



Nicholson GeoSolutions LLC

3433 East Lake Drive
Centennial, CO 80121

July 28, 2021

Mr. Jon Armstrong
Berry Petroleum Company
5201 Truxtun Avenue #100
Bakersfield, CA 90399

Subject: O-29 Landfarm Final Discrete Sampling Results

Dear Jon:

Nicholson GeoSolutions LLC conducted final discrete soil sampling of the landfarm on the O-29 well pad in the Garden Gulch area, Garfield County, Colorado on July 10th, 2021. The sampling was conducted in accordance with the new COGCC Series 900 Rules that are in effect as of January 15, 2021 and discussions with COGCC personnel.

This landfarm has been extensively tilled. The final landfarm contained an estimated 7,000 cubic yards of material and averaged about 12 inches deep at the time of sampling. 14 discrete soil samples were collected. The locations of the samples are shown on Figure 1. Ten samples were analyzed for PAHs only (the only remaining COCs in the landfarm soil) and four samples were analyzed for the entire Table 915-1 list of parameters to demonstrate compliance with the new Rules. The Table 915-1 list includes Total Volatile Petroleum Hydrocarbons (TVPH – gasoline range), Total Extractable Petroleum Hydrocarbons (TEPH – diesel and motor oil range), BTEX (benzene, toluene, ethylbenzene, and xylenes), sodium adsorption ratio (SAR), pH, conductivity, metals, PAHs, and selected VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene).

Table 1 provides a summary of the analytical results for the 14 samples. The laboratory report is contained in Appendix A. All results were below the Table 915-1 standards except arsenic for four samples and hexavalent chromium for one sample. Arsenic ranged from 6.65 mg/kg to 11.6 mg/kg, within the range of natural background concentrations for the Garden Gulch area (Nicholson 2014). Hexavalent chromium was reported at 2.56 mg/kg for sample O29-13. This result is anomalous as hexavalent chromium has never been detected before in samples from the landfarms.

Based on the sample results, remediation of the O-29 landfarm is now complete. Since all SAR, pH, and conductivity values are below the Table 915-1 standards for all samples, this material does not need to be buried and can be used for general site purposes pending COGCC approval.

Nicholson GeoSolutions LLC

A handwritten signature in blue ink that reads "DK Nicholson". The signature is fluid and cursive, with the initials "DK" being prominent.

David K. Nicholson, P.G.
Principal Geologist

Reference

Nicholson GeoSolutions LLC, 2014, Analysis of Background Arsenic Concentrations for the Garden Gulch, Old Mountain, and Long Ridge Areas, Garfield County, Colorado. Prepared for Berry Petroleum Company, February 24, 2014

Table 1 O-29 Landfarm Sample Results – July 10, 2021

		Sample ID				
Parameter	Table 915-1 Standards	O29-1	O29-2	O29-3	O29-4	O29-5
Contaminants of Concern						
TVPH – gasoline range	500 ¹	0.108	NA	NA	<0.1	NA
TEPH – diesel/motor oil range		83.7	NA	NA	143.9	NA
Soil Suitability for Reclamation						
sp. conductance (mmhos/cm)	<4	0.285	NA	NA	0.304	NA
SAR (ratio)	<6	0.904	NA	NA	0.786	NA
pH (standard units)	6-8.3	8.07	NA	NA	7.86	NA
boron (hot water extract)	2.0	<2.0	NA	NA	0.228	NA
Organic Compounds in Soils						
benzene	1.2	<0.001	NA	NA	<0.001	NA
toluene	490	<0.005	NA	NA	<0.005	NA
ethylbenzene	5.8	<0.0025	NA	NA	<0.0025	NA
xylene	58	<0.0065	NA	NA	<0.0065	NA
1,2,4-trimethylbenzene	30	<0.005	NA	NA	<0.005	NA
1,3,5-trimethylbenzene	27	<0.005	NA	NA	<0.005	NA
acenaphthene	360	<0.006	<0.006	<0.006	<0.006	<0.006
anthracene	1800	<0.006	<0.006	<0.006	<0.006	<0.006
benzo(a)anthracene	1.1	<0.006	0.042	0.037	0.0396	0.0395
benzo(b)flouranthene	1.1	0.0176	0.125	0.0886	0.114	0.107
benzo(k)flouranthene	11	<0.006	0.0281	0.0221	0.0252	0.0231
benzo(a)pyrene	0.11	0.00624	0.0416	0.0347	0.0383	0.0365
chrysene	110	0.00665	0.0519	0.0433	0.0463	0.0443
dibenz(a,h)anthracene	0.11	<0.006	0.0159	0.0111	0.0138	0.0132
fluoranthene	240	0.00727	0.0509	0.0549	0.0495	0.0511
flourene	240	<0.006	0.00607	<0.006	<0.006	<0.006
indeno(1,2,3-cd)pyrene	1.1	0.00948	0.0612	0.0421	0.0536	0.0508
1-methylnaphthalene	18	<0.02	0.0517	0.0327	0.0382	0.0367
2-methylnaphthalene	24	0.0203	0.0941	0.0645	0.0724	0.0709
naphthalene	2	<0.02	0.0598	0.0398	0.0464	0.0453
pyrene	180	<0.006	0.0385	0.0404	0.0362	0.0392
Metals in Soils						
arsenic	0.68	6.65	NA	NA	11.6	NA
barium	15,000	234	NA	NA	345	NA
cadmium	71	<0.5	NA	NA	<0.5	NA
chromium VI	0.3	<2	NA	NA	<2	NA
copper	3,100	17.3	NA	NA	33.1	NA
lead	400	13.5	NA	NA	25.3	NA
nickel	1,500	19.3	NA	NA	18.6	NA
selenium	390	<2	NA	NA	<2	NA
silver	390	<1	NA	NA	<1	NA
zinc	23,000	53.4	NA	NA	72.0	NA

¹The standard is 500 for the combined total of TVPH and TEPH NA = not analyzed

Values in bold type exceed standards

All units and standards in mg/kg except where indicated

Table 1 O-29 Landfarm Sample Results – July 10, 2021

		Sample ID				
Parameter	Table 915-1 Standards	O29-6	O29-7	O29-8	O29-9	O29-10
Contaminants of Concern						
TVPH – gasoline range	500 ¹	NA	NA	NA	<0.1	NA
TEPH – diesel/motor oil range		NA	NA	NA	82.4	NA
Soil Suitability for Reclamation						
sp. conductance (mmhos/cm)	<4	NA	NA	NA	0.289	NA
SAR (ratio)	<6	NA	NA	NA	0.725	NA
pH (standard units)	6-8.3	NA	NA	NA	7.96	NA
boron (hot water extract)	2.0	NA	NA	NA	0.218	NA
Organic Compounds in Soils						
benzene	1.2	NA	NA	NA	<0.001	NA
toluene	490	NA	NA	NA	<0.005	NA
ethylbenzene	5.8	NA	NA	NA	<0.0025	NA
xylenes	58	NA	NA	NA	<0.0065	NA
1,2,4-trimethylbenzene	30	NA	NA	NA	<0.005	NA
1,3,5-trimethylbenzene	27	NA	NA	NA	<0.005	NA
acenaphthene	360	<0.006	<0.006	<0.006	<0.006	<0.006
anthracene	1800	<0.006	<0.006	<0.006	<0.006	<0.006
benzo(a)anthracene	1.1	0.0437	0.0309	0.0438	<0.006	0.0132
benzo(b)flouranthene	1.1	0.112	0.0788	0.119	<0.006	0.0365
benzo(k)flouranthene	11	0.0258	0.0185	0.0279	<0.006	0.00789
benzo(a)pyrene	0.11	0.041	0.0287	0.043	<0.006	0.0125
chrysene	110	0.0432	0.0349	0.0468	<0.006	0.0161
dibenz(a,h)anthracene	0.11	0.0137	0.00956	0.0155	<0.006	<0.006
fluoranthene	240	0.0524	0.0405	0.0516	<0.006	0.0169
flourene	240	<0.006	<0.006	0.00655	<0.006	<0.006
indeno(1,2,3-cd)pyrene	1.1	0.0543	0.0376	0.0603	<0.006	0.0181
1-methylnaphthalene	18	0.0378	0.0309	0.0484	<0.02	0.0468
2-methylnaphthalene	24	0.0777	0.0555	0.085	<0.02	0.0725
naphthalene	2	0.0456	0.034	0.0511	<0.02	0.0425
pyrene	180	0.0414	0.0314	0.0402	<0.006	0.0129
Metals in Soils						
arsenic	0.68	NA	NA	NA	6.85	NA
barium	15,000	NA	NA	NA	263	NA
cadmium	71	NA	NA	NA	<0.5	NA
chromium VI	0.3	NA	NA	NA	<2	NA
copper	3,100	NA	NA	NA	27.5	NA
lead	400	NA	NA	NA	18.7	NA
nickel	1,500	NA	NA	NA	12.7	NA
selenium	390	NA	NA	NA	<2	NA
silver	390	NA	NA	NA	<1	NA
zinc	23,000	NA	NA	NA	58.2	NA

¹The standard is 500 for the combined total of TVPH and TEPH NA = not analyzed

Values in bold type exceed standards

All units and standards in mg/kg except where indicated

Table 1 O-29 Landfarm Sample Results – July 10, 2021

		Sample ID			
Parameter	Table 915-1 Standards	O29-11	O29-12	O29-13	O29-14
Contaminants of Concern					
TVPH – gasoline range	500 ¹	NA	NA	<0.1	NA
TEPH – diesel/motor oil range		NA	NA	105.4	NA
Soil Suitability for Reclamation					
sp. conductance (mmhos/cm)	<4	NA	NA	0.257	NA
SAR (ratio)	<6	NA	NA	0.433	NA
pH (standard units)	6-8.3	NA	NA	8.10	NA
boron (hot water extract)	2.0	NA	NA	0.201	NA
Organic Compounds in Soils					
benzene	1.2	NA	NA	<0.001	NA
toluene	490	NA	NA	<0.005	NA
ethylbenzene	5.8	NA	NA	<0.0025	NA
xylenes	58	NA	NA	<0.0065	NA
1,2,4-trimethylbenzene	30	NA	NA	<0.005	NA
1,3,5-trimethylbenzene	27	NA	NA	<0.005	NA
acenaphthene	360	<0.006	<0.006	<0.006	<0.006
anthracene	1800	<0.006	<0.006	<0.006	<0.006
benzo(a)anthracene	1.1	0.0127	0.037	0.017	0.033
benzo(b)fluoranthene	1.1	0.034	0.102	0.052	0.0942
benzo(k)fluoranthene	11	0.00834	0.0237	0.0122	0.0214
benzo(a)pyrene	0.11	0.0122	0.0362	0.0173	0.0336
chrysene	110	0.0147	0.043	0.0211	0.0409
dibenz(a,h)anthracene	0.11	<0.006	0.0131	0.00681	0.012
fluoranthene	240	0.0163	0.0439	0.0193	0.0397
flourene	240	<0.006	<0.006	<0.006	<0.006
indeno(1,2,3-cd)pyrene	1.1	0.0178	0.0508	0.0266	0.0466
1-methylnaphthalene	18	<0.02	0.0347	<0.02	0.0266
2-methylnaphthalene	24	0.0229	0.0621	0.0301	0.0503
naphthalene	2	<0.02	0.0393	<0.02	0.0303
pyrene	180	0.0126	0.0327	0.0148	0.0308
Metals in Soils					
arsenic	0.68	NA	NA	6.97	NA
barium	15,000	NA	NA	270	NA
cadmium	71	NA	NA	<0.5	NA
chromium VI	0.3	NA	NA	2.56	NA
copper	3,100	NA	NA	19.3	NA
lead	400	NA	NA	14.9	NA
nickel	1,500	NA	NA	20.2	NA
selenium	390	NA	NA	<2	NA
silver	390	NA	NA	<1	NA
zinc	23,000	NA	NA	58.0	NA

¹The standard is 500 for the combined total of TVPH and TEPH NA = not analyzed

Values in bold type exceed standards

All units and standards in mg/kg except where indicated

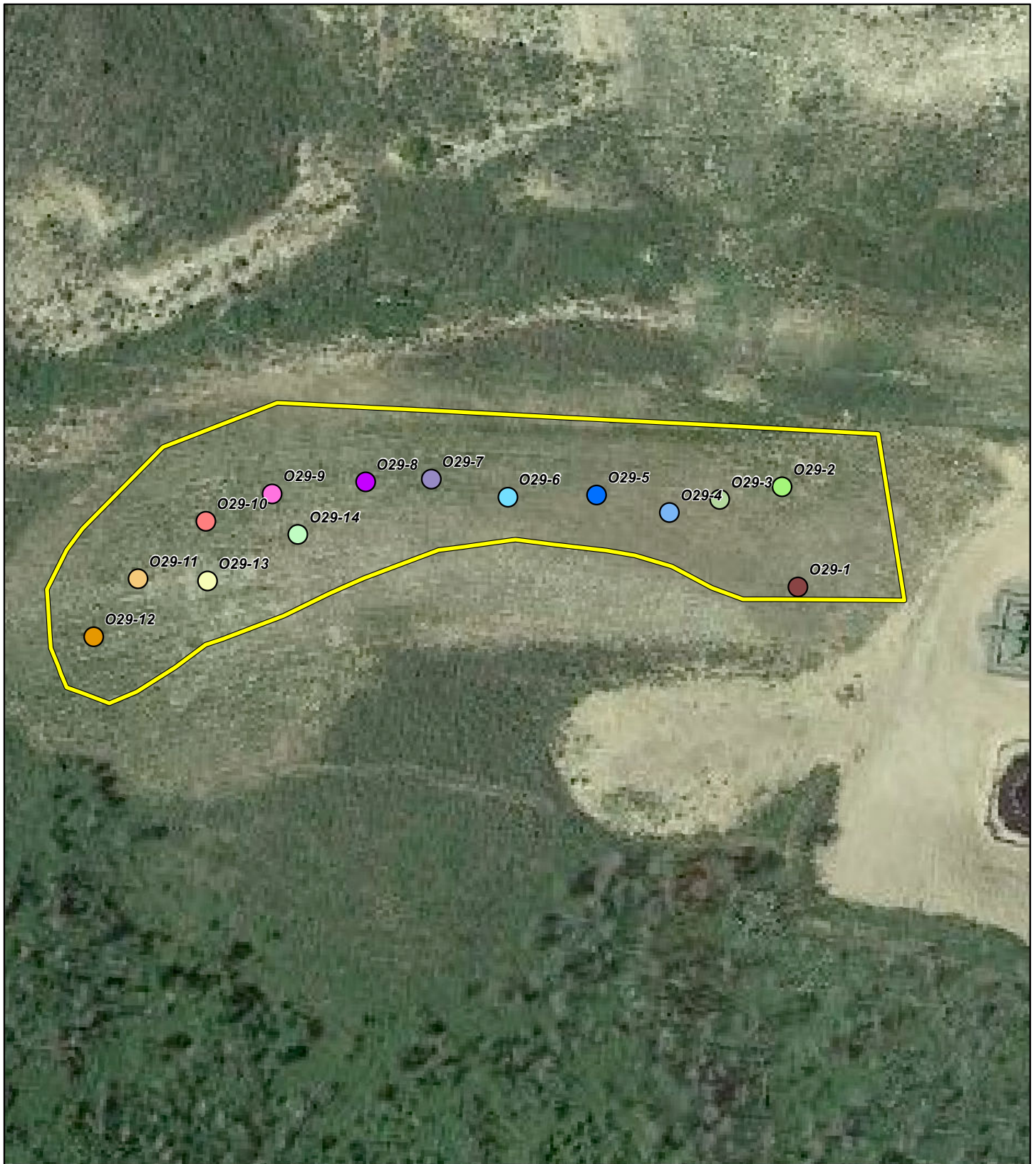




Figure 1

July
2021

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Legend

-  Discrete Sample Location
-  Land Farm Perimeter (1.74 Acres)

0 50 100 200 Feet 1" = 100'

Berry Petroleum Company

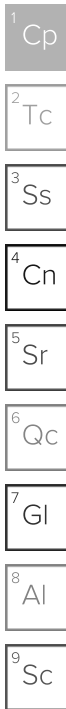
O-29
Landfarm Final
Discrete Samples

APPENDIX A
Laboratory Report



ANALYTICAL REPORT

July 27, 2021



Berry Petroleum - Denver, CO

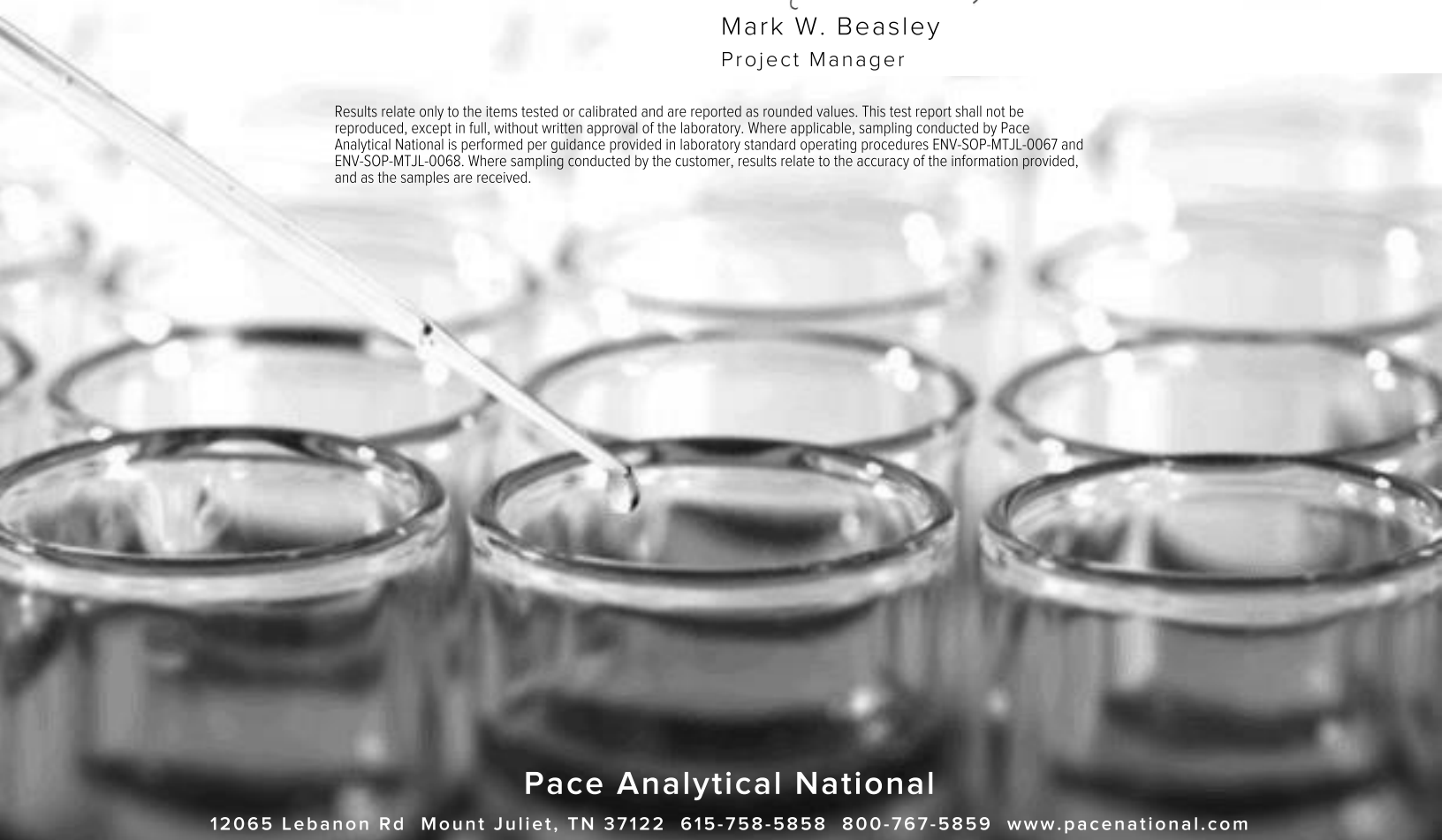
Sample Delivery Group: L1377536
Samples Received: 07/13/2021
Project Number:
Description: Garden Gulch LF

Report To: Dave Nicholson
3433 E. Lake Dr
Centennial, CO 80121

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

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



Pace Analytical National

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

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¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

SAMPLE SUMMARY

029-1 L1377536-01 Solid

				Collected by DK Nicholson	Collected date/time 07/10/21 12:00	Received date/time 07/13/21 13:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1707575	1	07/24/21 02:40	07/24/21 02:40	KMG	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1705929	1	07/16/21 09:19	07/17/21 13:19	ARM	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1707283	1	07/18/21 10:00	07/18/21 12:00	BMD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1706094	1	07/19/21 05:26	07/20/21 05:14	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1705349	1	07/22/21 06:45	07/23/21 15:29	KMG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1707892	1	07/22/21 11:36	07/24/21 18:07	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1706618	1	07/14/21 09:02	07/17/21 03:33	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1705433	1	07/14/21 09:02	07/15/21 16:49	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1707740	1	07/19/21 23:29	07/21/21 00:53	CAG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1707406	1	07/20/21 08:40	07/20/21 18:39	LEA	Mt. Juliet, TN

029-2 L1377536-02 Solid

				Collected by DK Nicholson	Collected date/time 07/10/21 12:00	Received date/time 07/13/21 13:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1707406	1	07/20/21 08:40	07/20/21 19:38	AAT	Mt. Juliet, TN

029-3 L1377536-03 Solid

				Collected by DK Nicholson	Collected date/time 07/10/21 12:00	Received date/time 07/13/21 13:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1707406	1	07/20/21 08:40	07/20/21 19:58	AAT	Mt. Juliet, TN

029-4 L1377536-04 Solid

				Collected by DK Nicholson	Collected date/time 07/10/21 12:00	Received date/time 07/13/21 13:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1707575	1	07/24/21 02:43	07/24/21 02:43	KMG	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1705929	1	07/16/21 09:19	07/17/21 13:23	ARM	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1707283	1	07/18/21 10:00	07/18/21 12:00	BMD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1706094	1	07/19/21 05:26	07/20/21 05:14	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1705349	1	07/22/21 06:45	07/23/21 15:32	KMG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1707892	1	07/22/21 11:36	07/24/21 18:10	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1706618	1	07/14/21 09:02	07/17/21 03:54	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1705433	1	07/14/21 09:02	07/15/21 17:08	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1707740	1	07/19/21 23:29	07/21/21 01:07	CAG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1707406	1	07/20/21 08:40	07/20/21 20:18	LEA	Mt. Juliet, TN

029-5 L1377536-05 Solid

				Collected by DK Nicholson	Collected date/time 07/10/21 12:00	Received date/time 07/13/21 13:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1707406	1	07/20/21 08:40	07/20/21 21:18	LEA	Mt. Juliet, TN

029-6 L1377536-06 Solid

				Collected by DK Nicholson	Collected date/time 07/10/21 12:00	Received date/time 07/13/21 13:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1707406	1	07/20/21 08:40	07/20/21 21:38	LEA	Mt. Juliet, TN



SAMPLE SUMMARY

029-7 L1377536-07 Solid

				Collected by DK Nicholson	Collected date/time 07/10/21 12:00	Received date/time 07/13/21 13:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1707406	1	07/20/21 08:40	07/20/21 21:58	LEA	Mt. Juliet, TN

029-8 L1377536-08 Solid

				Collected by DK Nicholson	Collected date/time 07/10/21 12:00	Received date/time 07/13/21 13:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1707406	1	07/20/21 08:40	07/20/21 20:58	LEA	Mt. Juliet, TN

029-9 L1377536-09 Solid

				Collected by DK Nicholson	Collected date/time 07/10/21 12:00	Received date/time 07/13/21 13:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1707575	1	07/24/21 02:46	07/24/21 02:46	KMG	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1705929	1	07/16/21 09:19	07/17/21 13:36	ARM	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1707283	1	07/18/21 10:00	07/18/21 12:00	BMD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1706094	1	07/19/21 05:26	07/20/21 05:14	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1705349	1	07/22/21 06:45	07/23/21 15:35	KMG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1707892	1	07/22/21 11:36	07/24/21 18:13	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1706618	1	07/14/21 09:02	07/17/21 04:15	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1705462	1	07/14/21 09:02	07/15/21 03:50	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1707478	1	07/19/21 20:20	07/20/21 04:13	CAG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1707406	1	07/20/21 08:40	07/20/21 17:39	LEA	Mt. Juliet, TN

029-10 L1377536-10 Solid

				Collected by DK Nicholson	Collected date/time 07/10/21 12:00	Received date/time 07/13/21 13:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1707406	1	07/20/21 08:40	07/20/21 20:38	LEA	Mt. Juliet, TN

029-11 L1377536-11 Solid

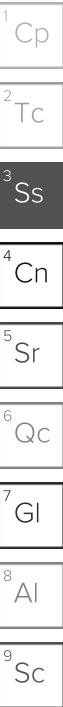
				Collected by DK Nicholson	Collected date/time 07/10/21 12:00	Received date/time 07/13/21 13:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1707406	1	07/20/21 08:40	07/20/21 22:18	LEA	Mt. Juliet, TN

029-12 L1377536-12 Solid

				Collected by DK Nicholson	Collected date/time 07/10/21 12:00	Received date/time 07/13/21 13:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1707406	1	07/20/21 08:40	07/20/21 22:38	LEA	Mt. Juliet, TN

029-13 L1377536-13 Solid

				Collected by DK Nicholson	Collected date/time 07/10/21 12:00	Received date/time 07/13/21 13:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1707575	1	07/24/21 02:54	07/24/21 02:54	KMG	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1705929	1	07/16/21 09:19	07/17/21 13:38	ARM	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1707283	1	07/18/21 10:00	07/18/21 12:00	BMD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1706094	1	07/19/21 05:26	07/20/21 05:14	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1705349	1	07/22/21 06:45	07/23/21 15:38	KMG	Mt. Juliet, TN



SAMPLE SUMMARY

029-13 L1377536-13 Solid

Collected by
DK Nicholson

Collected date/time
07/10/21 12:00

Received date/time
07/13/21 13:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1707892	1	07/22/21 11:36	07/24/21 18:16	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1706618	1	07/14/21 09:02	07/17/21 04:37	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1705462	1	07/14/21 09:02	07/15/21 04:09	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1707371	1	07/18/21 15:38	07/19/21 03:15	CAG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1707406	1	07/20/21 08:40	07/20/21 22:58	LEA	Mt. Juliet, TN

029-14 L1377536-14 Solid

Collected by
DK Nicholson

Collected date/time
07/10/21 12:00

Received date/time
07/13/21 13:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1707406	1	07/20/21 08:40	07/20/21 23:18	AAT	Mt. Juliet, TN

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

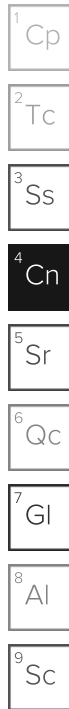
9 Sc

CASE NARRATIVE

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



Mark W. Beasley
Project Manager



029-1

Collected date/time: 07/10/21 12:00

SAMPLE RESULTS - 01

L1377536

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.904		1	07/24/2021 02:40	WG1707575

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	07/17/2021 13:19	WG1705929

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.07	T8	1	07/18/2021 12:00	WG1707283

Sample Narrative:

L1377536-01 WG1707283: 8.07 at 22.3C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	285		10.0	1	07/20/2021 05:14	WG1706094

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	6.65		2.00	1	07/23/2021 15:29	WG1705349
Barium	234		0.500	1	07/23/2021 15:29	WG1705349
Cadmium	ND		0.500	1	07/23/2021 15:29	WG1705349
Chromium	25.5		1.00	1	07/23/2021 15:29	WG1705349
Copper	17.3		2.00	1	07/23/2021 15:29	WG1705349
Lead	13.5		0.500	1	07/23/2021 15:29	WG1705349
Nickel	19.3		2.00	1	07/23/2021 15:29	WG1705349
Selenium	ND		2.00	1	07/23/2021 15:29	WG1705349
Silver	ND		1.00	1	07/23/2021 15:29	WG1705349
Zinc	53.4		5.00	1	07/23/2021 15:29	WG1705349

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	ND		0.200	1	07/24/2021 18:07	WG1707892

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.108		0.100	1	07/17/2021 03:33	WG1706618
(S) a,a,a-Trifluorotoluene(FID)	106		77.0-120		07/17/2021 03:33	WG1706618

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acetone	ND	J3 J4	0.0500	1	07/15/2021 16:49	WG1705433
Acrylonitrile	ND	J4	0.0125	1	07/15/2021 16:49	WG1705433
Benzene	ND		0.00100	1	07/15/2021 16:49	WG1705433
Bromobenzene	ND		0.0125	1	07/15/2021 16:49	WG1705433

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

029-1

SAMPLE RESULTS - 01

Collected date/time: 07/10/21 12:00

L1377536

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Bromodichloromethane	ND		0.00250	1	07/15/2021 16:49	WG1705433
Bromoform	ND		0.0250	1	07/15/2021 16:49	WG1705433
Bromomethane	ND		0.0125	1	07/15/2021 16:49	WG1705433
n-Butylbenzene	ND		0.0125	1	07/15/2021 16:49	WG1705433
sec-Butylbenzene	ND		0.0125	1	07/15/2021 16:49	WG1705433
tert-Butylbenzene	ND		0.00500	1	07/15/2021 16:49	WG1705433
Carbon tetrachloride	ND		0.00500	1	07/15/2021 16:49	WG1705433
Chlorobenzene	ND		0.00250	1	07/15/2021 16:49	WG1705433
Chlorodibromomethane	ND		0.00250	1	07/15/2021 16:49	WG1705433
Chloroethane	ND		0.00500	1	07/15/2021 16:49	WG1705433
Chloroform	ND		0.00250	1	07/15/2021 16:49	WG1705433
Chloromethane	ND		0.0125	1	07/15/2021 16:49	WG1705433
2-Chlorotoluene	ND		0.00250	1	07/15/2021 16:49	WG1705433
4-Chlorotoluene	ND		0.00500	1	07/15/2021 16:49	WG1705433
1,2-Dibromo-3-Chloropropane	ND	J3	0.0250	1	07/15/2021 16:49	WG1705433
1,2-Dibromoethane	ND		0.00250	1	07/15/2021 16:49	WG1705433
Dibromomethane	ND		0.00500	1	07/15/2021 16:49	WG1705433
1,2-Dichlorobenzene	ND		0.00500	1	07/15/2021 16:49	WG1705433
1,3-Dichlorobenzene	ND		0.00500	1	07/15/2021 16:49	WG1705433
1,4-Dichlorobenzene	ND		0.00500	1	07/15/2021 16:49	WG1705433
Dichlorodifluoromethane	ND		0.00250	1	07/15/2021 16:49	WG1705433
1,1-Dichloroethane	ND		0.00250	1	07/15/2021 16:49	WG1705433
1,2-Dichloroethane	ND		0.00250	1	07/15/2021 16:49	WG1705433
1,1-Dichloroethene	ND		0.00250	1	07/15/2021 16:49	WG1705433
cis-1,2-Dichloroethene	ND		0.00250	1	07/15/2021 16:49	WG1705433
trans-1,2-Dichloroethene	ND		0.00500	1	07/15/2021 16:49	WG1705433
1,2-Dichloropropane	ND		0.00500	1	07/15/2021 16:49	WG1705433
1,1-Dichloropropene	ND		0.00250	1	07/15/2021 16:49	WG1705433
1,3-Dichloropropane	ND		0.00500	1	07/15/2021 16:49	WG1705433
cis-1,3-Dichloropropene	ND		0.00250	1	07/15/2021 16:49	WG1705433
trans-1,3-Dichloropropene	ND		0.00500	1	07/15/2021 16:49	WG1705433
2,2-Dichloropropane	ND		0.00250	1	07/15/2021 16:49	WG1705433
Di-isopropyl ether	ND		0.00100	1	07/15/2021 16:49	WG1705433
Ethylbenzene	ND		0.00250	1	07/15/2021 16:49	WG1705433
Hexachloro-1,3-butadiene	ND		0.0250	1	07/15/2021 16:49	WG1705433
Isopropylbenzene	ND		0.00250	1	07/15/2021 16:49	WG1705433
p-Isopropyltoluene	0.00563		0.00500	1	07/15/2021 16:49	WG1705433
2-Butanone (MEK)	ND		0.100	1	07/15/2021 16:49	WG1705433
Methylene Chloride	ND		0.0250	1	07/15/2021 16:49	WG1705433
4-Methyl-2-pentanone (MIBK)	ND		0.0250	1	07/15/2021 16:49	WG1705433
Methyl tert-butyl ether	ND		0.00100	1	07/15/2021 16:49	WG1705433
Naphthalene	ND	J3	0.0125	1	07/15/2021 16:49	WG1705433
n-Propylbenzene	0.00715		0.00500	1	07/15/2021 16:49	WG1705433
Styrene	ND		0.0125	1	07/15/2021 16:49	WG1705433
1,1,1,2-Tetrachloroethane	ND		0.00250	1	07/15/2021 16:49	WG1705433
1,1,2,2-Tetrachloroethane	ND		0.00250	1	07/15/2021 16:49	WG1705433
1,1,2-Trichlorotrifluoroethane	ND		0.00250	1	07/15/2021 16:49	WG1705433
Tetrachloroethene	ND		0.00250	1	07/15/2021 16:49	WG1705433
Toluene	ND		0.00500	1	07/15/2021 16:49	WG1705433
1,2,3-Trichlorobenzene	ND	J3	0.0125	1	07/15/2021 16:49	WG1705433
1,2,4-Trichlorobenzene	ND	J3	0.0125	1	07/15/2021 16:49	WG1705433
1,1,1-Trichloroethane	ND		0.00250	1	07/15/2021 16:49	WG1705433
1,1,2-Trichloroethane	ND		0.00250	1	07/15/2021 16:49	WG1705433
Trichloroethene	ND		0.00100	1	07/15/2021 16:49	WG1705433
Trichlorofluoromethane	ND		0.00250	1	07/15/2021 16:49	WG1705433
1,2,3-Trichloropropane	ND	J4	0.0125	1	07/15/2021 16:49	WG1705433

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

ACCOUNT:

Berry Petroleum - Denver, CO

PROJECT:

SDG:

L1377536

DATE/TIME:

07/27/21 10:17

PAGE:

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029-1

Collected date/time: 07/10/21 12:00

SAMPLE RESULTS - 01

L1377536

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
1,2,4-Trimethylbenzene	ND		0.00500	1	07/15/2021 16:49	WG1705433
1,2,3-Trimethylbenzene	ND		0.00500	1	07/15/2021 16:49	WG1705433
1,3,5-Trimethylbenzene	ND		0.00500	1	07/15/2021 16:49	WG1705433
Vinyl chloride	ND		0.00250	1	07/15/2021 16:49	WG1705433
Xylenes, Total	ND		0.00650	1	07/15/2021 16:49	WG1705433
(S) Toluene-d8	104		75.0-131		07/15/2021 16:49	WG1705433
(S) 4-Bromofluorobenzene	95.3		67.0-138		07/15/2021 16:49	WG1705433
(S) 1,2-Dichloroethane-d4	105		70.0-130		07/15/2021 16:49	WG1705433

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	26.1		4.00	1	07/21/2021 00:53	WG1707740
C28-C40 Oil Range	57.6		4.00	1	07/21/2021 00:53	WG1707740
(S) o-Terphenyl	56.8		18.0-148		07/21/2021 00:53	WG1707740

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	07/20/2021 18:39	WG1707406
Acenaphthene	ND		0.00600	1	07/20/2021 18:39	WG1707406
Acenaphthylene	ND		0.00600	1	07/20/2021 18:39	WG1707406
Benzo(a)anthracene	ND		0.00600	1	07/20/2021 18:39	WG1707406
Benzo(a)pyrene	0.00624		0.00600	1	07/20/2021 18:39	WG1707406
Benzo(b)fluoranthene	0.0176		0.00600	1	07/20/2021 18:39	WG1707406
Benzo(g,h,i)perylene	0.0101		0.00600	1	07/20/2021 18:39	WG1707406
Benzo(k)fluoranthene	ND		0.00600	1	07/20/2021 18:39	WG1707406
Chrysene	0.00665		0.00600	1	07/20/2021 18:39	WG1707406
Dibenz(a,h)anthracene	ND		0.00600	1	07/20/2021 18:39	WG1707406
Fluoranthene	0.00727		0.00600	1	07/20/2021 18:39	WG1707406
Fluorene	ND		0.00600	1	07/20/2021 18:39	WG1707406
Indeno(1,2,3-cd)pyrene	0.00948		0.00600	1	07/20/2021 18:39	WG1707406
Naphthalene	ND		0.0200	1	07/20/2021 18:39	WG1707406
Phenanthrene	0.00706		0.00600	1	07/20/2021 18:39	WG1707406
Pyrene	ND		0.00600	1	07/20/2021 18:39	WG1707406
1-Methylnaphthalene	ND		0.0200	1	07/20/2021 18:39	WG1707406
2-Methylnaphthalene	0.0203		0.0200	1	07/20/2021 18:39	WG1707406
2-Chloronaphthalene	ND		0.0200	1	07/20/2021 18:39	WG1707406
(S) p-Terphenyl-d14	79.0		23.0-120		07/20/2021 18:39	WG1707406
(S) Nitrobenzene-d5	67.0		14.0-149		07/20/2021 18:39	WG1707406
(S) 2-Fluorobiphenyl	70.7		34.0-125		07/20/2021 18:39	WG1707406

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

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	07/20/2021 19:38	WG1707406
Acenaphthene	ND		0.00600	1	07/20/2021 19:38	WG1707406
Acenaphthylene	ND		0.00600	1	07/20/2021 19:38	WG1707406
Benzo(a)anthracene	0.0420		0.00600	1	07/20/2021 19:38	WG1707406
Benzo(a)pyrene	0.0416		0.00600	1	07/20/2021 19:38	WG1707406
Benzo(b)fluoranthene	0.125		0.00600	1	07/20/2021 19:38	WG1707406
Benzo(g,h,i)perylene	0.0620		0.00600	1	07/20/2021 19:38	WG1707406
Benzo(k)fluoranthene	0.0281		0.00600	1	07/20/2021 19:38	WG1707406
Chrysene	0.0519		0.00600	1	07/20/2021 19:38	WG1707406
Dibenz(a,h)anthracene	0.0159		0.00600	1	07/20/2021 19:38	WG1707406
Fluoranthene	0.0509		0.00600	1	07/20/2021 19:38	WG1707406
Fluorene	0.00607		0.00600	1	07/20/2021 19:38	WG1707406
Indeno(1,2,3-cd)pyrene	0.0612		0.00600	1	07/20/2021 19:38	WG1707406
Naphthalene	0.0598		0.0200	1	07/20/2021 19:38	WG1707406
Phenanthrene	0.0408		0.00600	1	07/20/2021 19:38	WG1707406
Pyrene	0.0385		0.00600	1	07/20/2021 19:38	WG1707406
1-Methylnaphthalene	0.0517		0.0200	1	07/20/2021 19:38	WG1707406
2-Methylnaphthalene	0.0941		0.0200	1	07/20/2021 19:38	WG1707406
2-Chloronaphthalene	ND		0.0200	1	07/20/2021 19:38	WG1707406
(S) p-Terphenyl-d14	78.9		23.0-120		07/20/2021 19:38	WG1707406
(S) Nitrobenzene-d5	68.8		14.0-149		07/20/2021 19:38	WG1707406
(S) 2-Fluorobiphenyl	69.8		34.0-125		07/20/2021 19:38	WG1707406

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc

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	07/20/2021 19:58	WG1707406
Acenaphthene	ND		0.00600	1	07/20/2021 19:58	WG1707406
Acenaphthylene	ND		0.00600	1	07/20/2021 19:58	WG1707406
Benzo(a)anthracene	0.0370		0.00600	1	07/20/2021 19:58	WG1707406
Benzo(a)pyrene	0.0347		0.00600	1	07/20/2021 19:58	WG1707406
Benzo(b)fluoranthene	0.0886		0.00600	1	07/20/2021 19:58	WG1707406
Benzo(g,h,i)perylene	0.0424		0.00600	1	07/20/2021 19:58	WG1707406
Benzo(k)fluoranthene	0.0221		0.00600	1	07/20/2021 19:58	WG1707406
Chrysene	0.0433		0.00600	1	07/20/2021 19:58	WG1707406
Dibenz(a,h)anthracene	0.0111		0.00600	1	07/20/2021 19:58	WG1707406
Fluoranthene	0.0549		0.00600	1	07/20/2021 19:58	WG1707406
Fluorene	ND		0.00600	1	07/20/2021 19:58	WG1707406
Indeno(1,2,3-cd)pyrene	0.0421		0.00600	1	07/20/2021 19:58	WG1707406
Naphthalene	0.0398		0.0200	1	07/20/2021 19:58	WG1707406
Phenanthrene	0.0399		0.00600	1	07/20/2021 19:58	WG1707406
Pyrene	0.0404		0.00600	1	07/20/2021 19:58	WG1707406
1-Methylnaphthalene	0.0327		0.0200	1	07/20/2021 19:58	WG1707406
2-Methylnaphthalene	0.0645		0.0200	1	07/20/2021 19:58	WG1707406
2-Chloronaphthalene	ND		0.0200	1	07/20/2021 19:58	WG1707406
(S) p-Terphenyl-d14	68.6		23.0-120		07/20/2021 19:58	WG1707406
(S) Nitrobenzene-d5	70.2		14.0-149		07/20/2021 19:58	WG1707406
(S) 2-Fluorobiphenyl	65.3		34.0-125		07/20/2021 19:58	WG1707406

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc

029-4

Collected date/time: 07/10/21 12:00

SAMPLE RESULTS - 04

L1377536

Calculated Results

	Result	Qualifier	Dilution	Analysis date / time	Batch
Analyte					
Sodium Adsorption Ratio	0.786		1	07/24/2021 02:43	WG1707575

Wet Chemistry by Method 3060A/7196A

	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Analyte	mg/kg		mg/kg			
Chromium,Hexavalent	ND		2.00	1	07/17/2021 13:23	WG1705929

Wet Chemistry by Method 9045D

	Result	Qualifier	Dilution	Analysis date / time	Batch
Analyte	su				
pH	7.86	T8	1	07/18/2021 12:00	WG1707283

Sample Narrative:

L1377536-04 WG1707283: 7.86 at 22C

Wet Chemistry by Method 9050AMod

	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Analyte	umhos/cm		umhos/cm			
Specific Conductance	304		10.0	1	07/20/2021 05:14	WG1706094

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Analyte	mg/kg		mg/kg			
Arsenic	11.6		2.00	1	07/23/2021 15:32	WG1705349
Barium	345		0.500	1	07/23/2021 15:32	WG1705349
Cadmium	ND		0.500	1	07/23/2021 15:32	WG1705349
Chromium	33.1		1.00	1	07/23/2021 15:32	WG1705349
Copper	25.3		2.00	1	07/23/2021 15:32	WG1705349
Lead	18.6		0.500	1	07/23/2021 15:32	WG1705349
Nickel	30.1		2.00	1	07/23/2021 15:32	WG1705349
Selenium	ND		2.00	1	07/23/2021 15:32	WG1705349
Silver	ND		1.00	1	07/23/2021 15:32	WG1705349
Zinc	72.0		5.00	1	07/23/2021 15:32	WG1705349

Metals (ICP) by Method 6010B-NE493 Ch 2

	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Analyte	mg/l		mg/l			
Hot Water Sol. Boron	0.228		0.200	1	07/24/2021 18:10	WG1707892

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

	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Analyte	mg/kg		mg/kg			
TPH (GC/FID) Low Fraction	ND		0.100	1	07/17/2021 03:54	WG1706618
(S) a,a,a-Trifluorotoluene(FID)	106		77.0-120		07/17/2021 03:54	WG1706618

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

	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Analyte	mg/kg		mg/kg			
Acetone	ND	J3 J4	0.0500	1	07/15/2021 17:08	WG1705433
Acrylonitrile	ND	J4	0.0125	1	07/15/2021 17:08	WG1705433
Benzene	ND		0.00100	1	07/15/2021 17:08	WG1705433
Bromobenzene	ND		0.0125	1	07/15/2021 17:08	WG1705433

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

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Collected date/time: 07/10/21 12:00

SAMPLE RESULTS - 04

L1377536

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Bromodichloromethane	ND		0.00250	1	07/15/2021 17:08	WG1705433
Bromoform	ND		0.0250	1	07/15/2021 17:08	WG1705433
Bromomethane	ND		0.0125	1	07/15/2021 17:08	WG1705433
n-Butylbenzene	ND		0.0125	1	07/15/2021 17:08	WG1705433
sec-Butylbenzene	ND		0.0125	1	07/15/2021 17:08	WG1705433
tert-Butylbenzene	ND		0.00500	1	07/15/2021 17:08	WG1705433
Carbon tetrachloride	ND		0.00500	1	07/15/2021 17:08	WG1705433
Chlorobenzene	ND		0.00250	1	07/15/2021 17:08	WG1705433
Chlorodibromomethane	ND		0.00250	1	07/15/2021 17:08	WG1705433
Chloroethane	ND		0.00500	1	07/15/2021 17:08	WG1705433
Chloroform	ND		0.00250	1	07/15/2021 17:08	WG1705433
Chloromethane	ND		0.0125	1	07/15/2021 17:08	WG1705433
2-Chlorotoluene	ND		0.00250	1	07/15/2021 17:08	WG1705433
4-Chlorotoluene	ND		0.00500	1	07/15/2021 17:08	WG1705433
1,2-Dibromo-3-Chloropropane	ND	J3	0.0250	1	07/15/2021 17:08	WG1705433
1,2-Dibromoethane	ND		0.00250	1	07/15/2021 17:08	WG1705433
Dibromomethane	ND		0.00500	1	07/15/2021 17:08	WG1705433
1,2-Dichlorobenzene	ND		0.00500	1	07/15/2021 17:08	WG1705433
1,3-Dichlorobenzene	ND		0.00500	1	07/15/2021 17:08	WG1705433
1,4-Dichlorobenzene	ND		0.00500	1	07/15/2021 17:08	WG1705433
Dichlorodifluoromethane	ND		0.00250	1	07/15/2021 17:08	WG1705433
1,1-Dichloroethane	ND		0.00250	1	07/15/2021 17:08	WG1705433
1,2-Dichloroethane	ND		0.00250	1	07/15/2021 17:08	WG1705433
1,1-Dichloroethene	ND		0.00250	1	07/15/2021 17:08	WG1705433
cis-1,2-Dichloroethene	ND		0.00250	1	07/15/2021 17:08	WG1705433
trans-1,2-Dichloroethene	ND		0.00500	1	07/15/2021 17:08	WG1705433
1,2-Dichloropropane	ND		0.00500	1	07/15/2021 17:08	WG1705433
1,1-Dichloropropene	ND		0.00250	1	07/15/2021 17:08	WG1705433
1,3-Dichloropropane	ND		0.00500	1	07/15/2021 17:08	WG1705433
cis-1,3-Dichloropropene	ND		0.00250	1	07/15/2021 17:08	WG1705433
trans-1,3-Dichloropropene	ND		0.00500	1	07/15/2021 17:08	WG1705433
2,2-Dichloropropane	ND		0.00250	1	07/15/2021 17:08	WG1705433
Di-isopropyl ether	ND		0.00100	1	07/15/2021 17:08	WG1705433
Ethylbenzene	ND		0.00250	1	07/15/2021 17:08	WG1705433
Hexachloro-1,3-butadiene	ND		0.0250	1	07/15/2021 17:08	WG1705433
Isopropylbenzene	ND		0.00250	1	07/15/2021 17:08	WG1705433
p-Isopropyltoluene	0.00660		0.00500	1	07/15/2021 17:08	WG1705433
2-Butanone (MEK)	ND		0.100	1	07/15/2021 17:08	WG1705433
Methylene Chloride	ND		0.0250	1	07/15/2021 17:08	WG1705433
4-Methyl-2-pentanone (MIBK)	ND		0.0250	1	07/15/2021 17:08	WG1705433
Methyl tert-butyl ether	ND		0.00100	1	07/15/2021 17:08	WG1705433
Naphthalene	ND	J3	0.0125	1	07/15/2021 17:08	WG1705433
n-Propylbenzene	ND		0.00500	1	07/15/2021 17:08	WG1705433
Styrene	ND		0.0125	1	07/15/2021 17:08	WG1705433
1,1,1,2-Tetrachloroethane	ND		0.00250	1	07/15/2021 17:08	WG1705433
1,1,2,2-Tetrachloroethane	ND		0.00250	1	07/15/2021 17:08	WG1705433
1,1,2-Trichlorotrifluoroethane	ND		0.00250	1	07/15/2021 17:08	WG1705433
Tetrachloroethene	ND		0.00250	1	07/15/2021 17:08	WG1705433
Toluene	ND		0.00500	1	07/15/2021 17:08	WG1705433
1,2,3-Trichlorobenzene	ND	J3	0.0125	1	07/15/2021 17:08	WG1705433
1,2,4-Trichlorobenzene	ND	J3	0.0125	1	07/15/2021 17:08	WG1705433
1,1,1-Trichloroethane	ND		0.00250	1	07/15/2021 17:08	WG1705433
1,1,2-Trichloroethane	ND		0.00250	1	07/15/2021 17:08	WG1705433
Trichloroethene	ND		0.00100	1	07/15/2021 17:08	WG1705433
Trichlorofluoromethane	ND		0.00250	1	07/15/2021 17:08	WG1705433
1,2,3-Trichloropropane	ND	J4	0.0125	1	07/15/2021 17:08	WG1705433

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

ACCOUNT:

Berry Petroleum - Denver, CO

PROJECT:

SDG:

L1377536

DATE/TIME:

07/27/21 10:17

PAGE:

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Collected date/time: 07/10/21 12:00

SAMPLE RESULTS - 04

L1377536

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
1,2,4-Trimethylbenzene	ND		0.00500	1	07/15/2021 17:08	WG1705433
1,2,3-Trimethylbenzene	ND		0.00500	1	07/15/2021 17:08	WG1705433
1,3,5-Trimethylbenzene	ND		0.00500	1	07/15/2021 17:08	WG1705433
Vinyl chloride	ND		0.00250	1	07/15/2021 17:08	WG1705433
Xylenes, Total	ND		0.00650	1	07/15/2021 17:08	WG1705433
(S) Toluene-d8	97.6		75.0-131		07/15/2021 17:08	WG1705433
(S) 4-Bromofluorobenzene	89.1		67.0-138		07/15/2021 17:08	WG1705433
(S) 1,2-Dichloroethane-d4	106		70.0-130		07/15/2021 17:08	WG1705433

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	48.9		4.00	1	07/21/2021 01:07	WG1707740
C28-C40 Oil Range	95.0		4.00	1	07/21/2021 01:07	WG1707740
(S) o-Terphenyl	73.5		18.0-148		07/21/2021 01:07	WG1707740

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	07/20/2021 20:18	WG1707406
Acenaphthene	ND		0.00600	1	07/20/2021 20:18	WG1707406
Acenaphthylene	ND		0.00600	1	07/20/2021 20:18	WG1707406
Benzo(a)anthracene	0.0396		0.00600	1	07/20/2021 20:18	WG1707406
Benzo(a)pyrene	0.0383		0.00600	1	07/20/2021 20:18	WG1707406
Benzo(b)fluoranthene	0.114		0.00600	1	07/20/2021 20:18	WG1707406
Benzo(g,h,i)perylene	0.0540		0.00600	1	07/20/2021 20:18	WG1707406
Benzo(k)fluoranthene	0.0252		0.00600	1	07/20/2021 20:18	WG1707406
Chrysene	0.0463		0.00600	1	07/20/2021 20:18	WG1707406
Dibenz(a,h)anthracene	0.0138		0.00600	1	07/20/2021 20:18	WG1707406
Fluoranthene	0.0495		0.00600	1	07/20/2021 20:18	WG1707406
Fluorene	ND		0.00600	1	07/20/2021 20:18	WG1707406
Indeno(1,2,3-cd)pyrene	0.0536		0.00600	1	07/20/2021 20:18	WG1707406
Naphthalene	0.0464		0.0200	1	07/20/2021 20:18	WG1707406
Phenanthrene	0.0353		0.00600	1	07/20/2021 20:18	WG1707406
Pyrene	0.0362		0.00600	1	07/20/2021 20:18	WG1707406
1-Methylnaphthalene	0.0382		0.0200	1	07/20/2021 20:18	WG1707406
2-Methylnaphthalene	0.0724		0.0200	1	07/20/2021 20:18	WG1707406
2-Chloronaphthalene	ND		0.0200	1	07/20/2021 20:18	WG1707406
(S) p-Terphenyl-d14	70.7		23.0-120		07/20/2021 20:18	WG1707406
(S) Nitrobenzene-d5	68.1		14.0-149		07/20/2021 20:18	WG1707406
(S) 2-Fluorobiphenyl	63.1		34.0-125		07/20/2021 20:18	WG1707406

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

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	07/20/2021 21:18	WG1707406
Acenaphthene	ND		0.00600	1	07/20/2021 21:18	WG1707406
Acenaphthylene	ND		0.00600	1	07/20/2021 21:18	WG1707406
Benzo(a)anthracene	0.0395		0.00600	1	07/20/2021 21:18	WG1707406
Benzo(a)pyrene	0.0365		0.00600	1	07/20/2021 21:18	WG1707406
Benzo(b)fluoranthene	0.107		0.00600	1	07/20/2021 21:18	WG1707406
Benzo(g,h,i)perylene	0.0510		0.00600	1	07/20/2021 21:18	WG1707406
Benzo(k)fluoranthene	0.0231		0.00600	1	07/20/2021 21:18	WG1707406
Chrysene	0.0443		0.00600	1	07/20/2021 21:18	WG1707406
Dibenz(a,h)anthracene	0.0132		0.00600	1	07/20/2021 21:18	WG1707406
Fluoranthene	0.0511		0.00600	1	07/20/2021 21:18	WG1707406
Fluorene	ND		0.00600	1	07/20/2021 21:18	WG1707406
Indeno(1,2,3-cd)pyrene	0.0508		0.00600	1	07/20/2021 21:18	WG1707406
Naphthalene	0.0453		0.0200	1	07/20/2021 21:18	WG1707406
Phenanthrene	0.0373		0.00600	1	07/20/2021 21:18	WG1707406
Pyrene	0.0392		0.00600	1	07/20/2021 21:18	WG1707406
1-Methylnaphthalene	0.0367		0.0200	1	07/20/2021 21:18	WG1707406
2-Methylnaphthalene	0.0709		0.0200	1	07/20/2021 21:18	WG1707406
2-Chloronaphthalene	ND		0.0200	1	07/20/2021 21:18	WG1707406
(S) p-Terphenyl-d14	81.8		23.0-120		07/20/2021 21:18	WG1707406
(S) Nitrobenzene-d5	77.0		14.0-149		07/20/2021 21:18	WG1707406
(S) 2-Fluorobiphenyl	72.0		34.0-125		07/20/2021 21:18	WG1707406

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc

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	07/20/2021 21:38	WG1707406
Acenaphthene	ND		0.00600	1	07/20/2021 21:38	WG1707406
Acenaphthylene	ND		0.00600	1	07/20/2021 21:38	WG1707406
Benzo(a)anthracene	0.0437		0.00600	1	07/20/2021 21:38	WG1707406
Benzo(a)pyrene	0.0410		0.00600	1	07/20/2021 21:38	WG1707406
Benzo(b)fluoranthene	0.112		0.00600	1	07/20/2021 21:38	WG1707406
Benzo(g,h,i)perylene	0.0545		0.00600	1	07/20/2021 21:38	WG1707406
Benzo(k)fluoranthene	0.0258		0.00600	1	07/20/2021 21:38	WG1707406
Chrysene	0.0432		0.00600	1	07/20/2021 21:38	WG1707406
Dibenz(a,h)anthracene	0.0137		0.00600	1	07/20/2021 21:38	WG1707406
Fluoranthene	0.0524		0.00600	1	07/20/2021 21:38	WG1707406
Fluorene	ND		0.00600	1	07/20/2021 21:38	WG1707406
Indeno(1,2,3-cd)pyrene	0.0543		0.00600	1	07/20/2021 21:38	WG1707406
Naphthalene	0.0456		0.0200	1	07/20/2021 21:38	WG1707406
Phenanthrene	0.0365		0.00600	1	07/20/2021 21:38	WG1707406
Pyrene	0.0414		0.00600	1	07/20/2021 21:38	WG1707406
1-Methylnaphthalene	0.0378		0.0200	1	07/20/2021 21:38	WG1707406
2-Methylnaphthalene	0.0777		0.0200	1	07/20/2021 21:38	WG1707406
2-Chloronaphthalene	ND		0.0200	1	07/20/2021 21:38	WG1707406
(S) p-Terphenyl-d14	73.7		23.0-120		07/20/2021 21:38	WG1707406
(S) Nitrobenzene-d5	69.1		14.0-149		07/20/2021 21:38	WG1707406
(S) 2-Fluorobiphenyl	65.0		34.0-125		07/20/2021 21:38	WG1707406

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc

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Collected date/time: 07/10/21 12:00

SAMPLE RESULTS - 07

L1377536

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	07/20/2021 21:58	WG1707406
Acenaphthene	ND		0.00600	1	07/20/2021 21:58	WG1707406
Acenaphthylene	ND		0.00600	1	07/20/2021 21:58	WG1707406
Benzo(a)anthracene	0.0309		0.00600	1	07/20/2021 21:58	WG1707406
Benzo(a)pyrene	0.0287		0.00600	1	07/20/2021 21:58	WG1707406
Benzo(b)fluoranthene	0.0788		0.00600	1	07/20/2021 21:58	WG1707406
Benzo(g,h,i)perylene	0.0382		0.00600	1	07/20/2021 21:58	WG1707406
Benzo(k)fluoranthene	0.0185		0.00600	1	07/20/2021 21:58	WG1707406
Chrysene	0.0349		0.00600	1	07/20/2021 21:58	WG1707406
Dibenz(a,h)anthracene	0.00956		0.00600	1	07/20/2021 21:58	WG1707406
Fluoranthene	0.0405		0.00600	1	07/20/2021 21:58	WG1707406
Fluorene	ND		0.00600	1	07/20/2021 21:58	WG1707406
Indeno(1,2,3-cd)pyrene	0.0376		0.00600	1	07/20/2021 21:58	WG1707406
Naphthalene	0.0340		0.0200	1	07/20/2021 21:58	WG1707406
Phenanthrene	0.0308		0.00600	1	07/20/2021 21:58	WG1707406
Pyrene	0.0314		0.00600	1	07/20/2021 21:58	WG1707406
1-Methylnaphthalene	0.0309		0.0200	1	07/20/2021 21:58	WG1707406
2-Methylnaphthalene	0.0555		0.0200	1	07/20/2021 21:58	WG1707406
2-Chloronaphthalene	ND		0.0200	1	07/20/2021 21:58	WG1707406
(S) p-Terphenyl-d14	68.1		23.0-120		07/20/2021 21:58	WG1707406
(S) Nitrobenzene-d5	68.7		14.0-149		07/20/2021 21:58	WG1707406
(S) 2-Fluorobiphenyl	62.3		34.0-125		07/20/2021 21:58	WG1707406

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc

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	07/20/2021 20:58	WG1707406
Acenaphthene	ND		0.00600	1	07/20/2021 20:58	WG1707406
Acenaphthylene	ND		0.00600	1	07/20/2021 20:58	WG1707406
Benzo(a)anthracene	0.0438		0.00600	1	07/20/2021 20:58	WG1707406
Benzo(a)pyrene	0.0430		0.00600	1	07/20/2021 20:58	WG1707406
Benzo(b)fluoranthene	0.119		0.00600	1	07/20/2021 20:58	WG1707406
Benzo(g,h,i)perylene	0.0609		0.00600	1	07/20/2021 20:58	WG1707406
Benzo(k)fluoranthene	0.0279		0.00600	1	07/20/2021 20:58	WG1707406
Chrysene	0.0468		0.00600	1	07/20/2021 20:58	WG1707406
Dibenz(a,h)anthracene	0.0155		0.00600	1	07/20/2021 20:58	WG1707406
Fluoranthene	0.0516		0.00600	1	07/20/2021 20:58	WG1707406
Fluorene	0.00655		0.00600	1	07/20/2021 20:58	WG1707406
Indeno(1,2,3-cd)pyrene	0.0603		0.00600	1	07/20/2021 20:58	WG1707406
Naphthalene	0.0511		0.0200	1	07/20/2021 20:58	WG1707406
Phenanthrene	0.0405		0.00600	1	07/20/2021 20:58	WG1707406
Pyrene	0.0402		0.00600	1	07/20/2021 20:58	WG1707406
1-Methylnaphthalene	0.0484		0.0200	1	07/20/2021 20:58	WG1707406
2-Methylnaphthalene	0.0850		0.0200	1	07/20/2021 20:58	WG1707406
2-Chloronaphthalene	ND		0.0200	1	07/20/2021 20:58	WG1707406
(S) p-Terphenyl-d14	74.9		23.0-120		07/20/2021 20:58	WG1707406
(S) Nitrobenzene-d5	73.4		14.0-149		07/20/2021 20:58	WG1707406
(S) 2-Fluorobiphenyl	69.2		34.0-125		07/20/2021 20:58	WG1707406

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc

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Collected date/time: 07/10/21 12:00

SAMPLE RESULTS - 09

L1377536

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.725		1	07/24/2021 02:46	WG1707575

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	07/17/2021 13:36	WG1705929

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.96	T8	1	07/18/2021 12:00	WG1707283

Sample Narrative:

L1377536-09 WG1707283: 7.96 at 21.9C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	289		10.0	1	07/20/2021 05:14	WG1706094

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	6.85		2.00	1	07/23/2021 15:35	WG1705349
Barium	263		0.500	1	07/23/2021 15:35	WG1705349
Cadmium	ND		0.500	1	07/23/2021 15:35	WG1705349
Chromium	27.5		1.00	1	07/23/2021 15:35	WG1705349
Copper	18.7		2.00	1	07/23/2021 15:35	WG1705349
Lead	12.7		0.500	1	07/23/2021 15:35	WG1705349
Nickel	20.1		2.00	1	07/23/2021 15:35	WG1705349
Selenium	ND		2.00	1	07/23/2021 15:35	WG1705349
Silver	ND		1.00	1	07/23/2021 15:35	WG1705349
Zinc	58.2		5.00	1	07/23/2021 15:35	WG1705349

Metals (ICP) by Method 6010B-NE493 Ch 2

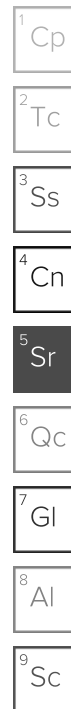
Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.218		0.200	1	07/24/2021 18:13	WG1707892

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.100	1	07/17/2021 04:15	WG1706618
(S) a,a,a-Trifluorotoluene(FID)	108		77.0-120		07/17/2021 04:15	WG1706618

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acetone	ND		0.0500	1	07/15/2021 03:50	WG1705462
Acrylonitrile	ND		0.0125	1	07/15/2021 03:50	WG1705462
Benzene	ND		0.00100	1	07/15/2021 03:50	WG1705462
Bromobenzene	ND		0.0125	1	07/15/2021 03:50	WG1705462



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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Bromodichloromethane	ND		0.00250	1	07/15/2021 03:50	WG1705462
Bromoform	ND		0.0250	1	07/15/2021 03:50	WG1705462
Bromomethane	ND		0.0125	1	07/15/2021 03:50	WG1705462
n-Butylbenzene	ND		0.0125	1	07/15/2021 03:50	WG1705462
sec-Butylbenzene	ND		0.0125	1	07/15/2021 03:50	WG1705462
tert-Butylbenzene	ND		0.00500	1	07/15/2021 03:50	WG1705462
Carbon tetrachloride	ND		0.00500	1	07/15/2021 03:50	WG1705462
Chlorobenzene	ND		0.00250	1	07/15/2021 03:50	WG1705462
Chlorodibromomethane	ND		0.00250	1	07/15/2021 03:50	WG1705462
Chloroethane	ND		0.00500	1	07/15/2021 03:50	WG1705462
Chloroform	ND		0.00250	1	07/15/2021 03:50	WG1705462
Chloromethane	ND		0.0125	1	07/15/2021 03:50	WG1705462
2-Chlorotoluene	ND		0.00250	1	07/15/2021 03:50	WG1705462
4-Chlorotoluene	ND		0.00500	1	07/15/2021 03:50	WG1705462
1,2-Dibromo-3-Chloropropane	ND		0.0250	1	07/15/2021 03:50	WG1705462
1,2-Dibromoethane	ND		0.00250	1	07/15/2021 03:50	WG1705462
Dibromomethane	ND		0.00500	1	07/15/2021 03:50	WG1705462
1,2-Dichlorobenzene	ND		0.00500	1	07/15/2021 03:50	WG1705462
1,3-Dichlorobenzene	ND		0.00500	1	07/15/2021 03:50	WG1705462
1,4-Dichlorobenzene	ND		0.00500	1	07/15/2021 03:50	WG1705462
Dichlorodifluoromethane	ND		0.00250	1	07/15/2021 03:50	WG1705462
1,1-Dichloroethane	ND		0.00250	1	07/15/2021 03:50	WG1705462
1,2-Dichloroethane	ND		0.00250	1	07/15/2021 03:50	WG1705462
1,1-Dichloroethene	ND		0.00250	1	07/15/2021 03:50	WG1705462
cis-1,2-Dichloroethene	ND		0.00250	1	07/15/2021 03:50	WG1705462
trans-1,2-Dichloroethene	ND		0.00500	1	07/15/2021 03:50	WG1705462
1,2-Dichloropropane	ND		0.00500	1	07/15/2021 03:50	WG1705462
1,1-Dichloropropene	ND		0.00250	1	07/15/2021 03:50	WG1705462
1,3-Dichloropropane	ND		0.00500	1	07/15/2021 03:50	WG1705462
cis-1,3-Dichloropropene	ND		0.00250	1	07/15/2021 03:50	WG1705462
trans-1,3-Dichloropropene	ND		0.00500	1	07/15/2021 03:50	WG1705462
2,2-Dichloropropane	ND		0.00250	1	07/15/2021 03:50	WG1705462
Di-isopropyl ether	ND		0.00100	1	07/15/2021 03:50	WG1705462
Ethylbenzene	ND		0.00250	1	07/15/2021 03:50	WG1705462
Hexachloro-1,3-butadiene	ND		0.0250	1	07/15/2021 03:50	WG1705462
Isopropylbenzene	ND		0.00250	1	07/15/2021 03:50	WG1705462
p-Isopropyltoluene	ND		0.00500	1	07/15/2021 03:50	WG1705462
2-Butanone (MEK)	ND		0.100	1	07/15/2021 03:50	WG1705462
Methylene Chloride	ND		0.0250	1	07/15/2021 03:50	WG1705462
4-Methyl-2-pentanone (MIBK)	ND		0.0250	1	07/15/2021 03:50	WG1705462
Methyl tert-butyl ether	ND		0.00100	1	07/15/2021 03:50	WG1705462
Naphthalene	ND		0.0125	1	07/15/2021 03:50	WG1705462
n-Propylbenzene	ND		0.00500	1	07/15/2021 03:50	WG1705462
Styrene	ND		0.0125	1	07/15/2021 03:50	WG1705462
1,1,1,2-Tetrachloroethane	ND		0.00250	1	07/15/2021 03:50	WG1705462
1,1,2,2-Tetrachloroethane	ND		0.00250	1	07/15/2021 03:50	WG1705462
1,1,2-Trichlorotrifluoroethane	ND		0.00250	1	07/15/2021 03:50	WG1705462
Tetrachloroethene	ND		0.00250	1	07/15/2021 03:50	WG1705462
Toluene	ND		0.00500	1	07/15/2021 03:50	WG1705462
1,2,3-Trichlorobenzene	ND		0.0125	1	07/15/2021 03:50	WG1705462
1,2,4-Trichlorobenzene	ND		0.0125	1	07/15/2021 03:50	WG1705462
1,1,1-Trichloroethane	ND		0.00250	1	07/15/2021 03:50	WG1705462
1,1,2-Trichloroethane	ND		0.00250	1	07/15/2021 03:50	WG1705462
Trichloroethene	ND		0.00100	1	07/15/2021 03:50	WG1705462
Trichlorofluoromethane	ND		0.00250	1	07/15/2021 03:50	WG1705462
1,2,3-Trichloropropane	ND		0.0125	1	07/15/2021 03:50	WG1705462

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

029-9

Collected date/time: 07/10/21 12:00

SAMPLE RESULTS - 09

L1377536

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
1,2,4-Trimethylbenzene	ND		0.00500	1	07/15/2021 03:50	WG1705462
1,2,3-Trimethylbenzene	ND	J4	0.00500	1	07/15/2021 03:50	WG1705462
1,3,5-Trimethylbenzene	ND		0.00500	1	07/15/2021 03:50	WG1705462
Vinyl chloride	ND		0.00250	1	07/15/2021 03:50	WG1705462
Xylenes, Total	ND		0.00650	1	07/15/2021 03:50	WG1705462
(S) Toluene-d8	102		75.0-131		07/15/2021 03:50	WG1705462
(S) 4-Bromofluorobenzene	93.8		67.0-138		07/15/2021 03:50	WG1705462
(S) 1,2-Dichloroethane-d4	110		70.0-130		07/15/2021 03:50	WG1705462

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	23.3	B	4.00	1	07/20/2021 04:13	WG1707478
C28-C40 Oil Range	59.1		4.00	1	07/20/2021 04:13	WG1707478
(S) o-Terphenyl	55.4		18.0-148		07/20/2021 04:13	WG1707478

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	07/20/2021 17:39	WG1707406
Acenaphthene	ND		0.00600	1	07/20/2021 17:39	WG1707406
Acenaphthylene	ND		0.00600	1	07/20/2021 17:39	WG1707406
Benzo(a)anthracene	ND		0.00600	1	07/20/2021 17:39	WG1707406
Benzo(a)pyrene	ND		0.00600	1	07/20/2021 17:39	WG1707406
Benzo(b)fluoranthene	ND		0.00600	1	07/20/2021 17:39	WG1707406
Benzo(g,h,i)perylene	ND		0.00600	1	07/20/2021 17:39	WG1707406
Benzo(k)fluoranthene	ND		0.00600	1	07/20/2021 17:39	WG1707406
Chrysene	ND		0.00600	1	07/20/2021 17:39	WG1707406
Dibenz(a,h)anthracene	ND		0.00600	1	07/20/2021 17:39	WG1707406
Fluoranthene	ND		0.00600	1	07/20/2021 17:39	WG1707406
Fluorene	ND		0.00600	1	07/20/2021 17:39	WG1707406
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	07/20/2021 17:39	WG1707406
Naphthalene	ND		0.0200	1	07/20/2021 17:39	WG1707406
Phenanthrene	ND		0.00600	1	07/20/2021 17:39	WG1707406
Pyrene	ND		0.00600	1	07/20/2021 17:39	WG1707406
1-Methylnaphthalene	ND		0.0200	1	07/20/2021 17:39	WG1707406
2-Methylnaphthalene	ND		0.0200	1	07/20/2021 17:39	WG1707406
2-Chloronaphthalene	ND		0.0200	1	07/20/2021 17:39	WG1707406
(S) p-Terphenyl-d14	86.9		23.0-120		07/20/2021 17:39	WG1707406
(S) Nitrobenzene-d5	73.6		14.0-149		07/20/2021 17:39	WG1707406
(S) 2-Fluorobiphenyl	76.3		34.0-125		07/20/2021 17:39	WG1707406

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

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	07/20/2021 20:38	WG1707406
Acenaphthene	ND		0.00600	1	07/20/2021 20:38	WG1707406
Acenaphthylene	ND		0.00600	1	07/20/2021 20:38	WG1707406
Benzo(a)anthracene	0.0132		0.00600	1	07/20/2021 20:38	WG1707406
Benzo(a)pyrene	0.0125		0.00600	1	07/20/2021 20:38	WG1707406
Benzo(b)fluoranthene	0.0365		0.00600	1	07/20/2021 20:38	WG1707406
Benzo(g,h,i)perylene	0.0186		0.00600	1	07/20/2021 20:38	WG1707406
Benzo(k)fluoranthene	0.00789		0.00600	1	07/20/2021 20:38	WG1707406
Chrysene	0.0161		0.00600	1	07/20/2021 20:38	WG1707406
Dibenz(a,h)anthracene	ND		0.00600	1	07/20/2021 20:38	WG1707406
Fluoranthene	0.0169		0.00600	1	07/20/2021 20:38	WG1707406
Fluorene	ND		0.00600	1	07/20/2021 20:38	WG1707406
Indeno(1,2,3-cd)pyrene	0.0181		0.00600	1	07/20/2021 20:38	WG1707406
Naphthalene	0.0425		0.0200	1	07/20/2021 20:38	WG1707406
Phenanthrene	0.0200		0.00600	1	07/20/2021 20:38	WG1707406
Pyrene	0.0129		0.00600	1	07/20/2021 20:38	WG1707406
1-Methylnaphthalene	0.0468		0.0200	1	07/20/2021 20:38	WG1707406
2-Methylnaphthalene	0.0725		0.0200	1	07/20/2021 20:38	WG1707406
2-Chloronaphthalene	ND		0.0200	1	07/20/2021 20:38	WG1707406
(S) p-Terphenyl-d14	81.6		23.0-120		07/20/2021 20:38	WG1707406
(S) Nitrobenzene-d5	73.1		14.0-149		07/20/2021 20:38	WG1707406
(S) 2-Fluorobiphenyl	72.1		34.0-125		07/20/2021 20:38	WG1707406

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

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	07/20/2021 22:18	WG1707406
Acenaphthene	ND		0.00600	1	07/20/2021 22:18	WG1707406
Acenaphthylene	ND		0.00600	1	07/20/2021 22:18	WG1707406
Benzo(a)anthracene	0.0127		0.00600	1	07/20/2021 22:18	WG1707406
Benzo(a)pyrene	0.0122		0.00600	1	07/20/2021 22:18	WG1707406
Benzo(b)fluoranthene	0.0340		0.00600	1	07/20/2021 22:18	WG1707406
Benzo(g,h,i)perylene	0.0186		0.00600	1	07/20/2021 22:18	WG1707406
Benzo(k)fluoranthene	0.00834		0.00600	1	07/20/2021 22:18	WG1707406
Chrysene	0.0147		0.00600	1	07/20/2021 22:18	WG1707406
Dibenz(a,h)anthracene	ND		0.00600	1	07/20/2021 22:18	WG1707406
Fluoranthene	0.0163		0.00600	1	07/20/2021 22:18	WG1707406
Fluorene	ND		0.00600	1	07/20/2021 22:18	WG1707406
Indeno(1,2,3-cd)pyrene	0.0178		0.00600	1	07/20/2021 22:18	WG1707406
Naphthalene	ND		0.0200	1	07/20/2021 22:18	WG1707406
Phenanthrene	0.0115		0.00600	1	07/20/2021 22:18	WG1707406
Pyrene	0.0126		0.00600	1	07/20/2021 22:18	WG1707406
1-Methylnaphthalene	ND		0.0200	1	07/20/2021 22:18	WG1707406
2-Methylnaphthalene	0.0229		0.0200	1	07/20/2021 22:18	WG1707406
2-Chloronaphthalene	ND		0.0200	1	07/20/2021 22:18	WG1707406
(S) p-Terphenyl-d14	79.5		23.0-120		07/20/2021 22:18	WG1707406
(S) Nitrobenzene-d5	72.7		14.0-149		07/20/2021 22:18	WG1707406
(S) 2-Fluorobiphenyl	71.4		34.0-125		07/20/2021 22:18	WG1707406

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc

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	07/20/2021 22:38	WG1707406
Acenaphthene	ND		0.00600	1	07/20/2021 22:38	WG1707406
Acenaphthylene	ND		0.00600	1	07/20/2021 22:38	WG1707406
Benzo(a)anthracene	0.0370		0.00600	1	07/20/2021 22:38	WG1707406
Benzo(a)pyrene	0.0362		0.00600	1	07/20/2021 22:38	WG1707406
Benzo(b)fluoranthene	0.102		0.00600	1	07/20/2021 22:38	WG1707406
Benzo(g,h,i)perylene	0.0512		0.00600	1	07/20/2021 22:38	WG1707406
Benzo(k)fluoranthene	0.0237		0.00600	1	07/20/2021 22:38	WG1707406
Chrysene	0.0430		0.00600	1	07/20/2021 22:38	WG1707406
Dibenz(a,h)anthracene	0.0131		0.00600	1	07/20/2021 22:38	WG1707406
Fluoranthene	0.0439		0.00600	1	07/20/2021 22:38	WG1707406
Fluorene	ND		0.00600	1	07/20/2021 22:38	WG1707406
Indeno(1,2,3-cd)pyrene	0.0508		0.00600	1	07/20/2021 22:38	WG1707406
Naphthalene	0.0393		0.0200	1	07/20/2021 22:38	WG1707406
Phenanthrene	0.0283		0.00600	1	07/20/2021 22:38	WG1707406
Pyrene	0.0327		0.00600	1	07/20/2021 22:38	WG1707406
1-Methylnaphthalene	0.0347		0.0200	1	07/20/2021 22:38	WG1707406
2-Methylnaphthalene	0.0621		0.0200	1	07/20/2021 22:38	WG1707406
2-Chloronaphthalene	ND		0.0200	1	07/20/2021 22:38	WG1707406
(S) p-Terphenyl-d14	73.5		23.0-120		07/20/2021 22:38	WG1707406
(S) Nitrobenzene-d5	69.7		14.0-149		07/20/2021 22:38	WG1707406
(S) 2-Fluorobiphenyl	66.3		34.0-125		07/20/2021 22:38	WG1707406

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.433		1	07/24/2021 02:54	WG1707575

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	2.56		2.00	1	07/17/2021 13:38	WG1705929

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.10	T8	1	07/18/2021 12:00	WG1707283

Sample Narrative:

L1377536-13 WG1707283: 8.1 at 22C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	257		10.0	1	07/20/2021 05:14	WG1706094

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	6.97		2.00	1	07/23/2021 15:38	WG1705349
Barium	270		0.500	1	07/23/2021 15:38	WG1705349
Cadmium	ND		0.500	1	07/23/2021 15:38	WG1705349
Chromium	29.9		1.00	1	07/23/2021 15:38	WG1705349
Copper	19.3		2.00	1	07/23/2021 15:38	WG1705349
Lead	14.9		0.500	1	07/23/2021 15:38	WG1705349
Nickel	20.2		2.00	1	07/23/2021 15:38	WG1705349
Selenium	ND		2.00	1	07/23/2021 15:38	WG1705349
Silver	ND		1.00	1	07/23/2021 15:38	WG1705349
Zinc	58.0		5.00	1	07/23/2021 15:38	WG1705349

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.201		0.200	1	07/24/2021 18:16	WG1707892

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.100	1	07/17/2021 04:37	WG1706618
(S) a,a,a-Trifluorotoluene(FID)	107		77.0-120		07/17/2021 04:37	WG1706618

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acetone	ND		0.0500	1	07/15/2021 04:09	WG1705462
Acrylonitrile	ND		0.0125	1	07/15/2021 04:09	WG1705462
Benzene	ND		0.00100	1	07/15/2021 04:09	WG1705462
Bromobenzene	ND		0.0125	1	07/15/2021 04:09	WG1705462

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

029-13

SAMPLE RESULTS - 13

Collected date/time: 07/10/21 12:00

L1377536

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Bromodichloromethane	ND		0.00250	1	07/15/2021 04:09	WG1705462
Bromoform	ND		0.0250	1	07/15/2021 04:09	WG1705462
Bromomethane	ND		0.0125	1	07/15/2021 04:09	WG1705462
n-Butylbenzene	ND		0.0125	1	07/15/2021 04:09	WG1705462
sec-Butylbenzene	ND		0.0125	1	07/15/2021 04:09	WG1705462
tert-Butylbenzene	ND		0.00500	1	07/15/2021 04:09	WG1705462
Carbon tetrachloride	ND		0.00500	1	07/15/2021 04:09	WG1705462
Chlorobenzene	ND		0.00250	1	07/15/2021 04:09	WG1705462
Chlorodibromomethane	ND		0.00250	1	07/15/2021 04:09	WG1705462
Chloroethane	ND		0.00500	1	07/15/2021 04:09	WG1705462
Chloroform	ND		0.00250	1	07/15/2021 04:09	WG1705462
Chloromethane	ND		0.0125	1	07/15/2021 04:09	WG1705462
2-Chlorotoluene	ND		0.00250	1	07/15/2021 04:09	WG1705462
4-Chlorotoluene	ND		0.00500	1	07/15/2021 04:09	WG1705462
1,2-Dibromo-3-Chloropropane	ND		0.0250	1	07/15/2021 04:09	WG1705462
1,2-Dibromoethane	ND		0.00250	1	07/15/2021 04:09	WG1705462
Dibromomethane	ND		0.00500	1	07/15/2021 04:09	WG1705462
1,2-Dichlorobenzene	ND		0.00500	1	07/15/2021 04:09	WG1705462
1,3-Dichlorobenzene	ND		0.00500	1	07/15/2021 04:09	WG1705462
1,4-Dichlorobenzene	ND		0.00500	1	07/15/2021 04:09	WG1705462
Dichlorodifluoromethane	ND		0.00250	1	07/15/2021 04:09	WG1705462
1,1-Dichloroethane	ND		0.00250	1	07/15/2021 04:09	WG1705462
1,2-Dichloroethane	ND		0.00250	1	07/15/2021 04:09	WG1705462
1,1-Dichloroethene	ND		0.00250	1	07/15/2021 04:09	WG1705462
cis-1,2-Dichloroethene	ND		0.00250	1	07/15/2021 04:09	WG1705462
trans-1,2-Dichloroethene	ND		0.00500	1	07/15/2021 04:09	WG1705462
1,2-Dichloropropane	ND		0.00500	1	07/15/2021 04:09	WG1705462
1,1-Dichloropropene	ND		0.00250	1	07/15/2021 04:09	WG1705462
1,3-Dichloropropane	ND		0.00500	1	07/15/2021 04:09	WG1705462
cis-1,3-Dichloropropene	ND		0.00250	1	07/15/2021 04:09	WG1705462
trans-1,3-Dichloropropene	ND		0.00500	1	07/15/2021 04:09	WG1705462
2,2-Dichloropropane	ND		0.00250	1	07/15/2021 04:09	WG1705462
Di-isopropyl ether	ND		0.00100	1	07/15/2021 04:09	WG1705462
Ethylbenzene	ND		0.00250	1	07/15/2021 04:09	WG1705462
Hexachloro-1,3-butadiene	ND		0.0250	1	07/15/2021 04:09	WG1705462
Isopropylbenzene	ND		0.00250	1	07/15/2021 04:09	WG1705462
p-Isopropyltoluene	ND		0.00500	1	07/15/2021 04:09	WG1705462
2-Butanone (MEK)	ND		0.100	1	07/15/2021 04:09	WG1705462
Methylene Chloride	ND		0.0250	1	07/15/2021 04:09	WG1705462
4-Methyl-2-pentanone (MIBK)	ND		0.0250	1	07/15/2021 04:09	WG1705462
Methyl tert-butyl ether	ND		0.00100	1	07/15/2021 04:09	WG1705462
Naphthalene	ND		0.0125	1	07/15/2021 04:09	WG1705462
n-Propylbenzene	ND		0.00500	1	07/15/2021 04:09	WG1705462
Styrene	ND		0.0125	1	07/15/2021 04:09	WG1705462
1,1,1,2-Tetrachloroethane	ND		0.00250	1	07/15/2021 04:09	WG1705462
1,1,2,2-Tetrachloroethane	ND		0.00250	1	07/15/2021 04:09	WG1705462
1,1,2-Trichlorotrifluoroethane	ND		0.00250	1	07/15/2021 04:09	WG1705462
Tetrachloroethene	ND		0.00250	1	07/15/2021 04:09	WG1705462
Toluene	ND		0.00500	1	07/15/2021 04:09	WG1705462
1,2,3-Trichlorobenzene	ND		0.0125	1	07/15/2021 04:09	WG1705462
1,2,4-Trichlorobenzene	ND		0.0125	1	07/15/2021 04:09	WG1705462
1,1,1-Trichloroethane	ND		0.00250	1	07/15/2021 04:09	WG1705462
1,1,2-Trichloroethane	ND		0.00250	1	07/15/2021 04:09	WG1705462
Trichloroethene	ND		0.00100	1	07/15/2021 04:09	WG1705462
Trichlorofluoromethane	ND		0.00250	1	07/15/2021 04:09	WG1705462
1,2,3-Trichloropropane	ND		0.0125	1	07/15/2021 04:09	WG1705462

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

ACCOUNT:

Berry Petroleum - Denver, CO

PROJECT:

SDG:

L1377536

DATE/TIME:

07/27/21 10:17

PAGE:

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
1,2,4-Trimethylbenzene	ND		0.00500	1	07/15/2021 04:09	WG1705462
1,2,3-Trimethylbenzene	ND	J4	0.00500	1	07/15/2021 04:09	WG1705462
1,3,5-Trimethylbenzene	ND		0.00500	1	07/15/2021 04:09	WG1705462
Vinyl chloride	ND		0.00250	1	07/15/2021 04:09	WG1705462
Xylenes, Total	ND		0.00650	1	07/15/2021 04:09	WG1705462
(S) Toluene-d8	99.6		75.0-131		07/15/2021 04:09	WG1705462
(S) 4-Bromofluorobenzene	95.8		67.0-138		07/15/2021 04:09	WG1705462
(S) 1,2-Dichloroethane-d4	110		70.0-130		07/15/2021 04:09	WG1705462

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	23.0		4.00	1	07/19/2021 03:15	WG1707371
C28-C40 Oil Range	82.4		4.00	1	07/19/2021 03:15	WG1707371
(S) o-Terphenyl	39.1		18.0-148		07/19/2021 03:15	WG1707371

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	07/20/2021 22:58	WG1707406
Acenaphthene	ND		0.00600	1	07/20/2021 22:58	WG1707406
Acenaphthylene	ND		0.00600	1	07/20/2021 22:58	WG1707406
Benzo(a)anthracene	0.0170		0.00600	1	07/20/2021 22:58	WG1707406
Benzo(a)pyrene	0.0173		0.00600	1	07/20/2021 22:58	WG1707406
Benzo(b)fluoranthene	0.0520		0.00600	1	07/20/2021 22:58	WG1707406
Benzo(g,h,i)perylene	0.0269		0.00600	1	07/20/2021 22:58	WG1707406
Benzo(k)fluoranthene	0.0122		0.00600	1	07/20/2021 22:58	WG1707406
Chrysene	0.0211		0.00600	1	07/20/2021 22:58	WG1707406
Dibenz(a,h)anthracene	0.00681		0.00600	1	07/20/2021 22:58	WG1707406
Fluoranthene	0.0193		0.00600	1	07/20/2021 22:58	WG1707406
Fluorene	ND		0.00600	1	07/20/2021 22:58	WG1707406
Indeno(1,2,3-cd)pyrene	0.0266		0.00600	1	07/20/2021 22:58	WG1707406
Naphthalene	ND		0.0200	1	07/20/2021 22:58	WG1707406
Phenanthrene	0.0141		0.00600	1	07/20/2021 22:58	WG1707406
Pyrene	0.0148		0.00600	1	07/20/2021 22:58	WG1707406
1-Methylnaphthalene	ND		0.0200	1	07/20/2021 22:58	WG1707406
2-Methylnaphthalene	0.0301		0.0200	1	07/20/2021 22:58	WG1707406
2-Chloronaphthalene	ND		0.0200	1	07/20/2021 22:58	WG1707406
(S) p-Terphenyl-d14	76.9		23.0-120		07/20/2021 22:58	WG1707406
(S) Nitrobenzene-d5	74.8		14.0-149		07/20/2021 22:58	WG1707406
(S) 2-Fluorobiphenyl	69.4		34.0-125		07/20/2021 22:58	WG1707406

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

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	07/20/2021 23:18	WG1707406
Acenaphthene	ND		0.00600	1	07/20/2021 23:18	WG1707406
Acenaphthylene	ND		0.00600	1	07/20/2021 23:18	WG1707406
Benzo(a)anthracene	0.0330		0.00600	1	07/20/2021 23:18	WG1707406
Benzo(a)pyrene	0.0336		0.00600	1	07/20/2021 23:18	WG1707406
Benzo(b)fluoranthene	0.0942		0.00600	1	07/20/2021 23:18	WG1707406
Benzo(g,h,i)perylene	0.0469		0.00600	1	07/20/2021 23:18	WG1707406
Benzo(k)fluoranthene	0.0214		0.00600	1	07/20/2021 23:18	WG1707406
Chrysene	0.0409		0.00600	1	07/20/2021 23:18	WG1707406
Dibenz(a,h)anthracene	0.0120		0.00600	1	07/20/2021 23:18	WG1707406
Fluoranthene	0.0397		0.00600	1	07/20/2021 23:18	WG1707406
Fluorene	ND		0.00600	1	07/20/2021 23:18	WG1707406
Indeno(1,2,3-cd)pyrene	0.0466		0.00600	1	07/20/2021 23:18	WG1707406
Naphthalene	0.0303		0.0200	1	07/20/2021 23:18	WG1707406
Phenanthrene	0.0285		0.00600	1	07/20/2021 23:18	WG1707406
Pyrene	0.0308		0.00600	1	07/20/2021 23:18	WG1707406
1-Methylnaphthalene	0.0266		0.0200	1	07/20/2021 23:18	WG1707406
2-Methylnaphthalene	0.0503		0.0200	1	07/20/2021 23:18	WG1707406
2-Chloronaphthalene	ND		0.0200	1	07/20/2021 23:18	WG1707406
(S) p-Terphenyl-d14	76.0		23.0-120		07/20/2021 23:18	WG1707406
(S) Nitrobenzene-d5	70.6		14.0-149		07/20/2021 23:18	WG1707406
(S) 2-Fluorobiphenyl	67.6		34.0-125		07/20/2021 23:18	WG1707406

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc

Method Blank (MB)

(MB) R3680659-1 07/17/21 13:15					
MB Result		<u>MB Qualifier</u>		MB MDL	MB RDL
mg/kg		mg/kg		mg/kg	mg/kg
Analyte					
Chromium, Hexavalent	U		0.640		2.00

L1378294-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1378294-04 07/17/21 13:45 • (DUP) R3680659-7 07/17/21 13:47					
Original Result		DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>
mg/kg		mg/kg		%	DUP RPD Limits
Analyte					%
Chromium, Hexavalent	ND	ND	1	0.000	20

L1378294-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1378294-05 07/17/21 13:47 • (DUP) R3680659-8 07/17/21 13:48					
Original Result		DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>
mg/kg		mg/kg		%	DUP RPD Limits
Analyte					%
Chromium, Hexavalent	ND	ND	1	0.000	20

Laboratory Control Sample (LCS)

(LCS) R3680659-2 07/17/21 13:15					
Spike Amount		LCS Result	Rec. Limits		<u>LCS Qualifier</u>
mg/kg		mg/kg	%		
Analyte					
Chromium, Hexavalent	24.0	23.0	96.0	80.0-120	

L1378294-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1378294-02 07/17/21 13:39 • (MS) R3680659-3 07/17/21 13:40 • (MSD) R3680659-4 07/17/21 13:40					
Spike Amount		Original Result	MS Result	MSD Result	MS Rec.
mg/kg		mg/kg	mg/kg	mg/kg	%
Analyte					%
Chromium, Hexavalent	20.0	ND	16.3	17.2	81.4
					86.1
					75.0-125
					1
					5.59
					20

L1378294-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1378294-02 07/17/21 13:39 • (MS) R3680659-5 07/17/21 13:40					
Spike Amount		Original Result	MS Result	MS Rec.	<u>MS Qualifier</u>
mg/kg		mg/kg	mg/kg	%	
Analyte					%
Chromium, Hexavalent	631	ND	755	120	50
					75.0-125

L1377985-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1377985-05 07/18/21 12:00 • (DUP) R3680769-3 07/18/21 12:00

Analyte	Original Result		DUP Result		DUP RPD		<u>DUP Qualifier</u>		DUP RPD Limits	
	su	%	su	%	su	%	su	%	su	%
pH	7.78		7.76		1	0.257			1	

Sample Narrative:

OS: 7.78 at 22.2C
DUP: 7.76 at 22.2C

Laboratory Control Sample (LCS)

(LCS) R3680769-1 07/18/21 12:00

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

Sample Narrative:

LCS: 10.06 at 21.8C

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3681329-1 07/20/21 05:14				
Analyte	MB Result umhos/cm	<u>MB Qualifier</u>	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

L1378090-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1378090-04 07/20/21 05:14 • (DUP) R3681329-3 07/20/21 05:14				
Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %
Specific Conductance	19.5	18.9	1	3.02
				DUP RPD Limits %
				20

L1378722-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1378722-03 07/20/21 05:14 • (DUP) R3681329-4 07/20/21 05:14				
Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %
Specific Conductance	244	257	1	5.03
				DUP RPD Limits %
				20

Laboratory Control Sample (LCS)

(LCS) R3681329-2 07/20/21 05:14				
Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %
Specific Conductance	899	912	101	85.0-115
				<u>LCS Qualifier</u>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3683399-1 07/23/21 14:19

Analyte	MB Result mg/kg	<u>MB Qualifier</u>	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.518	2.00
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Chromium	U		0.133	1.00
Copper	U		0.400	2.00
Lead	U		0.208	0.500
Nickel	U		0.132	2.00
Selenium	U		0.764	2.00
Silver	U		0.127	1.00
Zinc	U		0.832	5.00

Laboratory Control Sample (LCS)

(LCS) R3683399-2 07/23/21 14:21

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Arsenic	100	101	101	80.0-120	
Barium	100	105	105	80.0-120	
Cadmium	100	99.9	99.9	80.0-120	
Chromium	100	101	101	80.0-120	
Copper	100	99.7	99.7	80.0-120	
Lead	100	102	102	80.0-120	
Nickel	100	105	105	80.0-120	
Selenium	100	104	104	80.0-120	
Silver	20.0	18.3	91.7	80.0-120	
Zinc	100	102	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) R3683614-1 07/24/21 17:18					
Analyte	MB Result mg/l	<u>MB Qualifier</u>	MB MDL mg/l	MB RDL mg/l	
Hot Water Sol. Boron	U		0.0167	0.200	

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

(LCS) R3683614-2 07/24/21 17:21 • (LCSD) R3683614-3 07/24/21 17:24									
Analyte	Spike Amount		LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>
	mg/l		mg/l	mg/l	%	%	%	%	%
Hot Water Sol. Boron	1.00		1.02	1.01	102	101	80.0-120		1.04
									20

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3682350-2 07/17/21 02:50				
Analyte	MB Result mg/kg	<u>MB Qualifier</u>	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U	0.0217	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	113			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3682350-1 07/17/21 02:07				
Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %
TPH (GC/FID) Low Fraction	5.50	5.12	93.1	72.0-127
(S) a,a,a-Trifluorotoluene(FID)		101		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) R3680783-3 07/15/21 12:23

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acetone	U		0.0365	0.0500
Acrylonitrile	U		0.00361	0.0125
Benzene	U		0.000467	0.00100
Bromobenzene	U		0.000900	0.0125
Bromodichloromethane	U		0.000725	0.00250
Bromoform	U		0.00117	0.0250
Bromomethane	U		0.00197	0.0125
n-Butylbenzene	U		0.00525	0.0125
sec-Butylbenzene	U		0.00288	0.0125
tert-Butylbenzene	U		0.00195	0.00500
Carbon tetrachloride	U		0.000898	0.00500
Chlorobenzene	U		0.000210	0.00250
Chlorodibromomethane	U		0.000612	0.00250
Chloroethane	U		0.00170	0.00500
Chloroform	U		0.00103	0.00250
Chloromethane	U		0.00435	0.0125
2-Chlorotoluene	U		0.000865	0.00250
4-Chlorotoluene	U		0.000450	0.00500
1,2-Dibromo-3-Chloropropane	U		0.00390	0.0250
1,2-Dibromoethane	U		0.000648	0.00250
Dibromomethane	U		0.000750	0.00500
1,2-Dichlorobenzene	U		0.000425	0.00500
1,3-Dichlorobenzene	U		0.000600	0.00500
1,4-Dichlorobenzene	U		0.000700	0.00500
Dichlorodifluoromethane	U		0.00161	0.00250
1,1-Dichloroethane	U		0.000491	0.00250
1,2-Dichloroethane	U		0.000649	0.00250
1,1-Dichloroethene	U		0.000606	0.00250
cis-1,2-Dichloroethene	U		0.000734	0.00250
trans-1,2-Dichloroethene	U		0.00104	0.00500
1,2-Dichloropropane	U		0.00142	0.00500
1,1-Dichloropropene	U		0.000809	0.00250
1,3-Dichloropropane	U		0.000501	0.00500
cis-1,3-Dichloropropene	U		0.000757	0.00250
trans-1,3-Dichloropropene	U		0.00114	0.00500
2,2-Dichloropropane	U		0.00138	0.00250
Di-isopropyl ether	U		0.000410	0.00100
Ethylbenzene	U		0.000737	0.00250
Hexachloro-1,3-butadiene	U		0.00600	0.0250
Isopropylbenzene	U		0.000425	0.00250

Method Blank (MB)

(MB) R3680783-3 07/15/21 12:23

Analyte	MB Result mg/kg	<u>MB Qualifier</u>	MB MDL mg/kg	MB RDL mg/kg
p-Isopropyltoluene	U		0.00255	0.00500
2-Butanone (MEK)	0.0644	J	0.0635	0.100
Methylene Chloride	U		0.00664	0.0250
4-Methyl-2-pentanone (MIBK)	U		0.00228	0.0250
Methyl tert-butyl ether	U		0.000350	0.00100
Naphthalene	U		0.00488	0.0125
n-Propylbenzene	U		0.000950	0.00500
Styrene	U		0.000229	0.0125
1,1,2-Tetrachloroethane	U		0.000948	0.00250
1,1,2,2-Tetrachloroethane	U		0.000695	0.00250
Tetrachloroethene	U		0.000896	0.00250
Toluene	U		0.00130	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000754	0.00250
1,2,3-Trichlorobenzene	U		0.00733	0.0125
1,2,4-Trichlorobenzene	U		0.00440	0.0125
1,1,1-Trichloroethane	U		0.000923	0.00250
1,1,2-Trichloroethane	U		0.000597	0.00250
Trichloroethene	U		0.000584	0.00100
Trichlorofluoromethane	U		0.000827	0.00250
1,2,3-Trichloropropane	U		0.00162	0.0125
1,2,3-Trimethylbenzene	U		0.00158	0.00500
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
Vinyl chloride	U		0.00116	0.00250
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	97.3			75.0-131
(S) 4-Bromofluorobenzene	93.2			67.0-138
(S) 1,2-Dichloroethane-d4	109			70.0-130

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

(LCS) R3680783-1 07/15/21 11:06 • (LCSD) R3680783-2 07/15/21 11:25

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 %
Acetone	0.625	0.984	1.90	157	304	10.0-160		J3 J4	63.5	31
Acrylonitrile	0.625	0.826	0.993	132	159	45.0-153		J4	18.4	22
Benzene	0.125	0.130	0.131	104	105	70.0-123			0.766	20
Bromobenzene	0.125	0.141	0.128	113	102	73.0-121			9.67	20
Bromodichloromethane	0.125	0.130	0.135	104	108	73.0-121			3.77	20

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

(LCS) R3680783-1 07/15/21 11:06 • (LCSD) R3680783-2 07/15/21 11:25

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier		LCSD Qualifier		RPD Limits	
							%		%		%	
Bromoform	0.125	0.127	0.119	102	95.2	64.0-132					6.50 20	
Bromomethane	0.125	0.133	0.143	106	114	56.0-147					7.25 20	
n-Butylbenzene	0.125	0.100	0.115	80.0	92.0	68.0-135					14.0 20	
sec-Butylbenzene	0.125	0.120	0.110	96.0	88.0	74.0-130					8.70 20	
tert-Butylbenzene	0.125	0.118	0.116	94.4	92.8	75.0-127					1.71 20	
Carbon tetrachloride	0.125	0.131	0.132	105	106	66.0-128					0.760 20	
Chlorobenzene	0.125	0.132	0.119	106	95.2	76.0-128					10.4 20	
Chlorodibromomethane	0.125	0.119	0.119	95.2	95.2	74.0-127					0.000 20	
Chloroethane	0.125	0.147	0.149	118	119	61.0-134					1.35 20	
Chloroform	0.125	0.140	0.136	112	109	72.0-123					2.90 20	
Chloromethane	0.125	0.130	0.128	104	102	51.0-138					1.55 20	
2-Chlorotoluene	0.125	0.147	0.128	118	102	75.0-124					13.8 20	
4-Chlorotoluene	0.125	0.123	0.112	98.4	89.6	75.0-124					9.36 20	
1,2-Dibromo-3-Chloropropane	0.125	0.102	0.128	81.6	102	59.0-130			J3		22.6 20	
1,2-Dibromoethane	0.125	0.131	0.130	105	104	74.0-128					0.766 20	
Dibromomethane	0.125	0.143	0.145	114	116	75.0-122					1.39 20	
1,2-Dichlorobenzene	0.125	0.118	0.134	94.4	107	76.0-124					12.7 20	
1,3-Dichlorobenzene	0.125	0.116	0.130	92.8	104	76.0-125					11.4 20	
1,4-Dichlorobenzene	0.125	0.122	0.125	97.6	100	77.0-121					2.43 20	
Dichlorodifluoromethane	0.125	0.148	0.138	118	110	43.0-156					6.99 20	
1,1-Dichloroethane	0.125	0.140	0.139	112	111	70.0-127					0.717 20	
1,2-Dichloroethane	0.125	0.147	0.153	118	122	65.0-131					4.00 20	
1,1-Dichloroethene	0.125	0.132	0.119	106	95.2	65.0-131					10.4 20	
cis-1,2-Dichloroethene	0.125	0.127	0.125	102	100	73.0-125					1.59 20	
trans-1,2-Dichloroethene	0.125	0.116	0.118	92.8	94.4	71.0-125					1.71 20	
1,2-Dichloropropane	0.125	0.131	0.129	105	103	74.0-125					1.54 20	
1,1-Dichloropropene	0.125	0.129	0.121	103	96.8	73.0-125					6.40 20	
1,3-Dichloropropane	0.125	0.131	0.130	105	104	80.0-125					0.766 20	
cis-1,3-Dichloropropene	0.125	0.130	0.124	104	99.2	76.0-127					4.72 20	
trans-1,3-Dichloropropene	0.125	0.125	0.118	100	94.4	73.0-127					5.76 20	
2,2-Dichloropropane	0.125	0.158	0.133	126	106	59.0-135					17.2 20	
Di-isopropyl ether	0.125	0.129	0.134	103	107	60.0-136					3.80 20	
Ethylbenzene	0.125	0.115	0.118	92.0	94.4	74.0-126					2.58 20	
Hexachloro-1,3-butadiene	0.125	0.0960	0.117	76.8	93.6	57.0-150					19.7 20	
Isopropylbenzene	0.125	0.121	0.128	96.8	102	72.0-127					5.62 20	
p-Isopropyltoluene	0.125	0.112	0.113	89.6	90.4	72.0-133					0.889 20	
2-Butanone (MEK)	0.625	0.831	0.947	133	152	30.0-160					13.0 24	
Methylene Chloride	0.125	0.132	0.125	106	100	68.0-123					5.45 20	
4-Methyl-2-pentanone (MIBK)	0.625	0.799	0.798	128	128	56.0-143					0.125 20	
Methyl tert-butyl ether	0.125	0.158	0.164	126	131	66.0-132					3.73 20	

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

(LCS) R3680783-1 07/15/21 11:06 • (LCSD) R3680783-2 07/15/21 11:25

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 %
Naphthalene	0.125	0.0850	0.118	68.0	94.4	59.0-130		<u>J3</u>	32.5	20
n-Propylbenzene	0.125	0.135	0.122	108	97.6	74.0-126			10.1	20
Styrene	0.125	0.121	0.116	96.8	92.8	72.0-127			4.22	20
1,1,1,2-Tetrachloroethane	0.125	0.134	0.130	107	104	74.0-129			3.03	20
1,1,2,2-Tetrachloroethane	0.125	0.120	0.101	96.0	80.8	68.0-128			17.2	20
Tetrachloroethene	0.125	0.122	0.131	97.6	105	70.0-136			7.11	20
Toluene	0.125	0.125	0.115	100	92.0	75.0-121			8.33	20
1,1,2-Trichlorotrifluoroethane	0.125	0.139	0.138	111	110	61.0-139			0.722	20
1,2,3-Trichlorobenzene	0.125	0.0892	0.123	71.4	98.4	59.0-139	<u>J3</u>		31.9	20
1,2,4-Trichlorobenzene	0.125	0.0924	0.142	73.9	114	62.0-137	<u>J3</u>		42.3	20
1,1,1-Trichloroethane	0.125	0.137	0.135	110	108	69.0-126			1.47	20
1,1,2-Trichloroethane	0.125	0.137	0.125	110	100	78.0-123			9.16	20
Trichloroethene	0.125	0.126	0.143	101	114	76.0-126			12.6	20
Trichlorofluoromethane	0.125	0.134	0.135	107	108	61.0-142			0.743	20
1,2,3-Trichloropropane	0.125	0.167	0.143	134	114	67.0-129	<u>J4</u>		15.5	20
1,2,3-Trimethylbenzene	0.125	0.126	0.121	101	96.8	74.0-124			4.05	20
1,2,4-Trimethylbenzene	0.125	0.129	0.127	103	102	70.0-126			1.56	20
1,3,5-Trimethylbenzene	0.125	0.121	0.114	96.8	91.2	73.0-127			5.96	20
Vinyl chloride	0.125	0.129	0.121	103	96.8	63.0-134			6.40	20
Xylenes, Total	0.375	0.373	0.362	99.5	96.5	72.0-127			2.99	20
(S) Toluene-d8			98.6	92.2		75.0-131				
(S) 4-Bromofluorobenzene			95.6	98.9		67.0-138				
(S) 1,2-Dichloroethane-d4			117	116		70.0-130				

L1377435-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1377435-11 07/15/21 20:58 • (MS) R3680783-4 07/15/21 21:36 • (MSD) R3680783-5 07/15/21 21:55

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 %
Acetone	5.15	ND	10.4	11.4	267	292	8	10.0-160	<u>J5</u>	<u>J5</u>	9.17	40
Acrylonitrile	5.15	ND	6.98	4.82	179	124	8	10.0-160	<u>J5</u>		36.6	40
Benzene	1.03	0.206	0.899	0.956	88.8	96.2	8	10.0-149			6.15	37
Bromobenzene	1.03	ND	0.672	0.781	86.2	100	8	10.0-156			15.0	38
Bromodichloromethane	1.03	ND	0.531	0.797	68.1	102	8	10.0-143		<u>J3</u>	40.1	37
Bromoform	1.03	ND	0.666	0.678	85.4	86.9	8	10.0-146			1.79	36
Bromomethane	1.03	ND	0.671	0.816	86.0	105	8	10.0-149			19.5	38
n-Butylbenzene	1.03	1.59	1.71	1.83	15.4	30.8	8	10.0-160			6.78	40
sec-Butylbenzene	1.03	0.554	0.855	0.972	38.6	53.6	8	10.0-159			12.8	39
tert-Butylbenzene	1.03	ND	0.510	0.609	65.4	78.1	8	10.0-156			17.7	39

L1377435-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1377435-11 07/15/21 20:58 • (MS) R3680783-4 07/15/21 21:36 • (MSD) R3680783-5 07/15/21 21:55

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 %
Carbon tetrachloride	1.03	ND	0.650	0.702	83.3	90.0	8	10.0-145			7.69	37
Chlorobenzene	1.03	ND	0.679	0.744	87.1	95.4	8	10.0-152			9.14	39
Chlorodibromomethane	1.03	ND	0.619	0.652	79.4	83.6	8	10.0-146			5.19	37
Chloroethane	1.03	ND	0.793	0.904	102	116	8	10.0-146			13.1	40
Chloroform	1.03	ND	0.786	0.933	101	120	8	10.0-146			17.1	37
Chloromethane	1.03	ND	0.616	0.695	79.0	89.1	8	10.0-159			12.1	37
2-Chlorotoluene	1.03	ND	0.766	0.750	98.2	96.2	8	10.0-159			2.11	38
4-Chlorotoluene	1.03	ND	0.542	0.603	69.5	77.3	8	10.0-155			10.7	39
1,2-Dibromo-3-Chloropropane	1.03	ND	0.845	0.778	108	99.7	8	10.0-151			8.26	39
1,2-Dibromoethane	1.03	ND	0.719	0.747	92.2	95.8	8	10.0-148			3.82	34
Dibromomethane	1.03	ND	0.883	0.884	113	113	8	10.0-147			0.113	35
1,2-Dichlorobenzene	1.03	ND	0.698	0.692	89.5	88.7	8	10.0-155			0.863	37
1,3-Dichlorobenzene	1.03	ND	0.557	0.603	71.4	77.3	8	10.0-153			7.93	38
1,4-Dichlorobenzene	1.03	ND	0.563	0.610	72.2	78.2	8	10.0-151			8.01	38
Dichlorodifluoromethane	1.03	ND	0.680	0.835	87.2	107	8	10.0-160			20.5	35
1,1-Dichloroethane	1.03	ND	0.810	0.881	104	113	8	10.0-147			8.40	37
1,2-Dichloroethane	1.03	ND	0.812	0.818	104	105	8	10.0-148			0.736	35
1,1-Dichloroethene	1.03	ND	0.676	0.754	86.7	96.7	8	10.0-155			10.9	37
cis-1,2-Dichloroethene	1.03	ND	0.698	0.635	89.5	81.4	8	10.0-149			9.45	37
trans-1,2-Dichloroethene	1.03	ND	0.600	0.677	76.9	86.8	8	10.0-150			12.1	37
1,2-Dichloropropane	1.03	ND	0.760	1.02	97.4	131	8	10.0-148			29.2	37
1,1-Dichloropropene	1.03	ND	0.588	0.646	75.4	82.8	8	10.0-153			9.40	35
1,3-Dichloropropane	1.03	ND	0.704	0.782	90.3	100	8	10.0-154			10.5	35
cis-1,3-Dichloropropene	1.03	ND	0.653	0.676	83.7	86.7	8	10.0-151			3.46	37
trans-1,3-Dichloropropene	1.03	ND	0.624	0.755	80.0	96.8	8	10.0-148			19.0	37
2,2-Dichloropropane	1.03	ND	0.567	0.891	72.7	114	8	10.0-138	J3		44.4	36
Di-isopropyl ether	1.03	ND	0.748	0.785	95.9	101	8	10.0-147			4.83	36
Ethylbenzene	1.03	1.94	2.15	2.29	26.9	44.9	8	10.0-160			6.31	38
Hexachloro-1,3-butadiene	1.03	ND	0.589	0.795	75.5	102	8	10.0-160			29.8	40
Isopropylbenzene	1.03	1.08	1.37	1.45	37.2	47.4	8	10.0-155			5.67	38
p-Isopropyltoluene	1.03	0.0908	0.624	0.737	68.4	82.8	8	10.0-160			16.6	40
2-Butanone (MEK)	5.15	ND	6.51	5.83	167	149	8	10.0-160	J5		11.0	40
Methylene Chloride	1.03	ND	0.634	0.741	81.3	95.0	8	10.0-141			15.6	37
4-Methyl-2-pentanone (MIBK)	5.15	ND	6.64	6.71	170	172	8	10.0-160	J5	J5	1.05	35
Methyl tert-butyl ether	1.03	ND	0.925	0.852	119	109	8	11.0-147			8.22	35
Naphthalene	1.03	4.08	5.75	5.23	214	147	8	10.0-160	V	V	9.47	36
n-Propylbenzene	1.03	5.99	4.64	5.35	0.000	0.000	8	10.0-158	V	V	14.2	38
Styrene	1.03	ND	0.562	0.622	72.1	79.7	8	10.0-160			10.1	40
1,1,1,2-Tetrachloroethane	1.03	ND	0.702	0.745	90.0	95.5	8	10.0-149			5.94	39
1,1,2,2-Tetrachloroethane	1.03	ND	0.551	0.561	70.6	71.9	8	10.0-160			1.80	35

L1377435-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1377435-11 07/15/21 20:58 • (MS) R3680783-4 07/15/21 21:36 • (MSD) R3680783-5 07/15/21 21:55

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 Limits %
									MS Qualifier	MSD Qualifier	RPD	RPD	
Tetrachloroethene	1.03	ND	0.541	0.570	69.4	73.1	8	10.0-156			5.22		39
Toluene	1.03	ND	0.597	0.721	73.8	89.7	8	10.0-156			18.8		38
1,1,2-Trichlorotrifluoroethane	1.03	ND	0.573	0.694	73.5	89.0	8	10.0-160			19.1		36
1,2,3-Trichlorobenzene	1.03	ND	0.699	0.919	89.6	118	8	10.0-160			27.2		40
1,2,4-Trichlorobenzene	1.03	ND	0.857	1.05	110	135	8	10.0-160			20.2		40
1,1,1-Trichloroethane	1.03	ND	0.724	0.819	92.8	105	8	10.0-144			12.3		35
1,1,2-Trichloroethane	1.03	ND	0.962	1.06	123	136	8	10.0-160			9.69		35
Trichloroethene	1.03	ND	0.738	0.746	94.6	95.6	8	10.0-156			1.08		38
Trichlorofluoromethane	1.03	ND	0.748	0.873	95.9	112	8	10.0-160			15.4		40
1,2,3-Trichloropropane	1.03	ND	0.798	0.786	102	101	8	10.0-156			1.52		35
1,2,3-Trimethylbenzene	1.03	0.232	0.799	0.890	72.7	84.4	8	10.0-160			10.8		36
1,2,4-Trimethylbenzene	1.03	0.0808	0.634	0.689	70.9	78.0	8	10.0-160			8.31		36
1,3,5-Trimethylbenzene	1.03	0.238	0.699	0.797	59.1	71.7	8	10.0-160			13.1		38
Vinyl chloride	1.03	ND	0.645	0.690	82.7	88.5	8	10.0-160			6.74		37
Xylenes, Total	3.09	0.201	1.83	2.03	69.6	78.2	8	10.0-160			10.4		38
(S) Toluene-d8					96.8	105		75.0-131					
(S) 4-Bromofluorobenzene					96.8	97.2		67.0-138					
(S) 1,2-Dichloroethane-d4					127	117		70.0-130					

Method Blank (MB)

(MB) R3681629-2 07/15/21 03:31

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acetone	U		0.0365	0.0500
Acrylonitrile	U		0.00361	0.0125
Benzene	U		0.000467	0.00100
Bromobenzene	U		0.000900	0.0125
Bromodichloromethane	U		0.000725	0.00250
Bromoform	U		0.00117	0.0250
Bromomethane	U		0.00197	0.0125
n-Butylbenzene	U		0.00525	0.0125
sec-Butylbenzene	U		0.00288	0.0125
tert-Butylbenzene	U		0.00195	0.00500
Carbon tetrachloride	U		0.000898	0.00500
Chlorobenzene	U		0.000210	0.00250
Chlorodibromomethane	U		0.000612	0.00250
Chloroethane	U		0.00170	0.00500
Chloroform	U		0.00103	0.00250
Chloromethane	U		0.00435	0.0125
2-Chlorotoluene	U		0.000865	0.00250
4-Chlorotoluene	U		0.000450	0.00500
1,2-Dibromo-3-Chloropropane	U		0.00390	0.0250
1,2-Dibromoethane	U		0.000648	0.00250
Dibromomethane	U		0.000750	0.00500
1,2-Dichlorobenzene	U		0.000425	0.00500
1,3-Dichlorobenzene	U		0.000600	0.00500
1,4-Dichlorobenzene	U		0.000700	0.00500
Dichlorodifluoromethane	U		0.00161	0.00250
1,1-Dichloroethane	U		0.000491	0.00250
1,2-Dichloroethane	U		0.000649	0.00250
1,1-Dichloroethene	U		0.000606	0.00250
cis-1,2-Dichloroethene	U		0.000734	0.00250
trans-1,2-Dichloroethene	U		0.00104	0.00500
1,2-Dichloropropane	U		0.00142	0.00500
1,1-Dichloropropene	U		0.000809	0.00250
1,3-Dichloropropane	U		0.000501	0.00500
cis-1,3-Dichloropropene	U		0.000757	0.00250
trans-1,3-Dichloropropene	U		0.00114	0.00500
2,2-Dichloropropane	U		0.00138	0.00250
Di-isopropyl ether	U		0.000410	0.00100
Ethylbenzene	U		0.000737	0.00250
Hexachloro-1,3-butadiene	U		0.00600	0.0250
Isopropylbenzene	U		0.000425	0.00250

Method Blank (MB)

(MB) R3681629-2 07/15/21 03:31

Analyte	MB Result mg/kg	<u>MB Qualifier</u>	MB MDL mg/kg	MB RDL mg/kg
p-Isopropyltoluene	U		0.00255	0.00500
2-Butanone (MEK)	U		0.0635	0.100
Methylene Chloride	U		0.00664	0.0250
4-Methyl-2-pentanone (MIBK)	U		0.00228	0.0250
Methyl tert-butyl ether	U		0.000350	0.00100
Naphthalene	U		0.00488	0.0125
n-Propylbenzene	U		0.000950	0.00500
Styrene	U		0.000229	0.0125
1,1,1,2-Tetrachloroethane	U		0.000948	0.00250
1,1,2,2-Tetrachloroethane	U		0.000695	0.00250
Tetrachloroethene	U		0.000896	0.00250
Toluene	U		0.00130	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000754	0.00250
1,2,3-Trichlorobenzene	U		0.00733	0.0125
1,2,4-Trichlorobenzene	U		0.00440	0.0125
1,1,1-Trichloroethane	U		0.000923	0.00250
1,1,2-Trichloroethane	U		0.000597	0.00250
Trichloroethene	U		0.000584	0.00100
Trichlorofluoromethane	U		0.000827	0.00250
1,2,3-Trichloropropane	U		0.00162	0.0125
1,2,3-Trimethylbenzene	U		0.00158	0.00500
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
Vinyl chloride	U		0.00116	0.00250
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	105			75.0-131
(S) 4-Bromofluorobenzene	95.1			67.0-138
(S) 1,2-Dichloroethane-d4	112			70.0-130

Laboratory Control Sample (LCS)

(LCS) R3681629-1 07/15/21 02:33

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Acetone	0.625	0.616	98.6	10.0-160	
Acrylonitrile	0.625	0.775	124	45.0-153	
Benzene	0.125	0.123	98.4	70.0-123	
Bromobenzene	0.125	0.143	114	73.0-121	
Bromodichloromethane	0.125	0.126	101	73.0-121	

WG1705462

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

QUALITY CONTROL SUMMARY

L1377536-09,13

Laboratory Control Sample (LCS)

(LCS) R3681629-1 07/15/21 02:33

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Bromoform	0.125	0.117	93.6	64.0-132	
Bromomethane	0.125	0.108	86.4	56.0-147	
n-Butylbenzene	0.125	0.110	88.0	68.0-135	
sec-Butylbenzene	0.125	0.132	106	74.0-130	
tert-Butylbenzene	0.125	0.143	114	75.0-127	
Carbon tetrachloride	0.125	0.129	103	66.0-128	
Chlorobenzene	0.125	0.118	94.4	76.0-128	
Chlorodibromomethane	0.125	0.117	93.6	74.0-127	
Chloroethane	0.125	0.134	107	61.0-134	
Chloroform	0.125	0.136	109	72.0-123	
Chloromethane	0.125	0.119	95.2	51.0-138	
2-Chlorotoluene	0.125	0.138	110	75.0-124	
4-Chlorotoluene	0.125	0.124	99.2	75.0-124	
1,2-Dibromo-3-Chloropropane	0.125	0.0983	78.6	59.0-130	
1,2-Dibromoethane	0.125	0.125	100	74.0-128	
Dibromomethane	0.125	0.131	105	75.0-122	
1,2-Dichlorobenzene	0.125	0.136	109	76.0-124	
1,3-Dichlorobenzene	0.125	0.127	102	76.0-125	
1,4-Dichlorobenzene	0.125	0.127	102	77.0-121	
Dichlorodifluoromethane	0.125	0.103	82.4	43.0-156	
1,1-Dichloroethane	0.125	0.134	107	70.0-127	
1,2-Dichloroethane	0.125	0.148	118	65.0-131	
1,1-Dichloroethene	0.125	0.130	104	65.0-131	
cis-1,2-Dichloroethene	0.125	0.120	96.0	73.0-125	
trans-1,2-Dichloroethene	0.125	0.110	88.0	71.0-125	
1,2-Dichloropropane	0.125	0.131	105	74.0-125	
1,1-Dichloropropene	0.125	0.125	100	73.0-125	
1,3-Dichloropropane	0.125	0.130	104	80.0-125	
cis-1,3-Dichloropropene	0.125	0.131	105	76.0-127	
trans-1,3-Dichloropropene	0.125	0.115	92.0	73.0-127	
2,2-Dichloropropane	0.125	0.135	108	59.0-135	
Di-isopropyl ether	0.125	0.122	97.6	60.0-136	
Ethylbenzene	0.125	0.107	85.6	74.0-126	
Hexachloro-1,3-butadiene	0.125	0.101	80.8	57.0-150	
Isopropylbenzene	0.125	0.122	97.6	72.0-127	
p-Isopropyltoluene	0.125	0.119	95.2	72.0-133	
2-Butanone (MEK)	0.625	0.841	135	30.0-160	
Methylene Chloride	0.125	0.124	99.2	68.0-123	
4-Methyl-2-pentanone (MIBK)	0.625	0.751	120	56.0-143	
Methyl tert-butyl ether	0.125	0.153	122	66.0-132	

ACCOUNT:

Berry Petroleum - Denver, CO

PROJECT:

L1377536

DATE/TIME:

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Laboratory Control Sample (LCS)

(LCS) R3681629.1 07/15/21 02:33

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Naphthalene	0.125	0.0971	77.7	59.0-130	
n-Propylbenzene	0.125	0.134	107	74.0-126	
Styrene	0.125	0.111	88.8	72.0-127	
1,1,1,2-Tetrachloroethane	0.125	0.123	98.4	74.0-129	
1,1,2,2-Tetrachloroethane	0.125	0.115	92.0	68.0-128	
Tetrachloroethene	0.125	0.133	106	70.0-136	
Toluene	0.125	0.119	95.2	75.0-121	
1,1,2-Trichlorotrifluoroethane	0.125	0.134	107	61.0-139	
1,2,3-Trichlorobenzene	0.125	0.108	86.4	59.0-139	
1,2,4-Trichlorobenzene	0.125	0.105	84.0	62.0-137	
1,1,1-Trichloroethane	0.125	0.130	104	69.0-126	
1,1,2-Trichloroethane	0.125	0.138	110	78.0-123	
Trichloroethene	0.125	0.128	102	76.0-126	
Trichlorofluoromethane	0.125	0.124	99.2	61.0-142	
1,2,3-Trichloropropane	0.125	0.148	118	67.0-129	
1,2,3-Trimethylbenzene	0.125	0.168	134	74.0-124	J4
1,2,4-Trimethylbenzene	0.125	0.131	105	70.0-126	
1,3,5-Trimethylbenzene	0.125	0.117	93.6	73.0-127	
Vinyl chloride	0.125	0.122	97.6	63.0-134	
Xylenes, Total	0.375	0.342	91.2	72.0-127	
(S) Toluene-d8			99.9	75.0-131	
(S) 4-Bromofluorobenzene			93.7	67.0-138	
(S) 1,2-Dichloroethane-d4			120	70.0-130	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3680951-2 07/19/21 01:34				
Analyte	MB Result mg/kg	<u>MB Qualifier</u>	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U	1.61	4.00	4.00
C28-C40 Oil Range	U	0.274	4.00	4.00
(S) o-Terphenyl	68.5		18.0-148	

Laboratory Control Sample (LCS)

(LCS) R3680951-1 07/19/21 01:21				
Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %
C10-C28 Diesel Range	50.0	37.1	74.2	50.0-150
(S) o-Terphenyl		65.9	18.0-148	

Method Blank (MB)

(MB) R3681448-1 07/20/21 01:43					
Analyte	MB Result mg/kg	<u>MB Qualifier</u>	MB MDL mg/kg	MB RDL mg/kg	
C10-C28 Diesel Range	2.53	J	1.61	4.00	
C28-C40 Oil Range	1.69	J	0.274	4.00	
(S) o-Terphenyl	60.5			18.0-148	

Laboratory Control Sample (LCS)

(LCS) R3681448-2 07/20/21 01:56					
Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
C10-C28 Diesel Range	50.0	36.1	72.2	50.0-150	
(S) o-Terphenyl			74.3	18.0-148	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3681483-1 07/20/21 08:58

Analyte	MB Result mg/kg	<u>MB Qualifier</u> mg/kg	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U	1.61	4.00	4.00
C28-C40 Oil Range	U	0.274	4.00	4.00
(S) o-Terphenyl	61.9		18.0-148	

Laboratory Control Sample (LCS)

(LCS) R3681483-2 07/20/21 09:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
C10-C28 Diesel Range	50.0	39.3	78.6	50.0-150	
(S) o-Terphenyl		82.4	18.0-148		

L1376747-14 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1376747-14 07/20/21 22:41 • (MS) R3681483-3 07/20/21 22:54 • (MSD) R3681483-4 07/20/21 23:07

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	MSD Result mg/kg	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
C10-C28 Diesel Range	48.9	ND	34.8	71.2	37.5	75.0	1	50.0-150	7.47		20	
(S) o-Terphenyl			83.3	84.5				18.0-148				

Method Blank (MB)

(MB) R3681850-2 07/20/21 17:19

Analyte	MB Result mg/kg	<u>MB Qualifier</u>	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	71.1			14.0-149
(S) 2-Fluorobiphenyl	75.3			34.0-125
(S) p-Terphenyl-d14	86.3			23.0-120

Laboratory Control Sample (LCS)

(LCS) R3681850-1 07/20/21 16:59

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Anthracene	0.0800	0.0561	70.1	50.0-126	
Acenaphthene	0.0800	0.0592	74.0	50.0-120	
Acenaphthylene	0.0800	0.0632	79.0	50.0-120	
Benzo(a)anthracene	0.0800	0.0563	70.4	45.0-120	
Benzo(a)pyrene	0.0800	0.0548	68.5	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0606	75.8	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0595	74.4	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0587	73.4	49.0-125	
Chrysene	0.0800	0.0588	73.5	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0603	75.4	47.0-125	
Fluoranthene	0.0800	0.0579	72.4	49.0-129	

Laboratory Control Sample (LCS)

(LCS) R3681850-1 07/20/21 16:59

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Fluorene	0.0800	0.0608	76.0	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0582	72.8	46.0-125	
Naphthalene	0.0800	0.0605	75.6	50.0-120	
Phenanthrene	0.0800	0.0573	71.6	47.0-120	
Pyrene	0.0800	0.0574	71.8	43.0-123	
1-Methylnaphthalene	0.0800	0.0612	76.5	51.0-121	
2-Methylnaphthalene	0.0800	0.0582	72.8	50.0-120	
2-Chloronaphthalene	0.0800	0.0587	73.4	50.0-120	
(S) Nitrobenzene-d5		73.3		14.0-149	
(S) 2-Fluorobiphenyl		77.5		34.0-125	
(S) p-Terphenyl-d14		85.7		23.0-120	

L1377536-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1377536-09 07/20/21 17:39 • (MS) R3681850-3 07/20/21 17:59 • (MSD) R3681850-4 07/20/21 18:19

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	0.0788	ND	0.0395	0.0411	50.1	53.0	1	10.0-145		3.97	30	30
Acenaphthene	0.0788	ND	0.0423	0.0436	53.7	56.2	1	14.0-127		3.03	27	27
Acenaphthylene	0.0788	ND	0.0458	0.0469	58.1	60.4	1	21.0-124		2.37	25	25
Benzo(a)anthracene	0.0788	ND	0.0416	0.0431	52.8	55.5	1	10.0-139		3.54	30	30
Benzo(a)pyrene	0.0788	ND	0.0417	0.0431	52.9	55.5	1	10.0-141		3.30	31	31
Benzo(b)fluoranthene	0.0788	ND	0.0443	0.0437	56.2	56.3	1	10.0-140		1.36	36	36
Benzo(g,h,i)perylene	0.0788	ND	0.0424	0.0421	53.8	54.3	1	10.0-140		0.710	33	33
Benzo(k)fluoranthene	0.0788	ND	0.0453	0.0463	57.5	59.7	1	10.0-137		2.18	31	31
Chrysene	0.0788	ND	0.0489	0.0495	62.1	63.8	1	10.0-145		1.22	30	30
Dibenz(a,h)anthracene	0.0788	ND	0.0471	0.0485	59.8	62.5	1	10.0-132		2.93	31	31
Fluoranthene	0.0788	ND	0.0406	0.0406	51.5	52.3	1	10.0-153		0.000	33	33
Fluorene	0.0788	ND	0.0433	0.0442	54.9	57.0	1	11.0-130		2.06	29	29
Indeno(1,2,3-cd)pyrene	0.0788	ND	0.0409	0.0409	51.9	52.7	1	10.0-137		0.000	32	32
Naphthalene	0.0788	ND	0.0502	0.0505	63.7	65.1	1	10.0-135		0.596	27	27
Phenanthrene	0.0788	ND	0.0412	0.0412	52.3	53.1	1	10.0-144		0.000	31	31
Pyrene	0.0788	ND	0.0397	0.0400	50.4	51.5	1	10.0-148		0.753	35	35
1-Methylnaphthalene	0.0788	ND	0.0471	0.0472	59.8	60.8	1	10.0-142		0.212	28	28
2-Methylnaphthalene	0.0788	ND	0.0468	0.0458	59.4	59.0	1	10.0-137		2.16	28	28
2-Chloronaphthalene	0.0788	ND	0.0437	0.0444	55.5	57.2	1	29.0-120		1.59	24	24
(S) Nitrobenzene-d5				69.8		72.3		14.0-149				
(S) 2-Fluorobiphenyl				71.1		75.3		34.0-125				
(S) p-Terphenyl-d14				78.0		81.3		23.0-120				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

MDL	Method Detection Limit.
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
B	The same analyte is found in the associated blank.
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.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

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

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

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

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

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

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





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



SDG # 177596
Table #
Acctnum:
Template:
Prelogin:
PM:
PB:
Shipped Via:
Remarks

Sample #	Sample # (lab only)
11	
12	
13	
14	

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
RAD Screen <0.5 mR/hr: ☒ Y ☐ N

If preservation required by Login: Date/Time
Hold:
Condition: NCF / 08

PH, SPECN
Vols 8060 Full Screen
GRO
DRO/GRO
Hot water boron
Metals, Cr, SAR
Paths by 8070 SM

Report to:	City/State Collected:	Lab Project #	P.O. #	Quote #	No. of Cntrs
Project Description: Garden Gulch LF					
Phone:					
Collected by (print):	Site/Facility ID #				
Collected by (signature): DK Nickols	Rush? (Lab MUST Be Notified)				
Immediately Packed on Ice N Y	Same Day <input type="checkbox"/> Five Day <input type="checkbox"/> Next Day <input type="checkbox"/> 5 Day (Rad Only) <input type="checkbox"/> Two Day <input type="checkbox"/> 10 Day (Rad Only) <input type="checkbox"/> Three Day <input type="checkbox"/>				
Sample ID	Comp/Grab	Matrix*	Depth	Date	Time
029-11		SS		7/10	1250
029-12					1255
029-13					1300
029-14					1305

pH _____ Temp _____
Flow _____ Other _____

Trips Blank Received: Yes / No
HCL / MeOH
Bottles Received: 35
Temp: -1 °C
3.1 3
Date: 7/13/21
Time: 1345

Tracking #
Received by: (Signature)
Received by: (Signature)
Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier
Date: 7/12/21
Time: 0900
Date:
Time:
Date:
Time:

Relinquished by: (Signature)
Relinquished by: (Signature)
Relinquished by: (Signature)

Remarks:

- SS - Soil
- AIR - Air
- F - Filter
- GW - Groundwater
- B - Bioassay
- WW - Wastewater
- DW - Drinking Water
- OT - Other