



12065 Lebanon Rd.  
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Tax I.D. 62-0814289

Est. 1970

Project Manager  
Hunter Ridge Energy Services, LLC- CO  
143 Diamond Avenue  
Parachute, CO 81635

## Report Summary

Tuesday June 04, 2013

Report Number: L637268

Samples Received: 05/22/13

Client Project: J25 FRACPAD

Description: J25 Frac Pad Spill

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

  
Jarred Willis , ESC Representative

### Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,  
FL - E87487, GA - 923, IN - C-IN-01, KY - 90010, KYUST - 0016,  
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,  
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,  
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,  
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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# REPORT OF ANALYSIS

Project Manager  
Hunter Ridge Energy Services, LLC-  
143 Diamond Avenue  
Parachute, CO 81635

June 04, 2013

Date Received : May 22, 2013  
Description : J25 Frac Pad Spill  
Sample ID : J25 FRACPAD-SPILL-POR-052113  
Collected By : Matt Kasten  
Collection Date : 05/21/13 09:30

ESC Sample # : L637268-01  
Site ID : J25 FRACPAD  
Project # : J25 FRACPAD

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	05/28/13	1
Chromium, Trivalent	42.	2.0	mg/kg	Calc.	05/29/13	1
ORP	160		mV	2580 B-2011	05/28/13	1
pH	8.1		su	9045D	05/29/13	1
Sodium Adsorption Ratio	6.0			Calc.	05/30/13	1
Specific Conductance	510		umhos/cm	9050AMod	05/28/13	1
Mercury	0.79	0.040	mg/kg	7471	05/23/13	2
Arsenic	2.8	1.0	mg/kg	6010B	05/29/13	1
Barium	840	0.25	mg/kg	6010B	05/29/13	1
Cadmium	BDL	0.25	mg/kg	6010B	05/29/13	1
Chromium	42.	0.50	mg/kg	6010B	05/29/13	1
Copper	7.9	1.0	mg/kg	6010B	05/29/13	1
Lead	9.5	0.25	mg/kg	6010B	05/29/13	1
Nickel	17.	1.0	mg/kg	6010B	05/29/13	1
Selenium	BDL	5.0	mg/kg	6010B	05/29/13	5
Silver	BDL	0.50	mg/kg	6010B	05/29/13	1
Zinc	34.	1.5	mg/kg	6010B	05/29/13	1
Benzene	0.057	0.025	mg/kg	8021/8015	05/24/13	50
Toluene	2.9	0.25	mg/kg	8021/8015	05/24/13	50
Ethylbenzene	1.9	0.025	mg/kg	8021/8015	05/24/13	50
Total Xylene	28.	0.075	mg/kg	8021/8015	05/24/13	50
TPH (GC/FID) Low Fraction	1300	50.	mg/kg	GRO	05/29/13	500
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	103.		% Rec.	8021/8015	05/29/13	500
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021/8015	05/24/13	50
TPH (GC/FID) High Fraction	45000	2000	mg/kg	3546/DRO	06/03/13	500
Surrogate recovery(%)						
o-Terphenyl	0.00		% Rec.	3546/DRO	06/03/13	500
Polynuclear Aromatic Hydrocarbons						
Anthracene	1.6	0.60	mg/kg	8270C-SIM	05/26/13	100
Acenaphthene	3.9	0.60	mg/kg	8270C-SIM	05/26/13	100
Acenaphthylene	BDL	0.60	mg/kg	8270C-SIM	05/26/13	100
Benzo(a)anthracene	BDL	0.60	mg/kg	8270C-SIM	05/26/13	100
Benzo(a)pyrene	BDL	0.60	mg/kg	8270C-SIM	05/26/13	100

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
L637268-01 (PH) - 8.1@21.9c



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June 04, 2013

Date Received : May 22, 2013  
Description : J25 Frac Pad Spill  
Sample ID : J25 FRACPAD-SPILL-POR-052113  
Collected By : Matt Kasten  
Collection Date : 05/21/13 09:30

ESC Sample # : L637268-01

Site ID : J25 FRACPAD

Project # : J25 FRACPAD

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(b)fluoranthene	BDL	0.60	mg/kg	8270C-SIM	05/26/13	100
Benzo(g,h,i)perylene	BDL	0.60	mg/kg	8270C-SIM	05/26/13	100
Benzo(k)fluoranthene	BDL	0.60	mg/kg	8270C-SIM	05/26/13	100
Chrysene	BDL	0.60	mg/kg	8270C-SIM	05/26/13	100
Dibenz(a,h)anthracene	BDL	0.60	mg/kg	8270C-SIM	05/26/13	100
Fluoranthene	BDL	0.60	mg/kg	8270C-SIM	05/26/13	100
Fluorene	11.	0.60	mg/kg	8270C-SIM	05/26/13	100
Indeno(1,2,3-cd)pyrene	BDL	0.60	mg/kg	8270C-SIM	05/26/13	100
Naphthalene	18.	2.0	mg/kg	8270C-SIM	05/26/13	100
Phenanthrene	6.5	0.60	mg/kg	8270C-SIM	05/26/13	100
Pyrene	BDL	0.60	mg/kg	8270C-SIM	05/26/13	100
1-Methylnaphthalene	26.	2.0	mg/kg	8270C-SIM	05/26/13	100
2-Methylnaphthalene	85.	2.0	mg/kg	8270C-SIM	05/26/13	100
2-Chloronaphthalene	BDL	2.0	mg/kg	8270C-SIM	05/26/13	100
Surrogate Recovery						
Nitrobenzene-d5	17500		% Rec.	8270C-SIM	05/26/13	100
2-Fluorobiphenyl	380.		% Rec.	8270C-SIM	05/26/13	100
p-Terphenyl-d14	91.2		% Rec.	8270C-SIM	05/26/13	100

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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L637268-01 (PH) - 8.1@21.9c



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June 04, 2013

Date Received : May 22, 2013  
Description : J25 Frac Pad Spill  
Sample ID : J25 FRACPAD-SPILL-MID-052113  
Collected By : Matt Kasten  
Collection Date : 05/21/13 09:35

ESC Sample # : L637268-02  
Site ID : J25 FRACPAD  
Project # : J25 FRACPAD

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021/8015	05/24/13	5
Toluene	BDL	0.025	mg/kg	8021/8015	05/24/13	5
Ethylbenzene	0.0028	0.0025	mg/kg	8021/8015	05/24/13	5
Total Xylene	0.038	0.0075	mg/kg	8021/8015	05/29/13	5
TPH (GC/FID) Low Fraction	8.7	0.50	mg/kg	GRO	05/24/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8021/8015	05/24/13	5
a,a,a-Trifluorotoluene(PID)	98.9		% Rec.	8021/8015	05/24/13	5
TPH (GC/FID) High Fraction	790	80.	mg/kg	3546/DRO	05/29/13	20
Surrogate recovery(%)						
o-Terphenyl	86.8		% Rec.	3546/DRO	05/29/13	20

BDL - Below Detection Limit

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June 04, 2013

Date Received : May 22, 2013  
Description : J25 Frac Pad Spill  
Sample ID : J25 FRACPAD-SPILL-N-052113  
Collected By : Matt Kasten  
Collection Date : 05/21/13 09:40

ESC Sample # : L637268-03  
Site ID : J25 FRACPAD  
Project # : J25 FRACPAD

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.025	mg/kg	8021/8015	05/24/13	50
Toluene	BDL	0.25	mg/kg	8021/8015	05/24/13	50
Ethylbenzene	0.093	0.025	mg/kg	8021/8015	05/24/13	50
Total Xylene	2.8	0.075	mg/kg	8021/8015	05/24/13	50
TPH (GC/FID) Low Fraction	140	5.0	mg/kg	GRO	05/24/13	50
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	103.		% Rec.	8021/8015	05/24/13	50
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021/8015	05/24/13	50
TPH (GC/FID) High Fraction	1500	80.	mg/kg	3546/DRO	05/29/13	20
Surrogate recovery(%)						
o-Terphenyl	133.		% Rec.	3546/DRO	05/29/13	20

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Hunter Ridge Energy Services, LLC-  
143 Diamond Avenue  
Parachute, CO 81635

Date Received : May 22, 2013  
Description : J25 Frac Pad Spill  
Sample ID : J25 FRACPAD-SPILL-CSN-052113  
Collected By : Matt Kasten  
Collection Date : 05/21/13 09:45

ESC Sample # : L637268-04  
Site ID : J25 FRACPAD  
Project # : J25 FRACPAD

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021/8015	05/24/13	5
Toluene	BDL	0.025	mg/kg	8021/8015	05/24/13	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	05/24/13	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	05/30/13	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	05/24/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	101.		% Rec.	8021/8015	05/24/13	5
a,a,a-Trifluorotoluene(PID)	99.9		% Rec.	8021/8015	05/24/13	5
TPH (GC/FID) High Fraction	8.9	4.0	mg/kg	3546/DRO	05/31/13	1
Surrogate recovery(%)						
o-Terphenyl	66.3		% Rec.	3546/DRO	05/31/13	1

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REPORT OF ANALYSIS

Project Manager  
Hunter Ridge Energy Services, LLC-  
143 Diamond Avenue  
Parachute, CO 81635

June 04, 2013

Date Received : May 22, 2013  
Description : J25 Frac Pad Spill  
Sample ID : J25 FRACPAD-SPILL-CSE-052113  
Collected By : Matt Kasten  
Collection Date : 05/21/13 09:50

ESC Sample # : L637268-05

Site ID : J25 FRACPAD

Project # : J25 FRACPAD

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021/8015	05/24/13	5
Toluene	BDL	0.025	mg/kg	8021/8015	05/24/13	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	05/24/13	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	05/30/13	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	05/24/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	101.		% Rec.	8021/8015	05/24/13	5
a,a,a-Trifluorotoluene(PID)	98.9		% Rec.	8021/8015	05/24/13	5
TPH (GC/FID) High Fraction	BDL	4.0	mg/kg	3546/DRO	05/30/13	1
Surrogate recovery(%)						
o-Terphenyl	67.4		% Rec.	3546/DRO	05/30/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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143 Diamond Avenue  
Parachute, CO 81635

June 04, 2013

Date Received : May 22, 2013  
Description : J25 Frac Pad Spill  
Sample ID : J25 FRACPAD-SPILL-CSW-052113  
Collected By : Matt Kasten  
Collection Date : 05/21/13 09:55

ESC Sample # : L637268-06  
Site ID : J25 FRACPAD  
Project # : J25 FRACPAD

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021/8015	05/24/13	5
Toluene	BDL	0.025	mg/kg	8021/8015	05/24/13	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	05/24/13	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	05/30/13	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	05/24/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	101.		% Rec.	8021/8015	05/24/13	5
a,a,a-Trifluorotoluene(PID)	100.		% Rec.	8021/8015	05/24/13	5
TPH (GC/FID) High Fraction	BDL	4.0	mg/kg	3546/DRO	05/31/13	1
Surrogate recovery(%)						
o-Terphenyl	75.0		% Rec.	3546/DRO	05/31/13	1

BDL - Below Detection Limit

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Attachment A  
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L637268-01	WG663075	SAMP	Total Xylene	R2683783	B
	WG663607	SAMP	Selenium	R2688061	O
	WG663231	SAMP	Nitrobenzene-d5	R2685525	J7
	WG663231	SAMP	2-Fluorobiphenyl	R2685525	J7
	WG663231	SAMP	p-Terphenyl-d14	R2685525	J7
	WG663175	SAMP	Specific Conductance	R2685711	J3
	WG663235	SAMP	o-Terphenyl	R2691965	J7
	WG663235	SAMP	o-Terphenyl	R2688180	J7
L637268-02	WG663075	SAMP	Total Xylene	R2683783	B
L637268-03	WG663235	SAMP	o-Terphenyl	R2688180	J7

Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
B	(EPA) - The indicated compound was found in the associated method blank as well as the laboratory sample.
J3	The associated batch QC was outside the established quality control range for precision.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
O	(ESC) Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.



**YOUR LAB OF CHOICE**

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Level II  
L637268

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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Mercury	< .02	mg/kg			WG662846	05/23/13 18:58
Benzene	< .0005	mg/kg			WG663075	05/23/13 23:49
Ethylbenzene	< .0005	mg/kg			WG663075	05/23/13 23:49
Toluene	< .005	mg/kg			WG663075	05/23/13 23:49
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG663075	05/23/13 23:49
Total Xylene	< .0015	mg/kg			WG663075	05/23/13 23:49
a,a,a-Trifluorotoluene(FID)		% Rec.	101.9	59-128	WG663075	05/23/13 23:49
a,a,a-Trifluorotoluene(PID)		% Rec.	101.1	54-144	WG663075	05/23/13 23:49
Chromium,Hexavalent	< 2	mg/kg			WG663011	05/28/13 13:55
Specific Conductance	1.00	umhos/cm			WG663175	05/28/13 14:30
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG663677	05/29/13 14:43
Total Xylene	< .0015	mg/kg			WG663677	05/29/13 14:43
a,a,a-Trifluorotoluene(FID)		% Rec.	102.7	59-128	WG663677	05/29/13 14:43
a,a,a-Trifluorotoluene(PID)		% Rec.	101.8	54-144	WG663677	05/29/13 14:43
Arsenic	< 1	mg/kg			WG663607	05/29/13 18:51
Barium	< .25	mg/kg			WG663607	05/29/13 18:51
Cadmium	< .25	mg/kg			WG663607	05/29/13 18:51
Chromium	< .5	mg/kg			WG663607	05/29/13 18:51
Copper	< 1	mg/kg			WG663607	05/29/13 18:51
Lead	< .25	mg/kg			WG663607	05/29/13 18:51
Nickel	< 1	mg/kg			WG663607	05/29/13 18:51
Selenium	< 1	mg/kg			WG663607	05/29/13 18:51
Silver	< .5	mg/kg			WG663607	05/29/13 18:51
Zinc	< 1.5	mg/kg			WG663607	05/29/13 18:51
TPH (GC/FID) High Fraction	< 4	mg/kg			WG663554	05/31/13 19:46
o-Terphenyl		% Rec.	72.30	50-150	WG663554	05/31/13 19:46

Analyte	Units	Result	Duplicate		Limit	Ref Samp	Batch
			Duplicate	RPD			
Mercury	mg/kg	0	0.00215	75.8*	20	L637267-03	WG662846
Chromium,Hexavalent	mg/kg	16.0	13.0	18.2	20	L637431-01	WG663011
Chromium,Hexavalent	mg/kg	5.80	7.30	22.2*	20	L636947-01	WG663011
ORP	mV	180.	160.	11.8	20	L637268-01	WG662957
ORP	mV	440.	440.	0	20	L637431-01	WG662957
Specific Conductance	umhos/cm	660.	510.	25.0*	20	L637268-01	WG663175
Specific Conductance	umhos/cm	1300	1200	6.45	20	L637488-01	WG663175
pH	su	8.00	7.90	0.757	1	L637174-18	WG663557
pH	su	7.50	7.50	0.133	1	L637174-21	WG663557

\* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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June 04, 2013

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Arsenic	mg/kg	5.60	5.70	1.77	20	L637280-17	WG663607
Barium	mg/kg	26.0	26.0	0	20	L637280-17	WG663607
Cadmium	mg/kg	0	0	0	20	L637280-17	WG663607
Chromium	mg/kg	8.20	8.10	1.23	20	L637280-17	WG663607
Copper	mg/kg	15.0	14.0	6.90	20	L637280-17	WG663607
Lead	mg/kg	6.60	6.50	1.53	20	L637280-17	WG663607
Nickel	mg/kg	9.00	8.80	2.25	20	L637280-17	WG663607
Silver	mg/kg	0	0	0	20	L637280-17	WG663607
Zinc	mg/kg	39.0	40.0	2.53	20	L637280-17	WG663607
Selenium	mg/kg	0	0	0	20	L637280-17	WG663607

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Mercury	mg/kg	12.4	14.1	114.	71.6-128	WG662846
Benzene	mg/kg	.05	0.0433	86.7	76-113	WG663075
Ethylbenzene	mg/kg	.05	0.0442	88.5	78-115	WG663075
Toluene	mg/kg	.05	0.0444	88.8	76-114	WG663075
Total Xylene	mg/kg	.15	0.138	91.9	81-118	WG663075
a,a,a-Trifluorotoluene(PID)				102.5	54-144	WG663075
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.70	104.	67-135	WG663075
a,a,a-Trifluorotoluene(FID)				102.1	59-128	WG663075
Chromium,Hexavalent	mg/kg	146	148.	101.	80-120	WG663011
ORP	mV	228	223.	97.8	95.6-104.	WG662957
Specific Conductance	umhos/cm	878	878.	100.	85-115	WG663175
pH	su	5.79	5.80	100.	98.3-101.7	WG663557
Total Xylene	mg/kg	.15	0.146	97.5	81-118	WG663677
a,a,a-Trifluorotoluene(PID)				100.6	54-144	WG663677
TPH (GC/FID) Low Fraction	mg/kg	5.5	4.88	88.7	67-135	WG663677
a,a,a-Trifluorotoluene(FID)				102.5	59-128	WG663677
Arsenic	mg/kg	237	234.	98.7	83.1-117	WG663607
Barium	mg/kg	252	255.	101.	84.1-116	WG663607
Cadmium	mg/kg	191	182.	95.3	83.2-117	WG663607
Chromium	mg/kg	128	136.	106.	81.3-118	WG663607
Copper	mg/kg	123	130.	106.	83.7-116	WG663607
Lead	mg/kg	103	99.6	96.7	83.1-117	WG663607
Nickel	mg/kg	118	115.	97.5	82-118	WG663607
Selenium	mg/kg	110	98.6	89.6	78.7-122	WG663607
Silver	mg/kg	47.3	46.1	97.5	66.2-134	WG663607
Zinc	mg/kg	183	174.	95.1	82-118	WG663607
TPH (GC/FID) High Fraction	mg/kg	60	41.6	69.3	50-150	WG663554
o-Terphenyl				69.90	50-150	WG663554

\* Performance of this Analyte is outside of established criteria.

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Est. 1970

June 04, 2013

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Benzene	mg/kg	0.0479	0.0433	96.0	76-113	9.97	20	WG663075
Ethylbenzene	mg/kg	0.0478	0.0442	96.0	78-115	7.65	20	WG663075
Toluene	mg/kg	0.0478	0.0444	96.0	76-114	7.31	20	WG663075
Total Xylene	mg/kg	0.148	0.138	98.0	81-118	6.83	20	WG663075
a,a,a-Trifluorotoluene(PID)				99.37	54-144			WG663075
TPH (GC/FID) Low Fraction	mg/kg	5.66	5.70	103.	67-135	0.760	20	WG663075
a,a,a-Trifluorotoluene(FID)				101.8	59-128			WG663075
Chromium,Hexavalent	mg/kg	140.	148.	96.0	80-120	5.56	20	WG663011
ORP	mV	221.	223.	97.0	95.6-104.	0.901	20	WG662957
Specific Conductance	umhos/	869.	878.	99.0	85-115	1.03	20	WG663175
pH	su	5.80	5.80	100.	98.3-101.7	0	20	WG663557
Total Xylene	mg/kg	0.149	0.146	100.	81-118	2.21	20	WG663677
a,a,a-Trifluorotoluene(PID)				104.0	54-144			WG663677
TPH (GC/FID) Low Fraction	mg/kg	4.91	4.88	89.0	67-135	0.640	20	WG663677
a,a,a-Trifluorotoluene(FID)				102.6	59-128			WG663677
TPH (GC/FID) High Fraction	mg/kg	41.1	41.6	68.0	50-150	1.31	20	WG663554
o-Terphenyl				66.90	50-150			WG663554

Analyte	Units	Matrix Spike				Limit	Ref Samp	Batch
		MS Res	Ref Res	TV	% Rec			
Mercury	mg/kg	0.225	0.00215	.25	89.3	80-120	L637267-03	WG662846
Benzene	mg/kg	0.237	0	.05	94.7	32-137	L637268-02	WG663075
Ethylbenzene	mg/kg	0.208	0.00283	.05	82.0	10-150	L637268-02	WG663075
Toluene	mg/kg	0.229	0.00364	.05	90.2	20-142	L637268-02	WG663075
Total Xylene	mg/kg	0.682	0.0608	.15	82.8	16-141	L637268-02	WG663075
a,a,a-Trifluorotoluene(PID)					99.11	54-144		WG663075
TPH (GC/FID) Low Fraction	mg/kg	25.5	8.71	5.5	61.0	55-109	L637268-02	WG663075
a,a,a-Trifluorotoluene(FID)					98.24	59-128		WG663075
Chromium,Hexavalent	mg/kg	5.20	0	20	5.20*	75-125	L637164-01	WG663011
Total Xylene	mg/kg	0.809	0	.15	108.	16-141	L637815-05	WG663677
a,a,a-Trifluorotoluene(PID)					100.4	54-144		WG663677
TPH (GC/FID) Low Fraction	mg/kg	21.4	0.0864	5.5	77.4	55-109	L637815-05	WG663677
a,a,a-Trifluorotoluene(FID)					101.7	59-128		WG663677
Arsenic	mg/kg	55.1	5.70	50	98.8	75-125	L637280-17	WG663607
Barium	mg/kg	76.4	26.0	50	101.	75-125	L637280-17	WG663607
Cadmium	mg/kg	47.0	0	50	94.0	75-125	L637280-17	WG663607
Chromium	mg/kg	59.4	8.10	50	103.	75-125	L637280-17	WG663607
Copper	mg/kg	66.9	14.0	50	106.	75-125	L637280-17	WG663607
Lead	mg/kg	54.3	6.50	50	95.6	75-125	L637280-17	WG663607

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Nickel	mg/kg	55.6	8.80	50	93.6	75-125	L637280-17	WG663607
Silver	mg/kg	48.6	0	50	97.2	75-125	L637280-17	WG663607
Zinc	mg/kg	88.5	40.0	50	97.0	75-125	L637280-17	WG663607
Selenium	mg/kg	52.1	0	10	104.	75-125	L637280-17	WG663607
TPH (GC/FID) High Fraction	mg/kg	43.8	1.36	60	70.7	50-150	L637757-03	WG663554
o-Terphenyl					68.00	50-150		WG663554

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Mercury	mg/kg	0.224	0.225	88.8	80-120	0.511	20	L637267-03	WG662846
Benzene	mg/kg	0.220	0.237	87.8	32-137	7.48	39	L637268-02	WG663075
Ethylbenzene	mg/kg	0.168	0.208	66.1	10-150	21.1	44	L637268-02	WG663075
Toluene	mg/kg	0.199	0.229	78.2	20-142	14.1	42	L637268-02	WG663075
Total Xylene	mg/kg	0.551	0.682	65.4	16-141	21.2	46	L637268-02	WG663075
a,a,a-Trifluorotoluene(PID)				99.10	54-144				WG663075
TPH (GC/FID) Low Fraction	mg/kg	27.4	25.5	68.0	55-109	7.23	20	L637268-02	WG663075
a,a,a-Trifluorotoluene(FID)				98.28	59-128				WG663075
Chromium,Hexavalent	mg/kg	6.12	5.20	6.12*	75-125	16.3	20	L637164-01	WG663011
Total Xylene	mg/kg	0.721	0.809	96.1	16-141	11.5	46	L637815-05	WG663677
a,a,a-Trifluorotoluene(PID)				103.0	54-144				WG663677
TPH (GC/FID) Low Fraction	mg/kg	21.1	21.4	76.3	55-109	1.45	20	L637815-05	WG663677
a,a,a-Trifluorotoluene(FID)				101.6	59-128				WG663677
Arsenic	mg/kg	52.8	55.1	94.2	75-125	4.26	20	L637280-17	WG663607
Barium	mg/kg	72.6	76.4	93.2	75-125	5.10	20	L637280-17	WG663607
Cadmium	mg/kg	45.2	47.0	90.4	75-125	3.90	20	L637280-17	WG663607
Chromium	mg/kg	56.6	59.4	97.0	75-125	4.83	20	L637280-17	WG663607
Copper	mg/kg	65.4	66.9	103.	75-125	2.27	20	L637280-17	WG663607
Lead	mg/kg	51.1	54.3	89.2	75-125	6.07	20	L637280-17	WG663607
Nickel	mg/kg	52.8	55.6	88.0	75-125	5.17	20	L637280-17	WG663607
Silver	mg/kg	48.4	48.6	96.8	75-125	0.412	20	L637280-17	WG663607
Zinc	mg/kg	85.4	88.5	90.8	75-125	3.57	20	L637280-17	WG663607
Selenium	mg/kg	50.8	52.1	102.	75-125	2.53	20	L637280-17	WG663607
TPH (GC/FID) High Fraction	mg/kg	43.4	43.8	70.0	50-150	0.850	20	L637757-03	WG663554
o-Terphenyl				66.60	50-150				WG663554

Serial Dilution

Batch number /Run number / Sample number cross reference

WG662846: R2682448: L637268-01

WG663075: R2683783: L637268-01 02 03 04 05 06

WG663011: R2685421: L637268-01

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WG663231: R2685525: L637268-01  
WG663175: R2685711: L637268-01  
WG662957: R2685740: L637268-01  
WG663557: R2687740: L637268-01  
WG663677: R2687920: L637268-01 02 04 05 06  
WG663607: R2688061: L637268-01  
WG663235: R2688180 R2691965: L637268-02 03 01  
WG663645: R2689089: L637268-01  
WG663551: R2690164: L637268-05  
WG663554: R2691921: L637268-04 06

\* \* Calculations are performed prior to rounding of reported values.

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The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.