

December 27, 2021

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Terra Energy Partners

Sample Delivery Group: L1442539
Samples Received: 12/15/2021
Project Number: TEP-RIVER RANCH A
Description: Terra Energy Partners-River Ranch A-Riser Spill
Site: RISER SPILL-EXCAVATION
Report To: Mike Gardner & Kis Rowe
1058 County Road 215
Parachute, CO 81635

Entire Report Reviewed By:



Kelly Mercer
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

Cp: Cover Page	1
Tc: Table of Contents	2
Ss: Sample Summary	3
Cn: Case Narrative	4
Sr: Sample Results	5
EXC-SP3 L1442539-01	5
EXC-SP4 L1442539-02	6
EXC-SP6 L1442539-03	7
Qc: Quality Control Summary	8
Volatile Organic Compounds (GC/MS) by Method 8260B	8
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	10
Gl: Glossary of Terms	11
Al: Accreditations & Locations	12
Sc: Sample Chain of Custody	13

¹ Cp
² Tc
³ Ss
⁴ Cn
⁵ Sr
⁶ Qc
⁷ Gl
⁸ Al
⁹ Sc

SAMPLE SUMMARY

EXC-SP3 L1442539-01 Solid

Collected by
Kris Rowe

Collected date/time
12/14/21 14:00

Received date/time
12/15/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1791872	1	12/21/21 16:40	12/21/21 16:40	KMG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1791560	1	12/17/21 11:58	12/18/21 03:52	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1793233	1	12/17/21 11:58	12/21/21 20:40	ACG	Mt. Juliet, TN

¹Cp

²Tc

³Ss

EXC-SP4 L1442539-02 Solid

Collected by
Kris Rowe

Collected date/time
12/14/21 14:15

Received date/time
12/15/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1791872	1	12/21/21 16:43	12/21/21 16:43	KMG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1791499	1	12/17/21 11:58	12/17/21 19:08	BMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1793561	1	12/22/21 17:07	12/23/21 09:31	AGW	Mt. Juliet, TN

⁴Cn

⁵Sr

⁶Qc

EXC-SP6 L1442539-03 Solid

Collected by
Kris Rowe

Collected date/time
12/14/21 14:30

Received date/time
12/15/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1791872	1	12/21/21 16:51	12/21/21 16:51	KMG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1791499	1	12/17/21 11:58	12/17/21 19:28	BMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1793561	1	12/22/21 17:07	12/23/21 09:49	AGW	Mt. Juliet, TN

⁷Gl

⁸Al

⁹Sc

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Kelly Mercer
Project Manager

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	9.14		1	12/21/2021 16:40	WG1791872

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.000775	J	0.000467	0.00100	1	12/18/2021 03:52	WG1791560
(S) Toluene-d8	107			75.0-131		12/18/2021 03:52	WG1791560
(S) Toluene-d8	112			75.0-131		12/21/2021 20:40	WG1793233
(S) 4-Bromofluorobenzene	97.4			67.0-138		12/18/2021 03:52	WG1791560
(S) 4-Bromofluorobenzene	86.9			67.0-138		12/21/2021 20:40	WG1793233
(S) 1,2-Dichloroethane-d4	91.8			70.0-130		12/18/2021 03:52	WG1791560
(S) 1,2-Dichloroethane-d4	92.3			70.0-130		12/21/2021 20:40	WG1793233

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	8.89		1	12/21/2021 16:43	WG1791872

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
1,3,5-Trimethylbenzene	U		0.00200	0.00500	1	12/17/2021 19:08	WG1791499
(S) Toluene-d8	111			75.0-131		12/17/2021 19:08	WG1791499
(S) 4-Bromofluorobenzene	103			67.0-138		12/17/2021 19:08	WG1791499
(S) 1,2-Dichloroethane-d4	97.2			70.0-130		12/17/2021 19:08	WG1791499

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
1-Methylnaphthalene	U		0.00449	0.0200	1	12/23/2021 09:31	WG1793561
2-Methylnaphthalene	U		0.00427	0.0200	1	12/23/2021 09:31	WG1793561
(S) p-Terphenyl-d14	33.5			23.0-120		12/23/2021 09:31	WG1793561
(S) Nitrobenzene-d5	54.3			14.0-149		12/23/2021 09:31	WG1793561
(S) 2-Fluorobiphenyl	26.0	J2		34.0-125		12/23/2021 09:31	WG1793561

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	8.21		1	12/21/2021 16:51	WG1791872

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
1,3,5-Trimethylbenzene	U		0.00200	0.00500	1	12/17/2021 19:28	WG1791499
(S) Toluene-d8	114			75.0-131		12/17/2021 19:28	WG1791499
(S) 4-Bromofluorobenzene	93.9			67.0-138		12/17/2021 19:28	WG1791499
(S) 1,2-Dichloroethane-d4	92.9			70.0-130		12/17/2021 19:28	WG1791499

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
1-Methylnaphthalene	U		0.00449	0.0200	1	12/23/2021 09:49	WG1793561
2-Methylnaphthalene	U		0.00427	0.0200	1	12/23/2021 09:49	WG1793561
(S) p-Terphenyl-d14	55.6			23.0-120		12/23/2021 09:49	WG1793561
(S) Nitrobenzene-d5	49.4			14.0-149		12/23/2021 09:49	WG1793561
(S) 2-Fluorobiphenyl	40.6			34.0-125		12/23/2021 09:49	WG1793561

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3743534-3 12/17/21 17:21

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	110			75.0-131
(S) 4-Bromofluorobenzene	92.4			67.0-138
(S) 1,2-Dichloroethane-d4	95.4			70.0-130

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3743534-1 12/17/21 16:03 • (LCSD) R3743534-2 12/17/21 16:22

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
1,3,5-Trimethylbenzene	0.125	0.142	0.135	114	108	73.0-127			5.05	20
(S) Toluene-d8				106	107	75.0-131				
(S) 4-Bromofluorobenzene				105	99.4	67.0-138				
(S) 1,2-Dichloroethane-d4				101	102	70.0-130				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3742425-3 12/18/21 03:33

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
(S) Toluene-d8	107			75.0-131
(S) 4-Bromofluorobenzene	97.2			67.0-138
(S) 1,2-Dichloroethane-d4	87.6			70.0-130

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3742425-1 12/18/21 02:17 • (LCSD) R3742425-2 12/18/21 02:36

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	0.126	0.126	101	101	70.0-123			0.000	20
(S) Toluene-d8				105	105	75.0-131				
(S) 4-Bromofluorobenzene				99.1	99.9	67.0-138				
(S) 1,2-Dichloroethane-d4				96.3	98.1	70.0-130				

L1443365-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1443365-04 12/18/21 09:55 • (MS) R3742425-4 12/18/21 10:14 • (MSD) R3742425-5 12/18/21 10:33

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	2.75	0.0454	0.882	1.26	39.8	57.8	20	10.0-149			35.3	37
(S) Toluene-d8					104	103		75.0-131				
(S) 4-Bromofluorobenzene					99.5	100		67.0-138				
(S) 1,2-Dichloroethane-d4					96.5	100		70.0-130				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3744450-2 12/23/21 09:13

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
(S) Nitrobenzene-d5	46.6			14.0-149
(S) 2-Fluorobiphenyl	58.4			34.0-125
(S) p-Terphenyl-d14	65.0			23.0-120

Laboratory Control Sample (LCS)

(LCS) R3744450-1 12/23/21 08:56

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
1-Methylnaphthalene	0.0800	0.0593	74.1	51.0-121	
2-Methylnaphthalene	0.0800	0.0549	68.6	50.0-120	
(S) Nitrobenzene-d5			54.8	14.0-149	
(S) 2-Fluorobiphenyl			69.3	34.0-125	
(S) p-Terphenyl-d14			72.3	23.0-120	

L1441334-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1441334-10 12/23/21 12:29 • (MS) R3744450-3 12/23/21 12:47 • (MSD) R3744450-4 12/23/21 13:04

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1-Methylnaphthalene	0.0792	U	0.0446	0.0443	56.3	55.9	1	10.0-142			0.675	28
2-Methylnaphthalene	0.0792	U	0.0401	0.0385	50.6	48.6	1	10.0-137			4.07	28
(S) Nitrobenzene-d5					39.0	40.1		14.0-149				
(S) 2-Fluorobiphenyl					55.7	54.4		34.0-125				
(S) p-Terphenyl-d14					62.3	53.8		23.0-120				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

GLOSSARY OF TERMS

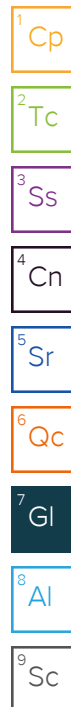
Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.
Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.



ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio--VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA -- ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA -- ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA--Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.



[illegible]

U1442539

<u>Tracking Numbers</u>	<u>Temperature</u>
5016 1232 0309	0.9
0310	2.1