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National Center for Testing & Innovation

ANALYTICAL REPORT

October 09, 2019

Laramie Energy - Grand Junction, CO

Sample Delivery Group:	L1146840
Samples Received:	10/05/2019
Project Number:	
Description:	Kobe Flange-Ditch/Soils

Report To: Robert Stockton
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

Entire Report Reviewed By: Chris Ward

Chris Ward
Project Manager

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KOBE FLANGE-DITCH UP L1146840-01 Solid

Collected by: Matt Kasten | Collected date/time: 10/04/19 09:05 | Received date/time: 10/05/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1357831	1	10/08/19 17:38	10/08/19 17:38	TRB	Mt. Juliet, TN
Calculated Results	WG1358232	1	10/06/19 05:54	10/07/19 23:45	TRB	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1358008	1	10/07/19 12:15	10/07/19 23:45	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1357778	1	10/07/19 08:54	10/07/19 10:10	EEM	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1358151	1	10/05/19 20:52	10/05/19 23:58	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1358737	1	10/08/19 12:50	10/08/19 20:42	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1358232	1	10/06/19 05:54	10/07/19 22:24	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1359167	1	10/05/19 16:34	10/08/19 12:19	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1358847	1	10/05/19 16:34	10/08/19 06:48	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1358352	1	10/06/19 23:35	10/07/19 10:29	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1358363	1	10/06/19 16:42	10/06/19 21:18	DMG	Mt. Juliet, TN

KOBE FLANGE-DITCH POR L1146840-02 Solid

Collected by: Matt Kasten | Collected date/time: 10/04/19 09:10 | Received date/time: 10/05/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1357831	1	10/08/19 17:41	10/08/19 17:41	TRB	Mt. Juliet, TN
Calculated Results	WG1358232	1	10/06/19 05:54	10/07/19 23:47	TRB	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1358008	1	10/07/19 12:15	10/07/19 23:47	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1357778	1	10/07/19 08:54	10/07/19 10:10	EEM	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1358151	1	10/05/19 20:52	10/05/19 23:58	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1358737	1	10/08/19 12:50	10/08/19 21:36	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1358232	1	10/06/19 05:54	10/07/19 22:27	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1359167	1	10/05/19 16:34	10/08/19 12:40	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1358847	1	10/05/19 16:34	10/08/19 07:06	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1358352	1	10/06/19 23:35	10/07/19 10:42	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1358363	1	10/06/19 16:42	10/06/19 21:39	DMG	Mt. Juliet, TN

KOBE FLANGE-DITCH MID L1146840-03 Solid

Collected by: Matt Kasten | Collected date/time: 10/04/19 09:15 | Received date/time: 10/05/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1357831	1	10/08/19 17:43	10/08/19 17:43	TRB	Mt. Juliet, TN
Calculated Results	WG1358232	1	10/06/19 05:54	10/07/19 23:48	TRB	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1358008	1	10/07/19 12:15	10/07/19 23:48	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1357778	1	10/07/19 08:54	10/07/19 10:10	EEM	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1358151	1	10/05/19 20:52	10/05/19 23:58	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1358737	1	10/08/19 12:50	10/08/19 21:39	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1358232	1	10/06/19 05:54	10/07/19 22:30	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1359167	1	10/05/19 16:34	10/08/19 13:00	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1358847	1	10/05/19 16:34	10/08/19 07:25	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1358352	2	10/06/19 23:35	10/07/19 11:32	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1358363	1	10/06/19 16:42	10/06/19 21:59	DMG	Mt. Juliet, TN

KOBE FLANGE-DITCH DOWN L1146840-04 Solid

Collected by: Matt Kasten | Collected date/time: 10/04/19 09:30 | Received date/time: 10/05/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1357831	1	10/08/19 17:46	10/08/19 17:46	TRB	Mt. Juliet, TN
Calculated Results	WG1358232	1	10/06/19 05:54	10/07/19 23:48	TRB	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1358008	1	10/07/19 12:15	10/07/19 23:48	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1357778	1	10/07/19 08:54	10/07/19 10:10	EEM	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1358151	1	10/05/19 20:52	10/05/19 23:58	AKA	Mt. Juliet, TN

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

KOBE FLANGE-DITCH DOWN L1146840-04 Solid

Collected by: Matt Kasten
Collected date/time: 10/04/19 09:30
Received date/time: 10/05/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Mercury by Method 7471A	WG1358737	1	10/08/19 12:50	10/08/19 21:42	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1358232	1	10/06/19 05:54	10/07/19 22:33	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1359167	1	10/05/19 16:34	10/08/19 13:21	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1358847	1	10/05/19 16:34	10/08/19 07:43	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1358352	1	10/06/19 23:35	10/07/19 10:54	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1358363	1	10/06/19 16:42	10/06/19 22:20	DMG	Mt. Juliet, TN

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

Chris Ward
Project Manager

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.58		1	10/08/2019 17:38	WG1357831

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	8.65		1.00	1	10/07/2019 23:45	WG1358232

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	10/07/2019 23:45	WG1358008

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.12	T8	1	10/07/2019 10:10	WG1357778

Sample Narrative:

L1146840-01 WG1357778: 8.12 at 21.5C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	408		10.0	1	10/05/2019 23:58	WG1358151

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND	J6	0.0300	1	10/08/2019 20:42	WG1358737

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	5.76		2.00	1	10/07/2019 22:24	WG1358232
Barium	741		0.500	1	10/07/2019 22:24	WG1358232
Cadmium	ND		0.500	1	10/07/2019 22:24	WG1358232
Chromium	8.65		1.00	1	10/07/2019 22:24	WG1358232
Copper	12.5		2.00	1	10/07/2019 22:24	WG1358232
Lead	8.49		0.500	1	10/07/2019 22:24	WG1358232
Nickel	9.69		2.00	1	10/07/2019 22:24	WG1358232
Selenium	ND		2.00	1	10/07/2019 22:24	WG1358232
Silver	ND		1.00	1	10/07/2019 22:24	WG1358232
Zinc	31.9		5.00	1	10/07/2019 22:24	WG1358232

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	0.358		0.100	1	10/08/2019 12:19	WG1359167
(S) a,a,a-Trifluorotoluene(FID)	*97.9*		*77.0-120*		*10/08/2019 12:19*	WG1359167

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	10/08/2019 06:48	WG1358847
Toluene	ND		0.00500	1	10/08/2019 06:48	WG1358847
Ethylbenzene	ND		0.00250	1	10/08/2019 06:48	WG1358847
Total Xylenes	ND		0.00650	1	10/08/2019 06:48	WG1358847
Methyl tert-butyl ether	ND		0.00100	1	10/08/2019 06:48	WG1358847
(S) Toluene-d8	*110*		*75.0-131*		*10/08/2019 06:48*	WG1358847
(S) 4-Bromofluorobenzene	*88.1*		*67.0-138*		*10/08/2019 06:48*	WG1358847
(S) 1,2-Dichloroethane-d4	*92.4*		*70.0-130*		*10/08/2019 06:48*	WG1358847

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		4.00	1	10/07/2019 10:29	WG1358352
(S) o-Terphenyl	*67.9*		*18.0-148*		*10/07/2019 10:29*	WG1358352

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	10/06/2019 21:18	WG1358363
Acenaphthene	ND		0.00600	1	10/06/2019 21:18	WG1358363
Acenaphthylene	ND		0.00600	1	10/06/2019 21:18	WG1358363
Benzo(a)anthracene	ND		0.00600	1	10/06/2019 21:18	WG1358363
Benzo(a)pyrene	ND		0.00600	1	10/06/2019 21:18	WG1358363
Benzo(b)fluoranthene	ND		0.00600	1	10/06/2019 21:18	WG1358363
Benzo(g,h,i)perylene	ND		0.00600	1	10/06/2019 21:18	WG1358363
Benzo(k)fluoranthene	ND		0.00600	1	10/06/2019 21:18	WG1358363
Chrysene	ND		0.00600	1	10/06/2019 21:18	WG1358363
Dibenz(a,h)anthracene	ND		0.00600	1	10/06/2019 21:18	WG1358363
Fluoranthene	ND		0.00600	1	10/06/2019 21:18	WG1358363
Fluorene	ND		0.00600	1	10/06/2019 21:18	WG1358363
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/06/2019 21:18	WG1358363
Naphthalene	ND		0.0200	1	10/06/2019 21:18	WG1358363
Phenanthrene	ND		0.00600	1	10/06/2019 21:18	WG1358363
Pyrene	ND		0.00600	1	10/06/2019 21:18	WG1358363
1-Methylnaphthalene	ND		0.0200	1	10/06/2019 21:18	WG1358363
2-Methylnaphthalene	ND		0.0200	1	10/06/2019 21:18	WG1358363
2-Chloronaphthalene	ND		0.0200	1	10/06/2019 21:18	WG1358363
(S) p-Terphenyl-d14	*96.1*		*23.0-120*		*10/06/2019 21:18*	WG1358363
(S) Nitrobenzene-d5	*71.5*		*14.0-149*		*10/06/2019 21:18*	WG1358363
(S) 2-Fluorobiphenyl	*77.7*		*34.0-125*		*10/06/2019 21:18*	WG1358363

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.69		1	10/08/2019 17:41	WG1357831

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	8.06		1.00	1	10/07/2019 23:47	WG1358232

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	10/07/2019 23:47	WG1358008

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.98	T8	1	10/07/2019 10:10	WG1357778

Sample Narrative:

L1146840-02 WG1357778: 7.98 at 21.4C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	431		10.0	1	10/05/2019 23:58	WG1358151

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0300	1	10/08/2019 21:36	WG1358737

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	4.98		2.00	1	10/07/2019 22:27	WG1358232
Barium	775		0.500	1	10/07/2019 22:27	WG1358232
Cadmium	ND		0.500	1	10/07/2019 22:27	WG1358232
Chromium	8.06		1.00	1	10/07/2019 22:27	WG1358232
Copper	11.0		2.00	1	10/07/2019 22:27	WG1358232
Lead	8.06		0.500	1	10/07/2019 22:27	WG1358232
Nickel	9.05		2.00	1	10/07/2019 22:27	WG1358232
Selenium	ND		2.00	1	10/07/2019 22:27	WG1358232
Silver	ND		1.00	1	10/07/2019 22:27	WG1358232
Zinc	30.9		5.00	1	10/07/2019 22:27	WG1358232

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	0.689		0.100	1	10/08/2019 12:40	WG1359167
(S) a,a,a-Trifluorotoluene(FID)	*94.0*		*77.0-120*		*10/08/2019 12:40*	WG1359167

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	10/08/2019 07:06	WG1358847
Toluene	ND		0.00500	1	10/08/2019 07:06	WG1358847
Ethylbenzene	ND		0.00250	1	10/08/2019 07:06	WG1358847
Total Xylenes	ND		0.00650	1	10/08/2019 07:06	WG1358847
Methyl tert-butyl ether	ND		0.00100	1	10/08/2019 07:06	WG1358847
(S) Toluene-d8	*108*		*75.0-131*		*10/08/2019 07:06*	WG1358847
(S) 4-Bromofluorobenzene	*87.3*		*67.0-138*		*10/08/2019 07:06*	WG1358847
(S) 1,2-Dichloroethane-d4	*95.2*		*70.0-130*		*10/08/2019 07:06*	WG1358847

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		4.00	1	10/07/2019 10:42	WG1358352
(S) o-Terphenyl	*63.2*		*18.0-148*		*10/07/2019 10:42*	WG1358352

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	10/06/2019 21:39	WG1358363
Acenaphthene	ND		0.00600	1	10/06/2019 21:39	WG1358363
Acenaphthylene	ND		0.00600	1	10/06/2019 21:39	WG1358363
Benzo(a)anthracene	ND		0.00600	1	10/06/2019 21:39	WG1358363
Benzo(a)pyrene	ND		0.00600	1	10/06/2019 21:39	WG1358363
Benzo(b)fluoranthene	ND		0.00600	1	10/06/2019 21:39	WG1358363
Benzo(g,h,i)perylene	ND		0.00600	1	10/06/2019 21:39	WG1358363
Benzo(k)fluoranthene	ND		0.00600	1	10/06/2019 21:39	WG1358363
Chrysene	ND		0.00600	1	10/06/2019 21:39	WG1358363
Dibenz(a,h)anthracene	ND		0.00600	1	10/06/2019 21:39	WG1358363
Fluoranthene	ND		0.00600	1	10/06/2019 21:39	WG1358363
Fluorene	ND		0.00600	1	10/06/2019 21:39	WG1358363
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/06/2019 21:39	WG1358363
Naphthalene	ND		0.0200	1	10/06/2019 21:39	WG1358363
Phenanthrene	ND		0.00600	1	10/06/2019 21:39	WG1358363
Pyrene	ND		0.00600	1	10/06/2019 21:39	WG1358363
1-Methylnaphthalene	ND		0.0200	1	10/06/2019 21:39	WG1358363
2-Methylnaphthalene	ND		0.0200	1	10/06/2019 21:39	WG1358363
2-Chloronaphthalene	ND		0.0200	1	10/06/2019 21:39	WG1358363
(S) p-Terphenyl-d14	*84.3*		*23.0-120*		*10/06/2019 21:39*	WG1358363
(S) Nitrobenzene-d5	*76.0*		*14.0-149*		*10/06/2019 21:39*	WG1358363
(S) 2-Fluorobiphenyl	*80.8*		*34.0-125*		*10/06/2019 21:39*	WG1358363

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.08		1	10/08/2019 17:43	WG1357831

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	8.87		1.00	1	10/07/2019 23:48	WG1358232

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	10/07/2019 23:48	WG1358008

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.72	T8	1	10/07/2019 10:10	WG1357778

Sample Narrative:

L1146840-03 WG1357778: 8.72 at 21.2C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	226		10.0	1	10/05/2019 23:58	WG1358151

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0300	1	10/08/2019 21:39	WG1358737

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	8.90		2.00	1	10/07/2019 22:30	WG1358232
Barium	715		0.500	1	10/07/2019 22:30	WG1358232
Cadmium	ND		0.500	1	10/07/2019 22:30	WG1358232
Chromium	8.87		1.00	1	10/07/2019 22:30	WG1358232
Copper	10.8		2.00	1	10/07/2019 22:30	WG1358232
Lead	9.46		0.500	1	10/07/2019 22:30	WG1358232
Nickel	10.2		2.00	1	10/07/2019 22:30	WG1358232
Selenium	ND		2.00	1	10/07/2019 22:30	WG1358232
Silver	ND		1.00	1	10/07/2019 22:30	WG1358232
Zinc	33.3		5.00	1	10/07/2019 22:30	WG1358232

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	0.252		0.100	1	10/08/2019 13:00	WG1359167
(S) a,a,a-Trifluorotoluene(FID)	*96.9*		*77.0-120*		*10/08/2019 13:00*	WG1359167

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	10/08/2019 07:25	WG1358847
Toluene	ND		0.00500	1	10/08/2019 07:25	WG1358847
Ethylbenzene	ND		0.00250	1	10/08/2019 07:25	WG1358847
Total Xylenes	ND		0.00650	1	10/08/2019 07:25	WG1358847
Methyl tert-butyl ether	ND		0.00100	1	10/08/2019 07:25	WG1358847
(S) Toluene-d8	*111*		*75.0-131*		*10/08/2019 07:25*	WG1358847
(S) 4-Bromofluorobenzene	*88.1*		*67.0-138*		*10/08/2019 07:25*	WG1358847
(S) 1,2-Dichloroethane-d4	*94.8*		*70.0-130*		*10/08/2019 07:25*	WG1358847

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	22.4		8.00	2	10/07/2019 11:32	WG1358352
(S) o-Terphenyl	*65.1*		*18.0-148*		*10/07/2019 11:32*	WG1358352

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	10/06/2019 21:59	WG1358363
Acenaphthene	ND		0.00600	1	10/06/2019 21:59	WG1358363
Acenaphthylene	ND		0.00600	1	10/06/2019 21:59	WG1358363
Benzo(a)anthracene	ND		0.00600	1	10/06/2019 21:59	WG1358363
Benzo(a)pyrene	ND		0.00600	1	10/06/2019 21:59	WG1358363
Benzo(b)fluoranthene	ND		0.00600	1	10/06/2019 21:59	WG1358363
Benzo(g,h,i)perylene	ND		0.00600	1	10/06/2019 21:59	WG1358363
Benzo(k)fluoranthene	ND		0.00600	1	10/06/2019 21:59	WG1358363
Chrysene	ND		0.00600	1	10/06/2019 21:59	WG1358363
Dibenz(a,h)anthracene	ND		0.00600	1	10/06/2019 21:59	WG1358363
Fluoranthene	ND		0.00600	1	10/06/2019 21:59	WG1358363
Fluorene	ND		0.00600	1	10/06/2019 21:59	WG1358363
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/06/2019 21:59	WG1358363
Naphthalene	ND		0.0200	1	10/06/2019 21:59	WG1358363
Phenanthrene	ND		0.00600	1	10/06/2019 21:59	WG1358363
Pyrene	ND		0.00600	1	10/06/2019 21:59	WG1358363
1-Methylnaphthalene	ND		0.0200	1	10/06/2019 21:59	WG1358363
2-Methylnaphthalene	ND		0.0200	1	10/06/2019 21:59	WG1358363
2-Chloronaphthalene	ND		0.0200	1	10/06/2019 21:59	WG1358363
(S) p-Terphenyl-d14	*93.5*		*23.0-120*		*10/06/2019 21:59*	WG1358363
(S) Nitrobenzene-d5	*67.0*		*14.0-149*		*10/06/2019 21:59*	WG1358363
(S) 2-Fluorobiphenyl	*80.1*		*34.0-125*		*10/06/2019 21:59*	WG1358363

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

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.12		1	10/08/2019 17:46	WG1357831

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	9.06		1.00	1	10/07/2019 23:48	WG1358232

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	10/07/2019 23:48	WG1358008

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.37	T8	1	10/07/2019 10:10	WG1357778

Sample Narrative:

L1146840-04 WG1357778: 8.37 at 21.4C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	212		10.0	1	10/05/2019 23:58	WG1358151

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0300	1	10/08/2019 21:42	WG1358737

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	9.29		2.00	1	10/07/2019 22:33	WG1358232
Barium	433		0.500	1	10/07/2019 22:33	WG1358232
Cadmium	ND		0.500	1	10/07/2019 22:33	WG1358232
Chromium	9.06		1.00	1	10/07/2019 22:33	WG1358232
Copper	7.90		2.00	1	10/07/2019 22:33	WG1358232
Lead	6.32		0.500	1	10/07/2019 22:33	WG1358232
Nickel	9.58		2.00	1	10/07/2019 22:33	WG1358232
Selenium	ND		2.00	1	10/07/2019 22:33	WG1358232
Silver	ND		1.00	1	10/07/2019 22:33	WG1358232
Zinc	30.7		5.00	1	10/07/2019 22:33	WG1358232

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	0.398		0.100	1	10/08/2019 13:21	WG1359167
(S) a,a,a-Trifluorotoluene(FID)	*95.4*		*77.0-120*		*10/08/2019 13:21*	WG1359167

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	10/08/2019 07:43	WG1358847
Toluene	ND		0.00500	1	10/08/2019 07:43	WG1358847
Ethylbenzene	ND		0.00250	1	10/08/2019 07:43	WG1358847
Total Xylenes	ND		0.00650	1	10/08/2019 07:43	WG1358847
Methyl tert-butyl ether	ND		0.00100	1	10/08/2019 07:43	WG1358847
(S) Toluene-d8	*112*		*75.0-131*		*10/08/2019 07:43*	WG1358847
(S) 4-Bromofluorobenzene	*86.9*		*67.0-138*		*10/08/2019 07:43*	WG1358847
(S) 1,2-Dichloroethane-d4	*92.9*		*70.0-130*		*10/08/2019 07:43*	WG1358847

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		4.00	1	10/07/2019 10:54	WG1358352
(S) o-Terphenyl	*52.5*		*18.0-148*		*10/07/2019 10:54*	WG1358352

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	10/06/2019 22:20	WG1358363
Acenaphthene	ND		0.00600	1	10/06/2019 22:20	WG1358363
Acenaphthylene	ND		0.00600	1	10/06/2019 22:20	WG1358363
Benzo(a)anthracene	ND		0.00600	1	10/06/2019 22:20	WG1358363
Benzo(a)pyrene	ND		0.00600	1	10/06/2019 22:20	WG1358363
Benzo(b)fluoranthene	ND		0.00600	1	10/06/2019 22:20	WG1358363
Benzo(g,h,i)perylene	ND		0.00600	1	10/06/2019 22:20	WG1358363
Benzo(k)fluoranthene	ND		0.00600	1	10/06/2019 22:20	WG1358363
Chrysene	ND		0.00600	1	10/06/2019 22:20	WG1358363
Dibenz(a,h)anthracene	ND		0.00600	1	10/06/2019 22:20	WG1358363
Fluoranthene	ND		0.00600	1	10/06/2019 22:20	WG1358363
Fluorene	ND		0.00600	1	10/06/2019 22:20	WG1358363
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/06/2019 22:20	WG1358363
Naphthalene	ND		0.0200	1	10/06/2019 22:20	WG1358363
Phenanthrene	ND		0.00600	1	10/06/2019 22:20	WG1358363
Pyrene	ND		0.00600	1	10/06/2019 22:20	WG1358363
1-Methylnaphthalene	ND		0.0200	1	10/06/2019 22:20	WG1358363
2-Methylnaphthalene	ND		0.0200	1	10/06/2019 22:20	WG1358363
2-Chloronaphthalene	ND		0.0200	1	10/06/2019 22:20	WG1358363
(S) p-Terphenyl-d14	*89.2*		*23.0-120*		*10/06/2019 22:20*	WG1358363
(S) Nitrobenzene-d5	*68.9*		*14.0-149*		*10/06/2019 22:20*	WG1358363
(S) 2-Fluorobiphenyl	*79.1*		*34.0-125*		*10/06/2019 22:20*	WG1358363

Method Blank (MB)

(MB) R3458621-1 10/07/19 23:13

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

L1146052-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1146052-02 10/07/19 23:33 • (DUP) R3458621-3 10/07/19 23:34

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

L1146840-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1146840-04 10/07/19 23:48 • (DUP) R3458621-8 10/07/19 23:48

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

Laboratory Control Sample (LCS)

(LCS) R3458621-2 10/07/19 23:13

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chromium,Hexavalent	24.0	24.9	104	80.0-120	

L1146052-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1146052-04 10/07/19 23:35 • (MS) R3458621-4 10/07/19 23:39 • (MSD) R3458621-5 10/07/19 23:39

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 %
Chromium,Hexavalent	20.0	ND	11.9	10.3	59.6	51.5	1	75.0-125	J6	J6	14.4	20

L1146052-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1146052-04 10/07/19 23:35 • (MS) R3458621-6 10/07/19 23:40

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chromium,Hexavalent	690	ND	595	86.3	50	75.0-125	

L1146058-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1146058-01 10/07/19 10:10 • (DUP) R3458348-3 10/07/19 10:10

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.63	7.69	1	0.783		1

Sample Narrative:

OS: 7.63 at 22.8C

DUP: 7.69 at 23C

Laboratory Control Sample (LCS)

(LCS) R3458348-1 10/07/19 10:10

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10 at 20.8C

Method Blank (MB)

(MB) R3458078-1 10/05/19 23:58

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

L1146011-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1146011-03 10/05/19 23:58 • (DUP) R3458078-3 10/05/19 23:58

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	1920	1920	1	0.365		20

L1146410-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1146410-01 10/05/19 23:58 • (DUP) R3458078-4 10/05/19 23:58

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	780	781	1	0.128		20

Laboratory Control Sample (LCS)

(LCS) R3458078-2 10/05/19 23:58

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	393	395	101	85.0-115	

Method Blank (MB)

(MB) R3459051-1 10/08/19 20:35

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Mercury	U		0.00280	0.0300

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

(LCS) R3459051-2 10/08/19 20:37 • (LCSD) R3459051-3 10/08/19 20:40

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Mercury	0.500	0.461	0.462	92.2	92.5	80.0-120			0.323	20

L1146840-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1146840-01 10/08/19 20:42 • (MS) R3459051-4 10/08/19 20:45 • (MSD) R3459051-5 10/08/19 20:48

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Mercury	0.500	ND	0.417	0.385	81.2	74.6	1	75.0-125		J6	8.17	20

Method Blank (MB)

(MB) R3458643-1 10/07/19 21:52

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

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

(LCS) R3458643-2 10/07/19 21:54 • (LCSD) R3458643-3 10/07/19 21:57

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	100	96.4	99.0	96.4	99.0	80.0-120			2.57	20
Barium	100	104	107	104	107	80.0-120			2.39	20
Cadmium	100	97.9	100	97.9	100	80.0-120			2.51	20
Chromium	100	100	103	100	103	80.0-120			2.90	20
Copper	100	101	104	101	104	80.0-120			3.14	20
Lead	100	98.1	101	98.1	101	80.0-120			2.54	20
Nickel	100	101	103	101	103	80.0-120			2.70	20
Selenium	100	101	104	101	104	80.0-120			2.82	20
Silver	20.0	18.0	18.5	89.9	92.5	80.0-120			2.89	20
Zinc	100	99.6	102	99.6	102	80.0-120			2.13	20

L1145572-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1145572-01 10/07/19 22:00 • (MS) R3458643-6 10/07/19 22:08 • (MSD) R3458643-7 10/07/19 22:11

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	ND	97.2	103	95.3	101	1	75.0-125			5.41	20
Barium	100	116	151	185	34.2	68.6	1	75.0-125	J6	J3 J6	20.5	20
Cadmium	100	ND	96.1	101	96.0	101	1	75.0-125			5.39	20
Chromium	100	12.7	99.1	105	86.3	92.6	1	75.0-125			6.14	20
Copper	100	6.34	102	108	95.7	101	1	75.0-125			5.23	20
Lead	100	10.2	98.1	106	87.8	95.7	1	75.0-125			7.72	20
Nickel	100	4.19	100	107	96.0	102	1	75.0-125			6.31	20

L1145572-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1145572-01 10/07/19 22:00 • (MS) R3458643-6 10/07/19 22:08 • (MSD) R3458643-7 10/07/19 22:11

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 %
Selenium	100	ND	99.9	105	99.9	105	1	75.0-125			4.68	20
Silver	20.0	ND	18.7	19.6	93.3	98.0	1	75.0-125			4.95	20
Zinc	100	44.7	113	140	68.3	95.2	1	75.0-125	J6	J3	21.3	20

Method Blank (MB)

(MB) R3459340-2 10/08/19 11:05

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	*101*			*77.0-120*

Laboratory Control Sample (LCS)

(LCS) R3459340-1 10/08/19 10:24

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.64	103	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*110*	*77.0-120*	

L1146059-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1146059-03 10/08/19 17:48 • (MS) R3459340-3 10/08/19 19:10 • (MSD) R3459340-4 10/08/19 19:30

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	135	ND	160	158	107	105	25	10.0-151			1.26	28
(S) a,a,a-Trifluorotoluene(FID)					*112*	*112*		*77.0-120*				

Method Blank (MB)

(MB) R3458697-3 10/08/19 01:33

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000400	0.00100
Ethylbenzene	U		0.000530	0.00250
Methyl tert-butyl ether	U		0.000295	0.00100
Toluene	U		0.00125	0.00500
Xylenes, Total	U		0.00478	0.00650
(S) Toluene-d8	*112*			*75.0-131*
(S) 4-Bromofluorobenzene	*87.9*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*88.4*			*70.0-130*

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

(LCS) R3458697-1 10/08/19 00:19 • (LCSD) R3458697-2 10/08/19 00:37

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	0.118	0.105	94.4	84.0	70.0-123			11.7	20
Ethylbenzene	0.125	0.135	0.124	108	99.2	74.0-126			8.49	20
Methyl tert-butyl ether	0.125	0.162	0.157	130	126	66.0-132			3.13	20
Toluene	0.125	0.136	0.124	109	99.2	75.0-121			9.23	20
Xylenes, Total	0.375	0.374	0.345	99.7	92.0	72.0-127			8.07	20
(S) Toluene-d8				*106*	*107*	*75.0-131*				
(S) 4-Bromofluorobenzene				*95.6*	*95.3*	*67.0-138*				
(S) 1,2-Dichloroethane-d4				*93.5*	*93.6*	*70.0-130*				

L1145963-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1145963-02 10/08/19 02:48 • (MS) R3458697-4 10/08/19 08:02 • (MSD) R3458697-5 10/08/19 08:21

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.00500	U	0.00223	0.00374	44.6	74.8	.04	10.0-149		J3	50.6	37
Ethylbenzene	0.00500	U	0.00252	0.00450	50.4	90.0	.04	10.0-160		J3	56.4	38
Methyl tert-butyl ether	0.00500	U	0.00544	0.00641	109	128	.04	11.0-147			16.4	35
Toluene	0.00500	U	0.00280	0.00469	56.0	93.8	.04	10.0-156		J3	50.5	38
Xylenes, Total	0.0150	U	0.00730	0.0121	48.7	80.7	.04	10.0-160		J3	49.5	38
(S) Toluene-d8					*109*	*110*		*75.0-131*				
(S) 4-Bromofluorobenzene					*86.3*	*85.6*		*67.0-138*				
(S) 1,2-Dichloroethane-d4					*96.2*	*95.4*		*70.0-130*				

Method Blank (MB)

(MB) R3458453-1 10/07/19 09:13

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	*66.5*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R3458453-2 10/07/19 09:26

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	37.4	74.8	50.0-150	
(S) o-Terphenyl			*89.5*	*18.0-148*	

L1145651-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1145651-03 10/07/19 12:10 • (MS) R3458453-3 10/07/19 12:23 • (MSD) R3458453-4 10/07/19 12:35

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	50.0	23.7	72.3	65.5	97.2	83.6	2	50.0-150			9.87	20
(S) o-Terphenyl					*74.7*	*72.3*		*18.0-148*				

Method Blank (MB)

(MB) R3458242-2 10/06/19 20:57

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.000600	0.00600
Acenaphthene	U		0.000600	0.00600
Acenaphthylene	U		0.000600	0.00600
Benzo(a)anthracene	U		0.000600	0.00600
Benzo(a)pyrene	U		0.000600	0.00600
Benzo(b)fluoranthene	U		0.000600	0.00600
Benzo(g,h,i)perylene	U		0.000600	0.00600
Benzo(k)fluoranthene	U		0.000600	0.00600
Chrysene	U		0.000600	0.00600
Dibenz(a,h)anthracene	U		0.000600	0.00600
Fluoranthene	U		0.000600	0.00600
Fluorene	U		0.000600	0.00600
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00600
Naphthalene	U		0.00200	0.0200
Phenanthrene	U		0.000600	0.00600
Pyrene	U		0.000600	0.00600
1-Methylnaphthalene	U		0.00200	0.0200
2-Methylnaphthalene	U		0.00200	0.0200
2-Chloronaphthalene	U		0.00200	0.0200
(S) Nitrobenzene-d5	*62.4*			*14.0-149*
(S) 2-Fluorobiphenyl	*84.2*			*34.0-125*
(S) p-Terphenyl-d14	*93.4*			*23.0-120*

Laboratory Control Sample (LCS)

(LCS) R3458242-1 10/06/19 20:37

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0809	101	50.0-126	
Acenaphthene	0.0800	0.0721	90.1	50.0-120	
Acenaphthylene	0.0800	0.0747	93.4	50.0-120	
Benzo(a)anthracene	0.0800	0.0764	95.5	45.0-120	
Benzo(a)pyrene	0.0800	0.0645	80.6	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0767	95.9	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0741	92.6	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0808	101	49.0-125	
Chrysene	0.0800	0.0739	92.4	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0780	97.5	47.0-125	
Fluoranthene	0.0800	0.0793	99.1	49.0-129	

Laboratory Control Sample (LCS)

(LCS) R3458242-1 10/06/19 20:37

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0788	98.5	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0774	96.8	46.0-125	
Naphthalene	0.0800	0.0625	78.1	50.0-120	
Phenanthrene	0.0800	0.0809	101	47.0-120	
Pyrene	0.0800	0.0795	99.4	43.0-123	
1-Methylnaphthalene	0.0800	0.0724	90.5	51.0-121	
2-Methylnaphthalene	0.0800	0.0687	85.9	50.0-120	
2-Chloronaphthalene	0.0800	0.0707	88.4	50.0-120	
(S) Nitrobenzene-d5			*84.1*	*14.0-149*	
(S) 2-Fluorobiphenyl			*95.3*	*34.0-125*	
(S) p-Terphenyl-d14			*97.1*	*23.0-120*	

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

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

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

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

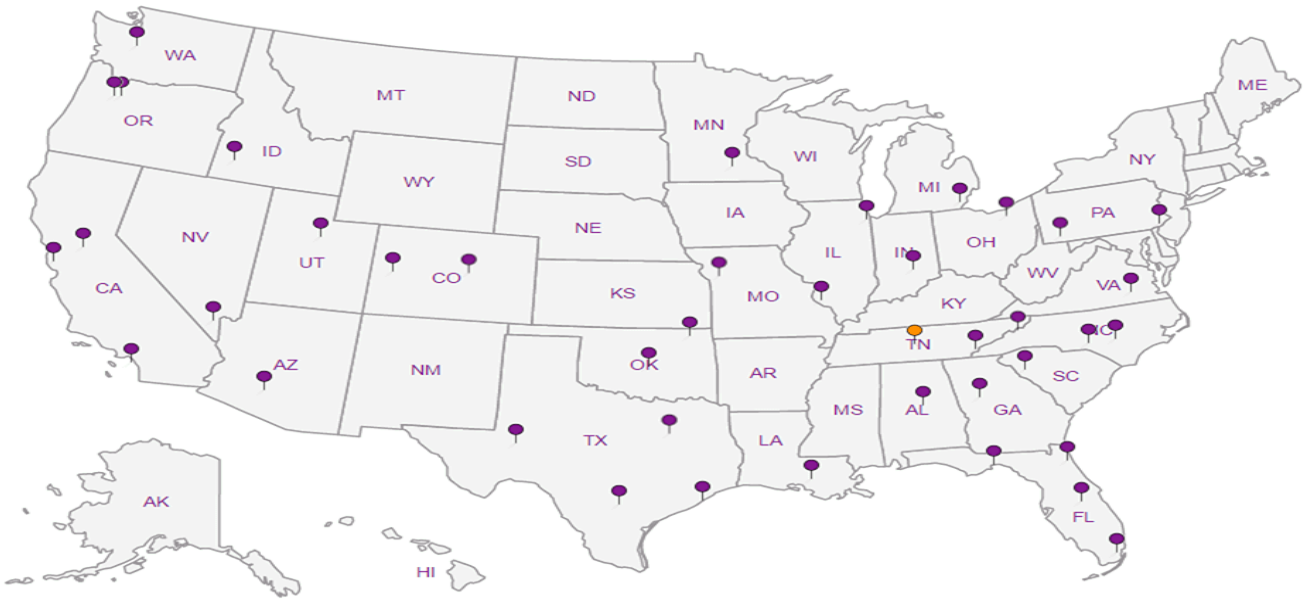
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

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



Entrada Consulting Group

330 Grand Avenue, Unit C
Grand Junction, CO 81501

Billing Information: OXYGJCO - LARAMIE OIL AND GAS

Report to: **Robert Stockton**

Email To: mkasten@entradainc.com

Project Description: KOBE FLANGE - Ditch/Soil

City/State Collected: ,CO

Phone: 970-901-9007
Fax:

Client Project #

Lab Project #

Collected by (print): Matt Kasten

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
Next Day ___ 5 Day (Rad Only)
X Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Btex, GRO, DRO	methane, ethane, propane	TDS, NO2/NO3,	CHEM, ALKB, ALKCA, SO4	Metals / PAHs	SPCON, pH, SAR, Arsenic	Total Alkalinity	major cations	major anions	RB, SRB, SXLM	Remarks	Sample # (lab only)
Kobe Flange - Ditch up	Grab	SS	0-6"	10/4/19	905	3	X	X	X		X	X						-01
Kobe Flange - Ditch Mid					910	3	X				X	X						02
Kobe Flange - Ditch Mid					915	3	X				X	X						03
Kobe Flange - Ditch Down					930	3	X				X	X						04
Kobe Flange																		

Chain of Custody Page 1 of 1

Pace Analytical® National Center for Testing & Innovation

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

L # 1146840

Table # G182

Acctnum: OXYGJCO

Template:

Prelogin:

TSR:

PB:

Shipped Via:

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

Remarks:
~~*SEE ATTCHED LIST FOR FULL ANALYTES~~
* CO SOIL TABLE 910-1

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking # 6194 4956 8104

pH _____ Temp _____

Flow _____ Other _____

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C 4.2+1.1=4.3 Bottles Received: 12

Sample Receipt Checklist
COC Seal Present/Intact: NP 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

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

	Date:	Time:
Relinquished by : (Signature)	10/4/19	1800
Relinquished by : (Signature)	10/4/19	1700
Relinquished by : (Signature)		

Received by: (Signature)

Received by: (Signature)

Received for lab by: (Signature) — Date: 10/5/19 Time: 8:45

Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client: OXYGJCO	1146840	
Cooler Received/Opened On: 10/5/14 845 Temperature:	4.3	
Received By: Willie Taylor		
Signature: Willie Taylor		

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	✓		
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			