SAF-RC-009
ERDF Full List Leachate Analysis
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

No Distribution Required KW 9/2/16
INITIAL/DATE

COMMENTS:

SDG J02198 **SAF-RC-009**

ERDF Leachate Tank, Summer 2016

Date: 17 August 2016
Project: ERDF Full List Leachate Analysis - July 2016
Subject: Radiochemistry & Hexavalent Chromium - Data Package No. J02198-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. J02198 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V931	07/20/16	Water	C	See note 1
J1V932	07/20/16	Water	C	See note 1

1 - Gamma spectroscopy, carbon-14, Iodine-129, gross alpha/beta, total radium, total uranium, technetium-99, tritium, & Hexavalent Chromium.

Data validation was conducted in accordance with the validation procedures identified in the references and WCH-173, Rev. 2, "Environmental Restoration Disposal Facility Leachate Sampling and Analysis Plan". Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data

DATA QUALITY PARAMETERS

Holding Times

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months. The maximum holding time for hexavalent chromium in water is 24 hours.

All holding times were acceptable.

Preparation (Method) Blanks

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA) or reporting limit (RL), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA or RL are qualified as undetected and flagged "U"; sample

results above the MDA or RL and greater than five times the highest blank concentration are not qualified.

All laboratory blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

Accuracy

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS recovery range is 70-130% and the acceptable matrix spike recovery is range 75-125%. For matrix spikes, if the concentration of the analyte is > 4 times the spike amount, no qualification for recovery outside the acceptance range is required. In addition, samples may be spiked with a carrier or radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 30% to 110%. The acceptable range for carrier recovery is 40% to 110%. Carrier or tracer recoveries greater than 110% are not qualified for non-detected results. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

Due to the lack of a matrix spike analysis, all tritium and carbon-14 results were qualified as estimates and flagged "J".

Due to the lack of an LCS analysis, all plutonium-238, thorium-228, and thorium-232 results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Laboratory Duplicates

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 20%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicates

Samples J1V931 and J1V932 are field duplicates.

The field RPD for Tc-99 was 22.8%. Under the validation guidelines, no qualification was required.

All other duplicate results were acceptable.

Detection Levels

Reported analytical detection levels for undetected analytes are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

Completeness

Data package No.J02198 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the lack of a matrix spike analysis, all tritium and carbon-14 results were qualified as estimates and flagged "J".

- Due to the lack of an LCS analysis, all plutonium-238, thorium-228, and thorium-232 results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH validation guidlines, the data may be used for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

HNF-20433, Rev. 0, *Data Validation Procedures for Chemical Analyses*, June 2004

HNF-20434, Rev. 0, *Data Validation Procedure for Radiological Analyses*, June 2004

WCH-173, Rev. 2, *Environmental Restoration Disposal Facility Leachate Sampling & Analysis Plan,* November 2015

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with validation protocols are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activith (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicated the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor quality control (QC) deficiency identified during the data validation, the associated quantitation limit is an estimate, but is useable for decision making puroposes.

J - Indicated the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are useable for decision making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major ZQC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable doe to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: J02198	REVIEWER: RLW	Project: ERDF	Page 1 of 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Tritium Carbon-14	J	All	No Matrix Spike analysis
Thorium-228 Thorium-232 Plutonium-238	J	All	No LCS analysis

Appendix 3

Annotated Laboratory Reports

Client: Washington Closure Hanford
Project/Site: ERDF Leachate Tank

TestAmerica Job ID: 300-3452-1
SDG: J02198

Client Sample ID: J1V931

Date Collected: 07/12/16 07:20
Date Received: 07/12/16 15:15

Lab Sample ID: 300-3452-1
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.15		0.040	0.0080	mg/L			07/12/16 17:14	1

Client Sample ID: J1V932

Date Collected: 07/12/16 07:20
Date Received: 07/12/16 15:15

Lab Sample ID: 300-3452-2
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.15		0.040	0.0080	mg/L			07/12/16 17:18	1

RLW
8-17-16

Sample Results Summary

Date: 15-Aug-16

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 69157

SDG No: J02198

Batch	Client Id / Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
6197012 C14_CHEM_LSC									
	J1V931								
	M8XLQ1AP	C-14	8.85E+01 +- 1.3E+01	J	pCi/L	100%	1.82E+01	2.00E+02	
	J1V932								
	M8XLR1AP	C-14	8.99E+01 +- 1.3E+01	J	pCi/L	100%	1.80E+01	2.00E+02	
	J1V932 DUP								
	M8XLR1AT	C-14	8.64E+01 +- 1.2E+01		pCi/L	100%	1.80E+01	2.00E+02	3.9
6197018 SRISO_SEP_PRECIP_GPC									
	J1V931								
	M8XLQ1AH	STRONTIUM	9.91E+00 +- 2.8E+00		pCi/L	77%	1.56E+00	2.00E+00	
	J1V932								
	M8XLR1AH	STRONTIUM	8.91E+00 +- 2.6E+00		pCi/L	76%	1.42E+00	2.00E+00	
	J1V932 DUP								
	M8XLR1A1	STRONTIUM	8.54E+00 +- 2.5E+00		pCi/L	75%	1.50E+00	2.00E+00	4.3
6197024 RL-ALP-002									
	J1V931								
	M8XLQ1AK	PU-238	-2.59E-02 +- 3.7E-01	U J	pCi/L	95%	7.27E-01	1.00E+00	
		PU239/40	1.80E-01 +- 3.7E-01	U	pCi/L	95%	5.85E-01	1.00E+00	
	J1V931 DUP								
	M8XLQ1A2	PU-238	-9.86E-03 +- 3.3E-01	U	pCi/L	107%	5.79E-01	1.00E+00	-89.6
		PU239/40	-2.30E-02 +- 3.3E-01	U	pCi/L	107%	6.49E-01	1.00E+00	258.5
	J1V932								
	M8XLR1AK	PU-238	0.00E+00 +- 3.3E-01	U J	pCi/L	106%	5.21E-01	1.00E+00	
		PU239/40	-1.64E-02 +- 3.3E-01	U	pCi/L	106%	6.16E-01	1.00E+00	
6197022 THISO_IE_PRECIP_AEA									
	J1V931								
	M8XLQ1AE	TH-228	6.71E-02 +- 1.0E-01	U J	pCi/L	111%	1.34E-01	1.00E+00	
		TH-230	2.99E-02 +- 7.2E-02	U J	pCi/L	111%	1.31E-01	1.00E+00	
		TH-232	-2.85E-03 +- 7.1E-02	U J	pCi/L	111%	1.18E-01	1.00E+00	
	J1V931 DUP								
	M8XLQ1A0	TH-228	0.00E+00 +- 7.1E-02	U	pCi/L	109%	1.20E-01	1.00E+00	200.0
		TH-230	3.46E-02 +- 7.0E-02	U	pCi/L	109%	1.17E-01	1.00E+00	14.6
		TH-232	0.00E+00 +- 6.9E-02	U	pCi/L	109%	1.17E-01	1.00E+00	-200.0
	J1V932								
	M8XLR1AE	TH-228	1.39E-01 +- 1.5E-01	U J	pCi/L	114%	1.55E-01	1.00E+00	
		TH-230	5.91E-02 +- 1.1E-01	U J	pCi/L	114%	1.58E-01	1.00E+00	
		TH-232	0.00E+00 +- 7.4E-02	U J	pCi/L	114%	1.19E-01	1.00E+00	
6197023 UISO_PLATE_AEA									
	J1V931								

TestAmerica Inc

rptTALRchSaSummary2 V5.6 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

11

Sample Results Summary

TestAmerica Inc TARL

RLW 8-17-16

Ordered by Method, Batch No., Client Sample ID.

Date: 15-Aug-16

Report No. : 69157

SDG No: J02198

Batch / Client Id / Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
6197023 UISO_PLATE_AEA								
J1V931								
M8XLQ2AL	U-234	2.39E+02 +- 4.2E+01		pCi/L	90%	4.64E-01	1.00E+00	
	U-235	2.67E+01 +- 5.3E+00		pCi/L	90%	3.26E-01	1.00E+00	
	U-238	2.09E+02 +- 3.7E+01		pCi/L	90%	5.12E-01	1.00E+00	
J1V931 DUP								
M8XLQ2A1	U-234	2.38E+02 +- 4.1E+01		pCi/L	96%	4.15E-01	1.00E+00	0.5
	U-235	2.41E+01 +- 4.8E+00		pCi/L	96%	3.16E-01	1.00E+00	10.1
	U-238	2.21E+02 +- 3.8E+01		pCi/L	96%	4.76E-01	1.00E+00	5.5
J1V932								
M8XLR1AL	U-234	2.41E+02 +- 4.2E+01		pCi/L	95%	3.44E-01	1.00E+00	
	U-235	2.38E+01 +- 4.9E+00		pCi/L	95%	2.70E-01	1.00E+00	
	U-238	2.19E+02 +- 3.9E+01		pCi/L	95%	3.64E-01	1.00E+00	
6197013 I129_SEP_LEPS_GS								
J1V931								
M8XLQ1AR	I129	1.77E-01 +- 2.9E-01	U	pCi/L	84%	5.80E-01	1.00E+00	
J1V932								
M8XLR1AR	I129	3.16E-01 +- 5.0E-01	U	pCi/L	96%	7.66E-01	1.00E+00	
J1V932 DUP								
M8XLR1AU	I129	1.11E-01 +- 5.5E-01	U	pCi/L	99%	1.02E+00	1.00E+00	95.9
6197014 GAMMA LL: COBALT 60 LL								
J1V931								
M8XLQ1AF	AMERICIUM 241	-1.36E+01 +- 1.5E+01	U	pCi/L		2.51E+01		
	CO-60	1.26E+00 +- 2.0E+00	U	pCi/L		3.95E+00	2.50E+01	
	CS-137	-1.68E-01 +- 1.9E+00	U	pCi/L		3.28E+00	1.50E+01	
	EU-152	-1.16E+00 +- 4.7E+00	U	pCi/L		8.16E+00	5.00E+01	
	EU-154	-9.31E-02 +- 5.4E+00	U	pCi/L		1.00E+01	5.00E+01	
	EU-155	9.90E-01 +- 4.6E+00	U	pCi/L		8.18E+00	5.00E+01	
	K-40	-5.38E+01 +- 5.2E+01	U	pCi/L		1.06E+02		
J1V932								
M8XLR1AF	AMERICIUM 241	2.13E+00 +- 9.3E+00	U	pCi/L		1.71E+01		
	CO-60	9.92E-01 +- 1.7E+00	U	pCi/L		3.46E+00	2.50E+01	
	CS-137	1.51E-01 +- 1.3E+00	U	pCi/L		2.36E+00	1.50E+01	
	EU-152	4.17E-01 +- 3.2E+00	U	pCi/L		5.72E+00	5.00E+01	
	EU-154	3.34E+00 +- 4.8E+00	U	pCi/L		9.68E+00	5.00E+01	
	EU-155	-3.59E+00 +- 3.6E+00	U	pCi/L		5.72E+00	5.00E+01	
	K-40	1.76E+01 +- 3.7E+01	U	pCi/L		2.74E+01		
J1V932 DUP								
M8XLR1AV	AMERICIUM 241	-5.70E+00 +- 1.5E+01	U	pCi/L		2.48E+01		-437.8

TestAmerica Inc

rptTALRchSaSummary2 V5.6 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Sample Results Summary

RLW 8-17-16

Date: 15-Aug-16

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 69157

SDG No: J02198

Batch / Client Id / Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
6197014 GAMMA LL: COBALT 60 LL								
J1V932 DUP								
M8XLR1AV	CO-60	1.54E+00 +- 2.0E+00	U	pCi/L		4.06E+00	2.50E+01	43.4
	CS-137	-8.13E-01 +- 1.9E+00	U	pCi/L		3.18E+00	1.50E+01	-291.4
	EU-152	-1.49E+00 +- 4.8E+00	U	pCi/L		8.26E+00	5.00E+01	-354.8
	EU-154	-1.91E+00 +- 6.5E+00	U	pCi/L		1.15E+01	5.00E+01	737.6
	EU-155	2.97E+00 +- 4.5E+00	U	pCi/L		8.30E+00	5.00E+01	-2114.4
	K-40	-4.32E+01 +- 5.2E+01	U	pCi/L		1.06E+02		-473.5
6197019 RATOT_AEAGEA								
J1V931								
M8XLQ1AN	TOTAL ALPHA RA	1.51E-01 +- 2.4E-01	U	pCi/L	90%	4.09E-01	1.00E+00	
J1V931 DUP								
M8XLQ1AV	TOTAL ALPHA RA	6.55E-02 +- 2.2E-01	U	pCi/L	87%	4.12E-01	1.00E+00	78.8
J1V932								
M8XLR1AN	TOTAL ALPHA RA	-2.71E-02 +- 2.5E-01	U	pCi/L	77%	5.35E-01	1.00E+00	
6197020 9310_ALPHABETA_GPC								
J1V931								
M8XLQ1AC	Beta	3.99E+02 +- 5.3E+01		pCi/L	100%	7.43E+00	4.00E+00	
J1V931 DUP								
M8XLQ1AW	Beta	4.00E+02 +- 5.4E+01		pCi/L	100%	7.45E+00	4.00E+00	0.5
J1V932								
M8XLR1AC	Beta	3.87E+02 +- 5.0E+01		pCi/L	100%	6.69E+00	4.00E+00	
6197021 9310_ALPHABETA_GPC								
J1V931								
M8XLQ2AA	Alpha	2.90E+02 +- 7.5E+01		pCi/L	100%	1.12E+01	3.00E+00	
J1V931 DUP								
M8XLQ2AX	Alpha	3.09E+02 +- 8.0E+01		pCi/L	100%	1.35E+01	3.00E+00	6.1
J1V932								
M8XLR1AA	Alpha	3.33E+02 +- 8.8E+01		pCi/L	100%	1.29E+01	3.00E+00	
6197015 TRITIUM_DIST_LSC								
J1V931								
M8XLQ1AD	H-3	5.85E+04 +- 1.8E+03 J		pCi/L	100%	3.07E+02	4.00E+02	
J1V932								
M8XLR1AD	H-3	5.78E+04 +- 1.7E+03 J		pCi/L	100%	3.07E+02	4.00E+02	
J1V932 DUP								
M8XLR1AW	H-3	5.81E+04 +- 1.8E+03		pCi/L	100%	3.08E+02	4.00E+02	0.6
6197016 TC99_ETVDSK_LSC								
J1V931								
M8XLQ1AQ	TC-99	1.75E+02 +- 9.0E+00		pCi/L	100%	8.96E+00	1.50E+01	

TestAmerica Inc

rptTALRchSaSummary2 V5.6 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

13

RLW 8-17-16

Sample Results Summary

Date: 15-Aug-16

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 69157 **SDG No:** J02198

Batch	Client Id / Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
6197016	TC99_ETVDSK_LSC								
	J1V932								
	M8XLR1AQ	TC-99	2.20E+02 +- 1.0E+01		pCi/L	100%	9.37E+00	1.50E+01	
	J1V932 DUP								
	M8XLR1A0	TC-99	2.09E+02 +- 9.9E+00		pCi/L	100%	9.11E+00	1.50E+01	4.8
6197017	UTOT_KPA								
	J1V931								
	M8XLQ1AJ	TOTAL-URANIUM	6.50E+02 +- 8.1E+01		ug/L		7.62E-02	1.40E-01	
	J1V931 DUP								
	M8XLQ1AU	TOTAL-URANIUM	6.59E+02 +- 8.2E+01		ug/L		8.28E-02	1.40E-01	1.4
	J1V932								
	M8XLR1AJ	TOTAL-URANIUM	6.36E+02 +- 7.9E+01		ug/L		8.15E-02	1.40E-01	

No. of Results: 72

TestAmerica Inc RPD - Relative Percent Difference.

rptTALRchSaSum
mary2 V5.6 A2002

Appendix 4

Laboratory Narrative and Chain–of-Custody Documentation

Job ID: 300-3452-1

Laboratory: TestAmerica Richland

4

Narrative

Job Narrative
300-3452-1
J02198 / RC-009

Comments
The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

Receipt
The samples were received on 7/12/2016 3:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 8.3° C.

General Chemistry
Hexavalent Chromium by EPA method 7196A:
The LCS, batch blank, samples, sample duplicate and sample matrix spike results are within contractual requirements.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

August 15, 2016

Attention: Joan Kessner

SAF Number	:	RC-009
Date SDG Closed	:	July 12, 2016
Number of Samples	:	Two (2)
Sample Type	:	Water
SDG Number	:	J02198
Data Deliverable	:	21– Day / Summary

CASE NARRATIVE

I. Introduction

On July 12, 2016, two water samples were received at TestAmerica for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Washington Closure Hanford (WCH) specific ID:

WCH ID#	TARL ID#	MATRIX	DATE OF RECEIPT
J1V931	M8XLQ	WATER	7/12/16
J1V932	M8XLR	WATER	7/12/16

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Alpha Spectroscopy
Plutonium-238, -239/240 by method RL-ALP-001
Thorium-228,230,232 by method RL-ALP-016
Uranium 234, 235 and 238 by method RL-ALP-015

Gas Proportional Counting
Gross Alpha by method RL-GPC-001
Gross Beta by method RL-GPC-001
Strontium-90 by method RL-GPC-010
Total Radium by method RL-RA-002
Gamma Spectroscopy
Gamma Spec by method RL-GAM-001
Iodine-129 (LL) by method RL-GAM-002
Liquid Scintillation Counting
Technetium-99 by method RL-LSC-014
Tritium by method RL-LSC-005
Carbon-14 by method RL-LSC-008
Laser Induced Phosphorimetry
Total Uranium by method RL-KPA-003

IV. Quality Control

The analytical results for each analysis performed includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Alpha Spectroscopy
Plutonium-238, -239/240 by method RL-ALP-001:
The LCS, batch blank, samples and sample duplicate (J1V931) results are within contractual requirements.

Thorium-228,230,232 by method RL-ALP-016:
The LCS, batch blank, samples and sample duplicate (J1V931) results are within contractual requirements.

Uranium 234, 235 and 238 by method RL-ALP-015:
The LCS, batch blank, samples and sample duplicate (J1V931) results are within contractual requirements.

Gas Proportional Counting
Gross Alpha by method RL-GPC-001:
The achieved MDA for the samples and sample duplicate (J1V931) exceeded the CRDL due to the aliquot reductions based on the weight screening results. The sample and sample duplicate (J1V931) agreement was not within the acceptance limits in the original count; they were recounted for an acceptable agreement. Except as noted; the LCS, batch blank, samples and sample duplicate (J1V931) results are within contractual requirements.

Gross Beta by method RL-GPC-001:
The achieved MDA for the samples and sample duplicate (J1V931) exceeded the CRDL due to the aliquot reductions based on the weight screening results. Except as noted; the LCS, batch blank, samples and sample duplicate (J1V931) results are within contractual requirements.

Strontium-90 by method RL-GPC-010:
The LCS, batch blank, samples and sample duplicate (J1V932) results are within contractual requirements.

Total Alpha Radium by method RL-RA-002:
The LCS, batch blank, samples and sample duplicate (J1V931) results are within contractual requirements.

Gamma Spectroscopy
Gamma Spec by method RL-GAM-001:
The LCS, batch blank, samples and sample duplicate (J1V932) results are within contractual requirements.

Iodine-129 (LL) by method RL-GAM-002:
The LCS, batch blank, samples and sample duplicate (J1V932) results are within contractual requirements.

Liquid Scintillation Counting
Technetium-99 by method RL-LSC-014:
The LCS, batch blank, samples, sample duplicate (J1V932) and sample matrix spike (J1V932) results are within contractual requirements.

Tritium by method RL-LSC-005:
The LCS, batch blank, samples and sample duplicate (J1V932) results are within contractual requirements.

Carbon-14 by method RL-LSC-008:
The LCS, batch blank, samples and sample duplicate (J1V932) results are within contractual requirements.

Total Uranium
Total Uranium by method RL-KPA-003:
The LCS, batch blank, samples, sample duplicate (J1V931) and sample matrix spike (J1V931) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Rhonda Wagar
Project Manager

13

Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-022 | Page 1 of 2

Collector: DOWNING, MK	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: ERDF Leachate Tank	Sampling Location: ERDF Leachate tank 4, Summer 2016		SAF No.: RC-009
Ice Chest No.: ERC-02-007	Field Logbook No.: EL-1626-03	COA: RERDF22560	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A
Other Labs Shipped To: TestAmerica Denver			

Price Code: 7D — Data Turnaround: 21 Days — 8/15/2016

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially radioactive, less than DOT limits

Special Handling and/or Storage
Cool 4 Deg C

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s)	Volume	Sample Analysis
				Cool <=6C	G/P	2	500mL	Chromium Hex - 7196
				None	G/P	2	125mL	Carbon-14
				HNO3 to pH <2	G/P	2	1000mL	See item (7) in Special Instructions
				HNO3 to pH <2	G/P	2	1000mL	Gross Alpha; Gross Beta
				HNO3 to pH <2	G/P	2	250mL	Total Uranium
				HNO3 to pH <2	G/P	2	500mL	Technetium-99
				None	G/P	4	1000mL	I-129 Low Level
				HNO3 to pH <2	G/P	2	1000mL	Total Radium
				None	P	2	250mL	Tritium - H3
				HNO3 to pH <2	G/P	2	1000mL	Isotopic Plutonium; Isotopic Thorium; Isotopic Uranium
J1V931	WATER	7-12-16	0720	✓	✓	✓	✓	✓

Page 13 of 17

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M Downing/M Downing WAI	7-12-16 0945	T.R. Edmundson J.R. Edmundson	7-12-16 0945
T.R. Edmundson J.R. Edmundson WCH	7-12-16 1515	J. Bock, TARL	7-12-16/1515

FINAL SAMPLE DISPOSITION: Disposal Method | Disposed By | Date/Time

SPECIAL INSTRUCTIONS

(7) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

3452
J02198

REVIEWED BY KW DATE 7/12/16

WCH-EE-011

300-3452 COC

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-009-022	Page 2 of 2

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code	Data Turnaround
DOWNING, MK	Joan Kessner 375-4688	KESSNER, JH	7D	21 Days

Project Designation	Sampling Location	SAF No.
ERDF Leachate Tank	ERDF Leachate tank 4, Summer 2016	RC-009

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC-02-007	EL-1626-03	RERDF22560	Local Delivery

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
TestAmerica Richland	N/A	N/A

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive, less than DOT limits

Special Handling and/or Storage

Cool 4 Deg C

Preservation	HNO3 to pH <2										
Type of Container	G/P										
No. of Container(s)	2										
Volume	1000mL										
Sample Analysis	Strontium-89,90 – Total Sr										

Sample No.	Matrix	Sample Date	Sample Time									
J1V931	WATER	7-12-16	0720	✓								

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M Downing WCH	7-12-16 0945	T.R. Edmundson S.R. Edmundson	7-12-16 0945
T.R. Edmundson S.R. Edmundson WCH	7-12-16 1515	Jack J. Jack TALR	7-12-16 1515

FINAL SAMPLE DISPOSITION

Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS

REVIEWED BY KW DATE 7/12/16

WCH-EE-011

8/19/2016

Page 14 of 17

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-009-023	Page 1 of 2

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
DOWNING, MK	Joan Kessner	375-4688	KESSNER, JH	7D	21 Days

Project Designation	Sampling Location	SAF No.
ERDF Leachate Tank	ERDF Leachate tank 4, Summer 2016	RC-009

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC-02-007	EL-1626-03	RERDF22560	Local Delivery

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
TestAmerica Richland	N/A	N/A

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive, less than DOT limits

Special Handling and/or Storage

Cool 4 Deg C

Preservation	Cool <=6C	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	None	HNO3 to pH <2	None	HNO3 to pH <2
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	P	G/P
No. of Container(s)	1	1	1	1	1	1	2	1	1	2
Volume	500mL	125mL	1000mL	1000mL	250mL	500mL	1000mL	1000mL	250mL	1000mL
Sample Analysis	Chromium Hex - 7196	Carbon-14	See item (7) in Special Instructions	Gross Alpha; Gross Beta	Total Uranium	Technetium-99	I-129 Low Level	Total Radium	Tritium - H3	Isotopic Plutonium; Isotopic Thorium; Isotopic Uranium

Sample No.	Matrix	Sample Date	Sample Time									
J1V932	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M Downing/M Downing HAL	7-12-16 0945	T.R. Edmundson T.R. Edmundson	7-12-16 0945
T.R. Edmundson T.R. Edmundson Chard	7-12-16 1515	J. Bock, TARL	7-12-16/1515

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS

(7) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

#3452
J02194

REVIEWED BY KW DATE 7/12/16

8/19/2016

Page 15 of 17

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-009-023	Page 2 of 2

Collector: DOWNING, MK	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: ERDF Leachate Tank	Sampling Location: ERDF Leachate tank 4, Summer 2016		SAF No.: RC-009
Ice Chest No.: ERC-02-007	Field Logbook No.: EL-1626-03	COA: RERDF22560	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A

Price Code: 7D — Data Turnaround: 21 Days — 8/15/2016

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive, less than DOT limits

Special Handling and/or Storage

Cool 4 Deg C

Preservation	HNO3 to pH <2											
Type of Container	G/P											
No. of Container(s)	1											
Volume	1000mL											
Sample Analysis	Strontium-89,90 – Total Sr											

Sample No.	Matrix	Sample Date	Sample Time									
J1V932	WATER	7-12-16	~~0720~~ 0945 TRE 7-12-16	✓								

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
W. Downing WA	7-12-16 0945	T.R. Edmundson T.R. Edmundson	7-12-16 0945
T.R. Edmundson T.R. Edmundson	7-12-16 1515	J. Bock, TARL	7-12-16/1515

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

SPECIAL INSTRUCTIONS

REVIEWED BY KW DATE 7/12/16

Page 16 of 17

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

APPENDIX 5

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	~~A~~	~~B~~	**C**	~~D~~	~~E~~
PROJECT: ERDF LEACHATE			DATA PACKAGE: J02198		
VALIDATOR: RL Weiss		LAB: TestAmerica - Richland		DATE: 08/17/2016	
			SDG: J02198		
ANALYSES PERFORMED					
~~Anions/IC~~	~~TOC~~	~~TOX~~	~~TPH 418.1~~	~~Oil and Grease~~	~~Alkalinity~~
~~Ammonia~~	~~BOD/COD~~	~~Chloride~~	**Chromium-VI**	~~pH~~	~~NO_3/NO_2~~
~~Sulfate~~	~~TDS~~	~~TKN~~	~~Phosphate~~		
SAMPLES/MATRIX					
J1V931, J1V932 – Water Matrix					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... **N/A**

Comments: _____

_____

_____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... **N/A**

Initial calibrations acceptable? ..... **N/A**

ICV and CCV checks performed on all instruments? ..... **N/A**

ICV and CCV checks acceptable? ..... **N/A**

Standards traceable? ..... **N/A**

Standards expired? ..... **N/A**

Calculation check acceptable? ..... **N/A**

Comments: _____

_____

APPENDIX 5

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... **N/A**

ICB and CCB results acceptable? (Levels D, E) ..... **N/A**

Laboratory blanks analyzed? ..... **Yes**

Laboratory blank results acceptable? ..... **Yes**

Field blanks analyzed? (Levels C, D, E) ..... **N/A**

Field blank results acceptable? (Levels C, D, E) ..... **N/A**

Transcription/calculation errors? (Levels D, E) ..... **N/A**

Comments: _____

_____

_____

_____

_____

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... **Yes**

Spike recoveries acceptable? ..... **Yes**

Sike standards NIST traceable? (Levels D, E) ..... **N/A**

Spike standards expired? (Levels D, E) ..... **N/A**

LCS/BSS samples analyzed? ..... **Yes**

LCS/BSS results acceptable? ..... **Yes**

Standards traceable? (Levels D, E) ..... **N/A**

Standards expired? (Levels D, E) ..... **N/A**

Transcription/calculation errors? (Levels D, E) ..... **N/A**

Performance audit sample(s) analyzed? ..... **N/A**

Performance audit sample results acceptable? ..... **N/A**

Comments: _____

_____

_____

_____

_____

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... **Yes**

Duplicate results acceptable? ..... **Yes**

MS/MSD standards NIST traceable? (Levels D, E) ..... **N/A**

MS/MSD standards expired? (Levels D, E) ..... **N/A**

Field duplicate RPD values acceptable? ..... **Yes**

Field split RPD values acceptable? ..... **N/A**

Transcription/calculation errors? (Levels D, E) ..... **N/A**

Comments: _____

_____

_____

_____

_____

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... **Yes**

Sample holding times acceptable? ..... **Yes**

Comments: _____

_____

_____

_____

_____

_____

_____

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... **Yes**

Results supported in the raw data? (Levels D, E) ..... **N/A**

Samples properly prepared? (Levels D, E) ..... **N/A**

Detection limits meet RDL? ..... **Yes**

Transcription/calculation errors? (Levels D, E) ..... **N/A**

Comments: _____

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	~~A~~	~~B~~	C	~~D~~	~~E~~
PROJECT: ERDF LEACHATE			DATA PACKAGE: J02198		
VALIDATOR: RL Weiss		LAB: TestAmerica-Richland		DATE: 08/17/2016	
			SDG: J02198		
ANALYSES PERFORMED					
X Gross Alpha/Beta	**X Total Radioactive Sr**	**X Technetium-99**	**X Alpha Spectroscopy**	**XGamma Spectroscopy**	
X Total Uranium	**X Total Radium Alpha**	**X Tritium**	**X Carbon-14**	**X Iodine-129**	
SAMPLES/MATRIX					
J1V931, J1V932 – Water Matrix					

1. Completeness ..... **N/A**

Technical verification forms present? ..... **N/A**

Comments:_____

_____

_____

_____

_____

2. Initial Calibration (Levels D, E) ..... **N/A**

Instruments/detectors calibrated? ..... **N/A**

Initial calibration acceptable? ..... **N/A**

Standards NIST traceable? ..... **N/A**

Standards Expired? ..... **N/A**

Calculation check acceptable? ..... **N/A**

Comments:_____

_____

_____

_____

_____

3. Continuing Calibration (Levels D, E) ..... **N/A**

Calibration checked within required frequency? ..... **N/A**

Calibration check acceptable? ..... **N/A**

Calibration check standards traceable? ..... **N/A**

Calibration check standards expired? ..... **N/A**

Calculation check acceptable? ..... **N/A**

Comments:_____

_____

4. Background Counts (Levels D, E) ..... **N/A**

Background Counts checked within required frequency? ..... **N/A**

Background Counts acceptable? ..... **N/A**

Calculation check acceptable? ..... **N/A**

Comments:

5. Blanks (Levels B, C, D, E)

Method blank analyzed within required frequency? **Yes**

Method blank results acceptable? **Yes**

Analytes detected in method blank? **Yes**

Field blank(s) analyzed? **No**

Field blank results acceptable? **N/A**

Analytes detected in field blank(s)? **N/A**

Transcription/Calculation Errors? (Levels D, E) **N/A**

Comments: U-238 was detected in the U-iso blank at levels < 1/5th of the sample results

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E)

LCS /BSS analyzed within required frequency? **Yes**

LCS/BSS recoveries acceptable? **Yes**

LCS/BSS traceable? (Levels D,E) **N/A**

LCS/BSS expired? (Levels D,E) **N/A**

LCS/BSS levels correct? (Levels D,E) **N/A**

Transcription/Calculation Errors? (Levels D, E) **N/A**

Comments: No LSC run for Th-iso; Th-228 & Th232, Pu-iso; Pu-238 – J flag results

7. Chemical Carrier Recovery (Levels C, D, E)

Chemical carrier added? **Yes**
Chemical recovery acceptable? **Yes**
Chemical carrier traceable? (Levels D, E) N/A
Chemical carrier expired? (Levels D, E) N/A
Transcription/Calculation errors? (Levels D, E) N/A
Comments:

8. Tracer Recovery (Levels C, D, E)

Tracer added? **Yes**
Tracer recovery acceptable? **Yes**
Tracer traceable? (Levels D, E) **N/A**
Tracer expired? (Levels D, E) **N/A**
Transcription/Calculation errors? (Levels D, E) **N/A**
Comments: Tracer recoveries for Th-iso exceeded criteria – no qualification due to non-detects

9. Matrix Spikes (Levels C, D, E)

Matrix spike analyzed? No
Spike recoveries acceptable? Yes
Spike source traceable? (Levels D, E) N/A
Spike source expired? Levels D, E) N/A
Transcription/Calculation Errors? (Levels D, E) N/A
Comments: Matrix spike samples not run for C-14 or Tritium – J flag all results
Spiking levels for U total were < $1/4^{th}$ of sample concentration – no qualification

10. Duplicates (Levels C, D, E)

Duplicates Analyzed at required frequency? **Yes**
RPD Values Acceptable? **Yes**
Transcription/Calculation Errors? (Levels D, E) **N/A**
Comments:

11. Field QC Samples (Levels C, D E) .....

Field duplicate sample(s) analyzed? ..... **Yes**

Field duplicate RPD values acceptable? ..... **No**

Field split sample(s) analyzed? ..... **No**

Field split RPD values acceptable? ..... **N/A**

Performance audit sample(s) analyzed? ..... **No**

Performance audit sample results acceptable? ..... **N/A**

Comments: Field duplicate RPD for Tc-99 was 22.8% - no qualification required.

12. Holding Times (All levels)

Are sample holding times acceptable? ..... **Yes**

Comments:

13. Results and Detection Limits (All Levels) .....

Results reported for all required sample analyses? ..... **Yes**

Results supported in raw data?(Levels D, E) ..... **N/A**

Results Acceptable? (Levels D, E) ..... **N/A**

Transcription/Calculation errors? (Levels D, E) ..... **N/A**

MDA's meet required detection limits? ..... **Yes**

Transcription/calculation errors? (Levels D, E) ..... **N/A**

Comments: Achieved MDAs for Gross Alpha and Gross Beta were above CRDLs, due to activtity present in the samples – no qualification required.

Appendix 6

Additional Documentation

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 300-5297/9
Matrix: Water
Analysis Batch: 5297

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.0080	U	0.040	0.0080	mg/L			07/12/16 17:12	1

Lab Sample ID: LCS 300-5297/10
Matrix: Water
Analysis Batch: 5297

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	0.500	0.506		mg/L		101	75 - 125

Lab Sample ID: 300-3452-1 MS
Matrix: Water
Analysis Batch: 5297

Client Sample ID: J1V931
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	0.15		0.750	0.919		mg/L		102	75 - 125

Lab Sample ID: 300-3452-1 MSD
Matrix: Water
Analysis Batch: 5297

Client Sample ID: J1V931
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cr (VI)	0.15		0.750	0.925		mg/L		103	75 - 125	1	

Lab Sample ID: 300-3452-1 DU
Matrix: Water
Analysis Batch: 5297

Client Sample ID: J1V931
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Cr (VI)	0.15		0.152		mg/L		1	20

QC Results Summary

Date: 15-Aug-16

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 69157 **SDG No.:** J02198

Batch Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
C14_CHEM_LSC								
6197012 BLANK QC,								
M8XMC1AA	C-14	-1.78E+01 +- 8.6E+00	U	pCi/L	100%			1.80E+01
6197012 LCS,								
M8XMC1AC	C-14	4.81E+02 +- 3.2E+01		pCi/L	100%	98%	0.0	1.85E+01
SRISO_SEP_PRECIP_GPC								
6197018 BLANK QC,								
M8XMT1AA	STRONTIUM	5.56E-01 +- 7.9E-01	U	pCi/L	85%			1.30E+00
6197018 LCS,								
M8XMT1AC	STRONTIUM	1.58E+01 +- 4.1E+00		pCi/L	80%	113%	0.1	1.42E+00
RL-ALP-002								
6197024 BLANK QC,								
M8XNC1AA	PU-238	-1.23E-02 +- 3.1E-01	U	pCi/L	91%			5.62E-01
	PU239/40	-1.54E-02 +- 3.1E-01	U	pCi/L	91%			5.79E-01
6197024 LCS,								
M8XNC1AC	PU239/40	2.24E+01 +- 6.6E+00		pCi/L	86%	96%	0.0	7.06E-01
THISO_IE_PRECIP_AEA								
6197022 BLANK QC,								
M8XM51AA	TH-228	4.63E-02 +- 1.3E-01	U	pCi/L	85%			2.70E-01
	TH-230	2.26E-02 +- 8.9E-02	U	pCi/L	85%			2.20E-01
	TH-232	-1.04E-02 +- 8.8E-02	U	pCi/L	85%			1.90E-01
6197022 LCS,								
M8XM51AC	TH-230	1.40E+01 +- 2.9E+00		pCi/L	91%	125%	0.2	2.23E-01
UISO_PLATE_AEA								
6197023 BLANK QC,								
M8XM71AA	U-234	3.28E-01 +- 3.5E-01	U	pCi/L	76%			3.46E-01
	U-235	8.21E-02 +- 1.7E-01	U	pCi/L	76%			2.89E-01
	U-238	5.09E-01 +- 4.3E-01		pCi/L	76%			2.89E-01
6197023 LCS,								
M8XM71AC	U-234	1.86E+01 +- 4.0E+00		pCi/L	88%	113%	0.1	2.92E-01
	U-235	5.29E-01 +- 4.1E-01		pCi/L	88%	70%	-0.3	2.55E-01
	U-238	1.90E+01 +- 4.1E+00		pCi/L	88%	110%	0.1	2.92E-01
I129_SEP_LEPS_GS								
6197013 BLANK QC,								
M8XMD1AA	I129	1.62E-02 +- 1.6E-01	U	pCi/L	98%			2.90E-01
6197013 LCS,								
M8XMD1AC	I129	1.70E+01 +- 2.1E+00		pCi/L	97%	89%	-0.1	6.15E-01
GAMMA LL: COBALT 60 LL								
6197014 BLANK QC,								
M8XMG1AA	AMERICIUM 241	-7.95E-02 +- 9.2E+00	U	pCi/L				1.68E+01
	CO-60	1.66E-01 +- 1.7E+00	U	pCi/L				3.23E+00
	CS-137	-3.87E-03 +- 1.3E+00	U	pCi/L				2.35E+00

TestAmerica Inc **Bias** - (Result/Expected)-1 as defined by ANSI N13.30.

rptSTLRchQcSummary V5.6 A2002 **U Qual** - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

QC Results Summary

Date: 15-Aug-16

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 69157 **SDG No.:** J02198

Batch Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
M8XMG1AA	EU-152	-1.95E+00 +- 3.5E+00	U	pCi/L				5.92E+00
	EU-154	-1.61E+00 +- 4.4E+00	U	pCi/L				7.80E+00
	EU-155	1.19E+00 +- 3.0E+00	U	pCi/L				5.34E+00
	K-40	6.98E+00 +- 3.4E+01	U	pCi/L				6.90E+01
6197014 LCS,								
M8XMG1AC	CO-60	4.23E+01 +- 9.1E+00		pCi/L		108%	0.1	4.08E+00
	CS-137	4.79E+01 +- 8.1E+00		pCi/L		95%	0.0	3.68E+00
	EU-152	9.18E+01 +- 1.7E+01		pCi/L		114%	0.1	9.94E+00
RATOT_AEAGEA								
6197019 BLANK QC,								
M8XMW1AA	TOTAL ALPHA RA	1.27E-01 +- 2.6E-01	U	pCi/L	85%			4.53E-01
6197019 LCS,								
M8XMW1AC	TOTAL ALPHA RA	6.24E+00 +- 1.7E+00		pCi/L	85%	98%	0.0	4.29E-01
9310_ALPHABETA_GPC								
6197020 BLANK QC,								
M8XM01AA	Beta	3.15E-01 +- 9.0E-01	U	pCi/L	100%			1.51E+00
6197020 LCS,								
M8XM01AC	Beta	2.03E+01 +- 3.0E+00		pCi/L	100%	93%	-0.1	1.42E+00
9310_ALPHABETA_GPC								
6197021 BLANK QC,								
M8XM21AA	Alpha	-5.50E-02 +- 3.8E-01	U	pCi/L	100%			7.17E-01
6197021 LCS,								
M8XM21AC	Alpha	2.27E+01 +- 5.8E+00		pCi/L	100%	109%	0.1	6.78E-01
TRITIUM_DIST_LSC								
6197015 BLANK QC,								
M8XMJ1AA	H-3	4.15E+01 +- 1.5E+02	U	pCi/L	100%			3.15E+02
6197015 LCS,								
M8XMJ1AC	H-3	3.17E+03 +- 2.6E+02		pCi/L	100%	117%	0.2	3.24E+02
TC99_ETVDSK_LSC								
6197016 BLANK QC,								
M8XMM1AA	TC-99	3.61E+00 +- 4.4E+00	U	pCi/L	100%			9.21E+00
6197016 LCS,								
M8XMM1AC	TC-99	1.01E+02 +- 7.2E+00		pCi/L	100%	94%	-0.1	9.18E+00
6197016 MATRIX SPIKE, J1V932								
M8XLR1AX	TC-99	4.60E+02 +- 2.3E+01		pCi/L	100%	87%	-0.1	8.94E+00
UTOT_KPA								
6197017 BLANK QC,								
M8XMP1AA	TOTAL-URANIUM	0.00E+00 +- 0.0E+00	U	ug/L				7.97E-02
6197017 LCS,								
M8XMP1AC	TOTAL-URANIUM	3.44E+00 +- 3.5E-01		ug/L		99%	0.0	8.03E-02
M8XMP1AD	TOTAL-URANIUM	3.59E+01 +- 4.5E+00		ug/L		99%	0.0	8.38E-02
6197017 MATRIX SPIKE, J1V931								
M8XLQ1AT	TOTAL-URANIUM	4.32E+01 +- 1.2E+02		ug/L		139%	0.4	7.23E-02

TestAmerica Inc rptSTLRchQcSummary V5.6 A2002

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Date: 22 August 2016
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: ERDF Leachate Tank Summer 2016
Subject: Pesticide/PCB - Data Package No. J02198-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. J02198 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V931	7/12/16	Water	C	See note 1
J1V932	7/12/16	Water	C	See note 1

1 – Pesticides by 8081B and PCBs by 8082.

Data validation was conducted in accordance with the WCH validation statement of work and WCH-173, Rev. 2, "Environmental Restoration Disposal Facility Leachate Sampling & Analysis Plan". Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Pesticide samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction. PCB samples ust be analyzed within 180 days of sample collection.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 50% to 150%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to LCS recoveries outside QC limits, all aldrin (34%) and heptachlor (45%) results were qualified as estimates and flagged "J".

Due to the lack of a matrix spike, matrix spike duplicate or LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been

established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 20%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the lack of a matrix spike and matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1V931/J1V932) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required detection limits (RDLs) to ensure that laboratory detection levels meet the required criteria. All results met the RDL.

- **Completeness**

Data Package No. J02198 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to LCS recoveries outside QC limits, all aldrin (34%) and heptachlor (45%) results were qualified as estimates and flagged "J".

- Due to the lack of a matrix spike, matrix spike duplicate or LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

WCH-173, Rev 2, *Environmental Restoration Disposal Facility Leachate Sampling and Analysis Plan*, November 2015.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

PESTICIDE/PCB DATA QUALIFICATION SUMMARY*

SDG: J02198	**REVIEWER: ELR**	**Project: ERDF**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aldrin heptachlor	J	All	LCS recovery
Toxaphene	J	All	No MS, MSD analysis

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V931**

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8081A Organochlorine Pesticides (GC)

Analysis Method: 8081A
Prep Method: 3510C
Dilution: 1.0
Analysis Date: 07/28/2016 2016
Prep Date: 07/19/2016 0853

Analysis Batch: 280-335548
Prep Batch: 280-334134

8/21/16

Instrument ID: SGC_P1
Initial Weight/Volume: 1025.2 mL
Final Weight/Volume: 10 mL
Injection Volume: 1 uL
Result Type: PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
4,4'-DDD	0.0075	U	0.0075	0.098
4,4'-DDE	0.0073	U N	0.0073	0.098
4,4'-DDT	0.014	U	0.014	0.098
Aldrin	0.0058	U N J	0.0058	0.049
alpha-BHC	0.0052	U	0.0052	0.049
alpha-Chlordane	0.0052	U	0.0052	0.49
beta-BHC	0.0085	U	0.0085	0.049
delta-BHC	0.0057	U	0.0057	0.049
Dieldrin	0.0061	U	0.0061	0.098
Endosulfan I	0.0057	U	0.0057	0.049
Endosulfan II	0.0068	U	0.0068	0.098
Endosulfan sulfate	0.0056	U	0.0056	0.098
Endrin	0.0077	U	0.0077	0.098
Endrin aldehyde	0.0086	U	0.0086	0.098
Endrin ketone	0.0068	U	0.0068	0.098
gamma-BHC (Lindane)	0.0067	U	0.0067	0.049
gamma-Chlordane	0.0089	U	0.0089	0.49
Heptachlor	0.0075	U N J	0.0075	0.049
Heptachlor epoxide	0.0073	U	0.0073	0.049
Methoxychlor	0.013	U	0.013	0.49
Toxaphene	0.36	U J	0.36	4.9

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	91		34 - 122
Tetrachloro-m-xylene	72		28 - 115

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8081A Organochlorine Pesticides (GC)

Analysis Method:	8081A	Analysis Batch:	280-335548	Instrument ID:	SGC_P1
Prep Method:	3510C	Prep Batch:	280-334134	Initial Weight/Volume:	1010.6 mL
Dilution:	1.0			Final Weight/Volume:	10 mL
Analysis Date:	07/28/2016 2106			Injection Volume:	1 uL
Prep Date:	07/19/2016 0853			Result Type:	PRIMARY

8/21/16

Analyte	Result (ug/L)	Qualifier	MDL	RL
4,4'-DDD	0.0076	U	0.0076	0.099
4,4'-DDE	0.0074	U N	0.0074	0.099
4,4'-DDT	0.015	U	0.015	0.099
Aldrin	0.0058	U N J	0.0058	0.049
alpha-BHC	0.0052	U	0.0052	0.049
alpha-Chlordane	0.0052	U	0.0052	0.49
beta-BHC	0.0086	U	0.0086	0.049
delta-BHC	0.0057	U	0.0057	0.049
Dieldrin	0.0062	U	0.0062	0.099
Endosulfan I	0.0057	U	0.0057	0.049
Endosulfan II	0.0069	U	0.0069	0.099
Endosulfan sulfate	0.0056	U	0.0056	0.099
Endrin	0.0078	U	0.0078	0.099
Endrin aldehyde	0.0087	U	0.0087	0.099
Endrin ketone	0.0069	U	0.0069	0.099
gamma-BHC (Lindane)	0.0068	U	0.0068	0.049
gamma-Chlordane	0.0090	U	0.0090	0.49
Heptachlor	0.0076	U N J	0.0076	0.049
Heptachlor epoxide	0.0074	U	0.0074	0.049
Methoxychlor	0.013	U	0.013	0.49
Toxaphene	0.36	U J	0.36	4.9

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	105		34 - 122
Tetrachloro-m-xylene	78		28 - 115

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V931**

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-335704	Instrument ID:	SGC_P3
Prep Method:	3510C	Prep Batch:	280-334134	Initial Weight/Volume:	1025.2 mL
Dilution:	1.0			Final Weight/Volume:	10 mL
Analysis Date:	07/29/2016 1441			Injection Volume:	1 uL
Prep Date:	07/19/2016 0853			Result Type:	PRIMARY

8/21/16

Analyte	Result (ug/L)	Qualifier	MDL	RL
Aroclor 1016	0.12	U	0.12	0.49
Aroclor 1221	0.21	U	0.21	0.49
Aroclor 1232	0.16	U	0.16	0.49
Aroclor 1242	0.10	U	0.10	0.49
Aroclor 1248	0.089	U	0.089	0.49
Aroclor 1254	0.11	U	0.11	0.49
Aroclor 1260	0.16	U	0.16	0.49

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	90		30 - 136
Tetrachloro-m-xylene	73		25 - 120

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-335704	Instrument ID:	SGC_P3
Prep Method:	3510C	Prep Batch:	280-334134	Initial Weight/Volume:	1010.6 mL
Dilution:	1.0			Final Weight/Volume:	10 mL
Analysis Date:	07/29/2016 1546			Injection Volume:	1 uL
Prep Date:	07/19/2016 0853			Result Type:	PRIMARY

8/2/16

Analyte	Result (ug/L)	Qualifier	MDL	RL
Aroclor 1016	0.12	U	0.12	0.49
Aroclor 1221	0.21	U	0.21	0.49
Aroclor 1232	0.16	U	0.16	0.49
Aroclor 1242	0.10	U	0.10	0.49
Aroclor 1248	0.091	U	0.091	0.49
Aroclor 1254	0.11	U	0.11	0.49
Aroclor 1260	0.16	U	0.16	0.49

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	100		30 - 136
Tetrachloro-m-xylene	71		25 - 120

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-85505-1

SDG #: J02198
SAF#: RC-009

Date SDG Closed: July 14, 2016
Data Deliverable: 21 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V931	280-85505-1	2320/300.0/2540C/2540D/350.1/353.2/410.4/ 9020/420.4/5310B/1664/9034/9012/8260/ 6010/7470/9050/9040/8015/8270/ WTPH-G/WTPH-D+/8151/8081/8082/8310	2320B/300.0/2540C/2540D/350.1/353.2/410.4/ 9020B/420.4/5310B/1664A/9034/9012A/8260B/ 6010B/6020/7470A/9050A/9040B/8015C/8270C/ NWTPH-Gx/NWTPH-Dx/8151A/8081A/8082/8310
J1V932	280-85505-2	2320/300.0/2540C/2540D/350.1/353.2/410.4/ 9020/420.4/5310B/1664/9034/9012/8260/ 6010/7470/9050/9040/8015/8270/ WTPH-G/WTPH-D+/8151/8081/8082/8310	2320B/300.0/2540C/2540D/350.1/353.2/410.4/ 9020B/420.4/5310B/1664A/9034/9012A/8260B/ 6010B/6020/7470A/9050A/9040B/8015C/8270C/ NWTPH-Gx/NWTPH-Dx/8151A/8081A/8082/8310
J1V933	280-85505-3	8260	8260B

The Uranium method substitution noted above, as agreed to by all parties, has no technical impact on the data.

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

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

RECEIPT
The samples were received on 7/13/2016 9:30 AM and 7/14/2016 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 1.7° C, 2.9° C, 3.4° C and 4.9° C.

Receipt Exceptions

It was noted that the VOA vials did not have labels affixed to them. There was one label for each set of VOA vials that was affixed to the bubble bag. Each label was transferred to one of the vials in each set. The client was notified on 7/15/2016.

GC/MS VOLATILES - SW846 8260B
The following compounds were not found as part of a TIC search performed for samples J1V931, J1V932 and J1V933: Acrylamide [79-06-1]; Formaldehyde [50-00-0]; 1,3-Butadiene [106-99-0]; Chlorodifluoromethane [75-45-6]; Dichloropropanol [26545-73-3]; Trichloromethanethiol [75-70-7]; Allyl alcohol (2-Propen-1-ol) [107-18-6]; Crotonaldehyde (2-Butenaldehyde) [4170-30-3]; Epichlorohydrin [106-89-8].

The GC/MS Volatiles analyses of samples J1V932 and J1V933 were performed 3 days outside the recommended sample holding times, due to analyst oversight. The client was notified on 8/2/2016.

The preservative used in the sample containers provided is not compatible with one of the Method 8260B analytes requested. Samples J1V931, J1V932 and J1V933 were received preserved with hydrochloric acid. The requested target analyte list includes 2-chloroethyl vinyl ether, an acid-labile compound that degrades in an acidic medium.

Methylene Chloride, a common laboratory contaminant, is present in the method blank associated with batch 280-334916 at a level exceeding the reporting limit. Because this common laboratory contaminant is present in the method blank at a level that is less than five times the reporting limit, corrective action is not required.

Low levels of Methylene chloride, a common laboratory contaminant, are present in the method blank associated with batch 280-335637. Because the concentration in the method blank is not present at a level greater than the reporting limit, corrective action is deemed unnecessary.

The LCS associated with batch 280-334916 exhibited the percent recovery outside the control limits, biased high, for Methylene Chloride, and the associated sample result has been flagged "T". As Methylene Chloride is not present at a level greater than the reporting limit in the associated sample, corrective action is deemed unnecessary.

2-Chloroethyl vinyl ether was not recovered in the MS/MSD performed on sample J1V931 in batch 280-334916 due to the acid preservative used in the sample. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

Due to analyst oversight, MS/MSD analysis was not performed for batch 280-335637. Method precision and accuracy have been verified by the acceptable LCS/LCSD analysis data.

A Continuing Calibration Verification (CCV) standard associated with samples in batch 280-334916 exhibited the %Difference (%D) value outside acceptance criteria, biased low, for 1-Butanol (-50.2%). The sample associated with this CCV was non-detect for the affected analyte. All CCC and SPCC compounds are in control; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

GC/MS SEMIVOLATILES - SW846 8270C
The following compounds were not found as part of a TIC search performed for samples J1V931 and J1V932: 1-Acetyl-2-thiorurea [591-08-2]; 2,5-Diaminotoluene [95-70-5]; 2-Cyclohexyl-4,6-dinitrophenol [131-89-5]; Hexachlorophene [70-30-4].

Low levels of Benzyl alcohol are present in the method blank associated with batch 280-334208. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

A Continuing Calibration Verification (CCV) standard associated with samples in analysis batch 280-335194 exhibited the %Difference (%D) value outside acceptance criteria, biased low, for 4-Nitroquinoline-1-oxide (-50.1%). The samples associated with this CCV were non-detect for the affected analyte. All CCC and SPCC compounds are in control; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

GLYCOLS - SW846 8015C
Surrogate 1,4-Butanediol was recovered outside the control limits, biased low, in samples J1V931 and J1V932. The laboratory noted that this anomaly was due to obvious matrix interference; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

METHANOL - SW846 8015C
No anomalies were encountered.

GRO - NWTPH-Gx
The samples were collected in properly preserved vials for analysis of gasoline range organics (GRO). However, when verified by the laboratory, the pH was greater than 2 and the following sample was analyzed after 7 days from sampling: J1V932 (pH = 7).

No other anomalies were encountered.

PESTICIDES - SW846 8081A
The LCS associated with batch 280-334134 exhibited percent recoveries outside the control limits, biased low, as follows: 4,4'-DDE = 72% (lower limit 74), Aldrin = 34% (lower limit 44), Heptachlor = 45% (lower limit 52). Associated sample results have been flagged with an "N". It can be noted that the spike compound recoveries and surrogate recoveries for the MS/MSD performed on sample J1V931 were in control. The laboratory re-extracted the samples, unavoidably 14 days past the 7 day recommended sample holding time. Upon re-extraction and reanalysis of the samples under batch 280-336109, the associated LCS spike compound recoveries were 100% in control. and the non-detect results were confirmed. The original analysis data have been reported as the non-detect sample results were confirmed.

No other anomalies were encountered.

PCBs - SW846 8082
No anomalies were encountered.

HERBICIDES - SW846 8151A
No anomalies were encountered.

DRO - NWTPH-Dx
Low levels of C10-C36 are present in the method blank associated with batch 280-334141. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

PAHs - SW846 8310
Surrogate Terphenyl-d14 recovered outside the control limits, biased low at 67% (lower limit 70%), in sample J1V931. No evidence of matrix interference was present and the sample was non-detect. It can be noted that the spike compound recoveries and surrogate recoveries for the MS/MSD performed on sample J1V931 were in control. The laboratory re-extracted the sample, unavoidably 13 days past the 7 day recommended sample holding time, and the surrogate was in control at 94% and the non-detect results were confirmed. Due to insufficient sample volume remaining, sample specific MS/MSD analysis could not be performed for the re-extract batch. The original analysis data have been reported as the non-detect sample results were confirmed and the sample specific batch MS/MSD was associated with the original analysis.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/6020/7470A
Serial dilution of a digestate in batch 280-334811 indicates that physical and chemical interferences are present for Uranium. Results have been flagged with an "X".

Low levels of Thallium are present in the method blank associated with batch 280-334811. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Calcium and Uranium in the Matrix Spike performed on sample J1V931; therefore, control limits are not applicable.

The duplicate analysis of sample J1V931 exhibited RPD data outside the control limits for Thallium, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

OIL & GREASE (HEM) - EPA 1664A
No anomalies were encountered.

ANIONS - MCAWW 300.0
The orthophosphate as P analyses for samples J1V931 and J1V932 were performed 8-9 hours outside the recommended 48 hour sample holding times. The analyses were originally performed within the sample holding times; however, due to associated continuing calibration verification (CCV) failures, reanalysis was required.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to high constituent concentration, samples J1V931 and J1V932 required dilutions prior to the analysis of Nitrate as N, Chloride and Sulfate, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

The orthophosphate as P Matrix Spike performed on sample J1V931 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

AMMONIA as N - MCAWW 350.1
No anomalies were encountered.

NITRATE NITRITE as N - MCAWW 353.2
Each sample is analyzed to achieve the lowest possible reporting limit within the constraints of the method. Due to high constituent concentration, samples J1V931 and J1V932 had to be analyzed at dilutions, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

The Matrix Spike performed on sample J1V931 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

CHEMICAL OXYGEN DEMAND - MCAWW 410.4
No anomalies were encountered.

PHENOLICS - MCAWW 420.4
Phenolics are present at a level greater than half the reporting limit in the method blank associated with batch 280-335552. As no detectable concentrations of Phenolics are present in the associated samples, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL CYANIDE - SW846 9012A
Low levels of Total Cyanide are present in the method blank associated with batch 280-334663. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL ORGANIC HALOGENS (TOX) - SW846 9020B
The laboratory noted that the containers submitted for samples J1V931 and J1V932 were received with excess headspace. This could cause volatile halides to evaporate, resulting in a low bias to the reported results.

Samples J1V931 and J1V932 exhibited elevated detection limits due to the limited sample volume used. The nominal sample amount could not be used due to the nature of the sample matrix.

No other anomalies were encountered.

SULFIDE - SW846 9034
No anomalies were encountered.

ALKALINITY - SM 2320B
Low levels of Alkalinity are present in the method blank associated with batch 280-333888. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL DISSOLVED SOLIDS - SM 2540C
Samples J1V931 and J1V932 exhibited elevated detection limits due to the limited sample volume used. The nominal sample amount could not be used due to high constituent concentration.

No other anomalies were encountered.

TOTAL SUSPENDED SOLIDS - SM 2540D
No anomalies were encountered.

TOTAL ORGANIC CARBON - SM 5310B
No anomalies were encountered.

PH - SW846 9040B
SU = standard units

Samples J1V931 and J1V932 were analyzed 14 days after sample receipt, due to analyst oversight. It can be noted that pH is a field parameter with a holding time of 15 minutes.

No other anomalies were encountered.

SPECIFIC CONDUCTANCE - SW846 9050A
No anomalies were encountered.

Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-022 | Page 2 of 2

Collector DOWNING, MK	**Company Contact** Joan Kessner	**Telephone No.** 375-4688	**Project Coordinator** KESSNER, JH
Price Code 7D	**Data Turnaround** 21 Days		
Project Designation ERDF Leachate Tank	**Sampling Location** ERDF Leachate tank 4, Summer 2016		**SAF No.** RC-009
Ice Chest No. ERC-02-404	**Field Logbook No.** EL-1626-03	**COA** RERDF22560	**Method of Shipment** Commercial Carrier
Shipped To TestAmerica Denver	**Offsite Property No.** A131487		**Bill of Lading/Air Bill No.** SEE OSPC
Other Labs Shipped To TestAmerica Richland			

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially radioactive, less than DOT limits

Special Handling and/or Storage
Cool 4 Deg C

Preservation	H2SO4 to pH <2	H2SO4 to pH <2	None	HCl or H2SO4 to pH <2	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	
Type of Container	aG	aGs*	G/P	aGs*	aG	aG	aG	aG	aG	
No. of Container(s)	3	2	2	6	4	4	4	4	4	
Volume	250mL	250mL	250mL	40mL	1000mL	1000mL	1000mL	1000mL	1000mL	
Sample Analysis	See Item (4) in Special Instructions	TOX - 9020	Conductivity - 9050; pH (Water) - 9040	See Item (5) in Special Instructions	See Item (6) in Special Instructions	PAHs - 8310	Pesticides - 8081	PCBs - 8082	Chloro-Herbicides - EPA8151	
Sample No.	**Matrix**	**Sample Date**	**Sample Time**							
J1W931	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Page 178 of 176

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
J Downing/J Downing WCH	7-12-16 0945	T.R. Edmundson T.R. Edmundson	7-12-16 0945
T.R. Edmundson T.R. Edmundson WCH	7-12-16 1500	Fed Ex	7-12-16 —
		[illegible]	0930 BJW16

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

SPECIAL INSTRUCTIONS

(4) Phenolics Total Recoverable - 420.4; Total Organic Carbon (TOC) - 5310B
(5) VOA - 8260 (App IX); VOA - 8260 (Client List) (1,1,2-Trichloro-1,2,2-trifluoroethane, 1-Butanol, 2-Chloroethyl vinyl ether, 2-Nitropropane, Acetic acid, methyl ester, Diethyl ether, Ethyl acetate, Ethyl cyanide, Isopropylbenzene, Tetrahydrofuran, cis-1,2-Dichloroethylene)
(6) Semi-VOA - 8270 (App IX); Semi-VOA – 8270 (Client List) (1,2-Diphenylhydrazine, 1,4-Dinitrobenzene, 3+4 Methylphenol (cresol, m+p), Benzaldehyde, Benzoic acid, Dimethoate, Diphenylamine, Disulfoton, Parathion, Phorate, Tris(2,3-dibromopropyl) phosphate)

REVIEWED BY KW DATE 7/12/16

0912212019

WCH-EE-011

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-023

Collector: DOWNING, MK	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: ERDF Leachate Tank	Sampling Location: ERDF Leachate tank 4, Summer 2016		SAF No.: RC-009
Ice Chest No.: ERC-02-404	Field Logbook No.: EL-1626-03	COA: RERDF22560	Method of Shipment: Commercial Carrier
Shipped To: TestAmerica Denver	Offsite Property No.: A131487		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 7D

Data Turnaround: 21 Days

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive, less than DOT limits

Special Handling and/or Storage

Cool 4 Deg C

Sample No.	Matrix	Sample Date	Sample Time	Preservation	H2SO4 to pH <2	H2SO4 to pH <2	None	HCl or H2SO4 to pH <2	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	
				Type of Container	aG	aGs*	G/P	aGs*	aG	aG	aG	aG	aG	
				No. of Container(s)	1	1	1	3	2	2	2	2	2	
				Volume	250mL	250mL	250mL	40mL	1000mL	1000mL	1000mL	1000mL	1000mL	
				Sample Analysis	See Item (4) in Special Instructions	TOX - 9020	Conductivity - 9050; pH (Water) - 9040	See item (5) in Special Instructions	See item (6) in Special Instructions	PAHs - 8310	Pesticides - 8081	PCBs - 8082	Chloro-Herbicides - EPA8151	
J1W932	WATER	7-12-16	0720		✓	✓	✓	✓	✓	✓	✓	✓	✓	

Page 150 of 176

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M. Downing / M. Downing	WCH 7-12-16 0945	T.R. Edmundson / T.R. Edmundson	7-12-16 0945
T.R. Edmundson / T.R. Edmundson	WCH 7-12-16 1500	Fed Ex	7-12-16
			0930 BWHC

Sign/Print Names

FINAL SAMPLE DISPOSITION

Disposal Method: _____ Disposed By: _____ Date/Time: _____

SPECIAL INSTRUCTIONS

(4) Phenolics Total Recoverable - 420.4; Total Organic Carbon (TOC) - 5310B
(5) VOA - 8260 (App IX); VOA - 8260 (Client List) {1,1,2-Trichloro-1,2,2-trifluoroethane, 1-Butanol, 2-Chloroethyl vinyl ether, 2-Nitropropane, Acetic acid, methyl ester, Diethyl ether, Ethyl acetate, Ethyl cyanide, Isopropylbenzene, Tetrahydrofuran, cis-1,2-Dichloroethylene}
(6) Semi-VOA - 8270 (App IX); Semi-VOA – 8270 (Client List) {1,2-Diphenylhydrazine, 1,4-Dinitrobenzene, 3+4 Methylphenol (cresol, m+p), Benzaldehyde, Benzoic acid, Dimethoate, Diphenylamine, Disulfoton, Parathion, Phorate, Tris(2,3-dibromopropyl) phosphate}

REVIEWED BY KW DATE 7/12/16

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: ERDF			DATA PACKAGE: J02198		
VALIDATOR: ELR		LAB: TAL		DATE: 8/22/14	
			SDG: J02198		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J1U931 J1U932					
				Water	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations acceptable? ..... Yes No (N/A)

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

DDT and endrin breakdowns acceptable? ..... Yes No N/A

Comments: _____

PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No (N/A)
Calibration blank results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... (Yes) No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes (No) N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: no FB's

4. ACCURACY (Levels C, D, and E)

Surrogates analyzed? ..... (Yes) No N/A
Surrogate recoveries acceptable? ..... (Yes) No N/A
Surrogates traceable? (Levels D, E) ..... Yes No (N/A)
Surrogates expired? (Levels D, E) ..... Yes No (N/A)
MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... (Yes) No N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)
Comments: LCS - aldrin + heptachlor - J all
toy - no MS/MSD/LCS - J all
no PAS

PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... (Yes) No N/A

Duplicate results acceptable? ..... (Yes) No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)

MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)

Field duplicate RPD values acceptable? ..... (Yes) No N/A

Field split RPD values acceptable? ..... Yes No (N/A)

Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: no tox ms/msd - J all

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No (N/A)

Positive results resolved acceptably? ..... Yes No (N/A)

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... (Yes) No N/A

Sample holding times acceptable? ..... Yes (No) N/A 8/22

Comments: ~~pest RT~~ - J all 8/22 (prep)

PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A
Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A
Results reported for all requested analyses? ..... Yes No N/A
Results supported in the raw data? (Levels D, E) ..... Yes No N/A
Samples properly prepared? (Levels D, E) ..... Yes No N/A
Detection limits meet RDL? ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:_____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed? ..... Yes No N/A
Lot check performed? ..... Yes No N/A
Check recoveries acceptable? ..... Yes No N/A
GPC cleanup performed? ..... Yes No N/A
GPC check performed? ..... Yes No N/A
GPC check recoveries acceptable? ..... Yes No N/A
GPC calibration performed? ..... Yes No N/A
GPC calibration check performed? ..... Yes No N/A
GPC calibration check retention times acceptable? ..... Yes No N/A
Check/calibration materials traceable? ..... Yes No N/A
Check/calibration materials Expired? ..... Yes No N/A
Analytical batch QC given similar cleanup? ..... Yes No N/A
Transcription/Calculation Errors? ..... Yes No N/A

Comments:_____

Appendix 6

Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334134

Method: 8081A
Preparation: 3510C

Lab Sample ID:	MB 280-334134/1-A	Analysis Batch:	280-335548	Instrument ID:	SGC_P1
Client Matrix:	Water	Prep Batch:	280-334134	Lab File ID:	07280029.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/28/2016 2123	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	07/19/2016 0853			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Result	Qual	MDL	RL
4,4'-DDD	0.0077	U	0.0077	0.10
4,4'-DDE	0.0075	U	0.0075	0.10
4,4'-DDT	0.015	U	0.015	0.10
Aldrin	0.0059	U	0.0059	0.050
alpha-BHC	0.0053	U	0.0053	0.050
alpha-Chlordane	0.0053	U	0.0053	0.50
beta-BHC	0.0087	U	0.0087	0.050
delta-BHC	0.0058	U	0.0058	0.050
Dieldrin	0.0063	U	0.0063	0.10
Endosulfan I	0.0058	U	0.0058	0.050
Endosulfan II	0.0070	U	0.0070	0.10
Endosulfan sulfate	0.0057	U	0.0057	0.10
Endrin	0.0079	U	0.0079	0.10
Endrin aldehyde	0.0088	U	0.0088	0.10
Endrin ketone	0.0070	U	0.0070	0.10
gamma-BHC (Lindane)	0.0069	U	0.0069	0.050
gamma-Chlordane	0.0091	U	0.0091	0.50
Heptachlor	0.0077	U	0.0077	0.050
Heptachlor epoxide	0.0075	U	0.0075	0.050
Methoxychlor	0.013	U	0.013	0.50
Toxaphene	0.37	U	0.37	5.0

Surrogate	% Rec	Acceptance Limits
Decachlorobiphenyl	107	34 - 122
Tetrachloro-m-xylene	62	28 - 115

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Lab Control Sample - Batch: 280-334134

Method: 8081A
Preparation: 3510C

Lab Sample ID:	LCS 280-334134/2-A	Analysis Batch:	280-335548	Instrument ID:	SGC_P1
Client Matrix:	Water	Prep Batch:	280-334134	Lab File ID:	07280024.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/28/2016 2000	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	07/19/2016 0853			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
4,4'-DDD	0.500	0.480	96	78 - 138	
4,4'-DDE	0.500	0.359	72	74 - 124	N
4,4'-DDT	0.500	0.449	90	72 - 139	
Aldrin	0.500	0.169	34	44 - 127	N
alpha-BHC	0.500	0.455	91	73 - 133	
alpha-Chlordane	0.500	0.402	80	75 - 128	J
beta-BHC	0.500	0.417	83	67 - 133	
delta-BHC	0.500	0.470	94	72 - 135	
Dieldrin	0.500	0.474	95	78 - 132	
Endosulfan I	0.500	0.471	94	73 - 128	
Endosulfan II	0.500	0.509	102	75 - 132	
Endosulfan sulfate	0.500	0.504	101	77 - 135	
Endrin	0.500	0.491	98	74 - 171	
Endrin aldehyde	0.500	0.450	90	59 - 136	
Endrin ketone	0.500	0.474	95	75 - 137	
gamma-BHC (Lindane)	0.500	0.463	93	71 - 132	
gamma-Chlordane	0.500	0.366	73	73 - 131	J
Heptachlor	0.500	0.226	45	52 - 129	N
Heptachlor epoxide	0.500	0.470	94	77 - 132	
Methoxychlor	0.500	0.482	96	67 - 150	J

Surrogate	% Rec	Acceptance Limits
Decachlorobiphenyl	99	34 - 122
Tetrachloro-m-xylene	61	28 - 115

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334134

Method: 8081A
Preparation: 3510C

MS Lab Sample ID:	280-85505-1	Analysis Batch:	280-335548	Instrument ID:	SGC_P1
Client Matrix:	Water	Prep Batch:	280-334134	Lab File ID:	07280026.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1010.2 mL
Analysis Date:	07/28/2016 2033			Final Weight/Volume:	10 mL
Prep Date:	07/19/2016 0853			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

MSD Lab Sample ID:	280-85505-1	Analysis Batch:	280-335548	Instrument ID:	SGC_P1
Client Matrix:	Water	Prep Batch:	280-334134	Lab File ID:	07280027.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1023.3 mL
Analysis Date:	07/28/2016 2049			Final Weight/Volume:	10 mL
Prep Date:	07/19/2016 0853			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
4,4'-DDD	101	100	78 - 138	2	50		
4,4'-DDE	97	95	74 - 124	4	50		
4,4'-DDT	102	100	72 - 139	3	25		
Aldrin	73	66	44 - 127	11	33		
alpha-BHC	100	100	73 - 133	1	50		
alpha-Chlordane	106	104	75 - 128	3	50		
beta-BHC	88	89	67 - 133	0	50		
delta-BHC	99	99	72 - 135	2	50		
Dieldrin	103	102	78 - 132	3	22		
Endosulfan I	101	99	73 - 128	2	50		
Endosulfan II	106	105	75 - 132	3	50		
Endosulfan sulfate	110	109	77 - 135	2	50		
Endrin	108	107	74 - 171	3	39		
Endrin aldehyde	99	98	59 - 136	2	50		
Endrin ketone	101	99	75 - 137	3	50		
gamma-BHC (Lindane)	99	100	71 - 132	1	26		
gamma-Chlordane	95	93	73 - 131	3	50	J	J
Heptachlor	82	77	52 - 129	8	27		
Heptachlor epoxide	107	107	77 - 132	1	50		
Methoxychlor	102	100	67 - 150	3	50		J

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
Decachlorobiphenyl	95	96	34 - 122
Tetrachloro-m-xylene	78	82	28 - 115

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334134

Method: 8081A
Preparation: 3510C

MS Lab Sample ID:	280-85505-1	Units: ug/L	
Client Matrix:	Water		
Dilution:	1.0		
Analysis Date:	07/28/2016 2033		
Prep Date:	07/19/2016 0853		
Leach Date:	N/A		

MSD Lab Sample ID:	280-85505-1
Client Matrix:	Water
Dilution:	1.0
Analysis Date:	07/28/2016 2049
Prep Date:	07/19/2016 0853
Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual		MSD Result/Qual	
4,4'-DDD	0.0075	U	0.495	0.489	0.501		0.491	
4,4'-DDE	0.0073	U	0.495	0.489	0.481		0.463	
4,4'-DDT	0.014	U	0.495	0.489	0.505		0.490	
Aldrin	0.0058	U	0.495	0.489	0.361		0.322	
alpha-BHC	0.0052	U	0.495	0.489	0.493		0.487	
alpha-Chlordane	0.0052	U	0.495	0.489	0.526		0.509	
beta-BHC	0.0085	U	0.495	0.489	0.434		0.435	
delta-BHC	0.0057	U	0.495	0.489	0.490		0.481	
Dieldrin	0.0061	U	0.495	0.489	0.510		0.497	
Endosulfan I	0.0057	U	0.495	0.489	0.498		0.486	
Endosulfan II	0.0068	U	0.495	0.489	0.526		0.512	
Endosulfan sulfate	0.0056	U	0.495	0.489	0.544		0.530	
Endrin	0.0077	U	0.495	0.489	0.536		0.521	
Endrin aldehyde	0.0086	U	0.495	0.489	0.489		0.481	
Endrin ketone	0.0068	U	0.495	0.489	0.498		0.484	
gamma-BHC (Lindane)	0.0067	U	0.495	0.489	0.490		0.487	
gamma-Chlordane	0.0089	U	0.495	0.489	0.473	J	0.456	J
Heptachlor	0.0075	U	0.495	0.489	0.408		0.378	
Heptachlor epoxide	0.0073	U	0.495	0.489	0.529		0.524	
Methoxychlor	0.013	U	0.495	0.489	0.503		0.489	J

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334134

Method: 8082
Preparation: 3510C

Lab Sample ID:	MB 280-334134/1-A	Analysis Batch:	280-335704	Instrument ID:	SGC_P3
Client Matrix:	Water	Prep Batch:	280-334134	Lab File ID:	07291604.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/29/2016 1358	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	07/19/2016 0853			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Result	Qual	MDL	RL
Aroclor 1016	0.12	U	0.12	0.50
Aroclor 1221	0.21	U	0.21	0.50
Aroclor 1232	0.17	U	0.17	0.50
Aroclor 1242	0.10	U	0.10	0.50
Aroclor 1248	0.092	U	0.092	0.50
Aroclor 1254	0.11	U	0.11	0.50
Aroclor 1260	0.16	U	0.16	0.50

Surrogate	% Rec	Acceptance Limits
Decachlorobiphenyl	95	30 - 136
Tetrachloro-m-xylene	61	25 - 120

Lab Control Sample - Batch: 280-334134

Method: 8082
Preparation: 3510C

Lab Sample ID:	LCS 280-334134/3-A	Analysis Batch:	280-335704	Instrument ID:	SGC_P3
Client Matrix:	Water	Prep Batch:	280-334134	Lab File ID:	07291605.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/29/2016 1419	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	07/19/2016 0853			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aroclor 1016	2.00	2.00	100	58 - 128	
Aroclor 1260	2.00	2.15	108	69 - 140	

Surrogate	% Rec	Acceptance Limits
Decachlorobiphenyl	98	30 - 136
Tetrachloro-m-xylene	53	25 - 120

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334134

Method: 8082
Preparation: 3510C

MS Lab Sample ID:	280-85505-1	Analysis Batch:	280-335704	Instrument ID:	SGC_P3
Client Matrix:	Water	Prep Batch:	280-334134	Lab File ID:	07291607.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	986.4 mL
Analysis Date:	07/29/2016 1502			Final Weight/Volume:	10 mL
Prep Date:	07/19/2016 0853			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY
MSD Lab Sample ID:	280-85505-1	Analysis Batch:	280-335704	Instrument ID:	SGC_P3
Client Matrix:	Water	Prep Batch:	280-334134	Lab File ID:	07291608.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1007.2 mL
Analysis Date:	07/29/2016 1524			Final Weight/Volume:	10 mL
Prep Date:	07/19/2016 0853			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Aroclor 1016	105	118	58 - 128	10	30		
Aroclor 1260	109	120	69 - 140	8	30		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
Decachlorobiphenyl	92	98	30 - 136
Tetrachloro-m-xylene	82	86	25 - 120

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334134

Method: 8082
Preparation: 3510C

MS Lab Sample ID:	280-85505-1	Units: ug/L		MSD Lab Sample ID:	280-85505-1
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	07/29/2016 1502			Analysis Date:	07/29/2016 1524
Prep Date:	07/19/2016 0853			Prep Date:	07/19/2016 0853
Leach Date:	N/A			Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Aroclor 1016	0.12	U	2.03	1.99	2.12	2.34
Aroclor 1260	0.16	U	2.03	1.99	2.20	2.38

Date: 22 August 2016
To: Washington Closure Hanford (technical representative)
From: ELR Consulting
Project: ERDF Leachate Tank Summer 2016
Subject: Semivolatile - Data Package No. J02198-TAL

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. J02198 prepared by TestAmerica Inc. (TAL). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V931	7/12/16	Water	C	See note 1
J1V932	7/12/16	Water	C	See note 1

1 – Semivolatile organics by 8270B.

Data validation was conducted in accordance with the WCH validation statement of work and WCH-173, Rev. 2, "Environmental Restoration Disposal Facility Leachate Sampling & Analysis Plan". Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times & Sample Preservation**

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. Samples must be prepared within 14 days and analyzed within 40 days.

If holding times are exceeded, but not by greater than twice the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than twice the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples of a given matrix. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as estimated and flagged "UJ".

Due to method blank contamination, all benzyl alcohol results were qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Laboratory Control Sample

Matrix spike/matrix spike duplicate and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike/matrix spike duplicate is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which percent recoveries must be within established laboratory quality control limits. If spike recoveries are outside control limits (50-150% or w/in laboratory specified limits), detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to an LCS recovery outside QC limits (33%), all hexachlorocyclopentadiene results were qualified as estimates and flagged "J".

Due to an MS and MSD recoveries outside QC limits (31% & 32%), all hexachlorocyclopentadiene results were qualified as estimates and flagged "J".

Due to a matrix spike and matrix spike duplicate results outside QC limits (22% & 36%), all 3,3-dichlorobenzidine results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For samples analyzed using SW-846 protocol, results must be within RPD limits of +/- 20% for water samples and +/- 35% for solid samples. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to an RPD outside QC limits (46%), all 3,3-dichlorobenzidine results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set field duplicates (J1V931/J1V932) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required detection limits (RDLs) to ensure that laboratory detection levels meet the required criteria. All results met the RDL.

- **Completeness**

Data package No. J02198 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, all benzyl alcohol results were qualified as undetected and flagged "U".
- Due to an LCS recovery outside QC limits (33%), all hexachlorocyclopentadiene results were qualified as estimates and flagged "J".
- Due to a matrix spike and matrix spike duplicate results outside QC limits (22% & 36%), all 3,3-dichlorobenzidine results were qualified as estimates and flagged "J".
- Due to an MS and MSD recoveries outside QC limits (31% & 32%), all hexachlorocyclopentadiene results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (46%), all 3,3-dichlorobenzidine results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services.*

WCH-173, Rev 2, *Environmental Restoration Disposal Facility Leachate Sampling and Analysis Plan*, November 2015.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validator in compliance with the WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

SEMIVOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: J02198	**REVIEWER: ELR**	**Project: ERDF**	**PAGE 1 OF 1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Benzyl alcohol	U	All	Method blank contamination
Hexachlorocyclopentadiene	J	All	LCS & MS recovery
3,3-dichorobenzidine	J	All	MS & MSD
3,3-dichorobenzidine	J	All	RPD

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V931**

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method: 8270C
Prep Method: 3520C
Dilution: 1.0
Analysis Date: 07/26/2016 2101
Prep Date: 07/19/2016 1337

Analysis Batch: 280-335194
Prep Batch: 280-334208

8/21/16

Instrument ID: SMS_G6
Lab File ID: G6_24485.D
Initial Weight/Volume: 999.7 mL
Final Weight/Volume: 1 mL
Injection Volume: 0.5 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,2,4,5-Tetrachlorobenzene	1.7	U	1.7	10
1,2,4-Trichlorobenzene	0.28	U	0.28	4.0
1,2-Dichlorobenzene	0.23	U	0.23	4.0
1,2-Diphenylhydrazine	0.23	U	0.23	10
1,3,5-Trinitrobenzene	4.0	U	4.0	50
1,3-Dichlorobenzene	0.30	U	0.30	10
1,3-Dinitrobenzene	2.0	U	2.0	10
1,4-Dichlorobenzene	0.32	U	0.32	4.0
1,4-Dinitrobenzene	2.0	U	2.0	10
1,4-Dioxane	1.7	U	1.7	20
1,4-Naphthoquinone	14	U	14	50
1-Naphthylamine	3.1	U	3.1	10
2,2'-oxybis[1-chloropropane]	0.28	U	0.28	10
2,3,4,6-Tetrachlorophenol	2.0	U	2.0	50
2,4,5-Trichlorophenol	0.45	U	0.45	10
2,4,6-Trichlorophenol	0.29	U	0.29	10
2,4-Dichlorophenol	0.64	U	0.64	10
2,4-Dimethylphenol	0.58	U	0.58	10
2,4-Dinitrophenol	10	U	10	25
2,4-Dinitrotoluene	1.7	U	1.7	10
2,6-Dichlorophenol	1.4	U	1.4	10
2,6-Dinitrotoluene	1.9	U	1.9	10
2-Acetylaminofluorene	7.0	U	7.0	100
2-Chloronaphthalene	0.26	U	0.26	4.0
2-Chlorophenol	2.0	U	2.0	10
2-Methylnaphthalene	0.29	U	0.29	4.0
2-Methylphenol	0.98	U	0.98	10
2-Naphthylamine	3.1	U	3.1	10
2-Nitroaniline	1.7	U	1.7	10
2-Nitrophenol	0.39	U	0.39	10
2-Picoline	1.2	U	1.2	20
2-sec-Butyl-4,6-dinitrophenol	4.0	U	4.0	20
2-Toluidine	1.4	U	1.4	10
3 & 4 Methylphenol	0.25	U	0.25	10
3,3'-Dichlorobenzidine	2.0	U J	2.0	10
3,3'-Dimethylbenzidine	4.0	U	4.0	20
3-Methylcholanthrene	1.7	U	1.7	20
3-Methylphenol	0.25	U	0.25	10
3-Nitroaniline	2.0	U	2.0	10
4,6-Dinitro-2-methylphenol	4.0	U	4.0	10
4-Aminobiphenyl	4.5	U	4.5	50
4-Bromophenyl phenyl ether	0.43	U	0.43	10
4-Chloro-3-methylphenol	2.4	U	2.4	10
4-Chloroaniline	2.1	U	2.1	10
4-Chlorophenyl phenyl ether	1.7	U	1.7	10
4-Methylphenol	0.25	U	0.25	10

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: J1V931

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method: 8270C
Prep Method: 3520C
Dilution: 1.0
Analysis Date: 07/26/2016 2101
Prep Date: 07/19/2016 1337

Analysis Batch: 280-335194
Prep Batch: 280-334208

8/21/16

Instrument ID: SMS_G6
Lab File ID: G6_24485.D
Initial Weight/Volume: 999.7 mL
Final Weight/Volume: 1 mL
Injection Volume: 0.5 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
4-Nitroaniline	2.0	U	2.0	10
4-Nitrophenol	1.2	U	1.2	10
4-Nitroquinoline-1-oxide	20	U	20	100
5-Nitro-o-toluidine	1.4	U	1.4	20
7,12-Dimethylbenz(a)anthracene	1.6	U	1.6	20
a,a-Dimethylphenethylamine	20	U	20	50
Acenaphthene	0.28	U	0.28	4.0
Acenaphthylene	0.49	U	0.49	4.0
Acetophenone	0.24	U	0.24	10
Aniline	2.0	U	2.0	10
Anthracene	0.42	U	0.42	4.0
Aramite, Total	9.2	U	9.2	18
Benzaldehyde	2.0	U	2.0	10
Benzo[a]anthracene	0.35	U	0.35	4.0
Benzo[a]pyrene	0.31	U	0.31	4.0
Benzo[b]fluoranthene	0.53	U	0.53	4.0
Benzo[g,h,i]perylene	0.50	U	0.50	4.0
Benzo[k]fluoranthene	0.46	U	0.46	4.0
Benzoic acid	10	U	10	25
Benzyl alcohol	0.57	J B V	0.23	10
Bis(2-chloroethoxy)methane	0.97	U	0.97	10
Bis(2-chloroethyl)ether	0.41	U	0.41	10
Bis(2-ethylhexyl) phthalate	0.56	U	0.56	10
Butyl benzyl phthalate	1.0	U	1.0	4.0
Chlorobenzilate	0.66	U	0.66	10
Chrysene	0.54	U	0.54	4.0
Diallate	0.56	U	0.56	5.6
Dibenz(a,h)anthracene	0.51	U	0.51	4.0
Dibenzofuran	0.29	U	0.29	4.0
Diethyl phthalate	0.38	U	0.38	4.0
Dimethoate	1.1	U	1.1	20
Dimethyl phthalate	0.21	U	0.21	4.0
Di-n-butyl phthalate	1.2	U	1.2	4.0
Di-n-octyl phthalate	0.35	U	0.35	4.0
Diphenylamine	1.1	U	1.1	10
Disulfoton	1.1	U	1.1	50
Ethyl methanesulfonate	0.94	U	0.94	10
Ethyl Parathion	2.0	U	2.0	50
Fluoranthene	0.20	U	0.20	4.0
Fluorene	0.31	U	0.31	4.0
Hexachlorobenzene	0.66	U	0.66	10
Hexachlorobutadiene	3.3	U	3.3	10
Hexachlorocyclopentadiene	10	U J	10	10
Hexachloroethane	2.1	U	2.1	10
Hexachloropropene	2.0	U	2.0	100
Indeno[1,2,3-cd]pyrene	0.65	U	0.65	4.0

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: J1V931

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method: 8270C
Prep Method: 3520C
Dilution: 1.0
Analysis Date: 07/26/2016 2101
Prep Date: 07/19/2016 1337

Analysis Batch: 280-335194
Prep Batch: 280-334208

8/2/16

Instrument ID: SMS_G6
Lab File ID: G6_24485.D
Initial Weight/Volume: 999.7 mL
Final Weight/Volume: 1 mL
Injection Volume: 0.5 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Isophorone	0.21	U	0.21	10
Isosafrole	1.0	U	1.0	3.5
Methapyrilene	20	U	20	50
Methyl methanesulfonate	1.0	U	1.0	10
Naphthalene	0.29	U	0.29	4.0
Nitrobenzene	0.81	U	0.81	10
N-Nitrosodiethylamine	1.7	U	1.7	10
N-Nitrosodimethylamine	0.29	U	0.29	10
N-Nitrosodi-n-butylamine	1.2	U	1.2	10
N-Nitrosodi-n-propylamine	0.35	U	0.35	10
n-Nitrosodiphenylamine(as diphenylamine)	0.44	U	0.44	10
N-Nitrosomethylethylamine	1.8	U	1.8	10
N-Nitrosomorpholine	2.0	U	2.0	10
N-Nitrosopiperidine	2.0	U	2.0	10
N-Nitrosopyrrolidine	0.80	U	0.80	10
o,o',o''-Triethylphosphorothioate	2.0	U	2.0	50
p-Dimethylamino azobenzene	2.0	U	2.0	20
Pentachlorobenzene	2.0	U	2.0	10
Pentachloroethane	2.0	U	2.0	50
Pentachloronitrobenzene	2.0	U	2.0	50
Pentachlorophenol	20	U	20	50
Phenacetin	1.1	U	1.1	20
Phenanthrene	0.26	U	0.26	4.0
Phenol	2.0	U	2.0	10
Phorate	2.0	U	2.0	50
p-Phenylene diamine	5.0	U	5.0	100
Pronamide	2.0	U	2.0	20
Pyrene	0.37	U	0.37	10
Pyridine	1.7	U	1.7	20
Safrole, Total	1.1	U	1.1	20
Tris(2,3-dibromopropyl)phosphate	25	U	25	100

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	83		48 - 135
2-Fluorobiphenyl	66		48 - 135
2-Fluorophenol	58		41 - 135
Nitrobenzene-d5	61		42 - 135
Phenol-d5	64		46 - 135
Terphenyl-d14	46		20 - 135

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: J1V931

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270C	Analysis Batch:	280-335194	Instrument ID:	SMS_G6
Prep Method:	3520C	Prep Batch:	280-334208	Lab File ID:	G6_24485.D
Dilution:	1.0			Initial Weight/Volume:	999.7 mL
Analysis Date:	07/26/2016 2101			Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 1337			Injection Volume:	0.5 uL

8/21/16

Tentatively Identified Compounds **Number TIC's Found: 5**

Cas Number	Analyte	RT	Est. Result (ug/L)	Qualifier
110-82-7	Cyclohexane	1.68	30	N J
994-05-8	Butane, 2-methoxy-2-methyl-	1.75	130	N J
	Unknown	3.12	13	N J
	Unknown	4.40	6.5	N J
104-76-7	1-Hexanol, 2-ethyl-	4.66	33	N J

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method: 8270C
Prep Method: 3520C
Dilution: 1.0
Analysis Date: 07/26/2016 2221
Prep Date: 07/19/2016 1337

Analysis Batch: 280-335194
Prep Batch: 280-334208

8/21/16

Instrument ID: SMS_G6
Lab File ID: G6_24488.D
Initial Weight/Volume: 996.3 mL
Final Weight/Volume: 1 mL
Injection Volume: 0.5 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,2,4,5-Tetrachlorobenzene	1.7	U	1.7	10
1,2,4-Trichlorobenzene	0.28	U	0.28	4.0
1,2-Dichlorobenzene	0.23	U	0.23	4.0
1,2-Diphenylhydrazine	0.23	U	0.23	10
1,3,5-Trinitrobenzene	4.0	U	4.0	50
1,3-Dichlorobenzene	0.30	U	0.30	10
1,3-Dinitrobenzene	2.0	U	2.0	10
1,4-Dichlorobenzene	0.32	U	0.32	4.0
1,4-Dinitrobenzene	2.0	U	2.0	10
1,4-Dioxane	1.7	U	1.7	20
1,4-Naphthoquinone	14	U	14	50
1-Naphthylamine	3.1	U	3.1	10
2,2'-oxybis[1-chloropropane]	0.28	U	0.28	10
2,3,4,6-Tetrachlorophenol	2.0	U	2.0	50
2,4,5-Trichlorophenol	0.45	U	0.45	10
2,4,6-Trichlorophenol	0.29	U	0.29	10
2,4-Dichlorophenol	0.64	U	0.64	10
2,4-Dimethylphenol	0.58	U	0.58	10
2,4-Dinitrophenol	10	U	10	25
2,4-Dinitrotoluene	1.7	U	1.7	10
2,6-Dichlorophenol	1.4	U	1.4	10
2,6-Dinitrotoluene	1.9	U	1.9	10
2-Acetylaminofluorene	7.0	U	7.0	100
2-Chloronaphthalene	0.26	U	0.26	4.0
2-Chlorophenol	2.0	U	2.0	10
2-Methylnaphthalene	0.29	U	0.29	4.0
2-Methylphenol	0.98	U	0.98	10
2-Naphthylamine	3.1	U	3.1	10
2-Nitroaniline	1.7	U	1.7	10
2-Nitrophenol	0.39	U	0.39	10
2-Picoline	1.2	U	1.2	20
2-sec-Butyl-4,6-dinitrophenol	4.0	U	4.0	20
2-Toluidine	1.4	U	1.4	10
3 & 4 Methylphenol	0.25	U	0.25	10
3,3'-Dichlorobenzidine	2.0	U J	2.0	10
3,3'-Dimethylbenzidine	4.0	U	4.0	20
3-Methylcholanthrene	1.7	U	1.7	20
3-Methylphenol	0.25	U	0.25	10
3-Nitroaniline	2.0	U	2.0	10
4,6-Dinitro-2-methylphenol	4.0	U	4.0	10
4-Aminobiphenyl	4.5	U	4.5	50
4-Bromophenyl phenyl ether	0.43	U	0.43	10
4-Chloro-3-methylphenol	2.4	U	2.4	10
4-Chloroaniline	2.1	U	2.1	10
4-Chlorophenyl phenyl ether	1.7	U	1.7	10
4-Methylphenol	0.25	U	0.25	10

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method: 8270C
Prep Method: 3520C
Dilution: 1.0
Analysis Date: 07/26/2016 2221
Prep Date: 07/19/2016 1337

Analysis Batch: 280-335194
Prep Batch: 280-334208

8/21/16

Instrument ID: SMS_G6
Lab File ID: G6_24488.D
Initial Weight/Volume: 996.3 mL
Final Weight/Volume: 1 mL
Injection Volume: 0.5 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
4-Nitroaniline	2.0	U	2.0	10
4-Nitrophenol	1.2	U	1.2	10
4-Nitroquinoline-1-oxide	20	U	20	100
5-Nitro-o-toluidine	1.4	U	1.4	20
7,12-Dimethylbenz(a)anthracene	1.6	U	1.6	20
a,a-Dimethylphenethylamine	20	U	20	50
Acenaphthene	0.28	U	0.28	4.0
Acenaphthylene	0.49	U	0.49	4.0
Acetophenone	0.24	U	0.24	10
Aniline	2.0	U	2.0	10
Anthracene	0.42	U	0.42	4.0
Aramite, Total	9.2	U	9.2	18
Benzaldehyde	2.0	U	2.0	10
Benzo[a]anthracene	0.35	U	0.35	4.0
Benzo[a]pyrene	0.31	U	0.31	4.0
Benzo[b]fluoranthene	0.53	U	0.53	4.0
Benzo[g,h,i]perylene	0.50	U	0.50	4.0
Benzo[k]fluoranthene	0.46	U	0.46	4.0
Benzoic acid	10	U	10	25
Benzyl alcohol	0.34	J B U	0.23	10
Bis(2-chloroethoxy)methane	0.97	U	0.97	10
Bis(2-chloroethyl)ether	0.41	U	0.41	10
Bis(2-ethylhexyl) phthalate	0.56	U	0.56	10
Butyl benzyl phthalate	1.0	U	1.0	4.0
Chlorobenzilate	0.66	U	0.66	10
Chrysene	0.54	U	0.54	4.0
Diallate	0.56	U	0.56	5.6
Dibenz(a,h)anthracene	0.51	U	0.51	4.0
Dibenzofuran	0.29	U	0.29	4.0
Diethyl phthalate	0.38	U	0.38	4.0
Dimethoate	1.1	U	1.1	20
Dimethyl phthalate	0.21	U	0.21	4.0
Di-n-butyl phthalate	1.2	U	1.2	4.0
Di-n-octyl phthalate	0.35	U	0.35	4.0
Diphenylamine	1.1	U	1.1	10
Disulfoton	1.1	U	1.1	50
Ethyl methanesulfonate	0.95	U	0.95	10
Ethyl Parathion	2.0	U	2.0	50
Fluoranthene	0.20	U	0.20	4.0
Fluorene	0.31	U	0.31	4.0
Hexachlorobenzene	0.66	U	0.66	10
Hexachlorobutadiene	3.3	U	3.3	10
Hexachlorocyclopentadiene	10	U J	10	10
Hexachloroethane	2.1	U	2.1	10
Hexachloropropene	2.0	U	2.0	100
Indeno[1,2,3-cd]pyrene	0.65	U	0.65	4.0

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method: 8270C
Prep Method: 3520C
Dilution: 1.0
Analysis Date: 07/26/2016 2221
Prep Date: 07/19/2016 1337

Analysis Batch: 280-335194
Prep Batch: 280-334208

8/2/16

Instrument ID: SMS_G6
Lab File ID: G6_24488.D
Initial Weight/Volume: 996.3 mL
Final Weight/Volume: 1 mL
Injection Volume: 0.5 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Isophorone	0.21	U	0.21	10
Isosafrole	1.0	U	1.0	3.5
Methapyrilene	20	U	20	50
Methyl methanesulfonate	1.0	U	1.0	10
Naphthalene	0.29	U	0.29	4.0
Nitrobenzene	0.81	U	0.81	10
N-Nitrosodiethylamine	1.7	U	1.7	10
N-Nitrosodimethylamine	0.29	U	0.29	10
N-Nitrosodi-n-butylamine	1.2	U	1.2	10
N-Nitrosodi-n-propylamine	0.35	U	0.35	10
n-Nitrosodiphenylamine(as diphenylamine)	0.44	U	0.44	10
N-Nitrosomethylethylamine	1.8	U	1.8	10
N-Nitrosomorpholine	2.0	U	2.0	10
N-Nitrosopiperidine	2.0	U	2.0	10
N-Nitrosopyrrolidine	0.81	U	0.81	10
o,o',o"-Triethylphosphorothioate	2.0	U	2.0	50
p-Dimethylamino azobenzene	2.0	U	2.0	20
Pentachlorobenzene	2.0	U	2.0	10
Pentachloroethane	2.0	U	2.0	50
Pentachloronitrobenzene	2.0	U	2.0	50
Pentachlorophenol	20	U	20	50
Phenacetin	1.1	U	1.1	20
Phenanthrene	0.26	U	0.26	4.0
Phenol	2.0	U	2.0	10
Phorate	2.0	U	2.0	50
p-Phenylene diamine	5.0	U	5.0	100
Pronamide	2.0	U	2.0	20
Pyrene	0.37	U	0.37	10
Pyridine	1.7	U	1.7	20
Safrole, Total	1.1	U	1.1	20
Tris(2,3-dibromopropyl)phosphate	25	U	25	100

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	90		48 - 135
2-Fluorobiphenyl	86		48 - 135
2-Fluorophenol	81		41 - 135
Nitrobenzene-d5	89		42 - 135
Phenol-d5	81		46 - 135
Terphenyl-d14	42		20 - 135

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method: 8270C
Prep Method: 3520C
Dilution: 1.0
Analysis Date: 07/26/2016 2221
Prep Date: 07/19/2016 1337

Analysis Batch: 280-335194
Prep Batch: 280-334208

8/22/16

Instrument ID: SMS_G6
Lab File ID: G6_24488.D
Initial Weight/Volume: 996.3 mL
Final Weight/Volume: 1 mL
Injection Volume: 0.5 uL

Tentatively Identified Compounds **Number TIC's Found: 7**

Cas Number	Analyte	RT	Est. Result (ug/L)	Qualifier
110-82-7	Cyclohexane	1.67	41	N J
	Unknown	1.75	210	N J
	Unknown	3.12	16	N J
21400-25-9	1-Propene, 1,1,2-trichloro-	4.08	4.7	N J
124-18-5	n-Decane	4.40	4.0	J N J
	Unknown	4.66	25	N J
15972-60-8	Alachlor	9.65	1.8	J N J

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-85505-1

SDG #: J02198
SAF#: RC-009

Date SDG Closed: July 14, 2016
Data Deliverable: 21 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V931	280-85505-1	2320/300.0/2540C/2540D/350.1/353.2/410.4/ 9020/420.4/5310B/1664/9034/9012/8260/ 6010/7470/9050/9040/8015/8270/ WTPH-G/WTPH-D+/8151/8081/8082/8310	2320B/300.0/2540C/2540D/350.1/353.2/410.4/ 9020B/420.4/5310B/1664A/9034/9012A/8260B/ 6010B/6020/7470A/9050A/9040B/8015C/8270C/ NWTPH-Gx/NWTPH-Dx/8151A/8081A/8082/8310
J1V932	280-85505-2	2320/300.0/2540C/2540D/350.1/353.2/410.4/ 9020/420.4/5310B/1664/9034/9012/8260/ 6010/7470/9050/9040/8015/8270/ WTPH-G/WTPH-D+/8151/8081/8082/8310	2320B/300.0/2540C/2540D/350.1/353.2/410.4/ 9020B/420.4/5310B/1664A/9034/9012A/8260B/ 6010B/6020/7470A/9050A/9040B/8015C/8270C/ NWTPH-Gx/NWTPH-Dx/8151A/8081A/8082/8310
J1V933	280-85505-3	8260	8260B

The Uranium method substitution noted above, as agreed to by all parties, has no technical impact on the data.

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

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

RECEIPT
The samples were received on 7/13/2016 9:30 AM and 7/14/2016 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 1.7° C, 2.9° C, 3.4° C and 4.9° C.

Receipt Exceptions

It was noted that the VOA vials did not have labels affixed to them. There was one label for each set of VOA vials that was affixed to the bubble bag. Each label was transferred to one of the vials in each set. The client was notified on 7/15/2016.

GC/MS VOLATILES - SW846 8260B
The following compounds were not found as part of a TIC search performed for samples J1V931, J1V932 and J1V933: Acrylamide [79-06-1]; Formaldehyde [50-00-0]; 1,3-Butadiene [106-99-0]; Chlorodifluoromethane [75-45-6]; Dichloropropanol [26545-73-3]; Trichloromethanethiol [75-70-7]; Allyl alcohol (2-Propen-1-ol) [107-18-6]; Crotonaldehyde (2-Butenaldehyde) [4170-30-3]; Epichlorohydrin [106-89-8].

The GC/MS Volatiles analyses of samples J1V932 and J1V933 were performed 3 days outside the recommended sample holding times, due to analyst oversight. The client was notified on 8/2/2016.

The preservative used in the sample containers provided is not compatible with one of the Method 8260B analytes requested. Samples J1V931, J1V932 and J1V933 were received preserved with hydrochloric acid. The requested target analyte list includes 2-chloroethyl vinyl ether, an acid-labile compound that degrades in an acidic medium.

Methylene Chloride, a common laboratory contaminant, is present in the method blank associated with batch 280-334916 at a level exceeding the reporting limit. Because this common laboratory contaminant is present in the method blank at a level that is less than five times the reporting limit, corrective action is not required.

Low levels of Methylene chloride, a common laboratory contaminant, are present in the method blank associated with batch 280-335637. Because the concentration in the method blank is not present at a level greater than the reporting limit, corrective action is deemed unnecessary.

The LCS associated with batch 280-334916 exhibited the percent recovery outside the control limits, biased high, for Methylene Chloride, and the associated sample result has been flagged "T". As Methylene Chloride is not present at a level greater than the reporting limit in the associated sample, corrective action is deemed unnecessary.

2-Chloroethyl vinyl ether was not recovered in the MS/MSD performed on sample J1V931 in batch 280-334916 due to the acid preservative used in the sample. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

Due to analyst oversight, MS/MSD analysis was not performed for batch 280-335637. Method precision and accuracy have been verified by the acceptable LCS/LCSD analysis data.

A Continuing Calibration Verification (CCV) standard associated with samples in batch 280-334916 exhibited the %Difference (%D) value outside acceptance criteria, biased low, for 1-Butanol (-50.2%). The sample associated with this CCV was non-detect for the affected analyte. All CCC and SPCC compounds are in control; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

GC/MS SEMIVOLATILES - SW846 8270C

The following compounds were not found as part of a TIC search performed for samples J1V931 and J1V932: 1-Acetyl-2-thiorurea [591-08-2]; 2,5-Diaminotoluene [95-70-5]; 2-Cyclohexyl-4,6-dinitrophenol [131-89-5]; Hexachlorophene [70-30-4].

Low levels of Benzyl alcohol are present in the method blank associated with batch 280-334208. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

A Continuing Calibration Verification (CCV) standard associated with samples in analysis batch 280-335194 exhibited the %Difference (%D) value outside acceptance criteria, biased low, for 4-Nitroquinoline-1-oxide (-50.1%). The samples associated with this CCV were non-detect for the affected analyte. All CCC and SPCC compounds are in control; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

GLYCOLS - SW846 8015C

Surrogate 1,4-Butanediol was recovered outside the control limits, biased low, in samples J1V931 and J1V932. The laboratory noted that this anomaly was due to obvious matrix interference; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

METHANOL - SW846 8015C

No anomalies were encountered.

GRO - NWTPH-Gx

The samples were collected in properly preserved vials for analysis of gasoline range organics (GRO). However, when verified by the laboratory, the pH was greater than 2 and the following sample was analyzed after 7 days from sampling: J1V932 (pH = 7).

No other anomalies were encountered.

PESTICIDES - SW846 8081A

The LCS associated with batch 280-334134 exhibited percent recoveries outside the control limits, biased low, as follows: 4,4'-DDE = 72% (lower limit 74), Aldrin = 34% (lower limit 44), Heptachlor = 45% (lower limit 52). Associated sample results have been flagged with an "N". It can be noted that the spike compound recoveries and surrogate recoveries for the MS/MSD performed on sample J1V931 were in control. The laboratory re-extracted the samples, unavoidably 14 days past the 7 day recommended sample holding time. Upon re-extraction and reanalysis of the samples under batch 280-336109, the associated LCS spike compound recoveries were 100% in control. and the non-detect results were confirmed. The original analysis data have been reported as the non-detect sample results were confirmed.

No other anomalies were encountered.

PCBs - SW846 8082

No anomalies were encountered.

HERBICIDES - SW846 8151A
No anomalies were encountered.

DRO - NWTPH-Dx
Low levels of C10-C36 are present in the method blank associated with batch 280-334141. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

PAHs - SW846 8310
Surrogate Terphenyl-d14 recovered outside the control limits, biased low at 67% (lower limit 70%), in sample J1V931. No evidence of matrix interference was present and the sample was non-detect. It can be noted that the spike compound recoveries and surrogate recoveries for the MS/MSD performed on sample J1V931 were in control. The laboratory re-extracted the sample, unavoidably 13 days past the 7 day recommended sample holding time, and the surrogate was in control at 94% and the non-detect results were confirmed. Due to insufficient sample volume remaining, sample specific MS/MSD analysis could not be performed for the re-extract batch. The original analysis data have been reported as the non-detect sample results were confirmed and the sample specific batch MS/MSD was associated with the original analysis.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/6020/7470A
Serial dilution of a digestate in batch 280-334811 indicates that physical and chemical interferences are present for Uranium. Results have been flagged with an "X".

Low levels of Thallium are present in the method blank associated with batch 280-334811. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Calcium and Uranium in the Matrix Spike performed on sample J1V931; therefore, control limits are not applicable.

The duplicate analysis of sample J1V931 exhibited RPD data outside the control limits for Thallium, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

OIL & GREASE (HEM) - EPA 1664A
No anomalies were encountered.

ANIONS - MCAWW 300.0
The orthophosphate as P analyses for samples J1V931 and J1V932 were performed 8-9 hours outside the recommended 48 hour sample holding times. The analyses were originally performed within the sample holding times; however, due to associated continuing calibration verification (CCV) failures, reanalysis was required.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to high constituent concentration, samples J1V931 and J1V932 required dilutions prior to the analysis of Nitrate as N, Chloride and Sulfate, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

The orthophosphate as P Matrix Spike performed on sample J1V931 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

AMMONIA as N - MCAWW 350.1
No anomalies were encountered.

NITRATE NITRITE as N - MCAWW 353.2
Each sample is analyzed to achieve the lowest possible reporting limit within the constraints of the method. Due to high constituent concentration, samples J1V931 and J1V932 had to be analyzed at dilutions, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

The Matrix Spike performed on sample J1V931 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

CHEMICAL OXYGEN DEMAND - MCAWW 410.4
No anomalies were encountered.

PHENOLICS - MCAWW 420.4
Phenolics are present at a level greater than half the reporting limit in the method blank associated with batch 280-335552. As no detectable concentrations of Phenolics are present in the associated samples, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL CYANIDE - SW846 9012A
Low levels of Total Cyanide are present in the method blank associated with batch 280-334663. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL ORGANIC HALOGENS (TOX) - SW846 9020B
The laboratory noted that the containers submitted for samples J1V931 and J1V932 were received with excess headspace. This could cause volatile halides to evaporate, resulting in a low bias to the reported results.

Samples J1V931 and J1V932 exhibited elevated detection limits due to the limited sample volume used. The nominal sample amount could not be used due to the nature of the sample matrix.

No other anomalies were encountered.

SULFIDE - SW846 9034
No anomalies were encountered.

ALKALINITY - SM 2320B
Low levels of Alkalinity are present in the method blank associated with batch 280-333888. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL DISSOLVED SOLIDS - SM 2540C
Samples J1V931 and J1V932 exhibited elevated detection limits due to the limited sample volume used. The nominal sample amount could not be used due to high constituent concentration.

No other anomalies were encountered.

TOTAL SUSPENDED SOLIDS - SM 2540D
No anomalies were encountered.

TOTAL ORGANIC CARBON - SM 5310B
No anomalies were encountered.

PH - SW846 9040B
SU = standard units

Samples J1V931 and J1V932 were analyzed 14 days after sample receipt, due to analyst oversight. It can be noted that pH is a field parameter with a holding time of 15 minutes.

No other anomalies were encountered.

SPECIFIC CONDUCTANCE - SW846 9050A
No anomalies were encountered.

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-022

Collector DOWNING, MK	**Company Contact** Joan Kessner	**Telephone No.** 375-4688	**Project Coordinator** KESSNER, JH
Project Designation ERDF Leachate Tank	**Sampling Location** ERDF Leachate tank 4, Summer 2016		**SAF No.** RC-009
Ice Chest No. ERC-02-404	**Field Logbook No.** EL-1626-03	**COA** RERDF22560	**Method of Shipment** Commercial Carrier
Shipped To TestAmerica Denver	**Offsite Property No.** A131487		**Bill of Lading/Air Bill No.** SEE OSPC
Other Labs Shipped To TestAmerica Richland			

Price Code 7D

Data Turnaround 21 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive, less than DOT limits

Special Handling and/or Storage

Cool 4 Deg C

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s)	Volume	Sample Analysis
				H2SO4 to pH <2	aG	3	250mL	See item (4) in Special Instructions
				H2SO4 to pH <2	aGs*	2	250mL	TOX - 9020
				None	G/P	2	250mL	Conductivity - 9050; pH (Water) - 9040
				HCl or H2SO4 to pH <2	aGs*	6	40mL	See item (5) in Special Instructions
				Cool <=6C	aG	4	1000mL	See item (6) in Special Instructions
				Cool <=6C	aG	4	1000mL	PAHs - 8310
				Cool <=6C	aG	4	1000mL	Pesticides - 8081
				Cool <=6C	aG	4	1000mL	PCBs - 8082
				Cool <=8C	aG	4	1000mL	Chloro-Herbicides - EPA8151
J10931	WATER	7-12-16	0720	✓	✓	✓	✓	✓ ✓ ✓ ✓ ✓

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
J. Downing/J. Downing WCH	7-12-16 0945	T.R. Edmundson/T.R. Edmundson	7-12-16 0945
T.R. Edmundson/T.R. Edmundson	7-12-16 1500	Fed Ex	7-12-16 —
		X	0930 BWH

Sign/Print Names

SPECIAL INSTRUCTIONS

(4) Phenolics Total Recoverable - 420.4; Total Organic Carbon (TOC) - 5310B
(5) VOA - 8260 (App IX); VOA - 8260 (Client List) {1,1,2-Trichloro-1,2,2-trifluoroethane, 1-Butanol, 2-Chloroethyl vinyl ether, 2-Nitropropane, Acetic acid, methyl ester, Diethyl ether, Ethyl acetate, Ethyl cyanide, Isopropylbenzene, Tetrahydrofuran, cis-1,2-Dichloroethylene}
(6) Semi-VOA - 8270 (App IX); Semi-VOA – 8270 (Client List) {1,2-Diphenylhydrazine, 1,4-Dinitrobenzene, 3+4 Methylphenol (cresol, m+p), Benzaldehyde, Benzoic acid, Dimethoate, Diphenylamine, Disulfoton, Parathion, Phorate, Tris(2,3-dibromopropyl) phosphate}

REVIEWED BY KJN DATE 7/12/16

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

FINAL SAMPLE DISPOSITION Disposal Method — Disposed By — Date/Time

WCH-EE-011

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-023

Collector DOWNING, MK	**Company Contact** Joan Kessner	**Telephone No.** 375-4688	**Project Coordinator** KESSNER, JH
Project Designation ERDF Leachate Tank	**Sampling Location** ERDF Leachate tank 4, Summer 2016		**SAF No.** RC-009
Ice Chest No. ERC-02-404	**Field Logbook No.** EL-1626-03	**COA** RERDF22560	**Method of Shipment** Commercial Carrier
Shipped To TestAmerica Denver	**Offsite Property No.** A131487		**Bill of Lading/Air Bill No.** SEE OSPC

Price Code 7D **Data Turnaround** 21 Days

Other Labs Shipped To TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially radioactive, less than DOT limits

Special Handling and/or Storage
Cool 4 Deg C

Preservation	H2SO4 to pH <2	H2SO4 to pH <2	None	HCl or H2SO4 to pH <2	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	
Type of Container	aG	aGs*	G/P	aGs*	aG	aG	aG	aG	aG	
No. of Container(s)	1	1	1	3	2	2	2	2	2	
Volume	250mL	250mL	250mL	40mL	1000mL	1000mL	1000mL	1000mL	1000mL	
Sample Analysis	See item (4) in Special Instructions	TOX - 9020	Conductivity - 9050; pH (Water) - 9040	See item (5) in Special Instructions	See item (6) in Special Instructions	PAHs - 8310	Pesticides - 8081	PCBs - 8082	Chloro-Herbicides - EPA8151	

Sample No.	Matrix	Sample Date	Sample Time									
J1V932	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓

Page 100 of 176

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M. Downing / M. Downing 10A1	7-12-16 0945	T.R. Edmundson / S.R. Edmundson	7-12-16 0945
T.R. Edmundson / S.R. Edmundson WCH	7-12-16 1500	Fed Ex	7-12-16
		[signature]	0930 B Wells

FINAL SAMPLE DISPOSITION Disposal Method: _____ Disposed By: _____ Date/Time: _____

SPECIAL INSTRUCTIONS

(4) Phenolics Total Recoverable - 420.4; Total Organic Carbon (TOC) - 5310B
(5) VOA - 8260 (App IX); VOA - 8260 (Client List) {1,1,2-Trichloro-1,2,2-trifluoroethane, 1-Butanol, 2-Chloroethyl vinyl ether, 2-Nitropropane, Acetic acid, methyl ester, Diethyl ether, Ethyl acetate, Ethyl cyanide, Isopropylbenzene, Tetrahydrofuran, cis-1,2-Dichloroethylene}
(6) Semi-VOA - 8270 (App IX); Semi-VOA – 8270 (Client List) {1,2-Diphenylhydrazine, 1,4-Dinitrobenzene, 3+4 Methylphenol (cresol, m+p), Benzaldehyde, Benzoic acid, Dimethoate, Diphenylamine, Disulfoton, Parathion, Phorate, Tris(2,3-dibromopropyl) phosphate}

REVIEWED BY KW DATE 7/12/16

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: ERDF			DATA PACKAGE: J02198		
VALIDATOR: ELR		LAB: TAL		DATE: 8/22/16	
			SDG: J02198		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J1V931 J1V932					
					Water

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No (N/A)

Initial calibrations acceptable? ..... Yes No (N/A)

Continuing calibrations acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No ~~N/A~~
Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: Benzyl alcohol - U all

no FQ

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A
Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A
Surrogates traceable? (Levels D, E) ..... Yes No N/A
Surrogates expired? (Levels D, E) ..... Yes No N/A
MS/MSD samples analyzed? ..... Yes No N/A
MS/MSD results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A

Comments: hexachlorocyclo pentadiene - J all LCS + MS
MS - 3,3-dichlorobenzidine - J all

no FA

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed?	Yes	No	N/A
MS/MSD RPD values acceptable?	Yes	No	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	N/A
MS/MSD standards expired? (Levels D, E)	Yes	No	N/A
Field duplicate RPD values acceptable?	Yes	No	N/A
Field split RPD values acceptable?	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments: 3,3-dichlorobenzidine - 4620 - J adj

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed?	Yes	No	N/A
Iinternal standard areas acceptable?	Yes	No	N/A
Internal standard retention times acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved?	Yes	No	N/A
Sample holding times acceptable?	Yes	No	N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A
Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A
Results reported for all requested analyses? ..... Yes No N/A
Results supported in the raw data? (Levels D, E) ..... Yes No N/A
Samples properly prepared? (Levels D, E) ..... Yes No N/A
Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A
Detection limits meet RDL? ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments:

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A
GPC check performed? ..... Yes No N/A
GPC check recoveries acceptable? ..... Yes No N/A
GPC calibration performed? ..... Yes No N/A
GPC calibration check performed? ..... Yes No N/A
GPC calibration check retention times acceptable? ..... Yes No N/A
Check/calibration materials traceable? ..... Yes No N/A
Check/calibration materials Expired? ..... Yes No N/A
Analytical batch QC given similar cleanup? ..... Yes No N/A
Transcription/Calculation Errors? ..... Yes No N/A
Comments:

Appendix 6

Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334208

Method: 8270C
Preparation: 3520C

Lab Sample ID:	MB 280-334208/1-A	Analysis Batch:	280-335194	Instrument ID:	SMS_G6
Client Matrix:	Water	Prep Batch:	280-334208	Lab File ID:	G6_24477.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/26/2016 1729	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 1337			Injection Volume:	0.5 uL
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
1,2,4,5-Tetrachlorobenzene	1.7	U	1.7	10
1,2,4-Trichlorobenzene	0.28	U	0.28	4.0
1,2-Dichlorobenzene	0.23	U	0.23	4.0
1,2-Diphenylhydrazine	0.23	U	0.23	10
1,3,5-Trinitrobenzene	4.0	U	4.0	50
1,3-Dichlorobenzene	0.30	U	0.30	10
1,3-Dinitrobenzene	2.0	U	2.0	10
1,4-Dichlorobenzene	0.32	U	0.32	4.0
1,4-Dinitrobenzene	2.0	U	2.0	10
1,4-Dioxane	1.7	U	1.7	20
1,4-Naphthoquinone	14	U	14	50
1-Naphthylamine	3.1	U	3.1	10
2,2'-oxybis[1-chloropropane]	0.28	U	0.28	10
2,3,4,6-Tetrachlorophenol	2.0	U	2.0	50
2,4,5-Trichlorophenol	0.45	U	0.45	10
2,4,6-Trichlorophenol	0.29	U	0.29	10
2,4-Dichlorophenol	0.64	U	0.64	10
2,4-Dimethylphenol	0.58	U	0.58	10
2,4-Dinitrophenol	10	U	10	25
2,4-Dinitrotoluene	1.7	U	1.7	10
2,6-Dichlorophenol	1.4	U	1.4	10
2,6-Dinitrotoluene	1.9	U	1.9	10
2-Acetylaminofluorene	7.0	U	7.0	100
2-Chloronaphthalene	0.26	U	0.26	4.0
2-Chlorophenol	2.0	U	2.0	10
2-Methylnaphthalene	0.29	U	0.29	4.0
2-Methylphenol	0.98	U	0.98	10
2-Naphthylamine	3.1	U	3.1	10
2-Nitroaniline	1.7	U	1.7	10
2-Nitrophenol	0.39	U	0.39	10
2-Picoline	1.2	U	1.2	20
2-sec-Butyl-4,6-dinitrophenol	4.0	U	4.0	20
2-Toluidine	1.4	U	1.4	10
3 & 4 Methylphenol	0.25	U	0.25	10
3,3'-Dichlorobenzidine	2.0	U	2.0	10
3,3'-Dimethylbenzidine	4.0	U	4.0	20
3-Methylcholanthrene	1.7	U	1.7	20
3-Methylphenol	0.25	U	0.25	10
3-Nitroaniline	2.0	U	2.0	10
4,6-Dinitro-2-methylphenol	4.0	U	4.0	10
4-Aminobiphenyl	4.5	U	4.5	50
4-Bromophenyl phenyl ether	0.43	U	0.43	10
4-Chloro-3-methylphenol	2.4	U	2.4	10
4-Chloroaniline	2.1	U	2.1	10
4-Chlorophenyl phenyl ether	1.7	U	1.7	10

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334208

Method: 8270C
Preparation: 3520C

Lab Sample ID:	MB 280-334208/1-A	Analysis Batch:	280-335194	Instrument ID:	SMS_G6
Client Matrix:	Water	Prep Batch:	280-334208	Lab File ID:	G6_24477.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/26/2016 1729	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 1337			Injection Volume:	0.5 uL
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
4-Methylphenol	0.25	U	0.25	10
4-Nitroaniline	2.0	U	2.0	10
4-Nitrophenol	1.2	U	1.2	10
4-Nitroquinoline-1-oxide	20	U	20	100
5-Nitro-o-toluidine	1.4	U	1.4	20
7,12-Dimethylbenz(a)anthracene	1.6	U	1.6	20
a,a-Dimethylphenethylamine	20	U	20	50
Acenaphthene	0.28	U	0.28	4.0
Acenaphthylene	0.49	U	0.49	4.0
Acetophenone	0.24	U	0.24	10
Aniline	2.0	U	2.0	10
Anthracene	0.42	U	0.42	4.0
Aramite, Total	9.2	U	9.2	18
Benzaldehyde	2.0	U	2.0	10
Benzo[a]anthracene	0.35	U	0.35	4.0
Benzo[a]pyrene	0.31	U	0.31	4.0
Benzo[b]fluoranthene	0.53	U	0.53	4.0
Benzo[g,h,i]perylene	0.50	U	0.50	4.0
Benzo[k]fluoranthene	0.46	U	0.46	4.0
Benzoic acid	10	U	10	25
Benzyl alcohol	1.14	J	0.23	10
Bis(2-chloroethoxy)methane	0.97	U	0.97	10
Bis(2-chloroethyl)ether	0.41	U	0.41	10
Bis(2-ethylhexyl) phthalate	0.56	U	0.56	10
Butyl benzyl phthalate	1.0	U	1.0	4.0
Chlorobenzilate	0.66	U	0.66	10
Chrysene	0.54	U	0.54	4.0
Diallate	0.56	U	0.56	5.6
Dibenz(a,h)anthracene	0.51	U	0.51	4.0
Dibenzofuran	0.29	U	0.29	4.0
Diethyl phthalate	0.38	U	0.38	4.0
Dimethoate	1.1	U	1.1	20
Dimethyl phthalate	0.21	U	0.21	4.0
Di-n-butyl phthalate	1.2	U	1.2	4.0
Di-n-octyl phthalate	0.35	U	0.35	4.0
Diphenylamine	1.1	U	1.1	10
Disulfoton	1.1	U	1.1	50
Ethyl methanesulfonate	0.94	U	0.94	10
Ethyl Parathion	2.0	U	2.0	50
Fluoranthene	0.20	U	0.20	4.0
Fluorene	0.31	U	0.31	4.0
Hexachlorobenzene	0.66	U	0.66	10
Hexachlorobutadiene	3.3	U	3.3	10
Hexachlorocyclopentadiene	10	U	10	10
Hexachloroethane	2.1	U	2.1	10

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334208

Method: 8270C
Preparation: 3520C

Lab Sample ID:	MB 280-334208/1-A	Analysis Batch:	280-335194	Instrument ID:	SMS_G6
Client Matrix:	Water	Prep Batch:	280-334208	Lab File ID:	G6_24477.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/26/2016 1729	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 1337			Injection Volume:	0.5 uL
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Hexachloropropene	2.0	U	2.0	100
Indeno[1,2,3-cd]pyrene	0.65	U	0.65	4.0
Isophorone	0.21	U	0.21	10
Isosafrole	1.0	U	1.0	3.5
Methapyrilene	20	U	20	50
Methyl methanesulfonate	1.0	U	1.0	10
Naphthalene	0.29	U	0.29	4.0
Nitrobenzene	0.81	U	0.81	10
N-Nitrosodiethylamine	1.7	U	1.7	10
N-Nitrosodimethylamine	0.29	U	0.29	10
N-Nitrosodi-n-butylamine	1.2	U	1.2	10
N-Nitrosodi-n-propylamine	0.35	U	0.35	10
n-Nitrosodiphenylamine(as diphenylamine)	0.44	U	0.44	10
N-Nitrosomethylethylamine	1.8	U	1.8	10
N-Nitrosomorpholine	2.0	U	2.0	10
N-Nitrosopiperidine	2.0	U	2.0	10
N-Nitrosopyrrolidine	0.80	U	0.80	10
o,o',o"-Triethylphosphorothioate	2.0	U	2.0	50
p-Dimethylamino azobenzene	2.0	U	2.0	20
Pentachlorobenzene	2.0	U	2.0	10
Pentachloroethane	2.0	U	2.0	50
Pentachloronitrobenzene	2.0	U	2.0	50
Pentachlorophenol	20	U	20	50
Phenacetin	1.1	U	1.1	20
Phenanthrene	0.26	U	0.26	4.0
Phenol	2.0	U	2.0	10
Phorate	2.0	U	2.0	50
p-Phenylene diamine	5.0	U	5.0	100
Pronamide	2.0	U	2.0	20
Pyrene	0.37	U	0.37	10
Pyridine	1.7	U	1.7	20
Safrole, Total	1.1	U	1.1	20
Tris(2,3-dibromopropyl)phosphate	25	U	25	100

Surrogate	% Rec	Acceptance Limits
2,4,6-Tribromophenol	83	48 - 135
2-Fluorobiphenyl	78	48 - 135
2-Fluorophenol	80	41 - 135
Nitrobenzene-d5	84	42 - 135
Phenol-d5	85	46 - 135
Terphenyl-d14	92	20 - 135

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank TICs- Batch: 280-334208

Cas Number	Analyte	RT	Est. Result (ug/	Qual
	Unknown	1.51	9.55	N J
110-82-7	Cyclohexane	1.68	35.7	N J
	Unknown	1.75	178	N J
	Unknown	2.63	17.9	N J
	Unknown	3.12	28.9	N J
104-76-7	1-Hexanol, 2-ethyl-	4.66	8.17	N J

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Lab Control Sample - Batch: 280-334208

Method: 8270C
Preparation: 3520C

Lab Sample ID:	LCS 280-334208/2-A	Analysis Batch:	280-335194	Instrument ID:	SMS_G6
Client Matrix:	Water	Prep Batch:	280-334208	Lab File ID:	G6_24478.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/26/2016 1756	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 1337			Injection Volume:	0.5 uL
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
1,2,4-Trichlorobenzene	80.0	55.0	69	44 - 135	
1,2-Dichlorobenzene	80.0	48.9	61	42 - 135	
1,2-Diphenylhydrazine	80.9	78.6	97	65 - 135	
1,3-Dichlorobenzene	80.0	44.2	55	39 - 135	
1,4-Dichlorobenzene	80.0	45.9	57	40 - 135	
2,2'-oxybis[1-chloropropane]	80.0	73.9	92	55 - 135	
2,4,5-Trichlorophenol	80.0	75.8	95	64 - 135	
2,4,6-Trichlorophenol	80.0	79.1	99	62 - 135	
2,4-Dichlorophenol	80.0	72.6	91	62 - 135	
2,4-Dimethylphenol	80.0	62.6	78	44 - 135	
2,4-Dinitrophenol	160	154	96	50 - 135	
2,4-Dinitrotoluene	80.0	82.1	103	65 - 135	
2,6-Dinitrotoluene	80.0	81.2	102	65 - 135	
2-Chloronaphthalene	80.0	70.5	88	59 - 135	
2-Chlorophenol	80.0	71.0	89	58 - 135	
2-Methylnaphthalene	80.0	67.1	84	56 - 135	
2-Methylphenol	80.0	72.0	90	62 - 135	
2-Nitroaniline	80.0	81.4	102	65 - 135	
2-Nitrophenol	80.0	73.0	91	65 - 135	
3 & 4 Methylphenol	80.0	75.4	94	65 - 135	
3,3'-Dichlorobenzidine	80.0	66.2	83	18 - 135	
3-Nitroaniline	80.0	79.2	99	38 - 135	
4,6-Dinitro-2-methylphenol	160	153	95	63 - 135	
4-Bromophenyl phenyl ether	80.0	74.0	93	65 - 135	
4-Chloro-3-methylphenol	80.0	74.6	93	65 - 135	
4-Chloroaniline	80.0	72.2	90	30 - 135	
4-Chlorophenyl phenyl ether	80.0	76.5	96	65 - 135	
4-Methylphenol	80.0	75.4	94	65 - 135	
4-Nitroaniline	80.0	83.2	104	65 - 135	
4-Nitrophenol	160	169	106	56 - 135	
Acenaphthene	80.0	74.4	93	61 - 135	
Acenaphthylene	80.0	71.0	89	63 - 135	
Aniline	80.0	68.0	85	22 - 135	
Anthracene	80.0	74.6	93	65 - 135	
Benzo[a]anthracene	80.0	74.4	93	65 - 135	
Benzo[a]pyrene	80.0	74.9	94	65 - 135	
Benzo[b]fluoranthene	80.0	76.5	96	65 - 135	
Benzo[g,h,i]perylene	80.0	78.2	98	65 - 135	
Benzo[k]fluoranthene	80.0	79.2	99	65 - 135	
Benzoic acid	80.0	62.0	77	41 - 135	
Benzyl alcohol	80.0	73.8	92	65 - 135	
Bis(2-chloroethoxy)methane	80.0	72.6	91	65 - 135	
Bis(2-chloroethyl)ether	80.0	73.9	92	65 - 135	
Bis(2-ethylhexyl) phthalate	80.0	74.7	93	65 - 135	
Butyl benzyl phthalate	80.0	72.4	91	65 - 135	
Chrysene	80.0	75.7	95	65 - 135	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Lab Control Sample - Batch: 280-334208

Method: 8270C
Preparation: 3520C

Lab Sample ID:	LCS 280-334208/2-A	Analysis Batch:	280-335194	Instrument ID:	SMS_G6
Client Matrix:	Water	Prep Batch:	280-334208	Lab File ID:	G6_24478.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/26/2016 1756	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 1337			Injection Volume:	0.5 uL
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Dibenz(a,h)anthracene	80.0	73.3	92	63 - 135	
Dibenzofuran	80.0	74.5	93	64 - 135	
Diethyl phthalate	80.0	79.4	99	65 - 135	
Dimethyl phthalate	80.0	77.9	97	65 - 135	
Di-n-butyl phthalate	80.0	74.9	94	65 - 135	
Di-n-octyl phthalate	80.0	65.9	82	65 - 135	
Fluoranthene	80.0	78.0	97	65 - 135	
Fluorene	80.0	76.6	96	65 - 135	
Hexachlorobenzene	80.0	72.8	91	65 - 135	
Hexachlorobutadiene	80.0	47.1	59	35 - 135	
Hexachlorocyclopentadiene	80.0	26.1	33	10 - 135	
Hexachloroethane	80.0	39.8	50	32 - 135	
Indeno[1,2,3-cd]pyrene	80.0	70.7	88	65 - 135	
Isophorone	80.0	72.6	91	65 - 135	
Naphthalene	80.0	61.7	77	56 - 135	
Nitrobenzene	80.0	70.6	88	65 - 135	
N-Nitrosodimethylamine	80.0	69.0	86	62 - 150	
N-Nitrosodi-n-propylamine	80.0	76.3	95	65 - 135	
n-Nitrosodiphenylamine(as diphenylamine)	80.0	72.5	91	65 - 135	
Pentachlorophenol	160	146	91	52 - 135	
Phenanthrene	80.0	75.5	94	65 - 135	
Phenol	80.0	73.1	91	61 - 135	
Pyrene	80.0	73.2	91	65 - 135	
Pyridine	80.0	59.6	74	30 - 135	

Surrogate	% Rec	Acceptance Limits
2,4,6-Tribromophenol	98	48 - 135
2-Fluorobiphenyl	87	48 - 135
2-Fluorophenol	82	41 - 135
Nitrobenzene-d5	85	42 - 135
Phenol-d5	86	46 - 135
Terphenyl-d14	90	20 - 135

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334208

Method: 8270C
Preparation: 3520C

MS Lab Sample ID: 280-85505-1
Client Matrix: Water
Dilution: 1.0
Analysis Date: 07/26/2016 2128
Prep Date: 07/19/2016 1337
Leach Date: N/A

Analysis Batch: 280-335194
Prep Batch: 280-334208
Leach Batch: N/A

Instrument ID: SMS_G6
Lab File ID: G6_24486.D
Initial Weight/Volume: 988.7 mL
Final Weight/Volume: 1 mL
Injection Volume: 0.5 uL

MSD Lab Sample ID: 280-85505-1
Client Matrix: Water
Dilution: 1.0
Analysis Date: 07/26/2016 2154
Prep Date: 07/19/2016 1337
Leach Date: N/A

Analysis Batch: 280-335194
Prep Batch: 280-334208
Leach Batch: N/A

Instrument ID: SMS_G6
Lab File ID: G6_24487.D
Initial Weight/Volume: 1018 mL
Final Weight/Volume: 1 mL
Injection Volume: 0.5 uL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
1,2,4-Trichlorobenzene	71	69	44 - 135	6	42		
1,2-Dichlorobenzene	70	68	42 - 135	6	49		
1,2-Diphenylhydrazine	94	94	65 - 135	3	30		
1,3-Dichlorobenzene	68	66	39 - 135	7	51		
1,4-Dichlorobenzene	69	66	40 - 135	8	50		
2,2'-oxybis[1-chloropropane]	82	78	55 - 135	8	37		
2,4,5-Trichlorophenol	91	91	64 - 135	3	30		
2,4,6-Trichlorophenol	95	93	62 - 135	5	30		
2,4-Dichlorophenol	83	80	62 - 135	7	30		
2,4-Dimethylphenol	80	76	44 - 135	8	30		
2,4-Dinitrophenol	99	99	50 - 135	2	30		
2,4-Dinitrotoluene	100	101	65 - 135	2	32		
2,6-Dinitrotoluene	99	98	65 - 135	4	30		
2-Chloronaphthalene	80	79	59 - 135	4	30		
2-Chlorophenol	76	73	58 - 135	7	46		
2-Methylnaphthalene	79	78	56 - 135	4	32		
2-Methylphenol	82	78	62 - 135	8	40		
2-Nitroaniline	99	98	65 - 135	4	30		
2-Nitrophenol	79	78	65 - 135	5	38		
3 & 4 Methylphenol	89	85	65 - 135	7	36		
3,3'-Dichlorobenzidine	22	36	18 - 135	46	50		
3-Nitroaniline	86	88	38 - 135	1	30		
4,6-Dinitro-2-methylphenol	96	96	63 - 135	4	30		
4-Bromophenyl phenyl ether	92	90	65 - 135	4	30		
4-Chloro-3-methylphenol	95	93	65 - 135	5	30		
4-Chloroaniline	75	77	30 - 135	0	38		
4-Chlorophenyl phenyl ether	91	92	65 - 135	2	30		
4-Methylphenol	89	85	65 - 135	7	36		
4-Nitroaniline	92	93	65 - 135	2	34		
4-Nitrophenol	105	104	56 - 135	4	50		
Acenaphthene	87	87	61 - 135	3	30		
Acenaphthylene	84	83	63 - 135	4	30		
Aniline	72	73	22 - 135	1	50		

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334208

Method: 8270C
Preparation: 3520C

MS Lab Sample ID: 280-85505-1
Client Matrix: Water
Dilution: 1.0
Analysis Date: 07/26/2016 2128
Prep Date: 07/19/2016 1337
Leach Date: N/A

Analysis Batch: 280-335194
Prep Batch: 280-334208
Leach Batch: N/A

Instrument ID: SMS_G6
Lab File ID: G6_24486.D
Initial Weight/Volume: 988.7 mL
Final Weight/Volume: 1 mL
Injection Volume: 0.5 uL

MSD Lab Sample ID: 280-85505-1
Client Matrix: Water
Dilution: 1.0
Analysis Date: 07/26/2016 2154
Prep Date: 07/19/2016 1337
Leach Date: N/A

Analysis Batch: 280-335194
Prep Batch: 280-334208
Leach Batch: N/A

Instrument ID: SMS_G6
Lab File ID: G6_24487.D
Initial Weight/Volume: 1018 mL
Final Weight/Volume: 1 mL
Injection Volume: 0.5 uL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Anthracene	91	92	65 - 135	2	30		
Benzo[a]anthracene	92	93	65 - 135	2	30		
Benzo[a]pyrene	90	93	65 - 135	0	30		
Benzo[b]fluoranthene	95	97	65 - 135	1	30		
Benzo[g,h,i]perylene	97	101	65 - 135	1	30		
Benzo[k]fluoranthene	96	98	65 - 135	1	30		
Benzoic acid	94	94	41 - 135	3	45		
Benzyl alcohol	86	82	65 - 135	7	37		
Bis(2-chloroethoxy)methane	80	76	65 - 135	7	30		
Bis(2-chloroethyl)ether	80	77	65 - 135	8	41		
Bis(2-ethylhexyl) phthalate	97	96	65 - 135	3	30		
Butyl benzyl phthalate	94	93	65 - 135	4	30		
Chrysene	93	94	65 - 135	3	30		
Dibenz(a,h)anthracene	95	96	63 - 135	1	30		
Dibenzofuran	89	89	64 - 135	3	30		
Diethyl phthalate	99	95	65 - 135	7	30		
Dimethyl phthalate	95	95	65 - 135	3	30		
Di-n-butyl phthalate	95	94	65 - 135	4	30		
Di-n-octyl phthalate	89	89	65 - 135	3	30		
Fluoranthene	97	97	65 - 135	3	30		
Fluorene	93	92	65 - 135	3	30		
Hexachlorobenzene	91	92	65 - 135	2	30		
Hexachlorobutadiene	65	65	35 - 135	3	47		
Hexachlorocyclopentadiene	31	32	10 - 135	2	66		
Hexachloroethane	65	63	32 - 135	6	53		
Indeno[1,2,3-cd]pyrene	87	91	65 - 135	1	30		
Isophorone	82	80	65 - 135	5	30		
Naphthalene	75	73	56 - 135	6	40		
Nitrobenzene	81	79	65 - 135	5	39		
N-Nitrosodimethylamine	76	72	62 - 150	7	36		
N-Nitrosodi-n-propylamine	86	81	65 - 135	8	30		
n-Nitrosodiphenylamine(as diphenylamine)	78	73	65 - 135	9	30		
Pentachlorophenol	99	98	52 - 135	4	30		

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334208

Method: 8270C
Preparation: 3520C

MS Lab Sample ID:	280-85505-1	Analysis Batch:	280-335194	Instrument ID:	SMS_G6
Client Matrix:	Water	Prep Batch:	280-334208	Lab File ID:	G6_24486.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	988.7 mL
Analysis Date:	07/26/2016 2128			Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 1337			Injection Volume:	0.5 uL
Leach Date:	N/A				

MSD Lab Sample ID:	280-85505-1	Analysis Batch:	280-335194	Instrument ID:	SMS_G6
Client Matrix:	Water	Prep Batch:	280-334208	Lab File ID:	G6_24487.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1018 mL
Analysis Date:	07/26/2016 2154			Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 1337			Injection Volume:	0.5 uL
Leach Date:	N/A				

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Phenanthrene	94	94	65 - 135	4	30		
Phenol	83	78	61 - 135	9	37		
Pyrene	90	90	65 - 135	3	30		
Pyridine	68	66	30 - 135	6	50		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
2,4,6-Tribromophenol	99	96	48 - 135
2-Fluorobiphenyl	77	76	48 - 135
2-Fluorophenol	71	67	41 - 135
Nitrobenzene-d5	73	71	42 - 135
Phenol-d5	78	72	46 - 135
Terphenyl-d14	88	60	20 - 135

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334208

Method: 8270C
Preparation: 3520C

MS Lab Sample ID:	280-85505-1	Units: ug/L	
Client Matrix:	Water		
Dilution:	1.0		
Analysis Date:	07/26/2016 2128		
Prep Date:	07/19/2016 1337		
Leach Date:	N/A		

MSD Lab Sample ID:	280-85505-1
Client Matrix:	Water
Dilution:	1.0
Analysis Date:	07/26/2016 2154
Prep Date:	07/19/2016 1337
Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
1,2,4-Trichlorobenzene	0.28	U	80.9	78.6	57.5	54.3
1,2-Dichlorobenzene	0.23	U	80.9	78.6	56.6	53.5
1,2-Diphenylhydrazine	0.23	U	81.8	79.4	77.1	74.6
1,3-Dichlorobenzene	0.30	U	80.9	78.6	55.3	51.6
1,4-Dichlorobenzene	0.32	U	80.9	78.6	56.0	51.7
2,2'-oxybis[1-chloropropane]	0.28	U	80.9	78.6	66.1	61.2
2,4,5-Trichlorophenol	0.45	U	80.9	78.6	74.0	71.7
2,4,6-Trichlorophenol	0.29	U	80.9	78.6	76.8	72.8
2,4-Dichlorophenol	0.64	U	80.9	78.6	67.4	63.1
2,4-Dimethylphenol	0.58	U	80.9	78.6	64.7	59.7
2,4-Dinitrophenol	10	U	162	157	160	156
2,4-Dinitrotoluene	1.7	U	80.9	78.6	81.0	79.2
2,6-Dinitrotoluene	1.9	U	80.9	78.6	80.0	77.0
2-Chloronaphthalene	0.26	U	80.9	78.6	64.9	62.3
2-Chlorophenol	2.0	U	80.9	78.6	61.9	57.7
2-Methylnaphthalene	0.29	U	80.9	78.6	63.8	61.0
2-Methylphenol	0.98	U	80.9	78.6	66.5	61.1
2-Nitroaniline	1.7	U	80.9	78.6	80.0	76.8
2-Nitrophenol	0.39	U	80.9	78.6	63.8	60.9
3 & 4 Methylphenol	0.25	U	80.9	78.6	71.8	67.0
3,3'-Dichlorobenzidine	2.0	U	80.9	78.6	17.6	28.1
3-Nitroaniline	2.0	U	80.9	78.6	69.7	68.8
4,6-Dinitro-2-methylphenol	4.0	U	162	157	156	150
4-Bromophenyl phenyl ether	0.43	U	80.9	78.6	74.0	70.9
4-Chloro-3-methylphenol	2.4	U	80.9	78.6	76.9	73.1
4-Chloroaniline	2.1	U	80.9	78.6	60.7	60.4
4-Chlorophenyl phenyl ether	1.7	U	80.9	78.6	73.8	72.1
4-Methylphenol	0.25	U	80.9	78.6	71.8	67.0
4-Nitroaniline	2.0	U	80.9	78.6	74.2	72.9
4-Nitrophenol	1.2	U	162	157	170	163
Acenaphthene	0.28	U	80.9	78.6	70.3	68.1
Acenaphthylene	0.49	U	80.9	78.6	68.2	65.3
Aniline	2.0	U	80.9	78.6	58.1	57.4
Anthracene	0.42	U	80.9	78.6	73.7	72.0
Benzo[a]anthracene	0.35	U	80.9	78.6	74.7	72.9
Benzo[a]pyrene	0.31	U	80.9	78.6	72.8	72.8
Benzo[b]fluoranthene	0.53	U	80.9	78.6	77.2	76.4
Benzo[g,h,i]perylene	0.50	U	80.9	78.6	78.5	79.3
Benzo[k]fluoranthene	0.46	U	80.9	78.6	77.9	76.7
Benzoic acid	10	U	80.9	78.6	76.0	73.7
Benzyl alcohol	0.57	J	80.9	78.6	70.0	65.2
Bis(2-chloroethoxy)methane	0.97	U	80.9	78.6	64.4	60.0
Bis(2-chloroethyl)ether	0.41	U	80.9	78.6	65.1	60.2

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334208

Method: 8270C
Preparation: 3520C

MS Lab Sample ID:	280-85505-1	Units: ug/L	
Client Matrix:	Water		
Dilution:	1.0		
Analysis Date:	07/26/2016 2128		
Prep Date:	07/19/2016 1337		
Leach Date:	N/A		

MSD Lab Sample ID:	280-85505-1
Client Matrix:	Water
Dilution:	1.0
Analysis Date:	07/26/2016 2154
Prep Date:	07/19/2016 1337
Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Bis(2-ethylhexyl) phthalate	0.56	U	80.9	78.6	78.3	75.8
Butyl benzyl phthalate	1.0	U	80.9	78.6	76.0	72.9
Chrysene	0.54	U	80.9	78.6	75.5	73.5
Dibenz(a,h)anthracene	0.51	U	80.9	78.6	76.6	75.6
Dibenzofuran	0.29	U	80.9	78.6	72.2	70.0
Diethyl phthalate	0.38	U	80.9	78.6	80.2	74.8
Dimethyl phthalate	0.21	U	80.9	78.6	76.7	74.8
Di-n-butyl phthalate	1.2	U	80.9	78.6	77.1	74.2
Di-n-octyl phthalate	0.35	U	80.9	78.6	72.1	70.2
Fluoranthene	0.20	U	80.9	78.6	78.7	76.6
Fluorene	0.31	U	80.9	78.6	74.9	72.5
Hexachlorobenzene	0.66	U	80.9	78.6	73.3	71.9
Hexachlorobutadiene	3.3	U	80.9	78.6	52.9	51.3
Hexachlorocyclopentadiene	10	U	80.9	78.6	25.2	24.8
Hexachloroethane	2.1	U	80.9	78.6	52.4	49.3
Indeno[1,2,3-cd]pyrene	0.65	U	80.9	78.6	70.5	71.1
Isophorone	0.21	U	80.9	78.6	66.0	62.7
Naphthalene	0.29	U	80.9	78.6	60.9	57.6
Nitrobenzene	0.81	U	80.9	78.6	65.2	62.1
N-Nitrosodimethylamine	0.29	U	80.9	78.6	61.3	57.0
N-Nitrosodi-n-propylamine	0.35	U	80.9	78.6	69.2	63.6
n-Nitrosodiphenylamine(as diphenylamine)	0.44	U	80.9	78.6	63.2	57.5
Pentachlorophenol	20	U	162	157	160	154
Phenanthrene	0.26	U	80.9	78.6	76.4	73.5
Phenol	2.0	U	80.9	78.6	67.4	61.5
Pyrene	0.37	U	80.9	78.6	73.1	70.7
Pyridine	1.7	U	80.9	78.6	55.0	51.7

Date: 22 August 2016
To: Washington Closure Hanford (technical representative)
From: ELR Consulting
Project: ERDF Leachate Tank Summer 2016
Subject: Inorganic - Data Package No. J02198-TAL

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. J02198 prepared by TestAmerica Inc. (TAL). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V931	7/12/16	Water	C	See note 1
J1V932	7/12/16	Water	C	See note 1

1 - ICP metals by 6010B.

Data validation was conducted in accordance with the WCH validation statement of work and WCH-173, Rev. 2. "Environmental Restoration Disposal Facility Leachate Sampling and Analysis Plan". Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times & Sample Preservation**

Analytical holding times for ICP metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be analyzed within six (6) months for ICP metals.

All holding times were met.

· Blanks

Preparation (Method) Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations (in ug/L) less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Due to method blank contamination, all thallium results were qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

· Accuracy

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 25% and a sample result below the instrument detection limit (IDL) are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within relative percent difference (RPD) limits of plus or minus 20% for water samples. If RPD values are out of specification and the ample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". The performance criteria for aqueous laboratory duplicates are an RPD less than 20% for positive sample results greater than five times the CRDL or plus or minus the CRDL for positive sample results less than five times the CRDL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

All laboratory duplicate results were acceptable.

Field Duplicate Samples

One set field duplicates (J1V931/J1V932) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific RQL.

- **Completeness**

Data package No. J02198 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, all thallium results were qualified as undetected and flagged "UJ".

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services.*

WCH-173, Rev. 2, *Environmental Restoration Disposal Facility Leachate Sampling & Analysis Plan,* November 2015.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validator in compliance with the WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

INORGANIC DATA QUALIFICATION SUMMARY*

SDG: J02198	**REVIEWER: ELR**	**Project: ERDF**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Thallium	UJ	All	Method blank contamination

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V931**

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 1.0
Analysis Date: 07/26/2016 2332
Prep Date: 07/26/2016 0810

Analysis Batch: 280-335322
Prep Batch: 280-334813

8/21/16

Instrument ID: MT_026
Lab File ID: 26a072616c.asc
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	0.046	B	0.018	0.050
Antimony	0.0031	U	0.0031	0.0060
Arsenic	0.0044	U	0.0044	0.010
Barium	0.071		0.00058	0.0050
Bismuth	0.0067	U	0.0067	0.10
Boron	0.36		0.0044	0.020
Cadmium	0.00049	B	0.00045	0.0020
Chromium	0.15		0.00066	0.0020
Cobalt	0.0019	B	0.0012	0.010
Lead	0.0026	U	0.0026	0.0050
Lithium	0.021		0.0091	0.020
Nickel	0.0081	B	0.0013	0.040
Phosphorus	0.025	B	0.014	3.0
Potassium	18.2		0.24	3.0
Selenium	0.0049	U	0.0049	0.010
Strontium	1.2		0.00030	0.010
Tin	0.0058	U	0.0058	0.10

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 1.0
Analysis Date: 07/27/2016 1401
Prep Date: 07/26/2016 0810

Analysis Batch: 280-335424
Prep Batch: 280-334813

Instrument ID: MT_026
Lab File ID: 26a072716aa.asc
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Beryllium	0.00047	U	0.00047	0.0010
Calcium	236		0.035	0.20
Copper	0.0060	B	0.0042	0.010
Iron	0.11		0.022	0.050
Magnesium	71.5		0.011	0.20
Manganese	0.0028	B	0.00025	0.0050
Molybdenum	0.0080	B	0.0031	0.020
Silicon	18.9		0.035	0.50
Silver	0.00093	U	0.00093	0.0020
Sodium	182		0.092	0.50
Vanadium	0.015		0.0011	0.010
Zinc	0.0045	U	0.0045	0.010

6020 Metals (ICP/MS)

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V931**

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

6020 Metals (ICP/MS)

Analysis Method: 6020
Prep Method: 3020A
Dilution: 1.0
Analysis Date: 07/26/2016 1753
Prep Date: 07/26/2016 0810

Analysis Batch: 280-335326
Prep Batch: 280-334811

Instrument ID: MT_077
Lab File ID: 096SMPL.d
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Thallium	0.00012	B C M OJ	0.000050	0.0010
Tungsten	0.00020	U	0.00020	0.0050
Uranium	0.60	X	0.000050	0.0010

7470A Mercury (CVAA)

Analysis Method: 7470A
Prep Method: 7470A
Dilution: 1.0
Analysis Date: 07/26/2016 1924
Prep Date: 07/26/2016 1215

Analysis Batch: 280-335325
Prep Batch: 280-335019

Instrument ID: MT_034
Lab File ID: 160726bc.txt
Initial Weight/Volume: 30 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	0.000027	U	0.000027	0.00020

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 1.0
Analysis Date: 07/27/2016 0026
Prep Date: 07/26/2016 0810

Analysis Batch: 280-335322
Prep Batch: 280-334813

4/2/16

Instrument ID: MT_026
Lab File ID: 26a072616c.asc
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	0.018	U	0.018	0.050
Antimony	0.0031	U	0.0031	0.0060
Arsenic	0.0044	U	0.0044	0.010
Barium	0.079		0.00058	0.0050
Bismuth	0.0067	U	0.0067	0.10
Boron	0.37		0.0044	0.020
Cadmium	0.00045	U	0.00045	0.0020
Chromium	0.16		0.00066	0.0020
Cobalt	0.0034	B	0.0012	0.010
Lead	0.0026	U	0.0026	0.0050
Lithium	0.023		0.0091	0.020
Nickel	0.0081	B	0.0013	0.040
Phosphorus	0.022	B	0.014	3.0
Potassium	20.3		0.24	3.0
Selenium	0.0064	B	0.0049	0.010
Strontium	1.3		0.00030	0.010
Tin	0.0058	U	0.0058	0.10

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 1.0
Analysis Date: 07/27/2016 1411
Prep Date: 07/26/2016 0810

Analysis Batch: 280-335424
Prep Batch: 280-334813

Instrument ID: MT_026
Lab File ID: 26a072716aa.asc
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Beryllium	0.00047	U	0.00047	0.0010
Calcium	238		0.035	0.20
Copper	0.0042	U	0.0042	0.010
Iron	0.022	U	0.022	0.050
Magnesium	73.1		0.011	0.20
Manganese	0.00079	B	0.00025	0.0050
Molybdenum	0.0081	B	0.0031	0.020
Silicon	19.2		0.035	0.50
Silver	0.00093	U	0.00093	0.0020
Sodium	186		0.092	0.50
Vanadium	0.016		0.0011	0.010
Zinc	0.0045	U	0.0045	0.010

6020 Metals (ICP/MS)

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

6020 Metals (ICP/MS)

Analysis Method: 6020
Prep Method: 3020A
Dilution: 1.0
Analysis Date: 07/26/2016 1811
Prep Date: 07/26/2016 0810

Analysis Batch: 280-335326
Prep Batch: 280-334811

Instrument ID: MT_077
Lab File ID: 101SMPL.d
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Thallium	0.00015	B C UJ	0.000050	0.0010
Tungsten	0.00022	B	0.00020	0.0050
Uranium	0.60	X	0.000050	0.0010

7470A Mercury (CVAA)

Analysis Method: 7470A
Prep Method: 7470A
Dilution: 1.0
Analysis Date: 07/26/2016 1936
Prep Date: 07/26/2016 1215

Analysis Batch: 280-335325
Prep Batch: 280-335019

Instrument ID: MT_034
Lab File ID: 160726bc.txt
Initial Weight/Volume: 30 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	0.000027	U	0.000027	0.00020

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-85505-1

SDG #: J02198
SAF#: RC-009

Date SDG Closed: July 14, 2016
Data Deliverable: 21 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V931	280-85505-1	2320/300.0/2540C/2540D/350.1/353.2/410.4/ 9020/420.4/5310B/1664/9034/9012/8260/ 6010/7470/9050/9040/8015/8270/ WTPH-G/WTPH-D+/8151/8081/8082/8310	2320B/300.0/2540C/2540D/350.1/353.2/410.4/ 9020B/420.4/5310B/1664A/9034/9012A/8260B/ 6010B/6020/7470A/9050A/9040B/8015C/8270C/ NWTPH-Gx/NWTPH-Dx/8151A/8081A/8082/8310
J1V932	280-85505-2	2320/300.0/2540C/2540D/350.1/353.2/410.4/ 9020/420.4/5310B/1664/9034/9012/8260/ 6010/7470/9050/9040/8015/8270/ WTPH-G/WTPH-D+/8151/8081/8082/8310	2320B/300.0/2540C/2540D/350.1/353.2/410.4/ 9020B/420.4/5310B/1664A/9034/9012A/8260B/ 6010B/6020/7470A/9050A/9040B/8015C/8270C/ NWTPH-Gx/NWTPH-Dx/8151A/8081A/8082/8310
J1V933	280-85505-3	8260	8260B

The Uranium method substitution noted above, as agreed to by all parties, has no technical impact on the data.

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

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

RECEIPT
The samples were received on 7/13/2016 9:30 AM and 7/14/2016 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 1.7° C, 2.9° C, 3.4° C and 4.9° C.

Receipt Exceptions

It was noted that the VOA vials did not have labels affixed to them. There was one label for each set of VOA vials that was affixed to the bubble bag. Each label was transferred to one of the vials in each set. The client was notified on 7/15/2016.

GC/MS VOLATILES - SW846 8260B
The following compounds were not found as part of a TIC search performed for samples J1V931, J1V932 and J1V933: Acrylamide [79-06-1]; Formaldehyde [50-00-0]; 1,3-Butadiene [106-99-0]; Chlorodifluoromethane [75-45-6]; Dichloropropanol [26545-73-3]; Trichloromethanethiol [75-70-7]; Allyl alcohol (2-Propen-1-ol) [107-18-6]; Crotonaldehyde (2-Butenaldehyde) [4170-30-3]; Epichlorohydrin [106-89-8].

The GC/MS Volatiles analyses of samples J1V932 and J1V933 were performed 3 days outside the recommended sample holding times, due to analyst oversight. The client was notified on 8/2/2016.

The preservative used in the sample containers provided is not compatible with one of the Method 8260B analytes requested. Samples J1V931, J1V932 and J1V933 were received preserved with hydrochloric acid. The requested target analyte list includes 2-chloroethyl vinyl ether, an acid-labile compound that degrades in an acidic medium.

Methylene Chloride, a common laboratory contaminant, is present in the method blank associated with batch 280-334916 at a level exceeding the reporting limit. Because this common laboratory contaminant is present in the method blank at a level that is less than five times the reporting limit, corrective action is not required.

Low levels of Methylene chloride, a common laboratory contaminant, are present in the method blank associated with batch 280-335637. Because the concentration in the method blank is not present at a level greater than the reporting limit, corrective action is deemed unnecessary.

The LCS associated with batch 280-334916 exhibited the percent recovery outside the control limits, biased high, for Methylene Chloride, and the associated sample result has been flagged "T". As Methylene Chloride is not present at a level greater than the reporting limit in the associated sample, corrective action is deemed unnecessary.

2-Chloroethyl vinyl ether was not recovered in the MS/MSD performed on sample J1V931 in batch 280-334916 due to the acid preservative used in the sample. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

Due to analyst oversight, MS/MSD analysis was not performed for batch 280-335637. Method precision and accuracy have been verified by the acceptable LCS/LCSD analysis data.

A Continuing Calibration Verification (CCV) standard associated with samples in batch 280-334916 exhibited the %Difference (%D) value outside acceptance criteria, biased low, for 1-Butanol (-50.2%). The sample associated with this CCV was non-detect for the affected analyte. All CCC and SPCC compounds are in control; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

GC/MS SEMIVOLATILES - SW846 8270C

The following compounds were not found as part of a TIC search performed for samples J1V931 and J1V932: 1-Acetyl-2-thiorurea [591-08-2]; 2,5-Diaminotoluene [95-70-5]; 2-Cyclohexyl-4,6-dinitrophenol [131-89-5]; Hexachlorophene [70-30-4].

Low levels of Benzyl alcohol are present in the method blank associated with batch 280-334208. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

A Continuing Calibration Verification (CCV) standard associated with samples in analysis batch 280-335194 exhibited the %Difference (%D) value outside acceptance criteria, biased low, for 4-Nitroquinoline-1-oxide (-50.1%). The samples associated with this CCV were non-detect for the affected analyte. All CCC and SPCC compounds are in control; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

GLYCOLS - SW846 8015C

Surrogate 1,4-Butanediol was recovered outside the control limits, biased low, in samples J1V931 and J1V932. The laboratory noted that this anomaly was due to obvious matrix interference; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

METHANOL - SW846 8015C

No anomalies were encountered.

GRO - NWTPH-Gx

The samples were collected in properly preserved vials for analysis of gasoline range organics (GRO). However, when verified by the laboratory, the pH was greater than 2 and the following sample was analyzed after 7 days from sampling: J1V932 (pH = 7).

No other anomalies were encountered.

PESTICIDES - SW846 8081A

The LCS associated with batch 280-334134 exhibited percent recoveries outside the control limits, biased low, as follows: 4,4'-DDE = 72% (lower limit 74), Aldrin = 34% (lower limit 44), Heptachlor = 45% (lower limit 52). Associated sample results have been flagged with an "N". It can be noted that the spike compound recoveries and surrogate recoveries for the MS/MSD performed on sample J1V931 were in control. The laboratory re-extracted the samples, unavoidably 14 days past the 7 day recommended sample holding time. Upon re-extraction and reanalysis of the samples under batch 280-336109, the associated LCS spike compound recoveries were 100% in control. and the non-detect results were confirmed. The original analysis data have been reported as the non-detect sample results were confirmed.

No other anomalies were encountered.

PCBs - SW846 8082

No anomalies were encountered.

HERBICIDES - SW846 8151A
No anomalies were encountered.

DRO - NWTPH-Dx
Low levels of C10-C36 are present in the method blank associated with batch 280-334141. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

PAHs - SW846 8310
Surrogate Terphenyl-d14 recovered outside the control limits, biased low at 67% (lower limit 70%), in sample J1V931. No evidence of matrix interference was present and the sample was non-detect. It can be noted that the spike compound recoveries and surrogate recoveries for the MS/MSD performed on sample J1V931 were in control. The laboratory re-extracted the sample, unavoidably 13 days past the 7 day recommended sample holding time, and the surrogate was in control at 94% and the non-detect results were confirmed. Due to insufficient sample volume remaining, sample specific MS/MSD analysis could not be performed for the re-extract batch. The original analysis data have been reported as the non-detect sample results were confirmed and the sample specific batch MS/MSD was associated with the original analysis.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/6020/7470A
Serial dilution of a digestate in batch 280-334811 indicates that physical and chemical interferences are present for Uranium. Results have been flagged with an "X".

Low levels of Thallium are present in the method blank associated with batch 280-334811. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Calcium and Uranium in the Matrix Spike performed on sample J1V931; therefore, control limits are not applicable.

The duplicate analysis of sample J1V931 exhibited RPD data outside the control limits for Thallium, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

OIL & GREASE (HEM) - EPA 1664A
No anomalies were encountered.

ANIONS - MCAWW 300.0
The orthophosphate as P analyses for samples J1V931 and J1V932 were performed 8-9 hours outside the recommended 48 hour sample holding times. The analyses were originally performed within the sample holding times; however, due to associated continuing calibration verification (CCV) failures, reanalysis was required.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to high constituent concentration, samples J1V931 and J1V932 required dilutions prior to the analysis of Nitrate as N, Chloride and Sulfate, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

The orthophosphate as P Matrix Spike performed on sample J1V931 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

AMMONIA as N - MCAWW 350.1
No anomalies were encountered.

NITRATE NITRITE as N - MCAWW 353.2
Each sample is analyzed to achieve the lowest possible reporting limit within the constraints of the method. Due to high constituent concentration, samples J1V931 and J1V932 had to be analyzed at dilutions, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

The Matrix Spike performed on sample J1V931 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

CHEMICAL OXYGEN DEMAND - MCAWW 410.4
No anomalies were encountered.

PHENOLICS - MCAWW 420.4
Phenolics are present at a level greater than half the reporting limit in the method blank associated with batch 280-335552. As no detectable concentrations of Phenolics are present in the associated samples, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL CYANIDE - SW846 9012A
Low levels of Total Cyanide are present in the method blank associated with batch 280-334663. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL ORGANIC HALOGENS (TOX) - SW846 9020B
The laboratory noted that the containers submitted for samples J1V931 and J1V932 were received with excess headspace. This could cause volatile halides to evaporate, resulting in a low bias to the reported results.

Samples J1V931 and J1V932 exhibited elevated detection limits due to the limited sample volume used. The nominal sample amount could not be used due to the nature of the sample matrix.

No other anomalies were encountered.

SULFIDE - SW846 9034
No anomalies were encountered.

ALKALINITY - SM 2320B
Low levels of Alkalinity are present in the method blank associated with batch 280-333888. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL DISSOLVED SOLIDS - SM 2540C
Samples J1V931 and J1V932 exhibited elevated detection limits due to the limited sample volume used. The nominal sample amount could not be used due to high constituent concentration.

No other anomalies were encountered.

TOTAL SUSPENDED SOLIDS - SM 2540D
No anomalies were encountered.

TOTAL ORGANIC CARBON - SM 5310B
No anomalies were encountered.

PH - SW846 9040B
SU = standard units

Samples J1V931 and J1V932 were analyzed 14 days after sample receipt, due to analyst oversight. It can be noted that pH is a field parameter with a holding time of 15 minutes.

No other anomalies were encountered.

SPECIFIC CONDUCTANCE - SW846 9050A
No anomalies were encountered.

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-022

Collector DOWNING, MK	**Company Contact** Joan Kessner	**Telephone No.** 375-4688	**Project Coordinator** KESSNER, JH
Price Code 7D	**Data Turnaround** 21 Days		
Project Designation ERDF Leachate Tank	**Sampling Location** ERDF Leachate tank 4, Summer 2016		**SAF No.** RC-009
Ice Chest No. ERC-02-404	**Field Logbook No.** EL-1626-03	**COA** RERDF22560	**Method of Shipment** Commercial Carrier
Shipped To TestAmerica Denver	**Offsite Property No.** A131487		**Bill of Lading/Air Bill No.** SEE OSPC

Other Labs Shipped To
TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially radioactive, less than DOT limits

Special Handling and/or Storage
Cool 4 Deg C

Preservation	HNO3 to pH <2	Cool <=6C	ZnAc+NaOH to pH >9	NaOH to pH >= 12	H2SO4 to pH <2	Cool <=6C	Cool <=6C	H2SO4 to pH <2	Cool <=6C	HCl to pH <2
Type of Container	G/P	G/P	G/P	G/P	G/P	aGs*	aGs*	G	aG	aGs*
No. of Container(s)	2	2	3	2	2	4	4	4	4	6
Volume	500mL	1000mL	250mL	250mL	250mL	40mL	40mL	1000mL	1000mL	40mL
Sample Analysis	See item (1) in Special Instructions	See item (2) in Special Instructions	Sulfides - 9034	Total Cyanide - 9012	Ammonia - 350.1; NO2/NO3 - 353.2; COD - 410.4	Glycols - 8015 (1,2-Propanediol (Propylene glycol), Ethylene glycol)	Alcohols - 8015 (Methanol)	Oil & Grease - 1664	See item (3) in Special Instructions	TPH-Gasoline Range - WTPH-G

Sample No.	Matrix	Sample Date	Sample Time									
J10931	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

280-85505 Chain of Custody

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M Downing	7-12-16 0945	T.R. Edmundson	7-12-16 0945
T.R. Edmundson	7-12-16 1500	Fed Ex	7-12-16 —
			0930 13Jul16

FINAL SAMPLE DISPOSITION

Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Tungsten, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Alkalinity - 2320; IC Anions - 300.0 {Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate}; TDS - 2540C; TSS - 2540D
(3) TPH-Diesel Range - WTPH-D + {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - diesel range extended to C36}

SDG # J02198 D.D. 7-15-16

4,9,1-7,2-9 IRS-0.0 13Jul16
Transfer
3,4 IRS-0.0
13Jul16

REVIEWED BY KW DATE 7/12/16

08/19/2016

WCH-EE-011

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-023

Collector DOWNING, MK	**Company Contact** Joan Kessner	**Telephone No.** 375-4688	**Project Coordinator** KESSNER, JH
Price Code 7D	**Data Turnaround** 21 Days		
Project Designation ERDF Leachate Tank	**Sampling Location** ERDF Leachate tank 4, Summer 2016		**SAF No.** RC-009
Ice Chest No. ERC-02-404	**Field Logbook No.** EL-1626-03	**COA** RERDF22560	**Method of Shipment** Commercial Carrier
Shipped To TestAmerica Denver	**Offsite Property No:** A131487		**Bill of Lading/Air Bill No.** SEE OSPC

Other Labs Shipped To
TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially radioactive, less than DOT limits

Special Handling and/or Storage
Cool 4 Deg C

Preservation	HNO3 to pH <2	Cool <=6C	ZnAc+NaOH to pH >9	NaOH to pH >= 12	H2SO4 to pH <2	Cool <=6C	Cool <=6C	H2SO4 to pH <2	Cool <=6C	HCl to pH <2
Type of Container	G/P	G/P	G/P	G/P	G/P	aGs*	aGs*	G	aG	aGs*
No. of Container(s)	1	1	1	1	1	2	2	2	2	3
Volume	500mL	1000mL	250mL	250mL	250mL	40mL	40mL	1000mL	1000mL	40mL
Sample Analysis	See item (1) in Special Instructions	See item (2) in Special Instructions	Sulfides - 9034	Total Cyanide - 9012	Ammonia - 350.1; NO2/NO3 - 353.2; COD – 410.4	Glycols - 8015 (1,2-Propanediol (Propylene glycol), Ethylene glycol)	Alcohols - 8015 (Methanol)	Oil & Grease - 1664	See item (3) in Special Instructions	TPH-Gasoline Range - WTPH-G

Sample No.	Matrix	Sample Date	Sample Time								
J19932	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
W. Downing / W. Downing WRI	7-12-16/0945	T.R. Edmundson / T.R. Edmundson	7-12-16 0945
Relinquished By/Removed From WCH T.R. Edmundson / T.R. Edmundson	Date/Time 7-12-16 1500	Received By/Stored In Fed Ex	Date/Time 7-12-16 —
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
			0930 B Duello
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Tungsten, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Alkalinity - 2320; IC Anions - 300.0 {Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate}; TDS - 2540C; TSS - 2540D
(3) TPH-Diesel Range - WTPH-D + {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - diesel range extended to C36}

REVIEWED BY KW DATE 7/12/16

09/22/2016

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: ERDF			DATA PACKAGE: J02198		
VALIDATOR: ELR		LAB: TAC		DATE: 8/21/16	
			SDG: J02198		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J1U931 J1U932					
					Water

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICP interference checks acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A
ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: thallium - OJ alf

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A
MS/MSD results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A

Comments: Uranium MS - 6420 - Jalf 8/22

No PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?	Yes	No	N/A
Duplicate results acceptable?	Yes	No	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	N/A
MS/MSD standards expired? (Levels D, E)	Yes	No	N/A
Field duplicate RPD values acceptable?	Yes	No	N/A
Field split RPD values acceptable?	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed?	Yes	No	N/A
ICP serial dilution %D values acceptable?	Yes	No	N/A
ICP post digestion spike required?	Yes	No	N/A
ICP post digestion spike values acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required?	Yes	No	N/A
Duplicate injection %RSD values acceptable?	Yes	No	N/A
Analytical spikes performed as required?	Yes	No	N/A
Analytical spike recoveries acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
MSA performed as required?	Yes	No	N/A
MSA results acceptable?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments:

8. HOLDING TIMES (all levels)

Samples properly preserved?	Yes	No	N/A
Sample holding times acceptable?	Yes	No	N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... (Yes) No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No (N/A)

Samples properly prepared? (Levels D, E) ..... Yes No (N/A)

Detection limits meet RDL? ..... (Yes) No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments:

Appendix 6

Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334813

Method: 6010B
Preparation: 3010A

Lab Sample ID:	MB 280-334813/1-A	Analysis Batch:	280-335322	Instrument ID:	MT_026
Client Matrix:	Water	Prep Batch:	280-334813	Lab File ID:	26a072616c.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/26/2016 2302	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 0810				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Aluminum	0.018	U	0.018	0.050
Antimony	0.0031	U	0.0031	0.0060
Arsenic	0.0044	U	0.0044	0.010
Barium	0.00058	U	0.00058	0.0050
Beryllium	0.00047	U	0.00047	0.0010
Bismuth	0.0067	U	0.0067	0.10
Boron	0.0044	U	0.0044	0.020
Cadmium	0.00045	U	0.00045	0.0020
Calcium	0.035	U	0.035	0.20
Chromium	0.00066	U	0.00066	0.0020
Cobalt	0.0012	U	0.0012	0.010
Copper	0.0042	U	0.0042	0.010
Iron	0.022	U	0.022	0.050
Lead	0.0026	U	0.0026	0.0050
Lithium	0.0091	U	0.0091	0.020
Magnesium	0.011	U	0.011	0.20
Manganese	0.00025	U	0.00025	0.0050
Molybdenum	0.0031	U	0.0031	0.020
Nickel	0.0013	U	0.0013	0.040
Phosphorus	0.014	U	0.014	3.0
Potassium	0.24	U	0.24	3.0
Selenium	0.0049	U	0.0049	0.010
Silicon	0.035	U	0.035	0.50
Silver	0.00093	U	0.00093	0.0020
Sodium	0.092	U	0.092	0.50
Strontium	0.00030	U	0.00030	0.010
Tin	0.0058	U	0.0058	0.10
Vanadium	0.0011	U	0.0011	0.010
Zinc	0.0045	U	0.0045	0.010

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Lab Control Sample - Batch: 280-334813

Method: 6010B
Preparation: 3010A

Lab Sample ID:	LCS 280-334813/2-A	Analysis Batch:	280-335322	Instrument ID:	MT_026
Client Matrix:	Water	Prep Batch:	280-334813	Lab File ID:	26a072616c.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/26/2016 2305	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 0810				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	2.00	2.03	101	87 - 111	
Antimony	0.500	0.533	107	88 - 110	
Arsenic	1.00	1.04	104	88 - 110	
Barium	2.00	2.08	104	90 - 112	
Beryllium	0.0500	0.0514	103	89 - 113	
Bismuth	2.00	2.15	108	80 - 120	
Boron	1.00	1.03	103	86 - 110	
Cadmium	0.100	0.0967	97	88 - 111	
Calcium	50.0	52.74	105	90 - 111	
Chromium	0.200	0.207	103	90 - 113	
Cobalt	0.500	0.518	104	89 - 111	
Copper	0.250	0.257	103	86 - 112	
Iron	1.00	1.09	109	89 - 115	
Lead	0.500	0.513	103	89 - 110	
Lithium	1.00	1.01	101	90 - 112	
Magnesium	50.0	52.67	105	90 - 113	
Manganese	0.500	0.522	104	90 - 110	
Molybdenum	1.00	1.05	105	90 - 110	
Nickel	0.500	0.514	103	89 - 111	
Phosphorus	10.0	10.38	104	86 - 115	
Potassium	50.0	51.24	102	89 - 114	
Selenium	2.00	2.06	103	85 - 112	
Silicon	10.0	10.42	104	90 - 110	
Silver	0.0500	0.0500	100	86 - 115	
Sodium	50.0	52.13	104	90 - 115	
Strontium	1.00	1.02	102	90 - 111	
Tin	2.00	2.07	103	85 - 113	
Vanadium	0.500	0.520	104	90 - 111	
Zinc	0.500	0.533	107	85 - 111	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike - Batch: 280-334813

Method: 6010B
Preparation: 3010A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-335322	Instrument ID:	MT_026
Client Matrix:	Water	Prep Batch:	280-334813	Lab File ID:	26a072616c.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2016 0020	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 0810				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	0.046	B	2.00	2.04	100	83 - 119	
Antimony	0.0031	U	0.500	0.555	111	81 - 124	
Arsenic	0.0044	U	1.00	1.13	113	84 - 124	
Barium	0.071		2.00	2.21	107	85 - 120	
Bismuth	0.0067	U	2.00	2.18	109	80 - 120	
Boron	0.36		1.00	1.43	107	87 - 113	
Cadmium	0.00049	B	0.100	0.0998	99	82 - 119	
Chromium	0.15		0.200	0.377	112	73 - 135	
Cobalt	0.0019	B	0.500	0.489	97	82 - 119	
Lead	0.0026	U	0.500	0.510	102	89 - 121	
Lithium	0.021		1.00	1.10	108	89 - 114	
Nickel	0.0081	B	0.500	0.511	101	84 - 120	
Phosphorus	0.025	B	10.0	11.32	113	80 - 120	
Potassium	18.2		50.0	77.08	118	76 - 132	
Selenium	0.0049	U	2.00	2.20	110	71 - 140	
Strontium	1.2		1.00	2.36	111	81 - 125	
Tin	0.0058	U	2.00	2.06	103	77 - 126	

Matrix Spike - Batch: 280-334813

Method: 6010B
Preparation: 3010A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-335424	Instrument ID:	MT_026
Client Matrix:	Water	Prep Batch:	280-334813	Lab File ID:	26a072716aa.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2016 1406	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 0810				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Beryllium	0.00047	U	0.0500	0.0496	99	79 - 121	
Calcium	236		50.0	292.6	113	48 - 153	4
Copper	0.0060	B	0.250	0.275	108	82 - 129	
Iron	0.11		1.00	1.10	99	52 - 155	
Magnesium	71.5		50.0	124.1	105	62 - 146	
Manganese	0.0028	B	0.500	0.501	100	79 - 121	
Molybdenum	0.0080	B	1.00	1.05	104	83 - 109	
Silicon	18.9		10.0	28.94	100	79 - 140	
Silver	0.00093	U	0.0500	0.0567	113	75 - 141	
Sodium	182		50.0	237.5	110	70 - 203	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike - Batch: 280-334813

Method: 6010B
Preparation: 3010A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-335424	Instrument ID:	MT_026
Client Matrix:	Water	Prep Batch:	280-334813	Lab File ID:	26a072716aa.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2016 1406	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 0810				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Vanadium	0.015		0.500	0.524	102	85 - 120	
Zinc	0.0045	U	0.500	0.481	96	60 - 137	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-334813

Method: 6010B
Preparation: 3010A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-335322	Instrument ID:	MT_026
Client Matrix:	Water	Prep Batch:	280-334813	Lab File ID:	26a072616c.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2016 0023	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 0810				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Aluminum	0.046	B	0.0407	11	25	B
Antimony	0.0031	U	0.0031	NC	25	U
Arsenic	0.0044	U	0.0107	NC	25	
Barium	0.071		0.0784	11	25	
Bismuth	0.0067	U	0.0067	NC	25	U
Boron	0.36		0.365	2	25	
Cadmium	0.00049	B	0.00045	NC	25	U
Chromium	0.15		0.162	6	25	
Cobalt	0.0019	B	0.00228	19	25	B
Lead	0.0026	U	0.0026	NC	25	U
Lithium	0.021		0.0228	9	25	
Nickel	0.0081	B	0.00768	6	25	B
Phosphorus	0.025	B	0.0264	7	25	B
Potassium	18.2		19.99	9	25	
Selenium	0.0049	U	0.0049	NC	25	U
Strontium	1.2		1.32	6	25	
Tin	0.0058	U	0.0058	NC	25	U

Duplicate - Batch: 280-334813

Method: 6010B
Preparation: 3010A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-335424	Instrument ID:	MT_026
Client Matrix:	Water	Prep Batch:	280-334813	Lab File ID:	26a072716aa.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2016 1409	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 0810				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Beryllium	0.00047	U	0.00047	NC	25	U
Calcium	236		239.1	1	25	
Copper	0.0060	B	0.00575	5	25	B
Iron	0.11		0.109	2	25	
Magnesium	71.5		72.53	1	25	
Manganese	0.0028	B	0.00295	5	25	B
Molybdenum	0.0080	B	0.00906	13	25	B
Silicon	18.9		19.12	1	25	
Silver	0.00093	U	0.00093	NC	25	U
Sodium	182		184.2	1	40	
Vanadium	0.015		0.0160	4	25	
Zinc	0.0045	U	0.0045	NC	25	U

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-334813

Method: 6010B
Preparation: 3010A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-335424	Instrument ID:	MT_026
Client Matrix:	Water	Prep Batch:	280-334813	Lab File ID:	26a072716aa.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2016 1409	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 0810				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334811

Method: 6020
Preparation: 3020A

Lab Sample ID:	MB 280-334811/1-A	Analysis Batch:	280-335326	Instrument ID:	MT_077
Client Matrix:	Water	Prep Batch:	280-334811	Lab File ID:	094_BLK.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/26/2016 1745	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 0810				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Thallium	0.0000510	B	0.000050	0.0010
Tungsten	0.00020	U	0.00020	0.0050
Uranium	0.000050	U	0.000050	0.0010

Lab Control Sample - Batch: 280-334811

Method: 6020
Preparation: 3020A

Lab Sample ID:	LCS 280-334811/2-A	Analysis Batch:	280-335326	Instrument ID:	MT_077
Client Matrix:	Water	Prep Batch:	280-334811	Lab File ID:	095_LCS.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/26/2016 1749	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 0810				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Thallium	0.0400	0.0424	106	85 - 118	
Tungsten	0.0200	0.0191	95	80 - 120	
Uranium	0.0400	0.0413	103	85 - 119	

Matrix Spike - Batch: 280-334811

Method: 6020
Preparation: 3020A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-335326	Instrument ID:	MT_077
Client Matrix:	Water	Prep Batch:	280-334811	Lab File ID:	098SMPL.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/26/2016 1800	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 0810				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Thallium	0.00012	B	0.0400	0.0386	96	85 - 118	
Tungsten	0.00020	U	0.0200	0.0181	90	80 - 120	
Uranium	0.60		0.0400	0.627	64	85 - 119	4

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-334811

Method: 6020
Preparation: 3020A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-335326	Instrument ID:	MT_077
Client Matrix:	Water	Prep Batch:	280-334811	Lab File ID:	099SMPL.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/26/2016 1804	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 0810				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Thallium	0.00012	B	0.0000610	63	20	B C M
Tungsten	0.00020	U	0.00020	NC	20	U
Uranium	0.60		0.624	4	20	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-335019

Method: 7470A
Preparation: 7470A

Lab Sample ID:	MB 280-335019/1-A	Analysis Batch:	280-335325	Instrument ID:	MT_034
Client Matrix:	Water	Prep Batch:	280-335019	Lab File ID:	160726bc.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	30 mL
Analysis Date:	07/26/2016 1919	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 1215				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Mercury	0.000027	U	0.000027	0.00020

Lab Control Sample - Batch: 280-335019

Method: 7470A
Preparation: 7470A

Lab Sample ID:	LCS 280-335019/2-A	Analysis Batch:	280-335325	Instrument ID:	MT_034
Client Matrix:	Water	Prep Batch:	280-335019	Lab File ID:	160726bc.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	30 mL
Analysis Date:	07/26/2016 1922	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 1215				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.00500	0.00493	99	84 - 120	

Matrix Spike - Batch: 280-335019

Method: 7470A
Preparation: 7470A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-335325	Instrument ID:	MT_034
Client Matrix:	Water	Prep Batch:	280-335019	Lab File ID:	160726bc.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	30 mL
Analysis Date:	07/26/2016 1934	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 1215				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.000027	U	0.00500	0.00435	87	75 - 125	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-335019

Method: 7470A
Preparation: 7470A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-335325	Instrument ID:	MT_034
Client Matrix:	Water	Prep Batch:	280-335019	Lab File ID:	160726bc.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	30 mL
Analysis Date:	07/26/2016 1931	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/26/2016 1215				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Mercury	0.000027	U	0.000027	NC	20	U

Date: 22 August 2016
To: Washington Closure Hanford (technical representative)
From: ELR Consulting
Project: ERDF Leachate Tank Summer 2016
Subject: General Organic - Data Package No. J02198-TAL

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. J02198 prepared by TestAmerica Inc. (TAL). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V931	7/12/16	Water	C	See note 1
J1V932	7/12/16	Water	C	See note 1

1 – Glycols by 8015C, non-halogenated organics by 8015C, diesel range organics by NWTPH-D and herbicides by 8151A.

Data validation was conducted in accordance with the WCH validation statement of work and WCH-173, Rev. 2, "Environmental Restoration Disposal Facility Leachate Sampling & Analysis Plan". Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times & Sample Preservation**

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. Samples must be analyzed as follows: TPHD must be extracted within 14 days and analyzed within 40 days; glycols & alcohols must be analyzed within 14 days; chlorinated herbicides must be extracted within 7 days and analyzed within 40 days.

If holding times are exceeded, but not by greater than twice the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than twice the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by less than twice the limit, all glycol results were qualified as estimates and flagged "J".

All other holding times were acceptable.

- **Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples of a given matrix. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as estimated and flagged "UJ".

Due to method blank contamination, all C10-C36 results were qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Laboratory Control Sample

Matrix spike/matrix spike duplicate and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike/matrix spike duplicate is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which percent recoveries must be within established laboratory quality control limits. If spike recoveries are outside control limits (50-150% or w/in laboratory specified limits), detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

Due to surrogate recoveries outside QC limits (60% & 59%), all ethylene glycol and propylene glycol results were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For samples analyzed using SW-846 protocol, results must be within RPD limits of +/- 20% for water samples and +/- 35% for solid samples. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

One set field duplicates (J1V931/J1V932) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required detection limits (RDLs) to ensure that laboratory detection levels meet the required criteria. All results met the RDL.

- **Completeness**

Data package No. J02198 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the holding time being exceeded by less than twice the limit, all ethylene glycol and propylene glycol results were qualified as estimates and flagged "J".
- Due to method blank contamination, all C10-C36 results were qualified as undetected and flagged "U".
- Due to surrogate recoveries outside QC limits (60% & 59%), all ethylene glycol and propylene glycol results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

WCH-173, Rev 2, *Environmental Restoration Disposal Facility Leachate Sampling and Analysis Plan*, November 2015.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validator in compliance with the WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

GENERAL ORGANIC DATA QUALIFICATION SUMMARY*

SDG: J02198	**REVIEWER: ELR**	**Project: ERDF**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
ethylene glycol propylene glycol	J	All	Hold time
C10-C36	U	All	Method blank contamination
ethylene glycol propylene glycol	J	All	Surrogate recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V931**

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8151A Herbicides (GC)

Analysis Method:	8151A	Analysis Batch:	280-335351	Instrument ID:	SGC_M
Prep Method:	8151A	Prep Batch:	280-334158	Initial Weight/Volume:	1024.5 mL
Dilution:	1.0			Final Weight/Volume:	10 mL
Analysis Date:	07/27/2016 1251			Injection Volume:	1 uL
Prep Date:	07/19/2016 1052			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
2,4,5-T	0.19	U	0.19	0.98
2,4-D	0.20	U	0.20	3.9
2,4-DB	0.35	U	0.35	3.9
Dalapon	0.89	U	0.89	2.0
Dicamba	0.15	U	0.15	2.0
Dichlorprop	0.63	U	0.63	3.9
Silvex (2,4,5-TP)	0.17	U	0.17	0.98

Surrogate	%Rec	Qualifier	Acceptance Limits
DCAA	70		39 - 135

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8151A Herbicides (GC)

Analysis Method: 8151A
Prep Method: 8151A
Dilution: 1.0
Analysis Date: 07/27/2016 1359
Prep Date: 07/19/2016 1052

Analysis Batch: 280-335351
Prep Batch: 280-334158

8/2/16

Instrument ID: SGC_M
Initial Weight/Volume: 1007.6 mL
Final Weight/Volume: 10 mL
Injection Volume: 1 uL
Result Type: PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
2,4,5-T	0.19	U	0.19	0.99
2,4-D	0.21	U	0.21	4.0
2,4-DB	0.36	U	0.36	4.0
Dalapon	0.90	U	0.90	2.0
Dicamba	0.15	U	0.15	2.0
Dichlorprop	0.65	U	0.65	4.0
Silvex (2,4,5-TP)	0.17	U	0.17	0.99

Surrogate	%Rec	Qualifier	Acceptance Limits
DCAA	61		39 - 135

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V931**

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8015C Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analysis Method: 8015C
N/A
Dilution: 1.0
Analysis Date: 07/20/2016 1629
Prep Date: N/A

Analysis Batch: 280-334425
N/A

✓ 8/2/16

Instrument ID: SGC_A
Initial Weight/Volume: 1 mL
Final Weight/Volume:
Injection Volume: 1 uL
Result Type: PRIMARY

Analyte	Result (mg/L)	Qualifier	MDL	RL
Methanol	0.15	U	0.15	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
Propanol	110		50 - 150

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8015C Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analysis Method:	8015C	Analysis Batch:	280-334425	Instrument ID:	SGC_A
	N/A		N/A	Initial Weight/Volume:	1 mL
Dilution:	1.0			Final Weight/Volume:	
Analysis Date:	07/20/2016 1718			Injection Volume:	1 uL
Prep Date:	N/A			Result Type:	PRIMARY

Analyte	Result (mg/L)	Qualifier	MDL	RL
Methanol	0.15	U	0.15	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
Propanol	109		50 - 150

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V931**

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8015C Glycols- Direct Injection (GC/FID)

Analysis Method: 8015C
N/A
Dilution: 1.0
Analysis Date: 07/26/2016 2106
Prep Date: N/A

Analysis Batch: 280-335251
N/A

8/21/16

Instrument ID: SGC_Z2
Initial Weight/Volume: 1 mL
Final Weight/Volume: 1 mL
Injection Volume: 0.5 uL
Result Type: PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
Ethylene glycol	2000	U J	2000	5000
Propylene glycol	2400	U J	2400	5000

Surrogate	%Rec	Qualifier	Acceptance Limits
1,4-Butanediol	60	*	77 - 134

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8015C Glycols- Direct Injection (GC/FID)

Analysis Method: 8015C
N/A
Dilution: 1.0
Analysis Date: 07/26/2016 2224
Prep Date: N/A

Analysis Batch: 280-335251
N/A

8/21/16

Instrument ID: SGC_Z2
Initial Weight/Volume: 1 mL
Final Weight/Volume: 1 mL
Injection Volume: 0.5 uL
Result Type: PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
Ethylene glycol	2000	U J	2000	5000
Propylene glycol	2400	U J	2400	5000

Surrogate	%Rec	Qualifier	Acceptance Limits
1,4-Butanediol	59	*	77 - 134

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V931**

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-335331	Instrument ID:	SGC_U2a
Prep Method:	3510C	Prep Batch:	280-334141	Lab File ID:	008F0901.D
Dilution:	1.0			Initial Weight/Volume:	1051 mL
Analysis Date:	07/27/2016 1821			Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 0937			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
C10-C36	110	J B U	53	480
C10-C28	73	J	31	240

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	97		50 - 115

8/12/16

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-335331	Instrument ID:	SGC_U2a
Prep Method:	3510C	Prep Batch:	280-334141	Lab File ID:	011F1201.D
Dilution:	1.0			Initial Weight/Volume:	1059.1 mL
Analysis Date:	07/27/2016 1935			Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 0937			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
C10-C36	110	J B U	53	470
C10-C28	72	J	31	240

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	91		50 - 115

8/21/16

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-85505-1

SDG #: J02198
SAF#: RC-009

Date SDG Closed: July 14, 2016
Data Deliverable: 21 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V931	280-85505-1	2320/300.0/2540C/2540D/350.1/353.2/410.4/ 9020/420.4/5310B/1664/9034/9012/8260/ 6010/7470/9050/9040/8015/8270/ WTPH-G/WTPH-D+/8151/8081/8082/8310	2320B/300.0/2540C/2540D/350.1/353.2/410.4/ 9020B/420.4/5310B/1664A/9034/9012A/8260B/ 6010B/6020/7470A/9050A/9040B/8015C/8270C/ NWTPH-Gx/NWTPH-Dx/8151A/8081A/8082/8310
J1V932	280-85505-2	2320/300.0/2540C/2540D/350.1/353.2/410.4/ 9020/420.4/5310B/1664/9034/9012/8260/ 6010/7470/9050/9040/8015/8270/ WTPH-G/WTPH-D+/8151/8081/8082/8310	2320B/300.0/2540C/2540D/350.1/353.2/410.4/ 9020B/420.4/5310B/1664A/9034/9012A/8260B/ 6010B/6020/7470A/9050A/9040B/8015C/8270C/ NWTPH-Gx/NWTPH-Dx/8151A/8081A/8082/8310
J1V933	280-85505-3	8260	8260B

The Uranium method substitution noted above, as agreed to by all parties, has no technical impact on the data.

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

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

RECEIPT
The samples were received on 7/13/2016 9:30 AM and 7/14/2016 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 1.7° C, 2.9° C, 3.4° C and 4.9° C.

Receipt Exceptions

It was noted that the VOA vials did not have labels affixed to them. There was one label for each set of VOA vials that was affixed to the bubble bag. Each label was transferred to one of the vials in each set. The client was notified on 7/15/2016.

GC/MS VOLATILES - SW846 8260B
The following compounds were not found as part of a TIC search performed for samples J1V931, J1V932 and J1V933: Acrylamide [79-06-1]; Formaldehyde [50-00-0]; 1,3-Butadiene [106-99-0]; Chlorodifluoromethane [75-45-6]; Dichloropropanol [26545-73-3]; Trichloromethanethiol [75-70-7]; Allyl alcohol (2-Propen-1-ol) [107-18-6]; Crotonaldehyde (2-Butenaldehyde) [4170-30-3]; Epichlorohydrin [106-89-8].

The GC/MS Volatiles analyses of samples J1V932 and J1V933 were performed 3 days outside the recommended sample holding times, due to analyst oversight. The client was notified on 8/2/2016.

The preservative used in the sample containers provided is not compatible with one of the Method 8260B analytes requested. Samples J1V931, J1V932 and J1V933 were received preserved with hydrochloric acid. The requested target analyte list includes 2-chloroethyl vinyl ether, an acid-labile compound that degrades in an acidic medium.

Methylene Chloride, a common laboratory contaminant, is present in the method blank associated with batch 280-334916 at a level exceeding the reporting limit. Because this common laboratory contaminant is present in the method blank at a level that is less than five times the reporting limit, corrective action is not required.

Low levels of Methylene chloride, a common laboratory contaminant, are present in the method blank associated with batch 280-335637. Because the concentration in the method blank is not present at a level greater than the reporting limit, corrective action is deemed unnecessary.

The LCS associated with batch 280-334916 exhibited the percent recovery outside the control limits, biased high, for Methylene Chloride, and the associated sample result has been flagged "T". As Methylene Chloride is not present at a level greater than the reporting limit in the associated sample, corrective action is deemed unnecessary.

2-Chloroethyl vinyl ether was not recovered in the MS/MSD performed on sample J1V931 in batch 280-334916 due to the acid preservative used in the sample. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

Due to analyst oversight, MS/MSD analysis was not performed for batch 280-335637. Method precision and accuracy have been verified by the acceptable LCS/LCSD analysis data.

A Continuing Calibration Verification (CCV) standard associated with samples in batch 280-334916 exhibited the %Difference (%D) value outside acceptance criteria, biased low, for 1-Butanol (-50.2%). The sample associated with this CCV was non-detect for the affected analyte. All CCC and SPCC compounds are in control; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

GC/MS SEMIVOLATILES - SW846 8270C
The following compounds were not found as part of a TIC search performed for samples J1V931 and J1V932: 1-Acetyl-2-thiorurea [591-08-2]; 2,5-Diaminotoluene [95-70-5]; 2-Cyclohexyl-4,6-dinitrophenol [131-89-5]; Hexachlorophene [70-30-4].

Low levels of Benzyl alcohol are present in the method blank associated with batch 280-334208. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

A Continuing Calibration Verification (CCV) standard associated with samples in analysis batch 280-335194 exhibited the %Difference (%D) value outside acceptance criteria, biased low, for 4-Nitroquinoline-1-oxide (-50.1%). The samples associated with this CCV were non-detect for the affected analyte. All CCC and SPCC compounds are in control; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

GLYCOLS - SW846 8015C
Surrogate 1,4-Butanediol was recovered outside the control limits, biased low, in samples J1V931 and J1V932. The laboratory noted that this anomaly was due to obvious matrix interference; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

METHANOL - SW846 8015C
No anomalies were encountered.

GRO - NWTPH-Gx
The samples were collected in properly preserved vials for analysis of gasoline range organics (GRO). However, when verified by the laboratory, the pH was greater than 2 and the following sample was analyzed after 7 days from sampling: J1V932 (pH = 7).

No other anomalies were encountered.

PESTICIDES - SW846 8081A
The LCS associated with batch 280-334134 exhibited percent recoveries outside the control limits, biased low, as follows: 4,4'-DDE = 72% (lower limit 74), Aldrin = 34% (lower limit 44), Heptachlor = 45% (lower limit 52). Associated sample results have been flagged with an "N". It can be noted that the spike compound recoveries and surrogate recoveries for the MS/MSD performed on sample J1V931 were in control. The laboratory re-extracted the samples, unavoidably 14 days past the 7 day recommended sample holding time. Upon re-extraction and reanalysis of the samples under batch 280-336109, the associated LCS spike compound recoveries were 100% in control. and the non-detect results were confirmed. The original analysis data have been reported as the non-detect sample results were confirmed.

No other anomalies were encountered.

PCBs - SW846 8082
No anomalies were encountered.

HERBICIDES - SW846 8151A
No anomalies were encountered.

DRO - NWTPH-Dx
Low levels of C10-C36 are present in the method blank associated with batch 280-334141. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

PAHs - SW846 8310
Surrogate Terphenyl-d14 recovered outside the control limits, biased low at 67% (lower limit 70%), in sample J1V931. No evidence of matrix interference was present and the sample was non-detect. It can be noted that the spike compound recoveries and surrogate recoveries for the MS/MSD performed on sample J1V931 were in control. The laboratory re-extracted the sample, unavoidably 13 days past the 7 day recommended sample holding time, and the surrogate was in control at 94% and the non-detect results were confirmed. Due to insufficient sample volume remaining, sample specific MS/MSD analysis could not be performed for the re-extract batch. The original analysis data have been reported as the non-detect sample results were confirmed and the sample specific batch MS/MSD was associated with the original analysis.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/6020/7470A
Serial dilution of a digestate in batch 280-334811 indicates that physical and chemical interferences are present for Uranium. Results have been flagged with an "X".

Low levels of Thallium are present in the method blank associated with batch 280-334811. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Calcium and Uranium in the Matrix Spike performed on sample J1V931; therefore, control limits are not applicable.

The duplicate analysis of sample J1V931 exhibited RPD data outside the control limits for Thallium, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

OIL & GREASE (HEM) - EPA 1664A
No anomalies were encountered.

ANIONS - MCAWW 300.0
The orthophosphate as P analyses for samples J1V931 and J1V932 were performed 8-9 hours outside the recommended 48 hour sample holding times. The analyses were originally performed within the sample holding times; however, due to associated continuing calibration verification (CCV) failures, reanalysis was required.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to high constituent concentration, samples J1V931 and J1V932 required dilutions prior to the analysis of Nitrate as N, Chloride and Sulfate, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

The orthophosphate as P Matrix Spike performed on sample J1V931 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

AMMONIA as N - MCAWW 350.1
No anomalies were encountered.

NITRATE NITRITE as N - MCAWW 353.2
Each sample is analyzed to achieve the lowest possible reporting limit within the constraints of the method. Due to high constituent concentration, samples J1V931 and J1V932 had to be analyzed at dilutions, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

The Matrix Spike performed on sample J1V931 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

CHEMICAL OXYGEN DEMAND - MCAWW 410.4
No anomalies were encountered.

PHENOLICS - MCAWW 420.4
Phenolics are present at a level greater than half the reporting limit in the method blank associated with batch 280-335552. As no detectable concentrations of Phenolics are present in the associated samples, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL CYANIDE - SW846 9012A
Low levels of Total Cyanide are present in the method blank associated with batch 280-334663. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL ORGANIC HALOGENS (TOX) - SW846 9020B
The laboratory noted that the containers submitted for samples J1V931 and J1V932 were received with excess headspace. This could cause volatile halides to evaporate, resulting in a low bias to the reported results.

Samples J1V931 and J1V932 exhibited elevated detection limits due to the limited sample volume used. The nominal sample amount could not be used due to the nature of the sample matrix.

No other anomalies were encountered.

SULFIDE - SW846 9034
No anomalies were encountered.

ALKALINITY - SM 2320B
Low levels of Alkalinity are present in the method blank associated with batch 280-333888. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL DISSOLVED SOLIDS - SM 2540C
Samples J1V931 and J1V932 exhibited elevated detection limits due to the limited sample volume used. The nominal sample amount could not be used due to high constituent concentration.

No other anomalies were encountered.

TOTAL SUSPENDED SOLIDS - SM 2540D
No anomalies were encountered.

TOTAL ORGANIC CARBON - SM 5310B
No anomalies were encountered.

PH - SW846 9040B
SU = standard units

Samples J1V931 and J1V932 were analyzed 14 days after sample receipt, due to analyst oversight. It can be noted that pH is a field parameter with a holding time of 15 minutes.

No other anomalies were encountered.

SPECIFIC CONDUCTANCE - SW846 9050A
No anomalies were encountered.

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-022

Collector DOWNING, MK	**Company Contact** Joan Kessner	**Telephone No.** 375-4688	**Project Coordinator** KESSNER, JH
Project Designation ERDF Leachate Tank	**Sampling Location** ERDF Leachate tank 4, Summer 2016		**SAF No.** RC-009
Ice Chest No. ERC-02-404	**Field Logbook No.** EL-1626-03	**COA** RERDF22560	**Method of Shipment** Commercial Carrier
Shipped To TestAmerica Denver	**Offsite Property No.** A131487		**Bill of Lading/Air Bill No.** SEE OSPC

Price Code 7D

Data Turnaround 21 Days

Other Labs Shipped To
TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially radioactive, less than DOT limits

Special Handling and/or Storage
Cool 4 Deg C

Preservation	HNO3 to pH <2	Cool <=6C	ZnAc+NaOH to pH >9	NaOH to pH >= 12	H2SO4 to pH <2	Cool <=6C	Cool <=6C	H2SO4 to pH <2	Cool <=6C	HCl to pH <2
Type of Container	G/P	G/P	G/P	G/P	G/P	aGs*	aGs*	aG	aG	aGs*
No. of Container(s)	2	2	3	2	2	4	4	4	4	6
Volume	500mL	1000mL	250mL	250mL	250mL	40mL	40mL	1000mL	1000mL	40mL
Sample Analysis	See item (1) in Special Instructions	See item (2) in Special Instructions	Sulfides - 9034	Total Cyanide - 9012	Ammonia - 350.1; NO2/NO3 - 353.2; COD - 410.4	Glycols - 8015 (1,2-Propanediol (Propylene glycol), Ethylene glycol)	Alcohols - 8015 (Methanol)	Oil & Grease - 1664	See item (3) in Special Instructions	TPH-Gasoline Range - WTPH-G

Sample No.	Matrix	Sample Date	Sample Time									
J19931	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓

280-85505 Chain of Custody

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
W Downing/W Downing	7-12-16 0945	T.R. Edmundson T.R. Edmundson	7-12-16 0945
T.R. Edmundson T.R. Edmundson	7-12-16 1530	Fed Ex	7-12-16 —
		0930	13Jul16

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Tungsten, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Alkalinity - 2320; IC Anions - 300.0 {Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate}; TDS - 2540C; TSS - 2540D
(3) TPH-Diesel Range - WTPH-D + {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - diesel range extended to C36}

SDG # J02198 D.D. 7-15-16

4,9,16,7,29 IRS-0.0 BJulle
Transfer

3,4 IRS-0.0
BJulle

REVIEWED BY KW DATE 7/12/16

FINAL SAMPLE DISPOSITION

Disposal Method — Disposed By — Date/Time

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-022

Collector: DOWNING, MK	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: ERDF Leachate Tank	Sampling Location: ERDF Leachate tank 4, Summer 2016		SAF No.: RC-009
Ice Chest No.: ERC-02-404	Field Logbook No.: EL-1626-03	COA: RERDF22560	Method of Shipment: Commercial Carrier
Shipped To: TestAmerica Denver	Offsite Property No.: A131487		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 7D

Data Turnaround: 21 Days

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially radioactive, less than DOT limits

Special Handling and/or Storage
Cool 4 Deg C

Preservation	H2SO4 to pH <2	H2SO4 to pH <2	None	HCl or H2SO4 to pH <2	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	
Type of Container	aG	aGs*	G/P	aGs*	aG	aG	aG	aG	aG	
No. of Container(s)	3	2	2	6	4	4	4	4	4	
Volume	250mL	250mL	250mL	40mL	1000mL	1000mL	1000mL	1000mL	1000mL	
Sample Analysis	See item (4) in Special Instructions	TOX - 9020	Conductivity - 9050; pH (Water) - 9040	See item (5) in Special Instructions	See item (6) in Special Instructions	PAHs - 8310	Pesticides - 8081	PCBs - 8082	Chloro-Herbicides - EPA8151	
Sample No.	Matrix	Sample Date	Sample Time								
J13931	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Page 188 of 176

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
D. Downing	7-12-16 0945	T.R. Edmundson	7-12-16 0945
T.R. Edmundson	7-12-16 1500	Fed Ex	7-12-16 —
			0930 BJW 7-13-16

Sign/Print Names

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

SPECIAL INSTRUCTIONS

(4) Phenolics Total Recoverable - 420.4; Total Organic Carbon (TOC) - 5310B
(5) VOA - 8260 (App IX); VOA - 8260 (Client List) {1,1,2-Trichloro-1,2,2-trifluoroethane, 1-Butanol, 2-Chloroethyl vinyl ether, 2-Nitropropane, Acetic acid, methyl ester, Diethyl ether, Ethyl acetate, Ethyl cyanide, Isopropylbenzene, Tetrahydrofuran, cis-1,2-Dichloroethylene}
(6) Semi-VOA - 8270 (App IX); Semi-VOA -- 8270 (Client List) {1,2-Diphenylhydrazine, 1,4-Dinitrobenzene, 3+4 Methylphenol (cresol, m+p), Benzaldehyde, Benzoic acid, Dimethoate, Diphenylamine, Disulfoton, Parathion, Phorate, Tris(2,3-dibromopropyl) phosphate}

REVIEWED BY KW DATE 7/12/16

2016 12/21

WCH-EE-011

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-023

Collector DOWNING, MK	**Company Contact** Joan Kessner	**Telephone No.** 375-4688	**Project Coordinator** KESSNER, JH
Project Designation ERDF Leachate Tank	**Sampling Location** ERDF Leachate tank 4, Summer 2016		**SAF No.** RC-009
Ice Chest No. ERC-02-404	**Field Logbook No.** EL-1626-03	**COA** RERDF22560	**Method of Shipment** Commercial Carrier
Shipped To TestAmerica Denver	**Offsite Property No:** A131487		**Bill of Lading/Air Bill No.** SEE OSPC
Other Labs Shipped To TestAmerica Richland			

Price Code 7D

Data Turnaround 21 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive, less than DOT limits

Special Handling and/or Storage

Cool 4 Deg C

Preservation	HNO3 to pH <2	Cool <=6C	ZnAc+NaOH to pH >9	NaOH to pH >= 12	H2SO4 to pH <2	Cool <=6C	Cool <=6C	H2SO4 to pH <2	Cool <=6C	HCl to pH <2
Type of Container	G/P	G/P	G/P	G/P	G/P	aGs*	aGs*	G	aG	aGs*
No. of Container(s)	1	1	1	1	1	2	2	2	2	3
Volume	500mL	1000mL	250mL	250mL	250mL	40mL	40mL	1000mL	1000mL	40mL
Sample Analysis	See item (1) in Special Instructions	See item (2) in Special Instructions	Sulfides - 9034	Total Cyanide - 9012	Ammonia - 350.1; NO2/NO3 - 353.2; COD - 410.4	Glycols - 8015 (1,2-Propanediol (Propylene glycol), Ethylene glycol)	Alcohols - 8015 (Methanol)	Oil & Grease - 1664	See Item (3) in Special Instructions	TPH-Gasoline Range - WTPH-G
Sample No.	**Matrix**	**Sample Date**	**Sample Time**								
J19932	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
W. Downing / M. Downing WCH	7-12-16/0945	T.R. Edmundson	7-12-16 0945
T.R. Edmundson WCH	7-12-16 1500	Fed Ex	7-12-16 —
			0930

Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

FINAL SAMPLE DISPOSITION

Disposal Method

Disposed By

Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Tungsten, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)
(2) Alkalinity - 2320; IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate); TDS - 2540C; TSS - 2540D
(3) TPH-Diesel Range - WTPH-D + (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - diesel range extended to C36)

REVIEWED BY KW DATE 7/12/16

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-023

Collector: DOWNING, MK	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: ERDF Leachate Tank	Sampling Location: ERDF Leachate tank 4, Summer 2016		SAF No.: RC-009
Ice Chest No.: ERC-02-404	Field Logbook No.: EL-1626-03	COA: RERDF22560	Method of Shipment: Commercial Carrier
Shipped To: TestAmerica Denver	Offsite Property No.: A131487		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 7D

Data Turnaround: 21 Days

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive, less than DOT limits

Special Handling and/or Storage

Cool 4 Deg C

Preservation	H2SO4 to pH <2	H2SO4 to pH <2	None	HCl or H2SO4 to pH <2	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	
Type of Container	aG	aGs*	G/P	aGs*	aG	aG	aG	aG	aG	
No. of Container(s)	1	1	1	3	2	2	2	2	2	
Volume	250mL	250mL	250mL	40mL	1000mL	1000mL	1000mL	1000mL	1000mL	
Sample Analysis	See Item (4) in Special Instructions	TOX - 9020	Conductivity - 9050; pH (Water) - 9040	See Item (5) in Special Instructions	See Item (6) in Special Instructions	PAHs - 8310	Pesticides - 8081	PCBs - 8082	Chloro-Herbicides - EPA8151	
Sample No.	Matrix	Sample Date	Sample Time								
J1V932	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Page 1 of 176

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Sign/Print Names	Date/Time
M. Downing / M. Downing	WCH 7-12-16 0945	T.R. Edmundson / T.R. Edmundson		7-12-16 0945
T.R. Edmundson / T.R. Edmundson	WCH 7-12-16 1500	Fed Ex		7-12-16
				0930

FINAL SAMPLE DISPOSITION

Disposal Method: _____ Disposed By: _____ Date/Time: _____

SPECIAL INSTRUCTIONS

(4) Phenolics Total Recoverable - 420.4; Total Organic Carbon (TOC) - 5310B
(5) VOA - 8260 (App IX); VOA - 8260 (Client List) {1,1,2-Trichloro-1,2,2-trifluoroethane, 1-Butanol, 2-Chloroethyl vinyl ether, 2-Nitropropane, Acetic acid, methyl ester, Diethyl ether, Ethyl acetate, Ethyl cyanide, Isopropylbenzene, Tetrahydrofuran, cis-1,2-Dichloroethylene}
(6) Semi-VOA - 8270 (App IX); Semi-VOA – 8270 (Client List) {1,2-Diphenylhydrazine, 1,4-Dinitrobenzene, 3+4 Methylphenol (cresol, m+p), Benzaldehyde, Benzoic acid, Dimethoate, Diphenylamine, Disulfoton, Parathion, Phorate, Tris(2,3-dibromopropyl) phosphate}

REVIEWED BY KW DATE 7/12/16

Appendix 5

Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: ERDF			DATA PACKAGE: J02198		
VALIDATOR: ELR		LAB: TAL		DATE: 8/22/14	
			SDG: J02198		
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX:					
~~JW391 JW392~~ wdc					
JW931 JW932					
wdc					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

GENERAL ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A
Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: C10-C36 - U all

no FDs

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A
Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A
Surrogates traceable? (Levels D, E) ..... Yes No N/A
Surrogates expired? (Levels D, E) ..... Yes No N/A
MS/MSD samples analyzed? ..... Yes No N/A
MS/MSD results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A

Comments: Surrogate - Glycols - J all

no PAs

GENERAL ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

Glycols >2x – J all

GENERAL ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A
Results supported in the raw data? (Levels D, E) ..... Yes No N/A
Samples properly prepared? (Levels D, E) ..... Yes No N/A
Detection limits meet RDL? ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other aborbant) cleanup performed? ..... Yes No N/A
Lot check performed? ..... Yes No N/A
Check recoveries aceptable? ..... Yes No N/A
Check materials traceable? ..... Yes No N/A
Check materials Expired? ..... Yes No N/A
Analytical batch QC given similar cleanup? ..... Yes No N/A
Transcription/Calculation Errors? ..... Yes No N/A
Comments: _____

Appendix 6

Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334158

Method: 8151A
Preparation: 8151A

Lab Sample ID:	MB 280-334158/1-A	Analysis Batch:	280-335351	Instrument ID:	SGC_M
Client Matrix:	Water	Prep Batch:	280-334158	Lab File ID:	07270014.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/27/2016 1422	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	07/19/2016 1052			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Result	Qual	MDL	RL
2,4,5-T	0.19	U	0.19	1.0
2,4-D	0.21	U	0.21	4.0
2,4-DB	0.36	U	0.36	4.0
Dalapon	0.91	U	0.91	2.0
Dicamba	0.15	U	0.15	2.0
Dichlorprop	0.65	U	0.65	4.0
Silvex (2,4,5-TP)	0.17	U	0.17	1.0

Surrogate	% Rec	Acceptance Limits
DCAA	72	39 - 135

Lab Control Sample - Batch: 280-334158

Method: 8151A
Preparation: 8151A

Lab Sample ID:	LCS 280-334158/2-A	Analysis Batch:	280-335351	Instrument ID:	SGC_M
Client Matrix:	Water	Prep Batch:	280-334158	Lab File ID:	07270009.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/27/2016 1229	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	07/19/2016 1052			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
2,4,5-T	5.00	3.91	78	45 - 135	
2,4-D	5.00	3.69	74	46 - 126	J
2,4-DB	5.00	4.39	88	18 - 135	
Dalapon	5.00	3.74	75	52 - 119	
Dicamba	5.00	3.68	74	50 - 128	
Dichlorprop	5.00	3.58	72	44 - 121	J
Silvex (2,4,5-TP)	5.00	3.93	79	48 - 127	

Surrogate	% Rec	Acceptance Limits
DCAA	75	39 - 135

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334158

Method: 8151A
Preparation: 8151A

MS Lab Sample ID:	280-85505-1	Analysis Batch:	280-335351	Instrument ID:	SGC_M
Client Matrix:	Water	Prep Batch:	280-334158	Lab File ID:	07270011.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1031.6 mL
Analysis Date:	07/27/2016 1314			Final Weight/Volume:	10 mL
Prep Date:	07/19/2016 1052			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY
MSD Lab Sample ID:	280-85505-1	Analysis Batch:	280-335351	Instrument ID:	SGC_M
Client Matrix:	Water	Prep Batch:	280-334158	Lab File ID:	07270012.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1013 mL
Analysis Date:	07/27/2016 1337			Final Weight/Volume:	10 mL
Prep Date:	07/19/2016 1052			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
2,4,5-T	77	70	45 - 135	7	30		
2,4-D	66	64	46 - 126	2	30	J	J
2,4-DB	64	58	18 - 135	7	30	J	J
Dalapon	73	72	52 - 119	1	30		
Dicamba	67	65	50 - 128	1	30		
Dichlorprop	64	62	44 - 121	1	30	J	J
Silvex (2,4,5-TP)	71	69	48 - 127	1	30		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
DCAA	72	69	39 - 135

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334158

Method: 8151A
Preparation: 8151A

MS Lab Sample ID:	280-85505-1	Units:	ug/L	MSD Lab Sample ID:	280-85505-1
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	07/27/2016 1314			Analysis Date:	07/27/2016 1337
Prep Date:	07/19/2016 1052			Prep Date:	07/19/2016 1052
Leach Date:	N/A			Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual		MSD Result/Qual	
2,4,5-T	0.19	U	4.85	4.94	3.73		3.48	
2,4-D	0.20	U	4.85	4.94	3.22	J	3.16	J
2,4-DB	0.35	U	4.85	4.94	3.10	J	2.89	J
Dalapon	0.89	U	4.85	4.94	3.55		3.58	
Dicamba	0.15	U	4.85	4.94	3.27		3.22	
Dichlorprop	0.63	U	4.85	4.94	3.12	J	3.07	J
Silvex (2,4,5-TP)	0.17	U	4.85	4.94	3.45		3.40	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334425

Method: 8015C
Preparation: N/A

Lab Sample ID:	MB 280-334425/5	Analysis Batch:	280-334425	Instrument ID:	SGC_A
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	004B0501.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 mL
Analysis Date:	07/20/2016 1541	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Result	Qual	MDL	RL
Methanol	0.15	U	0.15	1.0

Surrogate	% Rec	Acceptance Limits
Propanol	111	50 - 150

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 280-334425

Method: 8015C
Preparation: N/A

LCS Lab Sample ID:	LCS 280-334425/6	Analysis Batch:	280-334425	Instrument ID:	SGC_A
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	005B0601.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 mL
Analysis Date:	07/20/2016 1557	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY
LCSD Lab Sample ID:	LCSD 280-334425/7	Analysis Batch:	280-334425	Instrument ID:	SGC_A
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	006B0701.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 mL
Analysis Date:	07/20/2016 1613	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Methanol	116	115	50 - 150	1	30		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
Propanol	108	109	50 - 150

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 280-334425

Method: 8015C
Preparation: N/A

LCS Lab Sample ID:	LCS 280-334425/6	Units: mg/L	
Client Matrix:	Water		
Dilution:	1.0		
Analysis Date:	07/20/2016 1557		
Prep Date:	N/A		
Leach Date:	N/A		

LCSD Lab Sample ID:	LCSD 280-334425/7
Client Matrix:	Water
Dilution:	1.0
Analysis Date:	07/20/2016 1613
Prep Date:	N/A
Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Methanol	2.99	2.99	3.47	3.45

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334425

Method: 8015C
Preparation: N/A

MS Lab Sample ID:	280-85505-1	Analysis Batch:	280-334425	Instrument ID:	SGC_A
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	008B0901.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 mL
Analysis Date:	07/20/2016 1645			Final Weight/Volume:	
Prep Date:	N/A			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

MSD Lab Sample ID:	280-85505-1	Analysis Batch:	280-334425	Instrument ID:	SGC_A
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	009B1001.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 mL
Analysis Date:	07/20/2016 1701			Final Weight/Volume:	
Prep Date:	N/A			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Methanol	126	115	50 - 150	9	30		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
Propanol	107	111	50 - 150

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334425

Method: 8015C
Preparation: N/A

MS Lab Sample ID:	280-85505-1	Units: mg/L	
Client Matrix:	Water		
Dilution:	1.0		
Analysis Date:	07/20/2016 1645		
Prep Date:	N/A		
Leach Date:	N/A		

MSD Lab Sample ID:	280-85505-1
Client Matrix:	Water
Dilution:	1.0
Analysis Date:	07/20/2016 1701
Prep Date:	N/A
Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Methanol	0.15	U	2.99	2.99	3.76	3.45

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-335251

Method: 8015C
Preparation: N/A

Lab Sample ID:	MB 280-335251/26	Analysis Batch:	280-335251	Instrument ID:	SGC_Z2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	010F2601.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 mL
Analysis Date:	07/26/2016 2014	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	N/A			Injection Volume:	0.5 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Result	Qual	MDL	RL
Ethylene glycol	2000	U	2000	5000
Propylene glycol	2400	U	2400	5000

Surrogate	% Rec	Acceptance Limits
1,4-Butanediol	95	77 - 134

Lab Control Sample - Batch: 280-335251

Method: 8015C
Preparation: N/A

Lab Sample ID:	LCS 280-335251/29	Analysis Batch:	280-335251	Instrument ID:	SGC_Z2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	011F2901.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 mL
Analysis Date:	07/26/2016 2040	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	N/A			Injection Volume:	0.5 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ethylene glycol	50100	45200	90	75 - 120	
Propylene glycol	49700	46200	93	73 - 124	

Surrogate	% Rec	Acceptance Limits
1,4-Butanediol	98	77 - 134

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-335251

Method: 8015C
Preparation: N/A

MS Lab Sample ID:	280-85505-1	Analysis Batch:	280-335251	Instrument ID:	SGC_Z2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	013F3501.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 mL
Analysis Date:	07/26/2016 2132			Final Weight/Volume:	1 mL
Prep Date:	N/A			Injection Volume:	0.5 uL
Leach Date:	N/A			Column ID:	PRIMARY

MSD Lab Sample ID:	280-85505-1	Analysis Batch:	280-335251	Instrument ID:	SGC_Z2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	014F3801.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 mL
Analysis Date:	07/26/2016 2158			Final Weight/Volume:	1 mL
Prep Date:	N/A			Injection Volume:	0.5 uL
Leach Date:	N/A			Column ID:	PRIMARY

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Ethylene glycol	87	91	75 - 120	5	20		
Propylene glycol	91	93	73 - 124	2	20		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
1,4-Butanediol	86	83	77 - 134

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-335251

Method: 8015C
Preparation: N/A

MS Lab Sample ID:	280-85505-1	Units: ug/L		MSD Lab Sample ID:	280-85505-1
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	07/26/2016 2132			Analysis Date:	07/26/2016 2158
Prep Date:	N/A			Prep Date:	N/A
Leach Date:	N/A			Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Ethylene glycol	2000	U	50100	50100	43500	45800
Propylene glycol	2400	U	49700	49700	45000	46000

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334141

Method: NWTPH-Dx
Preparation: 3510C

Lab Sample ID:	MB 280-334141/1-A	Analysis Batch:	280-335331	Instrument ID:	SGC_U2a
Client Matrix:	Water	Prep Batch:	280-334141	Lab File ID:	006F0701.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/27/2016 1732	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 0937			Injection Volume:	1 uL
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
C10-C36	56.3	J	56	500
C10-C28	33	U	33	250

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	102	50 - 115

Lab Control Sample - Batch: 280-334141

Method: NWTPH-Dx
Preparation: 3510C

Lab Sample ID:	LCS 280-334141/2-A	Analysis Batch:	280-335331	Instrument ID:	SGC_U2a
Client Matrix:	Water	Prep Batch:	280-334141	Lab File ID:	007F0801.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/27/2016 1756	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 0937			Injection Volume:	1 uL
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
C10-C36	2000	1780	89	57 - 115	
C10-C28	2000	1770	88	54 - 115	

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	104	50 - 115

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334141

Method: NWTPH-Dx
Preparation: 3510C

MS Lab Sample ID:	280-85505-1	Analysis Batch:	280-335331	Instrument ID:	SGC_U2a
Client Matrix:	Water	Prep Batch:	280-334141	Lab File ID:	009F1001.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1017.6 mL
Analysis Date:	07/27/2016 1846			Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 0937			Injection Volume:	1 uL
Leach Date:	N/A				

MSD Lab Sample ID:	280-85505-1	Analysis Batch:	280-335331	Instrument ID:	SGC_U2a
Client Matrix:	Water	Prep Batch:	280-334141	Lab File ID:	010F1101.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	993.4 mL
Analysis Date:	07/27/2016 1910			Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 0937			Injection Volume:	1 uL
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
C10-C36	88	82	50 - 115	4	31		
C10-C28	89	83	50 - 115	4	31		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
o-Terphenyl	104	106	50 - 115

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334141

Method: NWTPH-Dx
Preparation: 3510C

MS Lab Sample ID:	280-85505-1	Units:	ug/L	MSD Lab Sample ID:	280-85505-1
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	07/27/2016 1846			Analysis Date:	07/27/2016 1910
Prep Date:	07/19/2016 0937			Prep Date:	07/19/2016 0937
Leach Date:	N/A			Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
C10-C36	110	J	1970	2010	1850	1770
C10-C28	73	J	1970	2010	1830	1750

Date: 22 August 2016
To: Washington Closure Hanford (technical representative)
From: ELR Consulting
Project: ERDF Leachate Tank Summer 2016
Subject: Polyaromatic Hydrocarbon - Data Package No. J02198-TAL

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. J02198 prepared by TestAmerica Inc. (TAL). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V931	7/12/16	Water	C	See note 1
J1V932	7/12/16	Water	C	See note 1

1 – Polyaromatic hydrocarbons by 8310.

Data validation was conducted in accordance with the WCH validation statement of work and WCH-173, Rev. 2, "Environmental Restoration Disposal Facility Leachate Sampling & Analysis Plan". Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times & Sample Preservation**

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. Samples must be prepared within 14 days and analyzed within 40 days.

If holding times are exceeded, but not by greater than twice the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than twice the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples of a given matrix. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as estimated and flagged "UJ".

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Laboratory Control Sample

Matrix spike/matrix spike duplicate and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike/matrix spike duplicate is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which percent recoveries must be within established laboratory quality control limits. If spike recoveries are outside control limits (50-150% or w/in laboratory specified limits), detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

Due to a surrogate recovery outside QC limits (67%), all PAH results in sample J1V931 were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For samples analyzed using SW-846 protocol, results must be within RPD limits of +/- 20% for water samples and +/- 35% for solid samples. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

One set field duplicates (J1V931/J1V932) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required detection limits (RDLs) to ensure that laboratory detection levels meet the required criteria. All results met the RDL.

- **Completeness**

Data package No. J02198 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to a surrogate recovery outside QC limits (67%), all PAH results in sample J1V931 were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

WCH-173, Rev 2, *Environmental Restoration Disposal Facility Leachate Sampling and Analysis Plan*, November 2015.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validator in compliance with the WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

POLYAROMATIC HYDROCARBON DATA QUALIFICATION SUMMARY*

SDG: J02198	**REVIEWER: ELR**	**Project: ERDF**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	J1V931	Surrogate recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: J1V931

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8310 PAHs (HPLC)

Analysis Method: 8310
Prep Method: 3510C
Dilution: 1.0
Analysis Date: 07/27/2016 1657
Prep Date: 07/19/2016 0930

Analysis Batch: 280-335329
Prep Batch: 280-334137

K 8/21/16

Instrument ID: CHHPLC_G
Initial Weight/Volume: 1002.1 mL
Final Weight/Volume: 1 mL
Injection Volume: 20 uL
Result Type: PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	0.043	U J	0.043	1.0
Acenaphthylene	0.043	U	0.043	1.0
Anthracene	0.061	U	0.061	0.30
Benzo[a]anthracene	0.032	U	0.032	0.20
Benzo[a]pyrene	0.053	U	0.053	0.20
Benzo[b]fluoranthene	0.052	U	0.052	0.20
Benzo[g,h,i]perylene	0.020	U	0.020	0.20
Benzo[k]fluoranthene	0.023	U	0.023	0.10
Chrysene	0.028	U	0.028	0.20
Dibenzo(a,h)anthracene	0.054	U	0.054	0.30
Fluoranthene	0.081	U	0.081	0.40
Fluorene	0.099	U	0.099	0.30
Indeno[1,2,3-cd]pyrene	0.047	U	0.047	0.20
Naphthalene	0.055	U	0.055	1.0
Phenanthrene	0.095	U	0.095	0.30
Pyrene	0.043	U	0.043	0.20

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14 (SUR)	67	*	70 - 115

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: J1V932

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8310 PAHs (HPLC)

Analysis Method: 8310
Prep Method: 3510C
Dilution: 1.0
Analysis Date: 07/27/2016 1829
Prep Date: 07/19/2016 0930

Analysis Batch: 280-335329
Prep Batch: 280-334137

8/21/16

Instrument ID: CHHPLC_G
Initial Weight/Volume: 991.1 mL
Final Weight/Volume: 1 mL
Injection Volume: 20 uL
Result Type: PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	0.044	U	0.044	1.0
Acenaphthylene	0.044	U	0.044	1.0
Anthracene	0.062	U	0.062	0.30
Benzo[a]anthracene	0.032	U	0.032	0.20
Benzo[a]pyrene	0.053	U	0.053	0.20
Benzo[b]fluoranthene	0.053	U	0.053	0.20
Benzo[g,h,i]perylene	0.020	U	0.020	0.20
Benzo[k]fluoranthene	0.023	U	0.023	0.10
Chrysene	0.028	U	0.028	0.20
Dibenzo(a,h)anthracene	0.055	U	0.055	0.30
Fluoranthene	0.082	U	0.082	0.40
Fluorene	0.10	J	0.10	0.30
Indeno[1,2,3-cd]pyrene	0.048	U	0.048	0.20
Naphthalene	0.056	U	0.056	1.0
Phenanthrene	0.096	U	0.096	0.30
Pyrene	0.043	U	0.043	0.20

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14 (SUR)	94		70 - 115

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-85505-1

SDG #: J02198
SAF#: RC-009

Date SDG Closed: July 14, 2016
Data Deliverable: 21 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V931	280-85505-1	2320/300.0/2540C/2540D/350.1/353.2/410.4/ 9020/420.4/5310B/1664/9034/9012/8260/ 6010/7470/9050/9040/8015/8270/ WTPH-G/WTPH-D+/8151/8081/8082/8310	2320B/300.0/2540C/2540D/350.1/353.2/410.4/ 9020B/420.4/5310B/1664A/9034/9012A/8260B/ 6010B/6020/7470A/9050A/9040B/8015C/8270C/ NWTPH-Gx/NWTPH-Dx/8151A/8081A/8082/8310
J1V932	280-85505-2	2320/300.0/2540C/2540D/350.1/353.2/410.4/ 9020/420.4/5310B/1664/9034/9012/8260/ 6010/7470/9050/9040/8015/8270/ WTPH-G/WTPH-D+/8151/8081/8082/8310	2320B/300.0/2540C/2540D/350.1/353.2/410.4/ 9020B/420.4/5310B/1664A/9034/9012A/8260B/ 6010B/6020/7470A/9050A/9040B/8015C/8270C/ NWTPH-Gx/NWTPH-Dx/8151A/8081A/8082/8310
J1V933	280-85505-3	8260	8260B

The Uranium method substitution noted above, as agreed to by all parties, has no technical impact on the data.

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

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

RECEIPT
The samples were received on 7/13/2016 9:30 AM and 7/14/2016 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 1.7° C, 2.9° C, 3.4° C and 4.9° C.

Receipt Exceptions

It was noted that the VOA vials did not have labels affixed to them. There was one label for each set of VOA vials that was affixed to the bubble bag. Each label was transferred to one of the vials in each set. The client was notified on 7/15/2016.

GC/MS VOLATILES - SW846 8260B
The following compounds were not found as part of a TIC search performed for samples J1V931, J1V932 and J1V933: Acrylamide [79-06-1]; Formaldehyde [50-00-0]; 1,3-Butadiene [106-99-0]; Chlorodifluoromethane [75-45-6]; Dichloropropanol [26545-73-3]; Trichloromethanethiol [75-70-7]; Allyl alcohol (2-Propen-1-ol) [107-18-6]; Crotonaldehyde (2-Butenaldehyde) [4170-30-3]; Epichlorohydrin [106-89-8].

The GC/MS Volatiles analyses of samples J1V932 and J1V933 were performed 3 days outside the recommended sample holding times, due to analyst oversight. The client was notified on 8/2/2016.

The preservative used in the sample containers provided is not compatible with one of the Method 8260B analytes requested. Samples J1V931, J1V932 and J1V933 were received preserved with hydrochloric acid. The requested target analyte list includes 2-chloroethyl vinyl ether, an acid-labile compound that degrades in an acidic medium.

Methylene Chloride, a common laboratory contaminant, is present in the method blank associated with batch 280-334916 at a level exceeding the reporting limit. Because this common laboratory contaminant is present in the method blank at a level that is less than five times the reporting limit, corrective action is not required.

Low levels of Methylene chloride, a common laboratory contaminant, are present in the method blank associated with batch 280-335637. Because the concentration in the method blank is not present at a level greater than the reporting limit, corrective action is deemed unnecessary.

The LCS associated with batch 280-334916 exhibited the percent recovery outside the control limits, biased high, for Methylene Chloride, and the associated sample result has been flagged "T". As Methylene Chloride is not present at a level greater than the reporting limit in the associated sample, corrective action is deemed unnecessary.

2-Chloroethyl vinyl ether was not recovered in the MS/MSD performed on sample J1V931 in batch 280-334916 due to the acid preservative used in the sample. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

Due to analyst oversight, MS/MSD analysis was not performed for batch 280-335637. Method precision and accuracy have been verified by the acceptable LCS/LCSD analysis data.

A Continuing Calibration Verification (CCV) standard associated with samples in batch 280-334916 exhibited the %Difference (%D) value outside acceptance criteria, biased low, for 1-Butanol (-50.2%). The sample associated with this CCV was non-detect for the affected analyte. All CCC and SPCC compounds are in control; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

GC/MS SEMIVOLATILES - SW846 8270C
The following compounds were not found as part of a TIC search performed for samples J1V931 and J1V932: 1-Acetyl-2-thiorurea [591-08-2]; 2,5-Diaminotoluene [95-70-5]; 2-Cyclohexyl-4,6-dinitrophenol [131-89-5]; Hexachlorophene [70-30-4].

Low levels of Benzyl alcohol are present in the method blank associated with batch 280-334208. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

A Continuing Calibration Verification (CCV) standard associated with samples in analysis batch 280-335194 exhibited the %Difference (%D) value outside acceptance criteria, biased low, for 4-Nitroquinoline-1-oxide (-50.1%). The samples associated with this CCV were non-detect for the affected analyte. All CCC and SPCC compounds are in control; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

GLYCOLS - SW846 8015C
Surrogate 1,4-Butanediol was recovered outside the control limits, biased low, in samples J1V931 and J1V932. The laboratory noted that this anomaly was due to obvious matrix interference; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

METHANOL - SW846 8015C
No anomalies were encountered.

GRO - NWTPH-Gx
The samples were collected in properly preserved vials for analysis of gasoline range organics (GRO). However, when verified by the laboratory, the pH was greater than 2 and the following sample was analyzed after 7 days from sampling: J1V932 (pH = 7).

No other anomalies were encountered.

PESTICIDES - SW846 8081A
The LCS associated with batch 280-334134 exhibited percent recoveries outside the control limits, biased low, as follows: 4,4'-DDE = 72% (lower limit 74), Aldrin = 34% (lower limit 44), Heptachlor = 45% (lower limit 52). Associated sample results have been flagged with an "N". It can be noted that the spike compound recoveries and surrogate recoveries for the MS/MSD performed on sample J1V931 were in control. The laboratory re-extracted the samples, unavoidably 14 days past the 7 day recommended sample holding time. Upon re-extraction and reanalysis of the samples under batch 280-336109, the associated LCS spike compound recoveries were 100% in control. and the non-detect results were confirmed. The original analysis data have been reported as the non-detect sample results were confirmed.

No other anomalies were encountered.

PCBs - SW846 8082
No anomalies were encountered.

HERBICIDES - SW846 8151A
No anomalies were encountered.

DRO - NWTPH-Dx
Low levels of C10-C36 are present in the method blank associated with batch 280-334141. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

PAHs - SW846 8310
Surrogate Terphenyl-d14 recovered outside the control limits, biased low at 67% (lower limit 70%), in sample J1V931. No evidence of matrix interference was present and the sample was non-detect. It can be noted that the spike compound recoveries and surrogate recoveries for the MS/MSD performed on sample J1V931 were in control. The laboratory re-extracted the sample, unavoidably 13 days past the 7 day recommended sample holding time, and the surrogate was in control at 94% and the non-detect results were confirmed. Due to insufficient sample volume remaining, sample specific MS/MSD analysis could not be performed for the re-extract batch. The original analysis data have been reported as the non-detect sample results were confirmed and the sample specific batch MS/MSD was associated with the original analysis.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/6020/7470A
Serial dilution of a digestate in batch 280-334811 indicates that physical and chemical interferences are present for Uranium. Results have been flagged with an "X".

Low levels of Thallium are present in the method blank associated with batch 280-334811. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Calcium and Uranium in the Matrix Spike performed on sample J1V931; therefore, control limits are not applicable.

The duplicate analysis of sample J1V931 exhibited RPD data outside the control limits for Thallium, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

OIL & GREASE (HEM) - EPA 1664A
No anomalies were encountered.

ANIONS - MCAWW 300.0
The orthophosphate as P analyses for samples J1V931 and J1V932 were performed 8-9 hours outside the recommended 48 hour sample holding times. The analyses were originally performed within the sample holding times; however, due to associated continuing calibration verification (CCV) failures, reanalysis was required.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to high constituent concentration, samples J1V931 and J1V932 required dilutions prior to the analysis of Nitrate as N, Chloride and Sulfate, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

The orthophosphate as P Matrix Spike performed on sample J1V931 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

AMMONIA as N - MCAWW 350.1
No anomalies were encountered.

NITRATE NITRITE as N - MCAWW 353.2
Each sample is analyzed to achieve the lowest possible reporting limit within the constraints of the method. Due to high constituent concentration, samples J1V931 and J1V932 had to be analyzed at dilutions, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

The Matrix Spike performed on sample J1V931 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

CHEMICAL OXYGEN DEMAND - MCAWW 410.4
No anomalies were encountered.

PHENOLICS - MCAWW 420.4
Phenolics are present at a level greater than half the reporting limit in the method blank associated with batch 280-335552. As no detectable concentrations of Phenolics are present in the associated samples, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL CYANIDE - SW846 9012A
Low levels of Total Cyanide are present in the method blank associated with batch 280-334663. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL ORGANIC HALOGENS (TOX) - SW846 9020B
The laboratory noted that the containers submitted for samples J1V931 and J1V932 were received with excess headspace. This could cause volatile halides to evaporate, resulting in a low bias to the reported results.

Samples J1V931 and J1V932 exhibited elevated detection limits due to the limited sample volume used. The nominal sample amount could not be used due to the nature of the sample matrix.

No other anomalies were encountered.

SULFIDE - SW846 9034
No anomalies were encountered.

ALKALINITY - SM 2320B
Low levels of Alkalinity are present in the method blank associated with batch 280-333888. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL DISSOLVED SOLIDS - SM 2540C
Samples J1V931 and J1V932 exhibited elevated detection limits due to the limited sample volume used. The nominal sample amount could not be used due to high constituent concentration.

No other anomalies were encountered.

TOTAL SUSPENDED SOLIDS - SM 2540D
No anomalies were encountered.

TOTAL ORGANIC CARBON - SM 5310B
No anomalies were encountered.

PH - SW846 9040B
SU = standard units

Samples J1V931 and J1V932 were analyzed 14 days after sample receipt, due to analyst oversight. It can be noted that pH is a field parameter with a holding time of 15 minutes.

No other anomalies were encountered.

SPECIFIC CONDUCTANCE - SW846 9050A
No anomalies were encountered.

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-022

Collector: DOWNING, MK	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: ERDF Leachate Tank	Sampling Location: ERDF Leachate tank 4, Summer 2016		SAF No.: RC-009
Ice Chest No.: ERC-02-404	Field Logbook No.: EL-1626-03	COA: RERDF22560	Method of Shipment: Commercial Carrier
Shipped To: TestAmerica Denver	Offsite Property No.: A131487		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 7D

Data Turnaround: 21 Days

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive, less than DOT limits

Special Handling and/or Storage

Cool 4 Deg C

Preservation	H2SO4 to pH <2	H2SO4 to pH <2	None	HCl or H2SO4 to pH <2	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C		
Type of Container	aG	aGs*	G/P	aGs*	aG	aG	aG	aG	aG		
No. of Container(s)	3	2	2	6	4	4	4	4	4		
Volume	250mL	250mL	250mL	40mL	1000mL	1000mL	1000mL	1000mL	1000mL		
Sample Analysis	See item (4) in Special Instructions	TOX - 9020	Conductivity - 9050; pH (Water) - 9040	See item (5) in Special Instructions	See item (5) in Special Instructions	PAHs - 8310	Pesticides - 8081	PCBs - 8082	Chloro-Herbicides - EPA8151		
Sample No.	Matrix	Sample Date	Sample Time								
J19931	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓	

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
J. Downing / J. Downing	WCH 7-12-16 0945	T.R. Edmundson / T.R. Edmundson	7-12-16 0945
T.R. Edmundson / T.R. Edmundson	WCH 7-12-16 1500	Fed Ex	7-12-16 —
		X	0930 BJW 16

Sign/Print Names

SPECIAL INSTRUCTIONS

(4) Phenolics Total Recoverable - 420.4; Total Organic Carbon (TOC) - 5310B
(5) VOA - 8260 (App IX); VOA - 8260 (Client List) (1,1,2-Trichloro-1,2,2-trifluoroethane, 1-Butanol, 2-Chloroethyl vinyl ether, 2-Nitropropane, Acetic acid, methyl ester, Diethyl ether, Ethyl acetate, Ethyl cyanide, Isopropylbenzene, Tetrahydrofuran, cis-1,2-Dichloroethylene)
Semi-VOA - 8270 (App IX); Semi-VOA – 8270 (Client List) (1,2-Diphenylhydrazine, 1,4-Dinitrobenzene, 3+4 Methylphenol (cresol, m+p), Benzaldehyde, Benzoic acid, Dimethoate, Diphenylamine, Disulfoton, Parathion, Phorate, Tris(2,3-dibromopropyl) phosphate)

REVIEWED BY KW DATE 7/12/16

FINAL SAMPLE DISPOSITION

Disposal Method:

Disposed By: Date/Time:

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-023

Price Code 7D

Data Turnaround 21 Days

Collector: DOWNING, MK	Company Contact: Joan Kessner; Telephone No.: 375-4688
Project Designation: ERDF Leachate Tank	Sampling Location: ERDF Leachate tank 4, Summer 2016
Ice Chest No.: ERC-02-404	Field Logbook No.: EL-1626-03; COA: RERDF22560
Shipped To: TestAmerica Denver	Offsite Property No.: A131487
Other Labs Shipped To: TestAmerica Richland	Project Coordinator: KESSNER, JH; SAF No.: RC-009; Method of Shipment: Commercial Carrier; Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive, less than DOT limits

Special Handling and/or Storage

Cool 4 Deg C

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s)	Volume	Sample Analysis
				H2SO4 to pH <2	aG	1	250mL	See Item (4) in Special Instructions
				H2SO4 to pH <2	aGe*	1	250mL	TOX - 9020
				None	G/P	1	250mL	Conductivity - 9050; pH (Water) - 9040
				HCl or H2SO4 to pH <2	aGe*	3	40mL	See Item (5) in Special Instructions
				Cool <=6C	aG	2	1000mL	See Item (6) in Special Instructions
				Cool <=6C	aG	2	1000mL	PAHs - 8310
				Cool <=6C	aG	2	1000mL	Pesticides - 8081
				Cool <=6C	aG	2	1000mL	PCBs - 8082
				Cool <=6C	aG	2	1000mL	Chloro-Herbicides - EPA8151
J1V932	WATER	7-12-16	0720	✓	✓	✓	✓	✓ ✓ ✓ ✓ ✓

Page 180 of 176

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M Downing / M Downing	7-12-16 0945	T.R. Edmundson / J.R. Edmundson	7-12-16 0945
T.R. Edmundson / J.R. Edmundson	7-12-16 1500	Fed Ex	7-12-16
			0930 BJulke

Sign/Print Names

SPECIAL INSTRUCTIONS

(4) Phenolics Total Recoverable - 420.4; Total Organic Carbon (TOC) - 5310B
(5) VOA - 8260 (App IX); VOA - 8260 (Client List) {1,1,2-Trichloro-1,2,2-trifluoroethane, 1-Butanol, 2-Chloroethyl vinyl ether, 2-Nitropropane, Acetic acid, methyl ester, Diethyl ether, Ethyl acetate, Ethyl cyanide, Isopropylbenzene, Tetrahydrofuran, cis-1,2-Dichloroethylene}
(6) Semi-VOA - 8270 (App IX); Semi-VOA – 8270 (Client List) {1,2-Diphenylhydrazine, 1,4-Dinitrobenzene, 3+4 Methylphenol (cresol, m+p), Benzaldehyde, Benzoic acid, Dimethoate, Diphenylamine, Disulfoton, Parathion, Phorate, Tris(2,3-dibromopropyl) phosphate}

REVIEWED BY KW DATE 7/12/16

FINAL SAMPLE DISPOSITION

Disposal Method: | Disposed By: | Date/Time:

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: ERDF			DATA PACKAGE: J02198		
VALIDATOR: ELR		LAB: TAL		DATE: 8/22/11	
			SDG: J02198		
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	8310
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX:					
J1U931 J1U932					
				Water	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments:_____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

Initial calibrations acceptable? ..... Yes No (N/A)

Continuing calibrations acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments:_____

GENERAL ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No (N/A)
Calibration blank results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... (Yes) No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes (No) N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... (Yes) No N/A
Surrogate/system monitoring compound recoveries acceptable? ..... Yes (No) N/A
Surrogates traceable? (Levels D, E) ..... Yes No (N/A)
Surrogates expired? (Levels D, E) ..... Yes No N/A
MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... (Yes) No N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)

Comments: surr - 3 - Jall

no PAS

GENERAL ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments: _____

GENERAL ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:_____

_____

_____

_____

_____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other aborbant) cleanup performed? ..... Yes No N/A

Lot check performed? ..... Yes No N/A

Check recoveries aceptable? ..... Yes No N/A

Check materials traceable? ..... Yes No N/A

Check materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments:_____

_____

_____

_____

_____

Appendix 6

Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334137

Method: 8310
Preparation: 3510C

Lab Sample ID:	MB 280-334137/1-A	Analysis Batch:	280-335329	Instrument ID:	CHHPLC_G
Client Matrix:	Water	Prep Batch:	280-334137	Lab File ID:	G0727014.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/27/2016 1556	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 0930			Injection Volume:	20 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Result	Qual	MDL	RL
Acenaphthene	0.043	U	0.043	1.0
Acenaphthylene	0.043	U	0.043	1.0
Anthracene	0.061	U	0.061	0.30
Benzo[a]anthracene	0.032	U	0.032	0.20
Benzo[a]pyrene	0.053	U	0.053	0.20
Benzo[b]fluoranthene	0.053	U	0.053	0.20
Benzo[g,h,i]perylene	0.020	U	0.020	0.20
Benzo[k]fluoranthene	0.023	U	0.023	0.10
Chrysene	0.028	U	0.028	0.20
Dibenzo(a,h)anthracene	0.055	U	0.055	0.30
Fluoranthene	0.081	U	0.081	0.40
Fluorene	0.099	U	0.099	0.30
Indeno[1,2,3-cd]pyrene	0.047	U	0.047	0.20
Naphthalene	0.056	U	0.056	1.0
Phenanthrene	0.095	U	0.095	0.30
Pyrene	0.043	U	0.043	0.20

Surrogate	% Rec	Acceptance Limits
Terphenyl-d14 (SUR)	98	70 - 115

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Lab Control Sample - Batch: 280-334137

Method: 8310
Preparation: 3510C

Lab Sample ID:	LCS 280-334137/2-A	Analysis Batch:	280-335329	Instrument ID:	CHHPLC_G
Client Matrix:	Water	Prep Batch:	280-334137	Lab File ID:	G0727015.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	07/27/2016 1627	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 0930			Injection Volume:	20 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	20.0	18.1	90	62 - 115	
Acenaphthylene	20.0	17.3	86	63 - 115	
Anthracene	20.0	18.1	90	68 - 115	
Benzo[a]anthracene	20.0	18.1	90	73 - 117	
Benzo[a]pyrene	20.0	19.1	95	71 - 115	
Benzo[b]fluoranthene	20.0	18.5	93	68 - 115	
Benzo[g,h,i]perylene	20.0	19.3	97	69 - 123	
Benzo[k]fluoranthene	20.0	18.5	92	75 - 115	
Chrysene	20.0	18.0	90	74 - 118	
Dibenzo(a,h)anthracene	20.0	18.0	90	73 - 115	
Fluoranthene	20.0	17.9	90	73 - 115	
Fluorene	20.0	17.9	89	70 - 115	
Indeno[1,2,3-cd]pyrene	20.0	19.7	99	73 - 119	
Naphthalene	20.0	17.0	85	51 - 115	
Phenanthrene	20.0	17.7	88	62 - 115	
Pyrene	20.0	18.9	95	68 - 116	

Surrogate	% Rec	Acceptance Limits
Terphenyl-d14 (SUR)	97	70 - 115

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334137

Method: 8310
Preparation: 3510C

MS Lab Sample ID:	280-85505-1	Analysis Batch:	280-335329	Instrument ID:	CHHPLC_G
Client Matrix:	Water	Prep Batch:	280-334137	Lab File ID:	G0727017.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	972.9 mL
Analysis Date:	07/27/2016 1728			Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 0930			Injection Volume:	20 uL
Leach Date:	N/A			Column ID:	PRIMARY

MSD Lab Sample ID:	280-85505-1	Analysis Batch:	280-335329	Instrument ID:	CHHPLC_G
Client Matrix:	Water	Prep Batch:	280-334137	Lab File ID:	G0727018.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1019.6 mL
Analysis Date:	07/27/2016 1759			Final Weight/Volume:	1 mL
Prep Date:	07/19/2016 0930			Injection Volume:	20 uL
Leach Date:	N/A			Column ID:	PRIMARY

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Acenaphthene	84	82	62 - 115	7	27		
Acenaphthylene	81	80	63 - 115	6	25		
Anthracene	88	86	68 - 115	6	22		
Benzo[a]anthracene	90	88	73 - 117	7	20		
Benzo[a]pyrene	95	92	71 - 115	7	20		
Benzo[b]fluoranthene	93	90	68 - 115	8	20		
Benzo[g,h,i]perylene	96	93	69 - 123	7	20		
Benzo[k]fluoranthene	92	90	75 - 115	7	20		
Chrysene	90	88	74 - 118	7	20		
Dibenzo(a,h)anthracene	89	87	73 - 115	7	20		
Fluoranthene	90	88	73 - 115	6	21		
Fluorene	87	85	70 - 115	7	26		
Indeno[1,2,3-cd]pyrene	98	95	73 - 119	7	20		
Naphthalene	73	73	51 - 115	4	31		
Phenanthrene	87	85	62 - 115	7	22		
Pyrene	95	94	68 - 116	6	22		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
Terphenyl-d14 (SUR)	96	94	70 - 115

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334137

Method: 8310
Preparation: 3510C

MS Lab Sample ID:	280-85505-1	Units: ug/L	MSD Lab Sample ID:	280-85505-1	
Client Matrix:	Water		Client Matrix:	Water	
Dilution:	1.0		Dilution:	1.0	
Analysis Date:	07/27/2016 1728		Analysis Date:	07/27/2016 1759	
Prep Date:	07/19/2016 0930		Prep Date:	07/19/2016 0930	
Leach Date:	N/A		Leach Date:	N/A	

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Acenaphthene	0.043	U	20.6	19.6	17.3	16.2
Acenaphthylene	0.043	U	20.6	19.6	16.6	15.7
Anthracene	0.061	U	20.6	19.6	18.0	16.9
Benzo[a]anthracene	0.032	U	20.6	19.6	18.5	17.3
Benzo[a]pyrene	0.053	U	20.6	19.6	19.5	18.1
Benzo[b]fluoranthene	0.052	U	20.6	19.6	19.1	17.7
Benzo[g,h,i]perylene	0.020	U	20.6	19.6	19.7	18.3
Benzo[k]fluoranthene	0.023	U	20.6	19.6	18.9	17.6
Chrysene	0.028	U	20.6	19.6	18.5	17.2
Dibenzo(a,h)anthracene	0.054	U	20.6	19.6	18.3	17.0
Fluoranthene	0.081	U	20.6	19.6	18.4	17.3
Fluorene	0.099	U	20.6	19.6	17.8	16.6
Indeno[1,2,3-cd]pyrene	0.047	U	20.6	19.6	20.2	18.7
Naphthalene	0.055	U	20.6	19.6	15.1	14.4
Phenanthrene	0.095	U	20.6	19.6	17.9	16.7
Pyrene	0.043	U	20.6	19.6	19.5	18.4

Date: 22 August 2016
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: ERDF Leachate Tank Summer 2016
Subject: Volatile Organic - Data Package No. J02198-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. J02198 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V931	7/12/16	Water	C	See note 1
J1V932	7/12/16	Water	C	See note 1
J1V933	7/12/16	Water	C	See note 1

1 - Volatiles by EPA 8260B & gasoline by NWTPH-D.

Data validation was conducted in accordance with the WCH validation statement of work and WCH-173, Rev. 2, "Environmental Restoration Disposal Facility Leachate Sampling and Analysis Plan". Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times & Sample Preservation**

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. Preserved water samples must be analyzed within: 14 days of the date of sample collection for preserved samples and 7 days for unpreserved samples.

If holding times are exceeded, but not by greater than twice the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than twice the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to an incompatible preservative (hydrochloric acid), all 2-chloroethyl vinyl ether results were qualified as estimates and flagged "J".

Due to the holding time being exceeded, all volatile organic results in samples J1V932 and J1V933 were qualified as estimates and flagged "J".

All other holding times and sample reservation parameters were acceptable.

- **Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples of a given matrix. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the project quantitation limit (PQL) and is less than five times (or less than ten times for laboratory contaminants) the highest associated blank result, the sample result value is raised to the PQL, qualified as undetected and flagged "U".

Due to method blank contamination, all methylene chloride results were qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

One field (trip) blank (J1V933) was submitted for analysis. No analytes were detected in the field blank.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Laboratory Control Sample

Matrix spike/matrix spike duplicate and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike/matrix spike duplicate is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which percent recoveries must be within established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are

qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to matrix spike and matrix spike duplicate recoveries outside QC limits (0% & 0%), all 2-chloroethyl vinyl ether results in sample J1V931 were qualified as estimates and flagged "J".

Due to the lack of a matrix spike and matrix spike duplicate analysis, all volatile organic results in samples J1V932 and J1V933 were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of system performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Samples with surrogate recoveries less than ten percent are qualified as estimates and flagged "J" for detects, and rejected and flagged "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification.

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For samples analyzed using SW-846 protocol, results must be within RPD limits of +/- 20% for water samples and +/- 35% for solid samples. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the lack of a matrix spike, matrix spike duplicate analysis, all volatile organic results in samples J1V932 and J1V933 were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set field duplicates (J1V931/J1V932) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required detection limits (RDLs) to ensure that laboratory detection levels meet the required criteria. All results met the RDL.

- **Completeness**

Data package No. J02198 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to an incompatible preservative (hydrochloric acid), all 2-chloroethyl vinyl ether results were qualified as estimates and flagged "J".
- Due to the holding time being exceeded, all volatile organic results in samples J1V932 and J1V933 were qualified as estimates and flagged "J".
- Due to method blank contamination, all methylene chloride results were qualified as undetected and flagged "U".
- Due to the lack of a matrix spike and matrix spike duplicate analysis, all volatile organic results in samples J1V932 and J1V933 were qualified as estimates and flagged "J".

- Due to matrix spike and matrix spike duplicate recoveries outside QC limits (0% & 0%), all 2-chloroethyl vinyl ether results in sample J1V931 were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services.*

WCH-173, Rev. 2, *Environmental Restoration Disposal Facility Leachate Sampling & Analysis Plan,* November 2015.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validator in compliance with the WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

VOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: J02198	**REVIEWER: ELR**	**Project: ERDF**	**PAGE 1 OF 1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene chloride	U	All	Method blank contamination
All	J	J1V932, J1V933	Hold time
2-chloroethyl vinyl ether	J	All	Sample preservation
All	J	J1V932, J1V933	No MS or MSD analysis
2-chloroethyl vinyl ether	J	J1V931	MS & MSD analysis

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: J1V931

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8260B Volatile Organic Compounds (GC/MS)

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 07/25/2016 1348
Prep Date: 07/25/2016 1348

Analysis Batch: 280-334916
Prep Batch: N/A

Instrument ID: VMS_P
Lab File ID: P0367.D
Initial Weight/Volume: 20 mL
Final Weight/Volume: 20 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	0.42	U	0.42	3.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,1-Dichloroethene	0.62	J	0.23	1.0
1,2,3-Trichloropropane	0.33	U	0.33	2.5
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	5.0
1,2-Dibromoethane	0.18	U	0.18	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1-Butanol	17	U	17	60
2-Butanone (MEK)	2.0	U	2.0	6.0
2-Chloroethyl vinyl ether	0.69	U T J	0.69	3.0
2-Hexanone	1.7	U	1.7	5.0
2-Nitropropane	1.6	U	1.6	5.0
4-Methyl-2-pentanone (MIBK)	0.98	U	0.98	5.0
Acetone	1.9	U	1.9	10
Acetonitrile	9.6	U	9.6	30
Acrolein	2.8	U	2.8	20
Acrylonitrile	1.4	U	1.4	20
Allyl chloride	0.17	U	0.17	2.0
Benzene	0.16	U	0.16	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	2.0
Carbon disulfide	0.45	U	0.45	2.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	2.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.33	J	0.30	2.0
Chloroprene	0.21	U	0.21	1.0
cis-1,2-Dichloroethene	0.15	U	0.15	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Dibromomethane	0.17	U	0.17	1.0
Dichlorodifluoromethane	0.31	U	0.31	2.0
Ethyl acetate	1.2	U	1.2	5.0
Ethyl ether	0.26	U	0.26	2.0
Ethyl methacrylate	0.86	U	0.86	3.0
Ethylbenzene	0.16	U	0.16	1.0
Iodomethane	0.23	U	0.23	1.0
Isobutyl alcohol	37	U	37	110
Isopropylbenzene	0.19	U	0.19	1.0

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V931**

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8260B Volatile Organic Compounds (GC/MS)

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 07/25/2016 1348
Prep Date: 07/25/2016 1348

Analysis Batch: 280-334916
Prep Batch: N/A

Instrument ID: VMS_P
Lab File ID: P0367.D
Initial Weight/Volume: 20 mL
Final Weight/Volume: 20 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methacrylonitrile	1.6	U	1.6	10
Methyl acetate	1.6	U	1.6	5.0
Methyl methacrylate	1.1	U	1.1	4.0
Methylene Chloride	1.5	J B T U	0.32	2.0
Propionitrile	3.7	U	3.7	20
Styrene	0.17	U	0.17	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Tetrahydrofuran	2.0	U	2.0	7.0
Toluene	0.17	U	0.17	1.0
trans-1,2-Dichloroethene	0.15	U	0.15	1.0
trans-1,3-Dichloropropene	0.19	U	0.19	3.0
trans-1,4-Dichloro-2-butene	0.80	U	0.80	3.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.33	J	0.29	2.0
Vinyl acetate	0.94	U	0.94	3.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	119		70 - 127
4-Bromofluorobenzene (Surr)	109		78 - 120
Dibromofluoromethane (Surr)	109		77 - 120
Toluene-d8 (Surr)	104		80 - 125

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V931**

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8260B Volatile Organic Compounds (GC/MS)

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 07/25/2016 1348
Prep Date: 07/25/2016 1348

Analysis Batch: 280-334916
Prep Batch: N/A

Instrument ID: VMS_P
Lab File ID: P0367.D
Initial Weight/Volume: 20 mL
Final Weight/Volume: 20 mL

8/2/16

Tentatively Identified Compounds **Number TIC's Found: 2**

Cas Number	Analyte	RT	Est. Result (ug/L)	Qualifier
75-43-4	Dichlorofluoromethane	4.88	0.29	J N
60-34-4	Hydrazine, methyl-	6.66	1.5	N J

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: J1V932

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8260B Volatile Organic Compounds (GC/MS)

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 07/29/2016 1230
Prep Date: 07/29/2016 1230

Analysis Batch: 280-335637
Prep Batch: N/A

Instrument ID: VMS_H
Lab File ID: H7351.D
Initial Weight/Volume: 20 mL
Final Weight/Volume: 20 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1,2-Tetrachloroethane	0.21	U J	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	0.42	U	0.42	3.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,1-Dichloroethene	0.24	J	0.23	1.0
1,2,3-Trichloropropane	0.33	U	0.33	2.5
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	5.0
1,2-Dibromoethane	0.18	U	0.18	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1-Butanol	17	U	17	60
2-Butanone (MEK)	2.0	U	2.0	6.0
2-Chloroethyl vinyl ether	0.69	U	0.69	3.0
2-Hexanone	1.7	U	1.7	5.0
2-Nitropropane	1.6	U	1.6	5.0
4-Methyl-2-pentanone (MIBK)	0.98	U	0.98	5.0
Acetone	1.9	U	1.9	10
Acetonitrile	9.6	U	9.6	30
Acrolein	2.8	U	2.8	20
Acrylonitrile	1.4	U	1.4	20
Allyl chloride	0.17	U	0.17	2.0
Benzene	0.16	U	0.16	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	2.0
Carbon disulfide	0.45	U	0.45	2.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	2.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	2.0
Chloroprene	0.21	U	0.21	1.0
cis-1,2-Dichloroethene	0.15	U	0.15	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Dibromomethane	0.17	U	0.17	1.0
Dichlorodifluoromethane	0.31	U	0.31	2.0
Ethyl acetate	1.2	U	1.2	5.0
Ethyl ether	0.26	U	0.26	2.0
Ethyl methacrylate	0.86	U	0.86	3.0
Ethylbenzene	0.16	U	0.16	1.0
Iodomethane	0.23	U	0.23	1.0
Isobutyl alcohol	37	U	37	110
Isopropylbenzene	0.19	U	0.19	1.0

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8260B Volatile Organic Compounds (GC/MS)

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 07/29/2016 1230
Prep Date: 07/29/2016 1230

Analysis Batch: 280-335637
Prep Batch: N/A

Instrument ID: VMS_H
Lab File ID: H7351.D
Initial Weight/Volume: 20 mL
Final Weight/Volume: 20 mL

JL 8/21/16

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methacrylonitrile	1.6	U J	1.6	10
Methyl acetate	1.6	U	1.6	5.0
Methyl methacrylate	1.1	U	1.1	4.0
Methylene Chloride	0.46	J B U	0.32	2.0
Propionitrile	3.7	U	3.7	20
Styrene	0.17	U	0.17	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Tetrahydrofuran	2.0	U	2.0	7.0
Toluene	0.17	U	0.17	1.0
trans-1,2-Dichloroethene	0.15	U	0.15	1.0
trans-1,3-Dichloropropene	0.19	U	0.19	3.0
trans-1,4-Dichloro-2-butene	0.80	U	0.80	3.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	2.0
Vinyl acetate	0.94	U	0.94	3.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	106		70 - 127
4-Bromofluorobenzene (Surr)	99		78 - 120
Dibromofluoromethane (Surr)	101		77 - 120
Toluene-d8 (Surr)	97		80 - 125

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-335637	Instrument ID:	VMS_H
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	H7351.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	07/29/2016 1230			Final Weight/Volume:	20 mL
Prep Date:	07/29/2016 1230				

Tentatively Identified Compounds **Number TIC's Found: 4**

Cas Number	Analyte	RT	Est. Result (ug/L)	Qualifier
75-43-4	Dichlorofluoromethane	2.94	0.31	J N J
67-63-0	Isopropyl alcohol	3.63	21	J N J
693-21-0	Ethanol, 2,2'-oxybis-, dinitrate	5.29	2.5	N J
556-67-2	Cyclotetrasiloxane, octamethyl-	13.02	1.3	N J

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V933**

Lab Sample ID: 280-85505-3
Client Matrix: Water

Date Sampled: 07/12/2016 0600
Date Received: 07/13/2016 0930

8260B Volatile Organic Compounds (GC/MS)

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 07/29/2016 1254
Prep Date: 07/29/2016 1254

Analysis Batch: 280-335637
Prep Batch: N/A

Instrument ID: VMS_H
Lab File ID: H7352.D
Initial Weight/Volume: 20 mL
Final Weight/Volume: 20 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	0.42	U	0.42	3.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2,3-Trichloropropane	0.33	U	0.33	2.5
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	5.0
1,2-Dibromoethane	0.18	U	0.18	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1-Butanol	17	U	17	60
2-Butanone (MEK)	2.0	U	2.0	6.0
2-Chloroethyl vinyl ether	0.69	U	0.69	3.0
2-Hexanone	1.7	U	1.7	5.0
2-Nitropropane	1.6	U	1.6	5.0
4-Methyl-2-pentanone (MIBK)	0.98	U	0.98	5.0
Acetone	1.9	U	1.9	10
Acetonitrile	9.6	U	9.6	30
Acrolein	2.8	U	2.8	20
Acrylonitrile	1.4	U	1.4	20
Allyl chloride	0.17	U	0.17	2.0
Benzene	0.16	U	0.16	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	2.0
Carbon disulfide	0.45	U	0.45	2.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	2.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	2.0
Chloroprene	0.21	U	0.21	1.0
cis-1,2-Dichloroethene	0.15	U	0.15	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Dibromomethane	0.17	U	0.17	1.0
Dichlorodifluoromethane	0.31	U	0.31	2.0
Ethyl acetate	1.2	U	1.2	5.0
Ethyl ether	0.26	U	0.26	2.0
Ethyl methacrylate	0.86	U	0.86	3.0
Ethylbenzene	0.16	U	0.16	1.0
Iodomethane	0.23	U	0.23	1.0
Isobutyl alcohol	37	U	37	110
Isopropylbenzene	0.19	U	0.19	1.0

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V933**

Lab Sample ID: 280-85505-3
Client Matrix: Water

Date Sampled: 07/12/2016 0600
Date Received: 07/13/2016 0930

8260B Volatile Organic Compounds (GC/MS)

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 07/29/2016 1254
Prep Date: 07/29/2016 1254

Analysis Batch: 280-335637
Prep Batch: N/A

Instrument ID: VMS_H
Lab File ID: H7352.D
Initial Weight/Volume: 20 mL
Final Weight/Volume: 20 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methacrylonitrile	1.6	U	1.6	10
Methyl acetate	1.6	U	1.6	5.0
Methyl methacrylate	1.1	U	1.1	4.0
Methylene Chloride	0.53	J B	0.32	2.0
Propionitrile	3.7	U	3.7	20
Styrene	0.17	U	0.17	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Tetrahydrofuran	2.0	U	2.0	7.0
Toluene	0.17	U	0.17	1.0
trans-1,2-Dichloroethene	0.15	U	0.15	1.0
trans-1,3-Dichloropropene	0.19	U	0.19	3.0
trans-1,4-Dichloro-2-butene	0.80	U	0.80	3.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	2.0
Vinyl acetate	0.94	U	0.94	3.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	113		70 - 127
4-Bromofluorobenzene (Surr)	102		78 - 120
Dibromofluoromethane (Surr)	106		77 - 120
Toluene-d8 (Surr)	102		80 - 125

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V933**

Lab Sample ID: 280-85505-3
Client Matrix: Water

Date Sampled: 07/12/2016 0600
Date Received: 07/13/2016 0930

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-335637	Instrument ID:	VMS_H
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	H7352.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	07/29/2016 1254			Final Weight/Volume:	20 mL
Prep Date:	07/29/2016 1254				

8/21/16

Tentatively Identified Compounds **Number TIC's Found: 3**

Cas Number	Analyte	RT	Est. Result (ug/L)	Qualifier
	Unknown	5.30	2.3	N J
541-05-9	Cyclotrisiloxane, hexamethyl-	9.52	1.7	N J
556-67-2	Cyclotetrasiloxane, octamethyl-	13.03	1.9	N J

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V931**

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

NWTPH-Gx Northwest - Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Gx	Analysis Batch:	280-334991	Instrument ID:	VGC_Q
Prep Method:	5030B		N/A	Initial Weight/Volume:	5 mL
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	07/25/2016 2138			Injection Volume:	5 mL
Prep Date:	07/25/2016 2138			Result Type:	PRIMARY

8/2/16

Analyte	Result (ug/L)	Qualifier	MDL	RL
Gasoline	10	U	10	25

Surrogate	%Rec	Qualifier	Acceptance Limits
a,a,a-Trifluorotoluene	103		82 - 110

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

NWTPH-Gx Northwest - Volatile Petroleum Products (GC)

Analysis Method: NWTPH-Gx
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 07/25/2016 2251
Prep Date: 07/25/2016 2251

Analysis Batch: 280-334991
N/A

8/21/16

Instrument ID: VGC_Q
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL
Injection Volume: 5 mL
Result Type: PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
Gasoline	10	U	10	25

Surrogate	%Rec	Qualifier	Acceptance Limits
a,a,a-Trifluorotoluene	92		82 - 110

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-85505-1

SDG #: J02198
SAF#: RC-009

Date SDG Closed: July 14, 2016
Data Deliverable: 21 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V931	280-85505-1	2320/300.0/2540C/2540D/350.1/353.2/410.4/ 9020/420.4/5310B/1664/9034/9012/8260/ 6010/7470/9050/9040/8015/8270/ WTPH-G/WTPH-D+/8151/8081/8082/8310	2320B/300.0/2540C/2540D/350.1/353.2/410.4/ 9020B/420.4/5310B/1664A/9034/9012A/8260B/ 6010B/6020/7470A/9050A/9040B/8015C/8270C/ NWTPH-Gx/NWTPH-Dx/8151A/8081A/8082/8310
J1V932	280-85505-2	2320/300.0/2540C/2540D/350.1/353.2/410.4/ 9020/420.4/5310B/1664/9034/9012/8260/ 6010/7470/9050/9040/8015/8270/ WTPH-G/WTPH-D+/8151/8081/8082/8310	2320B/300.0/2540C/2540D/350.1/353.2/410.4/ 9020B/420.4/5310B/1664A/9034/9012A/8260B/ 6010B/6020/7470A/9050A/9040B/8015C/8270C/ NWTPH-Gx/NWTPH-Dx/8151A/8081A/8082/8310
J1V933	280-85505-3	8260	8260B

The Uranium method substitution noted above, as agreed to by all parties, has no technical impact on the data.

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

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

RECEIPT
The samples were received on 7/13/2016 9:30 AM and 7/14/2016 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 1.7° C, 2.9° C, 3.4° C and 4.9° C.

Receipt Exceptions

It was noted that the VOA vials did not have labels affixed to them. There was one label for each set of VOA vials that was affixed to the bubble bag. Each label was transferred to one of the vials in each set. The client was notified on 7/15/2016.

GC/MS VOLATILES - SW846 8260B
The following compounds were not found as part of a TIC search performed for samples J1V931, J1V932 and J1V933: Acrylamide [79-06-1]; Formaldehyde [50-00-0]; 1,3-Butadiene [106-99-0]; Chlorodifluoromethane [75-45-6]; Dichloropropanol [26545-73-3]; Trichloromethanethiol [75-70-7]; Allyl alcohol (2-Propen-1-ol) [107-18-6]; Crotonaldehyde (2-Butenaldehyde) [4170-30-3]; Epichlorohydrin [106-89-8].

The GC/MS Volatiles analyses of samples J1V932 and J1V933 were performed 3 days outside the recommended sample holding times, due to analyst oversight. The client was notified on 8/2/2016.

The preservative used in the sample containers provided is not compatible with one of the Method 8260B analytes requested. Samples J1V931, J1V932 and J1V933 were received preserved with hydrochloric acid. The requested target analyte list includes 2-chloroethyl vinyl ether, an acid-labile compound that degrades in an acidic medium.

Methylene Chloride, a common laboratory contaminant, is present in the method blank associated with batch 280-334916 at a level exceeding the reporting limit. Because this common laboratory contaminant is present in the method blank at a level that is less than five times the reporting limit, corrective action is not required.

Low levels of Methylene chloride, a common laboratory contaminant, are present in the method blank associated with batch 280-335637. Because the concentration in the method blank is not present at a level greater than the reporting limit, corrective action is deemed unnecessary.

The LCS associated with batch 280-334916 exhibited the percent recovery outside the control limits, biased high, for Methylene Chloride, and the associated sample result has been flagged "T". As Methylene Chloride is not present at a level greater than the reporting limit in the associated sample, corrective action is deemed unnecessary.

2-Chloroethyl vinyl ether was not recovered in the MS/MSD performed on sample J1V931 in batch 280-334916 due to the acid preservative used in the sample. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

Due to analyst oversight, MS/MSD analysis was not performed for batch 280-335637. Method precision and accuracy have been verified by the acceptable LCS/LCSD analysis data.

A Continuing Calibration Verification (CCV) standard associated with samples in batch 280-334916 exhibited the %Difference (%D) value outside acceptance criteria, biased low, for 1-Butanol (-50.2%). The sample associated with this CCV was non-detect for the affected analyte. All CCC and SPCC compounds are in control; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

GC/MS SEMIVOLATILES - SW846 8270C

The following compounds were not found as part of a TIC search performed for samples J1V931 and J1V932: 1-Acetyl-2-thiorurea [591-08-2]; 2,5-Diaminotoluene [95-70-5]; 2-Cyclohexyl-4,6-dinitrophenol [131-89-5]; Hexachlorophene [70-30-4].

Low levels of Benzyl alcohol are present in the method blank associated with batch 280-334208. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

A Continuing Calibration Verification (CCV) standard associated with samples in analysis batch 280-335194 exhibited the %Difference (%D) value outside acceptance criteria, biased low, for 4-Nitroquinoline-1-oxide (-50.1%). The samples associated with this CCV were non-detect for the affected analyte. All CCC and SPCC compounds are in control; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

GLYCOLS - SW846 8015C

Surrogate 1,4-Butanediol was recovered outside the control limits, biased low, in samples J1V931 and J1V932. The laboratory noted that this anomaly was due to obvious matrix interference; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

METHANOL - SW846 8015C

No anomalies were encountered.

GRO - NWTPH-Gx

The samples were collected in properly preserved vials for analysis of gasoline range organics (GRO). However, when verified by the laboratory, the pH was greater than 2 and the following sample was analyzed after 7 days from sampling: J1V932 (pH = 7).

No other anomalies were encountered.

PESTICIDES - SW846 8081A

The LCS associated with batch 280-334134 exhibited percent recoveries outside the control limits, biased low, as follows: 4,4'-DDE = 72% (lower limit 74), Aldrin = 34% (lower limit 44), Heptachlor = 45% (lower limit 52). Associated sample results have been flagged with an "N". It can be noted that the spike compound recoveries and surrogate recoveries for the MS/MSD performed on sample J1V931 were in control. The laboratory re-extracted the samples, unavoidably 14 days past the 7 day recommended sample holding time. Upon re-extraction and reanalysis of the samples under batch 280-336109, the associated LCS spike compound recoveries were 100% in control. and the non-detect results were confirmed. The original analysis data have been reported as the non-detect sample results were confirmed.

No other anomalies were encountered.

PCBs - SW846 8082

No anomalies were encountered.

HERBICIDES - SW846 8151A
No anomalies were encountered.

DRO - NWTPH-Dx
Low levels of C10-C36 are present in the method blank associated with batch 280-334141. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

PAHs - SW846 8310
Surrogate Terphenyl-d14 recovered outside the control limits, biased low at 67% (lower limit 70%), in sample J1V931. No evidence of matrix interference was present and the sample was non-detect. It can be noted that the spike compound recoveries and surrogate recoveries for the MS/MSD performed on sample J1V931 were in control. The laboratory re-extracted the sample, unavoidably 13 days past the 7 day recommended sample holding time, and the surrogate was in control at 94% and the non-detect results were confirmed. Due to insufficient sample volume remaining, sample specific MS/MSD analysis could not be performed for the re-extract batch. The original analysis data have been reported as the non-detect sample results were confirmed and the sample specific batch MS/MSD was associated with the original analysis.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/6020/7470A
Serial dilution of a digestate in batch 280-334811 indicates that physical and chemical interferences are present for Uranium. Results have been flagged with an "X".

Low levels of Thallium are present in the method blank associated with batch 280-334811. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Calcium and Uranium in the Matrix Spike performed on sample J1V931; therefore, control limits are not applicable.

The duplicate analysis of sample J1V931 exhibited RPD data outside the control limits for Thallium, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

OIL & GREASE (HEM) - EPA 1664A
No anomalies were encountered.

ANIONS - MCAWW 300.0
The orthophosphate as P analyses for samples J1V931 and J1V932 were performed 8-9 hours outside the recommended 48 hour sample holding times. The analyses were originally performed within the sample holding times; however, due to associated continuing calibration verification (CCV) failures, reanalysis was required.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to high constituent concentration, samples J1V931 and J1V932 required dilutions prior to the analysis of Nitrate as N, Chloride and Sulfate, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

The orthophosphate as P Matrix Spike performed on sample J1V931 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

AMMONIA as N - MCAWW 350.1
No anomalies were encountered.

NITRATE NITRITE as N - MCAWW 353.2
Each sample is analyzed to achieve the lowest possible reporting limit within the constraints of the method. Due to high constituent concentration, samples J1V931 and J1V932 had to be analyzed at dilutions, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

The Matrix Spike performed on sample J1V931 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

CHEMICAL OXYGEN DEMAND - MCAWW 410.4
No anomalies were encountered.

PHENOLICS - MCAWW 420.4
Phenolics are present at a level greater than half the reporting limit in the method blank associated with batch 280-335552. As no detectable concentrations of Phenolics are present in the associated samples, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL CYANIDE - SW846 9012A
Low levels of Total Cyanide are present in the method blank associated with batch 280-334663. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL ORGANIC HALOGENS (TOX) - SW846 9020B
The laboratory noted that the containers submitted for samples J1V931 and J1V932 were received with excess headspace. This could cause volatile halides to evaporate, resulting in a low bias to the reported results.

Samples J1V931 and J1V932 exhibited elevated detection limits due to the limited sample volume used. The nominal sample amount could not be used due to the nature of the sample matrix.

No other anomalies were encountered.

SULFIDE - SW846 9034
No anomalies were encountered.

ALKALINITY - SM 2320B
Low levels of Alkalinity are present in the method blank associated with batch 280-333888. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL DISSOLVED SOLIDS - SM 2540C
Samples J1V931 and J1V932 exhibited elevated detection limits due to the limited sample volume used. The nominal sample amount could not be used due to high constituent concentration.

No other anomalies were encountered.

TOTAL SUSPENDED SOLIDS - SM 2540D
No anomalies were encountered.

TOTAL ORGANIC CARBON - SM 5310B
No anomalies were encountered.

PH - SW846 9040B
SU = standard units

Samples J1V931 and J1V932 were analyzed 14 days after sample receipt, due to analyst oversight. It can be noted that pH is a field parameter with a holding time of 15 minutes.

No other anomalies were encountered.

SPECIFIC CONDUCTANCE - SW846 9050A
No anomalies were encountered.

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-022

Collector DOWNING, MK	**Company Contact** Joan Kessner	**Telephone No.** 375-4688	**Project Coordinator** KESSNER, JH
Price Code 7D	**Data Turnaround** 21 Days		
Project Designation ERDF Leachate Tank	**Sampling Location** ERDF Leachate tank 4, Summer 2016		**SAF No.** RC-009
Ice Chest No. ERC-02-404	**Field Logbook No.** EL-1626-03	**COA** RERDF22560	**Method of Shipment** Commercial Carrier
Shipped To TestAmerica Denver	**Offsite Property No.** A131487		**Bill of Lading/Air Bill No.** SEE OSPC

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially radioactive, less than DOT limits

Special Handling and/or Storage
Cool 4 Deg C

Preservation	HNO3 to pH <2	Cool <=6C	Zn Ac+NaOH to pH >9	NaOH to pH >= 12	H2SO4 to pH <2	Cool <=6C	Cool <=6C	H2SO4 to pH <2	Cool <=6C	HCl to pH <2
Type of Container	G/P	G/P	G/P	G/P	G/P	aGs*	aGs*	G	aG	aGs*
No. of Container(s)	2	2	3	2	2	4	4	4	4	8
Volume	500mL	1000mL	250mL	250mL	250mL	40mL	40mL	1000mL	1000mL	40mL
Sample Analysis	See Item (1) in Special Instructions	See Item (2) in Special Instructions	Sulfides - 9034	Total Cyanide - 9012	Ammonia - 350.1; NO2/NO3 - 353.2; COD - 410.4	Glycols - 8015 (1,2-Propanediol (Propylene glycol), Ethylene glycol)	Alcohols - 8015 (Methanol)	Oil & Grease - 1664	See Item (3) in Special Instructions	TPH-Gasoline Range - WTPH-G

Sample No.	Matrix	Sample Date	Sample Time										
J1V931	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Page 167 of 176

280-85505 Chain of Custody

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M Downing/	7-12-16 0945	T.R. Edmundson	
T.R. Edmundson	7-12-16 1530	Fed Ex	7-12-16 —
			0930 7/13/16

Sign/Print Names

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

WCH-EE-011

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Tungsten, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)
(2) Alkalinity - 2320; IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate); TDS - 2540C; TSS - 2540D
(3) TPH-Diesel Range - WTPH-D + (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - diesel range extended to C36)

SDG # J02198 D.B. 7-15-16

4,9,1-7,2-9 IRS-0.0 RJWulle
Transfer from

3,4 IRS-0.0
RJWulle

REVIEWED BY KW DATE 7/12/16

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-022

Collector DOWNING, MK	**Company Contact** Joan Kessner	**Telephone No.** 375-4688	**Project Coordinator** KESSNER, JH
Project Designation ERDF Leachate Tank	**Sampling Location** ERDF Leachate tank 4, Summer 2016		**SAF No.** RC-009
Ice Chest No. ERC-02-404	**Field Logbook No.** EL-1626-03	**COA** RERDF22560	**Method of Shipment** Commercial Carrier
Shipped To TestAmerica Denver	**Offsite Property No.** A131487		**Bill of Lading/Air Bill No.** SEE OSPC
Other Labs Shipped To TestAmerica Richland			

Price Code 7D

Data Turnaround 21 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive, less than DOT limits

Special Handling and/or Storage

Cool 4 Deg C

Sample No.	Matrix	Sample Date	Sample Time	Preservation	H2SO4 to pH <2	H2SO4 to pH <2	None	HCl or H2SO4 to pH <2	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	
				Type of Container	aG	aGs*	G/P	aGs*	aG	aG	aG	aG	aG	
				No. of Container(s)	3	2	2	6	4	4	4	4	4	
				Volume	250mL	250mL	250mL	40mL	1000mL	1000mL	1000mL	1000mL	1000mL	
				Sample Analysis	See Item (4) in Special Instructions	TOX - 9020	Conductivity - 9050; pH (Water) - 9040	See Item (5) in Special Instructions	See Item (6) in Special Instructions	PAHs - 8310	Pesticides - 8081	PCBs - 8082	Chloro-Herbicides - EPA8151	
J1W931	WATER	7-12-16	0720		✓	✓	✓	✓	✓	✓	✓	✓	✓	

Page 118 of 176

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
J Downing / J Downing WCH	7-12-16 0945	T.R. Edmundson / T.R. Edmundson	7-12-16 0945
T.R. Edmundson / T.R. Edmundson WCH	7-12-16 1500	Fed Ex	7-12-16 —
		[signature]	0930 BJW16

Sign/Print Names

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

SPECIAL INSTRUCTIONS

(4) Phenolics Total Recoverable - 420.4; Total Organic Carbon (TOC) - 5310B
(5) VOA - 8260 (App IX); VOA - 8260 (Client List) {1,1,2-Trichloro-1,2,2-trifluoroethane, 1-Butanol, 2-Chloroethyl vinyl ether, 2-Nitropropane, Acetic acid, methyl ester, Diethyl ether, Ethyl acetate, Ethyl cyanide, Isopropylbenzene, Tetrahydrofuran, cis-1,2-Dichloroethylene}
(6) Semi-VOA - 8270 (App IX); Semi-VOA – 8270 (Client List) {1,2-Diphenylhydrazine, 1,4-Dinitrobenzene, 3+4 Methylphenol (cresol, m+p), Benzaldehyde, Benzoic acid, Dimethoate, Diphenylamine, Disulfoton, Parathion, Phorate, Tris(2,3-dibromopropyl) phosphate}

REVIEWED BY KW DATE 7/12/16

09/2012

WCH-EE-011

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-023

Collector DOWNING, MK	**Company Contact** Joan Kessner	**Telephone No.** 375-4688	**Project Coordinator** KESSNER, JH
Price Code 7D	**Data Turnaround** 21 Days		
Project Designation ERDF Leachate Tank	**Sampling Location** ERDF Leachate tank 4, Summer 2016		**SAF No.** RC-009
Ice Chest No. EEC-02-404	**Field Logbook No.** EL-1626-03	**COA** RERDF22560	**Method of Shipment** Commercial Carrier
Shipped To TestAmerica Denver	**Offsite Property No:** A131487		**Bill of Lading/Air Bill No.** SEE OSPC

Other Labs Shipped To
TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially radioactive, less than DOT limits

Special Handling and/or Storage
Cool 4 Deg C

Preservation	HNO3 to pH <2	Cool <=6C	ZnAc+NaOH to pH >9	NaOH to pH >= 12	H2SO4 to pH <2	Cool <=6C	Cool <=6C	H2SO4 to pH <2	Cool <=6C	HCl to pH <2
Type of Container	G/P	G/P	G/P	G/P	G/P	aGs*	aGs*	G	aG	aGs*
No. of Container(s)	1	1	1	1	1	2	2	2	2	3
Volume	500mL	1000mL	250mL	250mL	250mL	40mL	40mL	1000mL	1000mL	40mL
Sample Analysis	See item (1) in Special Instructions	See item (2) in Special Instructions	Sulfides - 9034	Total Cyanide - 9012	Ammonia - 350.1; NO2/NO3 - 353.2; COD – 410.4	Glycols - 8015 (1,2-Propanediol (Propylene glycol), Ethylene glycol)	Alcohols - 8015 (Methanol)	Oil & Grease - 1664	See Item (3) in Special Instructions	TPH-Gasoline Range - WTPH-G

Sample No.	Matrix	Sample Date	Sample Time										
J13932	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Page 176 of 176

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
J. Downing / M. Downing WRI	7-12-16/0945	T.R. Edmundson	7-12-16 0945
T.R. Edmundson WCH	7-12-16 1500	FedEx	7-12-16 —
			0930 13 Jul 16

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Tungsten, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)
(2) Alkalinity - 2320; IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorus in phosphate, Sulfate); TDS - 2540C; TSS - 2540D
(3) TPH-Diesel Range - WTPH-D + (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - diesel range extended to C36)

REVIEWED BY KW DATE 7/12/16

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-023

Collector DOWNING, MK	**Company Contact** Joan Kessner	**Telephone No.** 375-4688	**Project Coordinator** KESSNER, JH
Price Code 7D	**Data Turnaround** 21 Days		
Project Designation ERDF Leachate Tank	**Sampling Location** ERDF Leachate tank 4, Summer 2016		**SAF No.** RC-009
Ice Chest No. ERC-02 - 404	**Field Logbook No.** EL-1626-03	**COA** RERDF22560	**Method of Shipment** Commercial Carrier
Shipped To TestAmerica Denver	**Offsite Property No.** A131487		**Bill of Lading/Air Bill No.** SEE OSPC

Other Labs Shipped To
TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially radioactive, less than DOT limits

Special Handling and/or Storage
Cool 4 Deg C

Preservation	H_2SO_4 to pH <2	H_2SO_4 to pH <2	None	HCl or H_2SO_4 to pH <2	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	
Type of Container	aG	aGs*	G/P	aGs*	aG	aG	aG	aG	aG	
No. of Container(s)	1	1	1	3	2	2	2	2	2	
Volume	250mL	250mL	250mL	40mL	1000mL	1000mL	1000mL	1000mL	1000mL	
Sample Analysis	See Item (4) in Special Instructions	TOX - 9020	Conductivity - 9050; pH (Water) - 9040	See Item (5) in Special Instructions	See Item (6) in Special Instructions	PAHs - 8310	Pesticides - 8081	PCBs - 8082	Chloro-Herbicides - EPA8151	

Sample No.	Matrix	Sample Date	Sample Time									
J1932	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓

Page 176 of 176

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
J. Downing / J. Downing WCH	7-12-16 0945	T.R. Edmundson / T.R. Edmundson	7-12-16 0945
T.R. Edmundson / T.R. Edmundson WCH	7-12-16 1500	Fed Ex	7-12-16
			0930 B Bullo

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

SPECIAL INSTRUCTIONS

(4) Phenolics Total Recoverable - 420.4; Total Organic Carbon (TOC) - 5310B
(5) VOA - 8260 (App IX); VOA - 8260 (Client List) (1,1,2-Trichloro-1,2,2-trifluoroethane, 1-Butanol, 2-Chloroethyl vinyl ether, 2-Nitropropane, Acetic acid, methyl ester, Diethyl ether, Ethyl acetate, Ethyl cyanide, Isopropylbenzene, Tetrahydrofuran, cis-1,2-Dichloroethylene)
(6) Semi-VOA - 8270 (App IX); Semi-VOA – 8270 (Client List) (1,2-Diphenylhydrazine, 1,4-Dinitrobenzene, 3+4 Methylphenol (cresol, m+p), Benzaldehyde, Benzoic acid, Dimethoate, Diphenylamine, Disulfoton, Parathion, Phorate, Tris(2,3-dibromopropyl) phosphate)

REVIEWED BY KW DATE 7/12/16

09/12/2016

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-024

Collector DOWNING, MK	**Company Contact** Joan Kessner	**Telephone No.** 375-4688	**Project Coordinator** KESSNER, JH
Project Designation ERDF Leachate Tank	**Sampling Location** ERDF Leachate tank 4, Summer 2016		**SAF No.** RC-009
Ice Chest No. ERC-02-404	**Field Logbook No.** EL-1626-03	**COA** RERDF22560	**Method of Shipment** Commercial Carrier
Shipped To TestAmerica Denver	**Offsite Property No.** A131487		**Bill of Lading/Air Bill No.** SEE OSPC

Price Code 7D

Data Turnaround 21 Days

Other Labs Shipped To N/A

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

None

Preservation	HCl or H2SO4 to pH <2											
Type of Container	aGs*											
No. of Container(s)	2											
Volume	40mL											
Sample Analysis	See Item (1) in Special Instructions	-										

Sample No.	Matrix	Sample Date	Sample Time									
111V933	WATER	7-12-16	0600	✓								

Page 171 of 176

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M. Downing / M. Downing WCH	7-12-16 0945	T.R. Edmundson / T.R. Edmundson	7-12-16 0945
T.R. Edmundson / T.R. Edmundson WCH	7-12-16 1500	Fed Ex	7-12-16 —
		[signature]	0930 BJWilly

FINAL SAMPLE DISPOSITION Disposal Method — Disposed By — Date/Time

SPECIAL INSTRUCTIONS

(1) VOA - 8260 (App IX); VOA - 8260 (Client List) {1,1,2-Trichloro-1,2,2-trifluoroethane, 1-Butanol, 2-Chloroethyl vinyl ether, 2-Nitropropane, Acetic acid, methyl ester, Diethyl ether, Ethyl acetate, Ethyl cyanide, Isopropylbenzene, Tetrahydrofuran, cis-1,2-Dichloroethylene}

REVIEWED BY KW DATE 7/12/16

08/31/2016

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: ERDF			DATA PACKAGE: J02198		
VALIDATOR: PCLR		LAB: TAL		DATE: 8/22/16	
			SDG: J02198		
ANALYSES PERFORMED					
SW-846 8260	NWTPH-G	SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J1U931 J1U932					
					Water

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A
Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: methylene chloride - U all no PR

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A
Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A
Surrogates traceable? (Levels D, E) ..... Yes No N/A
Surrogates expired? (Levels D, E) ..... Yes No N/A
MS/MSD samples analyzed? ..... Yes No N/A
MS/MSD results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A

Comments: MS + MSD - 0% 2chloroethyl vinyl ether - J all low
no MS/MSD - 32+33 - J all J-31

no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? ... Yes No N/A
MS/MSD RPD values acceptable? ... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ... Yes No N/A
MS/MSD standards expired? (Levels D, E) ... Yes No N/A
Field duplicate RPD values acceptable? ... Yes No N/A
Field split RPD values acceptable? ... Yes No N/A
Transcription/calculation errors? (Levels D, E) ... Yes No N/A

Comments: 32033 – No ms/msd – Jall

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ... Yes No N/A
Iinternal standard areas acceptable? ... Yes No N/A
Internal standard retention times acceptable? ... Yes No N/A
Standards traceable? ... Yes No N/A
Standards expired? ... Yes No N/A
Transcription/calculation errors? ... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ... Yes No N/A
Sample holding times acceptable? ... Yes No N/A

Comments: HCl used for pres – 2 chlorobenzene vials

32+33 – over HT – Jall

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A
Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A
Results reported for all requested analyses? ..... Yes No N/A
Results supported in the raw data? (Levels D, E) ..... Yes No N/A
Samples properly prepared? (Levels D, E) ..... Yes No N/A
Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A
Detection limits meet RDL? ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments:_____

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A
GPC check performed? ..... Yes No N/A
GPC check recoveries acceptable? ..... Yes No N/A
GPC calibration performed? ..... Yes No N/A
GPC calibration check performed? ..... Yes No N/A
GPC calibration check retention times acceptable? ..... Yes No N/A
Check/calibration materials traceable? ..... Yes No N/A
Check/calibration materials Expired? ..... Yes No N/A
Analytical batch QC given similar cleanup? ..... Yes No N/A
Transcription/Calculation Errors? ..... Yes No N/A
Comments:_____

Appendix 6

Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334916

Method: 8260B
Preparation: 5030B

Lab Sample ID:	MB 280-334916/6	Analysis Batch:	280-334916	Instrument ID:	VMS_P
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	P0356.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	07/25/2016 1006	Units:	ug/L	Final Weight/Volume:	20 mL
Prep Date:	07/25/2016 1006				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	0.42	U	0.42	3.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2,3-Trichloropropane	0.33	U	0.33	2.5
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	5.0
1,2-Dibromoethane	0.18	U	0.18	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1-Butanol	17	U	17	60
2-Butanone (MEK)	2.0	U	2.0	6.0
2-Chloroethyl vinyl ether	0.69	U	0.69	3.0
2-Hexanone	1.7	U	1.7	5.0
2-Nitropropane	1.6	U	1.6	5.0
4-Methyl-2-pentanone (MIBK)	0.98	U	0.98	5.0
Acetone	1.9	U	1.9	10
Acetonitrile	9.6	U	9.6	30
Acrolein	2.8	U	2.8	20
Acrylonitrile	1.4	U	1.4	20
Allyl chloride	0.17	U	0.17	2.0
Benzene	0.16	U	0.16	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	2.0
Carbon disulfide	0.45	U	0.45	2.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	2.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	2.0
Chloroprene	0.21	U	0.21	1.0
cis-1,2-Dichloroethene	0.15	U	0.15	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Dibromomethane	0.17	U	0.17	1.0
Dichlorodifluoromethane	0.31	U	0.31	2.0
Ethyl acetate	1.2	U	1.2	5.0
Ethyl ether	0.26	U	0.26	2.0
Ethyl methacrylate	0.86	U	0.86	3.0
Ethylbenzene	0.16	U	0.16	1.0
Iodomethane	0.23	U	0.23	1.0
Isobutyl alcohol	37	U	37	110

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334916

Method: 8260B
Preparation: 5030B

Lab Sample ID:	MB 280-334916/6	Analysis Batch:	280-334916	Instrument ID:	VMS_P
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	P0356.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	07/25/2016 1006	Units:	ug/L	Final Weight/Volume:	20 mL
Prep Date:	07/25/2016 1006				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Isopropylbenzene	0.19	U	0.19	1.0
Methacrylonitrile	1.6	U	1.6	10
Methyl acetate	1.6	U	1.6	5.0
Methyl methacrylate	1.1	U	1.1	4.0
Methylene Chloride	2.72		0.32	2.0
Propionitrile	3.7	U	3.7	20
Styrene	0.17	U	0.17	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Tetrahydrofuran	2.0	U	2.0	7.0
Toluene	0.17	U	0.17	1.0
trans-1,2-Dichloroethene	0.15	U	0.15	1.0
trans-1,3-Dichloropropene	0.19	U	0.19	3.0
trans-1,4-Dichloro-2-butene	0.80	U	0.80	3.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	2.0
Vinyl acetate	0.94	U	0.94	3.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	2.0

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	107	70 - 127
4-Bromofluorobenzene (Surr)	112	78 - 120
Dibromofluoromethane (Surr)	101	77 - 120
Toluene-d8 (Surr)	108	80 - 125

Method Blank TICs- Batch: 280-334916

Cas Number	Analyte	RT	Est. Result (ug/	Qual
	Tentatively Identified Compound		None	
78-92-2	sec-Butyl Alcohol	6.67	28.1	J N J

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Lab Control Sample - Batch: 280-334916

Method: 8260B
Preparation: 5030B

Lab Sample ID:	LCS 280-334916/4	Analysis Batch:	280-334916	Instrument ID:	VMS_P
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	P0355.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	07/25/2016 0946	Units:	ug/L	Final Weight/Volume:	20 mL
Prep Date:	07/25/2016 0946				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
1,1,1,2-Tetrachloroethane	5.00	5.01	100	65 - 135	
1,1,1-Trichloroethane	5.00	4.85	97	65 - 135	
1,1,2,2-Tetrachloroethane	5.00	5.49	110	58 - 135	
1,1,2-Trichloroethane	5.00	5.17	103	64 - 135	
1,1-Dichloroethane	5.00	5.02	100	65 - 135	
1,1-Dichloroethene	5.00	4.46	89	65 - 136	
1,2,3-Trichloropropane	5.00	5.64	113	65 - 135	
1,2-Dibromo-3-Chloropropane	5.00	4.73	95	57 - 135	J
1,2-Dibromoethane	5.00	5.01	100	65 - 135	
1,2-Dichloroethane	5.00	5.73	115	65 - 135	
1,2-Dichloropropane	5.00	5.33	107	64 - 135	
2-Butanone (MEK)	20.0	23.5	117	44 - 177	
2-Chloroethyl vinyl ether	5.00	4.68	94	10 - 159	
2-Hexanone	20.0	19.9	99	57 - 139	
4-Methyl-2-pentanone (MIBK)	20.0	20.7	104	60 - 150	
Acetone	20.0	22.3	112	39 - 156	
Benzene	5.00	5.10	102	65 - 135	
Bromodichloromethane	5.00	5.09	102	65 - 135	
Bromoform	5.00	4.85	97	62 - 135	
Bromomethane	5.00	5.01	100	45 - 135	
Carbon disulfide	5.00	4.35	87	55 - 143	
Carbon tetrachloride	5.00	4.73	95	65 - 135	
Chlorobenzene	5.00	5.08	102	65 - 135	
Chloroethane	5.00	4.73	95	46 - 136	
Chloroform	5.00	5.29	106	65 - 135	
Chloromethane	5.00	5.00	100	34 - 145	
cis-1,2-Dichloroethene	5.00	5.09	102	65 - 135	
cis-1,3-Dichloropropene	5.00	4.91	98	65 - 135	
Dibromochloromethane	5.00	4.70	94	65 - 135	
Dibromomethane	5.00	5.28	106	65 - 135	
Dichlorodifluoromethane	5.00	4.58	92	43 - 142	
Ethylbenzene	5.00	4.95	99	65 - 135	
Isopropylbenzene	5.00	4.99	100	65 - 135	
Methylene Chloride	5.00	7.29	146	54 - 141	T
Styrene	5.00	4.66	93	65 - 135	
Tetrachloroethene	5.00	4.56	91	65 - 135	
Toluene	5.00	5.09	102	65 - 135	
trans-1,2-Dichloroethene	5.00	4.95	99	65 - 135	
trans-1,3-Dichloropropene	5.00	4.90	98	65 - 135	
Trichloroethene	5.00	4.94	99	65 - 135	
Trichlorofluoromethane	5.00	4.31	86	53 - 137	
Vinyl acetate	10.0	10.3	103	11 - 187	
Vinyl chloride	5.00	4.80	96	40 - 137	
Xylenes, Total	10.0	9.72	97	65 - 135	

Surrogate	% Rec	Acceptance Limits

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	104	70 - 127
4-Bromofluorobenzene (Surr)	104	78 - 120
Dibromofluoromethane (Surr)	99	77 - 120
Toluene-d8 (Surr)	101	80 - 125

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334916

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	280-85505-1	Analysis Batch:	280-334916	Instrument ID:	VMS_P
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	P0360.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	07/25/2016 1131			Final Weight/Volume:	20 mL
Prep Date:	07/25/2016 1131				20 mL
Leach Date:	N/A				

MSD Lab Sample ID:	280-85505-1	Analysis Batch:	280-334916	Instrument ID:	VMS_P
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	P0361.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	07/25/2016 1151			Final Weight/Volume:	20 mL
Prep Date:	07/25/2016 1151				20 mL
Leach Date:	N/A				

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
1,1,1,2-Tetrachloroethane	103	97	65 - 135	7	20		
1,1,1-Trichloroethane	101	92	65 - 135	10	20		
1,1,2,2-Tetrachloroethane	108	112	58 - 135	4	20		
1,1,2-Trichloroethane	101	110	64 - 135	9	27		
1,1-Dichloroethane	102	98	65 - 135	5	21		
1,1-Dichloroethene	93	85	65 - 136	8	20		
1,2,3-Trichloropropane	109	119	65 - 135	8	23		
1,2-Dibromo-3-Chloropropane	85	100	57 - 135	16	22	J	
1,2-Dibromoethane	95	95	65 - 135	0	27		
1,2-Dichloroethane	115	117	65 - 135	2	20		
1,2-Dichloropropane	108	110	64 - 135	2	20		
2-Butanone (MEK)	98	120	44 - 177	20	32		
2-Chloroethyl vinyl ether	0	0	10 - 159	NC	23	U T	U T
2-Hexanone	92	104	57 - 139	12	25		
4-Methyl-2-pentanone (MIBK)	101	111	60 - 150	9	22		
Acetone	100	117	39 - 156	15	23		
Benzene	100	99	65 - 135	1	20		
Bromodichloromethane	104	105	65 - 135	1	20		
Bromoform	96	100	62 - 135	4	27		
Bromomethane	97	97	45 - 135	0	33		
Carbon disulfide	87	79	55 - 143	10	20		
Carbon tetrachloride	98	89	65 - 135	9	21		
Chlorobenzene	105	98	65 - 135	7	20		
Chloroethane	91	92	46 - 136	1	25		
Chloroform	108	105	65 - 135	3	20		
Chloromethane	92	91	34 - 145	1	24		
cis-1,2-Dichloroethene	100	98	65 - 135	2	20		
cis-1,3-Dichloropropene	96	95	65 - 135	0	26		
Dibromochloromethane	92	91	65 - 135	1	20		
Dibromomethane	102	106	65 - 135	5	26		
Dichlorodifluoromethane	85	84	43 - 142	0	30		
Ethylbenzene	99	89	65 - 135	11	20		
Isopropylbenzene	100	94	65 - 135	6	20		

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334916

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	280-85505-1	Analysis Batch:	280-334916	Instrument ID:	VMS_P
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	P0360.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	07/25/2016 1131			Final Weight/Volume:	20 mL
Prep Date:	07/25/2016 1131				20 mL
Leach Date:	N/A				

MSD Lab Sample ID:	280-85505-1	Analysis Batch:	280-334916	Instrument ID:	VMS_P
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	P0361.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	07/25/2016 1151			Final Weight/Volume:	20 mL
Prep Date:	07/25/2016 1151				20 mL
Leach Date:	N/A				

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Methylene Chloride	90	91	54 - 141	1	26		
Styrene	92	89	65 - 135	4	26		
Tetrachloroethene	92	80	65 - 135	14	20		
Toluene	103	99	65 - 135	4	20		
trans-1,2-Dichloroethene	97	91	65 - 135	6	24		
trans-1,3-Dichloropropene	98	101	65 - 135	3	26		
Trichloroethene	99	93	65 - 135	6	20		
Trichlorofluoromethane	83	75	53 - 137	9	27		
Vinyl acetate	99	108	11 - 187	9	24		
Vinyl chloride	89	85	40 - 137	4	24		
Xylenes, Total	100	92	65 - 135	9	20		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	103	107	70 - 127
4-Bromofluorobenzene (Surr)	104	107	78 - 120
Dibromofluoromethane (Surr)	101	101	77 - 120
Toluene-d8 (Surr)	104	100	80 - 125

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334916

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	280-85505-1	Units: ug/L	
Client Matrix:	Water		
Dilution:	1.0		
Analysis Date:	07/25/2016 1131		
Prep Date:	07/25/2016 1131		
Leach Date:	N/A		

MSD Lab Sample ID:	280-85505-1
Client Matrix:	Water
Dilution:	1.0
Analysis Date:	07/25/2016 1151
Prep Date:	07/25/2016 1151
Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual		MSD Result/Qual	
1,1,1,2-Tetrachloroethane	0.21	U	5.00	5.00	5.17		4.83	
1,1,1-Trichloroethane	0.16	U	5.00	5.00	5.06		4.58	
1,1,2,2-Tetrachloroethane	0.21	U	5.00	5.00	5.40		5.59	
1,1,2-Trichloroethane	0.27	U	5.00	5.00	5.04		5.49	
1,1-Dichloroethane	0.22	U	5.00	5.00	5.11		4.88	
1,1-Dichloroethene	0.62	J	5.00	5.00	5.27		4.85	
1,2,3-Trichloropropane	0.33	U	5.00	5.00	5.47		5.94	
1,2-Dibromo-3-Chloropropane	0.47	U	5.00	5.00	4.27	J	5.01	
1,2-Dibromoethane	0.18	U	5.00	5.00	4.77		4.76	
1,2-Dichloroethane	0.13	U	5.00	5.00	5.73		5.87	
1,2-Dichloropropane	0.18	U	5.00	5.00	5.40		5.52	
2-Butanone (MEK)	2.0	U	20.0	20.0	19.6		24.0	
2-Chloroethyl vinyl ether	0.69	U	5.00	5.00	0.69	U T	0.69	U T
2-Hexanone	1.7	U	20.0	20.0	18.4		20.8	
4-Methyl-2-pentanone (MIBK)	0.98	U	20.0	20.0	20.2		22.1	
Acetone	1.9	U	20.0	20.0	20.1		23.3	
Benzene	0.16	U	5.00	5.00	5.00		4.96	
Bromodichloromethane	0.17	U	5.00	5.00	5.22		5.26	
Bromoform	0.19	U	5.00	5.00	4.79		4.98	
Bromomethane	0.21	U	5.00	5.00	4.85		4.83	
Carbon disulfide	0.45	U	5.00	5.00	4.37		3.97	
Carbon tetrachloride	0.19	U	5.00	5.00	4.89		4.46	
Chlorobenzene	0.17	U	5.00	5.00	5.25		4.91	
Chloroethane	0.41	U	5.00	5.00	4.55		4.58	
Chloroform	0.16	U	5.00	5.00	5.38		5.23	
Chloromethane	0.33	J	5.00	5.00	4.94		4.90	
cis-1,2-Dichloroethene	0.15	U	5.00	5.00	5.02		4.92	
cis-1,3-Dichloropropene	0.16	U	5.00	5.00	4.78		4.77	
Dibromochloromethane	0.17	U	5.00	5.00	4.60		4.57	
Dibromomethane	0.17	U	5.00	5.00	5.08		5.32	
Dichlorodifluoromethane	0.31	U	5.00	5.00	4.24		4.22	
Ethylbenzene	0.16	U	5.00	5.00	4.97		4.44	
Isopropylbenzene	0.19	U	5.00	5.00	4.99		4.69	
Methylene Chloride	1.5	J	5.00	5.00	5.97		6.00	
Styrene	0.17	U	5.00	5.00	4.61		4.45	
Tetrachloroethene	0.20	U	5.00	5.00	4.60		3.99	
Toluene	0.17	U	5.00	5.00	5.16		4.96	
trans-1,2-Dichloroethene	0.15	U	5.00	5.00	4.85		4.57	
trans-1,3-Dichloropropene	0.19	U	5.00	5.00	4.92		5.06	
Trichloroethene	0.16	U	5.00	5.00	4.94		4.64	
Trichlorofluoromethane	0.33	J	5.00	5.00	4.46		4.08	
Vinyl acetate	0.94	U	10.0	10.0	9.86		10.8	
Vinyl chloride	0.10	U	5.00	5.00	4.44		4.25	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334916

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	280-85505-1	Units: ug/L	
Client Matrix:	Water		
Dilution:	1.0		
Analysis Date:	07/25/2016 1131		
Prep Date:	07/25/2016 1131		
Leach Date:	N/A		

MSD Lab Sample ID:	280-85505-1
Client Matrix:	Water
Dilution:	1.0
Analysis Date:	07/25/2016 1151
Prep Date:	07/25/2016 1151
Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Xylenes, Total	0.19	U	10.0	10.0	10.0	9.19

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-335637

Method: 8260B
Preparation: 5030B

Lab Sample ID:	MB 280-335637/6	Analysis Batch:	280-335637	Instrument ID:	VMS_H
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	H7349.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	07/29/2016 1144	Units:	ug/L	Final Weight/Volume:	20 mL
Prep Date:	07/29/2016 1144				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	0.42	U	0.42	3.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2,3-Trichloropropane	0.33	U	0.33	2.5
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	5.0
1,2-Dibromoethane	0.18	U	0.18	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1-Butanol	17	U	17	60
2-Butanone (MEK)	2.0	U	2.0	6.0
2-Chloroethyl vinyl ether	0.69	U	0.69	3.0
2-Hexanone	1.7	U	1.7	5.0
2-Nitropropane	1.6	U	1.6	5.0
4-Methyl-2-pentanone (MIBK)	0.98	U	0.98	5.0
Acetone	1.9	U	1.9	10
Acetonitrile	9.6	U	9.6	30
Acrolein	2.8	U	2.8	20
Acrylonitrile	1.4	U	1.4	20
Allyl chloride	0.17	U	0.17	2.0
Benzene	0.16	U	0.16	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	2.0
Carbon disulfide	0.45	U	0.45	2.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	2.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	2.0
Chloroprene	0.21	U	0.21	1.0
cis-1,2-Dichloroethene	0.15	U	0.15	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Dibromomethane	0.17	U	0.17	1.0
Dichlorodifluoromethane	0.31	U	0.31	2.0
Ethyl acetate	1.2	U	1.2	5.0
Ethyl ether	0.26	U	0.26	2.0
Ethyl methacrylate	0.86	U	0.86	3.0
Ethylbenzene	0.16	U	0.16	1.0
Iodomethane	0.23	U	0.23	1.0
Isobutyl alcohol	37	U	37	110

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-335637

Method: 8260B
Preparation: 5030B

Lab Sample ID:	MB 280-335637/6	Analysis Batch:	280-335637	Instrument ID:	VMS_H
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	H7349.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	07/29/2016 1144	Units:	ug/L	Final Weight/Volume:	20 mL
Prep Date:	07/29/2016 1144				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Isopropylbenzene	0.19	U	0.19	1.0
Methacrylonitrile	1.6	U	1.6	10
Methyl acetate	1.6	U	1.6	5.0
Methyl methacrylate	1.1	U	1.1	4.0
Methylene Chloride	0.385	J	0.32	2.0
Propionitrile	3.7	U	3.7	20
Styrene	0.17	U	0.17	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Tetrahydrofuran	2.0	U	2.0	7.0
Toluene	0.17	U	0.17	1.0
trans-1,2-Dichloroethene	0.15	U	0.15	1.0
trans-1,3-Dichloropropene	0.19	U	0.19	3.0
trans-1,4-Dichloro-2-butene	0.80	U	0.80	3.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	2.0
Vinyl acetate	0.94	U	0.94	3.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	2.0

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	113	70 - 127
4-Bromofluorobenzene (Surr)	105	78 - 120
Dibromofluoromethane (Surr)	107	77 - 120
Toluene-d8 (Surr)	105	80 - 125

Method Blank TICs- Batch: 280-335637

Cas Number	Analyte	RT	Est. Result (ug/	Qual
	Unknown	5.30	1.90	N J
541-05-9	Cyclotrisiloxane, hexamethyl-	9.53	1.25	N J

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 280-335637

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 280-335637/4	Analysis Batch:	280-335637	Instrument ID:	VMS_H
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	H7347.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	07/29/2016 1058	Units:	ug/L	Final Weight/Volume:	20 mL
Prep Date:	07/29/2016 1058				20 mL
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 280-335637/5	Analysis Batch:	280-335637	Instrument ID:	VMS_H
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	H7348.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	07/29/2016 1121	Units:	ug/L	Final Weight/Volume:	20 mL
Prep Date:	07/29/2016 1121				20 mL
Leach Date:	N/A				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
1,1,1,2-Tetrachloroethane	96	97	65 - 135	1	20		
1,1,1-Trichloroethane	95	94	65 - 135	1	20		
1,1,2,2-Tetrachloroethane	103	99	58 - 135	4	20		
1,1,2-Trichloroethane	93	96	64 - 135	3	27		
1,1-Dichloroethane	96	95	65 - 135	1	21		
1,1-Dichloroethene	83	83	65 - 136	0	20		
1,2,3-Trichloropropane	100	99	65 - 135	1	23		
1,2-Dibromo-3-Chloropropane	108	110	57 - 135	2	22		
1,2-Dibromoethane	102	103	65 - 135	1	27		
1,2-Dichloroethane	108	110	65 - 135	2	20		
1,2-Dichloropropane	102	103	64 - 135	0	20		
2-Butanone (MEK)	103	109	44 - 177	6	32		
2-Chloroethyl vinyl ether	87	89	10 - 159	3	23		
2-Hexanone	102	111	57 - 139	8	25		
4-Methyl-2-pentanone (MIBK)	103	114	60 - 150	10	22		
Acetone	117	121	39 - 156	3	23		
Benzene	98	98	65 - 135	0	20		
Bromodichloromethane	102	103	65 - 135	1	20		
Bromoform	107	107	62 - 135	1	27		
Bromomethane	89	83	45 - 135	8	33		
Carbon disulfide	88	87	55 - 143	1	20		
Carbon tetrachloride	93	92	65 - 135	1	21		
Chlorobenzene	97	96	65 - 135	1	20		
Chloroethane	88	85	46 - 136	4	25		
Chloroform	101	101	65 - 135	0	20		
Chloromethane	93	86	34 - 145	8	24		
cis-1,2-Dichloroethene	96	98	65 - 135	2	20		
cis-1,3-Dichloropropene	106	103	65 - 135	2	26		
Dibromochloromethane	97	97	65 - 135	0	20		
Dibromomethane	105	104	65 - 135	0	26		
Dichlorodifluoromethane	108	92	43 - 142	16	30		
Ethylbenzene	93	90	65 - 135	3	20		
Isopropylbenzene	95	92	65 - 135	3	20		
Methylene Chloride	96	100	54 - 141	4	26		
Styrene	93	95	65 - 135	2	26		
Tetrachloroethene	89	86	65 - 135	4	20		

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 280-335637

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 280-335637/4	Analysis Batch:	280-335637	Instrument ID:	VMS_H
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	H7347.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	07/29/2016 1058	Units:	ug/L	Final Weight/Volume:	20 mL
Prep Date:	07/29/2016 1058				20 mL
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 280-335637/5	Analysis Batch:	280-335637	Instrument ID:	VMS_H
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	H7348.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	07/29/2016 1121	Units:	ug/L	Final Weight/Volume:	20 mL
Prep Date:	07/29/2016 1121				20 mL
Leach Date:	N/A				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Toluene	97	97	65 - 135	0	20		
trans-1,2-Dichloroethene	93	95	65 - 135	1	24		
trans-1,3-Dichloropropene	101	102	65 - 135	2	26		
Trichloroethene	97	96	65 - 135	1	20		
Trichlorofluoromethane	93	83	53 - 137	11	27		
Vinyl acetate	95	94	11 - 187	1	24		
Vinyl chloride	89	81	40 - 137	10	24		
Xylenes, Total	93	92	65 - 135	1	20		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	113	118	70 - 127
4-Bromofluorobenzene (Surr)	94	100	78 - 120
Dibromofluoromethane (Surr)	103	108	77 - 120
Toluene-d8 (Surr)	111	111	80 - 125

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 280-335637

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 280-335637/4	Units: ug/L	LCSD Lab Sample ID:	LCSD 280-335637/5	
Client Matrix:	Water		Client Matrix:	Water	
Dilution:	1.0		Dilution:	1.0	
Analysis Date:	07/29/2016 1058		Analysis Date:	07/29/2016 1121	
Prep Date:	07/29/2016 1058		Prep Date:	07/29/2016 1121	
Leach Date:	N/A		Leach Date:	N/A	

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
1,1,1,2-Tetrachloroethane	5.00	5.00	4.82	4.86
1,1,1-Trichloroethane	5.00	5.00	4.75	4.69
1,1,2,2-Tetrachloroethane	5.00	5.00	5.13	4.94
1,1,2-Trichloroethane	5.00	5.00	4.63	4.79
1,1-Dichloroethane	5.00	5.00	4.79	4.75
1,1-Dichloroethene	5.00	5.00	4.15	4.17
1,2,3-Trichloropropane	5.00	5.00	4.99	4.94
1,2-Dibromo-3-Chloropropane	5.00	5.00	5.39	5.52
1,2-Dibromoethane	5.00	5.00	5.09	5.14
1,2-Dichloroethane	5.00	5.00	5.42	5.51
1,2-Dichloropropane	5.00	5.00	5.12	5.13
2-Butanone (MEK)	20.0	20.0	20.7	21.9
2-Chloroethyl vinyl ether	5.00	5.00	4.33	4.45
2-Hexanone	20.0	20.0	20.4	22.1
4-Methyl-2-pentanone (MIBK)	20.0	20.0	20.6	22.8
Acetone	20.0	20.0	23.5	24.1
Benzene	5.00	5.00	4.91	4.90
Bromodichloromethane	5.00	5.00	5.10	5.15
Bromoform	5.00	5.00	5.36	5.33
Bromomethane	5.00	5.00	4.46	4.14
Carbon disulfide	5.00	5.00	4.41	4.36
Carbon tetrachloride	5.00	5.00	4.63	4.58
Chlorobenzene	5.00	5.00	4.84	4.78
Chloroethane	5.00	5.00	4.41	4.24
Chloroform	5.00	5.00	5.06	5.06
Chloromethane	5.00	5.00	4.67	4.32
cis-1,2-Dichloroethene	5.00	5.00	4.82	4.90
cis-1,3-Dichloropropene	5.00	5.00	5.28	5.16
Dibromochloromethane	5.00	5.00	4.87	4.85
Dibromomethane	5.00	5.00	5.24	5.22
Dichlorodifluoromethane	5.00	5.00	5.40	4.61
Ethylbenzene	5.00	5.00	4.64	4.52
Isopropylbenzene	5.00	5.00	4.75	4.59
Methylene Chloride	5.00	5.00	4.79	5.00
Styrene	5.00	5.00	4.65	4.74
Tetrachloroethene	5.00	5.00	4.43	4.28
Toluene	5.00	5.00	4.86	4.84
trans-1,2-Dichloroethene	5.00	5.00	4.67	4.73
trans-1,3-Dichloropropene	5.00	5.00	5.04	5.12

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 280-335637

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 280-335637/4	Units: ug/L	LCSD Lab Sample ID:	LCSD 280-335637/5
Client Matrix:	Water		Client Matrix:	Water
Dilution:	1.0		Dilution:	1.0
Analysis Date:	07/29/2016 1058		Analysis Date:	07/29/2016 1121
Prep Date:	07/29/2016 1058		Prep Date:	07/29/2016 1121
Leach Date:	N/A		Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Trichloroethene	5.00	5.00	4.84	4.79
Trichlorofluoromethane	5.00	5.00	4.64	4.15
Vinyl acetate	10.0	10.0	9.50	9.41
Vinyl chloride	5.00	5.00	4.46	4.03
Xylenes, Total	10.0	10.0	9.26	9.19

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334991

Method: NWTPH-Gx
Preparation: 5030B

Lab Sample ID:	MB 280-334991/22	Analysis Batch:	280-334991	Instrument ID:	VGC_Q
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	022F2201.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/25/2016 2023	Units:	ug/L	Final Weight/Volume:	5 mL
Prep Date:	07/25/2016 2023			Injection Volume:	5 mL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Result	Qual	MDL	RL
Gasoline	10	U	10	25

Surrogate	% Rec	Acceptance Limits
a,a,a-Trifluorotoluene	92	82 - 110

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 280-334991

Method: NWTPH-Gx
Preparation: 5030B

LCS Lab Sample ID:	LCS 280-334991/23	Analysis Batch:	280-334991	Instrument ID:	VGC_Q
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	023F2301.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/25/2016 2048	Units:	ug/L	Final Weight/Volume:	5 mL
Prep Date:	07/25/2016 2048			Injection Volume:	5 mL
Leach Date:	N/A			Column ID:	PRIMARY
LCSD Lab Sample ID:	LCSD 280-334991/24	Analysis Batch:	280-334991	Instrument ID:	VGC_Q
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	024F2401.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/25/2016 2113	Units:	ug/L	Final Weight/Volume:	5 mL
Prep Date:	07/25/2016 2113			Injection Volume:	5 mL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Gasoline	99	100	79 - 149	1	27		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
a,a,a-Trifluorotoluene	92	92	82 - 110

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 280-334991

Method: NWTPH-Gx
Preparation: 5030B

LCS Lab Sample ID:	LCS 280-334991/23	Units: ug/L	
Client Matrix:	Water		
Dilution:	1.0		
Analysis Date:	07/25/2016 2048		
Prep Date:	07/25/2016 2048		
Leach Date:	N/A		

LCSD Lab Sample ID:	LCSD 280-334991/24
Client Matrix:	Water
Dilution:	1.0
Analysis Date:	07/25/2016 2113
Prep Date:	07/25/2016 2113
Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Gasoline	101	101	99.4	100

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334991

Method: NWTPH-Gx
Preparation: 5030B

MS Lab Sample ID:	280-85505-1	Analysis Batch:	280-334991	Instrument ID:	VGC_Q
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	026F2601.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/25/2016 2202			Final Weight/Volume:	5 mL
Prep Date:	07/25/2016 2202			Injection Volume:	5 mL
Leach Date:	N/A			Column ID:	PRIMARY

MSD Lab Sample ID:	280-85505-1	Analysis Batch:	280-334991	Instrument ID:	VGC_Q
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	027F2701.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/25/2016 2227			Final Weight/Volume:	5 mL
Prep Date:	07/25/2016 2227			Injection Volume:	5 mL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Gasoline	98	100	79 - 149	2	27		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
a,a,a-Trifluorotoluene	91	92	82 - 110

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-334991

Method: NWTPH-Gx
Preparation: 5030B

MS Lab Sample ID:	280-85505-1	Units: ug/L	MSD Lab Sample ID:	280-85505-1
Client Matrix:	Water		Client Matrix:	Water
Dilution:	1.0		Dilution:	1.0
Analysis Date:	07/25/2016 2202		Analysis Date:	07/25/2016 2227
Prep Date:	07/25/2016 2202		Prep Date:	07/25/2016 2227
Leach Date:	N/A		Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Gasoline	10	U	101	101	98.9	101

Date: 22 August 2016
To: Washington Closure Hanford (technical representative)
From: ELR Consulting
Project: ERDF Leachate Tank Summer 2016
Subject: Wet Chemistry - Data Package No. J02198-TAL

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. J02198 prepared by TestAmerica Inc. (TAL). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V931	7/12/16	Water	C	See note 1
J1V932	7/12/16	Water	C	See note 1

1 - IC anions by 300.0, oil & grease by 1664A, ammonia by 350.1, nitrate/nitrite by 353.2, chemical oxygen demand (COD) by 410.4, total recoverable phenolics by 420.4, cyanide by 9012A, total organic halides (TOX) by 9020B, sulfides by 9034, pH by 9040B, specific conductance by 9050A, alkalinity by 310.1, total dissolved solids by 160.1, total suspended solids by 160.2, total organic carbon (TOC) by SM 5310B.

Data validation was conducted in accordance with the WCH validation statement of work and WCH-173, Rev. 2, "Environmental Restoration Disposal Facility Leachate Sampling & Analysis Plan". Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times & Sample Preservation**

Analytical holding times are assessed to ascertain whether the holding time requirements have been met by the laboratory. The holding time requirements are as follows: 28 days for oil & grease, ammonia, phenolics, TOC, COD, bromide, chloride, fluoride, sulfate, specific conductivity, nitrate/nitrite, TOX; 14 days for cyanide, alkalinity, TDS and TSS; 7 days for sulfide; 2 days for nitrate, nitrite and orthophosphate; immediate (24 hours) for pH.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-

detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by greater than twice the limit, all pH results were qualified as estimates and flagged "J".

Due to the holding time being exceeded by less than twice the limit, all orthophosphate results were qualified as estimates and flagged "J".

Due to the samples not being properly preserved (headspace), all TOX results were qualified as estimates and flagged "J".

All holding times and sample preservation parameters were met for all other samples.

- **Method Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

Due to method blank contamination, all cyanide results were qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

No equipment blank was submitted for analysis.

- **Accuracy**

Matrix Spike Analysis & Blank Spike Analysis

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 75% to 125%. Samples with a spike recovery of less than 30% and a sample value below the instrument detection limit (IDL) are rejected and flagged "UR". Samples with a spike recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 125% or less than 75% and a sample result greater than the

IDL are qualified "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required.

Due to the lack of a matrix spike analysis, all total dissolved solids, total suspended solids and alkalinity results were qualified as estimates and flagged "J".

Due to matrix spike recoveries outside QC limits, all orthophosphate (31%) and sulfide (79%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within relative percent difference (RPD) limits of plus or minus 20% for water samples. If RPD values are out of specification and the sample concentration is greater than five times the project quantitation limit (MDL) or CRQL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the MDL/CRQL and the sample concentration is less than five times the MDL/CRQL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 20% for positive sample results greater than five times the MDL/CRQL or plus or minus the MDL/CRQL for positive sample results less than five times the MDL/CRQL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

All laboratory duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1V931/J1V932) were submitted for analysis. Field duplicate results are compared using the same criteria as for laboratory duplicates. The RPD for TSS (180%) was outside QC limits. Under the WCH statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the minimum detection limits (MDLs) to ensure that laboratory detection levels meet the required criteria. All results met the MDLs.

- **Completeness**

The completion percentage was Data package SDG No. J02198 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiency was noted:

- Due to the samples not being properly preserved (headspace), all TOX results were qualified as estimates and flagged "J".
- Due to method blank contamination, all cyanide results were qualified as undetected and flagged "U".
- Due to the holding time being exceeded by greater than twice the limit, all pH results were qualified as estimates and flagged "J".
- Due to the holding time being exceeded by less than twice the limit, all orthophosphate results were qualified as estimates and flagged "J".
- Due to the lack of a matrix spike analysis, all total dissolved solids, total suspended solids and alkalinity results were qualified as estimates and flagged "J".
- Due to matrix spike recoveries outside QC limits, all orthophosphate (31%) and sulfide (79%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services.*

WCH-173, Rev 2, *Environmental Restoration Disposal Facility Leachate Sampling and Analysis Plan*, November 2015.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH procedures are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: J02198	**REVIEWER: ELR**	**Project: ERDF**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
pH orthophosphate	J	All	Hold time
Cyanide	U	All	Method blank contamination
TOX	J	All	Sample preservation (headspace)
Orthophosphate sulfide	J	All	MS recovery
total dissolved solids total suspended solids alkalinity	J	All	No MS analysis

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

General Chemistry

Client Sample ID: J1V931

Lab Sample ID: 280-85505-1
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
HEM (Oil & Grease)	1.6	U	mg/L	1.6	4.9	1.0	1664A
Analysis Batch: 280-336002	Analysis Date: 08/01/2016 1301						
Prep Batch: 280-335898	Prep Date: 08/01/2016 0704						
Bromide	0.11	U	mg/L	0.11	0.20	1.0	300.0
Analysis Batch: 280-333475	Analysis Date: 07/14/2016 0405						
Nitrate as N	44.7	D	mg/L	0.42	2.5	10	300.0
Analysis Batch: 280-333474	Analysis Date: 07/14/2016 0552						
Chloride	254	D	mg/L	2.5	30.0	10	300.0
Analysis Batch: 280-333475	Analysis Date: 07/14/2016 0552						
Nitrite as N	0.049	U	mg/L	0.049	0.25	1.0	300.0
Analysis Batch: 280-333474	Analysis Date: 07/14/2016 0405						
Fluoride	0.23	B	mg/L	0.060	0.50	1.0	300.0
Analysis Batch: 280-333475	Analysis Date: 07/14/2016 0405						
Orthophosphate as P	0.19	U N J	mg/L	0.19	0.50	1.0	300.0
Analysis Batch: 280-333661	Analysis Date: 07/14/2016 1525						
Sulfate	590	D	mg/L	2.3	50.0	10	300.0
Analysis Batch: 280-333475	Analysis Date: 07/14/2016 0552						
Ammonia as N	0.022	U	mg/L	0.022	0.10	1.0	350.1
Analysis Batch: 280-334602	Analysis Date: 07/21/2016 1940						
Nitrate Nitrite as N	43.9	N D	mg/L	0.19	0.75	10	353.2
Analysis Batch: 280-336720	Analysis Date: 08/04/2016 1244						
Chemical Oxygen Demand	24.6		mg/L	4.1	20.0	1.0	410.4
Analysis Batch: 280-334027	Analysis Date: 07/18/2016 1010						
Phenolics, Total Recoverable	0.0068	U	mg/L	0.0068	0.010	1.0	420.4
Analysis Batch: 280-336746	Analysis Date: 08/05/2016 1102						
Prep Batch: 280-335552	Prep Date: 07/28/2016 1331						
Total Cyanide	0.0059	B C U	mg/L	0.0020	0.010	1.0	9012A
Analysis Batch: 280-334810	Analysis Date: 07/23/2016 1036						
Prep Batch: 280-334663	Prep Date: 07/22/2016 1045						
Total Organic Halogens - Dup	0.051	J	mg/L	0.015	0.040	1.0	9020B
Analysis Batch: 280-336034	Analysis Date: 07/27/2016 1321						
Sulfide	0.79	U J	mg/L	0.79	4.0	1.0	9034
Analysis Batch: 280-333826	Analysis Date: 07/15/2016 1356						
Prep Batch: 280-333805	Prep Date: 07/15/2016 1134						
Alkalinity	217	J	mg/L	1.1	5.0	1.0	SM 2320B
Analysis Batch: 280-333888	Analysis Date: 07/16/2016 0919						
Total Dissolved Solids	1710	J	mg/L	9.4	20.0	1.0	SM 2540C
Analysis Batch: 280-334218	Analysis Date: 07/19/2016 1331						
Total Suspended Solids	32.0	J	mg/L	1.1	4.0	1.0	SM 2540D
Analysis Batch: 280-334068	Analysis Date: 07/18/2016 1422						
Total Organic Carbon - Quad	7.8		mg/L	0.16	1.0	1.0	SM 5310B
Analysis Batch: 280-335176	Analysis Date: 07/25/2016 1554						

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	7.94	J	SU	0.100	0.100	1.0	9040B
Analysis Batch: 280-335415	Analysis Date: 07/27/2016 1057						
~~Specific Conductance~~	~~34400~~	J	umho/cm	1.00	1.00	1.0	9050A
Analysis Batch: 280-333864	Analysis Date: 07/15/2016 2117						

General Chemistry

Client Sample ID: **J1V932**

Lab Sample ID: 280-85505-2
Client Matrix: Water

Date Sampled: 07/12/2016 0720
Date Received: 07/13/2016 0930

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
HEM (Oil & Grease)	1.5	U	mg/L	1.5	4.9	1.0	1664A
Analysis Batch: 280-336002	Analysis Date: 08/01/2016 1301						
Prep Batch: 280-335898	Prep Date: 08/01/2016 0704						
Bromide	0.11	U	mg/L	0.11	0.20	1.0	300.0
Analysis Batch: 280-333475	Analysis Date: 07/14/2016 0458						
Nitrate as N	44.3	D	mg/L	0.42	2.5	10	300.0
Analysis Batch: 280-333474	Analysis Date: 07/14/2016 0645						
Chloride	254	D	mg/L	2.5	30.0	10	300.0
Analysis Batch: 280-333475	Analysis Date: 07/14/2016 0645						
Nitrite as N	0.049	U	mg/L	0.049	0.25	1.0	300.0
Analysis Batch: 280-333474	Analysis Date: 07/14/2016 0458						
Fluoride	0.23	B	mg/L	0.060	0.50	1.0	300.0
Analysis Batch: 280-333475	Analysis Date: 07/14/2016 0458						
Orthophosphate as P	0.19	U J	mg/L	0.19	0.50	1.0	300.0
Analysis Batch: 280-333661	Analysis Date: 07/14/2016 1625						
Sulfate	591	D	mg/L	2.3	50.0	10	300.0
Analysis Batch: 280-333475	Analysis Date: 07/14/2016 0645						
Ammonia as N	0.022	U	mg/L	0.022	0.10	1.0	350.1
Analysis Batch: 280-334602	Analysis Date: 07/21/2016 1946						
Nitrate Nitrite as N	43.2	D	mg/L	0.19	0.75	10	353.2
Analysis Batch: 280-336720	Analysis Date: 08/04/2016 1250						
Chemical Oxygen Demand	26.9		mg/L	4.1	20.0	1.0	410.4
Analysis Batch: 280-334027	Analysis Date: 07/18/2016 1010						
Phenolics, Total Recoverable	0.0068	U	mg/L	0.0068	0.010	1.0	420.4
Analysis Batch: 280-336746	Analysis Date: 08/05/2016 1102						
Prep Batch: 280-335552	Prep Date: 07/28/2016 1331						
Total Cyanide	0.0042	B C U	mg/L	0.0020	0.010	1.0	9012A
Analysis Batch: 280-334810	Analysis Date: 07/23/2016 1040						
Prep Batch: 280-334663	Prep Date: 07/22/2016 1045						
Total Organic Halogens - Dup	0.037	B J	mg/L	0.015	0.040	1.0	9020B
Analysis Batch: 280-336034	Analysis Date: 07/27/2016 1321						
Sulfide	0.79	U J	mg/L	0.79	4.0	1.0	9034
Analysis Batch: 280-333826	Analysis Date: 07/15/2016 1356						
Prep Batch: 280-333805	Prep Date: 07/15/2016 1134						
Alkalinity	229	J	mg/L	1.1	5.0	1.0	SM 2320B
Analysis Batch: 280-333888	Analysis Date: 07/16/2016 0929						
Total Dissolved Solids	1740	J	mg/L	9.4	20.0	1.0	SM 2540C
Analysis Batch: 280-334218	Analysis Date: 07/19/2016 1331						
Total Suspended Solids	1.6	B J	mg/L	1.1	4.0	1.0	SM 2540D
Analysis Batch: 280-334068	Analysis Date: 07/18/2016 1422						
Total Organic Carbon - Quad	7.8		mg/L	0.16	1.0	1.0	SM 5310B
Analysis Batch: 280-335176	Analysis Date: 07/25/2016 1639						

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	7.97	J	SU	0.100	0.100	1.0	9040B
Analysis Batch: 280-335415	Analysis Date: 07/27/2016 1108						
~~Specific Conductance~~	~~2060~~	~~J~~	~~umho/cm~~	~~1.00~~	1.00	1.0	9050A
Analysis Batch: 280-333864	Analysis Date: 07/15/2016 2117						

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-85505-1

SDG #: J02198
SAF#: RC-009

Date SDG Closed: July 14, 2016
Data Deliverable: 21 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V931	280-85505-1	2320/300.0/2540C/2540D/350.1/353.2/410.4/ 9020/420.4/5310B/1664/9034/9012/8260/ 6010/7470/9050/9040/8015/8270/ WTPH-G/WTPH-D+/8151/8081/8082/8310	2320B/300.0/2540C/2540D/350.1/353.2/410.4/ 9020B/420.4/5310B/1664A/9034/9012A/8260B/ 6010B/6020/7470A/9050A/9040B/8015C/8270C/ NWTPH-Gx/NWTPH-Dx/8151A/8081A/8082/8310
J1V932	280-85505-2	2320/300.0/2540C/2540D/350.1/353.2/410.4/ 9020/420.4/5310B/1664/9034/9012/8260/ 6010/7470/9050/9040/8015/8270/ WTPH-G/WTPH-D+/8151/8081/8082/8310	2320B/300.0/2540C/2540D/350.1/353.2/410.4/ 9020B/420.4/5310B/1664A/9034/9012A/8260B/ 6010B/6020/7470A/9050A/9040B/8015C/8270C/ NWTPH-Gx/NWTPH-Dx/8151A/8081A/8082/8310
J1V933	280-85505-3	8260	8260B

The Uranium method substitution noted above, as agreed to by all parties, has no technical impact on the data.

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

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

RECEIPT
The samples were received on 7/13/2016 9:30 AM and 7/14/2016 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 1.7° C, 2.9° C, 3.4° C and 4.9° C.

Receipt Exceptions

It was noted that the VOA vials did not have labels affixed to them. There was one label for each set of VOA vials that was affixed to the bubble bag. Each label was transferred to one of the vials in each set. The client was notified on 7/15/2016.

GC/MS VOLATILES - SW846 8260B
The following compounds were not found as part of a TIC search performed for samples J1V931, J1V932 and J1V933: Acrylamide [79-06-1]; Formaldehyde [50-00-0]; 1,3-Butadiene [106-99-0]; Chlorodifluoromethane [75-45-6]; Dichloropropanol [26545-73-3]; Trichloromethanethiol [75-70-7]; Allyl alcohol (2-Propen-1-ol) [107-18-6]; Crotonaldehyde (2-Butenaldehyde) [4170-30-3]; Epichlorohydrin [106-89-8].

The GC/MS Volatiles analyses of samples J1V932 and J1V933 were performed 3 days outside the recommended sample holding times, due to analyst oversight. The client was notified on 8/2/2016.

The preservative used in the sample containers provided is not compatible with one of the Method 8260B analytes requested. Samples J1V931, J1V932 and J1V933 were received preserved with hydrochloric acid. The requested target analyte list includes 2-chloroethyl vinyl ether, an acid-labile compound that degrades in an acidic medium.

Methylene Chloride, a common laboratory contaminant, is present in the method blank associated with batch 280-334916 at a level exceeding the reporting limit. Because this common laboratory contaminant is present in the method blank at a level that is less than five times the reporting limit, corrective action is not required.

Low levels of Methylene chloride, a common laboratory contaminant, are present in the method blank associated with batch 280-335637. Because the concentration in the method blank is not present at a level greater than the reporting limit, corrective action is deemed unnecessary.

The LCS associated with batch 280-334916 exhibited the percent recovery outside the control limits, biased high, for Methylene Chloride, and the associated sample result has been flagged "T". As Methylene Chloride is not present at a level greater than the reporting limit in the associated sample, corrective action is deemed unnecessary.

2-Chloroethyl vinyl ether was not recovered in the MS/MSD performed on sample J1V931 in batch 280-334916 due to the acid preservative used in the sample. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

Due to analyst oversight, MS/MSD analysis was not performed for batch 280-335637. Method precision and accuracy have been verified by the acceptable LCS/LCSD analysis data.

A Continuing Calibration Verification (CCV) standard associated with samples in batch 280-334916 exhibited the %Difference (%D) value outside acceptance criteria, biased low, for 1-Butanol (-50.2%). The sample associated with this CCV was non-detect for the affected analyte. All CCC and SPCC compounds are in control; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

GC/MS SEMIVOLATILES - SW846 8270C
The following compounds were not found as part of a TIC search performed for samples J1V931 and J1V932: 1-Acetyl-2-thiorurea [591-08-2]; 2,5-Diaminotoluene [95-70-5]; 2-Cyclohexyl-4,6-dinitrophenol [131-89-5]; Hexachlorophene [70-30-4].

Low levels of Benzyl alcohol are present in the method blank associated with batch 280-334208. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

A Continuing Calibration Verification (CCV) standard associated with samples in analysis batch 280-335194 exhibited the %Difference (%D) value outside acceptance criteria, biased low, for 4-Nitroquinoline-1-oxide (-50.1%). The samples associated with this CCV were non-detect for the affected analyte. All CCC and SPCC compounds are in control; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

GLYCOLS - SW846 8015C
Surrogate 1,4-Butanediol was recovered outside the control limits, biased low, in samples J1V931 and J1V932. The laboratory noted that this anomaly was due to obvious matrix interference; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

METHANOL - SW846 8015C
No anomalies were encountered.

GRO - NWTPH-Gx
The samples were collected in properly preserved vials for analysis of gasoline range organics (GRO). However, when verified by the laboratory, the pH was greater than 2 and the following sample was analyzed after 7 days from sampling: J1V932 (pH = 7).

No other anomalies were encountered.

PESTICIDES - SW846 8081A
The LCS associated with batch 280-334134 exhibited percent recoveries outside the control limits, biased low, as follows: 4,4'-DDE = 72% (lower limit 74), Aldrin = 34% (lower limit 44), Heptachlor = 45% (lower limit 52). Associated sample results have been flagged with an "N". It can be noted that the spike compound recoveries and surrogate recoveries for the MS/MSD performed on sample J1V931 were in control. The laboratory re-extracted the samples, unavoidably 14 days past the 7 day recommended sample holding time. Upon re-extraction and reanalysis of the samples under batch 280-336109, the associated LCS spike compound recoveries were 100% in control. and the non-detect results were confirmed. The original analysis data have been reported as the non-detect sample results were confirmed.

No other anomalies were encountered.

PCBs - SW846 8082
No anomalies were encountered.

HERBICIDES - SW846 8151A
No anomalies were encountered.

DRO - NWTPH-Dx
Low levels of C10-C36 are present in the method blank associated with batch 280-334141. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

PAHs - SW846 8310
Surrogate Terphenyl-d14 recovered outside the control limits, biased low at 67% (lower limit 70%), in sample J1V931. No evidence of matrix interference was present and the sample was non-detect. It can be noted that the spike compound recoveries and surrogate recoveries for the MS/MSD performed on sample J1V931 were in control. The laboratory re-extracted the sample, unavoidably 13 days past the 7 day recommended sample holding time, and the surrogate was in control at 94% and the non-detect results were confirmed. Due to insufficient sample volume remaining, sample specific MS/MSD analysis could not be performed for the re-extract batch. The original analysis data have been reported as the non-detect sample results were confirmed and the sample specific batch MS/MSD was associated with the original analysis.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/6020/7470A
Serial dilution of a digestate in batch 280-334811 indicates that physical and chemical interferences are present for Uranium. Results have been flagged with an "X".

Low levels of Thallium are present in the method blank associated with batch 280-334811. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Calcium and Uranium in the Matrix Spike performed on sample J1V931; therefore, control limits are not applicable.

The duplicate analysis of sample J1V931 exhibited RPD data outside the control limits for Thallium, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

OIL & GREASE (HEM) - EPA 1664A
No anomalies were encountered.

ANIONS - MCAWW 300.0
The orthophosphate as P analyses for samples J1V931 and J1V932 were performed 8-9 hours outside the recommended 48 hour sample holding times. The analyses were originally performed within the sample holding times; however, due to associated continuing calibration verification (CCV) failures, reanalysis was required.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to high constituent concentration, samples J1V931 and J1V932 required dilutions prior to the analysis of Nitrate as N, Chloride and Sulfate, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

The orthophosphate as P Matrix Spike performed on sample J1V931 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

AMMONIA as N - MCAWW 350.1
No anomalies were encountered.

NITRATE NITRITE as N - MCAWW 353.2
Each sample is analyzed to achieve the lowest possible reporting limit within the constraints of the method. Due to high constituent concentration, samples J1V931 and J1V932 had to be analyzed at dilutions, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

The Matrix Spike performed on sample J1V931 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

CHEMICAL OXYGEN DEMAND - MCAWW 410.4
No anomalies were encountered.

PHENOLICS - MCAWW 420.4
Phenolics are present at a level greater than half the reporting limit in the method blank associated with batch 280-335552. As no detectable concentrations of Phenolics are present in the associated samples, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL CYANIDE - SW846 9012A
Low levels of Total Cyanide are present in the method blank associated with batch 280-334663. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL ORGANIC HALOGENS (TOX) - SW846 9020B
The laboratory noted that the containers submitted for samples J1V931 and J1V932 were received with excess headspace. This could cause volatile halides to evaporate, resulting in a low bias to the reported results.

Samples J1V931 and J1V932 exhibited elevated detection limits due to the limited sample volume used. The nominal sample amount could not be used due to the nature of the sample matrix.

No other anomalies were encountered.

SULFIDE - SW846 9034
No anomalies were encountered.

ALKALINITY - SM 2320B
Low levels of Alkalinity are present in the method blank associated with batch 280-333888. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL DISSOLVED SOLIDS - SM 2540C
Samples J1V931 and J1V932 exhibited elevated detection limits due to the limited sample volume used. The nominal sample amount could not be used due to high constituent concentration.

No other anomalies were encountered.

TOTAL SUSPENDED SOLIDS - SM 2540D
No anomalies were encountered.

TOTAL ORGANIC CARBON - SM 5310B
No anomalies were encountered.

PH - SW846 9040B
SU = standard units

Samples J1V931 and J1V932 were analyzed 14 days after sample receipt, due to analyst oversight. It can be noted that pH is a field parameter with a holding time of 15 minutes.

No other anomalies were encountered.

SPECIFIC CONDUCTANCE - SW846 9050A
No anomalies were encountered.

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-022 | Page 1 of 2

Collector: DOWNING, MK	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: ERDF Leachate Tank	Sampling Location: ERDF Leachate tank 4, Summer 2016		SAF No.: RC-009
Ice Chest No.: ERC-02-404	Field Logbook No.: EL-1626-03	COA: RERDF22560	Method of Shipment: Commercial Carrier
Shipped To: TestAmerica Denver	Offsite Property No.: A131487		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 7D | Data Turnaround: 21 Days

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially radioactive, less then DOT limits

Special Handling and/or Storage
Cool 4 Deg C

Preservation	HNO3 to pH <2	Cool <=6C	ZnAc+NaOH to pH >9	NaOH to pH >= 12	H2SO4 to pH <2	Cool <=6C	Cool <=6C	H2SO4 to pH <2	Cool <=6C	HCl to pH <2
Type of Container	G/P	G/P	G/P	G/P	G/P	aGs*	aGs*	aG	aG	aGs*
No. of Container(s)	2	2	3	2	2	4	4	4	4	8
Volume	500mL	1000mL	250mL	250mL	250mL	40mL	40mL	1000mL	1000mL	40mL
Sample Analysis	See Item (1) in Special Instructions	See Item (2) in Special Instructions	Sulfides - 9034	Total Cyanide - 9012	Ammonia - 350.1; NO2/NO3 - 353.2; COD - 410.4	Glycols - 8015 (1,2-Propanediol (Propylene glycol), Ethylene glycol)	Alcohols - 8015 (Methanol)	Oil & Grease - 1664	See Item (3) in Special Instructions	TPH-Gasoline Range - WTPH-G

Sample No.	Matrix	Sample Date	Sample Time										
J10931	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

280-85505 Chain of Custody

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M Downing/M Downing	7-12-16 0945	T.R. Edmundson/T.R. Edmundson	7-12-16 0945
T.R. Edmundson/T.R. Edmundson	7-12-16 1530	Fed Ex	7-12-16 —
		0930	7/13/16

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Tungsten, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Alkalinity - 2320; IC Anions - 300.0 {Bromide, Chloride, Fluoride, Nitrate, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate}; TDS - 2540C; TSS - 2540D
(3) TPH-Diesel Range - WTPH-D + {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - diesel range extended to C36}

SDG # J02198
D.L. 7-15-16

4,9,1-7,12,9 IRS-0.0 TJWulle
Transfer from
3,4 IRS-0.0
TJWulle

REVIEWED BY KW DATE 7/12/16

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Page 167 of 176

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-022 | Page 2 of 2

Collector: DOWNING, MK	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: ERDF Leachate Tank	Sampling Location: ERDF Leachate tank 4, Summer 2016		SAF No.: RC-009
Ice Chest No.: ERC-02-404	Field Logbook No.: EL-1626-03	COA: RERDF22560	Method of Shipment: Commercial Carrier
Shipped To: TestAmerica Denver	Offsite Property No.: A131487		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 7D | Data Turnaround: 21 Days

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially radioactive, less than DOT limits

Special Handling and/or Storage
Cool 4 Deg C

Preservation	H2SO4 to pH <2	H2SO4 to pH <2	None	HCl or H2SO4 to pH <2	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	
Type of Container	aG	aGs*	G/P	aGs*	aG	aG	aG	aG	aG	
No. of Container(s)	3	2	2	6	4	4	4	4	4	
Volume	250mL	250mL	250mL	40mL	1000mL	1000mL	1000mL	1000mL	1000mL	
Sample Analysis	See item (4) in Special Instructions	TOX - 9020	Conductivity - 9050; pH (Water) - 9040	See item (5) in Special Instructions	See item (6) in Special Instructions	PAHs - 8310	Pesticides - 8081	PCBs - 8082	Chloro-Herbicides - EPA8151	

Sample No.	Matrix	Sample Date	Sample Time									
J1[illegible]931	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓

Page 178 of 179

CHAIN OF POSSESSION

Sign/Print Names			
Relinquished By/Removed From: W Downing W Downing WDH	Date/Time: 7-12-16 0945	Received By/Stored In: T.R. Edmundson T.R. Edmundson	Date/Time: 7-12-16 0945
Relinquished By/Removed From: WDH T.R. Edmundson T.R. Edmundson	Date/Time: 7-12-16 1500	Received By/Stored In: Fed Ex	Date/Time: 7-12-16 —
Relinquished By/Removed From	Date/Time	Received By/Stored In: [illegible]	Date/Time: 0930 BJW 7/13
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time

SPECIAL INSTRUCTIONS

(4) Phenolics Total Recoverable - 420.4; Total Organic Carbon (TOC) - 5310B
(5) VOA - 8260 (App IX); VOA - 8260 (Client List) {1,1,2-Trichloro-1,2,2-trifluoroethane, 1-Butanol, 2-Chloroethyl vinyl ether, 2-Nitropropane, Acetic acid, methyl ester, Diethyl ether, Ethyl acetate, Ethyl cyanide, Isopropylbenzene, Tetrahydrofuran, cis-1,2-Dichloroethylene}
(6) Semi-VOA - 8270 (App IX); Semi-VOA – 8270 (Client List) {1,2-Diphenylhydrazine, 1,4-Dinitrobenzene, 3+4 Methylphenol (cresol, m+p), Benzaldehyde, Benzoic acid, Dimethoate, Diphenylamine, Disulfoton, Parathion, Phorate, Tris(2,3-dibromopropyl) phosphate}

REVIEWED BY KW DATE 7/12/16

WCH-EE-011

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-023

Collector DOWNING, MK	**Company Contact** Joan Kessner	**Telephone No.** 375-4688	**Project Coordinator** KESSNER, JH
Project Designation ERDF Leachate Tank	**Sampling Location** ERDF Leachate tank 4, Summer 2016		**SAF No.** RC-009
Ice Chest No. ERC-02-404	**Field Logbook No.** EL-1626-03	**COA** RERDF22560	**Method of Shipment** Commercial Carrier
Shipped To TestAmerica Denver	**Offsite Property No:** A131487		**Bill of Lading/Air Bill No.** SEE OSPC

Price Code 7D

Data Turnaround 21 Days

Other Labs Shipped To TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially radioactive, less than DOT limits

Special Handling and/or Storage
Cool 4 Deg C

Preservation	HNO3 to pH <2	Cool <=6C	ZnAc+NaOH to pH >9	NaOH to pH >= 12	H2SO4 to pH <2	Cool <=6C	Cool <=6C	H2SO4 to pH <2	Cool <=6C	HCl to pH <2
Type of Container	G/P	G/P	G/P	G/P	G/P	aGs*	aGs*	G	aG	aGs*
No. of Container(s)	1	1	1	1	1	2	2	2	2	3
Volume	500mL	1000mL	250mL	250mL	250mL	40mL	40mL	1000mL	1000mL	40mL
Sample Analysis	See item (1) in Special Instructions	See item (2) in Special Instructions	Sulfides - 9034	Total Cyanide - 9012	Ammonia - 350.1; NO2/NO3 - 353.2; COD - 410.4	Glycols - 8015 (1,2-Propanediol (Propylene glycol), Ethylene glycol)	Alcohols - 8015 (Methanol)	Oil & Grease - 1664	See Item (3) in Special Instructions	TPH-Gasoline Range - WTPH-G

Sample No.	Matrix	Sample Date	Sample Time										
J11932	WATER	7-12-16	0720	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
W.D. Downing / M.K. Downing WAI	7-12-16/0945	T.R. Edmundson / T.R. Edmundson	7-12-16 0945
T.R. Edmundson / T.R. Edmundson WCH	7-12-16 1500	Fed Ex	7-12-16 —
		[signature]	0930 13 Jul 16

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Tungsten, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)
(2) Alkalinity - 2320; IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate); TDS - 2540C; TSS - 2540D
(3) TPH-Diesel Range - WTPH-D + (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - diesel range extended to C36)

REVIEWED BY KW DATE 7/12/16

WCH-EE-011

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-009-023

Collector: DOWNING, MK	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: ERDF Leachate Tank	Sampling Location: ERDF Leachate tank 4, Summer 2016		SAF No.: RC-009
Ice Chest No.: ERC-02 - 404	Field Logbook No.: EL-1626-03	COA: RERDF22560	Method of Shipment: Commercial Carrier
Shipped To: TestAmerica Denver	Offsite Property No.: A131487		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 7D

Data Turnaround: 21 Days

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive, less than DOT limits

Special Handling and/or Storage

Cool 4 Deg C

Sample No.	Matrix	Sample Date	Sample Time	Preservation	H2SO4 to pH <2	H2SO4 to pH <2	None	HCl or H2SO4 to pH <2	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	
				Type of Container	aG	aGs*	G/P	aGs*	aG	aG	aG	aG	aG	
				No. of Container(s)	1	1	1	3	2	2	2	2	2	
				Volume	250mL	250mL	250mL	40mL	1000mL	1000mL	1000mL	1000mL	1000mL	
				Sample Analysis	See Item (4) in Special Instructions	TOX - 9020	Conductivity - 9050; pH (Water) - 9040	See Item (5) in Special Instructions	See Item (6) in Special Instructions	PAHs - 8310	Pesticides - 8081	PCBs - 8082	Chloro-Herbicides - EPA8151	
J1W932	WATER	7-12-16	0720		✓	✓	✓	✓	✓	✓	✓	✓	✓	

Page 190 of 1762

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M. Downing / M. Downing WCH	7-12-16 0945	T.R. Edmundson / T.R. Edmundson	7-12-16 0945
T.R. Edmundson / T.R. Edmundson WCH	7-12-16 1500	Fed Ex	7-12-16
			0920 BWHG

Sign/Print Names

SPECIAL INSTRUCTIONS

(4) Phenolics Total Recoverable - 420.4; Total Organic Carbon (TOC) - 5310B
(5) VOA - 8260 (App IX); VOA - 8260 (Client List) {1,1,2-Trichloro-1,2,2-trifluoroethane, 1-Butanol, 2-Chloroethyl vinyl ether, 2-Nitropropane, Acetic acid, methyl ester, Diethyl ether, Ethyl acetate, Ethyl cyanide, Isopropylbenzene, Tetrahydrofuran, cis-1,2-Dichloroethylene}
(6) Semi-VOA - 8270 (App IX); Semi-VOA -- 8270 (Client List) {1,2-Diphenylhydrazine, 1,4-Dinitrobenzene, 3+4 Methylphenol (cresol, m+p), Benzaldehyde, Benzoic acid, Dimethoate, Diphenylamine, Disulfoton, Parathion, Phorate, Tris(2,3-dibromopropyl) phosphate}

REVIEWED BY KW DATE 7/12/16

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

FINAL SAMPLE DISPOSITION

Disposal Method: | Disposed By: | Date/Time:

WCH-EE-011

20121214

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: BRDP			DATA PACKAGE: J02198		
VALIDATOR: BLR		LAB: TAL		DATE: 8/22/16	
			SDG: J02198		

ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	~~BOD~~/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfide	TDS	TKN	Phosphate	Cyanide	Phenolics
	TSS				Fecal

SAMPLES/MATRIX
J1U931 J1U932
Water

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes (No) N/A

Initial calibrations acceptable? ..... Yes (No) N/A

ICV and CCV checks performed on all instruments? ..... Yes (No) N/A

ICV and CCV checks acceptable? ..... Yes (No) N/A

Standards traceable? ..... Yes (No) N/A

Standards expired? ..... Yes (No) N/A

Calculation check acceptable? ..... Yes (No) N/A

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A
ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: cyanide - J all no FB

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... Yes No N/A
Spike recoveries acceptable? ..... Yes No N/A
Sike standards NIST traceable? (Levels D, E) ..... Yes No N/A
Spike standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A

Comments: Orthophosphate - yes - 31 % - J all
sulfide - LCS - 70 - J all
no MS - Sat TSS TDS alkalinity - J no FB

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A
Duplicate results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
Field duplicate RPD values acceptable? ..... Yes No N/A
Field split RPD values acceptable? ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: TSS - 180.1 - FD

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A
Sample holding times acceptable? ..... Yes No N/A

Comments: O-PO4 phosphate - <2x - Jall
pH - Jall >2x
Tox - headspce - Jall

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... (Yes) No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No (N/A)

Samples properly prepared? (Levels D, E) ..... Yes No (N/A)

Detection limits meet RDL? ..... (Yes) No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments:

Appendix 6

Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-335898

Method: 1664A
Preparation: 1664A

Lab Sample ID:	MB 280-335898/1-A	Analysis Batch:	280-336002	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	280-335898	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	08/01/2016 1301	Units:	mg/L	Final Weight/Volume:	1000 mL
Prep Date:	08/01/2016 0704				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
HEM (Oil & Grease)	1.6	U	1.6	5.0

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 280-335898

Method: 1664A
Preparation: 1664A

LCS Lab Sample ID:	LCS 280-335898/2-A	Analysis Batch:	280-336002	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	280-335898	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	08/01/2016 1301	Units:	mg/L	Final Weight/Volume:	1000 mL
Prep Date:	08/01/2016 0704				
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 280-335898/3-A	Analysis Batch:	280-336002	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	280-335898	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	08/01/2016 1301	Units:	mg/L	Final Weight/Volume:	1000 mL
Prep Date:	08/01/2016 0704				
Leach Date:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
HEM (Oil & Grease)	89	87	78 - 114	3	18		

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 280-335898

Method: 1664A
Preparation: 1664A

LCS Lab Sample ID:	LCS 280-335898/2-A	Units:	mg/L
Client Matrix:	Water		
Dilution:	1.0		
Analysis Date:	08/01/2016 1301		
Prep Date:	08/01/2016 0704		
Leach Date:	N/A		

LCSD Lab Sample ID:	LCSD 280-335898/3-A
Client Matrix:	Water
Dilution:	1.0
Analysis Date:	08/01/2016 1301
Prep Date:	08/01/2016 0704
Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
HEM (Oil & Grease)	40.0	40.0	35.70	34.60

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike - Batch: 280-335898

Method: 1664A
Preparation: 1664A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-336002	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	280-335898	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1029 mL
Analysis Date:	08/01/2016 1301	Units:	mg/L	Final Weight/Volume:	1000 mL
Prep Date:	08/01/2016 0704				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
HEM (Oil & Grease)	1.6	U	38.9	32.75	84	78 - 114	

Duplicate - Batch: 280-335898

Method: 1664A
Preparation: 1664A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-336002	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	280-335898	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1030 mL
Analysis Date:	08/01/2016 1301	Units:	mg/L	Final Weight/Volume:	1000 mL
Prep Date:	08/01/2016 0704				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
HEM (Oil & Grease)	1.6	U	1.5	NC	20	U

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-333474

Method: 300.0
Preparation: N/A

Lab Sample ID:	MB 280-333474/45	Analysis Batch:	280-333474	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	45.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 0347	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Nitrate as N	0.042	U	0.042	0.25
Nitrite as N	0.049	U	0.049	0.25

Method Reporting Limit Check - Batch: 280-333474

Method: 300.0
Preparation: N/A

Lab Sample ID:	MRL 280-333474/3	Analysis Batch:	280-333474	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	03.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/13/2016 1023	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N	0.200	0.210	105	50 - 150	B
Nitrite as N	0.200	0.186	93	50 - 150	B

Lab Control Sample - Batch: 280-333474

Method: 300.0
Preparation: N/A

Lab Sample ID:	LCS 280-333474/44	Analysis Batch:	280-333474	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	44.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 0329	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N	5.00	5.10	102	90 - 110	
Nitrite as N	5.00	5.35	107	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike - Batch: 280-333474

Method: 300.0
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-333474	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	48.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 0441	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				25 uL
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Nitrite as N	0.049	U	5.00	5.26	105	80 - 120	

Matrix Spike - Batch: 280-333474

Method: 300.0
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-333474	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	54.0000.d
Dilution:	10	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 0627	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				25 uL
Leach Date:	N/A				

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N	44.7	50.0	94.83	100	80 - 120	D

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-333474

Method: 300.0
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-333474	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	47.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 0423	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				25 uL
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Nitrite as N	0.049	U	0.049	NC	15	U

Duplicate - Batch: 280-333474

Method: 300.0
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-333474	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	53.0000.d
Dilution:	10	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 0610	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				25 uL
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Nitrate as N	44.7	43.54	3	15	D

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-333475

Method: 300.0
Preparation: N/A

Lab Sample ID:	MB 280-333475/45	Analysis Batch:	280-333475	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	45.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 0347	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Bromide	0.11	U	0.11	0.20
Chloride	0.25	U	0.25	3.0
Fluoride	0.060	U	0.060	0.50
Sulfate	0.23	U	0.23	5.0

Method Reporting Limit Check - Batch: 280-333475

Method: 300.0
Preparation: N/A

Lab Sample ID:	MRL 280-333475/3	Analysis Batch:	280-333475	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	03.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/13/2016 1023	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Bromide	0.200	0.209	104	50 - 150	
Chloride	2.50	2.53	101	50 - 150	B
Fluoride	0.200	0.185	93	50 - 150	B
Sulfate	2.50	2.54	101	50 - 150	B

Lab Control Sample - Batch: 280-333475

Method: 300.0
Preparation: N/A

Lab Sample ID:	LCS 280-333475/44	Analysis Batch:	280-333475	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	44.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 0329	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Bromide	5.00	5.12	102	90 - 110	
Chloride	100	102.1	102	90 - 110	
Fluoride	5.00	5.20	104	90 - 110	
Sulfate	100	101.5	101	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike - Batch: 280-333475

Method: 300.0
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-333475	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	48.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 0441	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				25 uL
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Bromide	0.11	U	5.00	6.01	120	80 - 120	
Fluoride	0.23	B	5.00	4.86	93	80 - 120	

Matrix Spike - Batch: 280-333475

Method: 300.0
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-333475	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	54.0000.d
Dilution:	10	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 0627	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				25 uL
Leach Date:	N/A				

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Chloride	254	250	512.0	103	80 - 120	D
Sulfate	590	250	837.3	99	80 - 120	D

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-333475

Method: 300.0
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-333475	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	47.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 0423	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				25 uL
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Bromide	0.11	U	0.11	NC	15	U
Fluoride	0.23	B	0.224	2	15	B

Duplicate - Batch: 280-333475

Method: 300.0
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-333475	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	53.0000.d
Dilution:	10	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 0610	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				25 uL
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Chloride	254	249.2	2	15	D
Sulfate	590	579.7	2	15	D

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-333661

Method: 300.0
Preparation: N/A

Lab Sample ID:	MB 280-333661/15	Analysis Batch:	280-333661	Instrument ID:	WC_IonChrom11
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	0015.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 1505	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Orthophosphate as P	0.19	U	0.19	0.50

Method Reporting Limit Check - Batch: 280-333661

Method: 300.0
Preparation: N/A

Lab Sample ID:	MRL 280-333661/10	Analysis Batch:	280-333661	Instrument ID:	WC_IonChrom11
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	0010.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 1314	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Orthophosphate as P	0.200	0.19	80	50 - 150	U

Lab Control Sample - Batch: 280-333661

Method: 300.0
Preparation: N/A

Lab Sample ID:	LCS 280-333661/14	Analysis Batch:	280-333661	Instrument ID:	WC_IonChrom11
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	0014.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 1446	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Orthophosphate as P	5.00	4.90	98	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike - Batch: 280-333661

Method: 300.0
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-333661	Instrument ID:	WC_IonChrom11
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	0018.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 1605	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				10 uL
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Orthophosphate as P	0.19	U	5.00	1.55	31	80 - 120	N

Duplicate - Batch: 280-333661

Method: 300.0
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-333661	Instrument ID:	WC_IonChrom11
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	0017.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/14/2016 1545	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				10 uL
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Orthophosphate as P	0.19	U	0.19	NC	15	U

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334602

Method: 350.1
Preparation: N/A

Lab Sample ID:	MB 280-334602/141	Analysis Batch:	280-334602	Instrument ID:	WC_Alp 3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\072116.RS
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/21/2016 1938	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Ammonia as N	0.022	U	0.022	0.10

Lab Control Sample - Batch: 280-334602

Method: 350.1
Preparation: N/A

Lab Sample ID:	LCS 280-334602/140	Analysis Batch:	280-334602	Instrument ID:	WC_Alp 3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\072116.RS
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	07/21/2016 1936	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia as N	2.50	2.57	103	90 - 110	

Matrix Spike - Batch: 280-334602

Method: 350.1
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-334602	Instrument ID:	WC_Alp 3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\072116.RS
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	07/21/2016 1944	Units:	mg/L	Final Weight/Volume:	10 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Ammonia as N	0.022	U	1.00	1.04	104	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-334602

Method: 350.1
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-334602	Instrument ID:	WC_Alp 3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\072116.RS
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/21/2016 1942	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Ammonia as N	0.022	U	0.022	NC	10	U

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-336720

Method: 353.2
Preparation: N/A

Lab Sample ID:	MB 280-336720/24	Analysis Batch:	280-336720	Instrument ID:	WC_Alp 2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\080416.RS
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	08/04/2016 1242	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Nitrate Nitrite as N	0.019	U	0.019	0.075

Method Reporting Limit Check - Batch: 280-336720

Method: 353.2
Preparation: N/A

Lab Sample ID:	MRL 280-336720/21	Analysis Batch:	280-336720	Instrument ID:	WC_Alp 2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\080416.RS
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	08/04/2016 1236	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N	0.100	0.0869	87	50 - 150	B

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 280-336720

Method: 353.2
Preparation: N/A

LCS Lab Sample ID:	LCS 280-336720/22	Analysis Batch:	280-336720	Instrument ID:	WC_Alp 2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\080416.RS
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	08/04/2016 1238	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 280-336720/23	Analysis Batch:	280-336720	Instrument ID:	WC_Alp 2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\080416.RS
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	08/04/2016 1240	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Nitrate Nitrite as N	98	98	90 - 110	0	10		

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 280-336720

Method: 353.2
Preparation: N/A

LCS Lab Sample ID:	LCS 280-336720/22	Units: mg/L	LCSD Lab Sample ID:	LCSD 280-336720/23	
Client Matrix:	Water		Client Matrix:	Water	
Dilution:	1.0		Dilution:	1.0	
Analysis Date:	08/04/2016 1238		Analysis Date:	08/04/2016 1240	
Prep Date:	N/A		Prep Date:	N/A	
Leach Date:	N/A		Leach Date:	N/A	

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Nitrate Nitrite as N	5.00	5.00	4.92	4.91

Matrix Spike - Batch: 280-336720

Method: 353.2
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-336720	Instrument ID:	WC_Alp 2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\080416.RS
Dilution:	10	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	08/04/2016 1248	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N	43.9	40.0	79.59	89	90 - 110	N D

Duplicate - Batch: 280-336720

Method: 353.2
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-336720	Instrument ID:	WC_Alp 2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\080416.RS
Dilution:	10	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	08/04/2016 1246	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Nitrate Nitrite as N	43.9	43.67	0.5	20	D

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334027

Method: 410.4
Preparation: N/A

Lab Sample ID:	MB 280-334027/4	Analysis Batch:	280-334027	Instrument ID:	WC_Genesys20
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	2 mL
Analysis Date:	07/18/2016 1010	Units:	mg/L	Final Weight/Volume:	2 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Chemical Oxygen Demand	4.1	U	4.1	20.0

Lab Control Sample - Batch: 280-334027

Method: 410.4
Preparation: N/A

Lab Sample ID:	LCS 280-334027/3	Analysis Batch:	280-334027	Instrument ID:	WC_Genesys20
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	07/18/2016 1010	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chemical Oxygen Demand	100	102.2	102	90 - 110	

Matrix Spike - Batch: 280-334027

Method: 410.4
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-334027	Instrument ID:	WC_Genesys20
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	07/18/2016 1010	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Chemical Oxygen Demand	24.6	50.0	73.87	99	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-334027

Method: 410.4
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-334027	Instrument ID:	WC_Genesys20
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	2 mL
Analysis Date:	07/18/2016 1010	Units:	mg/L	Final Weight/Volume:	2 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Chemical Oxygen Demand	24.6	21.08	15	20	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-335552

Method: 420.4
Preparation: Distill/Phenol

Lab Sample ID:	MB 280-335552/3-A	Analysis Batch:	280-336746	Instrument ID:	WC_Alp 1
Client Matrix:	Water	Prep Batch:	280-335552	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	08/05/2016 1102	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/28/2016 1331				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Phenolics, Total Recoverable	0.00717	B	0.0068	0.010

Lab Control Sample - Batch: 280-335552

Method: 420.4
Preparation: Distill/Phenol

Lab Sample ID:	LCS 280-335552/1-A	Analysis Batch:	280-336746	Instrument ID:	WC_Alp 1
Client Matrix:	Water	Prep Batch:	280-335552	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	08/05/2016 1102	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/28/2016 1331				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Phenolics, Total Recoverable	0.200	0.191	96	90 - 110	

Matrix Spike - Batch: 280-335552

Method: 420.4
Preparation: Distill/Phenol

Lab Sample ID:	280-85505-1	Analysis Batch:	280-336746	Instrument ID:	WC_Alp 1
Client Matrix:	Water	Prep Batch:	280-335552	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	08/05/2016 1102	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/28/2016 1331				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Phenolics, Total Recoverable	0.0068	U	0.200	0.195	97	72 - 118	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-335552

Method: 420.4
Preparation: Distill/Phenol

Lab Sample ID:	280-85505-1	Analysis Batch:	280-336746	Instrument ID:	WC_Alp 1
Client Matrix:	Water	Prep Batch:	280-335552	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	08/05/2016 1102	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/28/2016 1331				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Phenolics, Total Recoverable	0.0068	U	0.0068	NC	20	U

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334663

Method: 9012A
Preparation: 9012A

Lab Sample ID:	MB 280-334663/4-A	Analysis Batch:	280-334810	Instrument ID:	WC_Alp 1
Client Matrix:	Water	Prep Batch:	280-334663	Lab File ID:	C:\FLOW_4\C072316.R
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/23/2016 1034	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/22/2016 1045				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Total Cyanide	0.00225	B	0.0020	0.010

High Level Control Sample - Batch: 280-334663

Method: 9012A
Preparation: 9012A

Lab Sample ID:	HLCS 280-334663/1-A	Analysis Batch:	280-334810	Instrument ID:	WC_Alp 1
Client Matrix:	Water	Prep Batch:	280-334663	Lab File ID:	C:\FLOW_4\C072316.R
Dilution:	2.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/23/2016 1030	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/22/2016 1045				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Total Cyanide	0.400	0.400	100	90 - 110	

Low Level Control Sample - Batch: 280-334663

Method: 9012A
Preparation: 9012A

Lab Sample ID:	LLCS 280-334663/2-A	Analysis Batch:	280-334810	Instrument ID:	WC_Alp 1
Client Matrix:	Water	Prep Batch:	280-334663	Lab File ID:	C:\FLOW_4\C072316.R
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/23/2016 1031	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/22/2016 1045				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Total Cyanide	0.100	0.103	103	44 - 167	

Lab Control Sample - Batch: 280-334663

Method: 9012A
Preparation: 9012A

Lab Sample ID:	LCS 280-334663/3-A	Analysis Batch:	280-334810	Instrument ID:	WC_Alp 1
Client Matrix:	Water	Prep Batch:	280-334663	Lab File ID:	C:\FLOW_4\C072316.R
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/23/2016 1033	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/22/2016 1045				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Total Cyanide	0.100	0.103	103	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Matrix Spike - Batch: 280-334663

Method: 9012A
Preparation: 9012A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-334810	Instrument ID:	WC_Alp 1
Client Matrix:	Water	Prep Batch:	280-334663	Lab File ID:	C:\FLOW_4\C072316.R
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/23/2016 1037	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/22/2016 1045				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Total Cyanide	0.0059	B	0.100	0.103	97	90 - 110	

Duplicate - Batch: 280-334663

Method: 9012A
Preparation: 9012A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-334810	Instrument ID:	WC_Alp 1
Client Matrix:	Water	Prep Batch:	280-334663	Lab File ID:	C:\FLOW_4\C072316.R
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/23/2016 1039	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	07/22/2016 1045				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Total Cyanide	0.0059	B	0.00588	0	20	B C

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-336034

Method: 9020B
Preparation: N/A

Lab Sample ID:	MB 280-336034/2	Analysis Batch:	280-336034	Instrument ID:	WC_Thermo3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	07/27/2016 1321	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Total Organic Halogens - Dup	0.0077	U	0.0077	0.020

Lab Control Sample - Batch: 280-336034

Method: 9020B
Preparation: N/A

Lab Sample ID:	LCS 280-336034/4	Analysis Batch:	280-336034	Instrument ID:	WC_Thermo3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	07/27/2016 1321	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Total Organic Halogens - Dup	0.100	0.0925	93	78 - 114	

Matrix Spike - Batch: 280-336034

Method: 9020B
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-336034	Instrument ID:	WC_Thermo3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2016 1321	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Total Organic Halogens - Dup	0.051	0.100	0.131	80	78 - 114	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-336034

Method: 9020B
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-336034	Instrument ID:	WC_Thermo3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2016 1321	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Total Organic Halogens - Dup	0.051	0.0450	13	23	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-333805

Method: 9034
Preparation: 9030B

Lab Sample ID:	MB 280-333805/2-A	Analysis Batch:	280-333826	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	280-333805	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	250 mL
Analysis Date:	07/15/2016 1356	Units:	mg/L	Final Weight/Volume:	250 mL
Prep Date:	07/15/2016 1134				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Sulfide	0.79	U	0.79	4.0

Lab Control Sample - Batch: 280-333805

Method: 9034
Preparation: 9030B

Lab Sample ID:	LCS 280-333805/1-A	Analysis Batch:	280-333826	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	280-333805	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	250 mL
Analysis Date:	07/15/2016 1356	Units:	mg/L	Final Weight/Volume:	250 mL
Prep Date:	07/15/2016 1134				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfide	16.6	13.12	79	50 - 106	

Matrix Spike - Batch: 280-333805

Method: 9034
Preparation: 9030B

Lab Sample ID:	280-85505-1	Analysis Batch:	280-333826	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	280-333805	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	250 mL
Analysis Date:	07/15/2016 1356	Units:	mg/L	Final Weight/Volume:	250 mL
Prep Date:	07/15/2016 1134				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Sulfide	0.79	U	16.6	17.44	105	50 - 106	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-333805

Method: 9034
Preparation: 9030B

Lab Sample ID:	280-85505-1	Analysis Batch:	280-333826	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	280-333805	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	250 mL
Analysis Date:	07/15/2016 1356	Units:	mg/L	Final Weight/Volume:	250 mL
Prep Date:	07/15/2016 1134				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Sulfide	0.79	U	0.79	NC	20	U

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 280-335415

Method: 9040B
Preparation: N/A

LCS Lab Sample ID:	LCS 280-335415/4	Analysis Batch:	280-335415	Instrument ID:	WC-AT3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	072716 ph.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/27/2016 1049	Units:	SU	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 280-335415/5	Analysis Batch:	280-335415	Instrument ID:	WC-AT3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	072716 ph.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/27/2016 1052	Units:	SU	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
pH	100	100	99 - 101	0	5		

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 280-335415

Method: 9040B
Preparation: N/A

LCS Lab Sample ID:	LCS 280-335415/4	Units:	SU	LCSD Lab Sample ID:	LCSD 280-335415/5
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	07/27/2016 1049			Analysis Date:	07/27/2016 1052
Prep Date:	N/A			Prep Date:	N/A
Leach Date:	N/A			Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
pH	7.00	7.00	6.980	6.980

Duplicate - Batch: 280-335415

Method: 9040B
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-335415	Instrument ID:	WC-AT3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	072716 ph.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/27/2016 1103	Units:	SU	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
pH	7.94	8.000	0.8	5	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-333864

Method: 9050A
Preparation: N/A

Lab Sample ID:	MB 280-333864/5	Analysis Batch:	280-333864	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/15/2016 2116	Units:	umho/cm	Final Weight/Volume:	25 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	RL	RL
Specific Conductance	1.00	U	1.00	1.00

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 280-333864

Method: 9050A
Preparation: N/A

LCS Lab Sample ID:	LCS 280-333864/3	Analysis Batch:	280-333864	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/15/2016 2116	Units:	umho/cm	Final Weight/Volume:	25 mL
Prep Date:	N/A				
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 280-333864/4	Analysis Batch:	280-333864	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/15/2016 2116	Units:	umho/cm	Final Weight/Volume:	25 mL
Prep Date:	N/A				
Leach Date:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Specific Conductance	99	99	90 - 110	1	10		

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 280-333864

Method: 9050A
Preparation: N/A

LCS Lab Sample ID:	LCS 280-333864/3	Units:	umho/cm	LCSD Lab Sample ID:	LCSD 280-333864/4
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	07/15/2016 2116			Analysis Date:	07/15/2016 2116
Prep Date:	N/A			Prep Date:	N/A
Leach Date:	N/A			Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Specific Conductance	1410	1410	1394	1401

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-333864

Method: 9050A
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-333864	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/15/2016 2117	Units:	umho/cm	Final Weight/Volume:	25 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Specific Conductance	34400	35800	4	10	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-333888

Method: SM 2320B
Preparation: N/A

Lab Sample ID:	MB 280-333888/6	Analysis Batch:	280-333888	Instrument ID:	WC-AT3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	071616 alk a.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 mL
Analysis Date:	07/16/2016 0914	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Alkalinity	1.36	B	1.1	5.0

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 280-333888

Method: SM 2320B
Preparation: N/A

LCS Lab Sample ID:	LCS 280-333888/4	Analysis Batch:	280-333888	Instrument ID:	WC-AT3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	071616 alk a.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 mL
Analysis Date:	07/16/2016 0905	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 280-333888/5	Analysis Batch:	280-333888	Instrument ID:	WC-AT3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	071616 alk a.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 mL
Analysis Date:	07/16/2016 0910	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Alkalinity	100	98	90 - 110	1	10		

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 280-333888

Method: SM 2320B
Preparation: N/A

LCS Lab Sample ID:	LCS 280-333888/4	Units:	mg/L
Client Matrix:	Water		
Dilution:	1.0		
Analysis Date:	07/16/2016 0905		
Prep Date:	N/A		
Leach Date:	N/A		

LCSD Lab Sample ID:	LCSD 280-333888/5
Client Matrix:	Water
Dilution:	1.0
Analysis Date:	07/16/2016 0910
Prep Date:	N/A
Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Alkalinity	200	200	199.4	196.7

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-333888

Method: SM 2320B
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-333888	Instrument ID:	WC-AT3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	071616 alk a.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 mL
Analysis Date:	07/16/2016 0924	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Alkalinity	217	220.2	1	10	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334218

Method: SM 2540C
Preparation: N/A

Lab Sample ID:	MB 280-334218/1	Analysis Batch:	280-334218	Instrument ID:	MT_025
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	07/19/2016 1331	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Total Dissolved Solids	4.7	U	4.7	10.0

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 280-334218

Method: SM 2540C
Preparation: N/A

LCS Lab Sample ID:	LCS 280-334218/2	Analysis Batch:	280-334218	Instrument ID:	MT_025
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	07/19/2016 1331	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 280-334218/3	Analysis Batch:	280-334218	Instrument ID:	MT_025
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	07/19/2016 1331	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Total Dissolved Solids	98	98	86 - 110	0	20		

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 280-334218

Method: SM 2540C
Preparation: N/A

LCS Lab Sample ID:	LCS 280-334218/2	Units:	mg/L
Client Matrix:	Water		
Dilution:	1.0		
Analysis Date:	07/19/2016 1331		
Prep Date:	N/A		
Leach Date:	N/A		

LCSD Lab Sample ID:	LCSD 280-334218/3
Client Matrix:	Water
Dilution:	1.0
Analysis Date:	07/19/2016 1331
Prep Date:	N/A
Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Total Dissolved Solids	501	501	490.0	489.0

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-334218

Method: SM 2540C
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-334218	Instrument ID:	MT_025
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	07/19/2016 1331	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Total Dissolved Solids	1710	1724	1	10	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-334068

Method: SM 2540D
Preparation: N/A

Lab Sample ID:	MB 280-334068/3	Analysis Batch:	280-334068	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	250 mL
Analysis Date:	07/18/2016 1422	Units:	mg/L	Final Weight/Volume:	250 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Total Suspended Solids	1.1	U	1.1	4.0

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 280-334068

Method: SM 2540D
Preparation: N/A

LCS Lab Sample ID:	LCS 280-334068/1	Analysis Batch:	280-334068	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	250 mL
Analysis Date:	07/18/2016 1422	Units:	mg/L	Final Weight/Volume:	250 mL
Prep Date:	N/A				
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 280-334068/2	Analysis Batch:	280-334068	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	250 mL
Analysis Date:	07/18/2016 1422	Units:	mg/L	Final Weight/Volume:	250 mL
Prep Date:	N/A				
Leach Date:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Total Suspended Solids	96	92	86 - 114	4	20		

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 280-334068

Method: SM 2540D
Preparation: N/A

LCS Lab Sample ID:	LCS 280-334068/1	Units:	mg/L	LCSD Lab Sample ID:	LCSD 280-334068/2
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	07/18/2016 1422			Analysis Date:	07/18/2016 1422
Prep Date:	N/A			Prep Date:	N/A
Leach Date:	N/A			Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Total Suspended Solids	100	100	96.00	92.40

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-334068

Method: SM 2540D
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-334068	Instrument ID:	No Equipment Assigned
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	250 mL
Analysis Date:	07/18/2016 1422	Units:	mg/L	Final Weight/Volume:	250 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Total Suspended Solids	32.0	30.80	4	10	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Method Blank - Batch: 280-335176

Method: SM 5310B
Preparation: N/A

Lab Sample ID:	MB 280-335176/4	Analysis Batch:	280-335176	Instrument ID:	WC_SHI2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	072516.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/25/2016 1520	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Total Organic Carbon - Quad	0.16	U	0.16	1.0

Lab Control Sample - Batch: 280-335176

Method: SM 5310B
Preparation: N/A

Lab Sample ID:	LCS 280-335176/3	Analysis Batch:	280-335176	Instrument ID:	WC_SHI2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	072516.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/25/2016 1505	Units:	mg/L	Final Weight/Volume:	200 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Total Organic Carbon - Quad	25.0	25.37	101	88 - 112	

Matrix Spike - Batch: 280-335176

Method: SM 5310B
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-335176	Instrument ID:	WC_SHI2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	072516.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/25/2016 1623	Units:	mg/L	Final Weight/Volume:	50 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Total Organic Carbon - Quad	7.8	25.0	33.12	101	88 - 112	

Client: Washington Closure Hanford

Job Number: 280-85505-1
Sdg Number: J02198

Duplicate - Batch: 280-335176

Method: SM 5310B
Preparation: N/A

Lab Sample ID:	280-85505-1	Analysis Batch:	280-335176	Instrument ID:	WC_SHI2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	072516.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/25/2016 1608	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Total Organic Carbon - Quad	7.8	7.79	0.2	15	