

August 10, 2020

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Caerus Oil and Gas

Sample Delivery Group: L1246218
Samples Received: 08/04/2020
Project Number:
Description: F23 6D Spill

Report To: Jake Janicek
143 Diamond Avenue
Parachute, CO 81635

Entire Report Reviewed By:

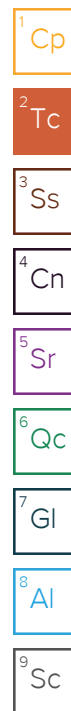
Chris Ward

Chris Ward
Project Manager

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SAMPLE SUMMARY

20200803-F23 6D POR L1246218-01 Solid

Collected by: Blair Rollins
 Collected date/time: 08/03/20 13:00
 Received date/time: 08/04/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1521123	1	08/07/20 12:05	08/07/20 12:05	TRB	Mt. Juliet, TN
Calculated Results	WG1521109	1	08/06/20 07:37	08/07/20 16:32	KEG	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1520987	1	08/05/20 18:00	08/07/20 16:32	KEG	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1520648	1	08/05/20 10:00	08/05/20 14:05	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1520226	1	08/05/20 06:00	08/05/20 09:00	CAT	Mt. Juliet, TN
Mercury by Method 7471A	WG1521139	1	08/05/20 21:50	08/06/20 09:54	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1521109	1	08/06/20 07:37	08/07/20 10:26	TRB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1521113	5	08/06/20 10:16	08/06/20 13:27	LAT	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1521115	500	08/05/20 12:28	08/07/20 12:07	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1521715	40	08/05/20 12:28	08/06/20 22:04	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1521857	20	08/06/20 21:52	08/07/20 15:52	JDG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1521855	1	08/07/20 03:39	08/07/20 11:17	LEA	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1521855	20	08/07/20 03:39	08/07/20 15:47	LEA	Mt. Juliet, TN

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



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.

Chris Ward
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	28.8		1	08/07/2020 12:05	WG1521123

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chromium, Trivalent	23.9		1.00	1	08/07/2020 16:32	WG1521109

Wet Chemistry by Method 3060A/7196A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	08/07/2020 16:32	WG1520987

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.23	<u>T8</u>	1	08/05/2020 14:05	WG1520648

Sample Narrative:

L1246218-01 WG1520648: 9.23 at 21.9C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	2920		10.0	1	08/05/2020 09:00	WG1520226

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	0.181		0.0400	1	08/06/2020 09:54	WG1521139

Metals (ICP) by Method 6010B

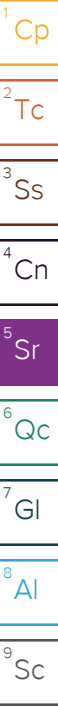
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	536		0.500	1	08/07/2020 10:26	WG1521109
Cadmium	0.566		0.500	1	08/07/2020 10:26	WG1521109
Chromium	23.9		1.00	1	08/07/2020 10:26	WG1521109
Copper	30.7		2.00	1	08/07/2020 10:26	WG1521109
Lead	16.3		0.500	1	08/07/2020 10:26	WG1521109
Nickel	20.5		2.00	1	08/07/2020 10:26	WG1521109
Selenium	ND		2.00	1	08/07/2020 10:26	WG1521109
Silver	ND		1.00	1	08/07/2020 10:26	WG1521109
Zinc	61.4		5.00	1	08/07/2020 10:26	WG1521109

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	21.0		1.00	5	08/06/2020 13:27	WG1521113

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	1300		50.0	500	08/07/2020 12:07	WG1521115





Collected date/time: 08/03/20 13:00

L1246218

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
(S) a,a,a-Trifluorotoluene(FID)	85.4		77.0-120		08/07/2020 12:07	WG1521115

1 Cp

2 Tc

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	1.58		0.0400	40	08/06/2020 22:04	WG1521715
Toluene	16.6		0.200	40	08/06/2020 22:04	WG1521715
Ethylbenzene	2.17		0.100	40	08/06/2020 22:04	WG1521715
Total Xylenes	58.5		0.260	40	08/06/2020 22:04	WG1521715
(S) Toluene-d8	95.6		75.0-131		08/06/2020 22:04	WG1521715
(S) 4-Bromofluorobenzene	119		67.0-138		08/06/2020 22:04	WG1521715
(S) 1,2-Dichloroethane-d4	110		70.0-130		08/06/2020 22:04	WG1521715

3 Ss

4 Cn

5 Sr

6 Qc

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
TPH (GC/FID) High Fraction	2180	J3 V	80.0	20	08/07/2020 15:52	WG1521857
(S) o-Terphenyl	120	J7	18.0-148		08/07/2020 15:52	WG1521857

7 Gl

8 Al

9 Sc

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Anthracene	ND		0.00600	1	08/07/2020 11:17	WG1521855
Acenaphthene	ND		0.120	20	08/07/2020 15:47	WG1521855
Acenaphthylene	ND		0.120	20	08/07/2020 15:47	WG1521855
Benzo(a)anthracene	ND		0.00600	1	08/07/2020 11:17	WG1521855
Benzo(a)pyrene	ND		0.00600	1	08/07/2020 11:17	WG1521855
Benzo(b)fluoranthene	ND		0.00600	1	08/07/2020 11:17	WG1521855
Benzo(g,h,i)perylene	ND		0.00600	1	08/07/2020 11:17	WG1521855
Benzo(k)fluoranthene	ND		0.00600	1	08/07/2020 11:17	WG1521855
Chrysene	ND		0.00600	1	08/07/2020 11:17	WG1521855
Dibenz(a,h)anthracene	ND		0.00600	1	08/07/2020 11:17	WG1521855
Fluoranthene	ND		0.00600	1	08/07/2020 11:17	WG1521855
Fluorene	0.336		0.120	20	08/07/2020 15:47	WG1521855
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	08/07/2020 11:17	WG1521855
Naphthalene	3.01		0.400	20	08/07/2020 15:47	WG1521855
Phenanthrene	0.119		0.00600	1	08/07/2020 11:17	WG1521855
Pyrene	ND		0.00600	1	08/07/2020 11:17	WG1521855
1-Methylnaphthalene	2.44		0.400	20	08/07/2020 15:47	WG1521855
2-Methylnaphthalene	6.93		0.400	20	08/07/2020 15:47	WG1521855
2-Chloronaphthalene	ND		0.400	20	08/07/2020 15:47	WG1521855
(S) p-Terphenyl-d14	87.1		23.0-120		08/07/2020 11:17	WG1521855
(S) p-Terphenyl-d14	94.2	J7	23.0-120		08/07/2020 15:47	WG1521855
(S) Nitrobenzene-d5	0.000	J2	14.0-149		08/07/2020 11:17	WG1521855
(S) Nitrobenzene-d5	0.000	J7	14.0-149		08/07/2020 15:47	WG1521855
(S) 2-Fluorobiphenyl	0.000	J2	34.0-125		08/07/2020 11:17	WG1521855
(S) 2-Fluorobiphenyl	143	J7	34.0-125		08/07/2020 15:47	WG1521855

Sample Narrative:

L1246218-01 WG1521855: IS/SURR failed on lower dilution.

L1246218-01 WG1521855: IS/SS recoveries impacted by matrix interference



Method Blank (MB)

(MB) R3557658-1 08/07/20 16:31

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Chromium,Hexavalent	U		0.640	2.00

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1246220-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1246220-01 08/07/20 16:35 • (DUP) R3557658-3 08/07/20 16:35

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Chromium,Hexavalent	ND	ND	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3557658-2 08/07/20 16:32

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Chromium,Hexavalent	24.0	23.8	99.0	80.0-120	

L1246752-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1246752-02 08/07/20 16:46 • (MS) R3557658-4 08/07/20 16:47 • (MSD) R3557658-5 08/07/20 16:47

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Chromium,Hexavalent	20.0	ND	ND	ND	0.000	0.000	1	75.0-125	<u>J6</u>	<u>J6</u>	0.000	20

Sample Narrative:

OS: sample is a reducer



L1246201-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1246201-01 08/05/20 14:05 • (DUP) R3556715-2 08/05/20 14:05

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.35	8.34	1	0.120		1

Sample Narrative:

OS: 8.35 at 21.9C
DUP: 8.34 at 22.1C

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

L1246218-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1246218-01 08/05/20 14:05 • (DUP) R3556715-3 08/05/20 14:05

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	9.23	9.24	1	0.108		1

Sample Narrative:

OS: 9.23 at 21.9C
DUP: 9.24 at 21.9C

6 Qc

7 Gl

8 Al

9 Sc

Laboratory Control Sample (LCS)

(LCS) R3556715-1 08/05/20 14:05

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.1	101	99.0-101	

Sample Narrative:

LCS: 10.05 at 22.1C



Method Blank (MB)

(MB) R3556478-1 08/05/20 09:00

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1246201-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1246201-03 08/05/20 09:00 • (DUP) R3556478-3 08/05/20 09:00

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits
Specific Conductance	2510	2570	1	2.44		20

L1246401-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1246401-01 08/05/20 09:00 • (DUP) R3556478-4 08/05/20 09:00

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits
Specific Conductance	2360	2200	1	7.03		20

Laboratory Control Sample (LCS)

(LCS) R3556478-2 08/05/20 09:00

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	268	269	100	85.0-115	



Method Blank (MB)

(MB) R3556898-1 08/06/20 09:34

Analyte	MB Result mg/kg	<u>MB Qualifier</u>	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3556898-2 08/06/20 09:36

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Mercury	0.500	0.509	102	80.0-120	

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) R3557493-1 08/07/20 09:49

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.240	0.500
Cadmium	U		0.0810	0.500
Chromium	U		0.250	1.00
Copper	U		0.506	2.00
Lead	U		0.208	0.500
Nickel	U		0.490	2.00
Selenium	U		0.617	2.00
Silver	U		0.228	1.00
Zinc	1.17	↓	0.939	5.00

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

Laboratory Control Sample (LCS)

(LCS) R3557493-2 08/07/20 09:52

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	93.0	93.0	80.0-120	
Cadmium	100	89.5	89.5	80.0-120	
Chromium	100	93.6	93.6	80.0-120	
Copper	100	91.2	91.2	80.0-120	
Lead	100	88.2	88.2	80.0-120	
Nickel	100	91.4	91.4	80.0-120	
Selenium	100	88.4	88.4	80.0-120	
Silver	20.0	17.2	86.2	80.0-120	
Zinc	100	89.7	89.7	80.0-120	

⁷ Gl

⁸ Al

⁹ Sc

L1246342-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1246342-01 08/07/20 09:54 • (MS) R3557493-5 08/07/20 10:02 • (MSD) R3557493-6 08/07/20 10:04

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 %
Barium	100	149	236	230	86.8	81.7	1	75.0-125			2.19	20
Cadmium	100	ND	89.8	85.5	89.5	85.2	1	75.0-125			4.94	20
Chromium	100	14.6	110	105	95.4	90.3	1	75.0-125			4.81	20
Copper	100	10.4	103	99.4	92.6	89.0	1	75.0-125			3.60	20
Lead	100	30.8	109	110	78.5	78.7	1	75.0-125			0.257	20
Nickel	100	11.8	107	103	95.6	91.1	1	75.0-125			4.28	20
Selenium	100	ND	86.9	82.5	86.9	82.5	1	75.0-125			5.19	20
Silver	20.0	ND	17.8	17.0	89.2	85.0	1	75.0-125			4.79	20
Zinc	100	31.0	117	114	85.5	83.2	1	75.0-125			2.04	20



Method Blank (MB)

(MB) R3556995-1 08/06/20 12:46

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.422	1.00

1 Cp

2 Tc

3 Ss

Laboratory Control Sample (LCS)

(LCS) R3556995-2 08/06/20 12:50

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	96.9	96.9	80.0-120	

4 Cn

5 Sr

L1245657-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1245657-10 08/06/20 12:54 • (MS) R3556995-5 08/06/20 13:05 • (MSD) R3556995-6 08/06/20 13:08

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 %
Arsenic	20.0	3.18	95.6	87.0	92.4	83.8	5	75.0-125			9.39	20

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3557463-2 08/07/20 05:32

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	97.6			77.0-120

1 Cp

2 Tc

3 Ss

4 Cn

Laboratory Control Sample (LCS)

(LCS) R3557463-1 08/07/20 04:40

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.20	94.5	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			112	77.0-120	

5 Sr

6 Qc

7 Gl

L1246218-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1246218-01 08/07/20 12:07 • (MS) R3557463-3 08/07/20 12:28 • (MSD) R3557463-4 08/07/20 12:49

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 %
TPH (GC/FID) Low Fraction	2750	1300	3370	3520	75.3	80.7	500	10.0-151			4.35	28
(S) a,a,a-Trifluorotoluene(FID)					108	108		77.0-120				

8 Al

9 Sc



Method Blank (MB)

(MB) R3557633-2 08/06/20 15:27

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Ethylbenzene	U		0.000737	0.00250
Toluene	U		0.00130	0.00500
Xylenes, Total	U		0.000880	0.00650
<i>(S) Toluene-d8</i>	100			75.0-131
<i>(S) 4-Bromofluorobenzene</i>	96.8			67.0-138
<i>(S) 1,2-Dichloroethane-d4</i>	97.2			70.0-130

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

Laboratory Control Sample (LCS)

(LCS) R3557633-1 08/06/20 14:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.00500	0.00513	103	70.0-123	
Ethylbenzene	0.00500	0.00468	93.6	74.0-126	
Toluene	0.00500	0.00496	99.2	75.0-121	
Xylenes, Total	0.0150	0.0152	101	72.0-127	
<i>(S) Toluene-d8</i>			96.1	75.0-131	
<i>(S) 4-Bromofluorobenzene</i>			101	67.0-138	
<i>(S) 1,2-Dichloroethane-d4</i>			112	70.0-130	

6 Qc

7 Gl

8 Al

9 Sc

L1246808-17 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1246808-17 08/06/20 20:49 • (MS) R3557633-3 08/06/20 22:23 • (MSD) R3557633-4 08/06/20 22:42

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	0.124	ND	0.151	0.150	122	121	1	10.0-149			0.664	37
Ethylbenzene	0.124	ND	0.143	0.138	115	111	1	10.0-160			3.56	38
Toluene	0.124	ND	0.145	0.152	117	123	1	10.0-156			4.71	38
Xylenes, Total	0.372	ND	0.434	0.439	117	118	1	10.0-160			1.15	38
<i>(S) Toluene-d8</i>					97.2	97.9		75.0-131				
<i>(S) 4-Bromofluorobenzene</i>					96.2	96.6		67.0-138				
<i>(S) 1,2-Dichloroethane-d4</i>					100	95.4		70.0-130				



Method Blank (MB)

(MB) R3557450-1 08/07/20 07:45

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
<i>(S) o-Terphenyl</i>	72.4			18.0-148

1 Cp

2 Tc

3 Ss

4 Cn

Laboratory Control Sample (LCS)

(LCS) R3557450-2 08/07/20 07:58

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	36.7	73.4	50.0-150	
<i>(S) o-Terphenyl</i>			63.7	18.0-148	

5 Sr

6 Qc

L1246218-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1246218-01 08/07/20 15:52 • (MS) R3557450-3 08/07/20 16:05 • (MSD) R3557450-4 08/07/20 16:18

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 %
TPH (GC/FID) High Fraction	50.0	2180	2900	2270	1440	180	20	50.0-150	<u>V</u>	<u>J3 V</u>	24.4	20
<i>(S) o-Terphenyl</i>					139	118		18.0-148	<u>J7</u>	<u>J7</u>		

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3557324-2 08/07/20 07:29

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.00230	0.00600
Acenaphthene	U		0.00209	0.00600
Acenaphthylene	U		0.00216	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(g,h,i)perylene	U		0.00177	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
Naphthalene	U		0.00408	0.0200
Phenanthrene	U		0.00231	0.00600
Pyrene	U		0.00200	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
2-Chloronaphthalene	U		0.00466	0.0200
(S) Nitrobenzene-d5	61.8			14.0-149
(S) 2-Fluorobiphenyl	76.1			34.0-125
(S) p-Terphenyl-d14	80.3			23.0-120

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Laboratory Control Sample (LCS)

(LCS) R3557324-1 08/07/20 07:08

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0584	73.0	50.0-126	
Acenaphthene	0.0800	0.0591	73.9	50.0-120	
Acenaphthylene	0.0800	0.0616	77.0	50.0-120	
Benzo(a)anthracene	0.0800	0.0596	74.5	45.0-120	
Benzo(a)pyrene	0.0800	0.0581	72.6	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0541	67.6	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0593	74.1	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0669	83.6	49.0-125	
Chrysene	0.0800	0.0625	78.1	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0586	73.3	47.0-125	
Fluoranthene	0.0800	0.0619	77.4	49.0-129	



Laboratory Control Sample (LCS)

(LCS) R3557324-1 08/07/20 07:08

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0600	75.0	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0596	74.5	46.0-125	
Naphthalene	0.0800	0.0565	70.6	50.0-120	
Phenanthrene	0.0800	0.0598	74.8	47.0-120	
Pyrene	0.0800	0.0602	75.3	43.0-123	
1-Methylnaphthalene	0.0800	0.0577	72.1	51.0-121	
2-Methylnaphthalene	0.0800	0.0549	68.6	50.0-120	
2-Chloronaphthalene	0.0800	0.0571	71.4	50.0-120	
(S) Nitrobenzene-d5			68.8	14.0-149	
(S) 2-Fluorobiphenyl			73.5	34.0-125	
(S) p-Terphenyl-d14			73.9	23.0-120	

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L1246181-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1246181-10 08/07/20 08:31 • (MS) R3557324-3 08/07/20 08:52 • (MSD) R3557324-4 08/07/20 09:13

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 %
Anthracene	0.0788	0.00840	0.0627	0.0752	68.9	84.8	1	10.0-145			18.1	30
Acenaphthene	0.0788	ND	0.0556	0.0641	70.6	81.3	1	14.0-127			14.2	27
Acenaphthylene	0.0788	ND	0.0563	0.0623	71.4	79.1	1	21.0-124			10.1	25
Benzo(a)anthracene	0.0788	0.0622	0.0988	0.165	46.4	130	1	10.0-139		J3	50.2	30
Benzo(a)pyrene	0.0788	0.0647	0.0875	0.144	28.9	101	1	10.0-141		J3	48.8	31
Benzo(b)fluoranthene	0.0788	0.101	0.0931	0.184	0.000	105	1	10.0-140	J6	J3	65.6	36
Benzo(g,h,i)perylene	0.0788	0.0546	0.0816	0.138	34.3	106	1	10.0-140		J3	51.4	33
Benzo(k)fluoranthene	0.0788	0.0269	0.0700	0.112	54.7	108	1	10.0-137		J3	46.2	31
Chrysene	0.0788	0.0752	0.0962	0.166	26.6	115	1	10.0-145		J3	53.2	30
Dibenz(a,h)anthracene	0.0788	0.0120	0.0607	0.0781	61.8	83.9	1	10.0-132			25.1	31
Fluoranthene	0.0788	0.177	0.160	0.301	0.000	157	1	10.0-153	J6	J3 J5	61.2	33
Fluorene	0.0788	ND	0.0577	0.0644	73.2	81.7	1	11.0-130			11.0	29
Indeno(1,2,3-cd)pyrene	0.0788	0.0441	0.0771	0.122	41.9	98.9	1	10.0-137		J3	45.1	32
Naphthalene	0.0788	ND	0.0540	0.0588	68.5	74.6	1	10.0-135			8.51	27
Phenanthrene	0.0788	0.0733	0.107	0.165	42.8	116	1	10.0-144		J3	42.6	31
Pyrene	0.0788	0.133	0.132	0.246	0.000	143	1	10.0-148	J6	J3	60.3	35
1-Methylnaphthalene	0.0788	ND	0.0544	0.0594	69.0	75.4	1	10.0-142			8.79	28
2-Methylnaphthalene	0.0788	ND	0.0517	0.0570	65.6	72.3	1	10.0-137			9.75	28
2-Chloronaphthalene	0.0788	ND	0.0529	0.0577	67.1	73.2	1	29.0-120			8.68	24
(S) Nitrobenzene-d5					57.7	70.8		14.0-149				
(S) 2-Fluorobiphenyl					66.4	68.5		34.0-125				
(S) p-Terphenyl-d14					69.3	67.7		23.0-120				



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.
ND	Not detected at the Reporting Limit (or MDL where applicable).
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.

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

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.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* 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 National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	n/a
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}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

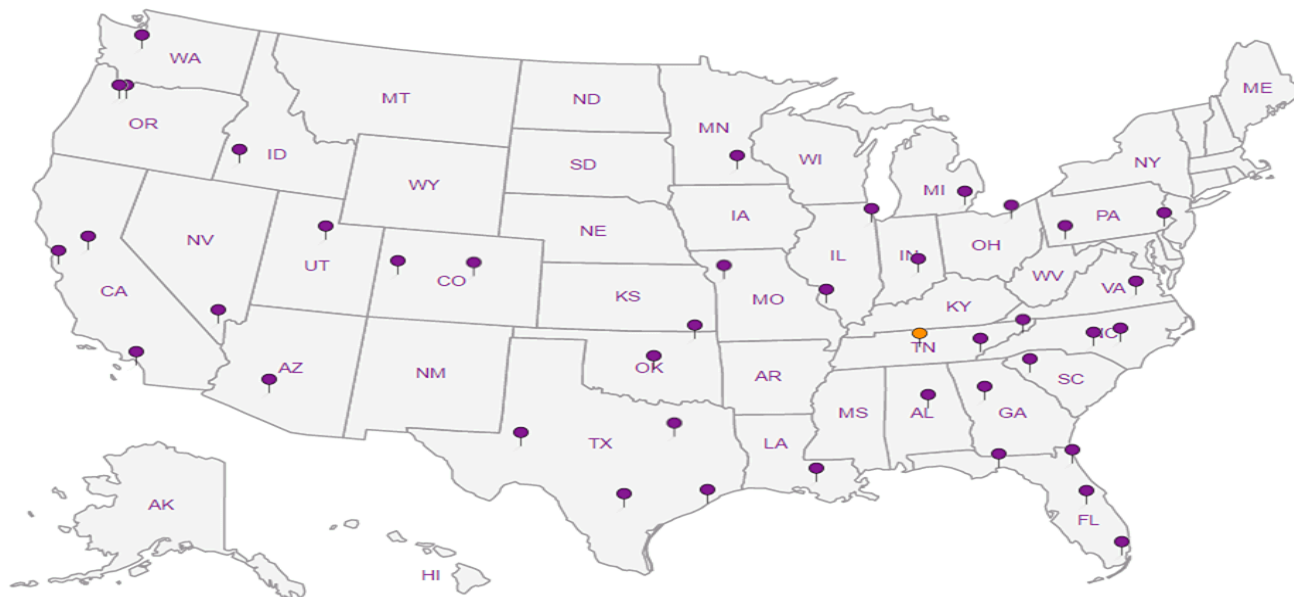
Third Party Federal Accreditations

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

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Caerus Oil & Gas
143 Diamond Ave
Parachute CO 81635

Billing Information:

Analysis / Container / Preservative

Chain of Custody Page ___ of ___



12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859



Report to: Blair Rollins

Email To:

Project Description: F23 6D spill

City/State Collected:

Phone: Client Project #
Fax: Lab Project #

Collected by (print): Blair Rollins

Site/Facility ID #

P.O. #

Collected by (signature): [Signature]

Rush? (Lab MUST Be Notified)

Quote #

Immediately Packed on Ice N ___ Y

___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Date Results Needed

No. of Cntrs

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs
-----------	-----------	----------	-------	------	------	--------------

20200803-F23 6D POR	G	SS	8'	8/3/20	1300	3
---------------------	---	----	----	--------	------	---

Pres Chk	Analysis	Container	Preservative
	BTEX	GRO + DRO (TPH)	EC, SAR, pH
			COGCC Table 910-1 PAH's
			COGCC Table 910-1 metals

L# L1746218

B094

Tab

Acctnum:

Template:

Prelogin:

TSR:

PB:

Shipped Via:

Remarks Sample # (lab only)

-01

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other

Remarks:

Samples returned via:
___ UPS ___ FedEx ___ Courier

Tracking # 1676 2750 2697

pH ___ Temp ___

Flow ___ Other ___

Sample Receipt Checklist

COC Seal Present/Intact: Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by: (Signature)

Date:

Time: 1640

Received by: (Signature)

Trip Blank Received: Yes / No

HCL / MeOH
TBR

Relinquished by: (Signature)

Date:

Time:

Received by: (Signature)

Temp: 25.0 = 2

Bottles Received: 3

If preservation required by Login: Date/Time

Relinquished by: (Signature)

Date:

Time:

Received for lab by: (Signature)

Date:

Time:

Hold:

Condition: NCF / OK