

April 29, 2019

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

## Absaroka Energy & Environmental - WY

Sample Delivery Group: L1091197  
Samples Received: 04/20/2019  
Project Number: SDE.CO.0171.19  
Description: Janet 3-16

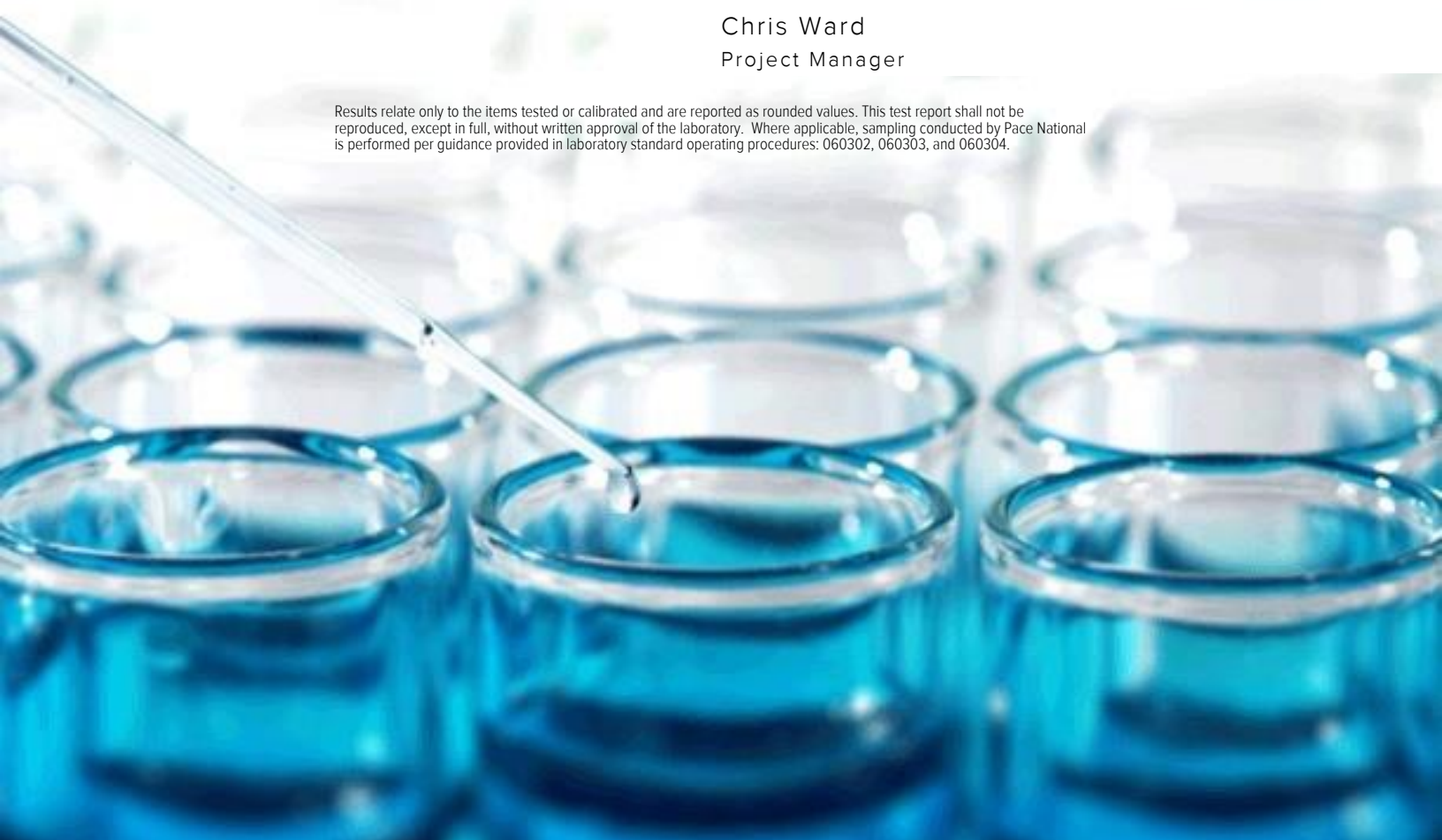
Report To: Max Moran  
112 High St  
Buffalo, WY 82834

Entire Report Reviewed By:

*Chris Ward*

Chris Ward  
Project Manager

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## SDE\_J\_SS\_03\_00\_06 L1091197-01 Solid

Collected by  
Tyler S.Collected date/time  
04/18/19 14:40Received date/time  
04/20/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1271813	2500	04/22/19 20:32	04/26/19 21:45	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1270388	20	04/22/19 20:32	04/23/19 17:00	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1271479	50	04/25/19 07:37	04/25/19 20:43	DMW	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1271893	1	04/25/19 22:31	04/26/19 08:06	DMG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1271893	20	04/25/19 22:31	04/26/19 11:24	DMG	Mt. Juliet, TN

<sup>1</sup>Cp<sup>2</sup>Tc<sup>3</sup>Ss<sup>4</sup>Cn

## SDE\_J\_SS\_03\_36\_42 L1091197-02 Solid

Collected by  
Tyler S.Collected date/time  
04/18/19 14:40Received date/time  
04/20/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1270972	1	04/22/19 20:32	04/24/19 18:06	ACG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1270388	1	04/22/19 20:32	04/23/19 15:26	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1271479	1	04/25/19 07:37	04/25/19 17:38	DMW	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1271893	1	04/25/19 22:31	04/26/19 06:18	DMG	Mt. Juliet, TN

<sup>5</sup>Sr<sup>6</sup>Qc<sup>7</sup>Gl<sup>8</sup>Al<sup>9</sup>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

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	3900		54.2	250	2500	04/26/2019 21:45	<a href="#">WG1271813</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	103			77.0-120		04/26/2019 21:45	<a href="#">WG1271813</a>

## 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	0.630		0.00800	0.0200	20	04/23/2019 17:00	<a href="#">WG1270388</a>
Toluene	5.75		0.0250	0.100	20	04/23/2019 17:00	<a href="#">WG1270388</a>
Ethylbenzene	13.4		0.0106	0.0500	20	04/23/2019 17:00	<a href="#">WG1270388</a>
Total Xylenes	25.7		0.0956	0.130	20	04/23/2019 17:00	<a href="#">WG1270388</a>
(S) Toluene-d8	87.3			75.0-131		04/23/2019 17:00	<a href="#">WG1270388</a>
(S) <i>a,a,a</i> -Trifluorotoluene	101			80.0-120		04/23/2019 17:00	<a href="#">WG1270388</a>
(S) 4-Bromofluorobenzene	115			67.0-138		04/23/2019 17:00	<a href="#">WG1270388</a>
(S) 1,2-Dichloroethane-d4	94.1			70.0-130		04/23/2019 17:00	<a href="#">WG1270388</a>

## Semi-Volatile Organic Compounds (GC) by Method 8015

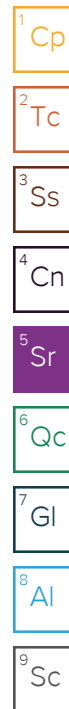
Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	11500		38.5	200	50	04/25/2019 20:43	<a href="#">WG1271479</a>
(S) <i>o</i> -Terphenyl	0.000	<a href="#">J7</a>		18.0-148		04/25/2019 20:43	<a href="#">WG1271479</a>

## 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
Anthracene	U		0.000600	0.00600	1	04/26/2019 08:06	<a href="#">WG1271893</a>
Acenaphthene	0.675		0.0120	0.120	20	04/26/2019 11:24	<a href="#">WG1271893</a>
Acenaphthylene	U		0.0120	0.120	20	04/26/2019 11:24	<a href="#">WG1271893</a>
Benzo(a)anthracene	0.295		0.000600	0.00600	1	04/26/2019 08:06	<a href="#">WG1271893</a>
Benzo(a)pyrene	0.164		0.000600	0.00600	1	04/26/2019 08:06	<a href="#">WG1271893</a>
Benzo(b)fluoranthene	0.0846		0.000600	0.00600	1	04/26/2019 08:06	<a href="#">WG1271893</a>
Benzo(g,h,i)perylene	0.0189		0.000600	0.00600	1	04/26/2019 08:06	<a href="#">WG1271893</a>
Benzo(k)fluoranthene	0.0206		0.000600	0.00600	1	04/26/2019 08:06	<a href="#">WG1271893</a>
Chrysene	0.427		0.000600	0.00600	1	04/26/2019 08:06	<a href="#">WG1271893</a>
Dibenz(a,h)anthracene	U		0.000600	0.00600	1	04/26/2019 08:06	<a href="#">WG1271893</a>
Fluoranthene	0.0535		0.000600	0.00600	1	04/26/2019 08:06	<a href="#">WG1271893</a>
Fluorene	2.22		0.0120	0.120	20	04/26/2019 11:24	<a href="#">WG1271893</a>
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00600	1	04/26/2019 08:06	<a href="#">WG1271893</a>
Naphthalene	7.64		0.0400	0.400	20	04/26/2019 11:24	<a href="#">WG1271893</a>
Phenanthrene	3.87		0.000600	0.00600	1	04/26/2019 08:06	<a href="#">WG1271893</a>
Pyrene	0.443		0.000600	0.00600	1	04/26/2019 08:06	<a href="#">WG1271893</a>
1-Methylnaphthalene	18.0		0.0400	0.400	20	04/26/2019 11:24	<a href="#">WG1271893</a>
2-Methylnaphthalene	19.7		0.0400	0.400	20	04/26/2019 11:24	<a href="#">WG1271893</a>
2-Chloronaphthalene	U		0.0400	0.400	20	04/26/2019 11:24	<a href="#">WG1271893</a>
(S) <i>p</i> -Terphenyl-d14	143	<a href="#">J7</a>		23.0-120		04/26/2019 11:24	<a href="#">WG1271893</a>
(S) <i>p</i> -Terphenyl-d14	115			23.0-120		04/26/2019 08:06	<a href="#">WG1271893</a>
(S) Nitrobenzene-d5	0.000	<a href="#">J2</a>		14.0-149		04/26/2019 08:06	<a href="#">WG1271893</a>
(S) Nitrobenzene-d5	0.000	<a href="#">J7</a>		14.0-149		04/26/2019 11:24	<a href="#">WG1271893</a>
(S) 2-Fluorobiphenyl	0.000	<a href="#">J2</a>		34.0-125		04/26/2019 08:06	<a href="#">WG1271893</a>
(S) 2-Fluorobiphenyl	87.1	<a href="#">J7</a>		34.0-125		04/26/2019 11:24	<a href="#">WG1271893</a>

## Sample Narrative:

L1091197-01 WG1271893: Surrogate recoveries impacted by matrix





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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0217	0.100	1	04/24/2019 18:06	<a href="#">WG1270972</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	101			77.0-120		04/24/2019 18:06	<a href="#">WG1270972</a>

## 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	U		0.000400	0.00100	1	04/23/2019 15:26	<a href="#">WG1270388</a>
Toluene	U		0.00125	0.00500	1	04/23/2019 15:26	<a href="#">WG1270388</a>
Ethylbenzene	U		0.000530	0.00250	1	04/23/2019 15:26	<a href="#">WG1270388</a>
Total Xylenes	U		0.00478	0.00650	1	04/23/2019 15:26	<a href="#">WG1270388</a>
(S) <i>Toluene-d8</i>	107			75.0-131		04/23/2019 15:26	<a href="#">WG1270388</a>
(S) <i>a,a,a</i> -Trifluorotoluene	95.5			80.0-120		04/23/2019 15:26	<a href="#">WG1270388</a>
(S) 4-Bromofluorobenzene	91.0			67.0-138		04/23/2019 15:26	<a href="#">WG1270388</a>
(S) 1,2-Dichloroethane-d4	98.6			70.0-130		04/23/2019 15:26	<a href="#">WG1270388</a>

## Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	24.5		0.769	4.00	1	04/25/2019 17:38	<a href="#">WG1271479</a>
(S) <i>o</i> -Terphenyl	35.8			18.0-148		04/25/2019 17:38	<a href="#">WG1271479</a>

## 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
Anthracene	U		0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Acenaphthene	0.00100	J	0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Acenaphthylene	U		0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Benzo(a)anthracene	U		0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Benzo(a)pyrene	U		0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Benzo(b)fluoranthene	U		0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Benzo(g,h,i)perylene	U		0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Benzo(k)fluoranthene	U		0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Chrysene	0.000758	J	0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Dibenz(a,h)anthracene	U		0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Fluoranthene	U		0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Fluorene	0.00320	J	0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Naphthalene	U		0.00200	0.0200	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Phenanthrene	0.00611		0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
Pyrene	0.000788	J	0.000600	0.00600	1	04/26/2019 06:18	<a href="#">WG1271893</a>
1-Methylnaphthalene	0.0294		0.00200	0.0200	1	04/26/2019 06:18	<a href="#">WG1271893</a>
2-Methylnaphthalene	0.00421	J	0.00200	0.0200	1	04/26/2019 06:18	<a href="#">WG1271893</a>
2-Chloronaphthalene	U		0.00200	0.0200	1	04/26/2019 06:18	<a href="#">WG1271893</a>
(S) <i>p</i> -Terphenyl-d14	67.4			23.0-120		04/26/2019 06:18	<a href="#">WG1271893</a>
(S) Nitrobenzene-d5	101			14.0-149		04/26/2019 06:18	<a href="#">WG1271893</a>
(S) 2-Fluorobiphenyl	54.8			34.0-125		04/26/2019 06:18	<a href="#">WG1271893</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3405398-3 04/24/19 12:01

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)	108			77.0-120

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

(LCS) R3405398-1 04/24/19 10:54 • (LCSD) R3405398-2 04/24/19 11:16

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 %
TPH (GC/FID) Low Fraction	5.50	6.05	6.11	110	111	72.0-127			0.888	20
(S) a,a,a-Trifluorotoluene(FID)				103	103	77.0-120				

L1091713-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1091713-04 04/24/19 20:19 • (MS) R3405398-4 04/24/19 20:42 • (MSD) R3405398-5 04/24/19 21:04

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 %
TPH (GC/FID) Low Fraction	5.50	204	344	367	102	119	25	10.0-151	E	E	6.50	28
(S) a,a,a-Trifluorotoluene(FID)					113	116		77.0-120				

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc

Method Blank (MB)

(MB) R3406103-2 04/26/19 12:02

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)	107			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3406103-1 04/26/19 11:17

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	6.20	113	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			111	77.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc





Method Blank (MB)

(MB) R3404967-2 04/23/19 10:09

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000400	0.00100
Ethylbenzene	U		0.000530	0.00250
Toluene	U		0.00125	0.00500
Xylenes, Total	U		0.00478	0.00650
(S) Toluene-d8	109			75.0-131
(S) a,a,a-Trifluorotoluene	105			80.0-120
(S) 4-Bromofluorobenzene	93.4			67.0-138
(S) 1,2-Dichloroethane-d4	102			70.0-130

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

Laboratory Control Sample (LCS)

(LCS) R3404967-1 04/23/19 09:12

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.125	0.131	104	70.0-123	
Ethylbenzene	0.125	0.131	105	74.0-126	
Toluene	0.125	0.117	94.0	75.0-121	
Xylenes, Total	0.375	0.322	85.9	72.0-127	
(S) Toluene-d8			107	75.0-131	
(S) a,a,a-Trifluorotoluene			115	80.0-120	
(S) 4-Bromofluorobenzene			86.3	67.0-138	
(S) 1,2-Dichloroethane-d4			104	70.0-130	



Method Blank (MB)

(MB) R3405582-1 04/25/19 16:18

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
(S) o-Terphenyl	65.9			18.0-148

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

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

(LCS) R3405582-2 04/25/19 16:32 • (LCSD) R3405582-3 04/25/19 16:46

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 %
TPH (GC/FID) High Fraction	50.0	41.2	39.7	82.4	79.4	50.0-150			3.71	20
(S) o-Terphenyl				62.9	61.9	18.0-148				

L1090956-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1090956-11 04/25/19 18:34 • (MS) R3405582-4 04/25/19 18:47 • (MSD) R3405582-5 04/25/19 19:00

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	59.7	220	332	317	188	164	1	50.0-150	J5	J5	4.41	20
(S) o-Terphenyl					80.9	86.0		18.0-148				



Method Blank (MB)

(MB) R3405720-3 04/26/19 02:04

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.000600	0.00600
Acenaphthene	U		0.000600	0.00600
Acenaphthylene	U		0.000600	0.00600
Benzo(a)anthracene	U		0.000600	0.00600
Benzo(a)pyrene	U		0.000600	0.00600
Benzo(b)fluoranthene	U		0.000600	0.00600
Benzo(g,h,i)perylene	U		0.000600	0.00600
Benzo(k)fluoranthene	U		0.000600	0.00600
Chrysene	U		0.000600	0.00600
Dibenz(a,h)anthracene	U		0.000600	0.00600
Fluoranthene	U		0.000600	0.00600
Fluorene	U		0.000600	0.00600
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00600
Naphthalene	U		0.00200	0.0200
Phenanthrene	U		0.000600	0.00600
Pyrene	U		0.000600	0.00600
1-Methylnaphthalene	U		0.00200	0.0200
2-Methylnaphthalene	U		0.00200	0.0200
2-Chloronaphthalene	U		0.00200	0.0200
(S) Nitrobenzene-d5	94.6			14.0-149
(S) 2-Fluorobiphenyl	86.7			34.0-125
(S) p-Terphenyl-d14	95.0			23.0-120

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) R3405720-1 04/26/19 01:22 • (LCSD) R3405720-2 04/26/19 01:43

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 %
Anthracene	0.0800	0.0733	0.0744	91.6	93.0	50.0-126			1.49	20
Acenaphthene	0.0800	0.0681	0.0697	85.1	87.1	50.0-120			2.32	20
Acenaphthylene	0.0800	0.0653	0.0662	81.6	82.8	50.0-120			1.37	20
Benzo(a)anthracene	0.0800	0.0699	0.0703	87.4	87.9	45.0-120			0.571	20
Benzo(a)pyrene	0.0800	0.0720	0.0713	90.0	89.1	42.0-120			0.977	20
Benzo(b)fluoranthene	0.0800	0.0754	0.0705	94.3	88.1	42.0-121			6.72	20
Benzo(g,h,i)perylene	0.0800	0.0725	0.0723	90.6	90.4	45.0-125			0.276	20
Benzo(k)fluoranthene	0.0800	0.0749	0.0818	93.6	102	49.0-125			8.81	20
Chrysene	0.0800	0.0695	0.0711	86.9	88.9	49.0-122			2.28	20
Dibenz(a,h)anthracene	0.0800	0.0770	0.0773	96.3	96.6	47.0-125			0.389	20
Fluoranthene	0.0800	0.0805	0.0785	101	98.1	49.0-129			2.52	20

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

(LCS) R3405720-1 04/26/19 01:22 • (LCSD) R3405720-2 04/26/19 01:43

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 %
Fluorene	0.0800	0.0711	0.0728	88.9	91.0	49.0-120			2.36	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0745	0.0743	93.1	92.9	46.0-125			0.269	20
Naphthalene	0.0800	0.0690	0.0708	86.3	88.5	50.0-120			2.58	20
Phenanthrene	0.0800	0.0683	0.0693	85.4	86.6	47.0-120			1.45	20
Pyrene	0.0800	0.0642	0.0645	80.3	80.6	43.0-123			0.466	20
1-Methylnaphthalene	0.0800	0.0787	0.0822	98.4	103	51.0-121			4.35	20
2-Methylnaphthalene	0.0800	0.0784	0.0818	98.0	102	50.0-120			4.24	20
2-Chloronaphthalene	0.0800	0.0675	0.0693	84.4	86.6	50.0-120			2.63	20
(S) Nitrobenzene-d5				122	114	14.0-149				
(S) 2-Fluorobiphenyl				95.6	99.8	34.0-125				
(S) p-Terphenyl-d14				103	106	23.0-120				

L1092118-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1092118-01 04/26/19 02:25 • (MS) R3405720-4 04/26/19 02:46 • (MSD) R3405720-5 04/26/19 03:08

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0965	U	0.0750	0.0791	77.8	82.0	1	10.0-145			5.32	30
Acenaphthene	0.0965	U	0.0679	0.0767	70.4	79.5	1	14.0-127			12.2	27
Acenaphthylene	0.0965	U	0.0647	0.0735	67.0	76.1	1	21.0-124			12.8	25
Benzo(a)anthracene	0.0965	0.00326	0.0743	0.0811	73.6	80.6	1	10.0-139			8.70	30
Benzo(a)pyrene	0.0965	U	0.0770	0.0825	79.8	85.5	1	10.0-141			6.96	31
Benzo(b)fluoranthene	0.0965	0.00102	0.0694	0.0754	70.8	77.1	1	10.0-140			8.33	36
Benzo(g,h,i)perylene	0.0965	0.00217	0.0772	0.0795	77.8	80.1	1	10.0-140			2.93	33
Benzo(k)fluoranthene	0.0965	U	0.0806	0.0824	83.5	85.4	1	10.0-137			2.22	31
Chrysene	0.0965	0.00168	0.0764	0.0820	77.4	83.3	1	10.0-145			7.16	30
Dibenz(a,h)anthracene	0.0965	U	0.0822	0.0842	85.1	87.3	1	10.0-132			2.47	31
Fluoranthene	0.0965	0.00162	0.0856	0.0930	87.1	94.7	1	10.0-153			8.24	33
Fluorene	0.0965	U	0.0694	0.0744	71.9	77.1	1	11.0-130			7.05	29
Indeno(1,2,3-cd)pyrene	0.0965	U	0.0773	0.0794	80.1	82.3	1	10.0-137			2.62	32
Naphthalene	0.0965	U	0.0708	0.0797	73.4	82.6	1	10.0-135			11.9	27
Phenanthrene	0.0965	0.00122	0.0698	0.0779	71.1	79.5	1	10.0-144			10.9	31
Pyrene	0.0965	0.00300	0.0672	0.0753	66.5	74.9	1	10.0-148			11.3	35
1-Methylnaphthalene	0.0965	U	0.0766	0.0899	79.4	93.1	1	10.0-142			15.9	28
2-Methylnaphthalene	0.0965	U	0.0770	0.0902	79.8	93.5	1	10.0-137			15.9	28
2-Chloronaphthalene	0.0965	U	0.0684	0.0780	70.9	80.9	1	29.0-120			13.2	24
(S) Nitrobenzene-d5					104	111		14.0-149				
(S) 2-Fluorobiphenyl					84.4	93.9		34.0-125				
(S) p-Terphenyl-d14					93.4	96.4		23.0-120				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



## 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.

### Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
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

E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
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.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 GI

8 AI

9 Sc



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 <sup>1</sup>	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina <sup>1</sup>	DW21704
Georgia	NELAP	North Carolina <sup>3</sup>	41
Georgia <sup>1</sup>	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 <sup>1 6</sup>	90010	South Carolina	84004
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1 4</sup>	2006
Louisiana <sup>1</sup>	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas <sup>5</sup>	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 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>6</sup> 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.



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