

December 22, 2018

Phoenix Resources

Sample Delivery Group: L1053696

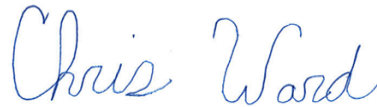
Samples Received: 12/15/2018

Project Number:

Description:

Report To: Taylor Heffner
5566 S. Sycamore Street
Littleton, CO 80120

Entire Report Reviewed By:



Chris Ward
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 National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



#1 1' FROM WELL L1053696-01 Solid

Collected by
Shawn Crane

Collected date/time
12/12/18 13:52

Received date/time
12/15/18 08:45

¹ Cp

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1212274	1	12/20/18 17:39	12/20/18 17:39	CCE
Calculated Results	WG1211910	1	12/18/18 15:44	12/19/18 09:22	TRB
Wet Chemistry by Method 3060A/7196A	WG1211902	1	12/17/18 08:42	12/17/18 12:25	EEM
Wet Chemistry by Method 9045D	WG1213098	1	12/19/18 10:30	12/19/18 13:43	KBW
Wet Chemistry by Method 9050AMod	WG1212538	1	12/19/18 13:27	12/19/18 14:57	MJA
Mercury by Method 7471A	WG1212721	1	12/18/18 15:40	12/18/18 22:16	TCT
Metals (ICP) by Method 6010B	WG1211910	1	12/18/18 15:44	12/19/18 09:22	TRB
Volatile Organic Compounds (GC) by Method 8015/8021	WG1213945	1	12/17/18 12:20	12/20/18 16:19	DWR
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1214130	1	12/20/18 21:16	12/21/18 12:14	DMW
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1213452	1	12/20/18 09:53	12/21/18 06:41	AO

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

#2 3' FROM WELL L1053696-02 Solid

Collected by
Shawn Crane

Collected date/time
12/12/18 13:59

Received date/time
12/15/18 08:45

⁷ Gl

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1212274	1	12/20/18 17:02	12/20/18 17:02	CCE
Calculated Results	WG1211910	1	12/18/18 15:44	12/19/18 09:25	TRB
Wet Chemistry by Method 3060A/7196A	WG1211902	1	12/17/18 08:42	12/17/18 12:25	EEM
Wet Chemistry by Method 9045D	WG1213098	1	12/19/18 10:30	12/19/18 13:43	KBW
Wet Chemistry by Method 9050AMod	WG1212538	1	12/19/18 13:27	12/19/18 14:57	MJA
Mercury by Method 7471A	WG1212721	1	12/18/18 15:40	12/18/18 22:19	TCT
Metals (ICP) by Method 6010B	WG1211910	1	12/18/18 15:44	12/19/18 09:25	TRB
Volatile Organic Compounds (GC) by Method 8015/8021	WG1213945	1	12/17/18 12:20	12/20/18 16:40	DWR
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1214130	1	12/20/18 21:16	12/21/18 13:14	DMW
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1213452	1	12/20/18 09:53	12/21/18 07:03	AO

⁸ Al

⁹ Sc

#3 10' FROM WELL L1053696-03 Solid

Collected by
Shawn Crane

Collected date/time
12/12/18 14:07

Received date/time
12/15/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1212274	1	12/20/18 17:05	12/20/18 17:05	CCE
Calculated Results	WG1211910	1	12/18/18 15:44	12/19/18 09:28	TRB
Wet Chemistry by Method 3060A/7196A	WG1211902	1	12/17/18 08:42	12/17/18 12:25	EEM
Wet Chemistry by Method 9045D	WG1213098	1	12/19/18 10:30	12/19/18 13:43	KBW
Wet Chemistry by Method 9050AMod	WG1212538	1	12/19/18 13:27	12/19/18 14:57	MJA
Mercury by Method 7471A	WG1212721	1	12/18/18 15:40	12/18/18 22:21	TCT
Metals (ICP) by Method 6010B	WG1211910	1	12/18/18 15:44	12/19/18 09:28	TRB
Volatile Organic Compounds (GC) by Method 8015/8021	WG1213945	1	12/17/18 12:20	12/20/18 17:01	DWR
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1214130	1	12/20/18 21:16	12/21/18 12:26	DMW
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1213452	1	12/20/18 09:53	12/21/18 07:24	AO

#4 50' FROM WELL L1053696-04 Solid

Collected by
Shawn Crane

Collected date/time
12/12/18 14:19

Received date/time
12/15/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1212274	1	12/20/18 17:07	12/20/18 17:07	CCE
Calculated Results	WG1211910	1	12/18/18 15:44	12/19/18 09:30	TRB
Wet Chemistry by Method 3060A/7196A	WG1211902	1	12/17/18 08:42	12/17/18 12:25	EEM
Wet Chemistry by Method 9045D	WG1213098	1	12/19/18 10:30	12/19/18 13:43	KBW
Wet Chemistry by Method 9050AMod	WG1212538	1	12/19/18 13:27	12/19/18 14:57	MJA
Mercury by Method 7471A	WG1212721	1	12/18/18 15:40	12/18/18 22:24	TCT
Metals (ICP) by Method 6010B	WG1211910	1	12/18/18 15:44	12/19/18 09:30	TRB
Volatile Organic Compounds (GC) by Method 8015/8021	WG1213945	1	12/17/18 12:20	12/20/18 17:22	DWR



#4 50' FROM WELL L1053696-04 Solid

Collected by
Shawn Crane

Collected date/time
12/12/18 14:19

Received date/time
12/15/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1214130	1	12/20/18 21:19	12/21/18 12:03	DMW
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1214162	1	12/21/18 14:19	12/22/18 08:53	DMG

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



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

#1 1' FROM WELL

Collected date/time: 12/12/18 13:52

SAMPLE RESULTS - 01

L1053696

ONE LAB. NATIONWIDE.



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.79		1	12/20/2018 17:39	WG1212274

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	5.19		1.00	1	12/19/2018 09:22	WG1211910

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	12/17/2018 12:25	WG1211902

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.90	T8	1	12/19/2018 13:43	WG1213098

Sample Narrative:

L1053696-01 WG1213098: 8.9 at 20.2C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	278		10.0	1	12/19/2018 14:57	WG1212538

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	12/18/2018 22:16	WG1212721

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.32		2.00	1	12/19/2018 09:22	WG1211910
Barium	55.8		0.500	1	12/19/2018 09:22	WG1211910
Boron	ND		10.0	1	12/19/2018 09:22	WG1211910
Cadmium	ND		0.500	1	12/19/2018 09:22	WG1211910
Chromium	5.19		1.00	1	12/19/2018 09:22	WG1211910
Copper	3.80		2.00	1	12/19/2018 09:22	WG1211910
Lead	2.50		0.500	1	12/19/2018 09:22	WG1211910
Nickel	4.44		2.00	1	12/19/2018 09:22	WG1211910
Selenium	ND		2.00	1	12/19/2018 09:22	WG1211910
Silver	ND		1.00	1	12/19/2018 09:22	WG1211910
Zinc	17.3		5.00	1	12/19/2018 09:22	WG1211910

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	12/20/2018 16:19	WG1213945
Toluene	ND		0.00500	1	12/20/2018 16:19	WG1213945
Ethylbenzene	ND		0.000500	1	12/20/2018 16:19	WG1213945
Total Xylene	ND		0.00150	1	12/20/2018 16:19	WG1213945

#1 1' FROM WELL

Collected date/time: 12/12/18 13:52

SAMPLE RESULTS - 01

L1053696

ONE LAB. NATIONWIDE.



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.100	1	12/20/2018 16:19	WG1213945
(S) a,a,a-Trifluorotoluene(FID)	90.3		77.0-120		12/20/2018 16:19	WG1213945
(S) a,a,a-Trifluorotoluene(PID)	99.8		72.0-128		12/20/2018 16:19	WG1213945

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	107		4.00	1	12/21/2018 12:14	WG1214130
(S) o-Terphenyl	78.6		18.0-148		12/21/2018 12:14	WG1214130

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	12/21/2018 06:41	WG1213452
Acenaphthene	ND		0.00600	1	12/21/2018 06:41	WG1213452
Acenaphthylene	ND		0.00600	1	12/21/2018 06:41	WG1213452
Benzo(a)anthracene	ND		0.00600	1	12/21/2018 06:41	WG1213452
Benzo(a)pyrene	ND		0.00600	1	12/21/2018 06:41	WG1213452
Benzo(b)fluoranthene	ND		0.00600	1	12/21/2018 06:41	WG1213452
Benzo(g,h,i)perylene	ND		0.00600	1	12/21/2018 06:41	WG1213452
Benzo(k)fluoranthene	ND		0.00600	1	12/21/2018 06:41	WG1213452
Chrysene	ND		0.00600	1	12/21/2018 06:41	WG1213452
Dibenz(a,h)anthracene	ND		0.00600	1	12/21/2018 06:41	WG1213452
Fluoranthene	ND		0.00600	1	12/21/2018 06:41	WG1213452
Fluorene	ND		0.00600	1	12/21/2018 06:41	WG1213452
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	12/21/2018 06:41	WG1213452
Naphthalene	ND		0.0200	1	12/21/2018 06:41	WG1213452
Phenanthrene	ND		0.00600	1	12/21/2018 06:41	WG1213452
Pyrene	ND		0.00600	1	12/21/2018 06:41	WG1213452
1-Methylnaphthalene	ND		0.0200	1	12/21/2018 06:41	WG1213452
2-Methylnaphthalene	ND		0.0200	1	12/21/2018 06:41	WG1213452
2-Chloronaphthalene	ND		0.0200	1	12/21/2018 06:41	WG1213452
(S) p-Terphenyl-d14	69.9		23.0-120		12/21/2018 06:41	WG1213452
(S) Nitrobenzene-d5	57.5		14.0-149		12/21/2018 06:41	WG1213452
(S) 2-Fluorobiphenyl	52.5		34.0-125		12/21/2018 06:41	WG1213452

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	3.44		1	12/20/2018 17:02	WG1212274

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	5.60		1.00	1	12/19/2018 09:25	WG1211910

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	12/17/2018 12:25	WG1211902

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.61	T8	1	12/19/2018 13:43	WG1213098

Sample Narrative:

L1053696-02 WG1213098: 8.61 at 20.1C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	671		10.0	1	12/19/2018 14:57	WG1212538

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	12/18/2018 22:19	WG1212721

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.94		2.00	1	12/19/2018 09:25	WG1211910
Barium	66.3		0.500	1	12/19/2018 09:25	WG1211910
Boron	ND		10.0	1	12/19/2018 09:25	WG1211910
Cadmium	ND		0.500	1	12/19/2018 09:25	WG1211910
Chromium	5.60		1.00	1	12/19/2018 09:25	WG1211910
Copper	2.95		2.00	1	12/19/2018 09:25	WG1211910
Lead	2.11		0.500	1	12/19/2018 09:25	WG1211910
Nickel	4.70		2.00	1	12/19/2018 09:25	WG1211910
Selenium	ND		2.00	1	12/19/2018 09:25	WG1211910
Silver	ND		1.00	1	12/19/2018 09:25	WG1211910
Zinc	12.3		5.00	1	12/19/2018 09:25	WG1211910

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	12/20/2018 16:40	WG1213945
Toluene	ND		0.00500	1	12/20/2018 16:40	WG1213945
Ethylbenzene	ND		0.000500	1	12/20/2018 16:40	WG1213945
Total Xylene	ND		0.00150	1	12/20/2018 16:40	WG1213945

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

#2 3' FROM WELL

Collected date/time: 12/12/18 13:59

SAMPLE RESULTS - 02

L1053696

ONE LAB. NATIONWIDE.



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.100	1	12/20/2018 16:40	WG1213945
(S) a,a,a-Trifluorotoluene(FID)	90.3		77.0-120		12/20/2018 16:40	WG1213945
(S) a,a,a-Trifluorotoluene(PID)	101		72.0-128		12/20/2018 16:40	WG1213945

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	50.1		4.00	1	12/21/2018 13:14	WG1214130
(S) o-Terphenyl	79.7		18.0-148		12/21/2018 13:14	WG1214130

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	12/21/2018 07:03	WG1213452
Acenaphthene	ND		0.00600	1	12/21/2018 07:03	WG1213452
Acenaphthylene	ND		0.00600	1	12/21/2018 07:03	WG1213452
Benzo(a)anthracene	ND		0.00600	1	12/21/2018 07:03	WG1213452
Benzo(a)pyrene	ND		0.00600	1	12/21/2018 07:03	WG1213452
Benzo(b)fluoranthene	ND		0.00600	1	12/21/2018 07:03	WG1213452
Benzo(g,h,i)perylene	ND		0.00600	1	12/21/2018 07:03	WG1213452
Benzo(k)fluoranthene	ND		0.00600	1	12/21/2018 07:03	WG1213452
Chrysene	ND		0.00600	1	12/21/2018 07:03	WG1213452
Dibenz(a,h)anthracene	ND		0.00600	1	12/21/2018 07:03	WG1213452
Fluoranthene	ND		0.00600	1	12/21/2018 07:03	WG1213452
Fluorene	ND		0.00600	1	12/21/2018 07:03	WG1213452
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	12/21/2018 07:03	WG1213452
Naphthalene	ND		0.0200	1	12/21/2018 07:03	WG1213452
Phenanthrene	ND		0.00600	1	12/21/2018 07:03	WG1213452
Pyrene	ND		0.00600	1	12/21/2018 07:03	WG1213452
1-Methylnaphthalene	ND		0.0200	1	12/21/2018 07:03	WG1213452
2-Methylnaphthalene	ND		0.0200	1	12/21/2018 07:03	WG1213452
2-Chloronaphthalene	ND		0.0200	1	12/21/2018 07:03	WG1213452
(S) p-Terphenyl-d14	73.1		23.0-120		12/21/2018 07:03	WG1213452
(S) Nitrobenzene-d5	65.0		14.0-149		12/21/2018 07:03	WG1213452
(S) 2-Fluorobiphenyl	61.7		34.0-125		12/21/2018 07:03	WG1213452

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

#3 10' FROM WELL

Collected date/time: 12/12/18 14:07

SAMPLE RESULTS - 03

L1053696

ONE LAB. NATIONWIDE.



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	5.79		1	12/20/2018 17:05	WG1212274

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	4.83		1.00	1	12/19/2018 09:28	WG1211910

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	12/17/2018 12:25	WG1211902

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.43	T8	1	12/19/2018 13:43	WG1213098

Sample Narrative:

L1053696-03 WG1213098: 8.43 at 20.1C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	1820		10.0	1	12/19/2018 14:57	WG1212538

Mercury by Method 7471A

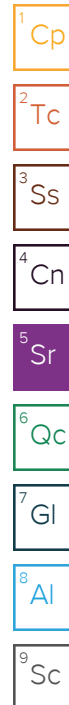
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	12/18/2018 22:21	WG1212721

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.33		2.00	1	12/19/2018 09:28	WG1211910
Barium	69.2		0.500	1	12/19/2018 09:28	WG1211910
Boron	ND		10.0	1	12/19/2018 09:28	WG1211910
Cadmium	ND		0.500	1	12/19/2018 09:28	WG1211910
Chromium	4.83		1.00	1	12/19/2018 09:28	WG1211910
Copper	3.85		2.00	1	12/19/2018 09:28	WG1211910
Lead	2.93		0.500	1	12/19/2018 09:28	WG1211910
Nickel	5.23		2.00	1	12/19/2018 09:28	WG1211910
Selenium	ND		2.00	1	12/19/2018 09:28	WG1211910
Silver	ND		1.00	1	12/19/2018 09:28	WG1211910
Zinc	16.3		5.00	1	12/19/2018 09:28	WG1211910

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	12/20/2018 17:01	WG1213945
Toluene	ND		0.00500	1	12/20/2018 17:01	WG1213945
Ethylbenzene	ND		0.000500	1	12/20/2018 17:01	WG1213945
Total Xylene	ND		0.00150	1	12/20/2018 17:01	WG1213945





Collected date/time: 12/12/18 14:07

L1053696

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.100	1	12/20/2018 17:01	WG1213945
(S) a,a,a-Trifluorotoluene(FID)	90.1		77.0-120		12/20/2018 17:01	WG1213945
(S) a,a,a-Trifluorotoluene(PID)	100		72.0-128		12/20/2018 17:01	WG1213945

1 Cp

2 Tc

3 Ss

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	70.0		4.00	1	12/21/2018 12:26	WG1214130
(S) o-Terphenyl	71.1		18.0-148		12/21/2018 12:26	WG1214130

4 Cn

5 Sr

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	12/21/2018 07:24	WG1213452
Acenaphthene	ND		0.00600	1	12/21/2018 07:24	WG1213452
Acenaphthylene	ND		0.00600	1	12/21/2018 07:24	WG1213452
Benzo(a)anthracene	ND		0.00600	1	12/21/2018 07:24	WG1213452
Benzo(a)pyrene	ND		0.00600	1	12/21/2018 07:24	WG1213452
Benzo(b)fluoranthene	ND		0.00600	1	12/21/2018 07:24	WG1213452
Benzo(g,h,i)perylene	ND		0.00600	1	12/21/2018 07:24	WG1213452
Benzo(k)fluoranthene	ND		0.00600	1	12/21/2018 07:24	WG1213452
Chrysene	ND		0.00600	1	12/21/2018 07:24	WG1213452
Dibenz(a,h)anthracene	ND		0.00600	1	12/21/2018 07:24	WG1213452
Fluoranthene	ND		0.00600	1	12/21/2018 07:24	WG1213452
Fluorene	ND		0.00600	1	12/21/2018 07:24	WG1213452
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	12/21/2018 07:24	WG1213452
Naphthalene	ND		0.0200	1	12/21/2018 07:24	WG1213452
Phenanthrene	ND		0.00600	1	12/21/2018 07:24	WG1213452
Pyrene	ND		0.00600	1	12/21/2018 07:24	WG1213452
1-Methylnaphthalene	ND		0.0200	1	12/21/2018 07:24	WG1213452
2-Methylnaphthalene	ND		0.0200	1	12/21/2018 07:24	WG1213452
2-Chloronaphthalene	ND		0.0200	1	12/21/2018 07:24	WG1213452
(S) p-Terphenyl-d14	73.0		23.0-120		12/21/2018 07:24	WG1213452
(S) Nitrobenzene-d5	72.5		14.0-149		12/21/2018 07:24	WG1213452
(S) 2-Fluorobiphenyl	66.5		34.0-125		12/21/2018 07:24	WG1213452

6 Qc

7 Gl

8 Al

9 Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.102		1	12/20/2018 17:07	WG1212274

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	6.01		1.00	1	12/19/2018 09:30	WG1211910

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	12/17/2018 12:25	WG1211902

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.28	T8	1	12/19/2018 13:43	WG1213098

Sample Narrative:

L1053696-04 WG1213098: 8.28 at 19.8C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	361		10.0	1	12/19/2018 14:57	WG1212538

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	12/18/2018 22:24	WG1212721

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	ND		2.00	1	12/19/2018 09:30	WG1211910
Barium	42.1		0.500	1	12/19/2018 09:30	WG1211910
Boron	ND		10.0	1	12/19/2018 09:30	WG1211910
Cadmium	ND		0.500	1	12/19/2018 09:30	WG1211910
Chromium	6.01		1.00	1	12/19/2018 09:30	WG1211910
Copper	3.82		2.00	1	12/19/2018 09:30	WG1211910
Lead	3.47		0.500	1	12/19/2018 09:30	WG1211910
Nickel	4.18		2.00	1	12/19/2018 09:30	WG1211910
Selenium	ND		2.00	1	12/19/2018 09:30	WG1211910
Silver	ND		1.00	1	12/19/2018 09:30	WG1211910
Zinc	16.9		5.00	1	12/19/2018 09:30	WG1211910

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	12/20/2018 17:22	WG1213945
Toluene	ND		0.00500	1	12/20/2018 17:22	WG1213945
Ethylbenzene	ND		0.000500	1	12/20/2018 17:22	WG1213945
Total Xylene	ND		0.00150	1	12/20/2018 17:22	WG1213945



Collected date/time: 12/12/18 14:19

L1053696

Volatile Organic Compounds (GC) by Method 8015/8021

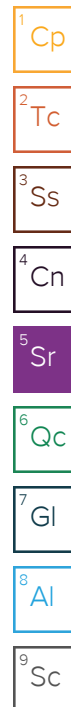
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.100	1	12/20/2018 17:22	WG1213945
(S) a,a,a-Trifluorotoluene(FID)	91.1		77.0-120		12/20/2018 17:22	WG1213945
(S) a,a,a-Trifluorotoluene(PID)	101		72.0-128		12/20/2018 17:22	WG1213945

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	11.0		4.00	1	12/21/2018 12:03	WG1214130
(S) o-Terphenyl	83.9		18.0-148		12/21/2018 12:03	WG1214130

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	12/22/2018 08:53	WG1214162
Acenaphthene	ND		0.00600	1	12/22/2018 08:53	WG1214162
Acenaphthylene	ND		0.00600	1	12/22/2018 08:53	WG1214162
Benzo(a)anthracene	ND		0.00600	1	12/22/2018 08:53	WG1214162
Benzo(a)pyrene	ND		0.00600	1	12/22/2018 08:53	WG1214162
Benzo(b)fluoranthene	ND		0.00600	1	12/22/2018 08:53	WG1214162
Benzo(g,h,i)perylene	ND		0.00600	1	12/22/2018 08:53	WG1214162
Benzo(k)fluoranthene	ND		0.00600	1	12/22/2018 08:53	WG1214162
Chrysene	ND		0.00600	1	12/22/2018 08:53	WG1214162
Dibenz(a,h)anthracene	ND		0.00600	1	12/22/2018 08:53	WG1214162
Fluoranthene	ND		0.00600	1	12/22/2018 08:53	WG1214162
Fluorene	ND		0.00600	1	12/22/2018 08:53	WG1214162
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	12/22/2018 08:53	WG1214162
Naphthalene	ND		0.0200	1	12/22/2018 08:53	WG1214162
Phenanthrene	ND		0.00600	1	12/22/2018 08:53	WG1214162
Pyrene	ND		0.00600	1	12/22/2018 08:53	WG1214162
1-Methylnaphthalene	ND		0.0200	1	12/22/2018 08:53	WG1214162
2-Methylnaphthalene	ND		0.0200	1	12/22/2018 08:53	WG1214162
2-Chloronaphthalene	ND		0.0200	1	12/22/2018 08:53	WG1214162
(S) p-Terphenyl-d14	69.3		23.0-120		12/22/2018 08:53	WG1214162
(S) Nitrobenzene-d5	68.9		14.0-149		12/22/2018 08:53	WG1214162
(S) 2-Fluorobiphenyl	81.7		34.0-125		12/22/2018 08:53	WG1214162





Method Blank (MB)

(MB) R3368811-1 12/17/18 12:17

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

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L1052582-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1052582-01 12/17/18 12:19 • (DUP) R3368811-3 12/17/18 12:20

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Chromium,Hexavalent	ND	0.000	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3368811-2 12/17/18 12:17

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Chromium,Hexavalent	24.0	24.4	102	80.0-120	

L1052582-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1052582-02 12/17/18 12:20 • (MS) R3368811-4 12/17/18 12:20 • (MSD) R3368811-5 12/17/18 12:21

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Chromium,Hexavalent	20.0	ND	9.40	8.36	47.0	41.8	1	75.0-125	J6	J6	11.7	20

L1052582-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1052582-02 12/17/18 12:20 • (MS) R3368811-7 12/17/18 12:22

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Chromium,Hexavalent	682	ND	609	89.3	50	75.0-125	

L1053636-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1053636-03 12/19/18 13:43 • (DUP) R3369636-2 12/19/18 13:43

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.52	8.56	1	0.468		1

Sample Narrative:
OS: 8.52 at 20.4C
DUP: 8.56 at 19.2C

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1054207-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1054207-01 12/19/18 13:43 • (DUP) R3369636-3 12/19/18 13:43

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.83	7.72	1	1.41	J3	1

Sample Narrative:
OS: 7.83 at 20C
DUP: 7.72 at 19.5C

Laboratory Control Sample (LCS)

(LCS) R3369636-1 12/19/18 13:43

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	9.96	99.6	99.0-101	

Sample Narrative:
LCS: 9.96 at 18.6C

Method Blank (MB)

(MB) R3369684-1 12/19/18 14:57

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

L1053530-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1053530-01 12/19/18 14:57 • (DUP) R3369684-3 12/19/18 14:57

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	391	369	1	5.79		20

L1054032-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1054032-02 12/19/18 14:57 • (DUP) R3369684-4 12/19/18 14:57

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	201	204	1	1.53		20

Laboratory Control Sample (LCS)

(LCS) R3369684-2 12/19/18 14:57

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	877	874	99.7	90.0-110	



Method Blank (MB)

(MB) R3369392-1 12/18/18 21:37

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Mercury	U		0.00280	0.0200

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

(LCS) R3369392-2 12/18/18 21:40 • (LCSD) R3369392-3 12/18/18 21:43

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Mercury	0.300	0.295	0.287	98.2	95.5	80.0-120			2.76	20

L1053735-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1053735-02 12/18/18 21:45 • (MS) R3369392-4 12/18/18 21:48 • (MSD) R3369392-5 12/18/18 21:50

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Mercury	0.300	ND	0.309	0.300	99.5	96.5	1	75.0-125			3.02	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3369536-1 12/19/18 08:20

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.460	2.00
Barium	U		0.170	0.500
Boron	U		1.26	10.0
Cadmium	U		0.0700	0.500
Chromium	U		0.140	1.00
Copper	U		0.530	2.00
Lead	U		0.190	0.500
Nickel	U		0.490	2.00
Selenium	U		0.620	2.00
Silver	U		0.120	1.00
Zinc	U		0.590	5.00

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

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

(LCS) R3369536-2 12/19/18 08:22 • (LCSD) R3369536-3 12/19/18 08:25

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 %
Arsenic	100	96.2	96.1	96.2	96.1	80.0-120			0.109	20
Barium	100	99.8	99.9	99.8	99.9	80.0-120			0.157	20
Boron	100	94.1	95.3	94.1	95.3	80.0-120			1.30	20
Cadmium	100	98.2	98.9	98.2	98.9	80.0-120			0.772	20
Chromium	100	99.6	99.5	99.6	99.5	80.0-120			0.128	20
Copper	100	95.1	95.2	95.1	95.2	80.0-120			0.124	20
Lead	100	94.8	96.0	94.8	96.0	80.0-120			1.25	20
Nickel	100	98.9	99.2	98.9	99.2	80.0-120			0.257	20
Selenium	100	96.9	97.3	96.9	97.3	80.0-120			0.457	20
Silver	20.0	19.2	19.3	95.8	96.5	80.0-120			0.780	20
Zinc	100	98.6	99.1	98.6	99.1	80.0-120			0.472	20

L1052994-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1052994-01 12/19/18 08:27 • (MS) R3369536-6 12/19/18 08:34 • (MSD) R3369536-7 12/19/18 08:37

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 %
Arsenic	128	9.76	128	137	92.5	99.7	1	75.0-125			6.97	20
Barium	128	173	298	299	97.6	99.0	1	75.0-125			0.584	20
Boron	128	2.83	115	127	88.1	97.3	1	75.0-125			9.73	20
Cadmium	128	0.126	123	135	96.2	105	1	75.0-125			9.06	20



[L1053696-01,02,03,04](#)

L1052994-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1052994-01 12/19/18 08:27 • (MS) R3369536-6 12/19/18 08:34 • (MSD) R3369536-7 12/19/18 08:37

	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Chromium	128	62.6	181	201	92.4	108	1	75.0-125			10.7	20
Copper	128	38.2	158	174	93.4	106	1	75.0-125			9.62	20
Lead	128	40.9	187	177	114	106	1	75.0-125			5.33	20
Nickel	128	57.8	183	205	97.8	116	1	75.0-125			11.7	20
Selenium	128	U	118	130	92.6	102	1	75.0-125			9.37	20
Silver	25.6	U	23.4	25.9	91.7	101	1	75.0-125			9.88	20
Zinc	128	68.4	182	204	88.5	106	1	75.0-125			11.6	20

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Method Blank (MB)

(MB) R3370447-5 12/20/18 12:04

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	0.000137	U	0.000120	0.000500
Toluene	0.000359	U	0.000150	0.00500
Ethylbenzene	U		0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	92.6			77.0-120
(S) a,a,a-Trifluorotoluene(PID)	103			72.0-128

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) R3370447-1 12/20/18 10:18 • (LCSD) R3370447-2 12/20/18 10:39

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	0.0500	0.0444	0.0443	88.7	88.5	76.0-121			0.241	20
Toluene	0.0500	0.0462	0.0462	92.5	92.4	80.0-120			0.103	20
Ethylbenzene	0.0500	0.0477	0.0475	95.3	94.9	80.0-124			0.386	20
Total Xylene	0.150	0.142	0.141	94.5	93.9	37.0-160			0.566	20
(S) a,a,a-Trifluorotoluene(FID)				91.1	91.7	77.0-120				
(S) a,a,a-Trifluorotoluene(PID)				100	99.8	72.0-128				

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

(LCS) R3370447-3 12/20/18 11:01 • (LCSD) R3370447-4 12/20/18 11:22

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 %
TPH (GC/FID) Low Fraction	5.50	5.36	5.65	97.4	103	72.0-127			5.32	20
(S) a,a,a-Trifluorotoluene(FID)				106	107	77.0-120				
(S) a,a,a-Trifluorotoluene(PID)				116	116	72.0-128				



Method Blank (MB)

(MB) R3370472-1 12/21/18 10:28

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	78.5			18.0-148

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

(LCS) R3370472-2 12/21/18 10:40 • (LCSD) R3370472-3 12/21/18 10:52

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	45.3	42.3	90.6	84.6	50.0-150			6.85	20
(S) o-Terphenyl				102	93.1	18.0-148				

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) R3370344-3 12/20/18 23:31

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	96.8			14.0-149
(S) 2-Fluorobiphenyl	78.7			34.0-125
(S) p-Terphenyl-d14	85.9			23.0-120

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) R3370344-1 12/20/18 22:48 • (LCSD) R3370344-2 12/20/18 23:09

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	0.0659	0.0695	82.4	86.9	50.0-126			5.32	20
Acenaphthene	0.0800	0.0661	0.0674	82.6	84.3	50.0-120			1.95	20
Acenaphthylene	0.0800	0.0644	0.0664	80.5	83.0	50.0-120			3.06	20
Benzo(a)anthracene	0.0800	0.0648	0.0656	81.0	82.0	45.0-120			1.23	20
Benzo(a)pyrene	0.0800	0.0560	0.0555	70.0	69.4	42.0-120			0.897	20
Benzo(b)fluoranthene	0.0800	0.0606	0.0619	75.8	77.4	42.0-121			2.12	20
Benzo(g,h,i)perylene	0.0800	0.0693	0.0690	86.6	86.3	45.0-125			0.434	20
Benzo(k)fluoranthene	0.0800	0.0740	0.0734	92.5	91.8	49.0-125			0.814	20
Chrysene	0.0800	0.0646	0.0732	80.7	91.5	49.0-122			12.5	20
Dibenz(a,h)anthracene	0.0800	0.0743	0.0686	92.9	85.8	47.0-125			7.98	20
Fluoranthene	0.0800	0.0742	0.0735	92.8	91.9	49.0-129			0.948	20

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

(LCS) R3370344-1 12/20/18 22:48 • (LCSD) R3370344-2 12/20/18 23:09

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
Fluorene	0.0800	0.0724	0.0654	90.5	81.8	49.0-120			10.2	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0723	0.0667	90.4	83.4	46.0-125			8.06	20
Naphthalene	0.0800	0.0612	0.0641	76.5	80.1	50.0-120			4.63	20
Phenanthrene	0.0800	0.0651	0.0664	81.4	83.0	47.0-120			1.98	20
Pyrene	0.0800	0.0623	0.0608	77.9	76.0	43.0-123			2.44	20
1-Methylnaphthalene	0.0800	0.0692	0.0676	86.5	84.5	51.0-121			2.34	20
2-Methylnaphthalene	0.0800	0.0670	0.0622	83.8	77.8	50.0-120			7.43	20
2-Chloronaphthalene	0.0800	0.0647	0.0627	80.9	78.4	50.0-120			3.14	20
(S) Nitrobenzene-d5				89.2	92.7	14.0-149				
(S) 2-Fluorobiphenyl				79.0	77.0	34.0-125				
(S) p-Terphenyl-d14				79.6	80.0	23.0-120				

L1053661-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1053661-05 12/21/18 04:53 • (MS) R3370344-4 12/21/18 05:15 • (MSD) R3370344-5 12/21/18 05:36

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Anthracene	0.0800	U	0.0595	0.0571	74.4	71.4	1	10.0-145			4.12	30
Acenaphthene	0.0800	U	0.0551	0.0568	68.9	71.0	1	14.0-127			3.04	27
Acenaphthylene	0.0800	U	0.0534	0.0540	66.8	67.5	1	21.0-124			1.12	25
Benzo(a)anthracene	0.0800	U	0.0544	0.0541	68.0	67.6	1	10.0-139			0.553	30
Benzo(a)pyrene	0.0800	U	0.0547	0.0586	68.4	73.3	1	10.0-141			6.88	31
Benzo(b)fluoranthene	0.0800	U	0.0469	0.0531	58.6	66.4	1	10.0-140			12.4	36
Benzo(g,h,i)perylene	0.0800	U	0.0547	0.0588	68.4	73.5	1	10.0-140			7.22	33
Benzo(k)fluoranthene	0.0800	U	0.0636	0.0612	79.5	76.5	1	10.0-137			3.85	31
Chrysene	0.0800	U	0.0573	0.0598	71.6	74.8	1	10.0-145			4.27	30
Dibenz(a,h)anthracene	0.0800	U	0.0583	0.0603	72.9	75.4	1	10.0-132			3.37	31
Fluoranthene	0.0800	U	0.0609	0.0603	76.1	75.4	1	10.0-153			0.990	33
Fluorene	0.0800	U	0.0565	0.0561	70.6	70.1	1	11.0-130			0.710	29
Indeno(1,2,3-cd)pyrene	0.0800	U	0.0576	0.0588	72.0	73.5	1	10.0-137			2.06	32
Naphthalene	0.0800	U	0.0496	0.0527	62.0	65.9	1	10.0-135			6.06	27
Phenanthrene	0.0800	U	0.0549	0.0549	68.6	68.6	1	10.0-144			0.000	31
Pyrene	0.0800	U	0.0508	0.0532	63.5	66.5	1	10.0-148			4.62	35
1-Methylnaphthalene	0.0800	U	0.0532	0.0572	66.5	71.5	1	10.0-142			7.25	28
2-Methylnaphthalene	0.0800	U	0.0508	0.0540	63.5	67.5	1	10.0-137			6.11	28
2-Chloronaphthalene	0.0800	U	0.0533	0.0541	66.6	67.6	1	29.0-120			1.49	24
(S) Nitrobenzene-d5					71.8	70.1		14.0-149				
(S) 2-Fluorobiphenyl					64.7	63.1		34.0-125				
(S) p-Terphenyl-d14					66.5	65.5		23.0-120				

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc



Method Blank (MB)

(MB) R3370640-3 12/22/18 08:11

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	74.6			14.0-149
(S) 2-Fluorobiphenyl	90.8			34.0-125
(S) p-Terphenyl-d14	81.3			23.0-120

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) R3370640-1 12/22/18 07:29 • (LCSD) R3370640-2 12/22/18 07:50

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	0.0561	0.0544	70.1	68.0	50.0-126			3.08	20
Acenaphthene	0.0800	0.0535	0.0510	66.9	63.8	50.0-120			4.78	20
Acenaphthylene	0.0800	0.0521	0.0499	65.1	62.4	50.0-120			4.31	20
Benzo(a)anthracene	0.0800	0.0529	0.0496	66.1	62.0	45.0-120			6.44	20
Benzo(a)pyrene	0.0800	0.0528	0.0502	66.0	62.8	42.0-120			5.05	20
Benzo(b)fluoranthene	0.0800	0.0491	0.0495	61.4	61.9	42.0-121			0.811	20
Benzo(g,h,i)perylene	0.0800	0.0559	0.0531	69.9	66.4	45.0-125			5.14	20
Benzo(k)fluoranthene	0.0800	0.0628	0.0582	78.5	72.8	49.0-125			7.60	20
Chrysene	0.0800	0.0573	0.0547	71.6	68.4	49.0-122			4.64	20
Dibenz(a,h)anthracene	0.0800	0.0552	0.0526	69.0	65.8	47.0-125			4.82	20
Fluoranthene	0.0800	0.0585	0.0563	73.1	70.4	49.0-129			3.83	20

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

(LCS) R3370640-1 12/22/18 07:29 • (LCSD) R3370640-2 12/22/18 07:50

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
Fluorene	0.0800	0.0524	0.0502	65.5	62.8	49.0-120			4.29	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0561	0.0535	70.1	66.9	46.0-125			4.74	20
Naphthalene	0.0800	0.0529	0.0513	66.1	64.1	50.0-120			3.07	20
Phenanthrene	0.0800	0.0540	0.0523	67.5	65.4	47.0-120			3.20	20
Pyrene	0.0800	0.0514	0.0489	64.3	61.1	43.0-123			4.99	20
1-Methylnaphthalene	0.0800	0.0566	0.0547	70.8	68.4	51.0-121			3.41	20
2-Methylnaphthalene	0.0800	0.0557	0.0538	69.6	67.3	50.0-120			3.47	20
2-Chloronaphthalene	0.0800	0.0574	0.0550	71.8	68.8	50.0-120			4.27	20
(S) Nitrobenzene-d5				72.3	69.7	14.0-149				
(S) 2-Fluorobiphenyl				84.9	82.0	34.0-125				
(S) p-Terphenyl-d14				75.5	71.7	23.0-120				

L1053950-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1053950-01 12/22/18 11:43 • (MS) R3370640-4 12/22/18 12:04 • (MSD) R3370640-5 12/22/18 12:25

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 %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Anthracene	0.118	ND	0.0802	0.0820	64.6	66.1	1	10.0-145			2.18	30
Acenaphthene	0.118	ND	0.0528	0.0574	44.9	48.8	1	14.0-127			8.28	27
Acenaphthylene	0.118	ND	0.0671	0.0698	51.9	54.2	1	21.0-124			3.87	25
Benzo(a)anthracene	0.118	ND	0.0595	0.0740	47.6	60.0	1	10.0-139			21.8	30
Benzo(a)pyrene	0.118	ND	0.0590	0.0717	50.1	60.9	1	10.0-141			19.4	31
Benzo(b)fluoranthene	0.118	ND	0.0528	0.0683	44.9	58.0	1	10.0-140			25.5	36
Benzo(g,h,i)perylene	0.118	ND	0.0568	0.0696	48.3	59.1	1	10.0-140			20.3	33
Benzo(k)fluoranthene	0.118	ND	0.0598	0.0683	50.8	58.0	1	10.0-137			13.3	31
Chrysene	0.118	ND	0.0702	0.0777	59.6	66.0	1	10.0-145			10.1	30
Dibenz(a,h)anthracene	0.118	ND	0.0576	0.0718	48.9	61.0	1	10.0-132			22.1	31
Fluoranthene	0.118	ND	0.0562	0.0629	47.8	53.4	1	10.0-153			11.1	33
Fluorene	0.118	ND	0.0412	0.0679	35.0	57.6	1	11.0-130		J3	48.9	29
Indeno(1,2,3-cd)pyrene	0.118	ND	0.0580	0.0711	49.3	60.4	1	10.0-137			20.3	32
Naphthalene	0.118	ND	0.0699	0.0760	59.4	64.5	1	10.0-135			8.27	27
Phenanthrene	0.118	ND	0.0654	0.0764	55.5	64.9	1	10.0-144			15.6	31
Pyrene	0.118	0.0115	0.0849	0.0941	62.4	70.1	1	10.0-148			10.2	35
1-Methylnaphthalene	0.118	ND	0.0704	0.0755	59.8	64.1	1	10.0-142			7.06	28
2-Methylnaphthalene	0.118	ND	0.0693	0.0746	58.9	63.4	1	10.0-137			7.36	28
2-Chloronaphthalene	0.118	ND	0.0558	0.0587	47.4	49.9	1	29.0-120			5.14	24
(S) Nitrobenzene-d5					100	107		14.0-149				
(S) 2-Fluorobiphenyl					60.8	61.4		34.0-125				
(S) p-Terphenyl-d14					58.2	62.7		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.
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.

Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

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 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	T 104704245-17-14
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.



