



Nicholson GeoSolutions LLC

3433 East Lake Drive
Centennial, CO 80121

May 31, 2016

Mr. Terry Pape
HRM Resources II, LLC
410 17th Street, Suite 1100
Denver, CO 80202

**Subject: Marick No. 1A Land Treatment Progress Report
COGCC Remediation #9015**

Dear Terry:

Nicholson GeoSolutions LLC was retained by HRM Resources II LLC (HRM) to conduct soil sampling of the landfarm cells on the Marick No. 1A lease, Washington County, Colorado. Sampling of the landfarm was conducted at the required rate of approximately one sample per 100 yards of material on May 5th, 2016. The landfarm was previously sampled on October 18th, 2015.

GPS mapping showed that two landfarm cells cover a total of about 1.39 acres and contain an estimated 3,650 yards of material. A total of 38 discrete soil samples were collected at depths of approximately 12-16 inches. These samples were collected from approximately the same locations as those collected in October 2015. The extent of the landfarm cells and the locations of the samples are shown on Figure 1.

All samples were analyzed for Total Volatile Petroleum Hydrocarbons (TVPH – gasoline range), Total Extractable Petroleum Hydrocarbons (TEPH – diesel and motor oil range), and BTEX (benzene, toluene, ethylbenzene, and xylenes) to evaluate compliance with the COGCC Table 910-1 standards, the rate of biodegradation, and further treatment needs.

Table 1 provides a summary of the analytical results for the samples. The laboratory report is contained in Appendix A. For the May 2016 sampling event, the sum of the concentrations of gasoline, diesel, and motor oil range petroleum hydrocarbons (total petroleum hydrocarbons [TPH]) exceeded the COGCC standard of 500 mg/kg for 37 of the 38 samples and ranged from 477 mg/kg to 41,500 mg/kg. All BTEX results were below the standards for all samples.

Table 1 Marick No. 1A Landfarm Sample Results – May 5, 2016

Parameter	Table 910-1 Standards	Marick LF-1	Marick LF-2	Marick LF-3	Marick LF-4	Marick LF-5
TVPH – gasoline range	500 ¹	<0.5 UJ	<0.5 UJ	<0.5 UJ	2.82 J	6.67 J
TEPH – diesel/motor oil range	500 ¹	2,014	1,358	809 J	8,320 J	2,092 J
benzene	0.17	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ
toluene	85	<0.025	<0.025	<0.025	<0.025	<0.025
ethylbenzene	100	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
xylenes	175	<0.0075	<0.0075	<0.0075	0.0766	0.108

Parameter	Table 910-1 Standards	Marick LF-6	Marick LF-7	Marick LF-8	Marick LF-9	Marick LF-10
TVPH – gasoline range	500 ¹	<0.5 UJ	<0.5 UJ	<0.5 UJ	<0.5 UJ	<0.5 UJ
TEPH – diesel/motor oil range	500 ¹	7,450 J	1,214	41,500 J	1,975	8,510 J
benzene	0.17	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ
toluene	85	<0.025	<0.025	<0.025	<0.025	<0.025
ethylbenzene	100	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
xylenes	175	0.00794	<0.0075	0.0103	<0.0075	<0.0075

Parameter	Table 910-1 Standards	Marick LF-11	Marick LF-12	Marick LF-13	Marick LF-14	Marick LF-15
TVPH – gasoline range	500 ¹	<0.5 UJ	<0.5 UJ	<0.5 UJ	0.538 J	<0.5 UJ
TEPH – diesel/motor oil range	500 ¹	9,430 J	5,880 J	7,460 J	1,719	1,073
benzene	0.17	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ
toluene	85	<0.025	<0.025	<0.025	<0.025	<0.025
ethylbenzene	100	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
xylenes	175	<0.0075	<0.0075	<0.0075	0.0242	0.0182

Parameter	Table 910-1 Standards	Marick LF-16	Marick LF-17	Marick LF-18	Marick LF-19	Marick LF-20
TVPH – gasoline range	500 ¹	<0.5 UJ	<0.5 UJ	<0.5 UJ	<0.5 UJ	1.73 J
TEPH – diesel/motor oil range	500 ¹	5,270 J	2,104	1,771	840	2,587
benzene	0.17	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ
toluene	85	<0.025	<0.025	<0.025	<0.025	<0.025
ethylbenzene	100	<0.0025	<0.0025	<0.0025	<0.0025	0.00513
xylenes	175	0.00917	0.00839	<0.0075	<0.0075	0.0368

Parameter	Table 910-1 Standards	Marick LF-21	Marick LF-22	Marick LF-23	Marick LF-24	Marick LF-25
TVPH – gasoline range	500 ¹	<0.5 UJ	<0.5 UJ	<0.5 UJ	<0.5 UJ	<0.5 UJ
TEPH – diesel/motor oil range	500 ¹	1,443	477	1,442	2,740	1,224
benzene	0.17	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ
toluene	85	<0.025	<0.025	<0.025	<0.025	<0.025
ethylbenzene	100	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
xylenes	175	<0.0075	<0.0075	<0.0075	<0.0075	0.0127

Parameter	Table 910-1 Standards	Marick LF-26	Marick LF-27	Marick LF-28	Marick LF-29	Marick LF-30
TVPH – gasoline range	500 ¹	<0.5 UJ	<0.5 UJ	<0.5 UJ	22.3 J	9.83 J
TEPH – diesel/motor oil range	500 ¹	3,100	1,153	1,908	6,170 J	7,820
benzene	0.17	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	0.00534
toluene	85	<0.025	<0.025	<0.025	0.0531	0.0524
ethylbenzene	100	<0.0025	<0.0025	<0.0025	0.0771	0.028
xylenes	175	<0.0075	<0.0075	<0.0075	0.378	0.187

Table 1 Marick No. 1A Landfarm Sample Results (concluded)

Parameter	Table 910-1 Standards	Marick LF-31	Marick LF-32	Marick LF-33	Marick LF-34	Marick LF-35
TVPH – gasoline range	500 ¹	<0.5 UJ	30.3 J	<0.5 UJ	<0.5 UJ	<0.5 UJ
TEPH – diesel/motor oil range	500 ¹	5,300	3,250	2,590	3,540	1,876
benzene	0.17	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ
toluene	85	<0.025	0.0818	<0.025	<0.025	<0.025
ethylbenzene	100	<0.0025	0.115	<0.0025	<0.0025	0.00278
xylenes	175	<0.0075	0.492	<0.0075	<0.0075	0.013

Parameter	Table 910-1 Standards	Marick LF-36	Marick LF-37	Marick LF-38
TVPH – gasoline range	500 ¹	<0.5 UJ	<0.5 UJ	<0.5 UJ
TEPH – diesel/motor oil range	500 ¹	5,290	855	1,193
benzene	0.17	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ
toluene	85	<0.025	<0.025	<0.025
ethylbenzene	100	<0.0025	<0.0025	<0.0025
xylenes	175	0.0141	<0.0075	<0.0075

¹The standard is 500 for the combined total of TVPH and TEPH All units in mg/kg

J = estimated concentration UJ = estimated detection limit

Values in bold type exceed standards

Table 2 provides the TPH results for the October 18th, 2015 and May 5th, 2016 samples and the percent difference between the two samples at each sample location. TPH ranged from 2,120 mg/kg to 21,601 mg/kg for the October 2015 samples and from 477 mg/kg to 41,500 mg/kg for the May 2016 samples. The TPH concentration was lower for the May 2016 samples at 35 of the 38 sample locations, slightly higher at two locations (Marick-LF-10 and Marick-LF-29), and substantially higher at one location (Marick-LF-8). The landfarm was thoroughly tilled on two occasions since the last sampling event.

Table 2 Comparison of TPH Results, October 18, 2015 and May 5, 2016

Sample Location	TPH (mg/kg) October 18, 2015	TPH (mg/kg) May 5, 2016	%Difference
Marick LF-1	2,120	2,014	-5.0
Marick LF-2	2,666	1,358	-49.1
Marick LF-3	21,601	809	-96.3
Marick LF-4	14,200	8,323	-41.4
Marick LF-5	13,311	2,097	-84.2
Marick LF-6	20,451	7,450	-63.6
Marick LF-7	8,990	1,214	-86.5
Marick LF-8	12,600	41,500	229.4
Marick LF-9	13,630	1,975	-85.5
Marick LF-10	7,910	8,510	7.6
Marick LF-11	19,291	9,430	-51.1
Marick LF-12	13,320	5,880	-55.9
Marick LF-13	12,271	7,460	-39.2
Marick LF-14	8,991	1,720	-80.9
Marick LF-15	7,280	1,073	-85.3
Marick LF-16	9,761	5,270	-46.0
Marick LF-17	16,330	2,104	-87.1
Marick LF-18	9,430	1,771	-81.2
Marick LF-19	9,800	840	-91.4

Table 2 Comparison of TPH Results (Concluded)			
Sample Location	TPH (mg/kg) October 18, 2015	TPH (mg/kg) May 5, 2016	%Difference
Marick LF-20	7,630	2,589	-66.1
Marick LF-21	14,887	1,443	-90.3
Marick LF-22	11,770	477	-95.9
Marick LF-23	9,282	1,442	-84.5
Marick LF-24	12,170	2,740	-77.5
Marick LF-25	16,081	1,224	-92.4
Marick LF-26	12,001	3,100	-74.2
Marick LF-27	12,321	1,153	-90.6
Marick LF-28	11,950	1,908	-84.0
Marick LF-29	5,824	6,170	5.9
Marick LF-30	11,298	7,820	-30.8
Marick LF-31	8,313	5,300	-36.2
Marick LF-32	14,291	3,280	-77.0
Marick LF-33	19,138	2,590	-86.5
Marick LF-34	11,665	3,540	-69.7
Marick LF-35	14,911	1,876	-87.4
Marick LF-36	9,181	5,290	-42.4
Marick LF-37	15,641	855	-94.5
Marick LF-38	12,011	1,193	-90.1

Table 3 provides summary statistics for the two sampling events. The average TPH concentration for the 38 samples dropped from 11,956 mg/kg to 4,337 mg/kg between October 18th, 2015 and May 5th, 2016. The median concentration dropped from 12,006 mg/kg to 2,101 mg/kg. Using the results provided above in Table 2, the average % difference between samples collected at the same location was -63.7%.

Using the difference between the average TPH concentrations of 7,619 mg/kg, and the time period of 200 days, a biodegradation rate of 38.1 mg/kg-day is obtained. However, with only two data points, the calculated rate assumes that the rate of decline is linear when it is likely a first-order or second-order decay equation. Therefore, the calculated biodegradation rate may be higher than the actual rate. A more accurate rate may be determined following the collection of the October 2016 samples.

Table 3 Summary Statistics for the October 2015 and May 2016 Samples					
Sample Date	Minimum	Maximum	Average	Median	Average % Difference
Oct 18, 2015	2,120	21,601	11,956	12,006	
May 5, 2016	477	41,500	4,337	2,101	-63.7%

Based on the analytical results, bioremediation of the TPH contained in the soils in the landfarm cells at the Marick No. 1A lease is occurring. Additional treatment of the landfarm cells including tilling will be conducted prior to the next sampling event in October 2016.

Nicholson GeoSolutions LLC

A handwritten signature in blue ink that reads "DK Nicholson". The signature is written in a cursive, flowing style.

David K. Nicholson, P.G.
Principal Geologist



APPENDIX A
Laboratory Report



12065 Lebanon Rd.
Mt. Juliet, TN 37122
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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Dave Nicholson
HRM Resources, LLC - Denver, CO
410 17th St., Ste. 1600
Denver, CO 80202

Report Summary

Tuesday May 17, 2016

Report Number: L834396

Samples Received: 05/10/16

Client Project:

Description: Marick 1A

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:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01,1461-02, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-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, EPA - TN002

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REPORT OF ANALYSIS

Dave Nicholson
HRM Resources, LLC - Denver, CO
410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-1
Collected By : DK Nicholson
Collection Date : 05/05/16 10:30

ESC Sample # : L834396-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/13/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/13/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/13/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	96.4		% Rec.	8015	05/13/16	1
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021	05/13/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	1240	40.0	mg/kg	8015	05/14/16	10
C28-C40 Oil Range	774.	40.0	mg/kg	8015	05/14/16	10
Surrogate Recovery						
o-Terphenyl	68.0		% Rec.	8015	05/14/16	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

Dave Nicholson
HRM Resources, LLC - Denver, CO
410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-2
Collected By : DK Nicholson
Collection Date : 05/05/16 10:40

ESC Sample # : L834396-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/13/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/13/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/13/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.5		% Rec.	8015	05/13/16	1
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021	05/13/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	846.	40.0	mg/kg	8015	05/14/16	10
C28-C40 Oil Range	512.	40.0	mg/kg	8015	05/14/16	10
Surrogate Recovery						
o-Terphenyl	57.4		% Rec.	8015	05/14/16	10

BDL - Below Detection Limit

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410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-3
Collected By : DK Nicholson
Collection Date : 05/05/16 10:50

ESC Sample # : L834396-03

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/13/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/13/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/13/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	88.3		% Rec.	8015	05/13/16	1
a,a,a-Trifluorotoluene(PID)	89.9		% Rec.	8021	05/13/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	497.	40.0	mg/kg	8015	05/14/16	10
C28-C40 Oil Range	312.	40.0	mg/kg	8015	05/14/16	10
Surrogate Recovery						
o-Terphenyl	42.4		% Rec.	8015	05/14/16	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-4
Collected By : DK Nicholson
Collection Date : 05/05/16 10:55

ESC Sample # : L834396-04

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/13/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Total Xylene	0.0766	0.00750	mg/kg	8021	05/13/16	5
TPH (GC/FID) Low Fraction	2.82	0.500	mg/kg	8015	05/13/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	93.2		% Rec.	8015	05/13/16	1
a,a,a-Trifluorotoluene(PID)	95.6		% Rec.	8021	05/13/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	5230	80.0	mg/kg	8015	05/14/16	20
C28-C40 Oil Range	3090	80.0	mg/kg	8015	05/14/16	20
Surrogate Recovery						
o-Terphenyl	26.7		% Rec.	8015	05/14/16	20

BDL - Below Detection Limit

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Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-5
Collected By : DK Nicholson
Collection Date : 05/05/16 11:00

ESC Sample # : L834396-05

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/13/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Total Xylene	0.108	0.00750	mg/kg	8021	05/13/16	5
TPH (GC/FID) Low Fraction	6.67	0.500	mg/kg	8015	05/13/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	86.5		% Rec.	8015	05/13/16	1
a,a,a-Trifluorotoluene(PID)	88.6		% Rec.	8021	05/13/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	1300	40.0	mg/kg	8015	05/14/16	10
C28-C40 Oil Range	792.	40.0	mg/kg	8015	05/14/16	10
Surrogate Recovery						
o-Terphenyl	48.7		% Rec.	8015	05/14/16	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-6
Collected By : DK Nicholson
Collection Date : 05/05/16 11:05

ESC Sample # : L834396-06

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/13/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Total Xylene	0.00794	0.00750	mg/kg	8021	05/13/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/13/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.0		% Rec.	8015	05/13/16	1
a,a,a-Trifluorotoluene(PID)	99.3		% Rec.	8021	05/13/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	4830	80.0	mg/kg	8015	05/14/16	20
C28-C40 Oil Range	2620	80.0	mg/kg	8015	05/14/16	20
Surrogate Recovery						
o-Terphenyl	0.00		% Rec.	8015	05/14/16	20

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Dave Nicholson
HRM Resources, LLC - Denver, CO
410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-7
Collected By : DK Nicholson
Collection Date : 05/05/16 11:10

ESC Sample # : L834396-07

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/13/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/13/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/13/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	96.8		% Rec.	8015	05/13/16	1
a,a,a-Trifluorotoluene(PID)	98.1		% Rec.	8021	05/13/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	734.	40.0	mg/kg	8015	05/14/16	10
C28-C40 Oil Range	480.	40.0	mg/kg	8015	05/14/16	10
Surrogate Recovery						
o-Terphenyl	50.7		% Rec.	8015	05/14/16	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Dave Nicholson
HRM Resources, LLC - Denver, CO
410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-8
Collected By : DK Nicholson
Collection Date : 05/05/16 11:15

ESC Sample # : L834396-08

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/13/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Total Xylene	0.0103	0.00750	mg/kg	8021	05/13/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/13/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	94.6		% Rec.	8015	05/13/16	1
a,a,a-Trifluorotoluene(PID)	96.3		% Rec.	8021	05/13/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	26300	800.	mg/kg	8015	05/14/16	200
C28-C40 Oil Range	15200	800.	mg/kg	8015	05/14/16	200
Surrogate Recovery						
o-Terphenyl	0.00		% Rec.	8015	05/14/16	200

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-9
Collected By : DK Nicholson
Collection Date : 05/05/16 11:20

ESC Sample # : L834396-09

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/13/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/13/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/13/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.7		% Rec.	8015	05/13/16	1
a,a,a-Trifluorotoluene(PID)	100.		% Rec.	8021	05/13/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	1190	40.0	mg/kg	8015	05/14/16	10
C28-C40 Oil Range	785.	40.0	mg/kg	8015	05/14/16	10
Surrogate Recovery						
o-Terphenyl	62.3		% Rec.	8015	05/14/16	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-10
Collected By : DK Nicholson
Collection Date : 05/05/16 11:25

ESC Sample # : L834396-10

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/13/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/13/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/13/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.1		% Rec.	8015	05/13/16	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	05/13/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	5290	200.	mg/kg	8015	05/14/16	50
C28-C40 Oil Range	3220	200.	mg/kg	8015	05/14/16	50
Surrogate Recovery						
o-Terphenyl	0.00		% Rec.	8015	05/14/16	50

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-11
Collected By : DK Nicholson
Collection Date : 05/05/16 11:30

ESC Sample # : L834396-11

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/13/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/13/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/13/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.3		% Rec.	8015	05/13/16	1
a,a,a-Trifluorotoluene(PID)	100.		% Rec.	8021	05/13/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	5930	80.0	mg/kg	8015	05/14/16	20
C28-C40 Oil Range	3500	80.0	mg/kg	8015	05/14/16	20
Surrogate Recovery						
o-Terphenyl	0.00		% Rec.	8015	05/14/16	20

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-12
Collected By : DK Nicholson
Collection Date : 05/05/16 11:35

ESC Sample # : L834396-12

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/13/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/13/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/13/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.2		% Rec.	8015	05/13/16	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	05/13/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	3500	200.	mg/kg	8015	05/14/16	50
C28-C40 Oil Range	2380	200.	mg/kg	8015	05/14/16	50
Surrogate Recovery						
o-Terphenyl	0.00		% Rec.	8015	05/14/16	50

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-13
Collected By : DK Nicholson
Collection Date : 05/05/16 11:40

ESC Sample # : L834396-13

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/13/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/13/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/13/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/13/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.3		% Rec.	8015	05/13/16	1
a,a,a-Trifluorotoluene(PID)	77.5		% Rec.	8021	05/13/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	4790	80.0	mg/kg	8015	05/14/16	20
C28-C40 Oil Range	2670	80.0	mg/kg	8015	05/14/16	20
Surrogate Recovery						
o-Terphenyl	0.00		% Rec.	8015	05/14/16	20

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-14
Collected By : DK Nicholson
Collection Date : 05/05/16 11:45

ESC Sample # : L834396-14

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/14/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/14/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/14/16	5
Total Xylene	0.0242	0.00750	mg/kg	8021	05/14/16	5
TPH (GC/FID) Low Fraction	0.538	0.500	mg/kg	8015	05/14/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.0		% Rec.	8015	05/14/16	1
a,a,a-Trifluorotoluene(PID)	96.7		% Rec.	8021	05/14/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	1080	40.0	mg/kg	8015	05/14/16	10
C28-C40 Oil Range	639.	40.0	mg/kg	8015	05/14/16	10
Surrogate Recovery						
o-Terphenyl	69.0		% Rec.	8015	05/14/16	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-15
Collected By : DK Nicholson
Collection Date : 05/05/16 11:50

ESC Sample # : L834396-15

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/14/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/14/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/14/16	5
Total Xylene	0.0182	0.00750	mg/kg	8021	05/14/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/14/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	94.2		% Rec.	8015	05/14/16	1
a,a,a-Trifluorotoluene(PID)	96.5		% Rec.	8021	05/14/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	662.	40.0	mg/kg	8015	05/14/16	10
C28-C40 Oil Range	411.	40.0	mg/kg	8015	05/14/16	10
Surrogate Recovery						
o-Terphenyl	69.6		% Rec.	8015	05/14/16	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-16
Collected By : DK Nicholson
Collection Date : 05/05/16 11:55

ESC Sample # : L834396-16

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/14/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/14/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/14/16	5
Total Xylene	0.00917	0.00750	mg/kg	8021	05/14/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/14/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.3		% Rec.	8015	05/14/16	1
a,a,a-Trifluorotoluene(PID)	99.8		% Rec.	8021	05/14/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	3480	200.	mg/kg	8015	05/14/16	50
C28-C40 Oil Range	1790	200.	mg/kg	8015	05/14/16	50
Surrogate Recovery						
o-Terphenyl	0.00		% Rec.	8015	05/14/16	50

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-17
Collected By : DK Nicholson
Collection Date : 05/05/16 12:00

ESC Sample # : L834396-17

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/15/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Total Xylene	0.00839	0.00750	mg/kg	8021	05/15/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/15/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.6		% Rec.	8015	05/15/16	1
a,a,a-Trifluorotoluene(PID)	96.9		% Rec.	8021	05/15/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	1320	40.0	mg/kg	8015	05/14/16	10
C28-C40 Oil Range	784.	40.0	mg/kg	8015	05/14/16	10
Surrogate Recovery						
o-Terphenyl	60.9		% Rec.	8015	05/14/16	10

BDL - Below Detection Limit

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410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-18
Collected By : DK Nicholson
Collection Date : 05/05/16 12:05

ESC Sample # : L834396-18

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/15/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/15/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/15/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.3		% Rec.	8015	05/15/16	1
a,a,a-Trifluorotoluene(PID)	99.1		% Rec.	8021	05/15/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	1160	40.0	mg/kg	8015	05/14/16	10
C28-C40 Oil Range	611.	40.0	mg/kg	8015	05/14/16	10
Surrogate Recovery						
o-Terphenyl	53.8		% Rec.	8015	05/14/16	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-19
Collected By : DK Nicholson
Collection Date : 05/05/16 12:10

ESC Sample # : L834396-19

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/15/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/15/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/15/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.3		% Rec.	8015	05/15/16	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	05/15/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	542.	40.0	mg/kg	8015	05/14/16	10
C28-C40 Oil Range	298.	40.0	mg/kg	8015	05/14/16	10
Surrogate Recovery						
o-Terphenyl	71.4		% Rec.	8015	05/14/16	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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Est. 1970

REPORT OF ANALYSIS

Dave Nicholson
HRM Resources, LLC - Denver, CO
410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-20
Collected By : DK Nicholson
Collection Date : 05/05/16 12:15

ESC Sample # : L834396-20

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/15/16	5
Ethylbenzene	0.00533	0.00250	mg/kg	8021	05/15/16	5
Total Xylene	0.0368	0.00750	mg/kg	8021	05/15/16	5
TPH (GC/FID) Low Fraction	1.73	0.500	mg/kg	8015	05/15/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	92.2		% Rec.	8015	05/15/16	1
a,a,a-Trifluorotoluene(PID)	94.4		% Rec.	8021	05/15/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	1660	40.0	mg/kg	8015	05/14/16	10
C28-C40 Oil Range	927.	40.0	mg/kg	8015	05/14/16	10
Surrogate Recovery						
o-Terphenyl	51.1		% Rec.	8015	05/14/16	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Dave Nicholson
HRM Resources, LLC - Denver, CO
410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-21
Collected By : DK Nicholson
Collection Date : 05/05/16 12:20

ESC Sample # : L834396-21

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/15/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/15/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/15/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.3		% Rec.	8015	05/15/16	1
a,a,a-Trifluorotoluene(PID)	100.		% Rec.	8021	05/15/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	819.	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	624.	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	71.9		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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Dave Nicholson
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Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-22
Collected By : DK Nicholson
Collection Date : 05/05/16 12:25

ESC Sample # : L834396-22

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/15/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/15/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/15/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.6		% Rec.	8015	05/15/16	1
a,a,a-Trifluorotoluene(PID)	100.		% Rec.	8021	05/15/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	303.	8.00	mg/kg	8015	05/13/16	2
C28-C40 Oil Range	174.	8.00	mg/kg	8015	05/13/16	2
Surrogate Recovery						
o-Terphenyl	59.3		% Rec.	8015	05/13/16	2

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
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May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-23
Collected By : DK Nicholson
Collection Date : 05/05/16 12:30

ESC Sample # : L834396-23

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/15/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/15/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/15/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.0		% Rec.	8015	05/15/16	1
a,a,a-Trifluorotoluene(PID)	100.		% Rec.	8021	05/15/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	808.	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	634.	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	67.4		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-24
Collected By : DK Nicholson
Collection Date : 05/05/16 12:35

ESC Sample # : L834396-24

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/15/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/15/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/15/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.5		% Rec.	8015	05/15/16	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	05/15/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	1690	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	1050	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	59.4		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-25
Collected By : DK Nicholson
Collection Date : 05/05/16 12:40

ESC Sample # : L834396-25

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/15/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Total Xylene	0.0127	0.00750	mg/kg	8021	05/15/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/15/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.6		% Rec.	8015	05/15/16	1
a,a,a-Trifluorotoluene(PID)	100.		% Rec.	8021	05/15/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	666.	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	558.	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	57.3		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-26
Collected By : DK Nicholson
Collection Date : 05/05/16 12:45

ESC Sample # : L834396-26

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/15/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/15/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/15/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.5		% Rec.	8015	05/15/16	1
a,a,a-Trifluorotoluene(PID)	100.		% Rec.	8021	05/15/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	1880	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	1220	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	57.2		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
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May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-27
Collected By : DK Nicholson
Collection Date : 05/05/16 12:50

ESC Sample # : L834396-27

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/15/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/15/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/15/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/15/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.8		% Rec.	8015	05/15/16	1
a,a,a-Trifluorotoluene(PID)	98.2		% Rec.	8021	05/15/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	649.	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	504.	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	80.9		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-28
Collected By : DK Nicholson
Collection Date : 05/05/16 12:55

ESC Sample # : L834396-28

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/16/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/16/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/16/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/16/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/16/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	101.		% Rec.	8015	05/16/16	1
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021	05/16/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	1200	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	708.	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	86.5		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-29
Collected By : DK Nicholson
Collection Date : 05/05/16 13:00

ESC Sample # : L834396-29

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/16/16	5
Toluene	0.0531	0.0250	mg/kg	8021	05/16/16	5
Ethylbenzene	0.0771	0.00250	mg/kg	8021	05/16/16	5
Total Xylene	0.378	0.00750	mg/kg	8021	05/16/16	5
TPH (GC/FID) Low Fraction	22.3	0.500	mg/kg	8015	05/16/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	84.3		% Rec.	8015	05/16/16	1
a,a,a-Trifluorotoluene(PID)	85.5		% Rec.	8021	05/16/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	4180	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	1990	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	468.		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-30
Collected By : DK Nicholson
Collection Date : 05/05/16 13:05

ESC Sample # : L834396-30

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.00534	0.00250	mg/kg	8021	05/16/16	5
Toluene	0.0524	0.0250	mg/kg	8021	05/16/16	5
Ethylbenzene	0.0280	0.00250	mg/kg	8021	05/16/16	5
Total Xylene	0.187	0.00750	mg/kg	8021	05/16/16	5
TPH (GC/FID) Low Fraction	9.83	0.500	mg/kg	8015	05/16/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	89.4		% Rec.	8015	05/16/16	1
a,a,a-Trifluorotoluene(PID)	93.8		% Rec.	8021	05/16/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	4760	1600	mg/kg	8015	05/13/16	400
C28-C40 Oil Range	3060	1600	mg/kg	8015	05/13/16	400
Surrogate Recovery						
o-Terphenyl	50.0		% Rec.	8015	05/13/16	400

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-31
Collected By : DK Nicholson
Collection Date : 05/05/16 13:10

ESC Sample # : L834396-31

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/16/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/16/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/16/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/16/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/16/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.9		% Rec.	8015	05/16/16	1
a,a,a-Trifluorotoluene(PID)	100.		% Rec.	8021	05/16/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	3500	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	1800	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	92.6		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-32
Collected By : DK Nicholson
Collection Date : 05/05/16 13:15

ESC Sample # : L834396-32

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/16/16	5
Toluene	0.0818	0.0250	mg/kg	8021	05/16/16	5
Ethylbenzene	0.115	0.00250	mg/kg	8021	05/16/16	5
Total Xylene	0.492	0.00750	mg/kg	8021	05/16/16	5
TPH (GC/FID) Low Fraction	30.3	0.500	mg/kg	8015	05/16/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	88.6		% Rec.	8015	05/16/16	1
a,a,a-Trifluorotoluene(PID)	90.0		% Rec.	8021	05/16/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	2070	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	1180	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	36.1		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Dave Nicholson
HRM Resources, LLC - Denver, CO
410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-33
Collected By : DK Nicholson
Collection Date : 05/05/16 13:20

ESC Sample # : L834396-33

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/16/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/16/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/16/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/16/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/16/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	96.9		% Rec.	8015	05/16/16	1
a,a,a-Trifluorotoluene(PID)	98.6		% Rec.	8021	05/16/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	1680	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	910.	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	89.2		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
Denver, CO 80202

May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-34
Collected By : DK Nicholson
Collection Date : 05/05/16 13:25

ESC Sample # : L834396-34

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/16/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/16/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/16/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/16/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/16/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.8		% Rec.	8015	05/16/16	1
a,a,a-Trifluorotoluene(PID)	100.		% Rec.	8021	05/16/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	2420	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	1120	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	83.5		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
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May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-35
Collected By : DK Nicholson
Collection Date : 05/05/16 13:30

ESC Sample # : L834396-35

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/16/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/16/16	5
Ethylbenzene	0.00278	0.00250	mg/kg	8021	05/16/16	5
Total Xylene	0.0130	0.00750	mg/kg	8021	05/16/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/16/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.6		% Rec.	8015	05/16/16	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	05/16/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	1210	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	666.	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	58.0		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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410 17th St., Ste. 1600
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May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-36
Collected By : DK Nicholson
Collection Date : 05/05/16 13:35

ESC Sample # : L834396-36

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/16/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/16/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/16/16	5
Total Xylene	0.0141	0.00750	mg/kg	8021	05/16/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/16/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	96.2		% Rec.	8015	05/16/16	1
a,a,a-Trifluorotoluene(PID)	98.2		% Rec.	8021	05/16/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	3650	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	1640	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	85.4		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-37
Collected By : DK Nicholson
Collection Date : 05/05/16 13:40

ESC Sample # : L834396-37

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/17/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/17/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/17/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/17/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/17/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	94.3		% Rec.	8015	05/17/16	1
a,a,a-Trifluorotoluene(PID)	96.0		% Rec.	8021	05/17/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	534.	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	321.	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	89.0		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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May 17, 2016

Date Received : May 10, 2016
Description : Marick 1A
Sample ID : MARICK-LF-38
Collected By : DK Nicholson
Collection Date : 05/05/16 13:45

ESC Sample # : L834396-38

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	05/17/16	5
Toluene	BDL	0.0250	mg/kg	8021	05/17/16	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	05/17/16	5
Total Xylene	BDL	0.00750	mg/kg	8021	05/17/16	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	05/17/16	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.2		% Rec.	8015	05/17/16	1
a,a,a-Trifluorotoluene(PID)	99.1		% Rec.	8021	05/17/16	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	753.	160.	mg/kg	8015	05/13/16	40
C28-C40 Oil Range	440.	160.	mg/kg	8015	05/13/16	40
Surrogate Recovery						
o-Terphenyl	81.2		% Rec.	8015	05/13/16	40

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L834396-01	WG872252	SAMP	Total Xylene	R3136704	B
L834396-02	WG872252	SAMP	Total Xylene	R3136704	B
L834396-03	WG872368	SAMP	Total Xylene	R3136737	J6
	WG871729	SAMP	o-Terphenyl	R3136784	J2
L834396-04	WG871729	SAMP	o-Terphenyl	R3136784	J7
L834396-05	WG871729	SAMP	o-Terphenyl	R3136784	J2
L834396-06	WG871729	SAMP	o-Terphenyl	R3136784	J7
L834396-08	WG871729	SAMP	o-Terphenyl	R3136784	J7
L834396-10	WG871729	SAMP	o-Terphenyl	R3136784	J7
L834396-11	WG871729	SAMP	o-Terphenyl	R3136784	J7
L834396-12	WG871729	SAMP	o-Terphenyl	R3136784	J7
L834396-13	WG871729	SAMP	o-Terphenyl	R3136784	J7
L834396-16	WG871729	SAMP	o-Terphenyl	R3136784	J7
L834396-17	WG872482	SAMP	Benzene	R3137200	J6
	WG872482	SAMP	Total Xylene	R3137200	B
	WG872482	SAMP	TPH (GC/FID) Low Fraction	R3137200	J6
L834396-18	WG872482	SAMP	Total Xylene	R3137200	B
L834396-19	WG872482	SAMP	Total Xylene	R3137200	B
L834396-20	WG872482	SAMP	Ethylbenzene	R3137200	B
	WG872482	SAMP	Total Xylene	R3137200	B
	WG871729	SAMP	C10-C28 Diesel Range	R3136784	V
L834396-21	WG872482	SAMP	Total Xylene	R3137200	B
	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-22	WG872482	SAMP	Total Xylene	R3137200	B
L834396-23	WG872482	SAMP	Total Xylene	R3137200	B
	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-24	WG872482	SAMP	Total Xylene	R3137200	B
	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-25	WG872482	SAMP	Total Xylene	R3137200	B
	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-26	WG872482	SAMP	Total Xylene	R3137200	B
	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-27	WG872482	SAMP	Total Xylene	R3137200	B
	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-28	WG872482	SAMP	Total Xylene	R3137200	B
	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-29	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-30	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-31	WG872482	SAMP	Total Xylene	R3137200	B
	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-32	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-33	WG872482	SAMP	Total Xylene	R3137200	B
	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-34	WG872482	SAMP	Total Xylene	R3137200	B
	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-35	WG872482	SAMP	Ethylbenzene	R3137200	B
	WG872482	SAMP	Total Xylene	R3137200	B
	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-36	WG872482	SAMP	Total Xylene	R3137200	B
	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-37	WG872089	SAMP	o-Terphenyl	R3136475	J7
L834396-38	WG872089	SAMP	o-Terphenyl	R3136475	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.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
V	(ESC) - Additional QC Info: The sample concentration is too high to evaluate accurate spike recoveries.

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.



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May 17, 2016

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
C10-C28 Diesel Range	< 4	mg/kg			WG872089	05/13/16 10:14
C28-C40 Oil Range	< 4	mg/kg			WG872089	05/13/16 10:14
o-Terphenyl		% Rec.	85.90	50-150	WG872089	05/13/16 10:14
Benzene	< .0005	mg/kg			WG872252	05/13/16 13:23
Ethylbenzene	< .0005	mg/kg			WG872252	05/13/16 13:23
Toluene	< .005	mg/kg			WG872252	05/13/16 13:23
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG872252	05/13/16 13:23
Total Xylene	< .0015	mg/kg			WG872252	05/13/16 13:23
a,a,a-Trifluorotoluene(FID)		% Rec.	97.90	59-128	WG872252	05/13/16 13:23
a,a,a-Trifluorotoluene(PID)		% Rec.	104.0	54-144	WG872252	05/13/16 13:23
Benzene	< .0005	mg/kg			WG872368	05/13/16 13:34
Ethylbenzene	< .0005	mg/kg			WG872368	05/13/16 13:34
Toluene	< .005	mg/kg			WG872368	05/13/16 13:34
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG872368	05/13/16 13:34
Total Xylene	< .0015	mg/kg			WG872368	05/13/16 13:34
a,a,a-Trifluorotoluene(FID)		% Rec.	100.0	59-128	WG872368	05/13/16 13:34
a,a,a-Trifluorotoluene(PID)		% Rec.	103.0	54-144	WG872368	05/13/16 13:34
C10-C28 Diesel Range	< 4	mg/kg			WG871729	05/14/16 10:32
C28-C40 Oil Range	< 4	mg/kg			WG871729	05/14/16 10:32
o-Terphenyl		% Rec.	95.90	50-150	WG871729	05/14/16 10:32
Benzene	< .0005	mg/kg			WG872482	05/15/16 18:11
Ethylbenzene	< .0005	mg/kg			WG872482	05/15/16 18:11
Toluene	< .005	mg/kg			WG872482	05/15/16 18:11
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG872482	05/15/16 18:11
Total Xylene	< .0015	mg/kg			WG872482	05/15/16 18:11
a,a,a-Trifluorotoluene(FID)		% Rec.	102.0	59-128	WG872482	05/15/16 18:11
a,a,a-Trifluorotoluene(PID)		% Rec.	101.0	54-144	WG872482	05/15/16 18:11
Benzene	< .0005	mg/kg			WG873012	05/17/16 12:30
Ethylbenzene	< .0005	mg/kg			WG873012	05/17/16 12:30
Toluene	< .005	mg/kg			WG873012	05/17/16 12:30
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG873012	05/17/16 12:30
Total Xylene	< .0015	mg/kg			WG873012	05/17/16 12:30
a,a,a-Trifluorotoluene(FID)		% Rec.	101.0	59-128	WG873012	05/17/16 12:30
a,a,a-Trifluorotoluene(PID)		% Rec.	102.0	54-144	WG873012	05/17/16 12:30

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
C10-C28 Diesel Range	mg/kg	60	42.6	70.9	50-100	WG872089
o-Terphenyl				90.70	50-150	WG872089
Benzene	mg/kg	.05	0.0476	95.3	70-130	WG872252
Ethylbenzene	mg/kg	.05	0.0485	97.0	70-130	WG872252
Toluene	mg/kg	.05	0.0475	95.0	70-130	WG872252
Total Xylene	mg/kg	.15	0.144	96.0	70-130	WG872252
a,a,a-Trifluorotoluene(FID)				97.10	59-128	WG872252
a,a,a-Trifluorotoluene(PID)				102.0	54-144	WG872252
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.68	103.	63.5-137	WG872252

* 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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May 17, 2016

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
a,a,a-Trifluorotoluene(FID)				104.0	59-128	
a,a,a-Trifluorotoluene(PID)				111.0	54-144	
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.72	104.	63.5-137	WG872368
a,a,a-Trifluorotoluene(FID)				101.0	59-128	WG872368
a,a,a-Trifluorotoluene(PID)				106.0	54-144	WG872368
Benzene	mg/kg	.05	0.0456	91.2	70-130	WG872368
Ethylbenzene	mg/kg	.05	0.0504	101.	70-130	WG872368
Toluene	mg/kg	.05	0.0494	98.8	70-130	WG872368
Total Xylene	mg/kg	.15	0.155	103.	70-130	WG872368
a,a,a-Trifluorotoluene(FID)				99.60	59-128	WG872368
a,a,a-Trifluorotoluene(PID)				102.0	54-144	WG872368
C10-C28 Diesel Range	mg/kg	60	50.6	84.3	50-100	WG871729
o-Terphenyl				99.20	50-150	WG871729
Benzene	mg/kg	.05	0.0420	84.0	70-130	WG872482
Ethylbenzene	mg/kg	.05	0.0471	94.2	70-130	WG872482
Toluene	mg/kg	.05	0.0457	91.4	70-130	WG872482
Total Xylene	mg/kg	.15	0.144	96.2	70-130	WG872482
a,a,a-Trifluorotoluene(FID)				101.0	59-128	WG872482
a,a,a-Trifluorotoluene(PID)				103.0	54-144	WG872482
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.10	92.7	63.5-137	WG872482
a,a,a-Trifluorotoluene(FID)				101.0	59-128	WG872482
a,a,a-Trifluorotoluene(PID)				106.0	54-144	WG872482
Benzene	mg/kg	.05	0.0490	98.1	70-130	WG873012
Ethylbenzene	mg/kg	.05	0.0537	107.	70-130	WG873012
Toluene	mg/kg	.05	0.0526	105.	70-130	WG873012
Total Xylene	mg/kg	.15	0.164	110.	70-130	WG873012
a,a,a-Trifluorotoluene(FID)				101.0	59-128	WG873012
a,a,a-Trifluorotoluene(PID)				103.0	54-144	WG873012
TPH (GC/FID) Low Fraction	mg/kg	5.5	6.52	119.	63.5-137	WG873012
a,a,a-Trifluorotoluene(FID)				102.0	59-128	WG873012
a,a,a-Trifluorotoluene(PID)				107.0	54-144	WG873012

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
C10-C28 Diesel Range	mg/kg	45.6	42.6	76.0	50-100	6.80	20	WG872089
o-Terphenyl				89.60	50-150			WG872089
Benzene	mg/kg	0.0472	0.0476	94.0	70-130	0.950	20	WG872252
Ethylbenzene	mg/kg	0.0486	0.0485	97.0	70-130	0.140	20	WG872252
Toluene	mg/kg	0.0469	0.0475	94.0	70-130	1.31	20	WG872252
Total Xylene	mg/kg	0.145	0.144	96.0	70-130	0.340	20	WG872252
a,a,a-Trifluorotoluene(FID)				97.30	59-128			WG872252
a,a,a-Trifluorotoluene(PID)				102.0	54-144			WG872252
TPH (GC/FID) Low Fraction	mg/kg	5.77	5.68	105.	63.5-137	1.57	20	WG872252
a,a,a-Trifluorotoluene(FID)				104.0	59-128			WG872252
a,a,a-Trifluorotoluene(PID)				112.0	54-144			WG872252
TPH (GC/FID) Low Fraction	mg/kg	5.74	5.72	104.	63.5-137	0.380	20	WG872368
a,a,a-Trifluorotoluene(FID)				100.0	59-128			WG872368
a,a,a-Trifluorotoluene(PID)				105.0	54-144			WG872368

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Quality Assurance Report
Level II

L834396

May 17, 2016

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Benzene	mg/kg	0.0444	0.0456	89.0	70-130	2.70	20	WG872368
Ethylbenzene	mg/kg	0.0488	0.0504	98.0	70-130	3.38	20	WG872368
Toluene	mg/kg	0.0477	0.0494	95.0	70-130	3.60	20	WG872368
Total Xylene	mg/kg	0.149	0.155	100.	70-130	3.79	20	WG872368
a,a,a-Trifluorotoluene(FID)				100.0	59-128			WG872368
a,a,a-Trifluorotoluene(PID)				103.0	54-144			WG872368
C10-C28 Diesel Range	mg/kg	52.4	50.6	87.0	50-100	3.49	20	WG871729
o-Terphenyl				101.0	50-150			WG871729
Benzene	mg/kg	0.0424	0.0420	85.0	70-130	0.960	20	WG872482
Ethylbenzene	mg/kg	0.0474	0.0471	95.0	70-130	0.580	20	WG872482
Toluene	mg/kg	0.0459	0.0457	92.0	70-130	0.450	20	WG872482
Total Xylene	mg/kg	0.145	0.144	96.0	70-130	0.280	20	WG872482
a,a,a-Trifluorotoluene(FID)				100.0	59-128			WG872482
a,a,a-Trifluorotoluene(PID)				103.0	54-144			WG872482
TPH (GC/FID) Low Fraction	mg/kg	5.19	5.10	94.0	63.5-137	1.74	20	WG872482
a,a,a-Trifluorotoluene(FID)				101.0	59-128			WG872482
a,a,a-Trifluorotoluene(PID)				106.0	54-144			WG872482
Benzene	mg/kg	0.0496	0.0490	99.0	70-130	1.25	20	WG873012
Ethylbenzene	mg/kg	0.0542	0.0537	108.	70-130	0.900	20	WG873012
Toluene	mg/kg	0.0532	0.0526	106.	70-130	1.00	20	WG873012
Total Xylene	mg/kg	0.166	0.164	110.	70-130	0.820	20	WG873012
a,a,a-Trifluorotoluene(FID)				101.0	59-128			WG873012
a,a,a-Trifluorotoluene(PID)				103.0	54-144			WG873012
TPH (GC/FID) Low Fraction	mg/kg	6.59	6.52	120.	63.5-137	1.12	20	WG873012
a,a,a-Trifluorotoluene(FID)				101.0	59-128			WG873012
a,a,a-Trifluorotoluene(PID)				106.0	54-144			WG873012

Analyte	Units	Matrix Spike				Limit	Ref Samp	Batch
		MS Res	Ref Res	TV	% Rec			
Benzene	mg/kg	0.183	0.00	.05	73.3	49.7-127	L834396-01	WG872252
Ethylbenzene	mg/kg	0.129	0.00	.05	51.7	40.8-141	L834396-01	WG872252
Toluene	mg/kg	0.150	0.00	.05	60.2	49.8-132	L834396-01	WG872252
Total Xylene	mg/kg	0.347	0.00	.15	46.2	41.2-140	L834396-01	WG872252
a,a,a-Trifluorotoluene(FID)					96.10	59-128		WG872252
a,a,a-Trifluorotoluene(PID)					102.0	54-144		WG872252
TPH (GC/FID) Low Fraction	mg/kg	12.6	0.130	5.5	45.2	28.5-138	L834396-01	WG872252
a,a,a-Trifluorotoluene(FID)					98.90	59-128		WG872252
a,a,a-Trifluorotoluene(PID)					105.0	54-144		WG872252
Benzene	mg/kg	0.156	0.00	.05	62.5	49.7-127	L834396-03	WG872368
Ethylbenzene	mg/kg	0.111	0.00	.05	44.5	40.8-141	L834396-03	WG872368
Toluene	mg/kg	0.138	0.00	.05	55.3	49.8-132	L834396-03	WG872368
Total Xylene	mg/kg	0.330	0.00422	.15	43.4	41.2-140	L834396-03	WG872368
a,a,a-Trifluorotoluene(FID)					89.70	59-128		WG872368
a,a,a-Trifluorotoluene(PID)					92.00	54-144		WG872368
TPH (GC/FID) Low Fraction	mg/kg	13.0	0.121	5.5	46.8	28.5-138	L834396-03	WG872368
a,a,a-Trifluorotoluene(FID)					90.40	59-128		WG872368
a,a,a-Trifluorotoluene(PID)					97.70	54-144		WG872368
C10-C28 Diesel Range	mg/kg	1820	1660	6	265.*	50-100	L834396-20	WG871729

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
o-Terphenyl					82.50	50-150		
Benzene	mg/kg	0.132	0.00	.05	52.7	49.7-127	L834396-17	WG872482
Ethylbenzene	mg/kg	0.136	0.00	.05	54.5	40.8-141	L834396-17	WG872482
Toluene	mg/kg	0.147	0.00	.05	58.6	49.8-132	L834396-17	WG872482
Total Xylene	mg/kg	0.409	0.00839	.15	53.4	41.2-140	L834396-17	WG872482
a,a,a-Trifluorotoluene(FID)					91.70	59-128		WG872482
a,a,a-Trifluorotoluene(PID)					95.00	54-144		WG872482
TPH (GC/FID) Low Fraction	mg/kg	8.66	0.00	5.5	31.5	28.5-138	L834396-17	WG872482
a,a,a-Trifluorotoluene(FID)					91.90	59-128		WG872482
a,a,a-Trifluorotoluene(PID)					96.30	54-144		WG872482

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Benzene	mg/kg	0.190	0.183	76.0	49.7-127	3.65	23.5	L834396-01	WG872252
Ethylbenzene	mg/kg	0.139	0.129	55.6	40.8-141	7.25	23.8	L834396-01	WG872252
Toluene	mg/kg	0.159	0.150	63.5	49.8-132	5.39	23.5	L834396-01	WG872252
Total Xylene	mg/kg	0.359	0.347	47.9	41.2-140	3.60	23.7	L834396-01	WG872252
a,a,a-Trifluorotoluene(FID)				94.40	59-128				WG872252
a,a,a-Trifluorotoluene(PID)				100.0	54-144				WG872252
TPH (GC/FID) Low Fraction	mg/kg	11.0	12.6	39.5	28.5-138	13.2	23.6	L834396-01	WG872252
a,a,a-Trifluorotoluene(FID)				98.20	59-128				WG872252
a,a,a-Trifluorotoluene(PID)				104.0	54-144				WG872252
Benzene	mg/kg	0.175	0.156	69.8	49.7-127	11.0	23.5	L834396-03	WG872368
Ethylbenzene	mg/kg	0.120	0.111	47.9	40.8-141	7.37	23.8	L834396-03	WG872368
Toluene	mg/kg	0.152	0.138	60.9	49.8-132	9.65	23.5	L834396-03	WG872368
Total Xylene	mg/kg	0.352	0.330	46.4	41.2-140	6.60	23.7	L834396-03	WG872368
a,a,a-Trifluorotoluene(FID)				88.40	59-128				WG872368
a,a,a-Trifluorotoluene(PID)				90.60	54-144				WG872368
TPH (GC/FID) Low Fraction	mg/kg	12.0	13.0	43.3	28.5-138	7.76	23.6	L834396-03	WG872368
a,a,a-Trifluorotoluene(FID)				86.00	59-128				WG872368
a,a,a-Trifluorotoluene(PID)				92.10	54-144				WG872368
C10-C28 Diesel Range	mg/kg	1830	1820	275.*	50-100	0.320	20	L834396-20	WG871729
o-Terphenyl				56.60	50-150				WG871729
Benzene	mg/kg	0.124	0.132	49.5*	49.7-127	6.20	23.5	L834396-17	WG872482
Ethylbenzene	mg/kg	0.134	0.136	53.6	40.8-141	1.82	23.8	L834396-17	WG872482
Toluene	mg/kg	0.136	0.147	54.4	49.8-132	7.50	23.5	L834396-17	WG872482
Total Xylene	mg/kg	0.403	0.409	52.6	41.2-140	1.36	23.7	L834396-17	WG872482
a,a,a-Trifluorotoluene(FID)				95.70	59-128				WG872482
a,a,a-Trifluorotoluene(PID)				98.70	54-144				WG872482
TPH (GC/FID) Low Fraction	mg/kg	7.56	8.66	27.5*	28.5-138	13.5	23.6	L834396-17	WG872482
a,a,a-Trifluorotoluene(FID)				96.10	59-128				WG872482
a,a,a-Trifluorotoluene(PID)				99.60	54-144				WG872482

Batch number /Run number / Sample number cross reference

WG872089: R3136475: L834396-21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38
WG872252: R3136704: L834396-01 02
WG872368: R3136737: L834396-03 04 05 06 07 08 09 10 11 12 13 14 15 16
WG871729: R3136784: L834396-01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20
WG872482: R3137200: L834396-17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
WG873012: R3137451: L834396-37 38

* * 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.