ERM

0519829 JLS

STANDARD LEVEL IV
REPORT OF ANALYSIS

WORK ORDER #20-08019-OR

September 15, 2020

EBERLINE ANALYTICAL/OAK RIDGE LABORATORY
OAK RIDGE, TN

TABLE OF CONTENTS

Eberline Services – Oak Ridge Laboratory

LABORATORY DATA SUPPORT CHECKLIST

MP-001-3

Eberline Services Work Order # 20-08019

The checklist items listed below are to be initialed by appropriate staff upon completion/verification.

Date for Partial	Initials	Date	Initials	Checklist Items
		8/4/20	JBS	Sample Log-In
		8/17/20		Data Compilation
		8-19-20	MH	First Technical Data Review
		8/25/20	CB	Second Technical Data Review
		9/10/20		Data Entry/Electronic Deliverable
		9/10/20		Case Narrative
		9/10/20	EJT	Electronic Deliverable Proof
		9/11/20		Samples Analyzed within Holding Time Yes? [✓] No? [ ]
		9/14/20	CB	QA/QC Review
		9/15/20	EJT	Client in Possession of Data Electronic or Hard Copy
				Invoiced by Laboratory

Technical/Clerical Corrections, Signatures Needed, Problems, Etc	Date/Initials

Date package approved by: _____ 9/15/20

Laboratory Manager Date

Copy No. _____

SECTION I

CHAIN OF CUSTODY
& pH CHECK

EBERLINE SERVICES — Richmond Laboratory

Chain of Custody

CLIENT: ERM

ADDRESS: 3838 N. Causeway Blvd
Metairie, LA 70001

PROJECT: JLS 0519829

PURCHASE ORDER NO. _____

SAMPLERS SIGNATURE: Judy Stuart

DATE 8/3/20 PAGE 1 OF 1

TAT (IN DAYS) STD

REC'D AUG 04 2020

20-0801 9

SAMPLE NO.	DATE	TIME	LOCATION	PARAMETERS: Ra 226/228	PARAMETERS: STAT	SAMPLE TYPE OR MATRIX	# CONTAINERS	OBSERVATIONS, COMMENTS, VOLUMES, SPECIAL OR ADDITIONAL TEST
4	7/30/20	16:25	JLS-11	X	X	GW	1	

1) RELINQUISHED BY / DATE: 8/3/20
COMPANY: ERM

2) RECEIVED BY / DATE: FedEx 8/30/20
COMPANY:

3) RELINQUISHED BY / DATE: Fedex
COMPANY:

4) RECEIVED BY / DATE: Randolph Spencer 8-4-20
COMPANY: Eberline 0940

5) RELINQUISHED BY / DATE:
COMPANY:

6) RECEIVED BY / DATE:
COMPANY:

7) RELINQUISHED BY / DATE:
COMPANY:

8) RECEIVED BY / DATE:
COMPANY:

TOTAL NO. OF CONTAINERS: 1

METHOD OF SHIPMENT: FedEx

SPECIAL SHIPMENT-HANDLING, STORAGE REQUIREMENTS, OR POSSIBLE HAZARDS

0006

2030 Wright Avenue P.O. Box 4040 Richmond, CA 94804-0040 (510) 235-2633 FAx No. (510) 235-0438

EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	20-08019
		Lab Deadline	8/17/2020
		Analysis	Ra226 - Level 4
		Sample Matrix	Water

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	20	DD1.3

	Location (circle one)					Initials	Date
Received by	**Sample Storage**	Rough Prep	Prep	Separations	Count Room	[illegible]	8/6/20 2215
Relinquished by	Sample Storage	Rough Prep	**Prep**	Separations	Count Room	[illegible]	8/[illegible] 2330
Received by	Sample Storage	Rough Prep	Prep	**Separations**	Count Room	AY	8/10/20 0710
Relinquished by	Sample Storage	Rough Prep	Prep	**Separations**	Count Room	AY	8/11/20 0835
Received by	Sample Storage	Rough Prep	Prep	Separations	**Count Room**	AG	8/11/20 0835
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	**Count Room**	YCB	8/11/20 1423
Received by	**Sample Storage**	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

EBERLINE SERVICES
Oak Ridge Laboratory

Internal Chain of Custody

Work Order #	**20-08019**
Lab Deadline	**8/17/2020**
Analysis	**Ra228 - Level 4**
Sample Matrix	**Water**

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	20	DD1.3

	Location (circle one)					Initials	Date
Received by	(Sample Storage)	Rough Prep	Prep	Separations	Count Room	[illegible]	8/6/2020 0915
Relinquished by	Sample Storage	Rough Prep	(Prep)	Separations	Count Room	[illegible]	8/9/2020
Received by	Sample Storage	Rough Prep	Prep	(Separations)	Count Room	AY	8/10/20 0710
Relinquished by	Sample Storage	Rough Prep	Prep	(Separations)	Count Room	AY	8/11/20 0835
Received by	Sample Storage	Rough Prep	Prep	Separations	(Count Room)	ICB	8/11/20 0835
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	(Count Room)	ICB	8/11/20 1423
Received by	Sample Storage	Rough Prep	Prep	(Separations)	Count Room	AY	8/11/20/1500
Relinquished by	Sample Storage	Rough Prep	Prep	(Separations)	Count Room	AY	8/12/20 1200
Received by	Sample Storage	Rough Prep	Prep	Separations	(Count Room)	ICB	8/12/20 1202
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	(Count Room)	ICB	8/12/20 1405
Received by	(Sample Storage)	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES
Oak Ridge Laboratory

Internal Chain of Custody

Work Order #	20-08019
Lab Deadline	8/6/2020
Analysis	TDS - Level 4
Sample Matrix	Water

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	20	DD1.3

	Location (circle one)					Initials	Date
Received by	(Sample Storage)	(Rough Prep)	Prep	Separations	Count Room 1130	kenysey	8-5-20
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	MLL	5AUG20 2345
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES

Sample Receiving Report
(Volumes, pH, & CPM)

Internal Work Order
20-08019
Received By
RSPENCER

FR	ClientID	# Btls	Comments	Matrix	Storage	Rec Vol Ttl	CPM Max
01	LCS	0		WA	DD1.3		
02	BLANK	0		WA	DD1.3		
03	DUP	0		WA	DD1.3		
04	JLS-11	1		WA	DD1.3	3.76	20
			Container Number	pH Orig	pH Final	Volume (L)	CPM
			1	7	7	3.7600	20

VwyF 8/4/20

Received by: Randolph Spencer Date: 8-4-20

SECTION II

SAMPLE ACKNOWLEDGEMENT

Client Name	Contract/PO	Project Type	Date Received	Required Turnaround Days	Eberline Services Work Order
Michael Pisani & Associates, Inc.	0519829	Environmental	08/04/2020	21	20-08019
Project Name	**Client WO**	**Sample Disp**	**Lab Deadline**	**Internal Deadline**	**Client Deadline**
519829	JLS	W	08/17/2020	08/24/2020	08/25/2020

Internal ID	Client ID	Sample Date	Matrix	Storage	Ra226	Ra228	TDS																						Ttl
01	LCS	08/04/20	WA	DD1.3	X	X	X																						3
02	BLANK	08/04/20	WA	DD1.3	X	X	X																						3
03	DUP	08/04/20	WA	DD1.3	X	X	X																						3
04	JLS-11	07/30/20 16:25	WA	DD1.3	X	X	X																						3
																													0
																													0
																													0
																													0
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																													0
																													0
																													0
																													0
																													0
																													0
				Totals Per Analysis (non QA samples)	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

EBERLINE SERVICES

Sample Log In Report

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830

Voice: (865) 481-0683
Fax: (865) 483-4621

Invoice	
	Accounts Payable
	ERM
	3838 N Causeway Blvd Suite 3000
	Metairie, LA 70002
Voice	504-582-2468
Fax	504-407-2098
Contact	Jody Shugart
Voice	504-582-2468
Fax	

Report Data	
	Jody Shugart
	ERM
	3838 N Causeway Blvd, Suite 3000
	Metairie, LA 70002
Voice	504-582-2468
Fax	

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Eberline Services – Oak Ridge Laboratory

SAMPLE RECEIPT CHECKLIST
MP-001-2

WORK ORDER # 20-08019

SAMPLE MATRIX/MATRICES: (CIRCLE ONE OR BOTH)

(AQUEOUS) NON-AQUEOUS

(CIRCLE EITHER YES, NO, OR N/A)

WERE SAMPLES:

Received in good condition?	(Y)	N	
If aqueous, properly preserved	(Y)	N	N/A

WERE CHAIN OF CUSTODY SEALS:

Present on outside of package?	(Y)	N
Unbroken on outside of package?	(Y)	N
Present on samples?	(Y)	N
Unbroken on samples?	(Y)	N
Was chain of custody present upon sample receipt?	(Y)	N

IF THE RESPONSE TO ANY OF THE ABOVE IS **NO**, A DISCREPANT SAMPLE RECEIPT REPORT (DSR) HAS BEEN ISSUED.

REMARKS: _____

SIGNATURE: Randolph Spencer DATE: 8-4-20

SECTION III

CASE NARRATIVE

EBERLINE ANALYTICAL

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD
OAK RIDGE, TENNESSEE 37830
PHONE (865) 481-0683
FAX (865) 483-4621

EBS-OR-47639

September 15, 2020

Jody Shugart
ERM
3838 N Causeway Blvd #3000
Metairie, LA 70002

CASE NARRATIVE
Work Order # 20-08019-OR

SAMPLE RECEIPT

This work order contains one water sample received 08/04/2020. Sample was analyzed for Radium-226/228 and Total Dissolved Solids.

CLIENT ID	LAB ID
JLS-11	20-08019-04

ANALYTICAL METHODS

Radium-226 was analyzed using EPA Method 903.0 Modified. Radium-228 was analyzed using EPA Method 904.0. Total Dissolved Solids were performed using Standard Methods 2540C.

ANALYTICAL RESULTS

Combined Standard Uncertainty is reported at 1-sigma value.

Minimum Detectable Activity (MDA) values for data represented in this report are sample-specific. MDA measurements are determined based on factors and conditions including instrument settings, aliquot size and matrix type.

RADIUM-226

Sample was prepared by removing a representative aliquot followed by mixed acid digestions as appropriate. This was followed by precipitations of Radium/Barium Sulfate. Precipitates were dissolved in alkaline EDTA. Radium was selectively precipitated and mounted on micro-porous filter media. Sample was counted by alpha spectroscopy using an energy specific region of interest for Radium-226. The final result was corrected for inherent self-absorption from elemental Barium. Chemical recovery was calculated using a Barium-133 tracer, which was determined by HPGe gamma spectroscopy.

Sample demonstrated acceptable results for all Radium-226 analyses. Chemical recovery was acceptable for all samples. The Radium-226 method blank demonstrated an acceptable result. Results for the Radium-226 duplicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Radium-226 laboratory control sample demonstrated an acceptable percent recovery.

ANALYTICAL RESULTS CONTINUED

RADIUM-228

Following alpha spectroscopy analysis of Radium-226, Barium/Radium Sulfate precipitates were redissolved and allowed for sufficient ingrowth of the Actinium-228 daughter. After ingrowth, Actinium-228 was selectively precipitated. Precipitates were filtered and beta emissions for Actinium-228 were counted on a gas proportional counter. Chemical recovery was determined using a Barium-133 tracer, the activity of which was determined by HPGe gamma spectroscopy and an elemental Yttrium carrier by gravimetric measurements. The product of these two recoveries was used to calculate chemical yield.

Sample demonstrated acceptable results for all Radium-228 analyses. Chemical recovery was acceptable for all samples. The Radium-228 method blank demonstrated an acceptable result. Results for the Radium-228 duplicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Radium-228 laboratory control sample demonstrated an acceptable percent recovery.

TOTAL DISSOLVED SOLIDS (TDS)

A volumetric aliquot of the sample was filtered through 0.45µm filter media into a tared 250 ml beaker. Sample was dried on a hot plate and allowed to cool. The TDS content was determined by reweighing the tared beaker.

Sample demonstrated a Total Dissolved Solids content of 68,247.0 mg/L.

CERTIFICATION OF ACCURACY

I certify that this data report complies with the terms and conditions of the Purchase Order, 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 cognizant project manager or his/her designee to be accurate as verified by the following signature.

M.R. McDougall
Laboratory Manager

Date: 9/15/2020

Eberline Analytical wants and encourages your feedback regarding our performance providing radioanalytical services. Please visit http://eberlineanalytical.com/ to provide us with feedback on our services.

SECTION IV

ANALYTICAL RESULTS SUMMARY

Eberline Analytical
Final Report of Analysis

Report To:
Jody Shugart
ERM
3838 N Causeway Blvd, Suite 3000
Metairie, LA 70002

Work Order Details:

SDG:	20-08019
Project:	0519829 JLS
Analysis Category:	ENVIRONMENTAL
Sample Matrix:	WA

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Report Units
20-08019-01	LCS	KNOWN	08/04/20 00:00	8/4/2020	8/11/2020	20-08019	Radium-226	EPA 903.0 Modified	1.01E+01	4.64E-01			pCi/l
20-08019-01	LCS	SPIKE	08/04/20 00:00	8/4/2020	8/11/2020	20-08019	Radium-226	EPA 903.0 Modified	1.05E+01	1.37E+00	2.60E+00	3.46E-01	pCi/l
20-08019-02	MBL	BLANK	08/04/20 00:00	8/4/2020	8/11/2020	20-08019	Radium-226	EPA 903.0 Modified	-8.98E-03	1.29E-01	1.29E-01	3.42E-01	pCi/l
20-08019-03	DUP	JLS-11	07/30/20 16:25	8/4/2020	8/11/2020	20-08019	Radium-226	EPA 903.0 Modified	5.03E+00	1.30E+00	1.68E+00	6.42E-01	pCi/l
20-08019-04	DO	JLS-11	07/30/20 16:25	8/4/2020	8/11/2020	20-08019	Radium-226	EPA 903.0 Modified	4.31E+00	7.99E-01	1.21E+00	2.85E-01	pCi/l
20-08019-01	LCS	KNOWN	08/04/20 00:00	8/4/2020	8/12/2020	20-08019	Radium-228	EPA 904.0	9.21E+00	4.70E-01			pCi/l
20-08019-01	LCS	SPIKE	08/04/20 00:00	8/4/2020	8/12/2020	20-08019	Radium-228	EPA 904.0	8.01E+00	7.31E-01	1.95E+00	8.91E-01	pCi/l
20-08019-02	MBL	BLANK	08/04/20 00:00	8/4/2020	8/12/2020	20-08019	Radium-228	EPA 904.0	2.13E-01	4.53E-01	4.55E-01	9.43E-01	pCi/l
20-08019-03	DUP	JLS-11	07/30/20 16:25	8/4/2020	8/12/2020	20-08019	Radium-228	EPA 904.0	5.01E+01	2.46E+00	1.16E+01	1.92E+00	pCi/l
20-08019-04	DO	JLS-11	07/30/20 16:25	8/4/2020	8/12/2020	20-08019	Radium-228	EPA 904.0	3.27E+01	1.21E+00	7.50E+00	7.72E-01	pCi/l
20-08019-04	TRG	JLS-11	07/30/20 16:25	8/4/2020	8/5/2020	20-08019	TDS	SM2540C	6.82E+04				mg/l

0017

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original

SECTION V

ANALYTICAL STANDARD

Ba-6
(f 6a)

National Institute of Standards & Technology

Certificate

ORIGINAL

Standard Reference Material 4251C
Barium-133 Radioactivity Standard

ORIGINAL

This Standard Reference Material (SRM) consists of radioactive barium-133 chloride, non-radioactive barium chloride, and hydrochloric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of ionization chambers and solid-state gamma-ray spectrometry systems.

Radiological Hazard

The SRM ampoule contains barium-133 with a total activity of approximately 2.5 MBq. Barium-133 decays by electron capture and during the decay process X-rays and gamma rays with energies from 4 to 400 keV are emitted. Most of these photons escape from the SRM ampoule and can represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]*. Appropriate shielding and/or distance should be used to minimize personnel exposure. The SRM should be used only by persons qualified to handle radioactive material.

Chemical Hazard

The SRM ampoule contains hydrochloric acid (HCl) with a concentration of 1 mole per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

Storage and Handling

The SRM should be stored and used at a temperature between 5 and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least June 2004.

The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) both because of the radioactivity and because of the strong acid.

Preparation

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, J.M.R. Hutchinson, Group Leader. The overall technical direction and physical measurements leading to certification were provided by L.L. Lucas of the Radioactivity Group and D.B. Golas, Nuclear Energy Institute Research Associate.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by N.M. Trahey.

Gaithersburg, Maryland 20899
October 1994

Thomas E. Gills, Chief
Standard Reference Materials Program

*Notes and references are on pages 5 and 6.

EBERLINE SERVICES

QUALITY CONTROL PROGRAM
QCP-009

Rev.8; 11/10/03
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION RECERTIFICATION

QCP-009-1-A

Solution Reference #	NIST SRM4251C	Date	4/23/20
		Solution #	Ba-6a

Principal Radionuclide	Half Life, Years	Half Life, Days
^{133}Ba	1.048E+01	3.828E+03

Radionuclide of Interest	^{133}Ba	Reference Date	9/1/1993 0:00
Parent Solution Conc.	1.48E+05 dpm/ml		

Chemical Composition of Standard Solution
$^{133}BaCl_2$ in 1M HCl

Dilution Instructions:

Dilution Solvent Used 1M HCl

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution:	25.0000	ml
Total Activity:	3.6950E+06	dpm
Final Volume:	1000.00	ml

Final Activity Concentration: 3.6950E+03 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

NOTES:

Expiration Date: April 23, 2021

Verified & Approved By _____ Date: 4/23/20

QC Approval _____ Date: 4/23/20

Ra-5

QA/QC REVIEWED
Date 2/8/94 Initials MT

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

Radionuclide:	Ra-226	Customer:	TMA EBERLINE
Half Life:	1600 ± 7 years	P.O.No.:	VH1888
Catalog No.:	7226	Reference Date:	February 1 1994 12:00 PST.
Source No.:	453-26	Contained Radioactivity: (Ra-226)	1.001 μCi.
		Contained Radioactivity: (Ra-226)	37.0 kBq.

Description of Solution

a. Mass of solution:	5.1864 g (in a 5 ml Flame Sealed Ampoule)	
b. Chemical form:	$Ra(NO_3)_2$ in 1 N HNO_3	
c. Carrier content:	None added	
d. Density:	1.0318	g/ml @ 20°C.

Radioimpurities: None detected(other than daughters)

Radioactive Daughters
Rn-222, Po-218, At-218, Pb-214, Bi-214, Po-214, Tl-210, Pb-210, Bi-210, Po-210 and Tl-206.

Radionuclide Concentration

(Ra-226) 0.1929 μCi/g.

Method of Calibration

Weighed aliquots of the solution were assayed using gamma spectrometry:
Energy peak(s) integrated under: 186 keV.
Branching ratio(s) used: 0.0351 gamma rays per decay.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration:	±3.4%
b. Random uncertainty in assay:	±3.1%
c. Random uncertainty in weighing(s):	±0.2%
d. Total uncertainty at the 99% confidence level:	±4.6%

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Leak Test(s)

See reverse side for Leak Test(s) applied to this source.

Notes

1. Nuclear data were taken from "Table of Radioactive Isotopes", edited by Virginia S. Shirley, 1986.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).

Ana U. Kuen
QUALITY CONTROL

Feb. 3, 1994
Date Signed

ISOTOPE PRODUCTS LABORATORIES
1800 North Keystone Street
Burbank, California 91504
(818) 843 - 7000

EBERLINE SERVICES

QUALITY CONTROL PROGRAM
MP 009

Rev.8; 11/01/03
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE SOLUTIONS
PRIMARY DILUTION RECERTIFICATION
MP 009

		CURRENT DATE	8/28/2020 0:00
SOLUTION REFERENCE #	IPL 453-26	**SOLUTION #**	Ra-5

Principal Radionuclide	**Half Life, Years**	**Half Life, Days**
^{226}Radium	1.600E+03	5.844E+05

Radionuclide	^{226}Radium	**Reference Date**	2/1/1994 0:00
Certified Activity	1.001E+00 µCi		
Certified Concentration		µCi per gram	

Ampoule /Solution Gross		**Weight, Grams**
Empty Ampoule		**Weight, Grams**
Solution Net		**Weight, Grams**
Total Activity in Ampoule	1.0010	µCi

Chemical Composition of Standard Solution
$^{226}Ra(NO_3)_2$ in 1M HNO_3

Dilution Instructions: **Dilution Solvent Used** 1M HNO_3

Dilute to a volume of 1000.00 **milliliters**

Certified Total Activity of 1.0010 µCi **Which Equals** 2.222E+06 **dpm at the date listed above**

And after dilution the activity of this solution is 2.222E+03 **dpm/ml**

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: August 28, 2021

Verified & Approved By _____ Date: 8/28/2020

QC Approval _____ Date: 8/28/20

EBERLINE SERVICES

QUALITY CONTROL PROGRAM
MP 009

Rev.8; 11/01/03
Title: **Radioactive Reference Standards Solutions & Records**

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION RECERTIFICATION

	MP 009	Date	8/28/2020 0:00
Solution Reference #	IPL-453-26	Solution #	Ra-5b

Principal Radionuclide	Half Life, Years	Half Life, Days
^{226}Radium	1.600E+03	5.844E+05

Radionuclide of Interest	^{226}Radium	Reference Date	2/1/1994 0:00
Parent Solution Conc.	2.22E+03 dpm/ml		

Chemical Composition of Standard Solution
$^{226}Ra(NO_3)_2$ in 1M HNO_3

Dilution Instructions: **Dilution Solvent Used** 1M HNO_3

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution:	20.0000 ml	Final Activity Concentration:	4.4440E+01 dpm/ml
Total Activity:	4.4440E+04 dpm		
Final Volume:	1000.00 ml		

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

NOTES:

Expiration Date: 28-Aug-21

Verified & Approved By _____ Date: 8/28/2020 0:00

QC Approval _____ Date: 8/28/20

ANALYTICS #411 Rec'd 2/15/06 R Brenton

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 • U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

Ra 228

72325-207

Ra-228 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Ra-228
ACTIVITY (dps):	4.022 E3
HALF-LIFE:	5.75 years
CALIBRATION DATE:	February 10, 2006 12:00 EST
RELATIIVE EXPANDED UNCERTAINTY (k=2):	4.0%

Impurities: γ-impurities <0.1%

5.10721 grams 0.1M HCl solution with 50 µg/g Ba carrier.

P O NUMBER 00003181, Item 1

SOURCE PREPARED BY: M Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED: 2-13-06

EBERLINE SERVICES

QUALITY CONTROL PROGRAM

MP-009

Rev.8; 1/10/03
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE SOLUTIONS
RECERTIFICATION
MP 009

		CURRENT DATE	1/15/2020 0:00
SOLUTION REFERENCE #	Analytics 7235-207	**SOLUTION #**	Ra-12

Principal Radionuclide	**Half Life, Years**	**Half Life, Days**
^{228}Ra	5.750E+00	2.100E+03

Radionuclide	^{228}Ra		
Certified Activity	1.087E-01	µCi	**Reference Date** 2/10/2006 0:00
Certified Concentration		µCi per gram	

Ampoule /Solution Gross	9.0741	**Weight, Grams**
Empty Ampoule	3.9858	**Weight, Grams**
Solution Net	5.0883	**Weight, Grams**
Total Activity in Ampoule	0.1087	µCi

Chemical Composition of Standard Solution

$^{228}Ra(NO_3)_2$ in 0.5 M HCl

Dilution Instructions: **Dilution Solvent Used** 0.5 M HCl

Dilute to a volume of 991.00 **Kg**

Certified Total Activity of 0.1087 µCi **Which Equals** 2.413E+05 **dpm at the date listed above**

And after dilution the activity of this solution is **2.435E+02** **dpm/ml**

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: January 15, 2021

Recertified By _____ Date: 1/15/20

QC Approval _____ Date: 1/15/20

SECTION VI

QUALITY CONTROL SAMPLE RESULTS SUMMARY

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
20-08019	Ra226	1	pCi	l	Michael Pisani & Associates, Inc.

Laboratory Control Sample

Analyte		LCS Measured	CSU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	CSU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
RA-226		103.72%	24.87%	100.00%	4.60%	1.01E+01	4.64E-01	1.05E+01	2.60E+00	Ra-5b	4.39E+01	4.60E+00	5.10E-01

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS CSU	Sample Result	Sample CSU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

Analyte	Normalized Difference	RPD	Original Result	Original CSU	Replicate Result	Replicate CSU
RA-226	0.68	15.35	4.31E+00	1.21E+00	5.03E+00	1.68E+00

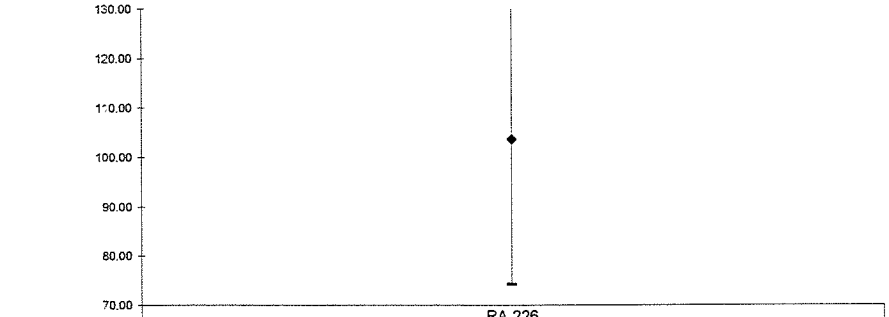
QC Summary

LCS Relative Bias	LCS % R		MS % R	MS ND	Rep RPD	Rep ND
1.04	OK				OK	OK

0027

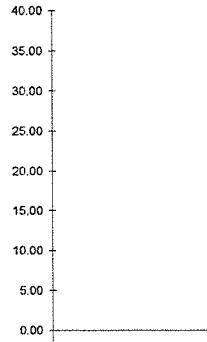
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
20-08019	Ra226	1	pCi	I	Michael Pisani & Associates, Inc.

LCS % Recovery



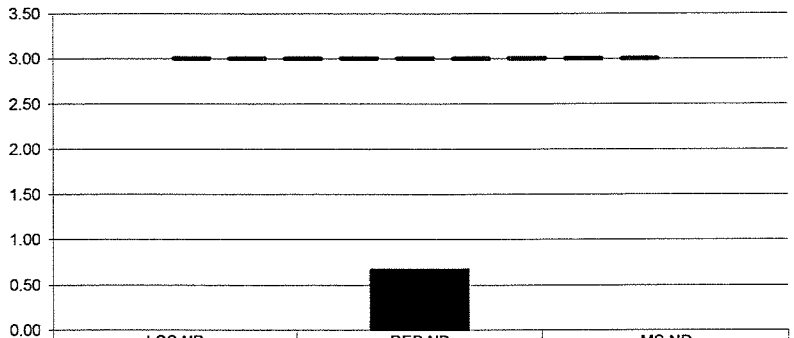
	RA-226
Lower Error	74.25
Upper Error	133.20
%R	103.72
LCL	75
Mean	100
UCL	125

Replicate Sample RPD



	RA-226
Lower Error	17.73
Upper Error	12.98
RPD	15.35
CL	35

Normalized Difference



	LCS ND	REP ND	MS ND
RA-226	0.00	0.68	0.00
UCL	3	3	3

No Matrix Spike

0028

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
20-08019	Ra228	1	pCi	l	Michael Pisani & Associates, Inc.

Laboratory Control Sample

Analyte		LCS Measured	CSU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	CSU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
RA-228		86.92%	24.41%	100.00%	5.10%	9.21E+00	4.70E-01	8.01E+00	1.95E+00	Ra-12	4.24E+01	5.10E+00	4.82E-01

Matrix Spike

Analyte	*Normalized Difference*	*MS Actual % Rec*	*Expected MS Result*	*Expected MS Uncert*	*Actual MS Result*	*Actual MS CSU*	*Sample Result*	*Sample CSU*	*Sample Aliquot*	*Standard ID*	*Standard ACT (dpm)*	*Standard Error %*	*Standard Added (g)*

Replicate Sample

Analyte	*Normalized Difference*	*RPD*	*Original Result*	*Original CSU*	*Replicate Result*	*Replicate CSU*
RA-228	2.47	42.15	3.27E+01	7.50E+00	5.01E+01	1.16E+01

QC Summary

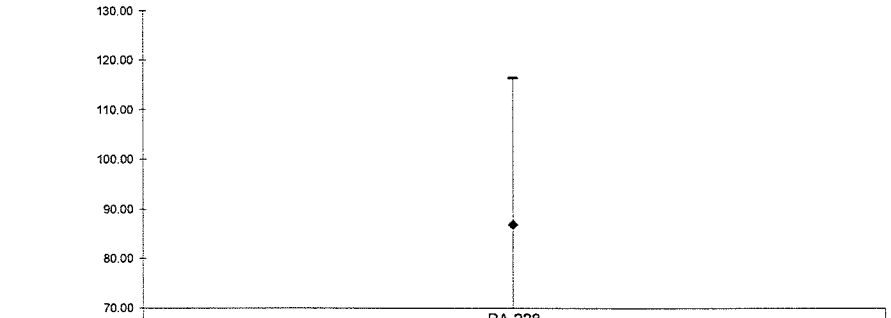
LCS Relative Bias	*LCS % R*		*MS % R*	*MS ND*	*Rep RPD*	*Rep ND*
0.87	OK				INV	OK

0029

Version

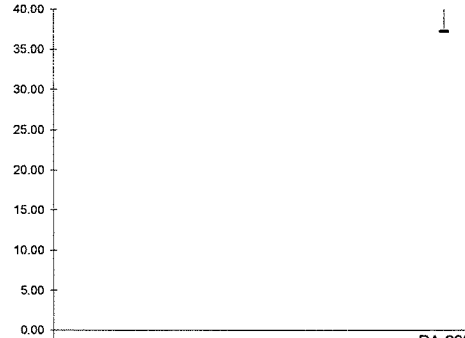
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
20-08019	Ra228	1	pCi	I	Michael Pisani & Associates, Inc.

LCS % Recovery



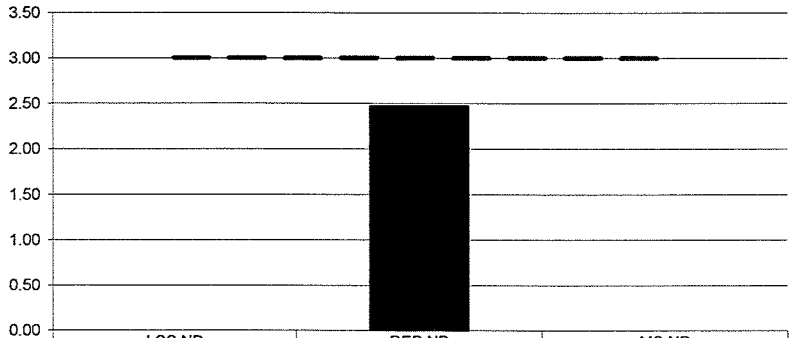
	RA-228
Lower Error	57.41
Upper Error	116.43
%R	86.92
LCL	75
Mean	100
UCL	125

Replicate Sample RPD



	RA-228
Lower Error	47.02
Upper Error	37.29
RPD	42.15
CL	35

Normalized Difference



	LCS ND	REP ND	MS ND
RA-228	0.00	2.47	0.00
UCL	3	3	3

No Matrix Spike

0030

SECTION VII

LABORATORY TECHNICIAN'S NOTES

RA-226 NOTES

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	20-08019
Analysis Code	Ra226
Run Number	1

#	Date	Dept	User	Notes
1	08/06/20 23:53	PREP	JHARVEY	ALIQUOTED AND ADDED SPIKES AND TRACERS- PH'D SAMPLES- PRECIPITATED WITH BA AND PB CARRIERS AND AMMONIUM SULFATE- DECANTED SAMPLES AND CENTRIFUGED- SUBMITTED RADIUM PRECIP TO SEPARATIONS
2	08/07/20 00:30	PREP	JHARVEY	SAMPLE WAS FILTERED

jharvey
8/7/20

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	20-08019
Analysis Code	Ra226
Run Number	1

#	Date	Dept	User	Notes
1	08/06/20 23:53	PREP	JHARVEY	ALIQUOTED AND ADDED SPIKES AND TRACERS- PH'D SAMPLES- PRECIPITATED WITH BA AND PB CARRIERS AND AMMONIUM SULFATE- DECANTED SAMPLES AND CENTRIFUGED- SUBMITTED RADIUM PRECIP TO SEPARATIONS
2	08/07/20 00:30	PREP	JHARVEY	SAMPLE WAS FILTERED
3	08/11/20 08:32	CHEM	AYARBER	ADDED EDTA TO SAMPLES AND LET SIT. ADDED AMMONIUM SULFATE AND ACETIC ACID TO SAMPLES. FILTERED ONTO TARED FILTER PAPERS, LET DRY UNDER HEAT LAMP, REWEIGHED, AND SUBMITTED TO COUNT.

Amanda Yarber 8/11/20

EBERLINE SERVICES

Reagents Used in an Analysis

Internal Work Order: 20-08019

Analysis Code: Ra226

Run: 1

Reagent ID	Reagent Name	Reagent Concentration	Analyst ID	Date Recorded
022002P	Ammonium Hydroxide	Reagent Grade	JHARVEY	8/6/2020
022142D02	Ammonium Sulfate	200 mg/ml	JHARVEY	8/6/2020
022147D03	Barium Carrier	1 mg/ml	JHARVEY	8/6/2020
022385D01	Lead Carrier	166 mg/ml	JHARVEY	8/6/2020
022264P	Nitric Acid	Reagent Grade	JHARVEY	8/6/2020
021557P	Acetic Acid	Reagent Grade	AYARBER	8/11/2020
021302D05	Ammonium Sulfate	200 mg/ml	AYARBER	8/11/2020
022266S	EDTA	0.25M	AYARBER	8/11/2020

Alpha 1

Date	Sample #	Client	Load time	Count time	Analysis	Tech
8/5/20	Daily Pulser	Lab	0400	10 min	NA	ICP
8/5/20	20071034(1-4)	UCOR	0800	2hr50min	PU	ICP
8/5/20	20080074(1-4)	USA	1057	2hr50—	Ra6	KB
8/6/20	Daily Pulser	Lab	0412	10 min	NA	ICP
8/6/20	20071098(1-3,7)	Unitech	0850	2hr50m	isoU	AG
8/6/20	20071304(1-4)	[illegible] N. American	1144	2hr50mins	Ra6	KB
8/6/20	20071034(1-4)	UCOR	1437	2hr50mins	Am243	KB
8/7/20	Daily ~~Blkg~~ Pulser	Lab	0407	10 min	NA	ICP
8/7/20	Cal Check(3-15)	Lab	0926	2hr30mins	NA	KB
8/7/20	20071344(3-6)	Phlebotechnics	1159	2hr50mins	PU	KB
8/7/20	System Blksd	Lab	1515	46.40 hrs	NA	KB
8/10/20	Daily Pulser	Lab	0415	10 min	NA	ICP
8/10/20	20080264(1-4)	USA	0812	2hr50min	Th	ICP
8/10/20	20080264(1-4)	USA	1108	2hr50min	Ra6	ICP
8/11/20	Daily Pulser	Lab	0315	10 min	NA	ICP
8/11/20	20071314 (1-4)	Feczor	0825	2hr50m	isoTh	AG
8/11/20	20080194 (1-4)	MPA	1120	2hr50m	Ra6	KB

RA-228 NOTES

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	20-08019
Analysis Code	Ra228
Run Number	1

#	Date	Dept	User	Notes
1	08/06/20 23:53	PREP	JHARVEY	ALIQUOTED AND ADDED SPIKES AND TRACERS- PH'D SAMPLES- PRECIPITATED WITH BA AND PB CARRIERS AND AMMONIUM SULFATE- DECANTED SAMPLES AND CENTRIFUGED- SUBMITTED RADIUM PRECIP TO SEPARATIONS
2	08/07/20 00:31	PREP	JHARVEY	SAMPLE WAS FILTERED

Red LB4110

Date	Sample #	Client	Load time	Count time	Analysis	Tech
8/10/20	20080025r(1)	UCOR	0618	30 min	Tot Sr	KP
8/10/20	20070925r(1-4)	TN Dept. of	1014	2 hrs	Tot Sr	KP
8/10/20	20070925Y(1-4)	TN Dept. of	1015	2 hrs	Sr^{90}	KP
8/10/20	20070915Y(1-8)	TN Dept Health	1341	2 hr	$Sr^{90/Y}$	KB
8/11/20	Daily Blgd/QC	Lab	0348/0329	1 hr/30 min	KB	KP
8/11/20	Cross Talk	Lab	0450	5 min	KB	KP
8/11/20	Cross Talk	Lab	0458	5 min	KB	KP
8/11/20	20070136NP(1-4)	UCOR	0834	10 min	β-Np	AG
8/11/20	20080226RA(1-4)	USA	1039	2 hrs	Ra	KB
8/11/20	20071130RA(1-4)	SGS N. America	1233	2 hrs	Ra	KB
8/12/20	Daily Blgd/QC	Lab	0453/0408	1 hr/30 min	KB	KP
8/12/20	Cross Talk	Lab	0615	5 min	KB	KP
8/12/20	Cross Talk	Lab	0623	5 min	KB	KP
8/12/20	20080018PB(1-4)	UCOR	0633	2 hrs	Pb	KP
8/12/20	20080194RA(1-4)	MPA	1203	2 hrs	Ra	KB

TDS NOTES

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	20-08019
Analysis Code	TDS
Run Number	1

#	Date	Dept	User	Notes
1	08/05/20 23:44	PREP	MHIGHTOWER	Filtered sample into tared beaker, dried, re-weighed

MK 5AUG20

SECTION VIII

ANALYTICAL DATA (RADIUM-226)

20-08019
Ra226
Run 1

Work Order	20-08019
Analysis Code	Ra226
Run	1
Date Received	8/4/2020
Lab Deadline	8/17/2020
Client	Michael Pisani & Associates, Inc.
Project	519829
Report Level	4
Activity Units	pCi
Aliquot Units	l
Matrix	WA
Method	EPA 903.0 Modified
Instrument Type	Alpha Spectroscopy
Radiometric Tracer	Ba-133
Radiometric Sol#	Ba-6a
Tracer Act (dpm/g)	418.72
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		08/04/20 00:00	1.0000E+00
02	MBL	BLANK		08/04/20 00:00	1.0000E+00
03	DUP	JLS-11	20	07/30/20 16:25	1.0000E+00
04	DO	JLS-11	20	07/30/20 16:25	1.0000E+00

0043

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

20-08019
Ra226
Run 1

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	2.1952	919.2	463.0	111.82		0.0198	0.0295	0.0097		110.00	3.00^	1.00
02	MBL	2.1956	919.3	435.0	105.04		0.0201	0.0288	0.0087		105.04	2.94	1.00
03	DUP	2.1940	918.7	182.0	43.98		0.0201	0.0273	0.0072		43.98	2.55	1.00
04	DO	2.1920	917.8	472.0	114.16		0.0201	0.0274	0.0073		110.00	2.58	1.00

0044

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			08/06/20 23:39	JHARVEY	08/10/20 07:20	AYARBER		
02	MBL			08/06/20 23:39	JHARVEY	08/10/20 07:20	AYARBER		
03	DUP			08/06/20 23:39	JHARVEY	08/11/20 07:30	AYARBER		
04	DO			08/06/20 23:39	JHARVEY	08/11/20 07:30	AYARBER		

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

Preliminary Data Report & Analytical Calculations

Work Order: 20-08019-Ra226-1

Client: Michael Pisani & Associates, Inc. 0046

Eberline Services Work Order: 20-08019

Analysis Code: Ra226

Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	RA-226	LCS	LCS	pCi/l	1.05E+01	1.37E+00	3.46E-01	1.01E+01	103.72	OK		OK	
02	RA-226	MBL	BLANK	pCi/l	-8.98E-03	1.29E-01	3.42E-01					OK	OK
03	RA-226	DUP	JLS-11	pCi/l	5.03E+00	1.30E+00	6.42E-01				OK	OK	
04	RA-226	DO	JLS-11	pCi/l	4.31E+00	7.99E-01	2.85E-01					OK	

Preliminary Data Report & Analytical Calculations

Work Order: 20-08019-Ra226-1

Client: Michael Pisani & Associates, Inc. 0047

Eberline Services Work Order: 20-08019

Analysis Code: Ra226

Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	RA-226	LCS	08/04/20 00:00	1.00E+00	100.00	0.00	110.00		8/10/2020 7:20	
02	RA-226	MBL	08/04/20 00:00	1.00E+00	100.00	0.00	105.04		8/10/2020 7:20	
03	RA-226	DUP	07/30/20 16:25	1.00E+00	43.98	0.00	43.98		8/11/2020 7:30	
04	RA-226	DO	07/30/20 16:25	1.00E+00	100.00	0.00	110.00		8/11/2020 7:30	

Client: Michael Pisani & Associates, Inc. 0048
Eberline Services Work Order: 20-08019
Analysis Code: Ra226
Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	RA-226	LCS	08/11/20 11:21		A_Spec	Alpha_004	170	2.42 E+02	1.30 E-02	18.4
02	RA-226	MBL	08/11/20 11:20		A_Spec	Alpha_010	170	-2.10 E-01	1.30 E-02	18.2
03	RA-226	DUP	08/11/20 11:20		A_Spec	Alpha_011	170	6.10 E+01	1.20 E-02	18.6
04	RA-226	DO	08/11/20 11:20		A_Spec	Alpha_012	170	1.18 E+02	1.20 E-02	18.7

Count Room Report
Client: Michael Pisani Associat

20-08019-Ra226-1 (pCi/l) in WA
Tracer ID: Ba-6a

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	08/04/20 00:00	1.0000	2.1952	919.1741	463.0000	111.82	3.00^	1.00
02	MBL	BLANK	08/04/20 00:00	1.0000	2.1956	919.3416	435.0000	105.04	2.94	1.00
03	DUP	JLS-11	07/30/20 16:25	1.0000	2.1940	918.6717	182.0000	43.98	2.55	1.00
04	DO	JLS-11	07/30/20 16:25	1.0000	2.1920	917.8342	472.0000	114.16	2.58	1.00

Eberline Services
Oak Ridge Laboratory

Spike and Tracer Worksheet

Printed: 8/6/2020 11:39 PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
20-08019	1	Ra226	8/6/2020 23:05	JHARVEY		

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	*Sol #*	*Activity dpm/g*	*Solution Date*	*Approx Addition*	*Volume Used (g)*	*Volume Used (g)*	*Volume Used (g)*	*Volume Used (g)*	*Known pCi*	*Error Estimate*	*Added pCi*	*Error Estimate*	*Known pCi*	*Error Estimate*	*Added pCi*	*Error Estimate*
Ra-226	Ra-5b	43.930	8/6/2020	0.500	0.5096				10.08	0.464	0.00	0.000	0.00	0.000	0.00	0.000

Tracers

fraction	*Isotope*	*Sol #*	*Activity dpm/g*	*Solution Date*	*Volume Used (g)*	*Approx Addition*
01	Ba-133	Ba-6a	418.720	8/6/2020	2.1952	2.4200
02	Ba-133	Ba-6a	418.720	8/6/2020	2.1956	2.4200
03	Ba-133	Ba-6a	418.720	8/6/2020	2.1940	2.4200
04	Ba-133	Ba-6a	418.720	8/6/2020	2.1920	2.4200

Balance Printer Tapes

Tracer

LCS

Matrix Spike

0050

Eberline Analytical
Oak Ridge Laboratory

Aliquot Worksheet

Printed: 8/6/2020 11:49 PM

Work Order	Run	Analysis Code	Rpt Units	Lab Deadline	Technician
20-08019	1	Ra226	liters	8/17/2020	JHARVEY

Lab Fraction	Michael Pisani & Associates, Inc. Client ID	Sample Type	Muffle Data	Dilution Data			Aliquot Data		MS Aliquot Data		H-3 Solids Only	
			Ratio Post/Pre	No of Dils	Dil Factor	Ratio	Aliquot	Net Equiv	Aliquot	Net Equiv	Water Added (ml)	H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	JLS-11	DUP					1.0000E+00	1.0000E+00				
04	JLS-11	DO					1.0000E+00	1.0000E+00				

Comments	

0051

Technician: _____ Date: 8/6/20

Gravimetric Worksheet

Work Order	Run	Analysis Code	Gravimetric Carrier	Carrier Conc (mg/ml)	Technician
20-08019	**1**	**Ra226**			**AYARBER**

TRetec	Michael Pisani & Associates, Inc.	Sample	Carrier Data	Filter Data			Gravimetric
Fraction	Client ID	Type	Carrier Added (ml)	Filter Tare (g)	Filter Final (g)	Filter Net (g)	% Recovery
01	LCS	LCS		0.0198	0.0295	**0.0097**	
02	BLANK	MBL		0.0201	0.0288	**0.0087**	
03	DUP	DUP		0.0201	0.0273	**0.0072**	
04	JLS-11	DO		0.0201	0.0274	**0.0073**	

0052

Technician: _____ Date: 8/11/20

KB 8/11/20

Apex-Alpha™

Sample Description: SPIKE
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00002778
Batch Identification: 2008019A-RA
Sample Identification: 01
Sample Geometry: Shelf 2
Procedure Description: Ra

Detector Name: Alpha_004
Chamber Serial Number:
Detector Serial Number: 4
Env. Background: System Bkgd 283252
Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
Generic Mult. Factor: 3.000E+000 Generic Div. Factor: 1.000E+000
Sample Date/Time: 8/11/2020 10:03:20 AM
Acquisition Date/Time: 8/11/2020 11:21:00 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.1838 +/- 0.0032 on 2/28/2020 2:49:49 PM
Effective Efficiency: 0.1838 +/- 0.0032

Control Certificate Name: Ra226_Ra-5b
Chem. Recov. of Control: RA-226 0.345709 +/- 0.025345
Peak Match Tolerance: 0.350 MeV

PEAK AREA REPORT

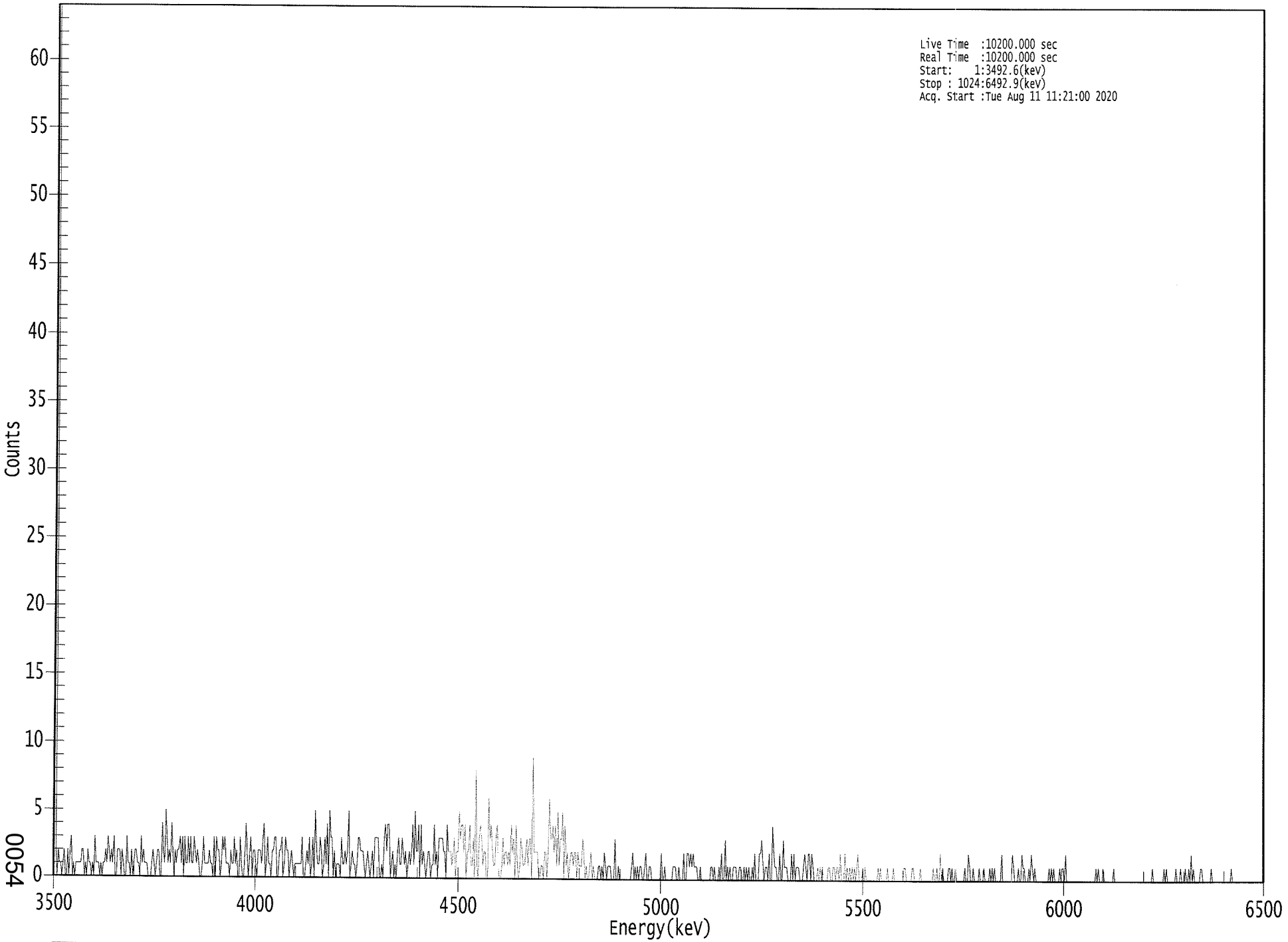
Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.506	33.13	35.16	1.87	0.00E+000	2.9
RA-226	4.635	241.79	12.67	2.21	0.00E+000	3.4

NUCLIDE ANALYSIS RESULTS

Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.959	5685.50*	1.51E+000 +/- 5.32E-001	3.44E-001 +/- 1.16E-002
RA-226	0.971	4785.00*	1.05E+001 +/- 1.37E+000	3.46E-001 +/- 1.16E-002

KG 8/11/20

0000277890.CNF



0054

ROI Type: 1

****
***** S P E C T R A L D A T A R E P O R T *****
****

Sample Title: 01

Elapsed Live time: 10200
Elapsed Real Time: 10200

Channel								
1:	10200	10200	2	0	2	1	1	0
9:	1	2	0	0	2	0	2	3
17:	0	1	0	1	1	1	1	1
25:	2	2	0	1	0	2	1	1
33:	0	1	0	3	1	1	1	0
41:	1	0	1	1	2	1	3	2
49:	1	2	1	3	0	0	2	2
57:	2	0	2	1	0	0	3	1
65:	1	0	2	0	1	2	2	1
73:	1	0	3	1	2	1	1	1
81:	0	0	0	1	2	1	0	1
89:	2	2	0	0	4	2	1	5
97:	3	1	2	1	4	2	0	2
105:	1	2	2	3	1	3	0	3
113:	1	1	3	1	3	1	1	3
121:	2	1	2	1	0	0	1	3
129:	1	1	1	1	2	1	1	0
137:	3	0	3	2	2	0	1	3
145:	2	3	1	1	1	0	2	1
153:	1	3	1	2	0	0	3	1
161:	0	0	2	4	1	0	2	3
169:	0	2	2	1	0	2	2	2
177:	1	3	4	0	1	3	1	1
185:	0	2	2	3	3	0	0	2
193:	2	3	0	1	3	2	2	0
201:	1	2	1	0	1	1	1	1
209:	1	1	3	0	0	1	2	1
217:	3	0	1	3	0	5	2	1
225:	1	3	2	0	1	3	1	4
233:	0	5	3	3	0	2	0	1
241:	1	1	0	3	1	1	2	1
249:	2	5	0	1	2	1	1	0
257:	1	3	3	2	2	2	1	0
265:	1	2	1	0	1	2	0	3
273:	3	3	3	0	0	1	0	3
281:	4	2	4	4	0	1	2	0
289:	1	0	2	3	1	1	3	2
297:	1	2	0	1	2	1	2	4
305:	1	5	2	2	4	0	4	1
313:	2	1	0	1	2	2	0	1
321:	1	4	1	2	0	3	3	3
329:	3	2	2	0	4	2	2	2
337:	1	2	3	0	2	2	5	3
345:	4	4	2	4	0	2	2	4
353:	1	1	3	0	8	1	0	3
361:	4	3	1	2	2	0	0	6

369:	3	4	2	1	1	3	4	1

Sample Title: 01

Channel								
377:	0	0	1	3	1	2	2	1
385:	2	1	4	2	3	0	4	1
393:	0	1	3	2	1	1	2	3
401:	1	3	3	0	9	2	2	2
409:	2	0	0	1	1	0	2	2
417:	0	2	6	3	3	4	2	4
425:	1	5	1	3	3	5	0	4
433:	1	2	0	1	2	2	1	2
441:	2	0	2	1	1	1	3	2
449:	0	1	0	0	1	2	0	1
457:	0	0	0	1	1	0	1	0
465:	2	1	0	1	1	1	0	0
473:	0	3	0	0	1	0	0	0
481:	0	0	0	0	0	0	0	1
489:	2	0	1	0	1	0	1	1
497:	0	0	1	2	0	0	1	1
505:	0	0	0	0	0	0	0	0
513:	2	0	0	1	0	0	0	0
521:	0	0	1	1	1	0	0	1
529:	0	0	0	2	0	0	2	2
537:	1	2	1	2	1	1	1	0
545:	0	1	0	0	0	0	0	0
553:	0	0	1	1	0	1	0	0
561:	0	1	0	2	0	0	3	0
569:	1	0	1	0	0	1	1	1
577:	0	0	1	1	0	0	1	0
585:	1	0	1	0	0	1	0	2
593:	0	0	0	2	2	3	1	0
601:	1	1	0	2	0	0	4	2
609:	1	1	0	0	2	0	0	3
617:	1	1	1	0	0	0	2	0
625:	2	0	1	1	1	0	0	0
633:	1	2	1	0	2	2	0	2
641:	1	0	0	0	1	0	1	0
649:	1	0	0	0	0	1	1	0
657:	0	1	1	0	1	1	0	2
665:	0	0	0	2	0	1	0	1
673:	0	1	0	1	0	1	2	0
681:	0	0	1	0	1	0	0	0
689:	0	0	0	0	0	0	0	1
697:	0	1	0	0	0	0	0	1
705:	0	0	0	0	1	0	0	0
713:	0	0	0	0	0	1	1	0
721:	0	0	0	0	1	1	0	0
729:	0	0	0	1	0	0	0	0
737:	0	0	0	0	0	0	1	0
745:	0	1	0	0	2	0	1	0
753:	0	0	0	1	1	0	1	0
761:	0	1	0	0	0	0	0	0
769:	0	1	0	0	2	1	0	0
777:	1	0	0	0	0	1	0	0
785:	0	1	0	0	0	0	1	0
793:	1	0	1	0	0	0	0	0

801:	2	0	0	0	0	0	0	0

Sample Title: 01

Channel								
809:	0	2	1	0	0	0	1	0
817:	0	2	1	1	0	0	0	1
825:	0	2	1	0	1	0	0	0
833:	0	0	0	0	0	0	0	0
841:	1	0	1	0	1	0	0	0
849:	0	1	0	1	1	0	2	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	1	0	1	0	0	0	1	0
889:	0	0	0	0	0	0	0	1
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	1	0	0	0	0	0	0	0
937:	0	0	1	0	1	0	0	0
945:	0	0	0	0	1	0	0	0
953:	1	0	0	0	1	0	0	1
961:	0	2	0	1	0	0	0	0
969:	0	1	1	0	0	0	0	0
977:	0	0	1	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	1	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

Apex-Alpha™

KD 8/11/20

Sample Description: BLANK
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00002778
Batch Identification: 2008019A-RA
Sample Identification: 02
Sample Geometry: Shelf 2
Procedure Description: Ra

Detector Name: Alpha_010
Chamber Serial Number:
Detector Serial Number: 10
Env. Background: System Bkgd 283253
Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
Generic Mult. Factor: 2.940E+000 Generic Div. Factor: 1.000E+000
Sample Date/Time: 8/11/2020 10:03:20 AM
Acquisition Date/Time: 8/11/2020 11:20:57 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.1821 +/- 0.0031 on 2/28/2020 2:49:50 PM
Effective Efficiency: 0.1821 +/- 0.0031

Peak Match Tolerance: 0.350 MeV

PEAK AREA REPORT

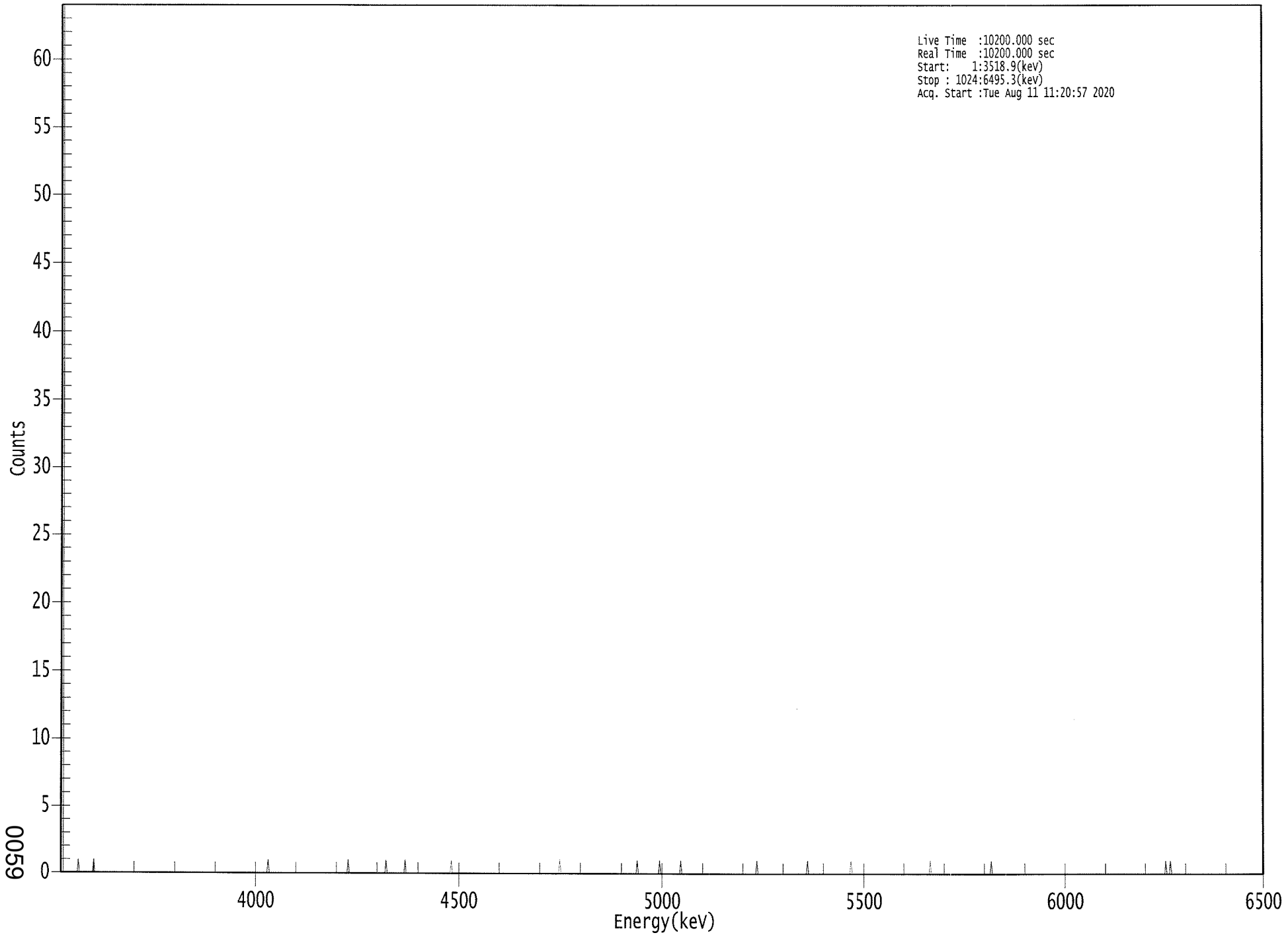
Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.567	-0.38	799.82	2.38	0.00E+000	2.9
RA-226	4.616	-0.21	1438.5	2.21	0.00E+000	2.9

NUCLIDE ANALYSIS RESULTS

Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.982	5685.50*	-1.71E-002 +/- 1.37E-001	3.69E-001 +/- 1.24E-002
RA-226	0.963	4785.00*	-8.98E-003 +/- 1.29E-001	3.42E-001 +/- 1.15E-002

AG
8/11/20

0000277873.CNF



0059

ROI Type: 1

****
***** S P E C T R A L D A T A R E P O R T *****
****

Sample Title: 02

Elapsed Live time: 10200
Elapsed Real Time: 10200

Channel								
1:	10200	10200	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	1
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	1	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	1	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	1	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	1	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	1	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	1	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369:	0	0	0	0	0	0	0	0

Sample Title: 02

Channel							
377:	0	0	0	0	0	0	0	0
385:	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0
401:	0	0	0	0	0	0	0	0
409:	0	0	0	0	0	0	0	0
417:	0	0	0	0	0	0	0	1
425:	0	0	0	0	0	0	0	0
433:	0	0	0	0	0	0	0	0
441:	0	0	0	0	0	0	0	0
449:	0	0	0	0	0	0	0	0
457:	0	0	0	0	0	0	0	0
465:	0	0	0	0	0	0	0	0
473:	0	0	0	0	0	0	0	0
481:	0	0	0	0	0	0	0	0
489:	1	0	0	0	0	0	0	0
497:	0	0	0	0	0	0	0	0
505:	0	0	0	1	0	0	0	0
513:	0	0	0	0	0	0	0	0
521:	0	0	0	0	0	1	0	0
529:	0	0	0	0	0	0	0	0
537:	0	0	0	0	0	0	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	1	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	1	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	1	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	1	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	1	0
793:	0	0	0	0	0	0	0	0

801:	0	0	0	0	0	0	0	0

Sample Title: 02

Channel								
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	1	0	0	0	1
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

Apex-Alpha™

Sample Description: JLS-11
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00002778
Batch Identification: 2008019A-RA
Sample Identification: 03
Sample Geometry: Shelf 2
Procedure Description: Ra

Detector Name: Alpha_011
Chamber Serial Number:
Detector Serial Number: 11
Env. Background: System Bkgd 283254
Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
Generic Mult. Factor: 2.550E+000 Generic Div. Factor: 1.000E+000
Sample Date/Time: 7/30/2020 10:03:20 AM
Acquisition Date/Time: 8/11/2020 11:20:58 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.4398 +/- 0.0000
Counting Efficiency: 0.1863 +/- 0.0032 on 2/28/2020 2:49:50 PM
Effective Efficiency: 0.0819 +/- 0.0014

Peak Match Tolerance: 0.350 MeV

PEAK AREA REPORT

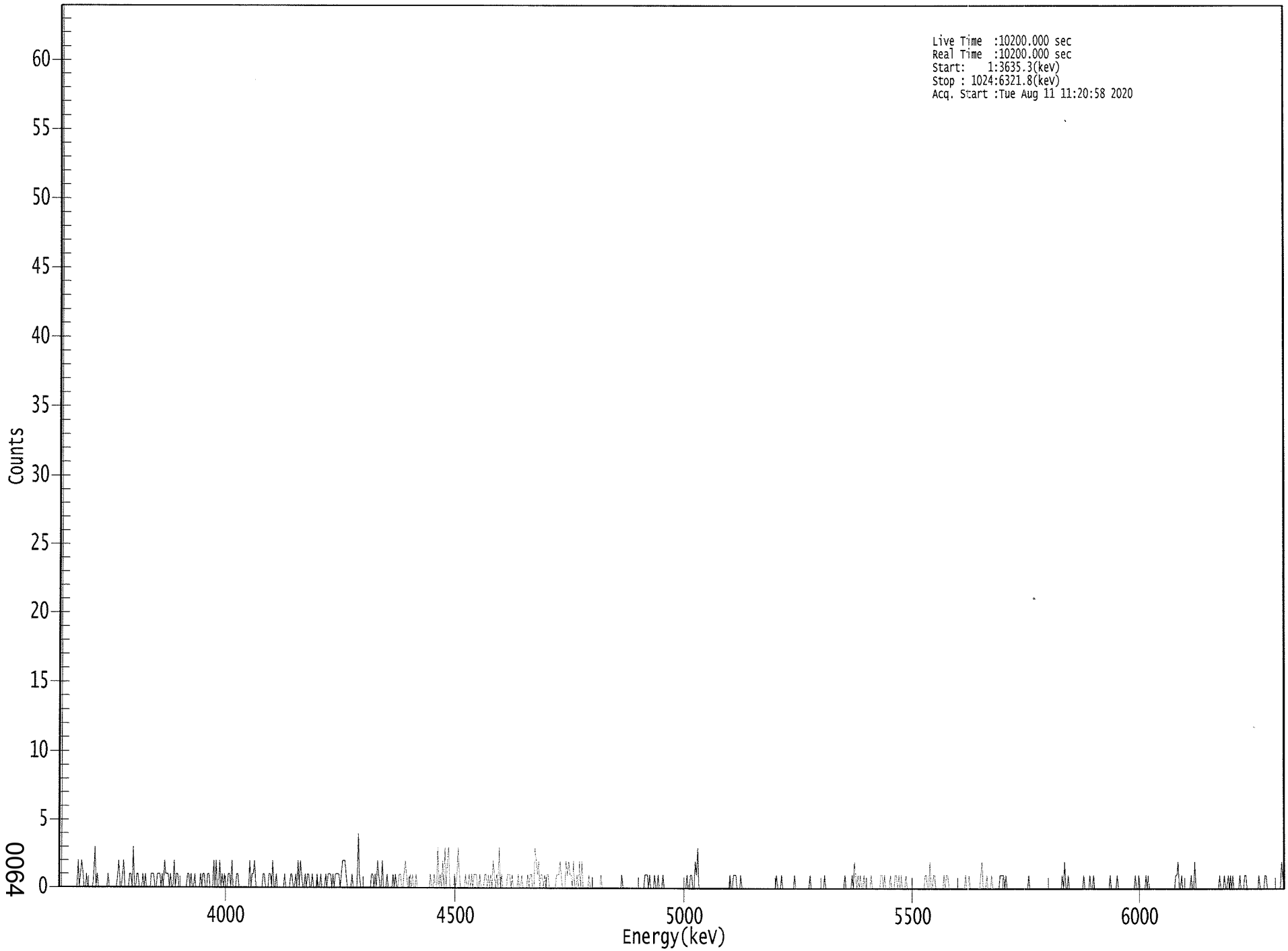
Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.510	29.11	38.38	2.89	0.00E+000	2.6
RA-226	4.668	60.96	25.59	2.04	0.00E+000	2.6

NUCLIDE ANALYSIS RESULTS

Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.961	5685.50*	2.53E+000 +/- 9.76E-001	7.62E-001 +/- 2.57E-002
RA-226	0.982	4785.00*	5.03E+000 +/- 1.30E+000	6.42E-001 +/- 2.16E-002

AG
8/11/20

0000277874.CNF



****
***** S P E C T R A L D A T A R E P O R T *****
****

Sample Title: 03

Elapsed Live time: 10200
Elapsed Real Time: 10200

Channel								
1:	10200	10200	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	2	0	1	2	1	0	0	1
25:	0	0	0	0	0	1	3	0
33:	1	0	0	0	0	0	0	0
41:	0	1	0	0	0	0	0	0
49:	0	1	2	0	0	1	2	0
57:	0	0	0	1	1	0	3	0
65:	0	1	1	0	0	0	1	0
73:	1	0	0	0	0	1	1	1
81:	0	0	1	1	1	0	1	0
89:	2	1	1	1	0	1	0	0
97:	2	0	1	1	0	0	0	0
105:	0	0	0	1	1	0	1	0
113:	0	1	0	0	0	0	1	0
121:	1	1	0	0	1	1	0	0
129:	0	2	0	2	0	0	2	0
137:	1	0	1	0	0	1	1	0
145:	2	0	0	0	1	1	0	0
153:	0	0	0	0	0	0	0	2
161:	0	1	1	2	0	0	0	0
169:	0	0	1	1	0	0	0	1
177:	1	0	2	0	0	1	0	0
185:	0	0	0	0	1	0	0	0
193:	0	1	1	0	0	1	0	2
201:	0	2	1	0	0	1	0	1
209:	1	0	0	1	0	0	0	1
217:	0	0	1	0	0	0	1	0
225:	1	1	1	0	1	0	1	1
233:	1	1	0	1	2	2	2	1
241:	0	0	0	0	1	0	0	0
249:	0	4	1	0	0	0	0	0
257:	0	0	0	0	1	1	0	1
265:	0	2	1	0	0	2	0	0
273:	0	1	0	0	0	0	1	0
281:	1	0	0	1	1	0	0	1
289:	2	1	0	0	1	0	1	0
297:	0	1	0	0	0	0	0	0
305:	0	0	0	0	0	1	0	0
313:	1	0	0	3	0	1	0	2
321:	0	3	0	2	3	0	0	0
329:	0	1	0	1	3	1	0	0
337:	0	0	1	0	0	1	0	1
345:	0	1	1	1	0	0	1	0
353:	0	0	1	1	0	1	0	1
361:	0	2	1	0	1	0	3	0

369:	1	0	0	0	0	1	1	1

Sample Title: 03

Channel							
377:	0	1	0	0	0	0	1	0
385:	0	1	0	0	0	0	1	0
393:	1	1	0	0	3	2	1	2
401:	0	1	1	0	1	0	1	1
409:	0	0	0	0	0	0	1	1
417:	1	2	1	0	0	0	2	1
425:	2	1	1	0	2	0	0	1
433:	0	2	0	2	0	0	0	0
441:	0	1	0	0	0	0	0	0
449:	0	0	0	1	0	0	0	0
457:	0	0	0	0	0	0	0	0
465:	0	0	0	0	1	0	0	0
473:	0	0	0	0	0	0	0	0
481:	0	0	0	0	0	0	0	1
489:	1	1	0	1	0	0	0	1
497:	0	0	1	0	0	0	1	0
505:	0	0	0	0	0	0	0	0
513:	0	0	0	0	0	0	0	0
521:	0	0	1	0	0	1	1	0
529:	0	2	1	3	0	0	0	0
537:	0	0	0	0	0	0	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	1	0
561:	0	1	1	1	0	0	0	1
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	1	0	0
601:	0	1	0	0	0	0	0	0
609:	0	0	0	0	1	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	1	0	0	0	0	0	0
633:	0	0	0	0	0	1	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	1	0
657:	0	0	0	0	1	0	2	1
665:	0	1	0	1	0	0	1	0
673:	0	0	0	0	1	0	0	0
681:	0	0	0	0	1	1	0	1
689:	0	0	0	0	1	0	0	0
697:	1	1	0	1	0	1	0	0
705:	0	1	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	1	1	0	0	2	0	0
729:	1	1	0	0	0	0	0	0
737:	0	1	0	1	1	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	1	0	0	1	0
761:	0	0	0	0	0	0	0	0
769:	1	2	0	0	0	1	0	0
777:	0	1	0	0	0	0	0	0
785:	1	1	1	1	0	1	0	0
793:	0	0	0	0	0	0	0	0

801:	0	0	0	0	0	0	0	0

Sample Title: 03

Channel								
809:	1	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	1	0	2	0
841:	0	1	0	0	0	0	0	0
849:	0	0	0	0	0	0	1	0
857:	0	0	0	1	0	0	1	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	1	0	0	0
881:	0	0	1	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	1	0	0	1	0	0	0
905:	0	0	1	0	1	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	1	1	2	0	0
937:	1	0	0	0	0	0	0	0
945:	1	0	0	2	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	1	0	0	0	1	0	0	1
977:	0	1	0	1	0	0	0	0
985:	0	1	0	0	0	1	1	0
993:	0	0	0	0	0	0	0	0
1001:	0	1	0	0	0	0	1	1
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	2	1	0	0

Apex-Alpha™

Sample Description: JLS-11
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00002778
Batch Identification: 2008019A-RA
Sample Identification: 04
Sample Geometry: Shelf 2
Procedure Description: Ra

Detector Name: Alpha_012
Chamber Serial Number:
Detector Serial Number: 12
Env. Background: System Bkgd 283255
Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
Generic Mult. Factor: 2.580E+000 Generic Div. Factor: 1.000E+000
Sample Date/Time: 7/30/2020 10:03:20 AM
Acquisition Date/Time: 8/11/2020 11:20:59 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.1871 +/- 0.0032 on 2/28/2020 2:49:50 PM
Effective Efficiency: 0.1871 +/- 0.0032

Peak Match Tolerance: 0.350 MeV

PEAK AREA REPORT

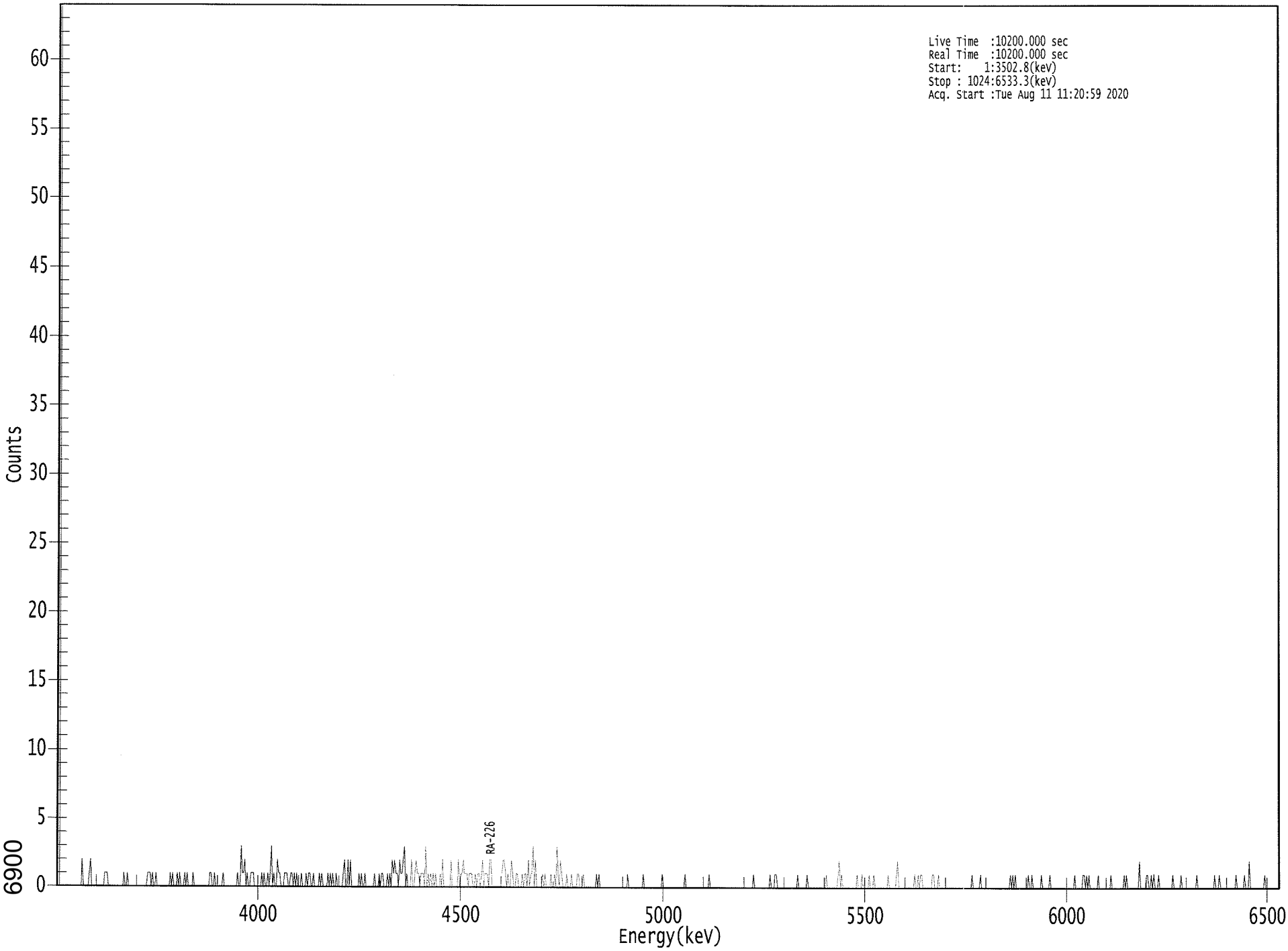
Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.551	16.43	54.15	3.57	0.00E+000	4.4
RA-226	4.501	117.96	18.23	2.04	0.00E+000	5.9

NUCLIDE ANALYSIS RESULTS

Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.977	5685.50*	6.34E-001 +/- 3.44E-001	3.64E-001 +/- 1.22E-002
RA-226	0.900	4785.00*	4.31E+000 +/- 7.99E-001	2.85E-001 +/- 9.57E-003

AG
8/11/20

0000277876.CNF



ROI Type: 1

****
***** S P E C T R A L D A T A R E P O R T *****
****

Sample Title: 04

Elapsed Live time: 10200
Elapsed Real Time: 10200

Channel								
1:	10200	10200	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	2	0	0
25:	0	0	0	1	2	0	0	0
33:	0	0	0	0	0	0	0	0
41:	1	1	1	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	1	0	0	1	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	1	1	1	0
81:	1	0	0	1	0	0	0	0
89:	0	0	0	0	0	0	0	1
97:	0	1	0	0	0	1	0	1
105:	0	0	0	1	0	1	0	0
113:	0	0	1	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	1	1	0	0	1	0	0	0
137:	0	0	0	1	0	0	0	0
145:	0	0	0	0	0	0	0	1
153:	0	0	3	1	1	2	0	1
161:	0	0	1	1	1	0	0	0
169:	0	0	0	1	0	1	0	0
177:	1	0	1	3	0	1	0	0
185:	2	1	1	0	0	0	1	1
193:	1	0	0	1	1	0	1	0
201:	1	0	0	0	1	0	0	0
209:	1	0	1	1	0	0	1	0
217:	0	0	0	1	0	1	0	0
225:	0	0	1	0	1	0	1	0
233:	0	1	0	0	0	0	0	1
241:	2	0	0	2	0	2	0	0
249:	0	0	0	0	1	0	1	0
257:	0	1	0	0	0	0	0	0
265:	0	1	0	0	0	1	0	1
273:	1	0	0	0	1	0	1	0
281:	2	1	2	1	1	0	2	1
289:	1	2	3	0	1	0	0	0
297:	2	0	0	1	2	1	1	0
305:	1	1	1	0	3	0	1	0
313:	1	0	1	0	1	0	0	0
321:	1	0	2	0	0	0	0	0
329:	0	2	0	0	0	0	0	2
337:	0	1	1	2	1	1	1	0
345:	1	1	1	0	0	1	0	1
353:	1	0	1	2	0	1	1	1
361:	0	2	2	0	0	0	0	0

369:	0	0	0	1	2	2	1	0

Sample Title: 04

Channel								
377:	1	0	0	2	1	0	0	1
385:	1	0	0	0	1	0	1	1
393:	0	2	0	1	1	3	0	2
401:	0	0	0	0	0	1	0	1
409:	0	0	0	0	1	0	0	1
417:	0	3	1	0	2	1	0	0
425:	0	1	0	0	0	1	0	0
433:	0	0	1	1	0	0	0	1
441:	0	0	0	0	0	0	0	0
449:	0	0	1	0	1	0	0	0
457:	0	0	0	0	0	0	0	0
465:	0	0	0	0	0	0	0	0
473:	0	0	0	0	1	0	0	0
481:	0	0	0	0	0	0	0	0
489:	0	1	0	0	0	0	0	0
497:	0	0	0	0	0	0	0	0
505:	0	1	0	0	0	0	0	0
513:	0	0	0	0	0	0	0	0
521:	0	0	0	0	1	0	0	0
529:	0	0	0	0	0	0	0	0
537:	0	0	0	0	0	0	0	0
545:	1	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	1	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	1	0	0	0	1
601:	1	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	1	0	0	0	0	0
625:	0	0	1	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	1	0	0	0	0	0
649:	0	0	0	0	1	2	0	1
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	1	0	0	0
673:	1	0	0	0	0	0	1	0
681:	0	0	1	0	0	0	0	0
689:	0	0	0	0	0	0	1	0
697:	0	0	0	0	0	1	2	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	1	0	0	1
721:	0	1	1	0	0	0	0	0
729:	0	0	0	1	1	0	0	0
737:	1	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	1	0	0	0
769:	0	0	0	1	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	1	0	1	0

801:	1	0	0	0	0	0	0	0

Sample Title: 04

Channel							
809:	0	0	0	1	0	0	1	0
817:	0	0	0	0	0	0	1	0
825:	0	0	0	0	0	1	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	1	0	0	0	0	0
857:	0	1	1	0	1	0	1	0
865:	0	0	0	0	0	0	1	0
873:	0	0	0	0	0	0	0	0
881:	0	1	0	0	0	0	0	0
889:	0	0	0	0	1	0	1	0
897:	0	0	0	0	0	0	0	0
905:	0	2	0	0	0	0	0	1
913:	1	0	0	1	0	1	0	0
921:	0	1	0	0	0	0	0	0
929:	0	0	0	0	0	1	0	0
937:	0	0	0	0	1	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	1	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	1	0	0	0	1	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	1	0	0	0	0	0
993:	0	1	0	0	0	2	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	1	0	0	0	0	0
1017:	0	0	0	0	0	0	0	1

8/11/2020 3:29:39 AM

Apex-Alpha™

QA SUMMARY REPORT
Review Of QA Results - Pulser Check

Date : 8/11/2020
Time : 3:29:39 AM

CHAMBER	DEVICE	PARAMETER	FLAG	DATE
Alpha_001	21f	ALL	Not Done	
Alpha_002	21f	ALL	Not Done	
Alpha_003	21f	ALL	Not Done	
Alpha_004	21f	ALL	Passed	8/11/2020 3:14:26 AM
Alpha_005	21f	ALL	Not Done	
Alpha_006	21f	ALL	Not Done	
Alpha_007	21f	ALL	Not Done	
Alpha_008	21f	ALL	Not Done	
Alpha_009	21f	ALL	Not Done	
Alpha_010	21f	ALL	Passed	8/11/2020 3:14:26 AM
Alpha_011	21f	ALL	Passed	8/11/2020 3:14:27 AM
Alpha_012	21f	ALL	Passed	8/11/2020 3:14:28 AM
Alpha_013	21f	ALL	Not Done	
Alpha_014	21f	ALL	Not Done	
Alpha_015	21f	ALL	Not Done	
Alpha_016	21f	ALL	Not Done	
Alpha_033	Alpha Analyst100DC	ALL	Not Done	
Alpha_034	Alpha Analyst100DC	ALL	Not Done	
Alpha_035	Alpha Analyst100DC	ALL	Passed	8/11/2020 3:14:29 AM
Alpha_036	Alpha Analyst100DC	ALL	Not Done	
Alpha_037	Alpha Analyst100DC	ALL	Passed	8/11/2020 3:14:31 AM
Alpha_038	Alpha Analyst100DC	ALL	Passed	8/11/2020 3:14:33 AM
Alpha_039	Alpha Analyst100DC	ALL	Passed	8/11/2020 3:14:34 AM
Alpha_040	Alpha Analyst100DC	ALL	Passed	8/11/2020 3:14:37 AM
Alpha_041	Alpha Analyst100DC	ALL	Passed	8/11/2020 3:14:39 AM
Alpha_042	Alpha Analyst100DC	ALL	Passed	8/11/2020 3:14:41 AM
Alpha_043	Alpha Analyst100DC	ALL	Passed	8/11/2020 3:14:43 AM
Alpha_044	Alpha Analyst100DC	ALL	Passed	8/11/2020 3:14:46 AM
Alpha_045	Alpha Analyst100DC	ALL	Not Done	
Alpha_046	Alpha Analyst100DC	ALL	Not Done	
Alpha_047	Alpha Analyst100DC	ALL	Not Done	
Alpha_048	Alpha Analyst100DC	ALL	Not Done	
Alpha_049	Alpha Analyst100DC	ALL	Not Done	
Alpha_050	Alpha Analyst100DC	ALL	Not Done	
Alpha_051	Alpha Analyst100DC	ALL	Not Done	
Alpha_052	Alpha Analyst100DC	ALL	Not Done	
Alpha_053	Alpha Analyst100DC	ALL	Not Done	
Alpha_054	Alpha Analyst100DC	ALL	Not Done	
Alpha_055	Alpha Analyst100DC	ALL	Not Done	
Alpha_056	Alpha Analyst100DC	ALL	Not Done	
Alpha_057	Alpha Analyst100DC	ALL	Passed	8/11/2020 3:14:48 AM
Alpha_058	Alpha Analyst100DC	ALL	Passed	8/11/2020 3:14:51 AM

Review of QA Results - Pulser Check

8/11/2020 3:29:39 AM

CHAMBER	DEVICE	PARAMETER	FLAG	DATE
Alpha_059	Alpha Analyst100DC	ALL	Passed	8/11/2020 3:14:53 AM
Alpha_060	Alpha Analyst100DC	ALL	Passed	8/11/2020 3:14:56 AM

APPROVED BY: KP

APPROVAL DATE: 8/11/20

****
***** L I B R A R Y L I S T I N G R E P O R T *****
****

Nuclide Library Title: Radium

Nuclide Library Description: Ra-226, Po-218, Rn-222

Nuclide Name	Half-Life (Seconds)	Energy (keV)	Energy Uncert. (keV)	Yield (%)	Yield Uncert.(Abs.+-)
PO-218	5.049E+010	6003.000*	0.000	99.9800	0.0000
RN-222	5.049E+010	5490.000*	0.000	99.9200	0.0000
RA-226	5.049E+010	4785.000*	0.000	100.0000	0.0000

* = key line

TOTALS: 3 Nuclides 3 Energy Lines

SECTION IX

ANALYTICAL DATA (RADIUM-228)

20-08019
Ra228
Run 1

Work Order	20-08019
Analysis Code	Ra228
Run	1
Date Received	8/4/2020
Lab Deadline	8/17/2020
Client	Michael Pisani & Associates, Inc.
Project	519829
Report Level	4
Activity Units	pCi
Aliquot Units	l
Matrix	WA
Method	EPA 904.0
Instrument Type	Alpha/Beta GPC
Radiometric Tracer	Ba-133
Radiometric Sol#	Ba-6a
Tracer Act (dpm/g)	418.26
Carrier	Yttrium
Carrier Conc (mg/ml)	34.083

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		08/04/20 00:00	1.0000E+00
02	MBL	BLANK		08/04/20 00:00	1.0000E+00
03	DUP	JLS-11	20	07/30/20 16:25	1.0000E+00
04	DO	JLS-11	20	07/30/20 16:25	1.0000E+00

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

20-08019
Ra228
Run 1

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	2.1952	918.2	463.0	111.95	2.100	0.0855	0.1565	0.0710	99.20	109.12	1.00	1.00
02	MBL	2.1956	918.3	435.0	105.16	2.030	0.0858	0.1549	0.0691	99.87	105.02	1.00	1.00
03	DUP	2.1940	917.7	182.0	44.03	2.200	0.0861	0.1609	0.0748	99.76	43.92	1.00	1.00
04	DO	2.1920	916.8	472.0	114.29	2.570	0.0861	0.1734	0.0873	99.67	109.63	1.00	1.00

0078

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

Client: Michael Pisani & Associates, Inc.
Eberline Services Work Order: 20-08019
Analysis Code: Ra228
Run: 1
6200

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	RA-228	LCS	LCS	pCi/l	8.01E+00	7.31E-01	8.91E-01	9.21E+00	86.92	OK		OK	
02	RA-228	MBL	BLANK	pCi/l	2.13E-01	4.53E-01	9.43E-01					OK	OK
03	RA-228	DUP	JLS-11	pCi/l	5.01E+01	2.46E+00	1.92E+00				INV	OK	
04	RA-228	DO	JLS-11	pCi/l	3.27E+01	1.21E+00	7.72E-01					OK	

Client: Michael Pisani & Associates, Inc. 0800
Eberline Services Work Order: 20-08019
Analysis Code: Ra228
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	RA-228	LCS	08/04/20 00:00	1.00E+00	111.95	99.20	109.12	1.00	8/11/2020 8:47	8/12/2020 10:10
02	RA-228	MBL	08/04/20 00:00	1.00E+00	105.16	99.87	105.02	1.00	8/11/2020 8:47	8/12/2020 10:10
03	RA-228	DUP	07/30/20 16:25	1.00E+00	44.03	99.76	43.92	1.00	8/11/2020 8:47	8/12/2020 10:10
04	RA-228	DO	07/30/20 16:25	1.00E+00	114.29	99.67	109.63	1.00	8/11/2020 8:47	8/12/2020 10:10

Client: Michael Pisani & Associates, Inc.
Eberline Services Work Order: 20-08019
Analysis Code: Ra228
Run: 1
0081

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	RA-228	LCS	08/12/20 12:03		LB4110A	G1	120	847	1.366666667	0.4705
02	RA-228	MBL	08/12/20 12:03		LB4110A	G2	120	221	1.683333333	0.4676
03	RA-228	DUP	08/12/20 12:03		LB4110A	G3	120	1982	1.166666667	0.4614
04	RA-228	DO	08/12/20 12:03		LB4110A	G4	120	3210	1.233333333	0.4714

Count Room Report
Client: Michael Pisani Associat

20-08019-Ra228-1 (pCi/l) in WA
Tracer ID: Ba-6a

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	08/04/20 00:00	1.0000	2.1952	918.1644	463.0000	111.95	1.00	1.00
02	MBL	BLANK	08/04/20 00:00	1.0000	2.1956	918.3317	435.0000	105.16	1.00	1.00
03	DUP	JLS-11	07/30/20 16:25	1.0000	2.1940	917.6624	182.0000	44.03	1.00	1.00
04	DO	JLS-11	07/30/20 16:25	1.0000	2.1920	916.8259	472.0000	114.29	1.00	1.00

0082

Spike and Tracer Worksheet

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
20-08019	1	Ra228	8/12/2020 9:58	AYARBER	AY	

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	*Sol #*	*Activity dpm/g*	*Solution Date*	*Approx Addition*	*Volume Used (g)*	*Volume Used (g)*	*Volume Used (g)*	*Volume Used (g)*	*Known pCi*	*Error Estimate*	*Added pCi*	*Error Estimate*	*Known pCi*	*Error Estimate*	*Added pCi*	*Error Estimate*
Ra-228	Ra-12	42.390	8/12/2020	0.470	0.4824				9.21	0.470	0.00	0.000	0.00	0.000	0.00	0.000

Tracers

fraction	*Isotope*	*Sol #*	*Activity dpm/g*	*Solution Date*	*Volume Used (g)*	*Approx Addition*
01	Ba-133	Ba-6a	418.260	8/12/2020	2.1952	2.4200
02	Ba-133	Ba-6a	418.260	8/12/2020	2.1956	2.4200
03	Ba-133	Ba-6a	418.260	8/12/2020	2.1940	2.4200
04	Ba-133	Ba-6a	418.260	8/12/2020	2.1920	2.4200

Balance Printer Tapes

Tracer

LCS

Matrix Spike

0083

Eberline Analytical
Oak Ridge Laboratory

Aliquot Worksheet

Printed: 8/6/2020 11:49 PM

Work Order	Run	Analysis Code	Rpt Units	Lab Deadline	Technician
20-08019	1	Ra228	liters	8/17/2020	JHARVEY

Lab Fraction	Michael Pisani & Associates, Inc. Client ID	Sample Type	Muffle Data	Dilution Data			Aliquot Data		MS Aliquot Data		H-3 Solids Only	
			Ratio Post/Pre	No of Dils	Dil Factor	Ratio	Aliquot	Net Equiv	Aliquot	Net Equiv	Water Added (ml)	H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	JLS-11	DUP					1.0000E+00	1.0000E+00				
04	JLS-11	DO					1.0000E+00	1.0000E+00				

Comments	

0084

Technician: JHarvey Date: 8/6/20

Eberline Services - Oak Ridge
Version 1.0 9/1999

Gravimetric Worksheet

Printed: 8/12/2020 11:43 AM

Work Order	Run	Analysis Code	Gravimetric Carrier	Carrier Conc (mg/ml)	Technician
20-08019	**1**	**Ra228**	**Yttrium**	**34.0830**	**AYARBER**

TRetec	Michael Pisani & Associates, Inc.	Sample	Carrier Data	Filter Data			Gravimetric
Fraction	Client ID	Type	Carrier Added (ml)	Filter Tare (g)	Filter Final (g)	Filter Net (g)	% Recovery
01	LCS	LCS	2.1000	0.0855	0.1565	**0.0710**	**99.20**
02	BLANK	MBL	2.0300	0.0858	0.1549	**0.0691**	**99.87**
03	DUP	DUP	2.2000	0.0861	0.1609	**0.0748**	**99.76**
04	JLS-11	DO	2.5700	0.0861	0.1734	**0.0873**	**99.67**

0085

Technician: _____ Date: 8/12/20

Detector ID	Sample ID	Alpha	Beta	Count Time	Voltage	TOD
G1	2008019-01	27	847	120	1410	8/12/2020 12:03:50 PM
G2	2008019-02	14	221	120	1410	8/12/2020 12:03:50 PM
G3	2008019-03	30	1982	120	1410	8/12/2020 12:03:50 PM
G4	2008019-04	43	3210	120	1410	8/12/2020 12:03:50 PM

AG
8/12/20

9800

GPC Detector Report
(ALL Backgrounds)

KP
8/12/20

Detector	Alpha/Beta	Calibration Date	Count Date	Bkg CPM	PFW	LCL	Mean	UCL
LB4110A - A1	Alpha	11/2/2019	8/12/2020	1.67E-01	P	-1.35E-02	1.39E-01	2.92E-01
LB4110A - A2	Alpha	11/2/2019	8/12/2020	8.33E-02	P	1.75E-03	1.37E-01	2.71E-01
LB4110A - A3	Alpha	11/2/2019	8/12/2020	1.00E-01	P	-2.24E-03	1.44E-01	2.90E-01
LB4110A - A4	Alpha	11/2/2019	8/12/2020	1.33E-01	P	3.74E-03	1.45E-01	2.87E-01
LB4110A - B1	Alpha	11/2/2019	8/12/2020	2.00E-01	P	-2.29E-03	1.39E-01	2.80E-01
LB4110A - B2	Alpha	11/2/2019	8/12/2020	2.17E-01	P	5.10E-02	2.05E-01	3.58E-01
LB4110A - B3	Alpha	11/2/2019	8/12/2020	1.17E-01	P	1.53E-02	1.42E-01	2.70E-01
LB4110A - B4	Alpha	11/2/2019	8/12/2020	8.33E-02	P	-1.70E-02	1.15E-01	2.47E-01
LB4110A - C1	Alpha	11/2/2019	8/12/2020	5.00E-02	P	-3.08E-02	8.99E-02	2.11E-01
LB4110A - C2	Alpha	11/2/2019	8/12/2020	1.50E-01	P	-3.77E-02	9.32E-02	2.24E-01
LB4110A - C3	Alpha	11/2/2019	8/12/2020	1.33E-01	P	-3.22E-02	7.48E-02	1.82E-01
LB4110A - C4	Alpha	11/2/2019	8/12/2020	2.83E-01	P	2.24E-02	1.90E-01	3.57E-01
LB4110A - D1	Alpha	11/2/2019	8/12/2020	1.00E-01	P	-3.25E-02	7.45E-02	1.82E-01
LB4110A - D2	Alpha	11/2/2019	8/12/2020	8.33E-02	P	-2.08E-02	9.15E-02	2.04E-01
LB4110A - D3	Alpha	11/2/2019	8/12/2020	2.17E-01	P	-1.60E-02	1.12E-01	2.39E-01
LB4110A - D4	Alpha	11/2/2019	8/12/2020	1.17E-01	P	2.22E-02	1.69E-01	3.15E-01
LB4110A - E1	Alpha	11/2/2017	5/19/2020	1.00E+05	F	-2.35E+04	8.93E+02	2.53E+04
LB4110A - E2	Alpha	11/2/2017	5/19/2020	1.00E+05	F	-2.35E+04	8.93E+02	2.53E+04
LB4110A - E3	Alpha	11/2/2017	5/19/2020	1.00E+05	F	-2.35E+04	8.93E+02	2.53E+04
LB4110A - E4	Alpha	11/2/2017	5/19/2020	1.00E+05	F	-2.35E+04	8.93E+02	2.53E+04
LB4110A - F1	Alpha	11/2/2019	8/12/2020	2.00E-01	P	-3.39E-02	1.09E-01	2.52E-01
LB4110A - F2	Alpha	11/2/2019	8/12/2020	1.00E-01	P	-3.69E-02	8.39E-02	2.05E-01
LB4110A - F3	Alpha	11/2/2019	8/12/2020	1.33E-01	P	-2.68E-02	9.77E-02	2.22E-01
LB4110A - F4	Alpha	11/2/2019	8/12/2020	1.00E-01	P	-3.80E-02	7.50E-02	1.88E-01
LB4110A - G1	Alpha	11/2/2019	8/12/2020	6.67E-02	P	-2.86E-02	9.10E-02	2.11E-01
LB4110A - G2	Alpha	11/2/2019	8/12/2020	1.33E-01	P	-2.12E-02	8.38E-02	1.89E-01
LB4110A - G3	Alpha	11/2/2019	8/12/2020	1.33E-01	P	-1.81E-02	1.16E-01	2.51E-01
LB4110A - G4	Alpha	11/2/2019	8/12/2020	1.17E-01	P	-4.18E-02	9.55E-02	2.33E-01

GPC Detector Report
(ALL Backgrounds)

KP
8/12/20

Detector	Alpha/Beta	Calibration Date	Count Date	Bkg CPM	PFW	LCL	Mean	UCL
LB4110A - A1	Beta	11/2/2019	8/12/2020	1.05E+00	P	-3.20E+00	1.50E+00	6.21E+00
LB4110A - A2	Beta	11/2/2019	8/12/2020	1.57E+00	P	-3.06E+00	1.81E+00	6.67E+00
LB4110A - A3	Beta	11/2/2019	8/12/2020	1.35E+00	P	-2.94E+00	1.58E+00	6.10E+00
LB4110A - A4	Beta	11/2/2019	8/12/2020	1.43E+00	P	-3.14E+00	1.61E+00	6.36E+00
LB4110A - B1	Beta	11/2/2019	8/12/2020	1.68E+00	P	1.07E+00	1.42E+00	1.77E+00
LB4110A - B2	Beta	11/2/2019	8/12/2020	1.85E+00	P	8.26E-01	1.46E+00	2.09E+00
LB4110A - B3	Beta	11/2/2019	8/12/2020	1.10E+00	P	9.25E-01	1.34E+00	1.75E+00
LB4110A - B4	Beta	11/2/2019	8/12/2020	1.83E+00	P	7.09E-01	1.51E+00	2.30E+00
LB4110A - C1	Beta	11/2/2019	8/12/2020	1.08E+00	P	7.90E-01	1.18E+00	1.56E+00
LB4110A - C2	Beta	11/2/2019	8/12/2020	9.17E-01	P	6.63E-01	1.01E+00	1.37E+00
LB4110A - C3	Beta	11/2/2019	8/12/2020	1.48E+00	P	8.25E-01	1.42E+00	2.02E+00
LB4110A - C4	Beta	11/2/2019	8/12/2020	1.17E+00	P	8.68E-01	1.31E+00	1.75E+00
LB4110A - D1	Beta	11/2/2019	8/12/2020	1.03E+00	P	6.79E-01	1.08E+00	1.49E+00
LB4110A - D2	Beta	11/2/2019	8/12/2020	1.18E+00	P	-9.01E-01	2.79E+00	6.48E+00
LB4110A - D3	Beta	11/2/2019	8/12/2020	1.33E+00	P	7.09E-01	1.14E+00	1.57E+00
LB4110A - D4	Beta	11/2/2019	8/12/2020	1.28E+00	P	1.05E+00	1.49E+00	1.94E+00
LB4110A - E1	Beta	11/2/2017	5/19/2020	1.00E+05	F	-2.35E+04	8.94E+02	2.53E+04
LB4110A - E2	Beta	11/2/2017	5/19/2020	1.00E+05	F	-2.35E+04	8.94E+02	2.53E+04
LB4110A - E3	Beta	11/2/2017	5/19/2020	1.00E+05	F	-2.35E+04	8.94E+02	2.53E+04
LB4110A - E4	Beta	11/2/2017	5/19/2020	1.00E+05	F	-2.35E+04	8.94E+02	2.53E+04
LB4110A - F1	Beta	11/2/2019	8/12/2020	1.03E+00	P	8.26E-01	1.28E+00	1.73E+00
LB4110A - F2	Beta	11/2/2019	8/12/2020	8.33E-01	P	5.44E-01	9.38E-01	1.33E+00
LB4110A - F3	Beta	11/2/2019	8/12/2020	1.20E+00	P	8.28E-01	1.18E+00	1.54E+00
LB4110A - F4	Beta	11/2/2019	8/12/2020	1.47E+00	P	1.57E-01	1.29E+00	2.42E+00
LB4110A - G1	Beta	11/2/2019	8/12/2020	1.37E+00	P	7.70E-01	1.20E+00	1.64E+00
LB4110A - G2	Beta	11/2/2019	8/12/2020	1.68E+00	P	1.11E+00	1.61E+00	2.11E+00
LB4110A - G3	Beta	11/2/2019	8/12/2020	1.17E+00	P	7.27E-01	1.20E+00	1.66E+00
LB4110A - G4	Beta	11/2/2019	8/12/2020	1.23E+00	P	8.58E-01	1.27E+00	1.68E+00

GPC Detector Report
(ALL Efficiencies)

Detector	Alpha/Beta	Calibration Date	Count Date	Eff	PFW	LCL	Mean	UCL
LB4110A - A1	Alpha	11/2/2019	8/12/2020	0.2339	P	0.2252	0.2336	0.2420
LB4110A - A2	Alpha	11/2/2019	8/12/2020	0.2046	P	0.1945	0.2025	0.2105
LB4110A - A3	Alpha	11/2/2019	8/12/2020	0.1980	P	0.1873	0.1969	0.2065
LB4110A - A4	Alpha	11/2/2019	8/12/2020	0.2277	P	0.2175	0.2270	0.2365
LB4110A - B1	Alpha	11/2/2019	8/12/2020	0.2078	P	0.1932	0.2086	0.2240
LB4110A - B2	Alpha	11/2/2019	8/12/2020	0.1998	P	0.1837	0.1976	0.2115
LB4110A - B3	Alpha	11/2/2019	8/12/2020	0.2363	P	0.2186	0.2340	0.2494
LB4110A - B4	Alpha	11/2/2019	8/12/2020	0.2306	P	0.2071	0.2251	0.2430
LB4110A - C1	Alpha	11/2/2019	8/12/2020	0.1993	P	0.1902	0.2009	0.2116
LB4110A - C2	Alpha	11/2/2019	8/12/2020	0.2005	P	0.1924	0.2035	0.2145
LB4110A - C3	Alpha	11/2/2019	8/12/2020	0.2280	P	0.2126	0.2296	0.2466
LB4110A - C4	Alpha	11/2/2019	8/12/2020	0.2153	P	0.1964	0.2142	0.2319
LB4110A - D1	Alpha	11/2/2019	8/12/2020	0.1926	P	0.1882	0.1993	0.2105
LB4110A - D2	Alpha	11/2/2019	8/12/2020	0.2345	P	0.2241	0.2361	0.2482
LB4110A - D3	Alpha	11/2/2019	8/12/2020	0.2443	P	0.2342	0.2437	0.2532
LB4110A - D4	Alpha	11/2/2019	8/12/2020	0.1884	P	0.1789	0.1862	0.1935
LB4110A - E1	Alpha	11/2/2017	5/19/2020	0.2075	P	0.1686	0.2257	0.2828
LB4110A - E2	Alpha	11/2/2017	5/19/2020	0.1778	P	0.1514	0.2049	0.2583
LB4110A - E3	Alpha	11/2/2017	5/19/2020	0.2234	P	0.1549	0.2076	0.2604
LB4110A - E4	Alpha	11/2/2017	5/19/2020	0.2155	P	0.1746	0.2353	0.2961
LB4110A - F1	Alpha	11/2/2019	8/12/2020	0.2089	P	0.2019	0.2132	0.2246
LB4110A - F2	Alpha	11/2/2019	8/12/2020	0.1796	P	0.1728	0.1800	0.1872
LB4110A - F3	Alpha	11/2/2019	8/12/2020	0.2243	P	0.2053	0.2213	0.2372
LB4110A - F4	Alpha	11/2/2019	8/12/2020	0.2124	P	0.2050	0.2143	0.2236
LB4110A - G1	Alpha	11/2/2019	8/12/2020	0.1902	P	0.1735	0.1870	0.2006
LB4110A - G2	Alpha	11/2/2019	8/12/2020	0.1841	P	0.1697	0.1831	0.1966
LB4110A - G3	Alpha	11/2/2019	8/12/2020	0.2186	P	0.2003	0.2152	0.2302
LB4110A - G4	Alpha	11/2/2019	8/12/2020	0.1865	P	0.1530	0.1828	0.2127

KP 8/12/20

KP 8/12/20 out of service

6800

Eberline Analytical
Oak Ridge Laboratory

GPC Detector Report
(ALL Efficiencies)

Printed: 8/12/2020 6:28 AM

KP 8/12/20

Detector	Alpha/Beta	Calibration Date	Count Date	Eff	PFW	LCL	Mean	UCL
LB4110A - A1	Beta	11/2/2019	8/12/2020	0.5686	P	0.5422	0.5622	0.5823
LB4110A - A2	Beta	11/2/2019	8/12/2020	0.4453	P	0.4269	0.4425	0.4582
LB4110A - A3	Beta	11/2/2019	8/12/2020	0.4829	P	0.4564	0.4775	0.4985
LB4110A - A4	Beta	11/2/2019	8/12/2020	0.5544	P	0.5317	0.5516	0.5714
LB4110A - B1	Beta	11/2/2019	8/12/2020	0.4918	P	0.4501	0.4882	0.5262
LB4110A - B2	Beta	11/2/2019	8/12/2020	0.4937	P	0.4560	0.4932	0.5304
LB4110A - B3	Beta	11/2/2019	8/12/2020	0.5848	P	0.5465	0.5852	0.6239
LB4110A - B4	Beta	11/2/2019	8/12/2020	0.5720	P	0.5097	0.5557	0.6017
LB4110A - C1	Beta	11/2/2019	8/12/2020	0.4810	P	0.4583	0.4805	0.5027
LB4110A - C2	Beta	11/2/2019	8/12/2020	0.4801	P	0.4593	0.4854	0.5114
LB4110A - C3	Beta	11/2/2019	8/12/2020	0.5637	P	0.5295	0.5751	0.6206
LB4110A - C4	Beta	11/2/2019	8/12/2020	0.5215	P	0.4789	0.5200	0.5612
LB4110A - D1	Beta	11/2/2019	8/12/2020	0.5636	P	0.5519	0.5803	0.6087
LB4110A - D2	Beta	11/2/2019	8/12/2020	0.6065	P	0.5650	0.5918	0.6185
LB4110A - D3	Beta	11/2/2019	8/12/2020	0.5994	P	0.5808	0.6037	0.6266
LB4110A - D4	Beta	11/2/2019	8/12/2020	0.4743	P	0.4672	0.4836	0.5000
LB4110A - E1	Beta	11/2/2017	5/19/2020	0.5360	P	0.4167	0.5408	0.6649
LB4110A - E2	Beta	11/2/2017	5/19/2020	0.4520	P	0.3728	0.4910	0.6092
LB4110A - E3	Beta	11/2/2017	5/19/2020	0.5775	P	0.3848	0.5001	0.6154
LB4110A - E4	Beta	11/2/2017	5/19/2020	0.5466	P	0.4532	0.5887	0.7241
LB4110A - F1	Beta	11/2/2019	8/12/2020	0.5283	P	0.5147	0.5348	0.5550
LB4110A - F2	Beta	11/2/2019	8/12/2020	0.4444	P	0.4375	0.4517	0.4660
LB4110A - F3	Beta	11/2/2019	8/12/2020	0.5749	P	0.5391	0.5739	0.6088
LB4110A - F4	Beta	11/2/2019	8/12/2020	0.5389	P	0.5259	0.5480	0.5701
LB4110A - G1	Beta	11/2/2019	8/12/2020	0.4551	P	0.4151	0.4458	0.4764
LB4110A - G2	Beta	11/2/2019	8/12/2020	0.4302	P	0.4025	0.4362	0.4700
LB4110A - G3	Beta	11/2/2019	8/12/2020	0.5178	P	0.4844	0.5190	0.5535
LB4110A - G4	Beta	11/2/2019	8/12/2020	0.4369	P	0.3715	0.4399	0.5084

KP 8/12/20 out of service

0600

SECTION X

BARIUM-133 ANALYTICAL TRACER DATA

KB 8/11/20

Apex-Gamma

Analysis Report for 2008019-01
SPIKE

GAMMA SPECTRUM ANALYSIS

Sample Identification	: 2008019-01
Sample Description	: SPIKE
Sample Type	: RA RECOVERY
Sample Size	: 1.000E+00 units
Facility	: Countroom
Sample Taken On	: 8/10/2020 1:55:47PM
Acquisition Started	: 8/11/2020 9:13:11AM
Procedure	: BAFIL
Operator	: Administrator
Detector Name	: GE2
Geometry	: BAFIL
Live Time	: 900.0 seconds
Real Time	: 900.2 seconds
Dead Time	: 0.02 %
Peak Locate Threshold	: 2.50
Peak Locate Range (in channels)	: 1 - 4096
Peak Area Range (in channels)	: 29 - 4096
Identification Energy Tolerance	: 2.500 keV
Energy Calibration Used Done On	: 6/6/2020
Efficiency Calibration Used Done On	: 9/14/2019
Efficiency Calibration Description	:
Sample Number	: 100748

PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/11/2020 9:28:14AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)

Analysis Report for 2008019-01

SPIKE

	Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)
	1	35.16	35 -	39	35.85	4.16E+02	60.41	2.74E+02	1.51
	2	52.97	51 -	57	53.64	4.42E+01	32.42	1.62E+02	1.24
M	3	61.55	58 -	69	62.21	1.88E+02	37.82	1.42E+02	1.70
m	4	65.83	58 -	69	66.49	6.92E+01	31.60	1.55E+02	1.71
	5	80.87	79 -	86	81.51	7.92E+02	65.24	1.76E+02	1.93
M	6	111.59	108 -	119	112.20	1.70E+02	32.89	9.50E+01	1.67
m	7	115.77	108 -	119	116.37	2.79E+01	30.50	1.14E+02	2.03
	8	276.23	272 -	278	276.67	4.80E+01	22.09	5.59E+01	1.46
m	9	302.73	292 -	315	303.15	1.72E+02	28.43	2.23E+01	1.65
m	10	306.59	292 -	315	307.00	2.27E+01	15.88	2.75E+01	1.50
m	11	311.47	292 -	315	311.87	9.55E+00	12.97	2.93E+01	1.66
M	12	333.60	329 -	342	333.99	6.39E+01	19.95	1.83E+01	1.68
M	13	352.35	351 -	362	352.72	2.19E+01	10.78	6.35E+00	2.27
m	14	356.08	351 -	362	356.45	5.42E+02	47.79	2.33E+01	1.54
	15	364.00	362 -	367	364.36	1.80E+01	12.73	1.80E+01	2.75
M	16	376.75	372 -	398	377.10	1.29E+01	11.53	1.23E+01	2.09
m	17	384.01	372 -	398	384.35	9.58E+01	23.17	1.35E+01	2.10
m	18	386.74	372 -	398	387.07	1.39E+02	30.05	1.27E+01	1.76
m	19	391.00	372 -	398	391.33	2.88E+01	19.92	1.74E+01	1.92
M	20	414.53	410 -	425	414.84	3.37E+01	12.53	1.00E+01	1.77
m	21	418.54	410 -	425	418.84	1.35E+01	11.36	1.00E+01	1.77
	22	437.22	434 -	441	437.50	6.42E+01	19.90	2.16E+01	2.00
	23	467.05	463 -	470	467.31	1.10E+01	11.83	1.60E+01	1.28
	24	520.50	518 -	524	520.70	1.00E+01	6.32	0.00E+00	2.12
	25	610.47	607 -	614	610.59	1.33E+01	8.72	3.47E+00	2.47

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/11/2020 9:28:14AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000100688.CNF

	Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
	1	35.16	4.16E+02	60.41			4.16E+02	6.04E+01
	2	52.97	4.42E+01	32.42			4.42E+01	3.24E+01
M	3	61.55	1.88E+02	37.82	1.09E+00	8.32E-01	1.87E+02	3.78E+01
m	4	65.83	6.92E+01	31.60	1.48E+00	9.64E-01	6.77E+01	3.16E+01

Analysis Report for 2008019-01

SPIKE

	Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
	5	80.87	7.92E+02	65.24			7.92E+02	6.52E+01
M	6	111.59	1.70E+02	32.89			1.70E+02	3.29E+01
m	7	115.77	2.79E+01	30.50			2.79E+01	3.05E+01
	8	276.23	4.80E+01	22.09			4.80E+01	2.21E+01
m	9	302.73	1.72E+02	28.43			1.72E+02	2.84E+01
m	10	306.59	2.27E+01	15.88			2.27E+01	1.59E+01
m	11	311.47	9.55E+00	12.97			9.55E+00	1.30E+01
M	12	333.60	6.39E+01	19.95			6.39E+01	1.99E+01
M	13	352.35	2.19E+01	10.78	2.29E+00	1.14E+00	1.96E+01	1.08E+01
m	14	356.08	5.42E+02	47.79			5.42E+02	4.78E+01
	15	364.00	1.80E+01	12.73			1.80E+01	1.27E+01
M	16	376.75	1.29E+01	11.53			1.29E+01	1.15E+01
m	17	384.01	9.58E+01	23.17			9.58E+01	2.32E+01
m	18	386.74	1.39E+02	30.05			1.39E+02	3.01E+01
m	19	391.00	2.88E+01	19.92			2.88E+01	1.99E+01
M	20	414.53	3.37E+01	12.53			3.37E+01	1.25E+01
m	21	418.54	1.35E+01	11.36			1.35E+01	1.14E+01
	22	437.22	6.42E+01	19.90			6.42E+01	1.99E+01
	23	467.05	1.10E+01	11.83			1.10E+01	1.18E+01
	24	520.50	1.00E+01	6.32			1.00E+01	6.32E+00
	25	610.47	1.33E+01	8.72	2.14E+00	1.04E+00	1.11E+01	8.78E+00

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\WSRC.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)		Yield(%)	Activity (pCi/units)	Activity Uncertainty
SN-113	0.95	255.12		1.93		
		391.69	*	61.90	1.91E+01	1.33E+01
BA-133	1.00	81.00	*	34.06	4.79E+02	6.24E+01
		302.84	*	18.33	6.13E+02	2.12E+02
		356.01	*	62.05	4.34E+02	6.16E+01
TH-234	0.92	63.29	*	3.80	3.79E+02	7.78E+01
AM-241	0.90	59.54	*	35.90	4.01E+01	8.24E+00

Analysis Report for 2008019-01

SPIKE

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 2.500 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

INTERFERENCE CORRECTED REPORT

	Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/units)	Wt mean Activity Uncertainty	Comments
	SN-113	0.953	1.91E+01	1.33E+01	
	BA-133	1.000	4.63E+02	4.30E+01	
?	TH-234	0.925	3.79E+02	7.78E+01	
?	AM-241	0.902	4.01E+01	8.24E+00	

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 2008019-01

SPIKE

UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/11/2020 9:28:14AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

	Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
	1	35.16	4.62146E-01	7.26		
	2	52.97	4.90711E-02	36.71		
m	4	65.83	7.52427E-02	23.34		
M	6	111.59	1.88497E-01	9.69		
m	7	115.77	3.09535E-02	54.73		
	8	276.23	5.33845E-02	22.98		
m	10	306.59	2.52012E-02	35.01		
m	11	311.47	1.06071E-02	67.94		
M	12	333.60	7.09860E-02	15.61		
M	13	352.35	2.18247E-02	27.60		
	15	364.00	2.00000E-02	35.36	Sum	
M	16	376.75	1.42935E-02	44.82		
m	17	384.01	1.06467E-01	12.09	Sum	
m	18	386.74	1.54241E-01	10.83		
M	20	414.53	3.73969E-02	18.61		
m	21	418.54	1.49914E-02	42.09	Sum	
	22	437.22	7.13333E-02	15.50	Sum	
	23	467.05	1.22222E-02	53.78		
	24	520.50	1.11111E-02	31.62		
	25	610.47	1.23673E-02	39.44		

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\WSRC.NLB

Analysis Report for 2008019-01

SPIKE

	Nuclide Name	Energy (keV)		Yield(%)	Line MDA (pCi/units)	Nuclide MDA (pCi/units)	Activity (pCi/units)	Dec. Level (pCi/units)
	FE-55	5.89		24.50	4.58E-09	4.58E-09	0.00E+00	0.00E+00
	CO-57	122.06		85.51	2.57E+01	2.57E+01	-4.68E+00	1.19E+01
		136.48		10.60	2.42E+02		8.11E+00	1.12E+02
	NI-59	6.92		29.80	2.55E-08	2.55E-08	0.00E+00	0.00E+00
	MO-93	16.59		52.90	9.74E-05	9.74E-05	0.00E+00	0.00E+00
		18.60		10.00	1.34E-03		0.00E+00	0.00E+00
	NB-93M	16.57		9.43	5.41E-04	5.41E-04	0.00E+00	0.00E+00
	CD-109	88.03		3.72	2.64E+02	2.64E+02	6.76E+01	1.22E+02
+	SN-113	255.12		1.93	1.19E+03	3.53E+01	3.15E+02	5.39E+02
		391.69	*	61.90	3.53E+01		1.91E+01	1.67E+01
	SN-119M	23.87		16.10	5.81E-03	5.81E-03	0.00E+00	0.00E+00
		25.10		22.70	5.93E-03		0.00E+00	0.00E+00
	I-129	29.78		57.00	6.02E-01	6.02E-01	5.60E+00	2.97E-01
		33.60		13.20	4.66E+00		8.02E+00	2.29E+00
		39.58		7.52	4.85E+00		-1.05E-01	2.26E+00
+	BA-133	81.00	*	34.06	3.44E+01	2.75E+01	4.79E+02	1.64E+01
		302.84	*	18.33	2.24E+02		6.13E+02	1.07E+02
		356.01	*	62.05	2.75E+01		4.34E+02	1.27E+01
	CE-139	165.85		80.35	3.98E+01	3.98E+01	-2.35E+00	1.85E+01
	CE-144	133.54		10.80	2.41E+02	2.41E+02	1.65E+02	1.12E+02
	HG-203	279.19		77.30	1.96E+01	1.96E+01	-7.27E-02	8.51E+00
	PB-210	46.50		4.25	1.97E+01	1.97E+01	5.54E+00	9.14E+00
	TH-231	25.64		14.70	1.06E-02	1.06E-02	0.00E+00	0.00E+00
		84.21		6.40	1.54E+02		-2.02E+03	7.19E+01
	PA-234M	9.89		89.00	4.30E-07	4.30E-07	0.00E+00	0.00E+00
		21.72		64.90	7.08E-04		0.00E+00	0.00E+00
		37.93		23.75	1.56E+00		4.85E-02	7.39E-01
		131.42		20.40	1.16E+02		-7.13E+00	5.39E+01
+	TH-234	63.29	*	3.80	1.68E+02	1.68E+02	3.79E+02	8.11E+01
	NP-237	29.37		14.00	2.24E+00	2.24E+00	2.08E+01	1.10E+00
		86.50		12.60	7.76E+01		1.67E+01	3.61E+01
	U-237	97.08		16.30	8.56E+01	6.64E+01	1.28E+01	3.97E+01
		101.07		26.30	6.64E+01		2.69E+01	3.11E+01
		114.00		12.30	2.49E+02		-2.33E+02	1.19E+02
		208.01		22.00	1.48E+02		5.12E+01	6.81E+01
+	AM-241	59.54	*	35.90	1.77E+01	1.77E+01	4.01E+01	8.58E+00
	AM-243	74.67		66.00	1.03E+01	1.03E+01	-4.35E-01	4.81E+00

\+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
\> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Apex-Gamma

Analysis Report for 2008019-02
BLANK

GAMMA SPECTRUM ANALYSIS

Sample Identification	: 2008019-02
Sample Description	: BLANK
Sample Type	: RA RECOVERY
Sample Size	: 1.000E+00 units
Facility	: Countroom
Sample Taken On	: 8/10/2020 1:55:56PM
Acquisition Started	: 8/11/2020 9:13:18AM
Procedure	: BAFIL
Operator	: Administrator
Detector Name	: GE3
Geometry	: BAFIL
Live Time	: 900.0 seconds
Real Time	: 902.2 seconds
Dead Time	: 0.24 %
Peak Locate Threshold	: 2.50
Peak Locate Range (in channels)	: 1 - 4096
Peak Area Range (in channels)	: 10 - 4096
Identification Energy Tolerance	: 2.500 keV
Energy Calibration Used Done On	: 6/6/2020
Efficiency Calibration Used Done On	: 10/19/2019
Efficiency Calibration Description	:
Sample Number	: 100749

PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/11/2020 9:28:25AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)

Analysis Report for 2008019-02

BLANK

	Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)
	1	20.79	17 -	25	21.23	1.01E+02	51.61	3.49E+02	1.96
M	2	31.03	26 -	39	31.45	2.21E+03	99.45	2.15E+02	2.00
m	3	35.32	26 -	39	35.74	5.10E+02	60.88	1.49E+02	2.13
	4	53.18	50 -	57	53.58	7.28E+01	37.04	1.80E+02	2.10
M	5	62.23	58 -	72	62.61	2.92E+02	46.95	1.66E+02	2.23
m	6	66.23	58 -	72	66.61	1.25E+02	45.65	1.72E+02	2.19
	7	81.39	78 -	87	81.75	8.99E+02	72.33	2.29E+02	2.06
M	8	111.92	108 -	121	112.25	2.47E+02	42.69	1.45E+02	2.33
m	9	115.86	108 -	121	116.18	5.87E+01	44.72	1.57E+02	2.54
	10	144.68	141 -	149	144.97	3.56E+01	34.95	1.65E+02	4.90
	11	160.81	157 -	165	161.08	3.60E+01	32.43	1.40E+02	1.48
M	12	269.81	268 -	285	269.94	1.82E+01	8.96	1.22E+01	2.98
m	13	276.48	268 -	285	276.60	6.19E+01	23.96	4.06E+01	2.98
	14	303.10	301 -	306	303.20	1.02E+02	27.77	7.88E+01	2.07
	15	312.87	311 -	316	312.95	1.98E+01	15.62	2.84E+01	1.23
M	16	333.79	329 -	342	333.84	1.05E+02	24.30	3.01E+01	2.28
m	17	338.15	329 -	342	338.21	2.57E+01	20.36	4.42E+01	2.28
	18	356.22	350 -	361	356.25	4.90E+02	47.92	4.18E+01	2.06
M	19	384.28	380 -	394	384.27	1.33E+02	34.15	4.01E+01	2.43
m	20	387.34	380 -	394	387.33	1.99E+02	36.84	2.53E+01	2.00
m	21	391.64	380 -	394	391.63	5.14E+01	25.40	1.46E+01	2.10
	22	408.01	403 -	411	407.98	1.33E+01	14.04	2.15E+01	1.49
M	23	417.22	411 -	423	417.18	4.73E+01	23.37	3.00E+01	3.42
m	24	421.45	411 -	423	421.40	1.25E+01	13.17	1.50E+01	1.80
	25	437.29	433 -	441	437.22	1.04E+02	23.09	1.80E+01	1.45
	26	468.41	462 -	474	468.31	2.60E+01	10.20	0.00E+00	2.67
	27	532.65	530 -	535	532.46	6.88E+00	6.40	2.25E+00	1.99
	28	694.95	691 -	698	694.57	6.31E+00	6.93	3.38E+00	1.09

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/11/2020 9:28:25AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000100689.CNF

Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
1	20.79	1.01E+02	51.61			1.01E+02	5.16E+01

Analysis Report for 2008019-02

BLANK

	Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
M	2	31.03	2.21E+03	99.45			2.21E+03	9.94E+01
m	3	35.32	5.10E+02	60.88			5.10E+02	6.09E+01
	4	53.18	7.28E+01	37.04			7.28E+01	3.70E+01
M	5	62.23	2.92E+02	46.95	1.29E+01	1.90E+00	2.79E+02	4.70E+01
m	6	66.23	1.25E+02	45.65			1.25E+02	4.57E+01
	7	81.39	8.99E+02	72.33			8.99E+02	7.23E+01
M	8	111.92	2.47E+02	42.69			2.47E+02	4.27E+01
m	9	115.86	5.87E+01	44.72			5.87E+01	4.47E+01
	10	144.68	3.56E+01	34.95	2.40E+00	1.65E+00	3.32E+01	3.50E+01
	11	160.81	3.60E+01	32.43			3.60E+01	3.24E+01
M	12	269.81	1.82E+01	8.96			1.82E+01	8.96E+00
m	13	276.48	6.19E+01	23.96			6.19E+01	2.40E+01
	14	303.10	1.02E+02	27.77			1.02E+02	2.78E+01
	15	312.87	1.98E+01	15.62			1.98E+01	1.56E+01
M	16	333.79	1.05E+02	24.30			1.05E+02	2.43E+01
m	17	338.15	2.57E+01	20.36			2.57E+01	2.04E+01
	18	356.22	4.90E+02	47.92			4.90E+02	4.79E+01
M	19	384.28	1.33E+02	34.15			1.33E+02	3.42E+01
m	20	387.34	1.99E+02	36.84			1.99E+02	3.68E+01
m	21	391.64	5.14E+01	25.40			5.14E+01	2.54E+01
	22	408.01	1.33E+01	14.04			1.33E+01	1.40E+01
M	23	417.22	4.73E+01	23.37			4.73E+01	2.34E+01
m	24	421.45	1.25E+01	13.17			1.25E+01	1.32E+01
	25	437.29	1.04E+02	23.09			1.04E+02	2.31E+01
	26	468.41	2.60E+01	10.20			2.60E+01	1.02E+01
	27	532.65	6.88E+00	6.40			6.88E+00	6.40E+00
	28	694.95	6.31E+00	6.93			6.31E+00	6.93E+00

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\WSRC.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)		Yield(%)	Activity (pCi/units)	Activity Uncertainty
SN-113	0.95	255.12		1.93		
		391.69	*	61.90	4.36E+01	2.21E+01

Analysis Report for 2008019-02

BLANK

Nuclide Name	Id Confidence	Energy (keV)		Yield(%)	Activity (pCi/units)	Activity Uncertainty
I-129	0.86	29.78	*	57.00	3.03E+01	1.37E+00
		33.60	*	13.20	5.07E+01	6.06E+00
		39.58		7.52		
BA-133	0.99	81.00	*	34.06	4.48E+02	5.69E+01
		302.84	*	18.33	3.35E+02	1.33E+02
		356.01	*	62.05	4.42E+02	6.99E+01
TH-234	0.97	63.29	*	3.80	6.35E+02	1.11E+02

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 2.500 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

INTERFERENCE CORRECTED REPORT

	Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/units)	Wt mean Activity Uncertainty	Comments
	SN-113	0.955	4.36E+01	2.21E+01	
	I-129	0.863	3.12E+01	1.34E+00	
	BA-133	0.998	4.35E+02	4.19E+01	
	TH-234	0.972	6.35E+02	1.11E+02	
X	NP-237	0.742			

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 2008019-02

BLANK

UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/11/2020 9:28:25AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

	Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
	1	20.79	1.12572E-01	25.47	Tol.	MO-93 PA-234M
	4	53.18	8.08453E-02	25.45		
m	6	66.23	1.39313E-01	18.20	Sum	
M	8	111.92	2.74929E-01	8.63	Sum	
m	9	115.86	6.51734E-02	38.12	Sum	
	10	144.68	3.69296E-02	52.63	Sum	
	11	160.81	4.00524E-02	44.98	Sum	
M	12	269.81	2.01726E-02	24.67		
m	13	276.48	6.87498E-02	19.36		
	15	312.87	2.19935E-02	39.46		
M	16	333.79	1.16943E-01	11.54	Sum	
m	17	338.15	2.85646E-02	39.60	Sum	
M	19	384.28	1.47854E-01	12.83	Sum	
m	20	387.34	2.21513E-01	9.24	Sum	
	22	408.01	1.47222E-02	53.00		
M	23	417.22	5.25771E-02	24.69	Sum	
m	24	421.45	1.39432E-02	52.48	Sum	
	25	437.29	1.15556E-01	11.10	Sum	
	26	468.41	2.88889E-02	19.61		
	27	532.65	7.63889E-03	46.57		
	28	694.95	7.01389E-03	54.88	Sum	

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

Analysis Report for 2008019-02

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NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\WSRC.NLB

	Nuclide Name	Energy (keV)		Yield(%)	Line MDA (pCi/units)	Nuclide MDA (pCi/units)	Activity (pCi/units)	Dec. Level (pCi/units)
	FE-55	5.89		24.50	6.04E-06	6.04E-06	0.00E+00	0.00E+00
	CO-57	122.06		85.51	1.70E+01	1.70E+01	2.14E+00	7.91E+00
		136.48		10.60	1.69E+02		1.08E+02	7.91E+01
	NI-59	6.92		29.80	1.47E-04	1.47E-04	-1.76E-05	6.56E-05
	MO-93	16.59		52.90	4.41E-02	4.41E-02	2.57E-03	2.10E-02
		18.60		10.00	5.34E-01		6.53E-01	2.57E-01
	NB-93M	16.57		9.43	2.46E-01	2.46E-01	1.43E-02	1.17E-01
	CD-109	88.03		3.72	2.48E+02	2.48E+02	-1.66E+02	1.17E+02
+	SN-113	255.12		1.93	1.17E+03	3.46E+01	3.23E+02	5.42E+02
		391.69	*	61.90	3.46E+01		4.36E+01	1.61E+01
	SN-119M	23.87		16.10	1.12E+00	9.17E-01	-6.73E-01	5.40E-01
		25.10		22.70	9.17E-01		-2.75E+01	4.40E-01
+	I-129	29.78	*	57.00	1.40E+00	1.40E+00	3.03E+01	6.82E-01
		33.60	*	13.20	9.99E+00		5.07E+01	4.86E+00
		39.58		7.52	1.75E+01		-1.61E-01	8.39E+00
+	BA-133	81.00	*	34.06	3.45E+01	2.96E+01	4.48E+02	1.66E+01
		302.84	*	18.33	1.13E+02		3.35E+02	5.18E+01
		356.01	*	62.05	2.96E+01		4.42E+02	1.36E+01
	CE-139	165.85		80.35	2.76E+01	2.76E+01	6.10E+00	1.29E+01
	CE-144	133.54		10.80	1.45E+02	1.45E+02	-2.83E+01	6.75E+01
	HG-203	279.19		77.30	3.58E+01	3.58E+01	2.98E+01	1.68E+01
	PB-210	46.50		4.25	3.97E+01	3.97E+01	-8.86E-01	1.87E+01
	TH-231	25.64		14.70	1.56E+00	1.56E+00	-4.67E+01	7.47E-01
		84.21		6.40	3.40E+02		1.20E+03	1.66E+02
	PA-234M	9.89		89.00	1.00E-03	1.00E-03	8.07E-04	4.73E-04
		21.72		64.90	1.83E-01		2.79E-01	8.82E-02
		37.93		23.75	8.16E+00		-3.92E-01	3.98E+00
		131.42		20.40	7.21E+01		-3.60E+01	3.34E+01
+	TH-234	63.29	*	3.80	2.14E+02	2.14E+02	6.35E+02	1.04E+02
	NP-237	29.37	*	14.00	5.70E+00	5.70E+00	1.23E+02	2.78E+00
		86.50		12.60	7.68E+01		8.35E-01	3.63E+01
	U-237	97.08		16.30	8.15E+01	5.21E+01	-2.67E+01	3.85E+01
		101.07		26.30	5.21E+01		7.78E+00	2.46E+01
		114.00		12.30	2.62E+02		8.06E+02	1.27E+02
		208.01		22.00	1.20E+02		-7.16E+01	5.58E+01
	AM-241	59.54		35.90	1.92E+01	1.92E+01	4.07E+01	9.30E+00
	AM-243	74.67		66.00	1.08E+01	1.08E+01	3.62E-01	5.11E+00

\+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
\> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Analysis Report for 2008019-02

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Apex-Gamma

Analysis Report for 2008019-03
JLS-11

GAMMA SPECTRUM ANALYSIS

Sample Identification	: 2008019-03
Sample Description	: JLS-11
Sample Type	: RA RECOVERY
Sample Size	: 1.000E+00 units
Facility	: Countroom
Sample Taken On	: 8/10/2020 1:56:09PM
Acquisition Started	: 8/11/2020 9:13:27AM
Procedure	: BAFIL
Operator	: Administrator
Detector Name	: GE4
Geometry	: BAFIL
Live Time	: 900.0 seconds
Real Time	: 900.4 seconds
Dead Time	: 0.04 %
Peak Locate Threshold	: 2.50
Peak Locate Range (in channels)	: 1 - 4096
Peak Area Range (in channels)	: 9 - 4096
Identification Energy Tolerance	: 2.500 keV
Energy Calibration Used Done On	: 6/6/2020
Efficiency Calibration Used Done On	: 10/12/2019
Efficiency Calibration Description	:
Sample Number	: 100750

PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/11/2020 9:28:36AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)

Analysis Report for 2008019-03

JLS-11

	Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)
M	1	30.55	25 -	39	30.57	7.36E+02	59.99	1.00E+02	2.28
m	2	34.84	25 -	39	34.85	1.89E+02	53.81	8.09E+01	2.62
	3	62.80	57 -	69	62.79	9.81E+01	44.65	1.88E+02	2.78
M	4	80.82	74 -	103	80.80	3.46E+02	42.80	8.51E+01	2.79
	5	110.88	105 -	116	110.83	6.07E+01	36.06	1.33E+02	3.02
	6	124.95	121 -	128	124.89	1.60E+01	16.61	3.41E+01	2.45
	7	276.47	273 -	280	276.29	1.76E+01	14.70	2.48E+01	1.47
	8	287.19	284 -	292	287.00	9.00E+00	12.37	1.80E+01	2.00
	9	302.76	297 -	309	302.56	6.59E+01	20.75	2.03E+01	2.43
M	10	322.55	321 -	340	322.33	6.28E+00	5.55	5.78E+00	2.91
m	11	326.52	321 -	340	326.30	1.11E+01	12.61	1.80E+01	3.92
	12	355.95	351 -	360	355.71	1.29E+02	27.62	3.53E+01	1.72
M	13	383.02	379 -	393	382.75	4.04E+01	16.49	2.23E+01	2.71
m	14	387.02	379 -	393	386.75	4.89E+01	19.08	1.88E+01	2.71
	15	407.93	404 -	410	407.64	1.40E+01	7.48	0.00E+00	1.47
	16	416.52	412 -	420	416.23	1.61E+01	12.36	1.38E+01	3.38
	17	431.55	427 -	433	431.25	6.50E+00	8.03	7.00E+00	1.52
	18	437.05	433 -	440	436.74	2.48E+01	15.49	2.23E+01	2.73
	19	587.08	583 -	589	586.66	6.25E+00	6.65	3.50E+00	2.68

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/11/2020 9:28:36AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000100690.CNF

	Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
M	1	30.55	7.36E+02	59.99			7.36E+02	6.00E+01
m	2	34.84	1.89E+02	53.81			1.89E+02	5.38E+01
	3	62.80	9.81E+01	44.65	1.28E+01	2.14E+00	8.53E+01	4.47E+01
M	4	80.82	3.46E+02	42.80			3.46E+02	4.28E+01
	5	110.88	6.07E+01	36.06			6.07E+01	3.61E+01
	6	124.95	1.60E+01	16.61			1.60E+01	1.66E+01
	7	276.47	1.76E+01	14.70			1.76E+01	1.47E+01
	8	287.19	9.00E+00	12.37			9.00E+00	1.24E+01
	9	302.76	6.59E+01	20.75			6.59E+01	2.08E+01
M	10	322.55	6.28E+00	5.55			6.28E+00	5.55E+00

Analysis Report for 2008019-03

JLS-11

	Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
m	11	326.52	1.11E+01	12.61			1.11E+01	1.26E+01
	12	355.95	1.29E+02	27.62			1.29E+02	2.76E+01
M	13	383.02	4.04E+01	16.49			4.04E+01	1.65E+01
m	14	387.02	4.89E+01	19.08			4.89E+01	1.91E+01
	15	407.93	1.40E+01	7.48			1.40E+01	7.48E+00
	16	416.52	1.61E+01	12.36			1.61E+01	1.24E+01
	17	431.55	6.50E+00	8.03			6.50E+00	8.03E+00
	18	437.05	2.48E+01	15.49			2.48E+01	1.55E+01
	19	587.08	6.25E+00	6.65			6.25E+00	6.65E+00

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\WSRC.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)		Yield(%)	Activity (pCi/units)	Activity Uncertainty
I-129	0.82	29.78	*	57.00	2.23E+02	2.79E+01
		33.60	*	13.20	2.36E+02	7.07E+01
		39.58		7.52		
BA-133	1.00	81.00	*	34.06	1.80E+02	2.84E+01
		302.84	*	18.33	2.34E+02	1.07E+02
		356.01	*	62.05	1.76E+02	4.65E+01
TH-234	0.99	63.29	*	3.80	3.66E+02	1.95E+02

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 2.500 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

Analysis Report for 2008019-03

JLS-11

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/units)	Wt mean Activity Uncertainty	Comments
I-129	0.822	2.25E+02	2.60E+01	
BA-133	1.000	1.82E+02	2.36E+01	
TH-234	0.994	3.66E+02	1.95E+02	

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 2008019-03

JLS-11

UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/11/2020 9:28:36AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

	Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
	5	110.88	6.74628E-02	29.69	Sum	
	6	124.95	1.77273E-02	52.06	Sum	
	7	276.47	1.95556E-02	41.75		
	8	287.19	1.00000E-02	68.72		
M	10	322.55	6.97347E-03	44.18		
m	11	326.52	1.23328E-02	56.80		
M	13	383.02	4.48434E-02	20.43	Sum	
m	14	387.02	5.42900E-02	19.52	Sum	
	15	407.93	1.55556E-02	26.73		
	16	416.52	1.78744E-02	38.41	Sum	
	17	431.55	7.22222E-03	61.78		
	18	437.05	2.75926E-02	31.19	Sum	
	19	587.08	6.94444E-03	53.22		

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\WSRC.NLB

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/units)	Nuclide MDA (pCi/units)	Activity (pCi/units)	Dec. Level (pCi/units)
FE-55	5.89	24.50	7.92E+01	7.92E+01	-1.02E+01	3.41E+01
CO-57	122.06	85.51	7.63E+00	7.63E+00	-3.62E-01	3.45E+00
	136.48	10.60	6.84E+01		1.52E+01	3.10E+01

Analysis Report for 2008019-03

JLS-11

	Nuclide Name	Energy (keV)		Yield(%)	Line MDA (pCi/units)	Nuclide MDA (pCi/units)	Activity (pCi/units)	Dec. Level (pCi/units)
	NI-59	6.92		29.80	7.07E+01	7.07E+01	1.11E+01	3.19E+01
	MO-93	16.59		52.90	2.68E+01	2.68E+01	-3.53E-01	1.28E+01
		18.60		10.00	1.33E+02		1.37E+02	6.34E+01
	NB-93M	16.57		9.43	1.51E+02	1.51E+02	-1.98E+00	7.17E+01
	CD-109	88.03		3.72	1.72E+02	1.72E+02	-2.10E+02	7.92E+01
	SN-113	255.12		1.93	6.72E+02	4.94E+01	-9.88E+01	3.00E+02
		391.69		61.90	4.94E+01		-1.61E+00	2.25E+01
	SN-119M	23.87		16.10	5.83E+01	3.94E+01	7.18E+00	2.75E+01
		25.10		22.70	3.94E+01		-3.67E+00	1.86E+01
+	I-129	29.78	*	57.00	2.14E+01	2.14E+01	2.23E+02	1.03E+01
		33.60	*	13.20	8.78E+01		2.36E+02	4.22E+01
		39.58		7.52	7.61E+01		1.03E+00	3.52E+01
+	BA-133	81.00	*	34.06	5.99E+01	3.87E+01	1.80E+02	2.92E+01
		302.84	*	18.33	8.51E+01		2.34E+02	3.78E+01
		356.01	*	62.05	3.87E+01		1.76E+02	1.75E+01
	CE-139	165.85		80.35	1.15E+01	1.15E+01	2.05E+00	5.24E+00
	CE-144	133.54		10.80	6.00E+01	6.00E+01	1.96E+01	2.69E+01
	HG-203	279.19		77.30	2.16E+01	2.16E+01	-7.54E-01	9.77E+00
	PB-210	46.50		4.25	1.26E+02	1.26E+02	-6.43E+01	5.81E+01
	TH-231	25.64		14.70	7.88E+01	7.88E+01	-7.90E+00	3.77E+01
		84.21		6.40	2.09E+02		3.87E+02	1.01E+02
	PA-234M	9.89		89.00	2.24E+01	1.62E+01	1.87E+01	1.05E+01
		21.72		64.90	1.62E+01		7.06E+00	7.67E+00
		37.93		23.75	4.11E+01		-3.24E+00	1.96E+01
		131.42		20.40	2.66E+01		-7.00E+00	1.17E+01
+	TH-234	63.29	*	3.80	2.99E+02	2.99E+02	3.66E+02	1.44E+02
	NP-237	29.37		14.00	1.67E+02	5.40E+01	7.96E+02	8.19E+01
		86.50		12.60	5.40E+01		-3.01E+02	2.50E+01
	U-237	97.08		16.30	4.53E+01	2.55E+01	-8.59E+00	2.09E+01
		101.07		26.30	2.55E+01		2.69E+00	1.17E+01
		114.00		12.30	8.90E+01		7.20E+01	4.19E+01
		208.01		22.00	5.23E+01		-1.72E+01	2.36E+01
	AM-241	59.54		35.90	2.37E+01	2.37E+01	1.13E+01	1.13E+01
	AM-243	74.67		66.00	9.84E+00	9.84E+00	1.05E+00	4.57E+00

\+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
\> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Apex-Gamma

Analysis Report for 2008019-04
JLS-11

GAMMA SPECTRUM ANALYSIS

Sample Identification	: 2008019-04
Sample Description	: JLS-11
Sample Type	: RA RECOVERY
Sample Size	: 1.000E+00 units
Facility	: Countroom
Sample Taken On	: 8/10/2020 1:56:22PM
Acquisition Started	: 8/11/2020 9:13:04AM
Procedure	: BAFIL
Operator	: Administrator
Detector Name	: GE5
Geometry	: BAFIL
Live Time	: 900.0 seconds
Real Time	: 1049.3 seconds
Dead Time	: 14.23 %
Peak Locate Threshold	: 2.50
Peak Locate Range (in channels)	: 1 - 4096
Peak Area Range (in channels)	: 2 - 4096
Identification Energy Tolerance	: 2.500 keV
Energy Calibration Used Done On	: 12/1/2018
Efficiency Calibration Used Done On	: 2/17/2018
Efficiency Calibration Description	:
Sample Number	: 100747

PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/11/2020 9:30:36AM
Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)

Analysis Report for 2008019-04

JLS-11

	Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)
	1	20.63	193	214	202.70	9.49E+01	36.40	9.63E+01	0.54
	2	30.44	286	318	301.57	2.33E+03	115.33	3.01E+02	0.73
M	3	34.58	332	361	343.29	4.72E+02	52.85	7.69E+01	0.62
m	4	35.48	332	361	352.33	1.15E+02	50.17	3.45E+01	0.73
	5	51.40	505	519	512.83	2.50E+01	15.49	2.00E+01	0.99
M	6	52.51	520	533	524.00	3.20E+01	11.85	8.49E+00	0.71
m	7	52.96	520	533	528.60	2.08E+01	16.98	9.88E+00	0.64
	8	61.33	598	629	612.90	2.75E+02	42.15	5.39E+01	0.62
	9	65.59	643	667	655.84	1.37E+02	38.62	9.06E+01	0.48
M	10	79.19	777	822	792.93	5.72E+01	56.98	4.27E+01	1.11
m	11	80.63	777	822	807.42	9.00E+02	63.12	2.80E+01	0.71
	12	92.38	915	932	925.91	1.52E+01	14.42	1.95E+01	0.48
M	13	111.24	1103	1128	1116.00	1.02E+02	39.40	1.03E+02	0.81
m	14	111.73	1103	1128	1120.92	1.05E+02	33.54	5.17E+01	0.71
	15	115.54	1151	1167	1159.32	2.81E+01	24.27	7.58E+01	0.14
	16	160.11	1596	1619	1608.57	3.22E+01	23.66	5.37E+01	0.83
M	17	275.42	2764	2787	2771.00	2.03E+01	10.85	7.13E+00	0.90
m	18	276.11	2764	2787	2778.00	3.82E+01	17.32	2.04E+01	1.00
M	19	302.50	3029	3058	3044.03	8.33E+01	23.66	0.00E+00	1.12
m	20	302.99	3029	3058	3049.00	1.20E+02	22.54	0.00E+00	1.02
M	21	333.14	3339	3365	3353.00	8.63E+01	19.50	2.24E+01	1.05
m	22	333.94	3339	3365	3361.00	1.86E+01	11.83	5.18E+00	0.85
	23	355.75	3564	3596	3580.98	4.67E+02	44.49	1.28E+01	0.93
	24	383.51	3845	3873	3860.87	8.16E+01	21.47	1.68E+01	0.73
M	25	386.10	3876	3904	3887.00	1.21E+02	26.39	1.84E+01	1.09
m	26	387.29	3876	3904	3899.00	4.91E+01	15.21	8.80E+00	1.09
M	27	390.46	3922	3943	3930.98	3.31E+01	14.14	1.64E+01	1.19
m	28	390.86	3922	3943	3935.00	1.93E+01	15.03	1.45E+01	1.09

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/11/2020 9:30:36AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000100692.CNF

Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
1	20.63	9.49E+01	36.40	3.99E+00	9.27E-01	9.09E+01	3.64E+01

Analysis Report for 2008019-04

JLS-11

	Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
	2	30.44	2.33E+03	115.33	6.27E+00	9.62E-01	2.32E+03	1.15E+02
M	3	34.58	4.72E+02	52.85	1.09E+00	5.51E-01	4.71E+02	5.29E+01
m	4	35.48	1.15E+02	50.17	1.09E+00	5.51E-01	1.14E+02	5.02E+01
	5	51.40	2.50E+01	15.49	4.95E-01	3.37E-01	2.45E+01	1.55E+01
M	6	52.51	3.20E+01	11.85	4.95E-01	3.37E-01	3.15E+01	1.19E+01
m	7	52.96	2.08E+01	16.98	4.95E-01	3.37E-01	2.03E+01	1.70E+01
	8	61.33	2.75E+02	42.15	2.52E+00	6.49E-01	2.73E+02	4.22E+01
	9	65.59	1.37E+02	38.62			1.37E+02	3.86E+01
M	10	79.19	5.72E+01	56.98			5.72E+01	5.70E+01
m	11	80.63	9.00E+02	63.12			9.00E+02	6.31E+01
	12	92.38	1.52E+01	14.42			1.52E+01	1.44E+01
M	13	111.24	1.02E+02	39.40	1.69E+00	5.84E-01	1.00E+02	3.94E+01
m	14	111.73	1.05E+02	33.54	1.69E+00	5.84E-01	1.03E+02	3.35E+01
	15	115.54	2.81E+01	24.27			2.81E+01	2.43E+01
	16	160.11	3.22E+01	23.66			3.22E+01	2.37E+01
M	17	275.42	2.03E+01	10.85			2.03E+01	1.09E+01
m	18	276.11	3.82E+01	17.32			3.82E+01	1.73E+01
M	19	302.50	8.33E+01	23.66			8.33E+01	2.37E+01
m	20	302.99	1.20E+02	22.54			1.20E+02	2.25E+01
M	21	333.14	8.63E+01	19.50			8.63E+01	1.95E+01
m	22	333.94	1.86E+01	11.83			1.86E+01	1.18E+01
	23	355.75	4.67E+02	44.49			4.67E+02	4.45E+01
	24	383.51	8.16E+01	21.47			8.16E+01	2.15E+01
M	25	386.10	1.21E+02	26.39			1.21E+02	2.64E+01
m	26	387.29	4.91E+01	15.21			4.91E+01	1.52E+01
M	27	390.46	3.31E+01	14.14			3.31E+01	1.41E+01
m	28	390.86	1.93E+01	15.03			1.93E+01	1.50E+01

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\WSRC.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)		Yield(%)	Activity (pCi/units)	Activity Uncertainty
SN-113	0.93	255.12		1.93		
		391.69	*	61.90	1.97E+01	1.55E+01

Analysis Report for 2008019-04

JLS-11

Nuclide Name	Id Confidence	Energy (keV)		Yield(%)	Activity (pCi/units)	Activity Uncertainty
I-129	0.89	29.78	*	57.00	2.97E+01	1.48E+00
		33.60	*	13.20	4.38E+01	4.92E+00
		39.58		7.52		
BA-133	0.99	81.00	*	34.06	4.61E+02	5.13E+01
		302.84	*	18.33	4.61E+02	1.33E+02
		356.01	*	62.05	5.01E+02	7.58E+01
TH-234	0.90	63.29	*	3.80	6.17E+02	9.90E+01
AM-241	0.92	59.54	*	35.90	6.53E+01	1.05E+01

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 2.500 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

INTERFERENCE CORRECTED REPORT

	Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/units)	Wt mean Activity Uncertainty	Comments
	SN-113	0.938	1.97E+01	1.55E+01	
	I-129	0.892	3.09E+01	1.42E+00	
	BA-133	0.998	4.72E+02	4.05E+01	
?	TH-234	0.906	6.17E+02	9.90E+01	
X	NP-237	0.767			
?	AM-241	0.921	6.53E+01	1.05E+01	

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 2008019-04

JLS-11

UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/11/2020 9:30:36AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

	Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
	1	20.63	1.00981E-01	20.03	Tol.	MO-93 PA-234M
m	4	35.48	1.26328E-01	22.06	Tol.	I-129 PA-234M
	5	51.40	2.72172E-02	31.63		
M	6	52.51	3.50321E-02	18.79		
m	7	52.96	2.25832E-02	41.78		
	9	65.59	1.51907E-01	14.13	Sum	
M	10	79.19	6.35826E-02	49.79	Tol.	BA-133
	12	92.38	1.69333E-02	47.32	Sum	
M	13	111.24	1.11530E-01	19.63	Sum	
m	14	111.73	1.14457E-01	16.28	Sum	
	15	115.54	3.12374E-02	43.17	Sum	
	16	160.11	3.57392E-02	36.79	Sum	
M	17	275.42	2.25776E-02	26.71		
m	18	276.11	4.24346E-02	22.68		
M	19	302.50	9.25268E-02	14.21	Tol.	BA-133
M	21	333.14	9.58786E-02	11.30	Sum	
m	22	333.94	2.06470E-02	31.84	Sum	
	24	383.51	9.06593E-02	13.16	Sum	
M	25	386.10	1.34941E-01	10.87	Sum	
m	26	387.29	5.45561E-02	15.49	Sum	
M	27	390.46	3.68212E-02	21.33	Sum	

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

Analysis Report for 2008019-04

JLS-11

NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\WSRC.NLB

	Nuclide Name	Energy (keV)		Yield(%)	Line MDA (pCi/units)	Nuclide MDA (pCi/units)	Activity (pCi/units)	Dec. Level (pCi/units)
	FE-55	5.89		24.50	6.18E-05	6.18E-05	-7.02E-06	2.78E-05
	CO-57	122.06		85.51	1.24E+01	1.24E+01	-2.09E+00	5.60E+00
		136.48		10.60	1.27E+02		3.83E+01	5.75E+01
	NI-59	6.92		29.80	1.67E-04	1.67E-04	-1.76E-06	7.53E-05
	MO-93	16.59		52.90	1.91E-02	1.91E-02	-6.60E-03	8.50E-03
		18.60		10.00	2.16E-01		-5.50E-02	9.81E-02
	NB-93M	16.57		9.43	1.06E-01	1.06E-01	-3.68E-02	4.74E-02
	CD-109	88.03		3.72	1.68E+02	1.68E+02	6.36E+01	7.64E+01
+	SN-113	255.12		1.93	6.72E+02	2.01E+01	-1.28E+02	2.86E+02
		391.69	*	61.90	2.01E+01		1.97E+01	8.66E+00
	SN-119M	23.87		16.10	4.98E-01	4.98E-01	-4.07E-02	2.28E-01
		25.10		22.70	5.49E-01		3.11E-01	2.56E-01
+	I-129	29.78	*	57.00	1.37E+00	1.37E+00	2.97E+01	6.68E-01
		33.60	*	13.20	5.68E+00		4.38E+01	2.71E+00
		39.58		7.52	7.10E+00		-9.18E-01	3.18E+00
+	BA-133	81.00	*	34.06	2.80E+01	1.04E+01	4.61E+02	1.33E+01
		302.84	*	18.33	1.04E+01		4.61E+02	0.00E+00
		356.01	*	62.05	2.16E+01		5.01E+02	9.36E+00
	CE-139	165.85		80.35	1.84E+01	1.84E+01	-5.67E+00	8.24E+00
	CE-144	133.54		10.80	1.21E+02	1.21E+02	2.46E+01	5.48E+01
	HG-203	279.19		77.30	1.48E+01	1.48E+01	-1.62E+01	6.15E+00
	PB-210	46.50		4.25	2.01E+01	2.01E+01	2.75E-01	8.89E+00
	TH-231	25.64		14.70	8.97E-01	8.97E-01	2.94E-01	4.17E-01
		84.21		6.40	8.99E+01		1.77E+01	4.09E+01
	PA-234M	9.89		89.00	6.55E-04	6.55E-04	-5.51E-05	2.98E-04
		21.72		64.90	8.65E-02		2.82E-03	3.99E-02
		37.93		23.75	1.92E+00		8.79E-01	8.59E-01
		131.42		20.40	6.41E+01		2.65E+00	2.92E+01
+	TH-234	63.29	*	3.80	1.04E+02	1.04E+02	6.17E+02	4.88E+01
	NP-237	29.37	*	14.00	5.58E+00	5.58E+00	1.21E+02	2.72E+00
		86.50		12.60	4.44E+01		-2.15E+00	2.00E+01
	U-237	97.08		16.30	4.89E+01	3.60E+01	-4.22E+00	2.21E+01
		101.07		26.30	3.60E+01		1.96E+01	1.64E+01
		114.00		12.30	9.99E+01		-1.30E+02	4.58E+01
		208.01		22.00	8.87E+01		1.32E+01	3.99E+01
+	AM-241	59.54	*	35.90	1.10E+01	1.10E+01	6.53E+01	5.17E+00
	AM-243	74.67		66.00	6.47E+00	6.47E+00	-2.17E-01	2.94E+00

\+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
\> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Analysis Report for 2008019-04

JLS-11

SECTION XI

ANALYTICAL DATA (TOTAL DISSOLVED SOLIDS)

TDS / TSS Worksheet

Work Order	Run	Analysis Code	Technician
20-08019	**1**	**TDS**	**MHIGHTOWER**

TRetec	Michael Pisani & Associates, Inc.		Filter Data			TDS/TSS	Maximum Aliq
Fraction	Client ID	Aliquot ml	Filter Tare (g)	Filter Final (g)	Filter Net (g)	(mg/L)	(mL)
04	**JLS-11**	100.0000	99.0574	105.8821	**6.8247**	**68247.0000**	**1.47**

0119

Technician: MH Date: 8/5/20

Eberline Analytical
Oak Ridge Laboratory

Aliquot Worksheet

Printed: 8/5/2020 11:50 AM

Work Order	Run	Analysis Code	Rpt Units	Lab Deadline	Technician
20-08019	1	TDS	liters	8/17/2020	KSALLINGS

Lab Fraction	Michael Pisani & Associates, Inc. Client ID	Sample Type	Muffle Data	Dilution Data			Aliquot Data		MS Aliquot Data		H-3 Solids Only	
			Ratio Post/Pre	No of Dils	Dil Factor	Ratio	Aliquot	Net Equiv	Aliquot	Net Equiv	Water Added (ml)	H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	JLS-11	DUP					1.0000E-01	1.0000E-01				
04	JLS-11	DO					1.0000E-01	1.0000E-01				

Comments	

0120

Technician: Kenny Sas Date: 8/5/20

Element Materials Technology Lafayette
2417 W. Pinhook Road
Lafayette, LA 70508-3344
TEL: (337) 235-0483 FAX: (337) 233-6540
Website: www.element.com

June 18, 2020

Jody Shugart
ERM Southwest
3838 North Causeway, Suite 2725
Metairie, LA 70002
TEL: (504) 831-6700
FAX: (504) 831-6742

RE: Jeanerette Lumber & Shingle/519829 Order No.: 20050855

Dear Jody Shugart:

Element Materials Technology Lafayette received 4 sample(s) on 5/27/2020 for the analyses presented in the following report.

In accordance with your instructions Element Lafayette conducted the analysis shown on the following pages on samples submitted by your company. The results related only to the items tested. Unless otherwise noted, all analyses were conducted using EPA approved methodologies and all test results meet all requirements of TNI. All relevant sampling information is on the attached Chain-of-Custody form.

Where applicable, all soil data, except for 29-B, are on a wet-weight basis unless otherwise indicated in the units field as –dry.

LELAP Certification No.: 01997. TCEQ Certification No.: T104704261. LDHH Certification No.: LA023. ISDH Certification No.: C-LA-01. NDELCP Certification No.: R-226. A scope of accredited parameters is available upon request. A "#" by the test method or analyte indicates this parameter is outside the scope of accreditation.

Estimated uncertainty is available upon request. This report shall not be reproduced except in full, without the written approval of the laboratory.

If you have any questions regarding these test results, please feel free to call.

Cristina Thibeaux
Customer Service Supervisor
2417 W. Pinhook Road
Lafayette, LA 70508-3344

Element Materials Technology Lafayette
2417 W. Pinhook Road
Lafayette, LA 70508-3344
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Website: www.element.com

Case Narrative

WO#: **20050855**
Date: **6/18/2020**

CLIENT: ERM Southwest
Project: Jeanerette Lumber & Shingle/519829

Unless specified by the client, a duplicate or MS/MSD, wherever applicable, is randomly selected and analyzed from each analytical batch provided sample volume is sufficient. The sample chosen for duplicate or MS/MSD may or may not be a sample submitted in this workorder. A method blank and/or a lab control sample (LCS)/lab control sample duplicate (LCSD), wherever applicable, are processed as a quality control check for each analytical batch. When the matrix QC data is not available due to insufficient sample volume or when the results indicate possible matrix effect, the validity of the batch is determined by the method blank and LCS/LCSD.

The results of the laboratory internal quality control data are provided in the QC Summary Report section of the report for your review. Laboratory-related QC exceptions that may impact the validity of data are discussed in the case narrative. Sample-related QC exceptions are flagged either in the results page(s) or in the QC report page(s). End users should consider QC exceptions when evaluating sample data against data quality objectives.

Any other exceptions associated with this report will be footnoted in the results page(s) or the QC summary page(s).

Element Materials Technology Lafayette
2417 W. Pinhook Road
Lafayette, LA 70508-3344
TEL: (337) 235-0483 FAX: (337) 233-6540
Website: www.element.com

Analytical Report

(consolidated)

WO#: **20050855**

Date Reported: **6/18/2020**

CLIENT: ERM Southwest **Collection Date:** 5/26/2020 1:20:00 PM

Project: Jeanerette Lumber & Shingle/519829

Lab ID: 20050855-001 **Matrix:** SOIL

Client Sample ID JLS-02 0-2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **MRM**
CATION EXCHANGE CAPACITY						
Cation Exchange Capacity	74.6	0.100		meq/100g	1	6/17/2020
29B SALTS				**LDNR 29-B**		Analyst: **MRM**
ELECTRICAL CONDUCTIVITY @ SATURATION						
Electrical Conductivity	15.2	0.10	*	mmhos/cm	1	6/5/2020 3:30:00 PM
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **MRM**
EXCHANGEABLE SODIUM PERCENTAGE						
Exchangeable Sodium %	10.4	0.10		%	1	6/17/2020
HEM, OIL & GREASE				**SW9071B**		Analyst: **HXW**
HEM, Oil & Grease	0.26	0.05		% dry wt	1	6/11/2020 10:12:00 AM
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **MRM**
SODIUM ADSORPTION RATIO						
Sodium Adsorption Ratio	16.8	0.10	*		1	6/9/2020
Soluble Calcium	31.3	0.02		meq/L	1	6/9/2020
Soluble Magnesium	13.6	0.05		meq/L	1	6/9/2020
Soluble Sodium	79.5	0.25		meq/L	1	6/9/2020
29B METALS				**SW7471A**	**SW7471A**	Analyst: **BXB**
MERCURY IN SOIL OR SLUDGE						
Mercury	< 0.0930	0.0930		mg/Kg	1	6/9/2020 5:08:42 PM
29B METALS				**SW6010B**	**SW3050B**	Analyst: **STS**
METALS IN SOIL OR SLUDGE BY ICP						
Arsenic	4.02	1.05		mg/Kg	1	5/28/2020 8:53:16 PM
Barium	268	0.523		mg/Kg	1	5/28/2020 8:53:16 PM
Cadmium	< 0.262	0.262		mg/Kg	1	5/28/2020 8:53:16 PM
Chromium	6.08	0.523		mg/Kg	1	5/28/2020 8:53:16 PM
Lead	7.10	0.523		mg/Kg	1	5/28/2020 8:53:16 PM
Selenium	< 2.09	2.09		mg/Kg	1	5/28/2020 8:53:16 PM
Silver	< 0.262	0.262		mg/Kg	1	5/28/2020 8:53:16 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
M	Matrix Interference	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
U	Analyte not detected	W	Sample container temperature is out of limit as specified at testcode

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Website: www.element.com

Analytical Report

(consolidated)

WO#: **20050855**

Date Reported: **6/18/2020**

CLIENT: ERM Southwest **Collection Date:** 5/26/2020 1:20:00 PM

Project: Jeanerette Lumber & Shingle/519829

Lab ID: 20050855-001 **Matrix:** SOIL

Client Sample ID JLS-02 0-2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
29B METALS				**SW6010B**	**SW3050B**	Analyst: **STS**
METALS IN SOIL OR SLUDGE BY ICP						
Zinc	40.4	0.523		mg/Kg	1	5/28/2020 8:53:16 PM
29B METALS				**LDNR 29-B**		Analyst: **STS**
TRUE TOTAL BARIUM						
True Total Barium	1,080	48.3		mg/Kg-dry	1	6/12/2020 12:59:58 PM

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
	M	Matrix Interference	ND	Not Detected at the Reporting Limit
	R	RPD outside accepted recovery limits	RL	Reporting Limit
	S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
	U	Analyte not detected	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

(consolidated)

WO#: **20050855**

Date Reported: **6/18/2020**

CLIENT: ERM Southwest **Collection Date:** 5/26/2020 1:25:00 PM

Project: Jeanerette Lumber & Shingle/519829

Lab ID: 20050855-002 **Matrix:** SOIL

Client Sample ID JLS-02 2-4

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **MRM**
CATION EXCHANGE CAPACITY						
Cation Exchange Capacity	70.2	0.100		meq/100g	1	6/17/2020
29B SALTS				**LDNR 29-B**		Analyst: **MRM**
ELECTRICAL CONDUCTIVITY @ SATURATION						
Electrical Conductivity	32.8	0.10	*	mmhos/cm	1	6/5/2020 3:30:00 PM
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **MRM**
EXCHANGEABLE SODIUM PERCENTAGE						
Exchangeable Sodium %	26.2	0.10	*	%	1	6/17/2020
HEM, OIL & GREASE				**SW9071B**		Analyst: **HXW**
HEM, Oil & Grease	0.43	0.05		% dry wt	1	6/11/2020 10:12:00 AM
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **MRM**
SODIUM ADSORPTION RATIO						
Sodium Adsorption Ratio	39.8	0.10	*		1	6/9/2020
Soluble Calcium	50.0	0.02		meq/L	1	6/9/2020
Soluble Magnesium	21.1	0.05		meq/L	1	6/9/2020
Soluble Sodium	237	0.25		meq/L	1	6/9/2020
29B METALS				**SW7471A**	**SW7471A**	Analyst: **BXB**
MERCURY IN SOIL OR SLUDGE						
Mercury	< 0.0965	0.0965		mg/Kg	1	6/9/2020 5:18:33 PM
29B METALS				**SW6010B**	**SW3050B**	Analyst: **STS**
METALS IN SOIL OR SLUDGE BY ICP						
Arsenic	7.74	1.00		mg/Kg	1	5/28/2020 8:56:48 PM
Barium	734	0.502		mg/Kg	1	5/28/2020 8:56:48 PM
Cadmium	< 0.251	0.251		mg/Kg	1	5/28/2020 8:56:48 PM
Chromium	6.66	0.502		mg/Kg	1	5/28/2020 8:56:48 PM
Lead	10.8	0.502		mg/Kg	1	5/28/2020 8:56:48 PM
Selenium	< 2.01	2.01		mg/Kg	1	5/28/2020 8:56:48 PM
Silver	< 0.251	0.251		mg/Kg	1	5/28/2020 8:56:48 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
M	Matrix Interference	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
U	Analyte not detected	W	Sample container temperature is out of limit as specified at testcode

Element Materials Technology Lafayette
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Analytical Report

(consolidated)

WO#: **20050855**

Date Reported: **6/18/2020**

CLIENT: ERM Southwest **Collection Date:** 5/26/2020 1:25:00 PM

Project: Jeanerette Lumber & Shingle/519829

Lab ID: 20050855-002 **Matrix:** SOIL

Client Sample ID JLS-02 2-4

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
29B METALS				**SW6010B**	**SW3050B**	Analyst: **STS**
METALS IN SOIL OR SLUDGE BY ICP						
Zinc	30.8	0.502		mg/Kg	1	5/28/2020 8:56:48 PM
29B METALS				**LDNR 29-B**		Analyst: **STS**
TRUE TOTAL BARIUM						
True Total Barium	2,570	47.6		mg/Kg-dry	1	6/12/2020 1:07:58 PM

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
	M	Matrix Interference	ND	Not Detected at the Reporting Limit
	R	RPD outside accepted recovery limits	RL	Reporting Limit
	S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
	U	Analyte not detected	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

(consolidated)

WO#: **20050855**

Date Reported: **6/18/2020**

CLIENT: ERM Southwest **Collection Date:** 5/26/2020 1:30:00 PM

Project: Jeanerette Lumber & Shingle/519829

Lab ID: 20050855-003 **Matrix:** SOIL

Client Sample ID JLS-02 4-6

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **MRM**
CATION EXCHANGE CAPACITY						
Cation Exchange Capacity	68.9	0.100		meq/100g	1	6/17/2020
29B SALTS				**LDNR 29-B**		Analyst: **MRM**
ELECTRICAL CONDUCTIVITY @ SATURATION						
Electrical Conductivity	44.6	0.10	*	mmhos/cm	1	6/5/2020 3:30:00 PM
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **MRM**
EXCHANGEABLE SODIUM PERCENTAGE						
Exchangeable Sodium %	30.7	0.10	*	%	1	6/17/2020
HEM, OIL & GREASE				**SW9071B**		Analyst: **HXW**
HEM, Oil & Grease	0.93	0.05		% dry wt	1	6/11/2020 10:12:00 AM
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **MRM**
SODIUM ADSORPTION RATIO						
Sodium Adsorption Ratio	50.8	0.10	*		1	6/9/2020
Soluble Calcium	63.7	0.02		meq/L	1	6/9/2020
Soluble Magnesium	27.3	0.05		meq/L	1	6/9/2020
Soluble Sodium	342	0.25		meq/L	1	6/9/2020
29B METALS				**SW7471A**	**SW7471A**	Analyst: **BXB**
MERCURY IN SOIL OR SLUDGE						
Mercury	< 0.0999	0.0999		mg/Kg	1	6/9/2020 5:20:51 PM
29B METALS				**SW6010B**	**SW3050B**	Analyst: **STS**
METALS IN SOIL OR SLUDGE BY ICP						
Arsenic	5.41	1.09		mg/Kg	1	5/28/2020 9:00:21 PM
Barium	825	0.544		mg/Kg	1	5/28/2020 9:00:21 PM
Cadmium	< 0.272	0.272		mg/Kg	1	5/28/2020 9:00:21 PM
Chromium	6.32	0.544		mg/Kg	1	5/28/2020 9:00:21 PM
Lead	10.2	0.544		mg/Kg	1	5/28/2020 9:00:21 PM
Selenium	< 2.18	2.18		mg/Kg	1	5/28/2020 9:00:21 PM
Silver	< 0.272	0.272		mg/Kg	1	5/28/2020 9:00:21 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
M	Matrix Interference	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
U	Analyte not detected	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

(consolidated)

WO#: **20050855**

Date Reported: **6/18/2020**

CLIENT: ERM Southwest **Collection Date:** 5/26/2020 1:30:00 PM

Project: Jeanerette Lumber & Shingle/519829

Lab ID: 20050855-003 **Matrix:** SOIL

Client Sample ID JLS-02 4-6

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
29B METALS				**SW6010B** **SW3050B**		Analyst: **STS**
METALS IN SOIL OR SLUDGE BY ICP						
Zinc	27.6	0.544		mg/Kg	1	5/28/2020 9:00:21 PM
29B METALS				**LDNR 29-B**		Analyst: **STS**
TRUE TOTAL BARIUM						
True Total Barium	3,410	48.1		mg/Kg-dry	1	6/12/2020 1:10:38 PM

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
	M	Matrix Interference	ND	Not Detected at the Reporting Limit
	R	RPD outside accepted recovery limits	RL	Reporting Limit
	S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
	U	Analyte not detected	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

(consolidated)

WO#: **20050855**

Date Reported: **6/18/2020**

CLIENT: ERM Southwest **Collection Date:** 5/26/2020 2:30:00 PM

Project: Jeanerette Lumber & Shingle/519829

Lab ID: 20050855-004 **Matrix:** SOIL

Client Sample ID JLS-03 0-2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **MRM**
CATION EXCHANGE CAPACITY						
Cation Exchange Capacity	76.9	0.100		meq/100g	1	6/17/2020
29B SALTS				**LDNR 29-B**		Analyst: **MRM**
ELECTRICAL CONDUCTIVITY @ SATURATION						
Electrical Conductivity	0.81	0.10		mmhos/cm	1	6/5/2020 3:30:00 PM
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **MRM**
EXCHANGEABLE SODIUM PERCENTAGE						
Exchangeable Sodium %	0.81	0.10		%	1	6/17/2020
HEM, OIL & GREASE				**SW9071B**		Analyst: **HXW**
HEM, Oil & Grease	0.05	0.05		% dry wt	1	6/11/2020 10:12:00 AM
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **MRM**
SODIUM ADSORPTION RATIO						
Sodium Adsorption Ratio	1.67	0.10			1	6/9/2020
Soluble Calcium	2.59	0.02		meq/L	1	6/9/2020
Soluble Magnesium	1.63	0.05		meq/L	1	6/9/2020
Soluble Sodium	2.42	0.25		meq/L	1	6/9/2020
29B METALS				**SW7471A**	**SW7471A**	Analyst: **BXB**
MERCURY IN SOIL OR SLUDGE						
Mercury	< 0.0979	0.0979		mg/Kg	1	6/9/2020 5:23:08 PM
29B METALS				**SW6010B**	**SW3050B**	Analyst: **STS**
METALS IN SOIL OR SLUDGE BY ICP						
Arsenic	2.83	1.04		mg/Kg	1	5/28/2020 9:03:51 PM
Barium	106	0.521		mg/Kg	1	5/28/2020 9:03:51 PM
Cadmium	< 0.260	0.260		mg/Kg	1	5/28/2020 9:03:51 PM
Chromium	8.74	0.521		mg/Kg	1	5/28/2020 9:03:51 PM
Lead	8.92	0.521		mg/Kg	1	5/28/2020 9:03:51 PM
Selenium	< 2.08	2.08		mg/Kg	1	5/28/2020 9:03:51 PM
Silver	< 0.260	0.260		mg/Kg	1	5/28/2020 9:03:51 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
M	Matrix Interference	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
U	Analyte not detected	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

(consolidated)

WO#: **20050855**

Date Reported: **6/18/2020**

CLIENT: ERM Southwest **Collection Date:** 5/26/2020 2:30:00 PM

Project: Jeanerette Lumber & Shingle/519829

Lab ID: 20050855-004 **Matrix:** SOIL

Client Sample ID JLS-03 0-2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
29B METALS				**SW6010B**	**SW3050B**	Analyst: **STS**
METALS IN SOIL OR SLUDGE BY ICP						
Zinc	30.6	0.521		mg/Kg	1	5/28/2020 9:03:51 PM
29B METALS				**LDNR 29-B**		Analyst: **STS**
TRUE TOTAL BARIUM						
True Total Barium	376	46.5		mg/Kg-dry	1	6/12/2020 1:13:17 PM

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
	M	Matrix Interference	ND	Not Detected at the Reporting Limit
	R	RPD outside accepted recovery limits	RL	Reporting Limit
	S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
	U	Analyte not detected	W	Sample container temperature is out of limit as specified at testcode

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QC SUMMARY REPORT

WO#: **20050855**

18-Jun-20

Client: ERM Southwest

Project: Jeanerette Lumber & Shingle/519829 **BatchID:** **34135**

Sample ID:	**MB-34135**	SampType:	**MBLK**	TestCode:	**6010_S**	Units:	**mg/Kg**	Prep Date:	**5/27/2020**	RunNo:	**89685**
Client ID:	**PBS**	Batch ID:	**34135**	TestNo:	**SW6010B**	**SW3050B**		Analysis Date:	**5/28/2020**	SeqNo:	**2215935**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	< 1.00	1.00									
Barium	< 0.500	0.500									
Cadmium	< 0.250	0.250									
Chromium	< 0.500	0.500									
Lead	< 0.500	0.500									
Selenium	< 2.00	2.00									
Silver	< 0.250	0.250									
Zinc	< 0.500	0.500									

Sample ID:	**LCS-34135**	SampType:	**LCS**	TestCode:	**6010_S**	Units:	**mg/Kg**	Prep Date:	**5/27/2020**	RunNo:	**89685**
Client ID:	**LCSS**	Batch ID:	**34135**	TestNo:	**SW6010B**	**SW3050B**		Analysis Date:	**5/28/2020**	SeqNo:	**2215936**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	26.2	1.00	25.00	0	105	80	120				
Barium	25.8	0.500	25.00	0	103	80	120				
Cadmium	25.8	0.250	25.00	0	103	80	120				
Chromium	25.8	0.500	25.00	0	103	80	120				
Lead	25.9	0.500	25.00	0	103	80	120				
Selenium	27.5	2.00	25.00	0	110	80	120				
Silver	5.14	0.250	5.000	0	103	80	120				
Zinc	25.9	0.500	25.00	0	103	80	120				

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20050855**

18-Jun-20

Client: ERM Southwest

Project: Jeanerette Lumber & Shingle/519829 **BatchID:** **34135**

Sample ID: **LCSD-34135** SampType: **LCSD** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/27/2020** RunNo: **89685**

Client ID: **LCSS02** Batch ID: **34135** TestNo: **SW6010B** **SW3050B** Analysis Date: **5/28/2020** SeqNo: **2215937**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	26.2	1.00	25.00	0	105	80	120	26.24	0.0381	20	
Barium	25.7	0.500	25.00	0	103	80	120	25.84	0.446	20	
Cadmium	25.6	0.250	25.00	0	103	80	120	25.76	0.447	20	
Chromium	25.6	0.500	25.00	0	103	80	120	25.78	0.525	20	
Lead	25.9	0.500	25.00	0	104	80	120	25.86	0.174	20	
Selenium	26.3	2.00	25.00	0	105	80	120	27.46	4.14	20	
Silver	5.10	0.250	5.000	0	102	80	120	5.145	0.977	20	
Zinc	25.8	0.500	25.00	0	103	80	120	25.86	0.252	20	

Sample ID: **20050635-001BMS** SampType: **MS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/27/2020** RunNo: **89685**

Client ID: **ZZZZZZ** Batch ID: **34135** TestNo: **SW6010B** **SW3050B** Analysis Date: **5/28/2020** SeqNo: **2215939**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	30.3	1.10	27.42	2.480	101	75	125				
Barium	124	0.548	27.42	91.67	119	75	125				
Cadmium	26.6	0.274	27.42	0	96.9	75	125				
Chromium	36.5	0.548	27.42	8.538	102	75	125				
Lead	35.0	0.548	27.42	6.963	102	75	125				
Selenium	24.4	2.19	27.42	0	89.1	75	125				
Silver	5.11	0.274	5.485	0	93.1	75	125				
Zinc	55.9	0.548	27.42	27.64	103	75	125				

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20050855**

18-Jun-20

Client: ERM Southwest

Project: Jeanerette Lumber & Shingle/519829 **BatchID:** **34135**

Sample ID:	**20050635-001BMSD**	SampType:	**MSD**	TestCode:	**6010_S**	Units:	**mg/Kg**	Prep Date:	**5/27/2020**	RunNo:	**89685**
Client ID:	**ZZZZZZ**	Batch ID:	**34135**	TestNo:	**SW6010B**	**SW3050B**		Analysis Date:	**5/28/2020**	SeqNo:	**2215940**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	30.0	1.06	26.51	2.480	104	75	125	30.31	1.15	20	
Barium	118	0.530	26.51	91.67	101	75	125	124.4	5.01	20	
Cadmium	25.5	0.265	26.51	0	96.1	75	125	26.59	4.24	20	
Chromium	34.7	0.530	26.51	8.538	98.9	75	125	36.54	5.04	20	
Lead	33.6	0.530	26.51	6.963	101	75	125	34.96	3.94	20	
Selenium	22.1	2.12	26.51	0	83.4	75	125	24.44	10.0	20	
Silver	4.88	0.265	5.301	0	92.1	75	125	5.106	4.49	20	
Zinc	53.2	0.530	26.51	27.64	96.5	75	125	55.95	4.99	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20050855**

18-Jun-20

Client: ERM Southwest

Project: Jeanerette Lumber & Shingle/519829 **BatchID:** **34169**

Sample ID:	**MB-34169**	SampType:	**MBLK**	TestCode:	**HG_S_7471A**	Units:	**mg/Kg**	Prep Date:	**6/9/2020**	RunNo:	**89950**
Client ID:	**PBS**	Batch ID:	**34169**	TestNo:	**SW7471A**	**SW7471A**		Analysis Date:	**6/9/2020**	SeqNo:	**2222042**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	< 0.100	0.100									

Sample ID:	**LCS-34169**	SampType:	**LCS**	TestCode:	**HG_S_7471A**	Units:	**mg/Kg**	Prep Date:	**6/9/2020**	RunNo:	**89950**
Client ID:	**LCSS**	Batch ID:	**34169**	TestNo:	**SW7471A**	**SW7471A**		Analysis Date:	**6/9/2020**	SeqNo:	**2222045**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.965	0.100	0.8330	0	116	80	120				

Sample ID:	**LCSD-34169**	SampType:	**LCSD**	TestCode:	**HG_S_7471A**	Units:	**mg/Kg**	Prep Date:	**6/9/2020**	RunNo:	**89950**
Client ID:	**LCSS02**	Batch ID:	**34169**	TestNo:	**SW7471A**	**SW7471A**		Analysis Date:	**6/9/2020**	SeqNo:	**2222046**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.966	0.100	0.8330	0	116	80	120	0.9652	0.100	20	

Sample ID:	**20050855-001AMS**	SampType:	**MS**	TestCode:	**HG_S_7471A**	Units:	**mg/Kg**	Prep Date:	**6/9/2020**	RunNo:	**89950**
Client ID:	**JLS-02 0-2**	Batch ID:	**34169**	TestNo:	**SW7471A**	**SW7471A**		Analysis Date:	**6/9/2020**	SeqNo:	**2222049**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.909	0.0927	0.7719	0.02624	114	75	125				

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20050855**

18-Jun-20

Client: ERM Southwest

Project: Jeanerette Lumber & Shingle/519829 **BatchID:** **34169**

Sample ID:	**20050855-001AMSD**	SampType:	**MSD**	TestCode:	**HG_S_7471A**	Units:	**mg/Kg**	Prep Date:	**6/9/2020**	RunNo:	**89950**
Client ID:	**JLS-02 0-2**	Batch ID:	**34169**	TestNo:	**SW7471A**	**SW7471A**		Analysis Date:	**6/9/2020**	SeqNo:	**2222050**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.930	0.0950	0.7914	0.02624	114	75	125	0.9092	2.21	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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Website: www.element.com

QC SUMMARY REPORT

WO#: **20050855**

18-Jun-20

Client: ERM Southwest

Project: Jeanerette Lumber & Shingle/519829 **BatchID:** **34236**

Sample ID: **20050804-047ADUP**	SampType: **DUP**	TestCode: **SAR_S**	Units:	Prep Date: **6/8/2020**	RunNo: **89930**
Client ID: **ZZZZZZ**	Batch ID: **34236**	TestNo: **LDNR 29-B**	**LDNR 29-B**	Analysis Date: **6/9/2020**	SeqNo: **2221780**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium Adsorption Ratio	38.6	0.10						38.63	0.05	20	*
Soluble Calcium	11.6	0.02						11.46	1.21	20	
Soluble Magnesium	52.3	0.05						51.57	1.37	20	
Soluble Sodium	218	0.25						216.9	0.60	20	

Sample ID: **20050855-001ADUP**	SampType: **DUP**	TestCode: **SAR_S**	Units:	Prep Date: **6/8/2020**	RunNo: **89930**
Client ID: **JLS-02 0-2**	Batch ID: **34236**	TestNo: **LDNR 29-B**	**LDNR 29-B**	Analysis Date: **6/9/2020**	SeqNo: **2221793**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium Adsorption Ratio	17.2	0.10						16.78	2.76	20	*
Soluble Calcium	32.7	0.02						31.27	4.35	20	
Soluble Magnesium	14.2	0.05						13.59	4.32	20	
Soluble Sodium	83.5	0.25						79.47	4.92	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
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QC SUMMARY REPORT

WO#: **20050855**

18-Jun-20

Client: ERM Southwest
Project: Jeanerette Lumber & Shingle/519829 **BatchID:** **34253**

Sample ID:	**MB-34253**	SampType:	**MBLK**	TestCode:	**TTBA**	Units:	**mg/Kg-dry**	Prep Date:	**6/10/2020**	RunNo:	**90066**
Client ID:	**PBS**	Batch ID:	**34253**	TestNo:	**LDNR 29-B**			Analysis Date:	**6/12/2020**	SeqNo:	**2227636**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
True Total Barium	< 50.0	50.0									

Sample ID:	**LCS-34253**	SampType:	**LCS**	TestCode:	**TTBA**	Units:	**mg/Kg-dry**	Prep Date:	**6/10/2020**	RunNo:	**90066**
Client ID:	**LCSS**	Batch ID:	**34253**	TestNo:	**LDNR 29-B**			Analysis Date:	**6/12/2020**	SeqNo:	**2227637**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
True Total Barium	4,890	50.0	5,000	0	97.8	75	125				

Sample ID:	**LCSD-34253**	SampType:	**LCSD**	TestCode:	**TTBA**	Units:	**mg/Kg-dry**	Prep Date:	**6/10/2020**	RunNo:	**90066**
Client ID:	**LCSS02**	Batch ID:	**34253**	TestNo:	**LDNR 29-B**			Analysis Date:	**6/12/2020**	SeqNo:	**2227638**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
True Total Barium	4,930	50.0	5,000	0	98.7	75	125	4,888	0.927	20	

Sample ID:	**20050855-001AMS**	SampType:	**MS**	TestCode:	**TTBA**	Units:	**mg/Kg-dry**	Prep Date:	**6/10/2020**	RunNo:	**90066**
Client ID:	**JLS-02 0-2**	Batch ID:	**34253**	TestNo:	**LDNR 29-B**			Analysis Date:	**6/12/2020**	SeqNo:	**2227649**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
True Total Barium	4,990	48.8	4,878	1,084	80.1	75	125				

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
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QC SUMMARY REPORT

WO#: **20050855**

18-Jun-20

Client: ERM Southwest

Project: Jeanerette Lumber & Shingle/519829 **BatchID:** **34253**

Sample ID: **20050855-001AMSD** SampType: **MSD** TestCode: **TTBA** Units: **mg/Kg-dry** Prep Date: **6/10/2020** RunNo: **90066**

Client ID: **JLS-02 0-2** Batch ID: **34253** TestNo: **LDNR 29-B** Analysis Date: **6/12/2020** SeqNo: **2227650**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
True Total Barium	5,810	49.8	4,980	1,084	94.9	75	125	4,990	15.2	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20050855**

18-Jun-20

Client: ERM Southwest

Project: Jeanerette Lumber & Shingle/519829 **BatchID:** **34294**

Sample ID: **20050855-001ADUP**	SampType: **DUP**	TestCode: **ESP_S**	Units: **%**	Prep Date: **6/11/2020**	RunNo: **90184**
Client ID: **JLS-02 0-2**	Batch ID: **34294**	TestNo: **LDNR 29-B**	**LDNR 29-B**	Analysis Date: **6/17/2020**	SeqNo: **2230162**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Exchangeable Sodium %	9.68	0.10						10.35	6.69	20	

Sample ID: **20050901-001ADUP**	SampType: **DUP**	TestCode: **ESP_S**	Units: **%**	Prep Date: **6/11/2020**	RunNo: **90184**
Client ID: **ZZZZZZ**	Batch ID: **34294**	TestNo: **LDNR 29-B**	**LDNR 29-B**	Analysis Date: **6/17/2020**	SeqNo: **2230167**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Exchangeable Sodium %	5.13	0.10						5.14	0.19	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20050855**

18-Jun-20

Client: ERM Southwest
Project: Jeanerette Lumber & Shingle/519829 **BatchID:** **34295**

Sample ID: **20050855-001ADUP** SampType: **DUP** TestCode: **CEC** Units: **meq/100g** Prep Date: **6/11/2020** RunNo: **90184**
Client ID: **JLS-02 0-2** Batch ID: **34295** TestNo: **LDNR 29-B** **LDNR 29-B** Analysis Date: **6/17/2020** SeqNo: **2230087**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cation Exchange Capacity	71.7	0.100						74.61	4.03	20	

Sample ID: **20050901-001ADUP** SampType: **DUP** TestCode: **CEC** Units: **meq/100g** Prep Date: **6/11/2020** RunNo: **90184**
Client ID: **ZZZZZZ** Batch ID: **34295** TestNo: **LDNR 29-B** **LDNR 29-B** Analysis Date: **6/17/2020** SeqNo: **2230092**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cation Exchange Capacity	31.9	0.100						30.77	3.73	20	

Sample ID: **lcs-34295** SampType: **LCS** TestCode: **CEC** Units: **meq/100g** Prep Date: **6/11/2020** RunNo: **90184**
Client ID: **LCSS** Batch ID: **34295** TestNo: **LDNR 29-B** **LDNR 29-B** Analysis Date: **6/17/2020** SeqNo: **2230100**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cation Exchange Capacity	22.1	0.100	25.00	0	88.4	76	124				

Sample ID: **lcsd-34295** SampType: **LCSD** TestCode: **CEC** Units: **meq/100g** Prep Date: **6/11/2020** RunNo: **90184**
Client ID: **LCSS02** Batch ID: **34295** TestNo: **LDNR 29-B** **LDNR 29-B** Analysis Date: **6/17/2020** SeqNo: **2230101**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cation Exchange Capacity	21.3	0.100	25.00	0	85.3	76	124	22.09	3.50	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
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QC SUMMARY REPORT

WO#: **20050855**

18-Jun-20

Client: ERM Southwest
Project: Jeanerette Lumber & Shingle/519829 **BatchID:** **R89878**

Sample ID: **MB-R89878**	SampType: **MBLK**	TestCode: **EC_S**	Units: **mmhos/cm**	Prep Date:	RunNo: **89878**
Client ID: **PBS**	Batch ID: **R89878**	TestNo: **LDNR 29-B**		Analysis Date: **6/5/2020**	SeqNo: **2220495**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Electrical Conductivity	< 0.10	0.10									

Sample ID: **LCS1-R89878**	SampType: **LCS1**	TestCode: **EC_S**	Units: **mmhos/cm**	Prep Date:	RunNo: **89878**
Client ID: **ZZZZZZ**	Batch ID: **R89878**	TestNo: **LDNR 29-B**		Analysis Date: **6/5/2020**	SeqNo: **2220496**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Electrical Conductivity	0.39	0.10	0.38	0	103	90.07	109.9				

Sample ID: **LCS2-R89878**	SampType: **LCS2**	TestCode: **EC_S**	Units: **mmhos/cm**	Prep Date:	RunNo: **89878**
Client ID: **ZZZZZZ**	Batch ID: **R89878**	TestNo: **LDNR 29-B**		Analysis Date: **6/5/2020**	SeqNo: **2220497**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Electrical Conductivity	52.1	0.10	53.00	0	98.3	90	110				

Sample ID: **20050855-001ADUP**	SampType: **DUP**	TestCode: **EC_S**	Units: **mmhos/cm**	Prep Date:	RunNo: **89878**
Client ID: **JLS-02 0-2**	Batch ID: **R89878**	TestNo: **LDNR 29-B**		Analysis Date: **6/5/2020**	SeqNo: **2220499**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Electrical Conductivity	15.5	0.10						15.21	2.15	20	*

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20050855**

18-Jun-20

Client: ERM Southwest

Project: Jeanerette Lumber & Shingle/519829 **BatchID:** **R89878**

Sample ID:	**20050901-001ADUP**	SampType:	**DUP**	TestCode:	**EC_S**	Units:	**mmhos/cm**	Prep Date:		RunNo:	**89878**
Client ID:	**ZZZZZZ**	Batch ID:	**R89878**	TestNo:	**LDNR 29-B**			Analysis Date:	**6/5/2020**	SeqNo:	**2220504**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Electrical Conductivity	0.72	0.10						0.69	3.40	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20050855**

18-Jun-20

Client: ERM Southwest
Project: Jeanerette Lumber & Shingle/519829 **BatchID:** **R90004**

Sample ID: **MB-R90004**	SampType: **MBLK**	TestCode: **HEM_S**	Units: **% dry wt**	Prep Date:	RunNo: **90004**
Client ID: **PBS**	Batch ID: **R90004**	TestNo: **SW9071B**		Analysis Date: **6/11/2020**	SeqNo: **2228050**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
HEM, Oil & Grease	< 0.05	0.05									

Sample ID: **LCS-R90004**	SampType: **LCS**	TestCode: **HEM_S**	Units: **% dry wt**	Prep Date:	RunNo: **90004**
Client ID: **LCSS**	Batch ID: **R90004**	TestNo: **SW9071B**		Analysis Date: **6/11/2020**	SeqNo: **2228051**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
HEM, Oil & Grease	0.22	0.05	0.20	0	109	70	130				

Sample ID: **LCSD-R90004**	SampType: **LCSD**	TestCode: **HEM_S**	Units: **% dry wt**	Prep Date:	RunNo: **90004**
Client ID: **LCSS02**	Batch ID: **R90004**	TestNo: **SW9071B**		Analysis Date: **6/11/2020**	SeqNo: **2228052**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
HEM, Oil & Grease	0.22	0.05	0.20	0	110	70	130	0.22	0.46	40	

Sample ID: **20050855-001BMS**	SampType: **MS**	TestCode: **HEM_S**	Units: **% dry wt**	Prep Date:	RunNo: **90004**
Client ID: **JLS-02 0-2**	Batch ID: **R90004**	TestNo: **SW9071B**		Analysis Date: **6/11/2020**	SeqNo: **2228053**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
HEM, Oil & Grease	1.17	0.05	0.76	0.26	120	70	130				

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
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QC SUMMARY REPORT

WO#: **20050855**

18-Jun-20

Client: ERM Southwest

Project: Jeanerette Lumber & Shingle/519829 **BatchID:** **R90004**

Sample ID: **20050855-001BDUP** SampType: **DUP** TestCode: **HEM_S** Units: **% dry wt** Prep Date: RunNo: **90004**

Client ID: **JLS-02 0-2** Batch ID: **R90004** TestNo: **SW9071B** Analysis Date: **6/11/2020** SeqNo: **2228055**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
HEM, Oil & Grease	0.26	0.05						0.26	0	40	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
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Sample Log-In Check List

Client Name: **ERM_METAIRIE** Work Order Number: **20050855** RcptNo: **1**

Logged by:	**Tammy Thibodeaux**	**5/27/2020 8:05:00 AM**	Tammy M Thibodeaux
Completed By:	**Tammy Thibodeaux**	**5/27/2020 8:23:15 AM**	Tammy M Thibodeaux
Reviewed By:	**Caitlin Duplantis**	**6/10/2020 1:44:54 PM**	Caitlin Duplantis

Chain of Custody

1.	Is Chain of Custody complete?	Yes	☑	No ☐	Not Present	☐
2.	How was the sample delivered?	Client				

Log In

3.	Coolers are present?	Yes	☑	No ☐	NA	☐
4.	Shipping container/cooler in good condition?	Yes	☑	No ☐		
	Custody seals intact on shipping container/cooler?	Yes	☐	No ☐	Not Present	☑
	No. Seal Date: Signed By:					
5.	Was an attempt made to cool the samples?	Yes	☑	No ☐	NA	☐
6.	Were all samples received at a temperature of >0° C to 6.0°C	Yes	☑	No ☐	NA	☐
7.	Sample(s) in proper container(s)?	Yes	☑	No ☐		
8.	Sufficient sample volume for indicated test(s)?	Yes	☑	No ☐		
9.	Are samples (except VOA and ONG) properly preserved?	Yes	☑	No ☐		
10.	Was preservative added to bottles?	Yes	☐	No ☑	NA	☐
11.	Is the headspace in the VOA vials less than 1/4 inch or 6 mm?	Yes	☐	No ☐	No VOA Vials	☑
12.	Were any sample containers received broken?	Yes	☐	No ☑		
13.	Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes	☑	No ☐		
14.	Are matrices correctly identified on Chain of Custody?	Yes	☑	No ☐		
15.	Is it clear what analyses were requested?	Yes	☑	No ☐		
16.	Were all holding times able to be met? (If no, notify customer for authorization.)	Yes	☑	No ☐		

Special Handling (if applicable)

17.	Was client notified of all discrepancies with this order?	Yes	☐	No ☐	NA	☑

Person Notified: Date:

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

18. Additional remarks:

Improper error correction(s) made by client

Cooler Information

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.6	Good	Not Present			

element™

Chain of Custody

Laboratory Number: 200555

Client Information:	Billing Information:	PO Number:	Project Name/Number:	Page 1 of 1
Company Name: ERM			519829 Jeanerette Lumber 3 Shingle	**Matrix Code**
Contact Name: Jody Shugart		Quote Number:		DW = Drinking Water
Address: 3838 N. Causeway Blvd			Sampler's Signature	WW = Waste Water
		Required QC Level		GW = Ground Water
City, State Zip: Metairie, LA 70002				AQ = Aqueous
Phone Number: 985-237-5091 Ext:	Ext:	Bill Monthly	Shipping Method:	OT = Other
Fax Number:		☐Yes	UPS / FedEx / NOW	SL = Sludge SOL = Solid
E-mail Address: jody.shugart@erm.com		☐No	DHL / Element / Hand / Mail	O = Oil SO = Soil
				F = Food SW = Swab
				NG = Natural Gas
				NGL = Natural Gas Liquid
				PW = Produced Water
				CF = Completion Fluid

Which Regulations Apply:
☐RCRA ☐Drinking Water
☐POTW ☐Distribution
☐NPDES ☐Special
☐USDA/FDA ☐State
☒RECAP/RISC ☐Other

Turn Time
☒Standard
RUSH
☐1 Day
☐2 Day
☐Other
(Rush turn times will incur a surcharge and must be pre-approved by lab.)

Sample ID/Description	Collection Information: Date	Time	Grab / Composite	Matrix	Container: Quantity	Container: Type P=Plastic, G=Glass, V=Vial	Pres.: HCl, HNO_3, H_2SO_4, NaOH, $Na_2S_2O_3$	Requested Tests: 29B metals	29B OG	29B solids	Comments
JLS-02(0-2)	5/26/20	13:00	G	Soil	2	P/G	-	X	X	X	
JLS-02(2-4)	"	13:15	"	"	"	"	"	X	X	X	
JLS-02(4-6)	"	13:30	"	"	"	"	"	X	X	X	
JLS-03(0-2)	"	14:30	"	"	"	"	"	X	X	X	

	Relinquished by	Date/Time	Received by	Date/Time
1		5/27/20 8:05		5/27/2020 0805
2				
3				

Field Notes:

Received at lab on ice?
☒Yes ☐No Temp: 4.6

All samples submitted to Element Materials Technology for analysis are accepted on a custodial basis only. Ownership of the material remains with the client submitting the samples. Element Materials Technology reserves the right to return unused sample portions.

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F 812-375-0731

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F 260-471-7777

909 Executive Dr
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46580 USA
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F 574-269-6569

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TEL: (337) 235-0483 FAX: (337) 233-6540
Website: www.element.com

August 17, 2020

Jody Shugart
ERM Southwest
3838 North Causeway, Suite 2725
Metairie, LA 70002
TEL: (504) 831-6700
FAX (504) 831-6742

RE: JLS 0519829 Order No.: 20080073

Dear Jody Shugart:

Element Materials Technology Lafayette received 3 sample(s) on 8/4/2020 for the analyses presented in the following report.

In accordance with your instructions Element Lafayette conducted the analysis shown on the following pages on samples submitted by your company. The results related only to the items tested. Unless otherwise noted, all analyses were conducted using EPA approved methodologies and all test results meet all requirements of TNI. All relevant sampling information is on the attached Chain-of-Custody form.

Where applicable, all soil data, except for 29-B, are on a wet-weight basis unless otherwise indicated in the units field as –dry.

LELAP Certification No.: 01997. TCEQ Certification No.: T104704261. LDHH Certification No.: LA023. ISDH Certification No.: C-LA-01. NDELCP Certification No.: R-226. A scope of accredited parameters is available upon request. A "#" by the test method or analyte indicates this parameter is outside the scope of accreditation.

Estimated uncertainty is available upon request. This report shall not be reproduced except in full, without the written approval of the laboratory.

If you have any questions regarding these test results, please feel free to call.

Cristina Thibeaux
Customer Service Supervisor
2417 W. Pinhook Road
Lafayette, LA 70508-3344

Element Materials Technology Lafayette
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Case Narrative

WO#: **20080073**
Date: **8/17/2020**

CLIENT: ERM Southwest
Project: JLS 0519829

Unless specified by the client, a duplicate or MS/MSD, wherever applicable, is randomly selected and analyzed from each analytical batch provided sample volume is sufficient. The sample chosen for duplicate or MS/MSD may or may not be a sample submitted in this workorder. A method blank and/or a lab control sample (LCS)/lab control sample duplicate (LCSD), wherever applicable, are processed as a quality control check for each analytical batch. When the matrix QC data is not available due to insufficient sample volume or when the results indicate possible matrix effect, the validity of the batch is determined by the method blank and LCS/LCSD.

The results of the laboratory internal quality control data are provided in the QC Summary Report section of the report for your review. Laboratory-related QC exceptions that may impact the validity of data are discussed in the case narrative. Sample-related QC exceptions are flagged either in the results page(s) or in the QC report page(s). End users should consider QC exceptions when evaluating sample data against data quality objectives.

Any other exceptions associated with this report will be footnoted in the results page(s) or the QC summary page(s).

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Analytical Report

(consolidated)

WO#: **20080073**

Date Reported: **8/17/2020**

CLIENT: ERM Southwest **Collection Date:** 7/29/2020 1:40:00 PM

Project: JLS 0519829

Lab ID: 20080073-001 **Matrix:** SOIL

Client Sample ID JLS-10 (12-14)

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ELECTRICAL CONDUCTIVITY @ SATURATION				**LDNR 29-B**		Analyst: **HXW**
Electrical Conductivity	3.02	0.10		mmhos/cm	1	8/12/2020 10:18:00 AM
PERCENT MOISTURE				**LDNR 29-B**		Analyst: **BXB**
Percent Moisture	78.3	1.00		wt%	1	8/4/2020 3:35:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode		

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Analytical Report

(consolidated)

WO#: **20080073**

Date Reported: **8/17/2020**

CLIENT: ERM Southwest **Collection Date:** 7/29/2020 2:00:00 PM

Project: JLS 0519829

Lab ID: 20080073-002 **Matrix:** SOIL

Client Sample ID JLS-10 (20-22)

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ELECTRICAL CONDUCTIVITY @ SATURATION				**LDNR 29-B**		Analyst: **HXW**
Electrical Conductivity	1.75	0.10		mmhos/cm	1	8/12/2020 10:18:00 AM
PERCENT MOISTURE				**LDNR 29-B**		Analyst: **BXB**
Percent Moisture	48.8	1.00		wt%	1	8/4/2020 3:35:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
SDL	Sample detection limit
W	Sample container temperature is out of limit as specified at testcode
M	Matrix Interference
RL	Reporting Limit
U	Analyte not detected

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Analytical Report

(consolidated)

WO#: **20080073**

Date Reported: **8/17/2020**

CLIENT: ERM Southwest **Collection Date:** 7/29/2020 3:25:00 PM

Project: JLS 0519829

Lab ID: 20080073-003 **Matrix:** SOIL

Client Sample ID JLS-10 (34-36)

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ELECTRICAL CONDUCTIVITY @ SATURATION				**LDNR 29-B**		Analyst: **HXW**
Electrical Conductivity	1.18	0.10		mmhos/cm	1	8/12/2020 10:18:00 AM
PERCENT MOISTURE				**LDNR 29-B**		Analyst: **BXB**
Percent Moisture	40.2	1.00		wt%	1	8/4/2020 3:35:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
SDL	Sample detection limit
W	Sample container temperature is out of limit as specified at testcode
M	Matrix Interference
RL	Reporting Limit
U	Analyte not detected

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QC SUMMARY REPORT

WO#: **20080073**

17-Aug-20

Client: ERM Southwest
Project: JLS 0519829 **BatchID:** **R91631**

Sample ID	**MB-R91631**	SampType:	**MBLK**	TestCode:	**EC_S**	Units:	**mmhos/cm**	Prep Date:		RunNo:	**91631**
Client ID:	**PBS**	Batch ID:	**R91631**	TestNo:	**LDNR 29-B**			Analysis Date:	**8/12/2020**	SeqNo:	**2265994**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Electrical Conductivity	< 0.10	0.10									

Sample ID	**LCS1-R91631**	SampType:	**LCS1**	TestCode:	**EC_S**	Units:	**mmhos/cm**	Prep Date:		RunNo:	**91631**
Client ID:	**ZZZZZZ**	Batch ID:	**R91631**	TestNo:	**LDNR 29-B**			Analysis Date:	**8/12/2020**	SeqNo:	**2265995**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Electrical Conductivity	0.42	0.10	0.38	0	108	90.07	109.9				

Sample ID	**LCS2-R91631**	SampType:	**LCS2**	TestCode:	**EC_S**	Units:	**mmhos/cm**	Prep Date:		RunNo:	**91631**
Client ID:	**ZZZZZZ**	Batch ID:	**R91631**	TestNo:	**LDNR 29-B**			Analysis Date:	**8/12/2020**	SeqNo:	**2265996**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Electrical Conductivity	55.1	0.10	53.00	0	104	90	110				

Sample ID	**20080092-001ADUP**	SampType:	**DUP**	TestCode:	**EC_S**	Units:	**mmhos/cm**	Prep Date:		RunNo:	**91631**
Client ID:	**ZZZZZZ**	Batch ID:	**R91631**	TestNo:	**LDNR 29-B**			Analysis Date:	**8/12/2020**	SeqNo:	**2266001**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Electrical Conductivity	1.19	0.10						1.16	2.73	20	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Matrix Interference	ND	Not Detected at the Reporting Limit
RL	Reporting Limit	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20080073**

17-Aug-20

Client: ERM Southwest
Project: JLS 0519829 **BatchID:** **R91692**

Sample ID	**20080348-001ADUP**	SampType:	**DUP**	TestCode:	**PMOIST_29B**	Units:	**wt%**	Prep Date:		RunNo:	**91692**
Client ID:	**ZZZZZZ**	Batch ID:	**R91692**	TestNo:	**LDNR 29-B**			Analysis Date:	**8/11/2020**	SeqNo:	**2268391**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	52.1	1.00						51.50	1.16	20	

Sample ID	**20080348-021ADUP**	SampType:	**DUP**	TestCode:	**PMOIST_29B**	Units:	**wt%**	Prep Date:		RunNo:	**91692**
Client ID:	**ZZZZZZ**	Batch ID:	**R91692**	TestNo:	**LDNR 29-B**			Analysis Date:	**8/11/2020**	SeqNo:	**2268412**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	34.0	1.00						33.00	2.99	20	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Matrix Interference	ND	Not Detected at the Reporting Limit
RL	Reporting Limit	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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Sample Log-In Check List

Client Name: **ERM_METAIRIE** Work Order Number: **20080073** RcptNo: **1**

Logged by:	**Tammy Thibodeaux**	**8/4/2020 10:45:00 AM**	Tammy Thibodeaux
Completed By:	**Tammy Thibodeaux**	**8/4/2020 12:49:22 PM**	Tammy Thibodeaux
Reviewed By:	**Caitlin Duplantis**	**8/7/2020 2:27:38 PM**	Caitlin Duplantis

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☐	No ☑	Not Present ☐
2.	How was the sample delivered?	FedEx Tracking No.: 771161868093		

Log In

3.	Coolers are present?	Yes ☐	No ☐	NA ☑
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
	Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
	No. Seal Date: Signed By:			
5.	Was an attempt made to cool the samples?	Yes ☐	No ☐	NA ☑
6.	Were all samples received at a temperature of >0° C to 6.0°C	Yes ☐	No ☑	NA ☐
		Not required		
7.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
8.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
9.	Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
10.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
11.	Is the headspace in the VOA vials less than 1/4 inch or 6 mm?	Yes ☐	No ☐	No VOA Vials ☑
12.	Were any sample containers received broken?	Yes ☐	No ☑	
13.	Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
14.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
15.	Is it clear what analyses were requested?	Yes ☑	No ☐	
16.	Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

Special Handling (if applicable)

17.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: Date

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

18. Additional remarks:

Improper error correction(s) made by client.

Incomplete custody signature(s) prior to receipt by Element personnel.

Cooler Information

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By

element™

Chain of Custody

Laboratory Number: 2080073

	Client Information:	Billing Information:	PO Number:	Project Name/Number:	Page 1 of 1
Company Name:	ERM	same		JLS 0519829	**Matrix Code**
Contact Name:	Jody Shugart	Christine Caruba	Quote Number:		DW = Drinking Water WW = Waste Water GW = Ground Water AQ = Aqueous OT = Other SL = Sludge SOL = Solid O = Oil SO = Soil F = Food SW = Swab NG = Natural Gas NGL = Natural Gas Liquid PW = Produced Water CF = Completion Fluid
Address:	3838 N Causeway Blvd			Sampler's Signature	
	Suite 3000		Required QC Level		
City, State Zip:	Metairie, Louisiana 70002				
Phone Number:	985-237-5091 Ext:	Ext:	Bill Monthly ☐Yes ☐No	Shipping Method: UPS / (FedEx) / Airborne DHL / Element / Hand / Mail	
Fax Number:					
E-mail Address:	Jody.shugart@erm.com				

Which Regulations Apply:
☐RCRA ☐Drinking Water
☐POTW ☐Distribution
☐NPDES ☐Special
☐USDA/FDA ☐State
☐RECAP/RISC ☐Other

Turn Time
☐Standard
RUSH
☐1 Day
☐2 Day
☐Other
(Rush turn times will incur a surcharge and must be pre-approved by lab.)

Sample ID/Description	Collection Information: Date	Time	Grab / Composite	Matrix	Container: Quantity	Container: Type P=Plastic, G=Glass, V=Vial	Pres.: HCl, HNO_3, H_2SO_4, NaOH, $Na_2S_2O_3$	Requested Tests: ~~HEM Oil & Grease~~	~~29B Metals~~	EC (29 B)	% moisture	Comments
JLS-10 (12-14)	7/29/26	13:40	G	SOIL	1	P	—			X	X	771161868093
JLS-10 (20-22)	1	14:00	1	1	1	1	1		~~X~~	X	X	
JLS-10 (34-36)	1	15:35	1	1	1	1	1			X	X	

	Relinquished by	Date/Time	Received by	Date/Time	Field Notes:
1		8/3/26 14:45			
2	FedEx	8/4/2026 1045		8/4/2026 1045	Received at lab on ice? ☐Yes ☒No Temp:
3					

All samples submitted to Element Materials Technology for analysis are accepted on a custodial basis only. Ownership of the material remains with the client submitting the samples. Element Materials Technology reserves the right to return unused sample portions.

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F 765-378-4109

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F 812-375-0731

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F 260-471-7777

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Warsaw, IN
46580-2368 USA
P 574-267-3305
F 574-269-6569

3371 Cleveland Road, Suite 100A
South Bend, IN
46628-9780 USA
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Element Materials Technology Lafayette
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September 25, 2020

Jonathan Miller
ERM Southwest
3838 North Causeway, Suite 2725
Metairie, LA 70002
TEL: (504) 831-6700
FAX (504) 831-6742

RE: Jeanerette Lumber/0519829

Order No.: 20090390

Dear Jonathan Miller:

Element Materials Technology Lafayette received 4 sample(s) on 9/11/2020 for the analyses presented in the following report.

In accordance with your instructions Element Lafayette conducted the analysis shown on the following pages on samples submitted by your company. The results related only to the items tested. Unless otherwise noted, all analyses were conducted using EPA approved methodologies and all test results meet all requirements of TNI. All relevant sampling information is on the attached Chain-of-Custody form.

Where applicable, all soil data, except for 29-B, are on a wet-weight basis unless otherwise indicated in the units field as –dry.

LELAP Certification No.: 01997. TCEQ Certification No.: T104704261. LDHH Certification No.: LA023. ISDH Certification No.: C-LA-01. NDELCP Certification No.: R-226. A scope of accredited parameters is available upon request. A "#" by the test method or analyte indicates this parameter is outside the scope of accreditation.

Estimated uncertainty is available upon request. This report shall not be reproduced except in full, without the written approval of the laboratory.

If you have any questions regarding these test results, please feel free to call.

Cristina Thibeaux
Customer Service Supervisor
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Case Narrative

WO#: **20090390**
Date: **9/25/2020**

CLIENT: ERM Southwest
Project: Jeanerette Lumber/0519829

Unless specified by the client, a duplicate or MS/MSD, wherever applicable, is randomly selected and analyzed from each analytical batch provided sample volume is sufficient. The sample chosen for duplicate or MS/MSD may or may not be a sample submitted in this workorder. A method blank and/or a lab control sample (LCS)/lab control sample duplicate (LCSD), wherever applicable, are processed as a quality control check for each analytical batch. When the matrix QC data is not available due to insufficient sample volume or when the results indicate possible matrix effect, the validity of the batch is determined by the method blank and LCS/LCSD.

The results of the laboratory internal quality control data are provided in the QC Summary Report section of the report for your review. Laboratory-related QC exceptions that may impact the validity of data are discussed in the case narrative. Sample-related QC exceptions are flagged either in the results page(s) or in the QC report page(s). End users should consider QC exceptions when evaluating sample data against data quality objectives.

Any other exceptions associated with this report will be footnoted in the results page(s) or the QC summary page(s).

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Website: www.element.com

Analytical Report

(consolidated)

WO#: **20090390**

Date Reported: **9/25/2020**

CLIENT: ERM Southwest **Collection Date:** 9/8/2020 1:30:00 PM

Project: Jeanerette Lumber/0519829

Lab ID: 20090390-001 **Matrix:** SOIL

Client Sample ID JLS-22 0-2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **BXB**
CATION EXCHANGE CAPACITY						
Cation Exchange Capacity	46.0	0.100		meq/100g	1	9/18/2020
29B SALTS				**LDNR 29-B**		Analyst: **HXW**
ELECTRICAL CONDUCTIVITY @ SATURATION						
Electrical Conductivity	1.25	0.10		mmhos/cm	1	9/17/2020 9:42:00 AM
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **BXB**
EXCHANGEABLE SODIUM PERCENTAGE						
Exchangeable Sodium %	8.70	0.10		%	1	9/18/2020
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **STS**
SODIUM ADSORPTION RATIO						
Sodium Adsorption Ratio	6.60	0.10			1	9/17/2020
Soluble Calcium	1.30	0.02		meq/L	1	9/17/2020
Soluble Magnesium	0.78	0.05		meq/L	1	9/17/2020
Soluble Sodium	6.73	0.25		meq/L	1	9/17/2020
29B METALS				**SW7471A**	**SW7471A**	Analyst: **BXB**
MERCURY IN SOIL OR SLUDGE						
Mercury	< 0.107	0.107		mg/Kg	1	9/17/2020 6:47:18 AM
29B METALS				**LDNR 29-B**		Analyst: **KML**
TRUE TOTAL BARIUM						
True Total Barium	< 198	198		mg/Kg-dry	20	9/23/2020 3:33:06 PM
METALS IN SOIL OR SLUDGE BY ICP-MS				**SW6020A**	**SW3050B**	Analyst: **KML**
Arsenic	3.05	1.24		mg/Kg	100	9/17/2020 3:11:42 PM
Barium	162	9.90		mg/Kg	100	9/17/2020 3:11:42 PM
Cadmium	< 1.24	1.24		mg/Kg	100	9/17/2020 3:11:42 PM
Chromium	14.0	12.4		mg/Kg	500	9/17/2020 4:33:16 PM
Lead	11.8	2.48		mg/Kg	100	9/17/2020 3:11:42 PM
Selenium	< 9.90	9.90		mg/Kg	100	9/17/2020 3:11:42 PM
Strontium	37.2	1.24		mg/Kg	100	9/17/2020 3:11:42 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
M	Matrix Interference	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
U	Analyte not detected	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

(consolidated)

WO#: **20090390**

Date Reported: **9/25/2020**

CLIENT: ERM Southwest **Collection Date:** 9/8/2020 1:30:00 PM

Project: Jeanerette Lumber/0519829

Lab ID: 20090390-001 **Matrix:** SOIL

Client Sample ID JLS-22 0-2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
METALS IN SOIL OR SLUDGE BY ICP-MS				**SW6020A** **SW3050B**		Analyst: **KML**
Zinc	53.6	49.5		mg/Kg	500	9/17/2020 4:33:16 PM
PERCENT MOISTURE				**LDNR 29-B**		Analyst: **BXB**
Percent Moisture	38.7	1.00		wt%	1	9/14/2020 7:30:00 AM

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
	M	Matrix Interference	ND	Not Detected at the Reporting Limit
	R	RPD outside accepted recovery limits	RL	Reporting Limit
	S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
	U	Analyte not detected	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

(consolidated)

WO#: **20090390**

Date Reported: **9/25/2020**

CLIENT: ERM Southwest **Collection Date:** 9/8/2020 1:35:00 PM

Project: Jeanerette Lumber/0519829

Lab ID: 20090390-002 **Matrix:** SOIL

Client Sample ID JLS-22 2-4

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **BXB**
CATION EXCHANGE CAPACITY						
Cation Exchange Capacity	49.5	0.100		meq/100g	1	9/18/2020
29B SALTS				**LDNR 29-B**		Analyst: **HXW**
ELECTRICAL CONDUCTIVITY @ SATURATION						
Electrical Conductivity	2.27	0.10		mmhos/cm	1	9/17/2020 9:42:00 AM
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **BXB**
EXCHANGEABLE SODIUM PERCENTAGE						
Exchangeable Sodium %	9.97	0.10		%	1	9/18/2020
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **STS**
SODIUM ADSORPTION RATIO						
Sodium Adsorption Ratio	9.25	0.10			1	9/17/2020
Soluble Calcium	2.32	0.02		meq/L	1	9/17/2020
Soluble Magnesium	1.24	0.05		meq/L	1	9/17/2020
Soluble Sodium	12.3	0.25		meq/L	1	9/17/2020
29B METALS				**SW7471A**	**SW7471A**	Analyst: **BXB**
MERCURY IN SOIL OR SLUDGE						
Mercury	< 0.104	0.104		mg/Kg	1	9/17/2020 6:49:36 AM
29B METALS				**LDNR 29-B**		Analyst: **KML**
TRUE TOTAL BARIUM						
True Total Barium	< 198	198		mg/Kg-dry	20	9/23/2020 3:55:35 PM
METALS IN SOIL OR SLUDGE BY ICP-MS				**SW6020A**	**SW3050B**	Analyst: **KML**
Arsenic	3.15	1.22		mg/Kg	100	9/17/2020 3:14:30 PM
Barium	139	9.76		mg/Kg	100	9/17/2020 3:14:30 PM
Cadmium	< 1.22	1.22		mg/Kg	100	9/17/2020 3:14:30 PM
Chromium	12.4	12.2		mg/Kg	500	9/17/2020 4:36:04 PM
Lead	11.1	2.44		mg/Kg	100	9/17/2020 3:14:30 PM
Selenium	< 9.76	9.76		mg/Kg	100	9/17/2020 3:14:30 PM
Strontium	32.9	1.22		mg/Kg	100	9/17/2020 3:14:30 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
M	Matrix Interference	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
U	Analyte not detected	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

(consolidated)

WO#: **20090390**

Date Reported: **9/25/2020**

CLIENT: ERM Southwest **Collection Date:** 9/8/2020 1:35:00 PM

Project: Jeanerette Lumber/0519829

Lab ID: 20090390-002 **Matrix:** SOIL

Client Sample ID JLS-22 2-4

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
METALS IN SOIL OR SLUDGE BY ICP-MS				**SW6020A**	**SW3050B**	Analyst: **KML**
Zinc	51.0	48.8		mg/Kg	500	9/17/2020 4:36:04 PM
PERCENT MOISTURE				**LDNR 29-B**		Analyst: **BXB**
Percent Moisture	38.0	1.00		wt%	1	9/14/2020 7:30:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
M	Matrix Interference	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
U	Analyte not detected	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

(consolidated)

WO#: **20090390**

Date Reported: **9/25/2020**

CLIENT: ERM Southwest **Collection Date:** 9/8/2020 2:35:00 PM

Project: Jeanerette Lumber/0519829

Lab ID: 20090390-003 **Matrix:** SOIL

Client Sample ID JLS-23 0-2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **BXB**
CATION EXCHANGE CAPACITY						
Cation Exchange Capacity	75.4	0.100		meq/100g	1	9/18/2020
29B SALTS				**LDNR 29-B**		Analyst: **HXW**
ELECTRICAL CONDUCTIVITY @ SATURATION						
Electrical Conductivity	1.45	0.10		mmhos/cm	1	9/17/2020 9:42:00 AM
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **BXB**
EXCHANGEABLE SODIUM PERCENTAGE						
Exchangeable Sodium %	2.53	0.10		%	1	9/18/2020
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **STS**
SODIUM ADSORPTION RATIO						
Sodium Adsorption Ratio	4.10	0.10			1	9/17/2020
Soluble Calcium	2.77	0.02		meq/L	1	9/17/2020
Soluble Magnesium	1.42	0.05		meq/L	1	9/17/2020
Soluble Sodium	5.94	0.25		meq/L	1	9/17/2020
29B METALS				**SW7471A**	**SW7471A**	Analyst: **BXB**
MERCURY IN SOIL OR SLUDGE						
Mercury	< 0.106	0.106		mg/Kg	1	9/17/2020 6:56:59 AM
29B METALS				**LDNR 29-B**		Analyst: **KML**
TRUE TOTAL BARIUM						
True Total Barium	< 198	198		mg/Kg-dry	20	9/23/2020 3:58:22 PM
METALS IN SOIL OR SLUDGE BY ICP-MS				**SW6020A**	**SW3050B**	Analyst: **KML**
Arsenic	2.29	1.22		mg/Kg	100	9/17/2020 3:17:18 PM
Barium	178	9.78		mg/Kg	100	9/17/2020 3:17:18 PM
Cadmium	< 1.22	1.22		mg/Kg	100	9/17/2020 3:17:18 PM
Chromium	5.74	2.45		mg/Kg	100	9/17/2020 3:17:18 PM
Lead	6.90	2.45		mg/Kg	100	9/17/2020 3:17:18 PM
Selenium	< 9.78	9.78		mg/Kg	100	9/17/2020 3:17:18 PM
Strontium	28.1	1.22		mg/Kg	100	9/17/2020 3:17:18 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
M	Matrix Interference	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
U	Analyte not detected	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

(consolidated)

WO#: **20090390**

Date Reported: **9/25/2020**

CLIENT: ERM Southwest **Collection Date:** 9/8/2020 2:35:00 PM

Project: Jeanerette Lumber/0519829

Lab ID: 20090390-003 **Matrix:** SOIL

Client Sample ID JLS-23 0-2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
METALS IN SOIL OR SLUDGE BY ICP-MS				**SW6020A** **SW3050B**		Analyst: **KML**
Zinc	28.5	9.78		mg/Kg	100	9/17/2020 3:17:18 PM
PERCENT MOISTURE				**LDNR 29-B**		Analyst: **BXB**
Percent Moisture	66.7	1.00		wt%	1	9/14/2020 7:30:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
M	Matrix Interference	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
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Analytical Report

(consolidated)

WO#: **20090390**

Date Reported: **9/25/2020**

CLIENT: ERM Southwest **Collection Date:** 9/8/2020 2:40:00 PM

Project: Jeanerette Lumber/0519829

Lab ID: 20090390-004 **Matrix:** SOIL

Client Sample ID JLS-23 2-4

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **BXB**
CATION EXCHANGE CAPACITY						
Cation Exchange Capacity	76.9	0.100		meq/100g	1	9/18/2020
29B SALTS				**LDNR 29-B**		Analyst: **HXW**
ELECTRICAL CONDUCTIVITY @ SATURATION						
Electrical Conductivity	3.73	0.10		mmhos/cm	1	9/17/2020 9:42:00 AM
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **BXB**
EXCHANGEABLE SODIUM PERCENTAGE						
Exchangeable Sodium %	9.65	0.10		%	1	9/18/2020
29B SALTS				**LDNR 29-B**	**LDNR 29-B**	Analyst: **STS**
SODIUM ADSORPTION RATIO						
Sodium Adsorption Ratio	13.8	0.10	*		1	9/17/2020
Soluble Calcium	3.24	0.02		meq/L	1	9/17/2020
Soluble Magnesium	1.63	0.05		meq/L	1	9/17/2020
Soluble Sodium	21.5	0.25		meq/L	1	9/17/2020
29B METALS				**SW7471A**	**SW7471A**	Analyst: **BXB**
MERCURY IN SOIL OR SLUDGE						
Mercury	< 0.0944	0.0944		mg/Kg	1	9/17/2020 6:59:17 AM
29B METALS				**LDNR 29-B**		Analyst: **KML**
TRUE TOTAL BARIUM						
True Total Barium	1,180	197		mg/Kg-dry	20	9/23/2020 4:01:10 PM
METALS IN SOIL OR SLUDGE BY ICP-MS				**SW6020A**	**SW3050B**	Analyst: **KML**
Arsenic	3.85	1.22		mg/Kg	100	9/17/2020 3:42:40 PM
Barium	302	19.5		mg/Kg	200	9/17/2020 4:47:17 PM
Cadmium	< 1.22	1.22		mg/Kg	100	9/17/2020 3:42:40 PM
Chromium	5.73	2.44		mg/Kg	100	9/17/2020 3:42:40 PM
Lead	8.80	2.44		mg/Kg	100	9/17/2020 3:42:40 PM
Selenium	< 9.77	9.77		mg/Kg	100	9/17/2020 3:42:40 PM
Strontium	41.7	1.22		mg/Kg	100	9/17/2020 3:42:40 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
M	Matrix Interference	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit
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Analytical Report

(consolidated)

WO#: **20090390**

Date Reported: **9/25/2020**

CLIENT: ERM Southwest **Collection Date:** 9/8/2020 2:40:00 PM

Project: Jeanerette Lumber/0519829

Lab ID: 20090390-004 **Matrix:** SOIL

Client Sample ID JLS-23 2-4

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
METALS IN SOIL OR SLUDGE BY ICP-MS				**SW6020A**	**SW3050B**	Analyst: **KML**
Zinc	23.6	9.77		mg/Kg	100	9/17/2020 3:42:40 PM
PERCENT MOISTURE				**LDNR 29-B**		Analyst: **BXB**
Percent Moisture	69.3	1.00		wt%	1	9/14/2020 7:30:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
M	Matrix Interference	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit
U	Analyte not detected	W	Sample container temperature is out of limit as specified at testcode

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QC SUMMARY REPORT

WO#: **20090390**
25-Sep-20

Client: ERM Southwest
Project: Jeanerette Lumber/0519829 **BatchID:** **35302**

Sample ID	**MB-35302**	SampType:	**MBLK**	TestCode:	**HG_S_7471A**	Units:	**mg/Kg**	Prep Date:	**9/16/2020**	RunNo:	**92476**
Client ID:	**PBS**	Batch ID:	**35302**	TestNo:	**SW7471A**	**SW7471A**		Analysis Date:	**9/17/2020**	SeqNo:	**2287662**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	< 0.100	0.100									

Sample ID	**LCS-35302**	SampType:	**LCS**	TestCode:	**HG_S_7471A**	Units:	**mg/Kg**	Prep Date:	**9/16/2020**	RunNo:	**92476**
Client ID:	**LCSS**	Batch ID:	**35302**	TestNo:	**SW7471A**	**SW7471A**		Analysis Date:	**9/17/2020**	SeqNo:	**2287663**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.890	0.100	0.8330	0	107	80	120				

Sample ID	**LCSD-35302**	SampType:	**LCSD**	TestCode:	**HG_S_7471A**	Units:	**mg/Kg**	Prep Date:	**9/16/2020**	RunNo:	**92476**
Client ID:	**LCSS02**	Batch ID:	**35302**	TestNo:	**SW7471A**	**SW7471A**		Analysis Date:	**9/17/2020**	SeqNo:	**2287664**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.887	0.100	0.8330	0	106	80	120	0.8896	0.319	20	

Sample ID	**20090233-001AMS**	SampType:	**MS**	TestCode:	**HG_S_7471A**	Units:	**mg/Kg**	Prep Date:	**9/16/2020**	RunNo:	**92476**
Client ID:	**ZZZZZZ**	Batch ID:	**35302**	TestNo:	**SW7471A**	**SW7471A**		Analysis Date:	**9/17/2020**	SeqNo:	**2287667**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	1.00	0.107	0.8914	0.02378	110	75	125				

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20090390**

25-Sep-20

Client: ERM Southwest
Project: Jeanerette Lumber/0519829 **BatchID:** **35302**

Sample ID	**20090233-001AMSD**	SampType:	**MSD**	TestCode:	**HG_S_7471A**	Units:	**mg/Kg**	Prep Date:	**9/16/2020**	RunNo:	**92476**
Client ID:	**ZZZZZZ**	Batch ID:	**35302**	TestNo:	**SW7471A**	**SW7471A**		Analysis Date:	**9/17/2020**	SeqNo:	**2287668**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	1.00	0.107	0.8898	0.02378	110	75	125	1.001	0.331	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20090390**

25-Sep-20

Client: ERM Southwest

Project: Jeanerette Lumber/0519829 **BatchID:** **35313**

Sample ID	**MB-35313**	SampType:	**MBLK**	TestCode:	**6020A_S**	Units:	**mg/Kg**	Prep Date:	**9/16/2020**	RunNo:	**92526**
Client ID:	**PBS**	Batch ID:	**35313**	TestNo:	**SW6020A**	**SW3050B**		Analysis Date:	**9/17/2020**	SeqNo:	**2288995**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	< 0.500	0.500									
Barium	< 4.00	4.00									
Cadmium	< 0.500	0.500									
Chromium	< 1.00	1.00									
Lead	< 1.00	1.00									
Selenium	< 4.00	4.00									
Strontium	< 0.500	0.500									
Zinc	< 4.00	4.00									

Sample ID	**LCS-35313**	SampType:	**LCS**	TestCode:	**6020A_S**	Units:	**mg/Kg**	Prep Date:	**9/16/2020**	RunNo:	**92526**
Client ID:	**LCSS**	Batch ID:	**35313**	TestNo:	**SW6020A**	**SW3050B**		Analysis Date:	**9/17/2020**	SeqNo:	**2288996**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	25.1	0.250	25.0	0	101	80	120				
Barium	25.9	2.00	25.0	0	103	80	120				
Cadmium	25.1	0.250	25.0	0	100	80	120				
Chromium	25.5	0.500	25.0	0	102	80	120				
Lead	27.0	0.500	25.0	0	108	80	120				
Selenium	25.9	2.00	25.0	0	103	80	120				
Strontium	26.0	0.250	25.0	0	104	80	120				
Zinc	28.5	2.00	25.0	0	114	80	120				

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20090390**

25-Sep-20

Client: ERM Southwest
Project: Jeanerette Lumber/0519829 **BatchID:** **35313**

Sample ID	**LCSD-35313**	SampType:	**LCSD**	TestCode:	**6020A_S**	Units:	**mg/Kg**	Prep Date:	**9/16/2020**	RunNo:	**92526**
Client ID:	**LCSS02**	Batch ID:	**35313**	TestNo:	**SW6020A**	**SW3050B**		Analysis Date:	**9/17/2020**	SeqNo:	**2288997**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	24.6	0.250	25.0	0	98.5	80	120	25.1	2.01	20	
Barium	26.6	2.00	25.0	0	107	80	120	25.9	2.94	20	
Cadmium	24.5	0.250	25.0	0	98.2	80	120	25.1	2.33	20	
Chromium	25.4	0.500	25.0	0	102	80	120	25.5	0.151	20	
Lead	26.1	0.500	25.0	0	104	80	120	27.0	3.54	20	
Selenium	24.8	2.00	25.0	0	99.2	80	120	25.9	4.15	20	
Strontium	25.2	0.250	25.0	0	101	80	120	26.0	2.82	20	
Zinc	28.4	2.00	25.0	0	113	80	120	28.5	0.424	20	

Sample ID	**20090387-001BMS**	SampType:	**MS**	TestCode:	**6020A_S**	Units:	**mg/Kg**	Prep Date:	**9/16/2020**	RunNo:	**92526**
Client ID:	**ZZZZZZ**	Batch ID:	**35313**	TestNo:	**SW6020A**	**SW3050B**		Analysis Date:	**9/17/2020**	SeqNo:	**2289003**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	30.2	0.489	24.4	6.43	97.1	80	120				
Cadmium	24.5	0.489	24.4	0.248	99.0	80	120				
Lead	32.1	0.978	24.4	11.7	83.5	80	120				
Selenium	25.3	3.91	24.4	2.12	95.0	80	120				
Strontium	53.1	0.489	24.4	25.9	112	80	120				

Sample ID	**20090387-001BMSD**	SampType:	**MSD**	TestCode:	**6020A_S**	Units:	**mg/Kg**	Prep Date:	**9/16/2020**	RunNo:	**92526**
Client ID:	**ZZZZZZ**	Batch ID:	**35313**	TestNo:	**SW6020A**	**SW3050B**		Analysis Date:	**9/17/2020**	SeqNo:	**2289004**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20090390**

25-Sep-20

Client: ERM Southwest
Project: Jeanerette Lumber/0519829 **BatchID:** **35313**

Sample ID	**20090387-001BMSD**	SampType:	**MSD**	TestCode:	**6020A_S**	Units:	**mg/Kg**	Prep Date:	**9/16/2020**	RunNo:	**92526**
Client ID:	**ZZZZZZ**	Batch ID:	**35313**	TestNo:	**SW6020A**	**SW3050B**		Analysis Date:	**9/17/2020**	SeqNo:	**2289004**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	32.8	0.489	24.5	6.43	108	80	120	30.2	8.41	20	
Cadmium	23.5	0.489	24.5	0.248	95.2	80	120	24.5	3.90	20	
Lead	31.9	0.978	24.5	11.7	82.4	80	120	32.1	0.769	20	
Selenium	26.0	3.91	24.5	2.12	97.5	80	120	25.3	2.51	20	
Strontium	53.7	0.489	24.5	25.9	114	80	120	53.1	1.13	20	

Sample ID	**20090387-001BMS**	SampType:	**MS**	TestCode:	**6020A_S**	Units:	**mg/Kg**	Prep Date:	**9/16/2020**	RunNo:	**92526**
Client ID:	**ZZZZZZ**	Batch ID:	**35313**	TestNo:	**SW6020A**	**SW3050B**		Analysis Date:	**9/17/2020**	SeqNo:	**2289035**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	185	9.78	24.4	157	117	80	120				
Chromium	32.4	2.44	24.4	11.8	84.2	80	120				
Zinc	67.9	9.78	24.4	48.6	79.1	80	120				S

Sample ID	**20090387-001BMSD**	SampType:	**MSD**	TestCode:	**6020A_S**	Units:	**mg/Kg**	Prep Date:	**9/16/2020**	RunNo:	**92526**
Client ID:	**ZZZZZZ**	Batch ID:	**35313**	TestNo:	**SW6020A**	**SW3050B**		Analysis Date:	**9/17/2020**	SeqNo:	**2289036**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	186	9.78	24.5	157	120	80	120	185	0.474	20	S
Chromium	34.0	2.45	24.5	11.8	90.7	80	120	32.4	4.87	20	
Zinc	66.6	9.78	24.5	48.6	73.8	80	120	67.9	1.89	20	S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

Element Materials Technology Lafayette
2417 W. Pinhook Road
Lafayette, LA 70508-3344
TEL: (337) 235-0483 FAX: (337) 233-6540
Website: www.element.com

QC SUMMARY REPORT

WO#: **20090390**

25-Sep-20

Client: ERM Southwest

Project: Jeanerette Lumber/0519829 **BatchID:** **35313**

Sample ID	**20090387-001BMSD**	SampType:	**MSD**	TestCode:	**6020A_S**	Units:	**mg/Kg**	Prep Date:	**9/16/2020**	RunNo:	**92526**
Client ID:	**ZZZZZZ**	Batch ID:	**35313**	TestNo:	**SW6020A**	**SW3050B**		Analysis Date:	**9/17/2020**	SeqNo:	**2289036**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

S - Spike recovery indicates matrix interference. The method is in control as indicated by the Lab Control Sample.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20090390**

25-Sep-20

Client: ERM Southwest

Project: Jeanerette Lumber/0519829 **BatchID:** **35336**

Sample ID	**20090406-006ADUP**	SampType:	**DUP**	TestCode:	**SAR_S**	Units:		Prep Date:	**9/17/2020**	RunNo:	**92528**
Client ID:	**ZZZZZZ**	Batch ID:	**35336**	TestNo:	**LDNR 29-B**	**LDNR 29-B**		Analysis Date:	**9/17/2020**	SeqNo:	**2289267**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium Adsorption Ratio	23.3	0.10						23.28	0.26	20	*
Soluble Calcium	1.67	0.02						1.67	0	20	
Soluble Magnesium	0.82	0.05						0.82	0	20	
Soluble Sodium	26.0	0.25						26.00	0.15	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20090390**

25-Sep-20

Client: ERM Southwest
Project: Jeanerette Lumber/0519829 **BatchID:** **35348**

Sample ID	**MB-35348**	SampType:	**MBLK**	TestCode:	**TTBA**	Units:	**mg/Kg-dry**	Prep Date:	**9/20/2020**	RunNo:	**92638**
Client ID:	**PBS**	Batch ID:	**35348**	TestNo:	**LDNR 29-B**			Analysis Date:	**9/23/2020**	SeqNo:	**2292485**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
True Total Barium	< 200	200									

Sample ID	**LCS-35348**	SampType:	**LCS**	TestCode:	**TTBA**	Units:	**mg/Kg-dry**	Prep Date:	**9/20/2020**	RunNo:	**92638**
Client ID:	**LCSS**	Batch ID:	**35348**	TestNo:	**LDNR 29-B**			Analysis Date:	**9/23/2020**	SeqNo:	**2292486**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
True Total Barium	4,830	500	5,000	0	96.5	75	125				

Sample ID	**LCSD-35348**	SampType:	**LCSD**	TestCode:	**TTBA**	Units:	**mg/Kg-dry**	Prep Date:	**9/20/2020**	RunNo:	**92638**
Client ID:	**LCSS02**	Batch ID:	**35348**	TestNo:	**LDNR 29-B**			Analysis Date:	**9/23/2020**	SeqNo:	**2292487**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
True Total Barium	4,910	500	5,000	0	98.2	75	125	4,827	1.71	20	

Sample ID	**20090390-001AMS**	SampType:	**MS**	TestCode:	**TTBA**	Units:	**mg/Kg-dry**	Prep Date:	**9/20/2020**	RunNo:	**92638**
Client ID:	**JLS-22 0-2**	Batch ID:	**35348**	TestNo:	**LDNR 29-B**			Analysis Date:	**9/23/2020**	SeqNo:	**2292490**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
True Total Barium	5,040	490	4,897	0	103	75	125				

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20090390**

25-Sep-20

Client: ERM Southwest
Project: Jeanerette Lumber/0519829 **BatchID:** **35348**

Sample ID **20090390-001AMSD** SampType: **MSD** TestCode: **TTBA** Units: **mg/Kg-dry** Prep Date: **9/20/2020** RunNo: **92638**
Client ID: **JLS-22 0-2** Batch ID: **35348** TestNo: **LDNR 29-B** Analysis Date: **9/23/2020** SeqNo: **2292491**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
True Total Barium	4,870	480	4,798	0	102	75	125	5,039	3.34	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20090390**

25-Sep-20

Client: ERM Southwest

Project: Jeanerette Lumber/0519829 **BatchID:** **R92455**

Sample ID **20090406-006ADUP** SampType: **DUP** TestCode: **PMOIST_29B** Units: **wt%** Prep Date: RunNo: **92455**

Client ID: **ZZZZZZ** Batch ID: **R92455** TestNo: **LDNR 29-B** Analysis Date: **9/14/2020** SeqNo: **2287124**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	39.3	1.00						42.00	6.64	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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QC SUMMARY REPORT

WO#: **20090390**

25-Sep-20

Client: ERM Southwest
Project: Jeanerette Lumber/0519829 **BatchID:** **R92475**

Sample ID	**MB-R92475**	SampType:	**MBLK**	TestCode:	**EC_S**	Units:	**mmhos/cm**	Prep Date:		RunNo:	**92475**
Client ID:	**PBS**	Batch ID:	**R92475**	TestNo:	**LDNR 29-B**			Analysis Date:	**9/17/2020**	SeqNo:	**2287804**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Electrical Conductivity	< 0.10	0.10									

Sample ID	**LCS1-R92475**	SampType:	**LCS1**	TestCode:	**EC_S**	Units:	**mmhos/cm**	Prep Date:		RunNo:	**92475**
Client ID:	**ZZZZZZ**	Batch ID:	**R92475**	TestNo:	**LDNR 29-B**			Analysis Date:	**9/17/2020**	SeqNo:	**2287805**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Electrical Conductivity	0.41	0.10	0.38	0	107	90.07	109.9				

Sample ID	**LCS2-R92475**	SampType:	**LCS2**	TestCode:	**EC_S**	Units:	**mmhos/cm**	Prep Date:		RunNo:	**92475**
Client ID:	**ZZZZZZ**	Batch ID:	**R92475**	TestNo:	**LDNR 29-B**			Analysis Date:	**9/17/2020**	SeqNo:	**2287806**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Electrical Conductivity	52.5	0.10	53.00	0	99.1	90	110				

Sample ID	**20090406-006ADUP**	SampType:	**DUP**	TestCode:	**EC_S**	Units:	**mmhos/cm**	Prep Date:		RunNo:	**92475**
Client ID:	**ZZZZZZ**	Batch ID:	**R92475**	TestNo:	**LDNR 29-B**			Analysis Date:	**9/17/2020**	SeqNo:	**2287817**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Electrical Conductivity	4.12	0.10						4.12	0	20	*

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded	M	Matrix Interference
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	RL	Reporting Limit
S	Spike Recovery outside accepted recovery limits	SDL	Sample detection limit	U	Analyte not detected
W	Sample container temperature is out of limit as specified at testcode				

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Lafayette, LA 70508-3344
TEL: (337) 235-0483 FAX: (337) 233-6540
Website: www.element.com

Sample Log-In Check List

Client Name: **ERM_METAIRIE** Work Order Number: **20090390** RcptNo: **1**

Logged by:	**Tammy Thibodeaux**	**9/11/2020 12:39:00 PM**	Tammy Thibodeaux
Completed By:	**Tammy Thibodeaux**	**9/11/2020 1:11:32 PM**	Tammy Thibodeaux
Reviewed By:	**Caitlin Duplantis**	**9/24/2020 3:12:36 PM**	Caitlin Duplantis

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Element		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
	Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
	No. Seal Date:	Signed By:		
5.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
6.	Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
7.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
8.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
9.	Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
10.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
11.	Is the headspace in the VOA vials less than 1/4 inch or 6 mm?	Yes ☐	No ☐	No VOA Vials ☑
12.	Were any sample containers received broken?	Yes ☐	No ☑	
13.	Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
14.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
15.	Is it clear what analyses were requested?	Yes ☑	No ☐	
16.	Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

Special Handling (if applicable)

17.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: Date

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

18. Additional remarks:

Cooler Information

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.8	Good	Not Present			

element

Chain of Custody

Laboratory Number: 20090390

Page 1 of 1

Client Information:	Billing Information:	PO Number:	Project Name/Number:
Company Name: ERM			Jeanerette Lumber / 0519829
Contact Name: Jonathan Miller		Quote Number:	Sampler's Signature: GG
Address: 3838 N. Causeway Blvd, Ste. 300 G		Required QC Level	
City, State Zip: Metairie, LA 70002			Shipping Method:
Phone Number: 504-831-6700 Ext:	Ext:	Bill Monthly ☐Yes ☐No	UPS / FedEx / NOW DHL / Element / (Hand) / Mail
Fax Number: Cell 504-810-1764			
E-mail Address: Jonathan.Miller@erm.com			

Matrix Code

DW = Drinking Water
WW = Waste Water
GW = Ground Water
AQ = Aqueous
OT = Other
SL = Sludge SOL = Solid
O = Oil SO = Soil
F = Food SW = Swab
NG = Natural Gas
NGL = Natural Gas Liquid
PW = Produced Water
CF = Completion Fluid

Which Regulations Apply:
☐RCRA ☐Drinking Water
☐POTW ☐Distribution
☐NPDES ☐Special
☐USDA/FDA ☐State
☐RECAP/RISC ☐Other

Turn Time
☒Standard
RUSH
☐1 Day
☐2 Day
☐Other
(Rush turn times will incur a surcharge and must be pre-approved by lab.)

Sample ID/Description	Collection Information: Date	Time	Grab / Composite	Matrix	Container: Quantity	Container: Type P=Plastic, G=Glass, V=Vial	Pres.: HCl, HNO_3, H_2SO_4, NaOH, $Na_2S_2O_3$	29-B Metals	% Moisture	Electrostatic Sodium Percentage (ESP)	Electrical Conductivity (EC)	Sodium Adsorption Ratio (SAR)	Cation Exchange Capacity (CEC)	Comments
SLS-22(0-2)	9/8/20	1330	Grab	SO	1	G	None	X	X	X	X	X	X	29-B Metals: wet weight reported
SLS-22(2-4)	9/8/20	1335	Grab	SO	1	G	None	X	X	X	X	X	X	As, Ba, Cd, Cr, Pb, Hg, Se, Sr, Zn
SLS-23(0-2)	9/8/20	1435	Grab	SO	1	G	None	X	X	X	X	X	X	29-B Metals: Dry weight reported
SLS-23(2-4)	9/8/20	1440	Grab	SO	1	G	None	X	X	X	X	X	X	True Total Bromine (TTBr)

	Relinquished by	Date/Time	Received by	Date/Time
1	GG/ERM	9-10-20/0848	Jessica R. Tunks	9/10/20 0848
2	Jessica R. Tunks	9/4/20 1054	Samantha	9/4/20 1054
3	Samantha	9/4/20 1239	[illegible]	9/4/20 1239

Field Notes: ~~3.8 E34~~ TRK

Received at lab on ice? ☑Yes ☐No Temp: 3.8 E34

All samples submitted to Element Materials Technology for analysis are accepted on a custodial basis only. Ownership of the material remains with the client submitting the samples. Element Materials Technology reserves the right to return unused sample portions.

O.D. C VOA IR10 9/11/20

9301 Innovation Drive, Suite 115, Daleville, IN 47334-0569 USA, P 765-378-4103, F 765-378-4109
629 Washington St. Suite 300, Columbus, IN 47201-6231 USA, P 812-375-0531, F 812-375-0731
2121 East Washington Boulevard, Fort Wayne, IN 46803-1328 USA, P 260-471-7000, F 260-471-7777
909 Executive Dr, Warsaw, IN 46580-2368 USA, P 574-267-3305, F 574-269-6569
3371 Cleveland Road, Suite 100A, South Bend, IN 46628-9780 USA, P 574-277-0707, F 574-273-5699
2417 W. Pinhook Rd, Lafayette, LA 70508-3344 USA, P 337-235-0483, F 337-233-6540

LELAP CERTIFICATE NUMBER: 01955
DOD-ELAP ACCREDITATION NUMBER: 74960

ANALYTICAL RESULTS

PERFORMED BY

Pace Analytical Gulf Coast
7979 Innovation Park Dr.
Baton Rouge, LA 70820
(225) 769-4900

Report Date 06/07/2020

Report # 220052720

Project Jeanerette Lumber & Shingle

Deliver To	***Additional Recipients***
Jody Shugart ERM 3838 N. Causeway Blvd Suite 3000 Metairie, LA 70002 985-237-5091	NONE

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with Pace Gulf Coast's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
NO	Indicates the sample did not ignite when preliminary test performed for EPA Method 1030
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
CF	HPLC or GC Confirmation
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	Organics - The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%
L	Reporting Limits adjusted to meet risk-based limit.
P	RPD between primary and confirmation result is greater than 40
DL	Diluted analysis – when appended to Client Sample ID

Sample receipt at Pace Gulf Coast is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of Pace Gulf Coast. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

Authorized Signature
Pace Gulf Coast Report 220052720

Certifications

Certification	Certification Number
DOD ELAP	74960
Alabama	01955
Arkansas	88-0655
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
Washington	C929
USDA Soil Permit	P330-16-00234

Case Narrative

Client: ERM **Report:** 220052720

Pace Analytical Gulf Coast received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

SEMI-VOLATILES GAS CHROMATOGRAPHY

In the MADEP EPH Revision 1.1 (LA) Aromatic analysis, the recoveries for the surrogates, 2-Bromonaphthalene and/or 2-Fluorobiphenyl are above the upper control limits for samples 22005272002 (JLS-02(4-6)), 22005272003 (JLS-03(0-2)), and 22005272004 (JLS-02(0-2)). No target Aromatic ranges were detected in these samples.

Sample Summary

LAB ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
22005272001	JLS-02(2-4)	Solid	05/26/2020 13:25	05/27/2020 09:40
22005272002	JLS-02(4-6)	Solid	05/26/2020 13:30	05/27/2020 09:40
22005272003	JLS-03(0-2)	Solid	05/26/2020 14:30	05/27/2020 09:40
22005272004	JLS-02(0-2)	Solid	05/26/2020 13:20	05/27/2020 09:40

Sample Results

JLS-02(2-4)

Collect Date	05/26/2020 13:25	**LAB ID**	22005272001
Receive Date	05/27/2020 09:40	**Matrix**	Solid

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
05/30/2020 07:00	684701	MADEP EPH Revision 1.1 (LA)	1	06/03/2020 18:59	MFS	685078

CAS#	Parameter	Result	LOQ	Units
GCSV-02-11	Aliphatic >C10-C12	ND	6.00	mg/kg
GCSV-02-12	Aliphatic >C12-C16	11.4	6.00	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
3386-33-2	1-Chlorooctadecane	4	1.78	mg/kg	45	40 - 140

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
05/30/2020 07:00	684701	MADEP EPH Revision 1.1 (LA)	1	06/03/2020 18:59	MFS	685079

CAS#	Parameter	Result	LOQ	Units
GCSV-05-18	Aromatic >C21-C35	22.1	6.00	mg/kg
GCSV-02-15	Unadjusted >C10-C12 Aromatics	ND	6.00	mg/kg
GCSV-02-16	Unadjusted >C12-C16 Aromatics	ND	6.00	mg/kg
GCSV-02-17	Unadjusted >C16-C21 Aromatics	ND	6.00	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	4	2.47	mg/kg	62	40 - 140
580-13-2	2-Bromonaphthalene	4	5.49	mg/kg	137	40 - 140
321-60-8	2-Fluorobiphenyl	4	5.53	mg/kg	138	40 - 140

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
05/30/2020 07:00	684701	MADEP EPH Revision 1.1 (LA)	2	06/05/2020 13:54	MFS	685285

CAS#	Parameter	Result	LOQ	Units
GCSV-02-31	Aliphatic >C16-C35	45.6	12.0	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
3386-33-2	1-Chlorooctadecane	4	1.65	mg/kg	41	40 - 140

Sample Results

JLS-02(4-6)

Collect Date	05/26/2020 13:30	**LAB ID**	22005272002
Receive Date	05/27/2020 09:40	**Matrix**	Solid

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
05/30/2020 07:00	684701	MADEP EPH Revision 1.1 (LA)	1	06/03/2020 19:19	MFS	685078

CAS#	Parameter	Result	LOQ	Units
GCSV-02-11	Aliphatic >C10-C12	ND	5.88	mg/kg
GCSV-02-12	Aliphatic >C12-C16	ND	5.88	mg/kg
GCSV-02-31	Aliphatic >C16-C35	10.9	5.88	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
3386-33-2	1-Chlorooctadecane	3.92	2.69	mg/kg	69	40 - 140

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
05/30/2020 07:00	684701	MADEP EPH Revision 1.1 (LA)	1	06/03/2020 19:19	MFS	685079

CAS#	Parameter	Result	LOQ	Units
GCSV-05-18	Aromatic >C21-C35	ND	5.88	mg/kg
GCSV-02-15	Unadjusted >C10-C12 Aromatics	ND	5.88	mg/kg
GCSV-02-16	Unadjusted >C12-C16 Aromatics	ND	5.88	mg/kg
GCSV-02-17	Unadjusted >C16-C21 Aromatics	ND	5.88	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	3.92	3.18	mg/kg	81	40 - 140
580-13-2	2-Bromonaphthalene	3.92	6.26	mg/kg	160*	40 - 140
321-60-8	2-Fluorobiphenyl	3.92	6.53	mg/kg	167*	40 - 140

JLS-03(0-2)

Collect Date	05/26/2020 14:30	**LAB ID**	22005272003
Receive Date	05/27/2020 09:40	**Matrix**	Solid

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
05/30/2020 07:00	684701	MADEP EPH Revision 1.1 (LA)	1	06/03/2020 20:18	MFS	685078

CAS#	Parameter	Result	LOQ	Units
GCSV-02-11	Aliphatic >C10-C12	ND	6.00	mg/kg
GCSV-02-12	Aliphatic >C12-C16	ND	6.00	mg/kg

Sample Results

JLS-03(0-2)

Collect Date	05/26/2020 14:30	**LAB ID**	22005272003
Receive Date	05/27/2020 09:40	**Matrix**	Solid

MADEP EPH Revision 1.1 (LA) (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
05/30/2020 07:00	684701	MADEP EPH Revision 1.1 (LA) (Continued)	1	06/03/2020 20:18	MFS	685078

CAS#	Parameter	Result	LOQ	Units
GCSV-02-31	Aliphatic >C16-C35	ND	6.00	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
3386-33-2	1-Chlorooctadecane	4	4.38	mg/kg	110	40 - 140

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
05/30/2020 07:00	684701	MADEP EPH Revision 1.1 (LA)	1	06/03/2020 20:18	MFS	685079

CAS#	Parameter	Result	LOQ	Units
GCSV-05-18	Aromatic >C21-C35	ND	6.00	mg/kg
GCSV-02-15	Unadjusted >C10-C12 Aromatics	ND	6.00	mg/kg
GCSV-02-16	Unadjusted >C12-C16 Aromatics	ND	6.00	mg/kg
GCSV-02-17	Unadjusted >C16-C21 Aromatics	ND	6.00	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	4	2.86	mg/kg	72	40 - 140
580-13-2	2-Bromonaphthalene	4	5.51	mg/kg	138	40 - 140
321-60-8	2-Fluorobiphenyl	4	5.84	mg/kg	146*	40 - 140

JLS-02(0-2)

Collect Date	05/26/2020 13:20	**LAB ID**	22005272004
Receive Date	05/27/2020 09:40	**Matrix**	Solid

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
05/30/2020 07:00	684701	MADEP EPH Revision 1.1 (LA)	1	06/03/2020 20:37	MFS	685078

CAS#	Parameter	Result	LOQ	Units
GCSV-02-11	Aliphatic >C10-C12	ND	6.00	mg/kg
GCSV-02-12	Aliphatic >C12-C16	ND	6.00	mg/kg

Sample Results

JLS-02(0-2)

Collect Date	05/26/2020 13:20	**LAB ID**	22005272004
Receive Date	05/27/2020 09:40	**Matrix**	Solid

MADEP EPH Revision 1.1 (LA) (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
05/30/2020 07:00	684701	MADEP EPH Revision 1.1 (LA) (Continued)	1	06/03/2020 20:37	MFS	685078

CAS#	Parameter	Result	LOQ	Units
GCSV-02-31	Aliphatic >C16-C35	9.12	6.00	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
3386-33-2	1-Chlorooctadecane	4	2.86	mg/kg	72	40 - 140

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
05/30/2020 07:00	684701	MADEP EPH Revision 1.1 (LA)	1	06/03/2020 20:37	MFS	685079

CAS#	Parameter	Result	LOQ	Units
GCSV-05-18	Aromatic >C21-C35	ND	6.00	mg/kg
GCSV-02-15	Unadjusted >C10-C12 Aromatics	ND	6.00	mg/kg
GCSV-02-16	Unadjusted >C12-C16 Aromatics	ND	6.00	mg/kg
GCSV-02-17	Unadjusted >C16-C21 Aromatics	ND	6.00	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	4	3.5	mg/kg	88	40 - 140
580-13-2	2-Bromonaphthalene	4	7.35	mg/kg	184*	40 - 140
321-60-8	2-Fluorobiphenyl	4	7.72	mg/kg	193*	40 - 140

GC Semi-Volatiles QC Summary

Analytical Batch	Client ID	MB684701		LCS684701				LCSD684701				
685059	LAB ID	2045058		2045059				2045060				
Prep Batch	Sample Type	MB		LCS				LCSD				
684701	Prep Date	05/30/2020 07:00		05/30/2020 07:00				05/30/2020 07:00				
Prep Method	Analysis Date	06/02/2020 19:27		06/02/2020 19:47				06/02/2020 20:07				
MADEP EPH Revision 1.1 (LA)	Matrix	Solid		Solid				Solid				
MADEP EPH Revision 1.1 (LA)		Units Result	mg/kg LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Aliphatic >C10-C12	GCSV-02-11	ND	6.00	10.0	6.65	67	30 - 140	10.0	6.42	64	4	25
Aliphatic >C12-C16	GCSV-02-12	ND	6.00	10.0	7.17	72	40 - 140	10.0	7.04	70	2	25
Aliphatic >C16-C35	GCSV-02-31	ND	6.00	45.0	37.7	84	40 - 140	45.0	35.7	79	5	25
Surrogate												
1-Chlorooctadecane	3386-33-2	3.49	87	4	2.35	59	40 - 140	4	2.44	61	NA	NA

Analytical Batch	Client ID	MB684701		LCS684701				LCSD684701				
685058	LAB ID	2045058		2045059				2045060				
Prep Batch	Sample Type	MB		LCS				LCSD				
684701	Prep Date	05/30/2020 07:00		05/30/2020 07:00				05/30/2020 07:00				
Prep Method	Analysis Date	06/02/2020 19:27		06/02/2020 19:47				06/02/2020 20:07				
MADEP EPH Revision 1.1 (LA)	Matrix	Solid		Solid				Solid				
MADEP EPH Revision 1.1 (LA)		Units Result	mg/kg LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Aromatic >C21-C35	GCSV-05-18	ND	6.00	50.0	30.3	61	40 - 140	50.0	32.6	65	7	25
Unadjusted >C10-C12 Aromatics	GCSV-02-15	ND	6.00	5.00	3.59	72	30 - 140	5.00	3.59	72	0	25
Unadjusted >C12-C16 Aromatics	GCSV-02-16	ND	6.00	20.0	13.9	70	40 - 140	20.0	14.0	70	1	25
Unadjusted >C16-C21 Aromatics	GCSV-02-17	ND	6.00	10.0	7.10	71	40 - 140	10.0	7.28	73	3	25
Surrogate												
2-Bromonaphthalene	580-13-2	2.78	70	4	3.45	86	40 - 140	4	3.5	88	NA	NA
2-Fluorobiphenyl	321-60-8	2.83	71	4	3.53	88	40 - 140	4	3.59	90	NA	NA
o-Terphenyl	84-15-1	2.09	52	4	2.41	60	40 - 140	4	2.41	60	NA	NA

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Work

Client ID: 4271 - ERM
SDG: 220052720
PM: AMK

ALL SHAD

Container Preservative Ty

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

Company: ERM	Billing Information:
Address: 3838 N. Causeway Blvd	
Report To: Jody Shugart	Email To: jody.shugart@erm.com
Copy To:	Site Collection Info/Address:
Customer Project Name/Number: 0519829 Jeanerette Lumber & Shingle	State: LA / County/City: Iberia / Time Zone Collected: [ ] PT [ ] MT [ ] CT [ ] ET
Phone: 985-237-5091 Email:	Site/Facility ID #: / Compliance Monitoring? [ ] Yes [X] No
Collected By (print): Jody Shugart	Purchase Order #: Quote #: / DW PWS ID #: DW Location Code:
Collected By (signature): Jody Shugart	Turnaround Date Required: Std / Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [ ] Hold: _____	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply) / Field Filtered (if applicable): [ ] Yes [ ] No Analysis: _____

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Analyses: EPH	Lab Sample # / Comments
~~JLS-02(0-2)~~	SL									
JLS-02(2-4)	SL	G	5/26/20	13:25	5/26/20			1	X	1
JLS-02(4-6)	SL	G	5/26/20	13:30	5/26/20			1	X	2
JLS-03(0-2)	SL	G	5/26/20	14:30	5/26/20			1	X	3
JLS-02(0-2)	SL	G	5/26/20	13:20	5/26/20			1	X	4

Lab Profile/Line:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signature Present	Y N NA
Bottles Intact	Y N NA
Correct Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Received on Ice	Y N NA
VOA - Headspace Acceptable	Y N NA
USDA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl Strips: _____	
Sample pH Acceptable	Y N NA
pH Strips: _____	
Sulfide Present	Y N NA
Lead Acetate Strips: _____	

LAB USE ONLY:
Lab Sample # / Comments:

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2525412

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: E34
Cooler 1 Temp Upon Receipt: 0.9 oC
Cooler 1 Therm Corr. Factor: _____ oC
Cooler 1 Corrected Temp: _____ oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
[signature]	5/27/20 9:30	[signature] PACE	5/27/20 0940
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: _____ of: _____

SAMPLE RECEIVING CHECKLIST

SAMPLE DELIVERY GROUP 220052720	
Client **PM** AMK 4271 - ERM	**Transport Method** CUSTOMER
Profile Number 285347	**Received By** McCune, Dodie N.
Line Item(s) 1 - Solid	**Receive Date(s)** 05/27/20

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☑	☐

COOLERS

Airbill	Thermometer ID: E34	Temp °C
		0.9

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.6

LELAP CERTIFICATE NUMBER: 01955
DOD-ELAP ACCREDITATION NUMBER: 74960

ANALYTICAL RESULTS

PERFORMED BY

Pace Analytical Gulf Coast
7979 Innovation Park Dr.
Baton Rouge, LA 70820
(225) 769-4900

Report Date 08/10/2020

Report # 220073175

Project 0519829 JLS

Deliver To	***Additional Recipients***
Jonathan Miller ERM 3838 N. Causeway Blvd. Suite 3000 Metairie, LA 70002	Jody Shugart, ERM

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with Pace Gulf Coast's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
NO	Indicates the sample did not ignite when preliminary test performed for EPA Method 1030
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
CF	HPLC or GC Confirmation
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	Organics - The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%
L	Reporting Limits adjusted to meet risk-based limit.
P	RPD between primary and confirmation result is greater than 40
DL	Diluted analysis – when appended to Client Sample ID

Sample receipt at Pace Gulf Coast is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of Pace Gulf Coast. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____

Authorized Signature
Pace Gulf Coast Report 220073175

Certifications

Certification	Certification Number
DOD ELAP	74960
Alabama	01955
Arkansas	88-0655
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
Washington	C929
USDA Soil Permit	P330-16-00234

Case Narrative

Client: ERM-Baton Rouge **Report:** 220073175

Pace Analytical Gulf Coast received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

No anomalies were found for the analyzed sample(s).

Sample Summary

LAB ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
22007317501	JLS-10	Water	07/30/2020 10:55	07/31/2020 14:30
22007317502	JLS-11	Water	07/30/2020 16:35	07/31/2020 14:30

Sample Results

JLS-10	**Collect Date**	07/30/2020 10:55	**LAB ID**	22007317501
	Receive Date	07/31/2020 14:30	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	08/05/2020 17:39	SMS	689415

CAS#	Parameter	Result	LOQ	Units
71-43-2	Benzene	ND	0.00500	mg/L
100-41-4	Ethylbenzene	ND	0.00500	mg/L
108-88-3	Toluene	0.010	0.00500	mg/L
1330-20-7	Xylene (total)	ND	0.015	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	0.05	.049	mg/L	98	78 - 130
1868-53-7	Dibromofluoromethane	0.05	.052	mg/L	104	77 - 127
2037-26-5	Toluene d8	0.05	.052	mg/L	105	76 - 134
17060-07-0	1,2-Dichloroethane-d4	0.05	.048	mg/L	96	71 - 127

MADEP VPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	08/07/2020 14:25	JAR	689604

CAS#	Parameter	Result	LOQ	Units
GCSV-02-10	Aliphatic >C8-C10	ND	0.020	mg/L
GCSV-02-30	Aliphatic C6-C8	0.032	0.030	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
615-59-8	2,5-Dibromotoluene	0.05	.043	mg/L	85	70 - 130

MADEP VPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	08/07/2020 14:25	JAR	689605

CAS#	Parameter	Result	LOQ	Units
GCSV-02-14	Aromatic >C8-C10	ND	0.030	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
615-59-8	2,5-Dibromotoluene	0.05	.046	mg/L	92	70 - 130

Sample Results

JLS-10	**Collect Date**	07/30/2020 10:55	**LAB ID**	22007317501
	Receive Date	07/31/2020 14:30	**Matrix**	Water

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/04/2020 06:45	689217	MADEP EPH Revision 1.1 (LA)	1	08/05/2020 14:12	MFS	689500

CAS#	Parameter	Result	LOQ	Units
GCSV-02-11	Aliphatic >C10-C12	ND	0.100	mg/L
GCSV-02-12	Aliphatic >C12-C16	ND	0.100	mg/L
GCSV-02-31	Aliphatic >C16-C35	ND	0.150	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
3386-33-2	1-Chlorooctadecane	0.16	.068	mg/L	43	40 - 140

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/04/2020 06:45	689217	MADEP EPH Revision 1.1 (LA)	1	08/05/2020 14:12	MFS	689499

CAS#	Parameter	Result	LOQ	Units
GCSV-05-18	Aromatic >C21-C35	ND	0.100	mg/L
GCSV-02-15	Unadjusted >C10-C12 Aromatics	ND	0.100	mg/L
GCSV-02-16	Unadjusted >C12-C16 Aromatics	ND	0.100	mg/L
GCSV-02-17	Unadjusted >C16-C21 Aromatics	ND	0.100	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	0.16	.118	mg/L	74	40 - 140
580-13-2	2-Bromonaphthalene	0.16	.171	mg/L	107	40 - 140
321-60-8	2-Fluorobiphenyl	0.16	.169	mg/L	106	40 - 140

EPA 6020B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/03/2020 07:45	689200	EPA 3010A	1	08/06/2020 15:46	LWZ	689530

CAS#	Parameter	Result	LOQ	Units
7440-38-2	Arsenic	0.079	0.0010	mg/L
7440-39-3	Barium	0.46	0.0010	mg/L
7440-43-9	Cadmium	ND	0.0010	mg/L
7440-70-2	Calcium	109	0.50	mg/L
7440-47-3	Chromium	ND	0.0010	mg/L
7439-89-6	Iron	15.1	0.10	mg/L
7439-92-1	Lead	ND	0.0010	mg/L
7439-95-4	Magnesium	36.7	0.10	mg/L
7439-96-5	Manganese	0.45	0.0050	mg/L
7440-09-7	Potassium	5.25	0.10	mg/L

Sample Results

JLS-10

Collect Date 07/30/2020 10:55 **LAB ID** 22007317501

Receive Date 07/31/2020 14:30 **Matrix** Water

EPA 6020B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/03/2020 07:45	689200	EPA 3010A	1	08/06/2020 15:46	LWZ	689530

CAS#	Parameter	Result	LOQ	Units
7440-24-6	Strontium	0.69	0.0010	mg/L
7440-66-6	Zinc	0.27	0.020	mg/L

EPA 6020B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/03/2020 07:45	689200	EPA 3010A	10	08/06/2020 15:41	LWZ	689530

CAS#	Parameter	Result	LOQ	Units
7440-23-5	Sodium	304	1.00	mg/L

EPA 6020B Dissolved

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/04/2020 13:30	689203	EPA 3005A Dissolved	1	08/05/2020 17:01	LWZ	689452

CAS#	Parameter	Result	LOQ	Units
7440-38-2	Arsenic	0.075	0.0010	mg/L
7440-39-3	Barium	0.40	0.0010	mg/L
7440-43-9	Cadmium	ND	0.0010	mg/L
7440-47-3	Chromium	ND	0.0010	mg/L
7439-92-1	Lead	ND	0.0010	mg/L
7440-24-6	Strontium	0.63	0.0010	mg/L
7440-66-6	Zinc	0.23	0.020	mg/L

EPA 7470A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/03/2020 08:30	689201	EPA 7470A	1	08/04/2020 13:03	BDP	689320

CAS#	Parameter	Result	LOQ	Units
7439-97-6	Mercury	ND	0.00020	mg/L

Sample Results

JLS-10	**Collect Date**	07/30/2020 10:55	**LAB ID**	22007317501
	Receive Date	07/31/2020 14:30	**Matrix**	Water

EPA 7470A Dissolved

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/03/2020 08:30	689201	EPA 7470A Dissolved	1	08/04/2020 13:06	BDP	689320

CAS#	Parameter	Result	LOQ	Units
7439-97-6	Mercury	ND	0.00020	mg/L

EPA 9056A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	2	08/05/2020 09:40	DAM	689273

CAS#	Parameter	Result	LOQ	Units
14808-79-8	Sulfate	1.68	0.400	mg/L

EPA 9056A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	100	08/04/2020 00:10	DAM	689273

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	280	20.0	mg/L

SM 2320 B-2011

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	08/03/2020 15:47	RYC	689290

CAS#	Parameter	Result	LOQ	Units
T-005-C	Carbonate Alkalinity	ND	1.0	mg/L CaCO3

SM 2320 B-2011

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	08/03/2020 15:47	RYC	689290

CAS#	Parameter	Result	LOQ	Units
T-005-B	Bicarbonate Alkalinity	654	1.0	mg/L CaCO3

Sample Results

JLS-10

Collect Date	07/30/2020 10:55	**LAB ID**	22007317501
Receive Date	07/31/2020 14:30	**Matrix**	Water

SM 2540 C-2011

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	08/05/2020 10:15	CJS	689403

CAS#	Parameter	Result	LOQ	Units
WET-035	Total Dissolved Solids(TDS)	1130	10.0	mg/L

JLS-11

Collect Date	07/30/2020 16:35	**LAB ID**	22007317502
Receive Date	07/31/2020 14:30	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	08/05/2020 18:01	SMS	689415

CAS#	Parameter	Result	LOQ	Units
71-43-2	Benzene	ND	0.00500	mg/L
100-41-4	Ethylbenzene	ND	0.00500	mg/L
108-88-3	Toluene	ND	0.00500	mg/L
1330-20-7	Xylene (total)	ND	0.015	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	0.05	.05	mg/L	99	78 - 130
1868-53-7	Dibromofluoromethane	0.05	.051	mg/L	101	77 - 127
2037-26-5	Toluene d8	0.05	.053	mg/L	106	76 - 134
17060-07-0	1,2-Dichloroethane-d4	0.05	.05	mg/L	99	71 - 127

MADEP VPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	08/07/2020 14:40	JAR	689604

CAS#	Parameter	Result	LOQ	Units
GCSV-02-10	Aliphatic >C8-C10	ND	0.020	mg/L
GCSV-02-30	Aliphatic C6-C8	ND	0.030	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
615-59-8	2,5-Dibromotoluene	0.05	.042	mg/L	84	70 - 130

Sample Results

JLS-11	**Collect Date**	07/30/2020 16:35	**LAB ID**	22007317502
	Receive Date	07/31/2020 14:30	**Matrix**	Water

MADEP VPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	08/07/2020 14:40	JAR	689605

CAS#	Parameter	Result	LOQ	Units
GCSV-02-14	Aromatic >C8-C10	ND	0.030	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
615-59-8	2,5-Dibromotoluene	0.05	.046	mg/L	91	70 - 130

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/04/2020 06:45	689217	MADEP EPH Revision 1.1 (LA)	1	08/05/2020 14:32	MFS	689500

CAS#	Parameter	Result	LOQ	Units
GCSV-02-11	Aliphatic >C10-C12	ND	0.100	mg/L
GCSV-02-12	Aliphatic >C12-C16	ND	0.100	mg/L
GCSV-02-31	Aliphatic >C16-C35	ND	0.150	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
3386-33-2	1-Chlorooctadecane	0.16	.081	mg/L	50	40 - 140

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/04/2020 06:45	689217	MADEP EPH Revision 1.1 (LA)	1	08/05/2020 14:32	MFS	689499

CAS#	Parameter	Result	LOQ	Units
GCSV-05-18	Aromatic >C21-C35	ND	0.100	mg/L
GCSV-02-15	Unadjusted >C10-C12 Aromatics	ND	0.100	mg/L
GCSV-02-16	Unadjusted >C12-C16 Aromatics	ND	0.100	mg/L
GCSV-02-17	Unadjusted >C16-C21 Aromatics	ND	0.100	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	0.16	.148	mg/L	93	40 - 140
580-13-2	2-Bromonaphthalene	0.16	.201	mg/L	126	40 - 140
321-60-8	2-Fluorobiphenyl	0.16	.198	mg/L	124	40 - 140

Sample Results

JLS-11	**Collect Date**	07/30/2020 16:35	**LAB ID**	22007317502
	Receive Date	07/31/2020 14:30	**Matrix**	Water

EPA 6020B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/03/2020 07:45	689200	EPA 3010A	100	08/06/2020 15:59	LWZ	689530

CAS#	Parameter	Result	LOQ		Units
7440-38-2	Arsenic	0.095	0.025	L	mg/L
7440-39-3	Barium	70.8	0.10		mg/L
7440-43-9	Cadmium	ND	0.025	L	mg/L
7440-70-2	Calcium	4260	50.0		mg/L
7440-47-3	Chromium	ND	0.10		mg/L
7439-89-6	Iron	353	10.0		mg/L
7439-92-1	Lead	ND	0.025	L	mg/L
7439-95-4	Magnesium	1270	10.0		mg/L
7439-96-5	Manganese	15.6	0.50		mg/L
7440-09-7	Potassium	39.1	10.0		mg/L
7440-24-6	Strontium	53.8	0.10		mg/L
7440-66-6	Zinc	ND	1.10	L	mg/L

EPA 6020B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/03/2020 07:45	689200	EPA 3010A	1000	08/06/2020 15:55	LWZ	689530

CAS#	Parameter	Result	LOQ	Units
7440-23-5	Sodium	16700	100	mg/L

EPA 6020B Dissolved

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/04/2020 13:30	689203	EPA 3005A Dissolved	100	08/06/2020 14:00	LWZ	689530

CAS#	Parameter	Result	LOQ		Units
7440-38-2	Arsenic	0.10	0.025	L	mg/L
7440-39-3	Barium	66.1	0.10		mg/L
7440-43-9	Cadmium	ND	0.025	L	mg/L
7440-47-3	Chromium	ND	0.10		mg/L
7439-92-1	Lead	ND	0.025	L	mg/L
7440-24-6	Strontium	48.3	0.10		mg/L
7440-66-6	Zinc	ND	1.10	L	mg/L

Sample Results

JLS-11	**Collect Date**	07/30/2020 16:35	**LAB ID**	22007317502
	Receive Date	07/31/2020 14:30	**Matrix**	Water

EPA 7470A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/03/2020 08:30	689201	EPA 7470A	1	08/04/2020 13:08	BDP	689320

CAS#	Parameter	Result	LOQ	Units
7439-97-6	Mercury	ND	0.00020	mg/L

EPA 7470A Dissolved

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
08/03/2020 08:30	689201	EPA 7470A Dissolved	1	08/04/2020 13:11	BDP	689320

CAS#	Parameter	Result	LOQ	Units
7439-97-6	Mercury	ND	0.00020	mg/L

EPA 9056A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	500	08/05/2020 09:59	DAM	689273

CAS#	Parameter	Result	LOQ	Units
14808-79-8	Sulfate	ND	100	mg/L

EPA 9056A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5000	08/04/2020 00:29	DAM	689273

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	42700	1000	mg/L

SM 2320 B-2011

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	08/03/2020 15:47	RYC	689290

CAS#	Parameter	Result	LOQ	Units
T-005-C	Carbonate Alkalinity	ND	1.0	mg/L CaCO3

Sample Results

JLS-11				
	Collect Date	07/30/2020 16:35	LAB ID	22007317502
	Receive Date	07/31/2020 14:30	Matrix	Water

SM 2320 B-2011

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	08/03/2020 15:47	RYC	689290

CAS#	Parameter	Result	LOQ	Units
T-005-B	Bicarbonate Alkalinity	283	1.0	mg/L CaCO3

SM 2540 C-2011

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	08/05/2020 10:15	CJS	689403

CAS#	Parameter	Result	LOQ	Units
WET-035	Total Dissolved Solids(TDS)	74100	10.0	mg/L

GC/MS Volatiles QC Summary

Analytical Batch 689415	Client ID	MB689415	LCS689415	LCSD689415
	LAB ID	2069055	2069056	2069057
	Sample Type	MB	LCS	LCSD
	Prep Date	NA	NA	NA
	Analysis Date	08/05/2020 11:23	08/05/2020 09:25	08/05/2020 09:47
	Matrix	Water	Water	Water

EPA 8260B		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Benzene	71-43-2	ND	0.00500	0.050	0.051	102	70 - 129	0.050	0.050	99	2	20
Ethylbenzene	100-41-4	ND	0.00500	0.050	0.050	99	74 - 126	0.050	0.047	95	6	30
Toluene	108-88-3	ND	0.00500	0.050	0.049	99	72 - 120	0.050	0.047	94	4	20
Xylene (total)	1330-20-7	ND	0.015	0.150	0.155	103	74 - 127	0.150	0.144	96	7	30
Surrogate												
1,2-Dichloroethane-d4	17060-07-0	.0474	95	.05	.0513	103	71 - 127	.05	.0508	102	NA	NA
4-Bromofluorobenzene	460-00-4	.0482	96	.05	.0494	99	78 - 130	.05	.0481	96	NA	NA
Dibromofluoromethane	1868-53-7	.0522	104	.05	.0504	101	77 - 127	.05	.0503	101	NA	NA
Toluene d8	2037-26-5	.0529	106	.05	.0491	98	76 - 134	.05	.0469	94	NA	NA

GC Volatiles QC Summary

Analytical Batch 689604	Client ID	MB689604		LCS689604				LCSD689604				
	LAB ID	2070101		2070102				2070103				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	08/07/2020 14:10		08/07/2020 13:04				08/07/2020 13:22				
	Matrix	Water		Water				Water				
MADEP VPH Revision 1.1 (LA)		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Aliphatic >C8-C10	GCSV-02-10	ND	0.020	0.100	0.087	87	60 - 140	0.100	0.097	97	11	30
Aliphatic C6-C8	GCSV-02-30	ND	0.030	0.150	0.146	97	60 - 140	0.150	0.150	100	3	30
Surrogate												
2,5-Dibromotoluene	615-59-8	.0435	87	.05	.0422	84	70 - 130	.05	.0434	87	NA	NA

Analytical Batch 689605	Client ID	MB689605		LCS689605				LCSD689605				
	LAB ID	2070104		2070105				2070106				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	08/07/2020 14:10		08/07/2020 13:04				08/07/2020 13:22				
	Matrix	Water		Water				Water				
MADEP VPH Revision 1.1 (LA)		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Aromatic >C8-C10	GCSV-02-14	ND	0.030	0.150	0.145	97	60 - 140	0.150	0.150	100	3	30
Surrogate												
2,5-Dibromotoluene	615-59-8	.0469	94	.05	.0464	93	70 - 130	.05	.0468	94	NA	NA

GC Semi-Volatiles QC Summary

Analytical Batch	Client ID	MB689217	LCS689217	LCSD689217
689500	LAB ID	2068072	2068073	2068074
Prep Batch	Sample Type	MB	LCS	LCSD
689217	Prep Date	08/04/2020 06:45	08/04/2020 06:45	08/04/2020 06:45
Prep Method	Analysis Date	08/05/2020 13:13	08/05/2020 13:32	08/05/2020 13:52
MADEP EPH Revision 1.1 (LA)	Matrix	Water	Water	Water

MADEP EPH Revision 1.1 (LA)		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Aliphatic >C10-C12	GCSV-02-11	ND	0.100	0.400	0.293	73	30 - 140	0.400	0.362	91	21	40
Aliphatic >C12-C16	GCSV-02-12	ND	0.100	0.400	0.296	74	40 - 140	0.400	0.308	77	4	40
Aliphatic >C16-C35	GCSV-02-31	ND	0.150	1.80	1.45	81	40 - 140	1.80	1.54	86	6	40
Surrogate												
1-Chlorooctadecane	3386-33-2	.118	74	.16	.0924	58	40 - 140	.16	.1	63	NA	NA

Analytical Batch	Client ID	MB689217	LCS689217	LCSD689217
689499	LAB ID	2068072	2068073	2068074
Prep Batch	Sample Type	MB	LCS	LCSD
689217	Prep Date	08/04/2020 06:45	08/04/2020 06:45	08/04/2020 06:45
Prep Method	Analysis Date	08/05/2020 13:13	08/05/2020 13:32	08/05/2020 13:52
MADEP EPH Revision 1.1 (LA)	Matrix	Water	Water	Water

MADEP EPH Revision 1.1 (LA)		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Aromatic >C21-C35	GCSV-05-18	ND	0.100	2.00	1.47	74	40 - 140	2.00	1.69	85	14	40
Unadjusted >C10-C12 Aromatics	GCSV-02-15	ND	0.100	0.200	0.166	83	30 - 140	0.200	0.178	89	7	40
Unadjusted >C12-C16 Aromatics	GCSV-02-16	ND	0.100	0.800	0.658	82	40 - 140	0.800	0.725	91	10	40
Unadjusted >C16-C21 Aromatics	GCSV-02-17	ND	0.100	0.400	0.337	84	40 - 140	0.400	0.383	96	13	40
Surrogate												
2-Bromonaphthalene	580-13-2	.161	101	.16	.162	101	40 - 140	.16	.161	101	NA	NA
2-Fluorobiphenyl	321-60-8	.164	103	.16	.161	101	40 - 140	.16	.161	101	NA	NA
o-Terphenyl	84-15-1	.116	73	.16	.118	74	40 - 140	.16	.132	83	NA	NA

Inorganics QC Summary

Analytical Batch	Client ID	MB689201	LCS689201
689320	LAB ID	2068011	2068012
Prep Batch	Sample Type	MB	LCS
689201	Prep Date	08/03/2020 08:30	08/03/2020 08:30
Prep Method	Analysis Date	08/04/2020 11:56	08/04/2020 11:59
EPA 7470A	Matrix	Water	Water

EPA 7470A		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R
Mercury	7439-97-6	ND	0.00020	0.0050	0.0050	99	80 - 120

Analytical Batch	Client ID	MB689201	LCS689201
689320	LAB ID	2068011	2068012
Prep Batch	Sample Type	MB	LCS
689201	Prep Date	08/03/2020 08:30	08/03/2020 08:30
Prep Method	Analysis Date	08/04/2020 11:56	08/04/2020 11:59
EPA 7470A	Matrix	Water	Water

EPA 7470A Dissolved		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R
Mercury	7439-97-6	ND	0.00020	0.0050	0.0050	99	80 - 120

Analytical Batch	Client ID	MB689200	LCS689200	LCSD689200
689530	LAB ID	2068008	2068010	2068009
Prep Batch	Sample Type	MB	LCS	LCSD
689200	Prep Date	08/03/2020 07:45	08/03/2020 07:45	08/03/2020 07:45
Prep Method	Analysis Date	08/06/2020 15:27	08/06/2020 15:36	08/06/2020 15:32
EPA 3010A	Matrix	Water	Water	Water

EPA 6020B		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Arsenic	7440-38-2	ND	0.0010	0.050	0.050	99	80 - 120	0.050	0.050	100	0	20
Barium	7440-39-3	ND	0.0010	0.050	0.048	96	80 - 120	0.050	0.049	98	2	20
Cadmium	7440-43-9	ND	0.0010	0.050	0.049	99	80 - 120	0.050	0.050	100	2	20
Calcium	7440-70-2	ND	0.50	25.0	25.3	101	80 - 120	25.0	26.0	104	3	20
Chromium	7440-47-3	ND	0.0010	0.050	0.049	99	80 - 120	0.050	0.051	101	4	20
Iron	7439-89-6	ND	0.10	5.00	5.00	100	80 - 120	5.00	5.06	101	1	20
Lead	7439-92-1	ND	0.0010	0.050	0.048	96	80 - 120	0.050	0.049	97	2	20
Magnesium	7439-95-4	ND	0.10	5.00	5.24	105	80 - 120	5.00	5.33	107	2	20
Manganese	7439-96-5	ND	0.0050	0.050	0.050	100	80 - 120	0.050	0.052	103	4	20
Potassium	7440-09-7	ND	0.10	5.00	5.04	101	80 - 120	5.00	5.25	105	4	20
Sodium	7440-23-5	ND	0.10	5.00	5.48	110	80 - 120	5.00	5.59	112	2	20
Strontium	7440-24-6	ND	0.0010	0.050	0.048	96	80 - 120	0.050	0.049	97	2	20
Zinc	7440-66-6	ND	0.020	1.00	0.97	97	80 - 120	1.00	0.98	98	1	20

Analytical Batch	Client ID	MB689203	LCS689203	LCSD689203
689452	LAB ID	2068018	2068020	2068019
Prep Batch	Sample Type	MB	LCS	LCSD
689203	Prep Date	08/04/2020 13:30	08/04/2020 13:30	08/04/2020 13:30
Prep Method	Analysis Date	08/05/2020 15:28	08/05/2020 15:35	08/05/2020 15:31
EPA 3005A Dissolved	Matrix	Water	Water	Water

EPA 6020B Dissolved		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Arsenic	7440-38-2	ND	0.00025	0.050	0.050	101	80 - 120	0.050	0.050	100	0	20
Barium	7440-39-3	ND	0.0010	0.050	0.049	98	80 - 120	0.050	0.049	97	0	20
Cadmium	7440-43-9	ND	0.00025	0.050	0.050	99	80 - 120	0.050	0.049	98	2	20
Chromium	7440-47-3	ND	0.0010	0.050	0.052	104	80 - 120	0.050	0.052	103	0	20
Lead	7439-92-1	ND	0.00025	0.050	0.050	100	80 - 120	0.050	0.050	99	0	20
Strontium	7440-24-6	ND	0.0010	0.050	0.050	99	80 - 120	0.050	0.049	99	2	20
Zinc	7440-66-6	ND	0.011	1.00	1.01	101	80 - 120	1.00	1.01	101	0	20

General Chemistry QC Summary

Analytical Batch 689273		Client ID	MB689273		LCS689273			
		LAB ID	2068277		2068278			
		Sample Type	MB		LCS			
		Prep Date	NA		NA			
		Analysis Date	08/03/2020 15:18		08/03/2020 14:39			
		Matrix	Water		Water			
EPA 9056A		Units	mg/L		Spike			
		Result	LOQ		Added	Result	%R	Control Limits%R
Chloride	16887-00-6	ND	0.200		2.50	2.60	104	80 - 120
Sulfate	14808-79-8	ND	0.200		2.50	2.45	98	80 - 120

Analytical Batch 689403		Client ID	MB689403	
		LAB ID	2069028	
		Sample Type	MB	
		Prep Date	NA	
		Analysis Date	08/05/2020 10:15	
		Matrix	Water	
SM 2540 C-2011		Units	mg/L	
		Result	LOQ	
Total Dissolved Solids(TDS)	WET-035	ND	10.0	

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Wor

ALL SHAD

Client ID: 4271 - ERM-Baton Rouge

SDG: 220073175

PM: AMK

Company: ERM	Billing Information:
Address: 3838 N. Causeway Blvd	
Report To: Jonathan.miller@erm.com	Email To:
Copy To:	Site Collection Info/Address:
Customer Project Name/Number: 519829 JLS	State: / County/City: Time Zone Collected: [ ] PT [ ] MT [ ] CT [ ] ET
Phone: Email:	Site/Facility ID #: Compliance Monitoring? [ ] Yes [X] No
Collected By (print): Jody Shugart	Purchase Order #: Quote #: DW PWS ID #: DW Location Code:
Collected By (signature):	Turnaround Date Required: Standard Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [ ] Hold: _____	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply) Field Filtered (if applicable): [X] Yes [ ] No Analysis: metals only

Container Preservative Ty

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Analyses: Metals (total) * see 7/23 email	Metals (dis)	TDS, Cl,	Na, Ca, Mg, K	SO4, carb/bicarb alk.	EPH/VPH	BTEX				Lab Profile/Line:
JLS-10	W	G	7/30/20	10:55				10	X	X	X	X	X	X	X				1
JLS-11	W	"	"	16:35				10	X	X	X	X	X	X	X				2

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signature Present	Y N NA
Bottles Intact	Y N NA
Correct Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Received on Ice	Y N NA
VOA - Headspace Acceptable	Y N NA
USDA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl Strips: _____	
Sample pH Acceptable	Y N NA
pH Strips: _____	
Sulfide Present	Y N NA
Lead Acetate Strips: _____	

LAB USE ONLY:
Lab Sample # / Comments:

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2536722

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: _____
Cooler 1 Temp Upon Receipt: _____oC
Cooler 1 Therm Corr. Factor: _____oC
Cooler 1 Corrected Temp: _____oC
Comments:
D2 E06

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
	7/31/20 14:30		7-31-20 14:30
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: _____ of: _____

SAMPLE RECEIVING CHECKLIST

SAMPLE DELIVERY GROUP 220073175	
Client **PM** AMK 4271 - ERM-Baton Rouge	**Transport Method** CUSTOMER
Profile Number 286447	**Received By** McCune, Dodie N.
Line Item(s) 1 - Waters - BTEX	**Receive Date(s)** 07/31/20

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☑	☐

COOLERS

Airbill	Thermometer ID: E26	Temp °C
		0.2

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.6

LELAP CERTIFICATE NUMBER: 01955
DOD-ELAP ACCREDITATION NUMBER: 74960

ANALYTICAL RESULTS

PERFORMED BY

Pace Analytical Gulf Coast
7979 Innovation Park Dr.
Baton Rouge, LA 70820
(225) 769-4900

Report Date 09/23/2020

Report # 220091011

Project 0519829 JLS

Deliver To	***Additional Recipients***
Jonathan Miller ERM 3838 N. Causeway Blvd. Suite 3000 Metairie, LA 70002	Guy Guinot, ERM

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with Pace Gulf Coast's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
NO	Indicates the sample did not ignite when preliminary test performed for EPA Method 1030
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
CF	HPLC or GC Confirmation
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	Organics - The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%
L	Reporting Limits adjusted to meet risk-based limit.
P	RPD between primary and confirmation result is greater than 40
DL	Diluted analysis – when appended to Client Sample ID

Sample receipt at Pace Gulf Coast is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of Pace Gulf Coast. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____

Authorized Signature
Pace Gulf Coast Report 220091011

Certifications

Certification	Certification Number
DOD ELAP	74960
Alabama	01955
Arkansas	88-0655
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
Washington	C929
USDA Soil Permit	P330-16-00234

Case Narrative

Client: ERM-Baton Rouge **Report:** 220091011

Pace Analytical Gulf Coast received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

No anomalies were found for the analyzed sample(s).

Sample Summary

LAB ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
22009101101	JLS-22 (0-2)	Solid	09/08/2020 13:30	09/10/2020 08:47
22009101102	JLS-22 (2-4)	Solid	09/08/2020 13:35	09/10/2020 08:47
22009101103	JLS-23 (0-2)	Solid	09/08/2020 14:35	09/10/2020 08:47
22009101104	JLS-23 (2-4)	Solid	09/08/2020 14:40	09/10/2020 08:47

Sample Results

JLS-22 (0-2)

Collect Date	09/08/2020 13:30	**LAB ID**	22009101101
Receive Date	09/10/2020 08:47	**Matrix**	Solid

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
09/11/2020 08:40	691916	MADEP EPH Revision 1.1 (LA)	1	09/16/2020 17:37	MFS	692413

CAS#	Parameter	Result	LOQ	Units
GCSV-02-11	Aliphatic >C10-C12	ND	2.99	mg/kg
GCSV-02-12	Aliphatic >C12-C16	ND	2.99	mg/kg
GCSV-02-31	Aliphatic >C16-C35	ND	2.99	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
3386-33-2	1-Chlorooctadecane	3.98	2.15	mg/kg	54	40 - 140

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
09/11/2020 08:40	691916	MADEP EPH Revision 1.1 (LA)	1	09/16/2020 17:37	MFS	692410

CAS#	Parameter	Result	LOQ	Units
GCSV-05-18	Aromatic >C21-C35	ND	2.99	mg/kg
GCSV-02-15	Unadjusted >C10-C12 Aromatics	ND	2.99	mg/kg
GCSV-02-16	Unadjusted >C12-C16 Aromatics	ND	2.99	mg/kg
GCSV-02-17	Unadjusted >C16-C21 Aromatics	ND	2.99	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	3.98	1.6	mg/kg	40	40 - 140
580-13-2	2-Bromonaphthalene	3.98	1.78	mg/kg	45	40 - 140
321-60-8	2-Fluorobiphenyl	3.98	1.98	mg/kg	50	40 - 140

JLS-22 (2-4)

Collect Date	09/08/2020 13:35	**LAB ID**	22009101102
Receive Date	09/10/2020 08:47	**Matrix**	Solid

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
09/21/2020 11:53	692620	MADEP EPH Revision 1.1 (LA)	1	09/22/2020 17:32	MFS	692880

CAS#	Parameter	Result	LOQ	Units
GCSV-05-18	Aromatic >C21-C35	ND	6.00	mg/kg
GCSV-02-15	Unadjusted >C10-C12 Aromatics	ND	6.00	mg/kg
GCSV-02-16	Unadjusted >C12-C16 Aromatics	ND	6.00	mg/kg

Sample Results

JLS-22 (2-4)

Collect Date	09/08/2020 13:35	**LAB ID**	22009101102
Receive Date	09/10/2020 08:47	**Matrix**	Solid

MADEP EPH Revision 1.1 (LA) (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
09/21/2020 11:53	692620	MADEP EPH Revision 1.1 (LA) (Continued)	1	09/22/2020 17:32	MFS	692880

CAS#	Parameter	Result	LOQ	Units
GCSV-02-17	Unadjusted >C16-C21 Aromatics	ND	6.00	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	4	2.52	mg/kg	63	40 - 140
580-13-2	2-Bromonaphthalene	4	3.78	mg/kg	95	40 - 140
321-60-8	2-Fluorobiphenyl	4	3.73	mg/kg	93	40 - 140

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
09/21/2020 11:53	692620	MADEP EPH Revision 1.1 (LA)	1	09/22/2020 17:32	MFS	692878

CAS#	Parameter	Result	LOQ	Units
GCSV-02-11	Aliphatic >C10-C12	ND	6.00	mg/kg
GCSV-02-12	Aliphatic >C12-C16	ND	6.00	mg/kg
GCSV-02-31	Aliphatic >C16-C35	ND	6.00	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
3386-33-2	1-Chlorooctadecane	4	2.4	mg/kg	60	40 - 140

JLS-23 (0-2)

Collect Date	09/08/2020 14:35	**LAB ID**	22009101103
Receive Date	09/10/2020 08:47	**Matrix**	Solid

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
09/11/2020 08:40	691916	MADEP EPH Revision 1.1 (LA)	1	09/17/2020 14:35	MFS	692424

CAS#	Parameter	Result	LOQ	Units
GCSV-05-18	Aromatic >C21-C35	ND	3.00	mg/kg
GCSV-02-15	Unadjusted >C10-C12 Aromatics	ND	3.00	mg/kg
GCSV-02-16	Unadjusted >C12-C16 Aromatics	ND	3.00	mg/kg

Sample Results

JLS-23 (0-2)

Collect Date	09/08/2020 14:35	**LAB ID**	22009101103
Receive Date	09/10/2020 08:47	**Matrix**	Solid

MADEP EPH Revision 1.1 (LA) (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
09/11/2020 08:40	691916	MADEP EPH Revision 1.1 (LA) (Continued)	1	09/17/2020 14:35	MFS	692424

CAS#	Parameter	Result	LOQ	Units
GCSV-02-17	Unadjusted >C16-C21 Aromatics	ND	3.00	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	4	2.74	mg/kg	69	40 - 140
580-13-2	2-Bromonaphthalene	4	1.64	mg/kg	41	40 - 140
321-60-8	2-Fluorobiphenyl	4	2.99	mg/kg	75	40 - 140

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
09/11/2020 08:40	691916	MADEP EPH Revision 1.1 (LA)	1	09/16/2020 18:16	MFS	692413

CAS#	Parameter	Result	LOQ	Units
GCSV-02-11	Aliphatic >C10-C12	ND	3.00	mg/kg
GCSV-02-12	Aliphatic >C12-C16	ND	3.00	mg/kg
GCSV-02-31	Aliphatic >C16-C35	10.9	3.00	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
3386-33-2	1-Chlorooctadecane	4	1.7	mg/kg	42	40 - 140

JLS-23 (2-4)

Collect Date	09/08/2020 14:40	**LAB ID**	22009101104
Receive Date	09/10/2020 08:47	**Matrix**	Solid

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
09/11/2020 08:40	691916	MADEP EPH Revision 1.1 (LA)	1	09/17/2020 14:55	MFS	692431

CAS#	Parameter	Result	LOQ	Units
GCSV-02-11	Aliphatic >C10-C12	ND	5.98	mg/kg
GCSV-02-12	Aliphatic >C12-C16	ND	5.98	mg/kg
GCSV-02-31	Aliphatic >C16-C35	ND	5.98	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
3386-33-2	1-Chlorooctadecane	3.99	1.62	mg/kg	41	40 - 140

Sample Results

JLS-23 (2-4)

Collect Date	09/08/2020 14:40	**LAB ID**	22009101104
Receive Date	09/10/2020 08:47	**Matrix**	Solid

MADEP EPH Revision 1.1 (LA)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
09/11/2020 08:40	691916	MADEP EPH Revision 1.1 (LA)	1	09/14/2020 21:40	MFS	692126

CAS#	Parameter	Result	LOQ	Units
GCSV-05-18	Aromatic >C21-C35	9.42	5.98	mg/kg
GCSV-02-15	Unadjusted >C10-C12 Aromatics	ND	5.98	mg/kg
GCSV-02-16	Unadjusted >C12-C16 Aromatics	ND	5.98	mg/kg
GCSV-02-17	Unadjusted >C16-C21 Aromatics	ND	5.98	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	3.99	3.96	mg/kg	99	40 - 140
580-13-2	2-Bromonaphthalene	3.99	1.96	mg/kg	49	40 - 140
321-60-8	2-Fluorobiphenyl	3.99	3.72	mg/kg	93	40 - 140

GC Semi-Volatiles QC Summary

Analytical Batch	Client ID	MB691916		LCS691916				LCSD691916				
692127	LAB ID	2082368		2082369				2082370				
Prep Batch	Sample Type	MB		LCS				LCSD				
691916	Prep Date	09/11/2020 08:40		09/11/2020 08:40				09/11/2020 08:40				
Prep Method	Analysis Date	09/14/2020 18:42		09/16/2020 16:57				09/16/2020 17:17				
MADEP EPH Revision 1.1 (LA)	Matrix	Solid		Solid				Solid				
MADEP EPH Revision 1.1 (LA)		Units Result	mg/kg LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Aliphatic >C10-C12	GCSV-02-11	ND	3.00	9.98	5.12	51	30 - 140	10.0	5.88	59	14	25
Aliphatic >C12-C16	GCSV-02-12	ND	3.00	9.98	5.57	56	40 - 140	10.0	5.98	60	7	25
Aliphatic >C16-C35	GCSV-02-31	ND	3.00	44.9	25.6	57	40 - 140	45.0	26.0	58	2	25
Surrogate												
1-Chlorooctadecane	3386-33-2	3.08	77	3.99	1.95	49	40 - 140	4	1.99	50	NA	NA

Analytical Batch	Client ID	MB692620		LCS692620				LCSD692620				
692878	LAB ID	2085956		2085957				2085958				
Prep Batch	Sample Type	MB		LCS				LCSD				
692620	Prep Date	09/21/2020 11:53		09/21/2020 11:53				09/21/2020 11:53				
Prep Method	Analysis Date	09/22/2020 16:33		09/22/2020 16:52				09/22/2020 17:12				
MADEP EPH Revision 1.1 (LA)	Matrix	Solid		Solid				Solid				
MADEP EPH Revision 1.1 (LA)		Units Result	mg/kg LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Aliphatic >C10-C12	GCSV-02-11	ND	6.00	10.0	7.04	70	30 - 140	10.0	7.45	75	6	25
Aliphatic >C12-C16	GCSV-02-12	ND	6.00	10.0	6.20	62	40 - 140	10.0	5.93	59	4	25
Aliphatic >C16-C35	GCSV-02-31	ND	6.00	45.0	29.7	66	40 - 140	45.0	33.4	74	12	25
Surrogate												
1-Chlorooctadecane	3386-33-2	2.43	61	4	2.58	65	40 - 140	4	2.52	63	NA	NA

Analytical Batch	Client ID	JLS-22 (2-4)		2082032MS				2082032MSD				
692878	LAB ID	22009101102		2085959				2085960				
Prep Batch	Sample Type	SAMPLE		MS				MSD				
692620	Prep Date	09/21/2020 11:53		09/21/2020 11:53				09/21/2020 11:53				
Prep Method	Analysis Date	09/22/2020 17:32		09/22/2020 17:51				09/22/2020 18:11				
MADEP EPH Revision 1.1 (LA)	Matrix	Solid		Solid				Solid				
MADEP EPH Revision 1.1 (LA)		Units Result	mg/kg LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Aliphatic >C10-C12	GCSV-02-11	0.00	6.00	10.0	5.32	53	30 - 140	10.0	7.00	70	27*	25
Aliphatic >C12-C16	GCSV-02-12	0.00	6.00	10.0	5.80	58	40 - 140	10.0	7.92	79	31*	25
Aliphatic >C16-C35	GCSV-02-31	0.00	6.00	45.0	25.2	56	40 - 140	45.0	30.7	68	20	25
Surrogate												
1-Chlorooctadecane	3386-33-2	2.4	60	4	3.03	76	40 - 140	4	2.65	66	NA	NA

Analytical Batch	Client ID	MB691916		LCS691916				LCSD691916				
692126	LAB ID	2082368		2082369				2082370				
Prep Batch	Sample Type	MB		LCS				LCSD				
691916	Prep Date	09/11/2020 08:40		09/11/2020 08:40				09/11/2020 08:40				
Prep Method	Analysis Date	09/14/2020 18:42		09/16/2020 16:57				09/16/2020 17:17				
MADEP EPH Revision 1.1 (LA)	Matrix	Solid		Solid				Solid				
MADEP EPH Revision 1.1 (LA)		Units Result	mg/kg LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Aromatic >C21-C35	GCSV-05-18	ND	3.00	49.9	22.2	44	40 - 140	50.0	25.1	50	12	25
Unadjusted >C10-C12 Aromatics	GCSV-02-15	ND	3.00	4.99	3.00	60	30 - 140	5.00	3.17	63	6	25
Unadjusted >C12-C16 Aromatics	GCSV-02-16	ND	3.00	20.0	11.0	55	40 - 140	20.0	12.0	60	9	25
Unadjusted >C16-C21 Aromatics	GCSV-02-17	ND	3.00	9.98	5.17	52	40 - 140	10.0	5.76	58	11	25
Surrogate												
2-Bromonaphthalene	580-13-2	1.94	49	3.99	2.15	54	40 - 140	4	2.05	51	NA	NA
2-Fluorobiphenyl	321-60-8	3.83	96	3.99	2.44	61	40 - 140	4	2.56	64	NA	NA
o-Terphenyl	84-15-1	3.36	84	3.99	1.87	47	40 - 140	4	2.14	54	NA	NA

GC Semi-Volatiles QC Summary

Analytical Batch	Client ID	MB692620		LCS692620				LCSD692620				
692880	LAB ID	2085956		2085957				2085958				
Prep Batch	Sample Type	MB		LCS				LCSD				
692620	Prep Date	09/21/2020 11:53		09/21/2020 11:53				09/21/2020 11:53				
Prep Method	Analysis Date	09/22/2020 16:33		09/22/2020 16:52				09/22/2020 17:12				
MADEP EPH Revision 1.1 (LA)	Matrix	Solid		Solid				Solid				
MADEP EPH Revision 1.1 (LA)		Units Result	mg/kg LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Aromatic >C21-C35	GCSV-05-18	ND	6.00	50.0	36.8	74	40 - 140	50.0	36.7	73	0	25
Unadjusted >C10-C12 Aromatics	GCSV-02-15	ND	6.00	5.00	3.93	79	30 - 140	5.00	3.73	75	5	25
Unadjusted >C12-C16 Aromatics	GCSV-02-16	ND	6.00	20.0	15.6	78	40 - 140	20.0	14.9	75	5	25
Unadjusted >C16-C21 Aromatics	GCSV-02-17	ND	6.00	10.0	7.91	79	40 - 140	10.0	7.77	78	2	25
Surrogate												
2-Bromonaphthalene	580-13-2	3.42	86	4	3.88	97	40 - 140	4	3.46	87	NA	NA
2-Fluorobiphenyl	321-60-8	3.22	81	4	3.87	97	40 - 140	4	3.38	85	NA	NA
o-Terphenyl	84-15-1	2.1	53	4	3.03	76	40 - 140	4	2.78	70	NA	NA

Analytical Batch	Client ID	JLS-22 (2-4)		2082032MS				2082032MSD				
692880	LAB ID	22009101102		2085959				2085960				
Prep Batch	Sample Type	SAMPLE		MS				MSD				
692620	Prep Date	09/21/2020 11:53		09/21/2020 11:53				09/21/2020 11:53				
Prep Method	Analysis Date	09/22/2020 17:32		09/22/2020 17:51				09/22/2020 18:11				
MADEP EPH Revision 1.1 (LA)	Matrix	Solid		Solid				Solid				
MADEP EPH Revision 1.1 (LA)		Units Result	mg/kg LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Aromatic >C21-C35	GCSV-05-18	0.00	6.00	50.0	33.1	66	40 - 140	50.0	38.4	77	15	25
Unadjusted >C10-C12 Aromatics	GCSV-02-15	0.00	6.00	5.00	3.43	69	30 - 140	5.00	4.23	85	21	25
Unadjusted >C12-C16 Aromatics	GCSV-02-16	0.00	6.00	20.0	13.6	68	40 - 140	20.0	16.7	84	20	25
Unadjusted >C16-C21 Aromatics	GCSV-02-17	0.00	6.00	10.0	6.91	69	40 - 140	10.0	8.35	84	19	25
Surrogate												
2-Bromonaphthalene	580-13-2	3.78	95	4	3.18	80	40 - 140	4	3.9	98	NA	NA
2-Fluorobiphenyl	321-60-8	3.73	93	4	3.17	79	40 - 140	4	3.89	97	NA	NA
o-Terphenyl	84-15-1	2.52	63	4	2.55	64	40 - 140	4	3.04	76	NA	NA

Client ID: 4271 - ERM-Baton Rouge
SDG: 220091011
PM: AMK

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workor

ALL SHADED

Company: ERM	Billing Information:
Address: 3838 N. Causeway Blvd, Ste. 3000 Metairie, LA 70002	
Report To: Jonathan Miller	Email To: Jonathan.Miller@erm.com
Copy To: Guy.Guinet@erm.com	Site Collection Info/Address: Bayou Pigeon 0.1 Gas Field
Customer Project Name/Number: Scanlette Lumber / 0519829	State: LA / County/City: LA / Iberia Parish / Time Zone Collected: [ ]PT [ ]MT [X]CT [ ]ET
Phone: 504-810-1764 Email: Jonathan.Miller@erm.com	Site/Facility ID #: / Compliance Monitoring? [ ] Yes [ ] No
Collected By (print): Guy Guinet	Purchase Order #: / Quote #: / DW PWS ID #: / DW Location Code:
Collected By (signature): GsGs	Turnaround Date Required: Standard / Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [X] Dispose as appropriate [ ] Return [ ] Archive: _____ [ ] Hold: _____	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply) / Field Filtered (if applicable): [ ] Yes [X] No Analysis: _____

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Container Preservative Type **: U

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Analyses: Extractable Petroleum Hydrocarbons (EPH) Fractions	Lab Profile/Line:
SLS-22(0-2)	SO	Grab	9/8/20	1330				1	X	1
SLS-22(2-4)	SO	Grab	9/8/20	1335				1	X	2
SLS-23(0-2)	SO	Grab	9/8/20	1435				1	X	3
SLS-23(2-4)	SO	Grab	9/8/20	1440				1	X	4

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y	N	NA
Custody Signatures Present	Y	N	NA
Collector Signature Present	Y	N	NA
Bottles Intact	Y	N	NA
Correct Bottles	Y	N	NA
Sufficient Volume	Y	N	NA
Samples Received on Ice	Y	N	NA
VOA - Headspace Acceptable	Y	N	NA
USDA Regulated Soils	Y	N	NA
Samples in Holding Time	Y	N	NA
Residual Chlorine Present	Y	N	NA
Cl Strips: _____			
Sample pH Acceptable	Y	N	NA
pH Strips: _____			
Sulfide Present	Y	N	NA
Lead Acetate Strips: _____			

LAB USE ONLY:
Lab Sample # / Comments:

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2525425

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: E34
Cooler 1 Temp Upon Receipt: 4.4 oC
Cooler 1 Therm Corr. Factor: _____ oC
Cooler 1 Corrected Temp: _____ oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
GsGs/ERM	9-10-20/0847	Jessica R. Kenny PACE	9/10/20 0847
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: _____ of: _____

SAMPLE RECEIVING CHECKLIST

SAMPLE DELIVERY GROUP 220091011	
Client **PM** AMK 4271 - ERM-Baton Rouge	**Transport Method** CUSTOMER
Profile Number 286447	**Received By** Alayyadhi, Rachel L.
Line Item(s) 2 - Solid	**Receive Date(s)** 09/10/20

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☑	☐

COOLERS

Airbill	Thermometer ID: E34	Temp °C
		4.1

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.6