LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

AECOM
1001 Bishop Street Suite 1600
Honolulu, HI 96813
ATTN: Ms. Alethea Ramos
alethea.ramos@aecom.com

July 12, 2021

SUBJECT: **Revised** Red Hill Bulk Storage Facility, CTO 18F0126, Data Validation

Dear Ms. Ramos,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received from June 3rd & 4th, 2021. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #50747C RV1:

SDG #	**Fraction**
95917/B21042016	Volatiles, Lead, TPH as Extractables, DOC

The data validation was performed under Stage 2B & 4 validation guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017)
- Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017)
- Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017)
- Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018)
- U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019)
- DoD General Validation Guidelines (November 2019)
- U.S. Department of Defense (DoD) Data Validation Guidelines Module 1: Data Validation Procedure for Organic Analysis by GC/MS (May 2020)
- U.S. Department of Defense (DoD) Data Validation Guidelines Module 2: Data Validation Metals by ICP-OES (May 2020)
- U.S. Department of Defense (DoD) Data Validation Guidelines Module 4: Data Validation Procedure for Organic Analysis by GC (March 2021)
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Stella Cuenco
Operations Manager/Senior Chemist
scuenco@lab-data.com

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

AECOM
1001 Bishop Street Suite 1600
Honolulu, HI 96813
ATTN: Ms. Alethea Ramos
alethea.ramos@aecom.com

June 18, 2021

SUBJECT: Red Hill Bulk Storage Facility, CTO 18F0126, Data Validation

Dear Ms. Ramos,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received from June 3rd & 4th, 2021. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #50747 C-D:

SDG #	**Fraction**
95917, 96222/B21051886	Volatiles, Lead, TPH as Extractables, DOC

The data validation was performed under Stage 2B & 4 validation guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017)
- Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017)
- Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017)
- Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018)
- U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019)
- DoD General Validation Guidelines (November 2019)
- U.S. Department of Defense (DoD) Data Validation Guidelines Module 1: Data Validation Procedure for Organic Analysis by GC/MS (May 2020)
- U.S. Department of Defense (DoD) Data Validation Guidelines Module 2: Data Validation Metals by ICP-OES (May 2020)
- U.S. Department of Defense (DoD) Data Validation Guidelines Module 4: Data Validation Procedure for Organic Analysis by GC (March 2021)
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Stella Cuenco
Operations Manager/Senior Chemist
scuenco@lab-data.com

390 pages-DL/EM R5 (added S8) Attachment 1

90/10 2B/4 EDD

LDC# 50747 (AECOM - Honolulu, HI / Red Hill Bulk Storage Facility, CTO 18F0126)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (524.2)		Pb (200.8)		TPH-E (8015B)		DOC (9060A)																							
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
C	95917	06/03/21	06/17/21	3	0	2	0	-	-	1	0																						
D	96222/B21051886	06/04/21	06/18/21	1	0	1	0	1	0	1	0																						
D	96222/B21051886	06/04/21	06/18/21	1	0	1	0	1	0	1	0																						
Total	T/J/SC			5	0	4	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B/4 validation). These sample counts do not include MS/MSD, and DUPs L:\AECOM\Red Hill\50747ST_18F0126_C_and_D_only.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 16, 2021

Parameters: Volatiles

Validation Level: Stage 2B

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 95917

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1354	BA31077	Water	04/21/21
ERH1355	BA31078	Water	04/21/21
ERH1356	BA31079	Water	04/21/21

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019), the DoD General Validation Guidelines (November 2019), and the U.S. Department of Defense (DoD) Data Validation Guidelines Module 1: Data Validation Procedure for Organic Analysis by GC/MS (May 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Analytes (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was not detected and the associated numerical value is approximate.

X (Exclusion of data recommended): The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Exclusion of the data is recommended.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

a ICP Serial Dilution %D was not within control limits.

b Presumed contamination from preparation (method blank).

c Calibration %RSD, r, r^2, %D or %R was noncompliant.

d The analysis with this flag should not be used because another more technically sound analysis is available.

e MS/MSD or Duplicate RPD was high.

f Presumed contamination from FB or ER.

g ICP ICS results were unsatisfactory.

h Holding times were exceeded.

i Internal standard performance was unsatisfactory.

k Estimated Maximum Possible Concentration (HRGC/HRMS only)

l LCS/LCSD %R was not within control limits.

m Result exceeded the calibration range.

o Cooler temperature or temperature blank was noncompliant and/or sample custody problems.

p RPD between two columns was high (GC only).

q MS/MSD recovery was not within control limits.

s Surrogate recovery was not within control limits.

t Presumed contamination from trip blank.

v Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

w LCS/LCSD RPD was high.

y Chemical recovery was not within control limits (Radiochemistry only).

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
ERH1354	All analytes	A headspace was apparent in the sample containers.	There should be no headspace in the sample containers.	J- (all detects) UJ (all non-detects)	A

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all analytes.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all analytes.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1354 was identified as a trip blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to headspace, data were qualified as estimated in one sample.

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Data Qualification Summary - SDG 95917

Sample	Analyte	Flag	A or P	Reason (Code)
ERH1354	All analytes	J- (all detects) UJ (all non-detects)	A	Sample receipt (headspace) (v)

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Laboratory Blank Data Qualification Summary - SDG 95917

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Field Blank Data Qualification Summary - SDG 95917

No Sample Data Qualified in this SDG

LDC #: 50747C1a
SDG #: 95917
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 6/16/21
Page: 1 of 1
Reviewer: M
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	SW / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	% RSD ≤ 20, r² ICV ≤ 30
IV.	Continuing calibration	A	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	not required
IX.	Laboratory control samples	A	LCS 1P
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1354 TB	BA31077	Water	04/21/21
2	ERH1355	BA31078	Water	04/21/21
3	ERH1356	BA31079	Water	04/21/21
4				
5				
6				
7				
8				
9				

Notes:

	210426AM						

LDC #: 50747C1a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: FT

All circled dates have exceeded the technical holding times.
~~Y~~ N N/A Were all cooler temperatures within validation criteria?
Y N N/A Were air bubbles > 1/4 inch or was headspace present in the vials?

METHOD : GC/MS VOA (EPA Method 524.2) (✓)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
1	VOA	contained Headspace					J-/UJ/A

TECHNICAL HOLDING TIME CRITERIA

Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
Water preserved: Within 14 days of sample collection.
Soil: Within 14 days of sample collection.

LDC Report# 50747C4a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 17, 2021

Parameters: Lead

Validation Level: Stage 2B

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 95917

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1355	BA31078	Water	04/21/21
ERH1356	BA31079	Water	04/21/21
ERH1356MS	BA31079MS	Water	04/21/21

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019), the DoD General Validation Guidelines (November 2019), and the U.S. Department of Defense (DoD) Data Validation Guidelines Module 2: Data Validation Procedure for Metals by ICP-OES (May 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Lead by Environmental Protection Agency (EPA) Method 200.8

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was not detected and the associated numerical value is approximate.

X (Exclusion of data recommended): The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Exclusion of the data is recommended.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

a ICP Serial Dilution %D was not within control limits.

b Presumed contamination from preparation (method blank).

c Calibration %RSD, r, r^2, %D or %R was noncompliant.

d The analysis with this flag should not be used because another more technically sound analysis is available.

e MS/MSD or Duplicate RPD was high.

f Presumed contamination from FB or ER.

g ICP ICS results were unsatisfactory.

h Holding times were exceeded.

i Internal standard performance was unsatisfactory.

k Estimated Maximum Possible Concentration (HRGC/HRMS only)

l LCS/LCSD %R was not within control limits.

m Result exceeded the calibration range.

o Cooler temperature or temperature blank was noncompliant and/or sample custody problems.

p RPD between two columns was high (GC only).

q MS/MSD recovery was not within control limits.

s Surrogate recovery was not within control limits.

t Presumed contamination from trip blank.

v Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

w LCS/LCSD RPD was high.

y Chemical recovery was not within control limits (Radiochemistry only).

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

VIII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits.

XIII. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Lead - Data Qualification Summary - SDG 95917

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Lead - Laboratory Blank Data Qualification Summary - SDG 95917

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Lead - Field Blank Data Qualification Summary - SDG 95917

No Sample Data Qualified in this SDG

LDC #: 50747C4a
SDG #: 95917
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 6/16/21
Page: 1 of 1
Reviewer: AH
2nd Reviewer: AH

METHOD: Lead (EPA Method 200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	A	3
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS/LCSD
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	A	
XIII.	Target Analyte Quantitation	N	
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1355	BA31078	Water	04/21/21
2	ERH1356	BA31079	Water	04/21/21
3	ERH1356MS	BA31079MS	Water	04/21/21
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

LDC Report# 50747C6_RV1

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 28, 2021

Parameters: Dissolved Organic Carbon

Validation Level: Stage 2B

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 95917

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1355	BA31078	Water	04/21/21
ERH1356	BA31079	Water	04/21/21
ERH1355DUP	BA31078DUP	Water	04/21/21

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019), and the DoD General Validation Guidelines (November 2019). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Dissolved Organic Carbon by Standard Method 5310C

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was not detected and the associated numerical value is approximate.

X (Exclusion of data recommended): The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Exclusion of the data is recommended.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

a ICP Serial Dilution %D was not within control limits.

b Presumed contamination from preparation (method blank).

c Calibration %RSD, r, r^2, %D or %R was noncompliant.

d The analysis with this flag should not be used because another more technically sound analysis is available.

e MS/MSD or Duplicate RPD was high.

f Presumed contamination from FB or ER.

g ICP ICS results were unsatisfactory.

h Holding times were exceeded.

i Internal standard performance was unsatisfactory.

k Estimated Maximum Possible Concentration (HRGC/HRMS only)

l LCS/LCSD %R was not within control limits.

m Result exceeded the calibration range.

o Cooler temperature or temperature blank was noncompliant and/or sample custody problems.

p RPD between two columns was high (GC only).

q MS/MSD recovery was not within control limits.

s Surrogate recovery was not within control limits.

t Presumed contamination from trip blank.

v Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

w LCS/LCSD RPD was high.

y Chemical recovery was not within control limits (Radiochemistry only).

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
ERH1356	Dissolved organic carbon	51 days	28 days	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to technical holding time, data were qualified as estimated in one sample.

Red Hill Bulk Storage Facility, CTO 18F0126
Dissolved Organic Carbon - Data Qualification Summary - SDG 95917

Sample	Analyte	Flag	A or P	Reason
ERH1356	Dissolved organic carbon	J (all detects)	P	Technical holding times (h)

Red Hill Bulk Storage Facility, CTO 18F0126
Dissolved Organic Carbon - Laboratory Blank Data Qualification Summary - SDG 95917

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Dissolved Organic Carbon - Field Blank Data Qualification Summary - SDG 95917

No Sample Data Qualified in this SDG

LDC #: 50747C6
SDG #: 95917
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 6/16/21
Page: 1 of 1
Reviewer: ATL
2nd Reviewer: AE

METHOD: (Analyte) DOC (EPA SW846 Method ~~9060A~~ SM5310C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A, A	SW
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	
VII.	Duplicate sample analysis	A	2
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	N	
X.	Target Analyte Quantitation	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1355	BA31078	Water	04/21/21
2	↓ DUP	↓ DUP	↓	↓
3	ERH1356	BA31079	↓	↓
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Notes:

LDC #: 50747C6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: ATV

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ?
(Y) N N/A Were all cooler temperatures within validation criteria?

Code: hv

Method:	DOC (SM 5310C)	
Parameters:	water	
Technical holding time:	28 days	

Sample ID	Sampling date	Analysis date	Total Time	Qualifier	Analysis date	Total Time	Qualifier
3	04/21/21	06/11/21	51 days	J/UJ/P (detect)			

LDC Report# 50747C8

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: July 7, 2021

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Stage 2B

Laboratory: APPL, Inc./Energy Laboratories

Sample Delivery Group (SDG): 95917/B21042016

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1355	BA31078/B21042016-001	Water	04/21/21
ERH1356	BA31079/B21042016-002	Water	04/21/21

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019), the DoD General Validation Guidelines (November 2019), and the U.S. Department of Defense (DoD) Data Validation Guidelines Module 4: Data Validation Procedure for Organic Analysis by GC (March 2021). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015C

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was not detected and the associated numerical value is approximate.

X (Exclusion of data recommended): The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Exclusion of the data is recommended.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

a ICP Serial Dilution %D was not within control limits.

b Presumed contamination from preparation (method blank).

c Calibration %RSD, r, r^2, %D or %R was noncompliant.

d The analysis with this flag should not be used because another more technically sound analysis is available.

e MS/MSD or Duplicate RPD was high.

f Presumed contamination from FB or ER.

g ICP ICS results were unsatisfactory.

h Holding times were exceeded.

i Internal standard performance was unsatisfactory.

k Estimated Maximum Possible Concentration (HRGC/HRMS only)

l LCS/LCSD %R was not within control limits.

m Result exceeded the calibration range.

o Cooler temperature or temperature blank was noncompliant and/or sample custody problems.

p RPD between two columns was high (GC only).

q MS/MSD recovery was not within control limits.

s Surrogate recovery was not within control limits.

t Presumed contamination from trip blank.

v Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

w LCS/LCSD RPD was high.

y Chemical recovery was not within control limits (Radiochemistry only).

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 95917/B21042016

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 95917/B21042016

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 95917/B21042016

No Sample Data Qualified in this SDG

LDC #: 50747C8

SDG #: 95917/B21042016

Laboratory: ~~Energy Laboratories~~ APPL

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 7/7/21

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	% RSD / ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	MS
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Target analyte quantitation	N	
XI.	Target analyte identification	N	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID		Lab ID	Matrix	Date
1	ERH1355	B21042016-001	BA31078	Water	04/21/21
2	ERH1356	B21042016-002	BA31079	Water	04/21/21
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Notes:

	MB-154879						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 16, 2021

Parameters: Volatiles

Validation Level: Stage 2B & 4

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 96222

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1359	BA32813	Water	05/19/21
ERH1360**	BA32814**	Water	05/19/21

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019), the DoD General Validation Guidelines (November 2019), and the U.S. Department of Defense (DoD) Data Validation Guidelines Module 1: Data Validation Procedure for Organic Analysis by GC/MS (May 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was not detected and the associated numerical value is approximate.

X (Exclusion of data recommended): The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Exclusion of the data is recommended.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

a ICP Serial Dilution %D was not within control limits.

b Presumed contamination from preparation (method blank).

c Calibration %RSD, r, r^2, %D or %R was noncompliant.

d The analysis with this flag should not be used because another more technically sound analysis is available.

e MS/MSD or Duplicate RPD was high.

f Presumed contamination from FB or ER.

g ICP ICS results were unsatisfactory.

h Holding times were exceeded.

i Internal standard performance was unsatisfactory.

k Estimated Maximum Possible Concentration (HRGC/HRMS only)

l LCS/LCSD %R was not within control limits.

m Result exceeded the calibration range.

o Cooler temperature or temperature blank was noncompliant and/or sample custody problems.

p RPD between two columns was high (GC only).

q MS/MSD recovery was not within control limits.

s Surrogate recovery was not within control limits.

t Presumed contamination from trip blank.

v Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

w LCS/LCSD RPD was high.

y Chemical recovery was not within control limits (Radiochemistry only).

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all analytes.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all analytes.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

All target analyte quantitations met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Data Qualification Summary - SDG 96222

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Laboratory Blank Data Qualification Summary - SDG 96222

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Field Blank Data Qualification Summary - SDG 96222

No Sample Data Qualified in this SDG

LDC #: 50747D1a
SDG #: 96222
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 6/16/21
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	% RSD ≤ 20, r ICV ≤ 30
IV.	Continuing calibration	A	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	not required
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	Not reviewed for Stage 2B validation.
XIII.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XIV.	System performance	A	Not reviewed for Stage 2B validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	ERH1359	BA32813	Water	05/19/21
2	ERH1360**	BA32814**	Water	05/19/21
3				
4				
5				
6				
7				
8				
9				

Notes:

	210520AL-BLK						

LDC #: 50147D1a

VALIDATION FINDINGS CHECKLIST

Reviewer: PT

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?	✓			
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation/CRQLs				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?		✓		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 50747D1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: __FJ__

METHOD: GCMS 524.2

The calibration factors (RRFF), average RRFF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

RRF = (Ax)(Cis)/(Ais)(Cx)
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

Where:
Ax = Area of compound
Cx = Concentration of compound
S = Standard deviation of the RRFs
X = Mean of the RRFs
Ais = Area of associated internal standard
Cis = Concentration of internal Standard

#	Standard ID	Calibration Date	Compound	Reported (RRF 10ug/L std)	Recalculated (RRF 10 ug/L std)	Reported AverageRRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
	ICAL	5/20/2021	QQQ	0..1342	0..1342	0.1371	0.1371	8.9	8.9
			EE	0.2665	0.2665	0.2720	0.2720	8.9	8.9
	Loki		BB	0.2684	0.2684	0.2761	0.2761	11	11

LDC #: 50747D/a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	ICV	5/20/21	QQQ (1st internal standard)	0.1371	0.1302	0.1302	5.0	5.0
			EE (2nd internal standard)	0.2720	0.2569	0.2569	5.5	5.5
			BB (3rd internal standard)	0.2761	0.2501	0.2501	9.4	9.4
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 50747O1a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #2

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4	25.0	25.34	101	101	0
Toluene-d8					
Bromofluorobenzene	25.0	24.07	96.3	96.3	0

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 507470|a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: 210520 AL ios 10

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
V	10.0	10.0	9.18	9.75	91.8	91.8	97.5	97.5	6.0	6.0
QQQ	↓	↓	9.24	9.45	92.4	92.4	94.5	94.5	2.2	2.2
BE	↓	↓	9.68	9.87	96.8	96.8	98.7	98.7	1.9	1.9
CC	↓	↓	9.59	9.80	95.9	95.9	98.0	98.0	2.2	2.2
C	↓	↓	10.0	10.1	100	100	101	101	1.0	1.0

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 50747D1a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT

METHOD: GC MS VOA Method 524.2

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 210520AL, LCS QQQ

Conc. = $\frac{(24291)(25)}{(479435)(0.1371)}$

= 9.24 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	LCS	QQQ	9.24	9.24	

LDC Report# 50747D4a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 17, 2021

Parameters: Lead

Validation Level: Stage 2B & 4

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 96222

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1359	BA32813	Water	05/19/21
ERH1360**	BA32814**	Water	05/19/21
ERH1360MS	BA32814MS	Water	05/19/21

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019), the DoD General Validation Guidelines (November 2019), and the U.S. Department of Defense (DoD) Data Validation Guidelines Module 2: Data Validation Procedure for Metals by ICP-OES (May 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Lead by Environmental Protection Agency (EPA) Method 200.8

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was not detected and the associated numerical value is approximate.

X (Exclusion of data recommended): The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Exclusion of the data is recommended.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

a ICP Serial Dilution %D was not within control limits.

b Presumed contamination from preparation (method blank).

c Calibration %RSD, r, r^2, %D or %R was noncompliant.

d The analysis with this flag should not be used because another more technically sound analysis is available.

e MS/MSD or Duplicate RPD was high.

f Presumed contamination from FB or ER.

g ICP ICS results were unsatisfactory.

h Holding times were exceeded.

i Internal standard performance was unsatisfactory.

k Estimated Maximum Possible Concentration (HRGC/HRMS only)

l LCS/LCSD %R was not within control limits.

m Result exceeded the calibration range.

o Cooler temperature or temperature blank was noncompliant and/or sample custody problems.

p RPD between two columns was high (GC only).

q MS/MSD recovery was not within control limits.

s Surrogate recovery was not within control limits.

t Presumed contamination from trip blank.

v Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

w LCS/LCSD RPD was high.

y Chemical recovery was not within control limits (Radiochemistry only).

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

VIII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits.

XIII. Target Analyte Quantitation

All target analyte quantitations met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Lead - Data Qualification Summary - SDG 96222

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Lead - Laboratory Blank Data Qualification Summary - SDG 96222

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Lead - Field Blank Data Qualification Summary - SDG 96222

No Sample Data Qualified in this SDG

LDC #: 50747D4a
SDG #: 96222
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 6/16/21
Page: 1 of 1
Reviewer: ATV
2nd Reviewer: M

METHOD: Lead (EPA Method 200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	A	3
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A	LCS/LCSD
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	A	
XIII.	Target Analyte Quantitation	A	Not reviewed for Stage 2B validation.
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	ERH1359	BA32813	Water	05/19/21
2	ERH1360**	BA32814**	Water	05/19/21
3	ERH1360MS	BA32814MS	Water	05/19/21
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	✓			
Were all water samples preserved to a pH of <2.	✓			
II. ICP-MS Tune				
Were mass resolutions within 0.1 amu for all isotopes in the tuning solution?	✓			
Were %RSDs of isoptoes in the tuning solution ≤5%?	✓			
III. Calibration				
Were all instruments calibrated daily?	✓			
Were the proper standards used?	✓			
Were all initial and continuing calibration verifications within the 90-110% (80-120% for mercury) QC limits?	✓			
Were the low level standard checks within 70-130%? 80-120%	✓			
Were all initial calibration correlation coefficients within limits as specifed by the method?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks?		✓		
Was there contamination in the initial and continuing calibration blanks?		✓		
V. Interference Check Sample				
Were the interference check samples performed daily?	✓			
Were the AB solution recoveries within 80-120%?	✓			
VI. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries within the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	✓			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?			✓	
VII. Laboratory Control Samples				
SDG?	✓			

Were the LCS recoveries and RPDs (if applicable) within QC limits?	✓			
METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
VIII. Internal Standards				
Were all percent recoveries within the 30-120% (60-125% for EPA Method 200.8) QC limits?	✓			
If the recoveries were outside the limits, was a reanalysis performed?			✓	
IX. Serial Dilution				
Were all percent differences <10%?			✓	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
X. Target Analyte Quantitation				
Were all reporting limits adjusted to reflect sample dilutions?	✓			
Were all soil samples dry weight corrected?			✓	
XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	✓			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?		✓		
Were target analytes detected in the field duplicates?			✓	
XIII. Field Blanks				
Were field blanks identified in this SDG?		✓		
Were target analytes detected in the field blanks?			✓	

LDC #: 50747D4a

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: ATV

METHOD: Trace metals (EPA SW 846 Method 6010/6020/7000)
An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Low Level calibration)						
LLICV	ICP/MS (Low Level calibration)	Pb	0.515	0.500	103	103	Y
	ICP (Initial calibration)						
ICV	ICP/MS (Initial calibration)	Pb	51.760	50.000	104	104	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV	ICP/MS (Continuing calibration)	Pb	48.581	50.000	97.2	97.2	Y
	CVAA (Continuing calibration)						

ICP-MS TUNE	Calculation	Mass	Actual (Mean Counts / Axis)	Required (Counts / Axis)	Recalculated %RSD	Acceptable (Y/N)
	Mass Axis	59	59.00	± 0.1 AMU	NA	Y
	%RSD	115	185536	≤ 5% RSD	0.823	Y

Comments:

LDC #: 50747D4a

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: ATV

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$

Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$

Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$

Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	µg/L Found / S / I (units)	µg/L True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICSAB	ICP interference check	Pb	94.055	100.00	94.1	94.1	Y
LCS	Laboratory control sample	Pb	95.246	100.00	95.2	95.2	Y
3	Matrix spike	Pb	(SSR-SR) 210.6	250.00	84.2	84.2	Y
	Duplicate						
	Post digestion spike						
	ICP serial dilution						

Comments:

LDC #: 50747D4a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: ATL

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for Pb were recalculated and verified using the following equation:

Concentration = (RD)(FV)(Dil) / (In. Vol.)

Recalculation: #2

Pb = 0.592

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

#	Sample ID	Analyte	Reported Concentration (µg/L)	Calculated Concentration (µg/L)	Acceptable (Y/N)
	2	Pb	0.59	0.592	Y

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 17, 2021

Parameters: Dissolved Organic Carbon

Validation Level: Stage 2B & 4

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 96222

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1359	BA32813	Water	05/19/21
ERH1360**	BA32814**	Water	05/19/21
ERH1359MS	BA32813MS	Water	05/19/21
ERH1359MSD	BA32813MSD	Water	05/19/21
ERH1359DUP	BA32813DUP	Water	05/19/21

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019), and the DoD General Validation Guidelines (November 2019). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Dissolved Organic Carbon by Environmental Protection Agency (EPA) SW Method 9060A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was not detected and the associated numerical value is approximate.

X (Exclusion of data recommended): The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Exclusion of the data is recommended.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

a ICP Serial Dilution %D was not within control limits.

b Presumed contamination from preparation (method blank).

c Calibration %RSD, r, r^2, %D or %R was noncompliant.

d The analysis with this flag should not be used because another more technically sound analysis is available.

e MS/MSD or Duplicate RPD was high.

f Presumed contamination from FB or ER.

g ICP ICS results were unsatisfactory.

h Holding times were exceeded.

i Internal standard performance was unsatisfactory.

k Estimated Maximum Possible Concentration (HRGC/HRMS only)

l LCS/LCSD %R was not within control limits.

m Result exceeded the calibration range.

o Cooler temperature or temperature blank was noncompliant and/or sample custody problems.

p RPD between two columns was high (GC only).

q MS/MSD recovery was not within control limits.

s Surrogate recovery was not within control limits.

t Presumed contamination from trip blank.

v Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

w LCS/LCSD RPD was high.

y Chemical recovery was not within control limits (Radiochemistry only).

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

All target analyte quantitation met validation criteria for samples which underwent Stage 4validation. Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Dissolved Organic Carbon - Data Qualification Summary - SDG 96222

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Dissolved Organic Carbon - Laboratory Blank Data Qualification Summary - SDG 96222

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Dissolved Organic Carbon - Field Blank Data Qualification Summary - SDG 96222

No Sample Data Qualified in this SDG

LDC #: 50747D6
SDG #: 96222
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 6/16/21
Page: 1 of 1
Reviewer: ATV
2nd Reviewer: [illegible]

METHOD: (Analyte) DOC (EPA SW846 Method 9060A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	(3,4)
VII.	Duplicate sample analysis	A	5
VIII.	Laboratory control samples	A	LCS / LCSD
IX.	Field duplicates	N	
X.	Target Analyte Quantitation	A	Not reviewed for Stage 2B validation.
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	ERH1359	BA32813	Water	05/19/21
2	ERH1360**	BA32814**	Water	05/19/21
3	ERH1359MS	BA32813MS	Water	05/19/21
4	ERH1359MSD	BA32813MSD	Water	05/19/21
5	ERH1359DUP	BA32813DUP	Water	05/19/21
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Notes:

METHOD: Inorganics				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	✓			
II. Calibration				
Were all instruments calibrated at the required frequency?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verifications within the QC limits?	✓			
Were all initial calibration correlation coefficients within limits as specifed by the method?	✓			
Were balance checks performed as required?			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks?		✓		
Was there contamination in the initial and continuing calibration blanks?		✓		
IV. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries within the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	✓			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?	✓			
V. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	✓			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	✓			
X. Target Analyte Quantitation				
Were all reporting limits adjusted to reflect sample dilutions?	✓			
Were all soil samples dry weight corrected?			✓	
XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	✓			

METHOD: Inorganics				
Validation Area	**Yes**	**No**	**NA**	**Comments**
XII. Field Duplicates				
Were field duplicates identifed in this SDG?		✓		
Were target analytes detected in the field duplicates?			✓	
XIII. Field Blanks				
Were field blanks identified in this SDG?		✓		
Were target analytes detected in the field blanks?			✓	

LDC #: 50747D6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer:__ATL__

Method: Inorganics, Method ___See Cover_____

The correlation coefficient (r) for the calibration of _DOC____ was recalculated.Calibration date:__06/11/20_____

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found X 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	FOUND Standard	TRUE Conc. (mg/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	DOC	s1	0.0	6172	*0.99990*	*0.99990*	Y
		s2	0.5	13120			
		s3	2	30622			
		s4	5	66151			
		s5	10	126505			
		s6	20	241922			
ICV Calibration verification	DOC	4.983	5.000		99.7	99.8	Y
CCV Calibration verification	DOC	5.041	5.000		100.8	101.4	Y
CCV Calibration verification	DOC	5.038	5.000		100.8	101.3	Y

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 50747D6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: ATL

METHOD: Inorganics, Method see cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	mg/L Found / S (units)	mg/L True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	DOC	5.026	5.000	101	101	Y
3	Matrix spike sample	DOC	(SSR-SR) 4.793	5.000	96	103	Y
5	Duplicate sample	DOC	0.721	0.845	16	19	Y

Comments:

LDC #: 50747D6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: ATL

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments?
Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for DOC reported with a positive detect were recalculated and verified using the following equation:

Concentration = Recalculation:

$$4951 \times (8.122 \times 10^{-5}) = 0.402$$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
	2	DOC	0.28	0.402	Y

Note:

LDC Report# 50747D8

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 17, 2021

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Stage 2B & 4

Laboratory: APPL, Inc./Energy Laboratories

Sample Delivery Group (SDG): 96222/B21051886

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1359	BA32813/B21051886-001	Water	05/19/21
ERH1360**	BA32814/B21051886-002**	Water	05/19/21

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019), the DoD General Validation Guidelines (November 2019), and the U.S. Department of Defense (DoD) Data Validation Guidelines Module 4: Data Validation Procedure for Organic Analysis by GC (March 2021). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015C

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was not detected and the associated numerical value is approximate.

X (Exclusion of data recommended): The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Exclusion of the data is recommended.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

a ICP Serial Dilution %D was not within control limits.

b Presumed contamination from preparation (method blank).

c Calibration %RSD, r, r^2, %D or %R was noncompliant.

d The analysis with this flag should not be used because another more technically sound analysis is available.

e MS/MSD or Duplicate RPD was high.

f Presumed contamination from FB or ER.

g ICP ICS results were unsatisfactory.

h Holding times were exceeded.

i Internal standard performance was unsatisfactory.

k Estimated Maximum Possible Concentration (HRGC/HRMS only)

l LCS/LCSD %R was not within control limits.

m Result exceeded the calibration range.

o Cooler temperature or temperature blank was noncompliant and/or sample custody problems.

p RPD between two columns was high (GC only).

q MS/MSD recovery was not within control limits.

s Surrogate recovery was not within control limits.

t Presumed contamination from trip blank.

v Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

w LCS/LCSD RPD was high.

y Chemical recovery was not within control limits (Radiochemistry only).

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
All samples in SDG 96222/B21051886	All analytes	Cooler temperature was reported at 10.1°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	UJ (all non-detects)	A

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

All target analyte quantitations met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to cooler temperature, data were qualified as estimated in two samples.

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 96222/B21051886

Sample	Analyte	Flag	A or P	Reason (Code)
ERH1359 ERH1360**	All analytes	UJ (all non-detects)	A	Sample receipt (cooler temperature) (o)

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 96222/B21051886

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 96222/B21051886

No Sample Data Qualified in this SDG

LDC #: 50747D8

SDG #: 96222/B21051886

Laboratory: Energy Laboratories

APPL

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015C)

VALIDATION COMPLETENESS WORKSHEET

Stage 2B/4

Date: 6/16/21

Page: 1 of 1

Reviewer: FT

2nd Reviewer: FC

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	SW/A	✓
II.	Initial calibration/ICV	A/A	~~%RSD ≤ 20~~ ICV ≤ 20
III.	Continuing calibration	A	F7 CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Target analyte quantitation	A	Not reviewed for Stage 2B validation.
XI.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID	SUB-LAB	Lab ID	Matrix	Date
1	ERH1359	B21051886-001	BA32813	Water	05/19/21
2	ERH1360**	B21051886-002	BA32814**	Water	05/19/21
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Notes:

	155811						

LDC #: 50747D8

VALIDATION FINDINGS CHECKLIST

Reviewer: FT

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?		✓		
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%? PM	✓		✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?	✓		✓	
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
V. Field Blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed per analytical or extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Target analyte quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Wereanalyte quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target analyte identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 50147D8

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: FT

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD : ✓ GC ___ HPLC (8)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
All	cooler	temp	= 10.1°C				J-/UJ/A (ND)

TECHNICAL HOLDING TIME CRITERIA

VOLATILES:	Water unpreserved:	Aromatic within 7 days, non-aromatic within 14 days of sample collection.
	Water preserved:	Both within 14 days of sample collection.
	Soils:	Both within 14 days of sample collection.
	Encores unpreserved:	Both within 48 hours of sample collection.
	Encores preserved:	Both within 14 days of sample collection.
EXTRACTABLES:		
	Water:	Extracted within 7 days, analyzed within 40 days.
	Soil:	Extracted within 14 days, analyzed within 40 days.

LDC#: 50747D8

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: F7

Method: 8015C

Calibration Date	System	Compound	Standard	(Y) Response	(X) Concentration
1/8/2021	GC HP51	Total Extractable Hydrocarbons	1	3979014	150
			2	1.14E+08	3750
			3	4.53E+08	15000
			5	1.15E+09	37500
			5	1.47E+09	50000

Regression Output	*Calculated*	*Reported*
Constant	*0.000000*	*0.000000*
Std Err of Y Est		
R Squared	*0.999624*	*0.998587*
Degrees of Freedom		
X Coefficient(s)	*29816.57275560*	*29457.330000*
Std Err of Coef.		
Correlation Coefficient	*0.999812*	
Coefficient of Determination (r^2)	*0.999624*	*0.998587*

LDC #: 50747D8

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %R	Recalculated %R
1	CCV 1144	5/27/21	Total Extractable Hydrocarbons	15	16.59378	16.59378	111	111
2	CCV 930	5/27/21	↓	↓	16.19413	16.19413	108	108
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 50747D8

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT

METHOD: ✓ **GC** ___ **HPLC**

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #2

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
O- Terphenyl		0.198	0.176	89.0	89.0	0

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C`	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 50747PY

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT

METHOD: ✓ GC ___HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples:_____

Compound	Spike Added (mg/L)		Spike Sample Concentration (mg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Total Extractable Hydrocarbons	15	NA	13.41519	NA	89	89	NA	—		

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 50747D8

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT

METHOD: ✓ GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= (A)(Fv)(Df) / (RF)(Vs or Ws)(%S/100)

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. LCS Compound Name TPHE

Concentration = $\frac{1.983193 \times 10^8 \ (2)(1000)}{29457.33 \ (1000)}$ = 13,464 mg/L

#	Sample ID	Compound	Reported Concentrations (mg/L)	Recalculated Results Concentrations (mg/L)	Qualifications
	LCS	TPHE	13.41519	13,464	

Comments:

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **200.8**													
ERH1355	BA31078	1	LEAD	4/21/2021 9:15:00 AM	4/26/2021 7:09:00 PM	3		UG_L	U	0.2	0.18	U	
ERH1356	BA31079	1	LEAD	4/21/2021 9:45:00 AM	4/26/2021 7:16:00 PM	3	0.17	UG_L	J	0.2	0.18	J	
METHOD: **524.2**													
ERH1354	BA31077	1	1,1,1,2-TETRACHLORO ETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.12	UJ	v
ERH1354	BA31077	1	1,1,1-TRICHLOROETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.16	UJ	v
ERH1354	BA31077	1	1,1,2,2-TETRACHLOROETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.24	UJ	v
ERH1354	BA31077	1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.04	UJ	v
ERH1354	BA31077	1	1,1,2-TRICHLOROETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.32	UJ	v
ERH1354	BA31077	1	1,1-DICHLOROETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.08	UJ	v
ERH1354	BA31077	1	1,1-DICHLOROETHENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.16	UJ	v
ERH1354	BA31077	1	1,1-DICHLOROPROPENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.24	UJ	v
ERH1354	BA31077	1	1,2,3-TRICHLOROBENZENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.24	UJ	v
ERH1354	BA31077	1	1,2,3-TRICHLOROPROPANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.36	UJ	v
ERH1354	BA31077	1	1,2,4-TRICHLOROBENZENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.20	UJ	v
ERH1354	BA31077	1	1,2,4-TRIMETHYLBENZENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.45	UJ	v
ERH1354	BA31077	1	1,2-DIBROMO-3-CHLOROPROPANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	5.0	0.92	UJ	v
ERH1354	BA31077	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.20	UJ	v
ERH1354	BA31077	1	1,2-DICHLOROBENZENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.12	UJ	v
ERH1354	BA31077	1	1,2-DICHLOROETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.16	UJ	v
ERH1354	BA31077	1	1,2-DICHLOROPROPANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.24	UJ	v
ERH1354	BA31077	1	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.08	UJ	v
ERH1354	BA31077	1	1,3-DICHLOROBENZENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.12	UJ	v
ERH1354	BA31077	1	1,3-DICHLOROPROPANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.16	UJ	v
ERH1354	BA31077	1	1,4-DICHLOROBENZENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.12	UJ	v
ERH1354	BA31077	1	2,2-DICHLOROPROPANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.16	UJ	v

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **524.2**													
ERH1354	BA31077	1	2-CHLOROTOLUENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.12	UJ	v
ERH1354	BA31077	1	4-CHLOROTOLUENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.08	UJ	v
ERH1354	BA31077	1	BENZENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.12	UJ	v
ERH1354	BA31077	1	BROMOBENZENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.24	UJ	v
ERH1354	BA31077	1	BROMOCHLOROMETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.12	UJ	v
ERH1354	BA31077	1	BROMODICHLOROMETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.08	UJ	v
ERH1354	BA31077	1	BROMOFORM	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.20	UJ	v
ERH1354	BA31077	1	BROMOMETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.40	UJ	v
ERH1354	BA31077	1	CARBON TETRACHLORIDE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.2	0.18	UJ	v
ERH1354	BA31077	1	CHLOROBENZENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.20	UJ	v
ERH1354	BA31077	1	CHLOROETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.40	UJ	v
ERH1354	BA31077	1	CHLOROFORM	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.16	UJ	v
ERH1354	BA31077	1	CHLOROMETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.20	UJ	v
ERH1354	BA31077	1	CIS-1,2-DICHLOROETHYLENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.08	UJ	v
ERH1354	BA31077	1	CIS-1,3-DICHLOROPROPENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.12	UJ	v
ERH1354	BA31077	1	CYMENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.12	UJ	v
ERH1354	BA31077	1	DIBROMOCHLOROMETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.12	UJ	v
ERH1354	BA31077	1	DIBROMOMETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.32	UJ	v
ERH1354	BA31077	1	DICHLORODIFLUOROMETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.36	UJ	v
ERH1354	BA31077	1	ETHYLBENZENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.12	UJ	v
ERH1354	BA31077	1	HEXACHLOROBUTADIENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.20	UJ	v
ERH1354	BA31077	1	ISOPROPYLBENZENE (CUMENE)	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.16	UJ	v
ERH1354	BA31077	1	METHYLENE CHLORIDE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.45	UJ	v
ERH1354	BA31077	1	NAPHTHALENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.24	UJ	v
ERH1354	BA31077	1	N-BUTYLBENZENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.16	UJ	v
ERH1354	BA31077	1	N-PROPYLBENZENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.16	UJ	v
ERH1354	BA31077	1	SEC-BUTYLBENZENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.16	UJ	v

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **524.2**													
ERH1354	BA31077	1	STYRENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.24	UJ	v
ERH1354	BA31077	1	T-BUTYLBENZENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.04	UJ	v
ERH1354	BA31077	1	TERT-BUTYL METHYL ETHER	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.47	UJ	v
ERH1354	BA31077	1	TETRACHLOROETHYLENE(PCE)	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.2	0.20	UJ	v
ERH1354	BA31077	1	TOLUENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.40	UJ	v
ERH1354	BA31077	1	TRANS-1,2-DICHLOROETHENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.16	UJ	v
ERH1354	BA31077	1	TRANS-1,3-DICHLOROPROPENE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.12	UJ	v
ERH1354	BA31077	1	TRICHLOROETHYLENE (TCE)	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.2	0.12	UJ	v
ERH1354	BA31077	1	TRICHLOROFLUOROMETHANE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.20	UJ	v
ERH1354	BA31077	1	VINYL CHLORIDE	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.16	UJ	v
ERH1354	BA31077	1	Xylenes	4/21/2021 9:00:00 AM	4/26/2021 7:35:00 PM	3		UG_L	U	0.5	0.44	UJ	v
ERH1355	BA31078	1	1,1,1,2-TETRACHLORO ETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1355	BA31078	1	1,1,1-TRICHLOROETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1355	BA31078	1	1,1,2,2-TETRACHLOROETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.24	U	
ERH1355	BA31078	1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.04	U	
ERH1355	BA31078	1	1,1,2-TRICHLOROETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.32	U	
ERH1355	BA31078	1	1,1-DICHLOROETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.08	U	
ERH1355	BA31078	1	1,1-DICHLOROETHENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1355	BA31078	1	1,1-DICHLOROPROPENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.24	U	
ERH1355	BA31078	1	1,2,3-TRICHLOROBENZENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.24	U	
ERH1355	BA31078	1	1,2,3-TRICHLOROPROPANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.36	U	
ERH1355	BA31078	1	1,2,4-TRICHLOROBENZENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.20	U	
ERH1355	BA31078	1	1,2,4-TRIMETHYLBENZENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.45	U	
ERH1355	BA31078	1	1,2-DIBROMO-3-CHLOROPROPANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	5.0	0.92	U	
ERH1355	BA31078	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.20	U	
ERH1355	BA31078	1	1,2-DICHLOROBENZENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1355	BA31078	1	1,2-DICHLOROETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.16	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **524.2**													
ERH1355	BA31078	1	1,2-DICHLOROPROPANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.24	U	
ERH1355	BA31078	1	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.08	U	
ERH1355	BA31078	1	1,3-DICHLOROBENZENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1355	BA31078	1	1,3-DICHLOROPROPANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1355	BA31078	1	1,4-DICHLOROBENZENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1355	BA31078	1	2,2-DICHLOROPROPANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1355	BA31078	1	2-CHLOROTOLUENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1355	BA31078	1	4-CHLOROTOLUENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.08	U	
ERH1355	BA31078	1	BENZENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1355	BA31078	1	BROMOBENZENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.24	U	
ERH1355	BA31078	1	BROMOCHLOROMETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1355	BA31078	1	BROMODICHLOROMETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.08	U	
ERH1355	BA31078	1	BROMOFORM	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.20	U	
ERH1355	BA31078	1	BROMOMETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.40	U	
ERH1355	BA31078	1	CARBON TETRACHLORIDE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.2	0.18	U	
ERH1355	BA31078	1	CHLOROBENZENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.20	U	
ERH1355	BA31078	1	CHLOROETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.40	U	
ERH1355	BA31078	1	CHLOROFORM	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1355	BA31078	1	CHLOROMETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.20	U	
ERH1355	BA31078	1	CIS-1,2-DICHLOROETHYLENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.08	U	
ERH1355	BA31078	1	CIS-1,3-DICHLOROPROPENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1355	BA31078	1	CYMENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1355	BA31078	1	DIBROMOCHLOROMETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1355	BA31078	1	DIBROMOMETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.32	U	
ERH1355	BA31078	1	DICHLORODIFLUOROMETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.36	U	
ERH1355	BA31078	1	ETHYLBENZENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1355	BA31078	1	HEXACHLOROBUTADIENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.20	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **524.2**													
ERH1355	BA31078	1	ISOPROPYLBENZENE (CUMENE)	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1355	BA31078	1	METHYLENE CHLORIDE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.45	U	
ERH1355	BA31078	1	NAPHTHALENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.24	U	
ERH1355	BA31078	1	N-BUTYLBENZENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1355	BA31078	1	N-PROPYLBENZENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1355	BA31078	1	SEC-BUTYLBENZENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1355	BA31078	1	STYRENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.24	U	
ERH1355	BA31078	1	T-BUTYLBENZENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.04	U	
ERH1355	BA31078	1	TERT-BUTYL METHYL ETHER	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.47	U	
ERH1355	BA31078	1	TETRACHLOROETHYLENE(PCE)	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.2	0.20	U	
ERH1355	BA31078	1	TOLUENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.40	U	
ERH1355	BA31078	1	TRANS-1,2-DICHLOROETHENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1355	BA31078	1	TRANS-1,3-DICHLOROPROPENE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1355	BA31078	1	TRICHLOROETHYLENE (TCE)	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.2	0.12	U	
ERH1355	BA31078	1	TRICHLOROFLUOROMETHANE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.20	U	
ERH1355	BA31078	1	VINYL CHLORIDE	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1355	BA31078	1	Xylenes	4/21/2021 9:15:00 AM	4/26/2021 8:03:00 PM	3		UG_L	U	0.5	0.44	U	
ERH1356	BA31079	1	1,1,1,2-TETRACHLORO ETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1356	BA31079	1	1,1,1-TRICHLOROETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1356	BA31079	1	1,1,2,2-TETRACHLOROETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.24	U	
ERH1356	BA31079	1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.04	U	
ERH1356	BA31079	1	1,1,2-TRICHLOROETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.32	U	
ERH1356	BA31079	1	1,1-DICHLOROETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.08	U	
ERH1356	BA31079	1	1,1-DICHLOROETHENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1356	BA31079	1	1,1-DICHLOROPROPENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.24	U	
ERH1356	BA31079	1	1,2,3-TRICHLOROBENZENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.24	U	
ERH1356	BA31079	1	1,2,3-TRICHLOROPROPANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.36	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **524.2**													
ERH1356	BA31079	1	1,2,4-TRICHLOROBENZENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.20	U	
ERH1356	BA31079	1	1,2,4-TRIMETHYLBENZENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.45	U	
ERH1356	BA31079	1	1,2-DIBROMO-3-CHLOROPROPANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	5.0	0.92	U	
ERH1356	BA31079	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.20	U	
ERH1356	BA31079	1	1,2-DICHLOROBENZENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1356	BA31079	1	1,2-DICHLOROETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1356	BA31079	1	1,2-DICHLOROPROPANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.24	U	
ERH1356	BA31079	1	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.08	U	
ERH1356	BA31079	1	1,3-DICHLOROBENZENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1356	BA31079	1	1,3-DICHLOROPROPANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1356	BA31079	1	1,4-DICHLOROBENZENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1356	BA31079	1	2,2-DICHLOROPROPANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1356	BA31079	1	2-CHLOROTOLUENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1356	BA31079	1	4-CHLOROTOLUENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.08	U	
ERH1356	BA31079	1	BENZENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1356	BA31079	1	BROMOBENZENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.24	U	
ERH1356	BA31079	1	BROMOCHLOROMETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1356	BA31079	1	BROMODICHLOROMETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.08	U	
ERH1356	BA31079	1	BROMOFORM	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.20	U	
ERH1356	BA31079	1	BROMOMETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.40	U	
ERH1356	BA31079	1	CARBON TETRACHLORIDE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.2	0.18	U	
ERH1356	BA31079	1	CHLOROBENZENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.20	U	
ERH1356	BA31079	1	CHLOROETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.40	U	
ERH1356	BA31079	1	CHLOROFORM	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1356	BA31079	1	CHLOROMETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.20	U	
ERH1356	BA31079	1	CIS-1,2-DICHLOROETHYLENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.08	U	
ERH1356	BA31079	1	CIS-1,3-DICHLOROPROPENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.12	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **524.2**													
ERH1356	BA31079	1	CYMENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1356	BA31079	1	DIBROMOCHLOROMETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1356	BA31079	1	DIBROMOMETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.32	U	
ERH1356	BA31079	1	DICHLORODIFLUOROMETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.36	U	
ERH1356	BA31079	1	ETHYLBENZENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1356	BA31079	1	HEXACHLOROBUTADIENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.20	U	
ERH1356	BA31079	1	ISOPROPYLBENZENE (CUMENE)	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1356	BA31079	1	METHYLENE CHLORIDE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.45	U	
ERH1356	BA31079	1	NAPHTHALENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.24	U	
ERH1356	BA31079	1	N-BUTYLBENZENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1356	BA31079	1	N-PROPYLBENZENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1356	BA31079	1	SEC-BUTYLBENZENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1356	BA31079	1	STYRENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.24	U	
ERH1356	BA31079	1	T-BUTYLBENZENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.04	U	
ERH1356	BA31079	1	TERT-BUTYL METHYL ETHER	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.47	U	
ERH1356	BA31079	1	TETRACHLOROETHYLENE(PCE)	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.2	0.20	U	
ERH1356	BA31079	1	TOLUENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.40	U	
ERH1356	BA31079	1	TRANS-1,2-DICHLOROETHENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1356	BA31079	1	TRANS-1,3-DICHLOROPROPENE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.12	U	
ERH1356	BA31079	1	TRICHLOROETHYLENE (TCE)	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.2	0.12	U	
ERH1356	BA31079	1	TRICHLOROFLUOROMETHANE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.20	U	
ERH1356	BA31079	1	VINYL CHLORIDE	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.16	U	
ERH1356	BA31079	1	Xylenes	4/21/2021 9:45:00 AM	4/26/2021 8:31:00 PM	3		UG_L	U	0.5	0.44	U	
METHOD: **5310C**													
ERH1355	BA31078	1	DISSOLVED ORGANIC CARBON	4/21/2021 9:15:00 AM	4/24/2021 4:41:00 AM	3	0.27	MG_L	J	0.5	0.35	J	
ERH1356	BA31079	1	DISSOLVED ORGANIC CARBON	4/21/2021 9:45:00 AM	6/11/2021 3:50:00 PM	3	0.34	MG_L	J	0.5	0.35	J	h
METHOD: **8015C**													

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **8015C**													
ERH1355	B210420164		C10-C25 DIESEL RANGE ORGANICS	4/21/2021 9:15:00 AM	4/29/2021 6:54:00 PM	3		MG/L	U		0.3	U	
ERH1355	B210420164		C8-C18 PETROLEUM HYDROCARBONS	4/21/2021 9:15:00 AM	4/29/2021 6:54:00 PM	3		MG/L	U		0.3	U	
ERH1356	B210420164		C10-C25 DIESEL RANGE ORGANICS	4/21/2021 9:45:00 AM	4/29/2021 7:36:00 PM	3		MG/L	U		0.3	U	
ERH1356	B210420164		C8-C18 PETROLEUM HYDROCARBONS	4/21/2021 9:45:00 AM	4/29/2021 7:36:00 PM	3		MG/L	U		0.3	U	

Red Hill Bulk Storage Facility, CTO 18F0126 - SDG 96222/B21051886

AECOM

LDC 50747

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **200.8**													
ERH1359	BA32813	1	LEAD	5/19/2021 8:05:00 AM	6/3/2021 3:14:00 AM	3	0.18	UG_L	U	0.2	0.18	U	
ERH1360	BA32814	1	LEAD	5/19/2021 8:55:00 AM	6/3/2021 3:21:00 AM	4	0.59	UG_L		0.2	0.18		
METHOD: **524.2**													
ERH1359	BA32813	1	1,1,1,2-TETRACHLORO ETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.12	UG_L	U	0.5	0.12	U	
ERH1359	BA32813	1	1,1,1-TRICHLOROETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.16	UG_L	U	0.5	0.16	U	
ERH1359	BA32813	1	1,1,2,2-TETRACHLOROETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.24	UG_L	U	0.5	0.24	U	
ERH1359	BA32813	1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.04	UG_L	U	0.5	0.04	U	
ERH1359	BA32813	1	1,1,2-TRICHLOROETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.32	UG_L	U	0.5	0.32	U	
ERH1359	BA32813	1	1,1-DICHLOROETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.08	UG_L	U	0.5	0.08	U	
ERH1359	BA32813	1	1,1-DICHLOROETHENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.16	UG_L	U	0.5	0.16	U	
ERH1359	BA32813	1	1,1-DICHLOROPROPENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.24	UG_L	U	0.5	0.24	U	
ERH1359	BA32813	1	1,2,3-TRICHLOROBENZENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.24	UG_L	U	0.5	0.24	U	
ERH1359	BA32813	1	1,2,3-TRICHLOROPROPANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.36	UG_L	U	0.5	0.36	U	
ERH1359	BA32813	1	1,2,4-TRICHLOROBENZENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.20	UG_L	U	0.5	0.20	U	
ERH1359	BA32813	1	1,2,4-TRIMETHYLBENZENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.45	UG_L	U	0.5	0.45	U	
ERH1359	BA32813	1	1,2-DIBROMO-3-CHLOROPROPANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.92	UG_L	U	2.0	0.92	U	
ERH1359	BA32813	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.20	UG_L	U	0.5	0.20	U	
ERH1359	BA32813	1	1,2-DICHLOROBENZENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.12	UG_L	U	0.5	0.12	U	
ERH1359	BA32813	1	1,2-DICHLOROETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.16	UG_L	U	0.5	0.16	U	
ERH1359	BA32813	1	1,2-DICHLOROPROPANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.24	UG_L	U	0.5	0.24	U	
ERH1359	BA32813	1	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.08	UG_L	U	0.5	0.08	U	
ERH1359	BA32813	1	1,3-DICHLOROBENZENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.12	UG_L	U	0.5	0.12	U	
ERH1359	BA32813	1	1,3-DICHLOROPROPANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.16	UG_L	U	0.5	0.16	U	
ERH1359	BA32813	1	1,4-DICHLOROBENZENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.12	UG_L	U	0.5	0.12	U	
ERH1359	BA32813	1	2,2-DICHLOROPROPANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.16	UG_L	U	0.5	0.16	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **524.2**													
ERH1359	BA32813	1	2-CHLOROTOLUENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.12	UG_L	U	0.5	0.12	U	
ERH1359	BA32813	1	4-CHLOROTOLUENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.08	UG_L	U	0.5	0.08	U	
ERH1359	BA32813	1	BENZENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.12	UG_L	U	0.5	0.12	U	
ERH1359	BA32813	1	BROMOBENZENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.24	UG_L	U	0.5	0.24	U	
ERH1359	BA32813	1	BROMOCHLOROMETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.12	UG_L	U	0.5	0.12	U	
ERH1359	BA32813	1	BROMODICHLOROMETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.08	UG_L	U	0.5	0.08	U	
ERH1359	BA32813	1	BROMOFORM	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.20	UG_L	U	0.5	0.20	U	
ERH1359	BA32813	1	BROMOMETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.40	UG_L	U	0.5	0.40	U	
ERH1359	BA32813	1	CARBON TETRACHLORIDE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.18	UG_L	U	0.2	0.18	U	
ERH1359	BA32813	1	CHLOROBENZENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.20	UG_L	U	0.5	0.20	U	
ERH1359	BA32813	1	CHLOROETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.40	UG_L	U	0.5	0.40	U	
ERH1359	BA32813	1	CHLOROFORM	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.16	UG_L	U	0.5	0.16	U	
ERH1359	BA32813	1	CHLOROMETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.20	UG_L	U	0.5	0.20	U	
ERH1359	BA32813	1	CIS-1,2-DICHLOROETHYLENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.08	UG_L	U	0.5	0.08	U	
ERH1359	BA32813	1	CIS-1,3-DICHLOROPROPENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.12	UG_L	U	0.5	0.12	U	
ERH1359	BA32813	1	CYMENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.12	UG_L	U	0.5	0.12	U	
ERH1359	BA32813	1	DIBROMOCHLOROMETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.12	UG_L	U	0.5	0.12	U	
ERH1359	BA32813	1	DIBROMOMETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.32	UG_L	U	0.5	0.32	U	
ERH1359	BA32813	1	DICHLORODIFLUOROMETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.36	UG_L	U	0.5	0.36	U	
ERH1359	BA32813	1	ETHYLBENZENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.12	UG_L	U	0.5	0.12	U	
ERH1359	BA32813	1	HEXACHLOROBUTADIENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.20	UG_L	U	0.5	0.20	U	
ERH1359	BA32813	1	ISOPROPYLBENZENE (CUMENE)	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.16	UG_L	U	0.5	0.16	U	
ERH1359	BA32813	1	METHYLENE CHLORIDE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.45	UG_L	U	0.5	0.45	U	
ERH1359	BA32813	1	NAPHTHALENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.24	UG_L	U	0.5	0.24	U	
ERH1359	BA32813	1	N-BUTYLBENZENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.16	UG_L	U	0.5	0.16	U	
ERH1359	BA32813	1	N-PROPYLBENZENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.16	UG_L	U	0.5	0.16	U	
ERH1359	BA32813	1	SEC-BUTYLBENZENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.16	UG_L	U	0.5	0.16	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **524.2**													
ERH1359	BA32813	1	STYRENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.24	UG_L	U	0.5	0.24	U	
ERH1359	BA32813	1	T-BUTYLBENZENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.04	UG_L	U	0.5	0.04	U	
ERH1359	BA32813	1	TERT-BUTYL METHYL ETHER	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.47	UG_L	U	0.5	0.47	U	
ERH1359	BA32813	1	TETRACHLOROETHYLENE(PCE)	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.20	UG_L	U	0.2	0.20	U	
ERH1359	BA32813	1	TOLUENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.40	UG_L	U	0.5	0.40	U	
ERH1359	BA32813	1	TRANS-1,2-DICHLOROETHENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.16	UG_L	U	0.5	0.16	U	
ERH1359	BA32813	1	TRANS-1,3-DICHLOROPROPENE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.12	UG_L	U	0.5	0.12	U	
ERH1359	BA32813	1	TRICHLOROETHYLENE (TCE)	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.12	UG_L	U	0.2	0.12	U	
ERH1359	BA32813	1	TRICHLOROFLUOROMETHANE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.20	UG_L	U	0.5	0.20	U	
ERH1359	BA32813	1	VINYL CHLORIDE	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.16	UG_L	U	0.5	0.16	U	
ERH1359	BA32813	1	Xylenes	5/19/2021 8:05:00 AM	5/20/2021 8:16:00 PM	3	0.44	UG_L	U	0.5	0.44	U	
ERH1360	BA32814	1	1,1,1,2-TETRACHLORO ETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.12	UG_L	U	0.5	0.12	U	
ERH1360	BA32814	1	1,1,1-TRICHLOROETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.16	UG_L	U	0.5	0.16	U	
ERH1360	BA32814	1	1,1,2,2-TETRACHLOROETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.24	UG_L	U	0.5	0.24	U	
ERH1360	BA32814	1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.04	UG_L	U	0.5	0.04	U	
ERH1360	BA32814	1	1,1,2-TRICHLOROETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.32	UG_L	U	0.5	0.32	U	
ERH1360	BA32814	1	1,1-DICHLOROETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.08	UG_L	U	0.5	0.08	U	
ERH1360	BA32814	1	1,1-DICHLOROETHENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.16	UG_L	U	0.5	0.16	U	
ERH1360	BA32814	1	1,1-DICHLOROPROPENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.24	UG_L	U	0.5	0.24	U	
ERH1360	BA32814	1	1,2,3-TRICHLOROBENZENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.24	UG_L	U	0.5	0.24	U	
ERH1360	BA32814	1	1,2,3-TRICHLOROPROPANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.36	UG_L	U	0.5	0.36	U	
ERH1360	BA32814	1	1,2,4-TRICHLOROBENZENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.20	UG_L	U	0.5	0.20	U	
ERH1360	BA32814	1	1,2,4-TRIMETHYLBENZENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.45	UG_L	U	0.5	0.45	U	
ERH1360	BA32814	1	1,2-DIBROMO-3-CHLOROPROPANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.92	UG_L	U	2.0	0.92	U	
ERH1360	BA32814	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.20	UG_L	U	0.5	0.20	U	
ERH1360	BA32814	1	1,2-DICHLOROBENZENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.12	UG_L	U	0.5	0.12	U	
ERH1360	BA32814	1	1,2-DICHLOROETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.16	UG_L	U	0.5	0.16	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **524.2**													
ERH1360	BA32814	1	1,2-DICHLOROPROPANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.24	UG_L	U	0.5	0.24	U	
ERH1360	BA32814	1	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.08	UG_L	U	0.5	0.08	U	
ERH1360	BA32814	1	1,3-DICHLOROBENZENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.12	UG_L	U	0.5	0.12	U	
ERH1360	BA32814	1	1,3-DICHLOROPROPANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.16	UG_L	U	0.5	0.16	U	
ERH1360	BA32814	1	1,4-DICHLOROBENZENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.12	UG_L	U	0.5	0.12	U	
ERH1360	BA32814	1	2,2-DICHLOROPROPANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.16	UG_L	U	0.5	0.16	U	
ERH1360	BA32814	1	2-CHLOROTOLUENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.12	UG_L	U	0.5	0.12	U	
ERH1360	BA32814	1	4-CHLOROTOLUENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.08	UG_L	U	0.5	0.08	U	
ERH1360	BA32814	1	BENZENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.12	UG_L	U	0.5	0.12	U	
ERH1360	BA32814	1	BROMOBENZENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.24	UG_L	U	0.5	0.24	U	
ERH1360	BA32814	1	BROMOCHLOROMETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.12	UG_L	U	0.5	0.12	U	
ERH1360	BA32814	1	BROMODICHLOROMETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.08	UG_L	U	0.5	0.08	U	
ERH1360	BA32814	1	BROMOFORM	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.20	UG_L	U	0.5	0.20	U	
ERH1360	BA32814	1	BROMOMETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.40	UG_L	U	0.5	0.40	U	
ERH1360	BA32814	1	CARBON TETRACHLORIDE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.18	UG_L	U	0.2	0.18	U	
ERH1360	BA32814	1	CHLOROBENZENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.20	UG_L	U	0.5	0.20	U	
ERH1360	BA32814	1	CHLOROETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.40	UG_L	U	0.5	0.40	U	
ERH1360	BA32814	1	CHLOROFORM	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.16	UG_L	U	0.5	0.16	U	
ERH1360	BA32814	1	CHLOROMETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.20	UG_L	U	0.5	0.20	U	
ERH1360	BA32814	1	CIS-1,2-DICHLOROETHYLENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.08	UG_L	U	0.5	0.08	U	
ERH1360	BA32814	1	CIS-1,3-DICHLOROPROPENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.12	UG_L	U	0.5	0.12	U	
ERH1360	BA32814	1	CYMENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.12	UG_L	U	0.5	0.12	U	
ERH1360	BA32814	1	DIBROMOCHLOROMETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.12	UG_L	U	0.5	0.12	U	
ERH1360	BA32814	1	DIBROMOMETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.32	UG_L	U	0.5	0.32	U	
ERH1360	BA32814	1	DICHLORODIFLUOROMETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.36	UG_L	U	0.5	0.36	U	
ERH1360	BA32814	1	ETHYLBENZENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.12	UG_L	U	0.5	0.12	U	
ERH1360	BA32814	1	HEXACHLOROBUTADIENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.20	UG_L	U	0.5	0.20	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **524.2**													
ERH1360	BA32814	1	ISOPROPYLBENZENE (CUMENE)	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.16	UG_L	U	0.5	0.16	U	
ERH1360	BA32814	1	METHYLENE CHLORIDE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.45	UG_L	U	0.5	0.45	U	
ERH1360	BA32814	1	NAPHTHALENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.24	UG_L	U	0.5	0.24	U	
ERH1360	BA32814	1	N-BUTYLBENZENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.16	UG_L	U	0.5	0.16	U	
ERH1360	BA32814	1	N-PROPYLBENZENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.16	UG_L	U	0.5	0.16	U	
ERH1360	BA32814	1	SEC-BUTYLBENZENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.16	UG_L	U	0.5	0.16	U	
ERH1360	BA32814	1	STYRENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.24	UG_L	U	0.5	0.24	U	
ERH1360	BA32814	1	T-BUTYLBENZENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.04	UG_L	U	0.5	0.04	U	
ERH1360	BA32814	1	TERT-BUTYL METHYL ETHER	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.47	UG_L	U	0.5	0.47	U	
ERH1360	BA32814	1	TETRACHLOROETHYLENE(PCE)	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.20	UG_L	U	0.2	0.20	U	
ERH1360	BA32814	1	TOLUENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.40	UG_L	U	0.5	0.40	U	
ERH1360	BA32814	1	TRANS-1,2-DICHLOROETHENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.16	UG_L	U	0.5	0.16	U	
ERH1360	BA32814	1	TRANS-1,3-DICHLOROPROPENE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.12	UG_L	U	0.5	0.12	U	
ERH1360	BA32814	1	TRICHLOROETHYLENE (TCE)	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.12	UG_L	U	0.2	0.12	U	
ERH1360	BA32814	1	TRICHLOROFLUOROMETHANE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.20	UG_L	U	0.5	0.20	U	
ERH1360	BA32814	1	VINYL CHLORIDE	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.16	UG_L	U	0.5	0.16	U	
ERH1360	BA32814	1	Xylenes	5/19/2021 8:55:00 AM	5/20/2021 8:44:00 PM	4	0.44	UG_L	U	0.5	0.44	U	
METHOD: **5310C**													
ERH1359	BA32813	1	DISSOLVED ORGANIC CARBON	5/19/2021 8:05:00 AM	5/21/2021 3:06:00 PM	3	0.61	MG_L		0.5	0.35		
ERH1360	BA32814	1	DISSOLVED ORGANIC CARBON	5/19/2021 8:55:00 AM	5/21/2021 4:58:00 PM	4	0.28	MG_L	J	0.5	0.35	J	
METHOD: **8015C**													
ERH1359	B210518861		C10-C25 DIESEL RANGE ORGANICS	5/19/2021 8:05:00 AM	5/27/2021 2:33:00 PM	3		MG/L	U		0.31	UJ	o
ERH1359	B210518861		C8-C18 PETROLEUM HYDROCARBONS	5/19/2021 8:05:00 AM	5/27/2021 2:33:00 PM	3		MG/L	U		0.31	UJ	o
ERH1360	B210518861		C10-C25 DIESEL RANGE ORGANICS	5/19/2021 8:55:00 AM	5/27/2021 3:15:00 PM	4		MG/L	U		0.3	UJ	o
ERH1360	B210518861		C8-C18 PETROLEUM HYDROCARBONS	5/19/2021 8:55:00 AM	5/27/2021 3:15:00 PM	4		MG/L	U		0.3	UJ	o