ENVIRONMENTAL STANDARDS

Setting the Standards for Innovative Environmental Solutions

Data Validation Report
Tennessee Valley Authority
Johnsonville Fossil Plant
Environmental Investigation Plan
Seep Soil Samples
Chain-of-Custody Number: JOF-SES-20201001_1B

This quality assurance (QA) review is based upon an examination of the data generated from the analyses of one solid sample and two aqueous blanks collected on October 1, 2020, at the Tennessee Valley Authority (TVA) Johnsonville Fossil Plant facility. These samples were collectively analyzed by Eurofins TestAmerica, of St. Louis, Missouri, for radium-226 and for radium-228 by EPA Method 901.1.

This review was performed in accordance with the Environmental Investigation Plan for the Tennessee Valley Authority Johnsonville Fossil Plant Environmental Investigation (JOF EIP, Revision 4, December 2018). This review was performed with guidance from the National Functional Guidelines for Inorganic Data Review (US EPA, October 2004); the US EPA Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (November 2001); and the US EPA Region IV Data Validation Standard Operating Procedures. These validation guidance documents specifically address analyses performed in accordance with the Contract Laboratory Program (CLP) analytical methods and are not completely applicable to the type of analyses and analytical protocols performed for the US EPA Methods utilized by the laboratory for these samples. Environmental Standards, Inc. (Environmental Standards) used professional judgment to determine the usability of the analytical results and compliance relative to the US EPA Methods utilized by the laboratory.

Summary

The analytical results and associated laboratory quality control (QC) samples were reviewed to determine the integrity of the reported analytical results and to ensure that the data met the established data quality objectives. This QA review includes all samples in Eurofins TestAmerica Job Number 180-111757-1.

The samples that have undergone Stage 4 data validation are listed below:

Sample Identification	Laboratory Sample Identification	Job Number	Matrix	Date Sample Collected	Parameters Examined
JOF-SeS-01-20201001	180-111757-1	180-111757-1	Solid	10/1/20	Ra-226, Ra-228, Ra-226/228
JOF-SeS-FB01-20201001 (Field Blank)	180-111757-2	180-111757-1	Aq	10/1/20	Ra-226, Ra-228, Ra-226/228
JOF-SeS-EB01-20201001 (Equipment Blank)	180-111757-3	180-111757-1	Aq	10/1/20	Ra-226, Ra-228, Ra-226/228

Parameters Examined

Ra-226 - Radium-226 by US EPA Method 901.1.
Ra-228 - Radium-228 by US EPA Method 901.1.
Ra-226/228 - Radium-226/228 Calculation by US EPA Method 901.1.
Aq - Aqueous.

Items Reviewed	
Holding Times	Calibrations
Sample Preservation	Blank Results
Chain-of-Custody (COC) Record and Case Narrative	Sample Preparation
Laboratory Control Sample (LCS) Results	Laboratory Duplicate Results
Quantitation of Positive Results	Chemical Yield

Comments and Exceptions

- All analyses performed for the sampling event were in compliance with the requirements set forth in the EIP.

- Radium-226+228 was reported as the summation of the calculated activities for radium-226 and radium-228. The reported results for radium-226+228 for the samples included in this report may have been adjusted and/or qualified in accordance with the TVA reporting protocols and assigned an “S” reason code.

Qualifier Summary

- Any radium-226+228 result reported from the summation of one isotope activity less than the MDA (non-negative value) and one isotope activity greater than the MDA should be considered estimated and have been flagged “J” on the data tables.

Review performed by: Abigail P. Bossbaly, Quality Assurance Chemist
Review reviewed by: Danielle Coles, Quality Assurance Chemist
Review approved by: Andrew L. Piasecki, Senior Quality Assurance Chemist
Review approved by: Rock J. Vitale, CEAC, Technical Director of Chemistry/Principal
Date review completed: 2/17/21

SECTION 2

ANALYTICAL RESULTS

INORGANIC DATA QUALIFIERS

U* This result should be considered “not-detected” because it was detected in a rinsate blank or laboratory blank at a similar level.

UR Unreliable reporting limit; analyte may or may not be present in sample.

R Unreliable positive result; analyte may or may not be present in sample.

J Quantitation is approximate due to limitations identified during data validation.

UJ This analyte was not detected, but the reporting limit may or may not be higher due to a bias identified during data validation.

REASON CODES AND EXPLANATIONS

Reason Code	Explanation
BE	Equipment blank contamination. The result should be considered “not-detected.”
BF	Field blank contamination. The result should be considered “not-detected.”
BL	Laboratory blank contamination. The result should be considered “not-detected.”
BN	Negative laboratory blank contamination.
C	Initial and/or Continuing Calibration issue, indeterminate bias.
C+	Initial and/or Continuing Calibration issue. The result may be biased high.
C-	Initial and/or Continuing Calibration issue. The result may be biased low.
FD	Field duplicate imprecision.
FG	Total versus Dissolved Imprecision.
H	Holding time exceeded.
I	Internal standard recovery outside of acceptance limits.
L	LCS and LCSD recoveries outside of acceptance limits, indeterminate bias.
L+	LCS and/or LCSD recoveries outside of acceptance limits. The result may be biased high.
L-	LCS and/or LCSD recoveries outside of acceptance limits. The result may be biased low.
LD	Laboratory duplicate imprecision.
LP	LCS/LCSD imprecision.
M	MS and MSD recoveries outside of acceptance limits, indeterminate bias.
M+	MS and/or MSD recoveries outside of acceptance limits. The result may be biased high.
M-	MS and/or MSD recoveries outside of acceptance limits. The result may be biased low.
MP	MS/MSD imprecision.
P	Post-digestion spike recoveries outside of acceptance limits, indeterminate bias.
P+	Post-digestion spike recovery outside of acceptance limits. The result may be biased high.
P-	Post-digestion spike recovery outside of acceptance limits. The result may be biased low.
Q	Chemical Preservation issue.
R	RL standards outside of acceptance limits, indeterminate bias.
R+	RL standard(s) outside of acceptance limits. The result may be biased high.
R-	RL standard(s) outside of acceptance limits. The result may be biased low.
S	Radium-226+228 flagged due to reporting protocol for combined results.
T	Temperature preservation issue.
SD	Serial Dilution imprecision.
X	Percent solids < 50%.
Y+	Chemical Yield outside of acceptance limits. The result may be biased high.
Y-	Chemical yield outside of acceptance limits. The result may be biased low.
Z	ICP or ICP/MS Interference.
ZZ	Other.

TVA CCR Program
Facility: Johnsonville Fossil Plant
SDG: 1801117571

Lab Sample ID	180-111757-1
Sys Sample Code	JOF-SES-01-20201001
Sample Name	JOF-SES-01-20201001
Sample Date	10/1/2020 12:00:00 PM
Location	AOI1
Sample Type	N
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 901.1	Radium 226 + radium 228	RA226/228	T	pCi/g	2.19			0.361				Y	Yes	1	DRY
	Radium 228	15262-20-1	T	pCi/g	0.944			0.251	0.142	0.142	1.00	Y	Yes	1	DRY
	Radium-226	13982-63-3	T	pCi/g	1.25			0.259	0.169	0.169	1.00	Y	Yes	1	DRY

TVA CCR Program
Facility: Johnsonville Fossil Plant
SDG: 1801117571

Lab Sample ID	180-111757-2
Sys Sample Code	JOF-SES-FB01-20201001
Sample Name	JOF-SES-FB01-20201001
Sample Date	10/1/2020 10:30:00 AM
Location	AOI1
Sample Type	FB
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 901.1	Radium 226 + radium 228	RA226/228	T	pCi/L	39.2	J	S	40.2				Y	Yes	1	NA
	Radium 228	15262-20-1	T	pCi/L	11.2	U		34.9	50.0	50.0	50.0	N	Yes	1	NA
	Radium-226	13982-63-3	T	pCi/L	28.0			19.9	24.1	24.1	50.0	Y	Yes	1	NA

TVA CCR Program
Facility: Johnsonville Fossil Plant
SDG: 1801117571

Lab Sample ID	180-111757-3
Sys Sample Code	JOF-SES-EB01-20201001
Sample Name	JOF-SES-EB01-20201001
Sample Date	10/1/2020 10:40:00 AM
Location	AOI1
Sample Type	EB
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 901.1	Radium 226 + radium 228	RA226/228	T	pCi/L	10.3	U	S	33.0				N	Yes	1	NA
	Radium 228	15262-20-1	T	pCi/L	-25.2	U		29.5	41.5	41.5	50.0	N	Yes	1	NA
	Radium-226	13982-63-3	T	pCi/L	10.3	U		14.8	18.9	18.9	50.0	N	Yes	1	NA

SECTION 3

SUPPORTING DOCUMENTATION FOR QUALIFIERS

RADIOLOGICAL ANALYSIS SUPPORT DOCUMENTATION

Client Name:	TVA	EnvStd Project Manager:	AP
Site/Project Name:	JOF EI Implementation QA	Reviewed by:	APB
Job Number/Task/Subtask:	20188360.A000	Approved by:	DC
Laboratory/Location:	TestAmerica/ St. Louis	Completion Date:	1/15/2021
SDG:	180-111757-1	Validation Level:	4
Sample Collection Dates:	10/01/2020		

The following table indicates criteria that were examined, the identified problems, and support documentation attachments.

	Criteria Examined in Detail							Problems Identified **Note:** All problems identified have been included in the Support Document unless otherwise noted.						
	Check (√) if Yes or Footnote Letter for Comments Below													
Parameter/ Method	Ra-226	Ra-228						Ra-226	Ra-228					
Condition upon Receipt	√	√												
Sample Preservation	√	√												
Holding Times	√	√												
Blank Analysis Results	√	√												
Laboratory Control Sample	√	√												
Tracer/Carrier Yield	√	√												
Laboratory Duplicate	√	√												
Field Duplicate														
Matrix Spike/Matrix Spike Duplicate														
Sample Preparation	√	√												
Quantitation of Results	√	√												
Detection Limit	√	√												
Efficiency/Energy Calibrations	√	√												
Initial Calibration Verifications	√	√												
Annual Calibration Verifications	√	√												
Continuing Calibration Checks	√	√												
Resolution Checks														
Background Checks	√	√												
Analytical Sequence	√	√												
Standards Preparation Logs	√	√												
Deliverable was Complete	√	√												
Others:														

Comments: All results are usable unless otherwise qualified.

RADIOLOGICAL BLANK CONTAMINATION

Normalized Absolute Difference (NAD) = $\frac{\text{ABS (Sample Activity - Blank Activity)}}{\sqrt{(\text{Sample } 2\sigma \text{ Error})^2 + (\text{Blank } 2\sigma \text{ Error})^2}}$

2σ NAD = NAD × 2

Laboratory SDG	**JOF 1801117571**
Qualification Limit	2.58
Qualifier	U*

Analyte	Blank ID	Sample ID	Sample Activity	Sample 2σ Error*	Blank Activity	Blank 2σ Error*	2σ NAD	Qualifier
RA226	180-111757-2	180-111757-1	1.25	0.26	0.028	0.02	9.41	

* TPU 2σ or CSU 2σ. Not the counting error.

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: JOF_SES_20201001_1B

Job ID: 180-111757-1

Client Sample ID: JOF-SES-01-20201001 ~ AOI1

Lab Sample ID: 180-111757-1

Date Collected: 10/01/20 12:00

Matrix: Solid

Date Received: 10/02/20 09:00

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.25		0.224	0.259	1.00	0.169	pCi/g	10/19/20 18:37	11/12/20 13:17	1
Radium-228	0.944		0.232	0.251		0.142	pCi/g	10/19/20 18:37	11/12/20 13:17	1
Radium 226 and 228 (positive only)	2.19		0.322	0.361			pCi/g	10/19/20 18:37	11/12/20 13:17	1

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: JOF_SES_20201001_1B

Job ID: 180-111757-1

Client Sample ID: JOF-SES-FB01-20201001 ~ AOI1

Lab Sample ID: 180-111757-2

Date Collected: 10/01/20 10:30
Date Received: 10/02/20 09:00

Matrix: Water

BF - no Qual, see eval

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and Radium 228	39.2	~~U~~ J S	40.0	40.2			pCi/L	10/19/20 18:32	11/12/20 18:16	1
Radium-226	**28.0**		19.6	19.9	50.0	24.1	pCi/L	10/19/20 18:32	11/12/20 18:16	1
Radium-228	11.2	U	34.9	34.9	50.0	50.0	pCi/L	10/19/20 18:32	11/12/20 18:16	1

Camplared units to units
= pCi/L • 1000 = pCi/g

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: JOF_SES_20201001_1B

Job ID: 180-111757-1

Client Sample ID: JOF-SES-EB01-20201001 ~ AOI1

Lab Sample ID: 180-111757-3

Date Collected: 10/01/20 10:40

Matrix: Water

Date Received: 10/02/20 09:00

Equipment Blank; no detects

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and Radium 228	10.3	U S	32.8	33.0			pCi/L	10/19/20 18:32	11/12/20 20:58	1
Radium-226	10.3	U	14.8	14.8	50.0	18.9	pCi/L	10/19/20 18:32	11/12/20 20:58	1
Radium-228	-25.2	U	29.3	29.5	50.0	41.5	pCi/L	10/19/20 18:32	11/12/20 20:58	1

SECTION 4

CASE NARRATIVE AND CHAIN-OF-CUSTODY RECORD

Sample Summary

Client: Environmental Standards Inc.
Project/Site: JOF_SES_20201001_1B

Job ID: 180-111757-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-111757-1	JOF-SES-01-20201001 ~ AOI1	Solid	10/01/20 12:00	10/02/20 09:00	
180-111757-2	JOF-SES-FB01-20201001 ~ AOI1	Water	10/01/20 10:30	10/02/20 09:00	
180-111757-3	JOF-SES-EB01-20201001 ~ AOI1	Water	10/01/20 10:40	10/02/20 09:00	

Job Narrative
180-111757-1

This report was revised to attach missing ICV data in the level 4 report.

Receipt
The samples were received on 10/2/2020 9:00 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.5º C.

RAD
Method 901.1: Gamma prep batch 160-486236:
Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often, such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:

Inferred from	Reported to Analyte
Ac-228	Ra-228
Bi-214	Ra-226

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
JOF-SES-01-20201001 ~ AOI1 (180-111757-1), JOF-SES-01-20201001 ~ AOI1 (180-111757-1[DU]), (LCS 160-486236/2-A) and (MB 160-486236/1-A)

Method 901.1: Gamma Prep Batch 160-486234
Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often, such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:

Inferred from	Reported to Analyte
Ac-228	Ra-228
Bi-214	Ra-226

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
JOF-SES-FB01-20201001 ~ AOI1 (180-111757-2), JOF-SES-EB01-20201001 ~ AOI1 (180-111757-3) and (180-111757-B-2-B DU)

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

TVA Environmental Investigations

Tennessee Valley Authority

COOLER No.:	1	of	1
COC No:	JOF_SES_20201001_1B		
1 of 1 Pages			
Task Desc:	JOF_SES		

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

Required Ship to Lab:	
Lab Name:	TestAmerica Pittsburgh
Lab Address:	301 Alpha Drive Pittsburgh, PA 15238
Lab Manager Contact Information	
Lab PM:	Gail Lage
Phone/Fax:	615-301-5741
Lab Email:	Gail.Lage@eurofinset.com

Required Project Information:				
Site ID #:	Johnsonville Fossil Plant			
Project #:	175568286			
Site Address	535 Steam Plant Road			
City	New Johnsonville	State, Zip:	TN	37134
Site PM Name:	Roy Quinn			
Phone/Fax:	423-751-3753			
Site PM Email:	jrquinn@tva.gov			

Required Sampler Information			
Sampler:	Courtnae Ramser, Chris Knabel		
Sampling Company:	Stantec		
Address	601 Grassmere Park Rd, Ste 22		
City/State	Nashville, TN	Phone:	615-885-1144
Sampling Team Number:	1		
Send EDD/Hard Copy to:	tva_deliverables@envstd.com		

Analysis Turnaround Time

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☐ 5 Business Days
☑ **10 Business Days**

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Depth Unit	Sample Depth: Select Unit	Start Depth	End Depth	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Filtered	Preserve: None	Preserve: HNO3	Analysis: SEEP_SOIL_RAD	Analysis: SEEP_SOIL_BLANKS_RAD
1	JOF-SeS-01-20201001	AOI1			4"	4"	SES	C	N	10/1/2020	1200	6	MS/MSD	☑	N			X	
2	JOF-SeS-FB01-20201001	AOI1			NA	NA	AQ	G	FB	10/1/2020	1030	3	None	☐	N				X
3	JOF-SeS-EB01-20201001	AOI1			NA	NA	AQ	G	EB	10/1/2020	1040	3	None	☐	N				X
4														☐					
5														☐					
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			

CR 10/1/20

CR 10/1/20

180-111757 Chain of Custody

Additional Comments/Special Instructions:

Additional volume collected should be used for laboratory duplicate analysis.

RELINQISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Courtnae Ramser / Stantec / Courtnae Ramser	10/1/20	1600	[illegible]	10/2/20	900

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
FedEx	Courtnae Ramser Courtnae Ramser

Sample Receipt Conditions

Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?
☑ Yes ☐ No	☑ Yes ☐ No	☑ Yes ☐ No	☐ Yes ☑ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

Form TVA 30067A

TVA Environmental Investigations

Rev. 1 (CR 1/8/2021)

Rev 2 BJ 6/3/2021 BJ 6/9/2021 Rev 3

TVA Tennessee Valley Authority

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

COOLER No.: | | of | |

COC No: JOF_SES_20201001_1B

1 of 1 Pages

Task Desc: JOF_SES

Required Ship to Lab:

Lab Name: TestAmerica Pittsburgh
Lab Address: 301 Alpha Drive, Pittsburgh, PA 15238

Lab Manager Contact Information

Lab PM: Gail Lage
Phone/Fax: 615-301-5741
Lab Email: Gail.Lage@eurofinset.com

Required Project Information:

Site ID #: Johnsonville Fossil Plant
Project #: 175568286
Site Address: 535 Steam Plant Road
City: New Johnsonville State, Zip: TN 37134
Site PM Name: Roy Quinn
Phone/Fax: 423-751-3753
Site PM Email: jrquinn@tva.gov

Required Sampler Information

Sampler: Courtnae Ramser, Chris Knabel
Sampling Company: Stantec
Address: 601 Grassmere Park Rd, Ste 22
City/State: Nashville, TN Phone: 615-885-1144
Sampling Team Number: 1
Send EDD/Hard Copy to: tva_deliverables@envstd.com

Analysis Turnaround Time

☐ CALENDAR DAYS ☐ WORKING DAYS

TAT if different from Below _____
☐ 24 Hours
☐ 3 Business Days
☐ 5 Business Days
☑ 10 Business Days

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Depth Unit	Sample Depth: Select Unit	Start Depth	End Depth	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Filtered N	Filtered N	Preserve None	Preserve HNO3	Analysis SEEP_SOIL_RAD	Analysis SEEP_SOIL_BLANKS_RAD
1	JOF-SeS-01-20201001	~~AOI1~~			~~4"~~	~~4"~~	SES	C	N	10/1/2020	1200	6	MS/MSD	☐					X	
2	JOF-SeS-FB01-20201001	~~AOI1~~			NA	NA	AQ	G	FB	10/1/2020	1030	23	None	☐						X
3	JOF-SeS-EB01-20201001	~~AOI1~~			NA	NA	AQ	G	EB	10/1/2020	1040	23	None	☐						X
4	AOI01 (CR 1/8/21)													☐						
5	AOI01 (CR 1/8/21)													☐						
6	AOI01 (CR 1/8/21)													☐						
7														☐						
8														☐						
9														☐						
10														☐						
11														☐						
12														☐						
13														☐						

~~0.34~~ BJ 6/3/2021

BJ 6/9/2021

180-111757 Chain of Custody

Additional Comments/Special Instructions:

Additional volume collected should be used for laboratory duplicate analysis.

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Courtnae Ramser / Stantec /	10/1/20	1600		10/2/20	900

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
FedEx	Courtnae Ramser

Sample Receipt Conditions

Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?
Yes / No	Yes / No	Yes / No	Yes / No
Yes / No	Yes / No	Yes / No	Yes / No
Yes / No	Yes / No	Yes / No	Yes / No
Yes / No	Yes / No	Yes / No	Yes / No

Form TVA 30067A

180-111757 Waybill

eurofins | Environment Testing TestAmerica

Part # 1594TD-434 RIT2 EXP 06/21

ORIGIN ID:PHDA (330) 966-9677
COURTNAE RAMSER
STANTEC
1216 W END STATION DRIVE

LEBANON, TN 37078
UNITED STATES US

SHIP DATE: 22SEP20
ACTWGT: 10.00 LB MAN
CAD: 0562065/CAFE3406

TO SAMPLE RECEIVING
TESTAMERICA PITTSBURGH
301 ALPHA DRIVE
RIDC PARK
PITTSBURGH PA 15238

(412) 963-7058
REF: S180-64217

RMA:

FedEx Express

FedEx

TRK# 0221 9235 2418 7218

FRI - 02 OCT AA
PRIORITY OVERNIGHT

15238
PA-US
PIT

XH AGCA

Uncorrected temp 15 °C
Thermometer ID 14
CF 0 Initials B
PT-WI-SR-001 effective 11/8/18

FID: 3651983 010ct2020 MQYA 56DG2/A27E/05A2

Eurofins TestAmerica, Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rumble, Jennifer L	Carrier Tracking No(s):	COC No: 180-414058.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jennifer.Rumble@Eurofinset.com	State of Origin: Tennessee	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 180-111757-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 10/14/2020			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: JOF_SES_20201001_1B	Project #: 18020000			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	901.1_Ra/Dry_Grind Positive Combined Radium-226/228	901.1_Ra/Fill_Geo_21 Positive Combined Radium-226/228	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
JOF-SES-01-20201001 ~ AOI1 (180-111757-1)	10/1/20	12:00 Central		Solid			X		3	TVA - Batch alone. Contact PM if insufficient volume for Tuna
JOF-SES-01-20201001 ~ AOI1 (180-111757-1DU)	10/1/20	12:00 Central	DU	Solid			X		3	TVA - Batch alone. Contact PM if insufficient volume for Tuna
JOF-SES-FB01-20201001 ~ AOI1 (180-111757-2)	10/1/20	10:30 Central		Water				X	3	TVA - Batch alone
JOF-SES-EB01-20201001 ~ AOI1 (180-111757-3)	10/1/20	10:40 Central		Water				X	3	TVA - Batch alone

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	10/6/20 1500	Eurofins	FED EX		
Relinquished by: FED EX	Date/Time:	Company	Received by: Micha Konnuhing	Date/Time: OCT 07 2020 09:19	Company ETA SR
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 180-111757-1

Login Number: 111757
List Number: 1
Creator: Say, Thomas C

List Source: Eurofins TestAmerica, Pittsburgh

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

Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 180-111757-1

Login Number: 111757
List Number: 2
Creator: Korrinhizer, Micha L

List Source: Eurofins TestAmerica, St. Louis
List Creation: 10/08/20 07:15 PM

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

Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 180-111757-1

Login Number: 111757
List Number: 3
Creator: Korrinhizer, Micha L

List Source: Eurofins TestAmerica, St. Louis
List Creation: 10/08/20 07:16 PM

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