radiological Prelim data (Level 1or2)=see TAT above. DoD Stage	ı <i>ıcai</i> AT above. DoD Stage	Special Instructions/QC Requirements: DOD QSM project.	Disposal By Lab ents: DOD QSM proje	Archive ror		MORITIS
Empty Kit Relinguished by:	4 report standard TAT. AECOM EQUIS EDD. Date:		Time:	Method of Shipment:	111		
1 1 8 0 8 W	22	Company	Received by:	Date/Time; 8	1 (23)	1325	Company
7.05 X	23		1/1		11/23	2	Company
]	Ime:		Received by:	Date/Time:		Ö	Company
Custody Seals Intact: Custody Seal No.:		-	Cooler Temperature(s) °C and Other Remarks:		4-6		
				9 3) - (c	Ve	Ver: 01/16/2019



Environment Testing

🕏 eurofins

Chain of Custody Record

Eurofins FGS, Seattle

Tacoma, WA 98424 5755 8th Street East

Eurofins FGS, Seattle 5755 8th Street East Tacoma, WA 98424	Chain of Custody Record	ıstody Rec	ord		4. eurofins Environment Testing America
Client Information	Sampler And Town	Lab PM: Elaine Walker	alker	Carrier Tracking No(s): FedEx	COC No: 2303W1AFEA02
	Phone: 402-871-5712	E-Mail: M.Elaine.	E-Mait: M.Elaine.Walker@EurofinsET.com	State of Origin: Hawaii	Page: Page 1 of 1
Company: AECOM	PWSID:		Analysis Requested	nested	Job #:
hop St. Suite 1600	Due Date Requested: see subcontract				Preservation Codes: A - HCL M - Hexane
	TAT Requested (days): Rush - ASAP		Įc		B - NaOH N - None C - Zn Acetate O - ASNaO2
State, Zp: Hawaii 96813	Compliance Project: △ Yes △ No		othano		D - Nitro Acid P - NazO4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3
Phone: 808-954-4512 / 770-331-0794	PO #:	(ON	-{Áxoų		70
gaecom.com)/ Mark Kromis (mark.kromis@aecom.com)	WO #:			X	I - Ice J - DI Water
Project Name: CTO N6274223F0104	Project #: 60697810		nq-z)-	}	K - EDTA L - EDA
	SSOW#:				of other:
	Sample	Matrix et (W=water, Et S=solid, O=waste/oil, et o	stform MS/N		edmuN lsta
Sample Identification	Sample Date Time G=grab)	BT=Tissue, A=Air) IL. Ition Code: X	2272		Special instructions/Note:
AF-RHMW03-WGN01LF-2303W1	5 5021 82/5/8	z	×		n
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	25				
	A Company of the Comp				
	100				
Possible Hazard Identification Non-Hazard	Contraction (Sadiological	S	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Return To Client Disposal By Lab Archive For	assessed if samples are r	etained longer than 1 month) Archive For Months
ssted: I, II, III, IV, Other (specify)	/el 1or	bove. DoD Stage S	Requirem	nts: DOD QSM project.	
	Date:	Time:	45	Method of Shipment:	
L'AND CAST	Date/Time; 1525	Company	Received by: Authory Low	Loycock Date/Time;	(23 1325 Company (23)
YCOCK	2/q /23 1335	Company AECOM	17,1		23 (0:33 Company
	Date/ I me:	Company	Keceived by:	Date/ Ime:	Company
Custody Seals Intact: Custody Seal No.: Δ Yes Δ No	-22		Cooler Temperature(s) °C and Other Remarks:	emarks: 4-6	
				0-6	Ver. 01/16/2019
)	

5755 8th Street East Tacoma, WA 98424	Chain of Custody Record	ly Record		Environment Testing America
Client Information	Sampler.	Lab PM: Elaine Walker	Carrier Tracking No(s): FedEx	COC No: 2303W1AFEA01
	280	E-Mail: M.Elaine.Walker@EurofinsET.com		Page: Page 1 of 1
Company: AECOM		Analysis Requested	quested	Job #;
hop St. Suite 1600	Due Date Requested: see subcontract			Š
F 1	TAT Requested (days): Rush - ASAP	lo		B - NaOH N - None C - Zn Acetate O - AsNaO2
State, Zip: Hawaii 96813	Compliance Project: Δ Yes Δ No	ueys		
770-331-0794	PO#:		<u> </u>	.0
aecom.com)/ Mark Kromis (mark.kromis@aecom.com)	#OM	(oN 1	Sier	- Ice J - DI Water
	Project #: 60697810	o sey	Ž distric	
	SSOW#:) asv	, , , , , , , , , , , , , , , , , , ,	Other:
	Sample M. Type w	Matrix Matrix Ellitered Filliered Comm MS/I Strong	edmuN ls	
Sample Identification	G=grab)	E101	nto T	Special Instructions/Note:
	Preservation Code:	Sode: XX A	X	
AF-RHMW02-WGN01LF-2303W1	9 <u> 5101 82/5/8</u>	× z z z ×	m	and the state of t
	and an order			
2/9/5	2			
Identification	lг	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	assessed if samples are retain	ined longer than 1 month)
Non-Hazard Flammable Skin Irritant Poison B Unk Deliverable Requested: I, II, III, IV, Other (specify)	Unknown Hadiologicar Prelim data (Level 10r2)=see TAT above. DoD Stage	Negran I o Cilent Usposal By Lab D Stage Special Instructions/QC Requirements: DOD QSM project.		Archive For Months
Empty Kit Relinquished by:	4 report standard LAL. AECOM EQUIS EDD. Date:	Time:	Method of Shipment:	
own coxt &	Date/Time: Company 2/9/75 1325 AECOM	any Received by: M Anthony Laycock	Date/Time;	123 1325 Company
Layer W	3 1335	2	Date/Jimg / 2:	3 10.20 Company
			Date/Time:	Company
Custody Seals Intact Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:	emarks:	
				Ver. 01/16/2019

Client: AECOM Job Number: 580-124582-1

Login Number: 124582 List Source: Eurofins Seattle

List Number: 1

Creator: Presley, Kim A

Creator. Presiey, Kiili A		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
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.	N/A	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	N/A	
Containers are not broken or leaking.	N/A	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	N/A	
Sample bottles are completely filled.	N/A	
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 <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Client: AECOM Job Number: 580-124582-1

Login Number: 124582 List Source: Eurofins Savannah List Number: 2 List Creation: 03/17/23 04:48 PM

Creator: Johnson, Corey M

ordator. Comison, Corcy in		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	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 <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	