



Nicholson GeoSolutions LLC

3433 East Lake Drive
Centennial, CO 80121

November 14, 2016

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

**Subject: Landfarm Sampling Results for the Anderson No. 1 Lease,
COGCC Remediation #9050**

Dear Terry:

Nicholson GeoSolutions LLC was retained by HRM Resources II LLC (HRM) to conduct soil sampling of the landfarm on the Anderson No. 1 lease, Washington County, Colorado. Sampling of the landfarm was conducted at the required rate of approximately one sample per 100 yards of material on October 29th, 2016. The landfarm was previously sampled on October 18th, 2015 and May 25th, 2016.

GPS mapping showed that the landfarm covers about 0.09 acres and contains an estimated 500 yards of material. A total of 5 discrete soil samples were collected at depths of approximately 12-16 inches. These samples were collected from approximately the same locations as those previously collected. The extent of the landfarm cell 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), BTEX (benzene, toluene, ethylbenzene, and xylenes), sodium adsorption ratio (SAR), pH, and conductivity to evaluate compliance with the COGCC Table 910-1 standards 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 October 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 four of the five samples and ranged from 369 mg/kg to 6,880 mg/kg. In addition, pH exceeded the standard for 3 of the 5 samples and SAR exceeded the standard for 4 of 5 samples. Conductivity was below the standard for all samples.

Table 1 Anderson No. 1 Landfarm Sample Results – October 29, 2016

	Table 910-1 Standards	Anderson LF-1	Anderson LF-2	Anderson LF-3	Anderson LF-4	Anderson LF-5
TVPH – gasoline range	500 ¹	<0.1 UJ	<0.1 UJ	<0.1 UJ	0,307 J	<0.1 UJ
TEPH – diesel/motor oil range	500 ¹	6,880	4,540	369	6,640	1,901
benzene	0.17	<0.0005 UJ	<0.0005 UJ	<0.0005 UJ	<0.0005 UJ	<0.0005 UJ
toluene	85	<0.005 UJ	<0.005 UJ	<0.005 UJ	<0.005 UJ	<0.005 UJ
ethylbenzene	100	0.0206 J	<0.0005 UJ	<0.0005 UJ	0.00395 J	<0.0005 UJ
xylenes	175	0.027 J	<0.0015 UJ	<0.0015 UJ	0.00577 J	<0.0015 UJ
SAR (ratio)	<12	12.5	19.0	15.3	14.2	10.3
pH (units)	6-9	9.15	8.95	9.09	8.88	9.36
sp. conductance (mmhos/cm)	<4.0	0.656	1.39	0.959	1.04	0.624

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

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 October 29th, 2016 samples and the percent difference between the two samples at each sample location. TPH ranged from 368 mg/kg to 9,010 mg/kg for the October 2015 samples and from 369 mg/kg to 6,880 mg/kg for the October 2016 samples. The TPH concentration was lower for the October 2016 samples at three of the five sample locations and higher at the remaining two locations. The landfarm was reconstructed and thoroughly tilled since the last sampling event which may account for the erratic results.

Table 2 Comparison of TPH Results, October 18, 2015 and October 29, 2016

Sample Location	TPH (mg/kg) October 18, 2015	TPH (mg/kg) October 29, 2016	%Difference
Anderson-LF-1	7,525	6,880	-8.6
Anderson-LF-2	368	4,540	1133.7
Anderson-LF-3	1,652	369	-77.7
Anderson-LF-4	1,925	6,640	244.9
Anderson-LF-5	9,010	1,901	-78.9

Table 3 provides summary statistics for the two sampling events. The average TPH concentration for the five samples decreased from 4,096 mg/kg to 4,066 mg/kg between October 18th, 2015 and October 29th, 2016. The median concentration increased from 1,925 mg/kg to 4,520 mg/kg. Using the results provided above in Table 2, the average TPH decrease for the overall landfarm was 0.7%.

Table 3 Summary Statistics for the October 2015 and October 2016 Samples

Sample Date	Minimum	Maximum	Average	Median	Average % Difference
Oct 18, 2015	368	9,010	4,096	1,925	
Oct 29, 2016	369	6,880	4,066	4,520	-0.7

Using the difference between the average TPH concentrations of 30 mg/kg, and the time period of 376 days, a biodegradation rate of 0.08 mg/kg-day is obtained. Using these data, over 44,000 days of treatment remain to reach the standard of 500 mg/kg. However, the landfarm is now more homogenous than previously and better results may be obtained for the next sampling event.

Based on the analytical results, bioremediation of the TPH contained in the soils in the landfarm cells at the Anderson No. 1 lease may be occurring but the results so far are erratic. Tilling of the landfarm was performed on March 9th and August 12th during 2016. Additional treatment of the landfarm cells including tilling will be conducted prior to the next sampling event in May 2017.

Nicholson GeoSolutions LLC

A handwritten signature in blue ink that reads "DK Nicholson". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

David K. Nicholson, P.G.
Principal Geologist



APPENDIX A
Laboratory Report

HRM Resources, LLC - Denver, CO

Sample Delivery Group: L869693

Samples Received: 11/01/2016

Project Number:

Description: Anderson No. 1

Report To:

Dave Nicholson

410 17th St., Ste. 1600

Denver, CO 80202

Entire Report Reviewed By:



Mark W. Beasley

Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



¹Cp: Cover Page	1
²Tc: Table of Contents	2
³Ss: Sample Summary	3
⁴Cn: Case Narrative	4
⁵Sr: Sample Results	5
AND-LF-1 L869693-01	5
AND-LF-2 L869693-02	6
AND-LF-3 L869693-03	7
AND-LF-4 L869693-04	8
AND-LF-5 L869693-05	9
⁶Qc: Quality Control Summary	10
Wet Chemistry by Method 9045D	10
Wet Chemistry by Method 9050AMod	11
Volatile Organic Compounds (GC) by Method 8015/8021	12
Semi-Volatile Organic Compounds (GC) by Method 8015	14
⁷Gl: Glossary of Terms	15
⁸Al: Accreditations & Locations	16
⁹Sc: Chain of Custody	17





AND-LF-1 L869693-01 Solid

Collected by
Dave NicholsonCollected date/time
10/29/16 14:00Received date/time
11/01/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG922935	1	11/04/16 06:53	11/08/16 03:31	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG923689	50	11/03/16 22:47	11/04/16 12:05	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG923251	1	11/02/16 14:00	11/04/16 00:06	ACG
Wet Chemistry by Method 9045D	WG922755	1	11/08/16 07:55	11/08/16 08:44	MHM
Wet Chemistry by Method 9050AMod	WG922908	1	11/02/16 19:59	11/02/16 19:59	MZ

¹ Cp² Tc³ Ss⁴ Cn

AND-LF-2 L869693-02 Solid

Collected by
Dave NicholsonCollected date/time
10/29/16 14:05Received date/time
11/01/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG922935	1	11/04/16 06:53	11/08/16 03:33	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG923689	50	11/03/16 22:47	11/04/16 12:17	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG923251	1	11/02/16 14:00	11/04/16 00:28	ACG
Wet Chemistry by Method 9045D	WG922755	1	11/08/16 07:55	11/08/16 08:44	MHM
Wet Chemistry by Method 9050AMod	WG922908	1	11/02/16 19:59	11/02/16 19:59	MZ

⁶ Qc⁷ Gl⁸ Al

AND-LF-3 L869693-03 Solid

Collected by
Dave NicholsonCollected date/time
10/29/16 14:10Received date/time
11/01/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG922935	1	11/04/16 06:53	11/08/16 03:36	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG923689	10	11/03/16 22:47	11/04/16 11:39	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG923251	1	11/02/16 14:00	11/04/16 00:50	ACG
Wet Chemistry by Method 9045D	WG922755	1	11/08/16 07:55	11/08/16 08:44	MHM
Wet Chemistry by Method 9050AMod	WG922908	1	11/02/16 19:59	11/02/16 19:59	MZ

⁹ Sc

AND-LF-4 L869693-04 Solid

Collected by
Dave NicholsonCollected date/time
10/29/16 14:15Received date/time
11/01/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG922935	1	11/04/16 06:53	11/08/16 03:39	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG923689	50	11/03/16 22:47	11/04/16 12:30	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG923251	1	11/02/16 14:00	11/04/16 01:13	ACG
Wet Chemistry by Method 9045D	WG922755	1	11/08/16 07:55	11/08/16 08:44	MHM
Wet Chemistry by Method 9050AMod	WG922908	1	11/02/16 19:59	11/02/16 19:59	MZ

AND-LF-5 L869693-05 Solid

Collected by
Dave NicholsonCollected date/time
10/29/16 14:20Received date/time
11/01/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG922935	1	11/04/16 06:53	11/08/16 03:42	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG923689	10	11/03/16 22:47	11/04/16 11:51	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG923251	1	11/02/16 14:00	11/04/16 01:35	ACG
Wet Chemistry by Method 9045D	WG922755	1	11/08/16 07:55	11/08/16 08:44	MHM
Wet Chemistry by Method 9050AMod	WG922908	1	11/02/16 19:59	11/02/16 19:59	MZ



All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Technical Service Representative

Sample Handling and Receiving

The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

<u>ESC Sample ID</u>	<u>Project Sample ID</u>	<u>Method</u>
L869693-01	AND-LF-1	9045D
L869693-02	AND-LF-2	9045D
L869693-03	AND-LF-3	9045D
L869693-04	AND-LF-4	9045D
L869693-05	AND-LF-5	9045D

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	12.5		1	11/08/2016 03:31	WG922935

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.15		1	11/08/2016 08:44	WG922755

Sample Narrative:

9045D L869693-01 WG922755: 9.15 at 19.9c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	11/02/2016 19:59	WG922908

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	11/04/2016 00:06	WG923251
Toluene	ND		0.00500	1	11/04/2016 00:06	WG923251
Ethylbenzene	0.0206		0.000500	1	11/04/2016 00:06	WG923251
Total Xylene	0.0270		0.00150	1	11/04/2016 00:06	WG923251
TPH (GC/FID) Low Fraction	1.82		0.100	1	11/04/2016 00:06	WG923251
(S) a,a,a-Trifluorotoluene(FID)	75.9		59.0-128		11/04/2016 00:06	WG923251
(S) a,a,a-Trifluorotoluene(PID)	70.1		54.0-144		11/04/2016 00:06	WG923251

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	4380		200	50	11/04/2016 12:05	WG923689
C28-C40 Oil Range	2500		200	50	11/04/2016 12:05	WG923689
(S) o-Terphenyl	171	J7	50.0-150		11/04/2016 12:05	WG923689

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	19.0		1	11/08/2016 03:33	WG922935

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.95		1	11/08/2016 08:44	WG922755

Sample Narrative:

9045D L869693-02 WG922755: 8.95 at 20.3c

Wet Chemistry by Method 9050AMod

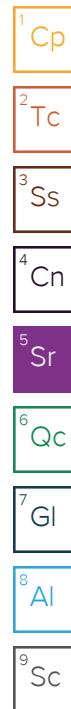
Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	11/02/2016 19:59	WG922908

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	11/04/2016 00:28	WG923251
Toluene	ND		0.00500	1	11/04/2016 00:28	WG923251
Ethylbenzene	ND		0.000500	1	11/04/2016 00:28	WG923251
Total Xylene	ND		0.00150	1	11/04/2016 00:28	WG923251
TPH (GC/FID) Low Fraction	ND		0.100	1	11/04/2016 00:28	WG923251
(S) a,a,a-Trifluorotoluene(FID)	86.9		59.0-128		11/04/2016 00:28	WG923251
(S) a,a,a-Trifluorotoluene(PID)	81.7		54.0-144		11/04/2016 00:28	WG923251

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	2760		200	50	11/04/2016 12:17	WG923689
C28-C40 Oil Range	1780		200	50	11/04/2016 12:17	WG923689
(S) o-Terphenyl	0.000	J7	50.0-150		11/04/2016 12:17	WG923689





Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	15.3		1	11/08/2016 03:36	WG922935

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.09		1	11/08/2016 08:44	WG922755

Sample Narrative:

9045D L869693-03 WG922755: 9.09 at 20.0c

Wet Chemistry by Method 9050AMod

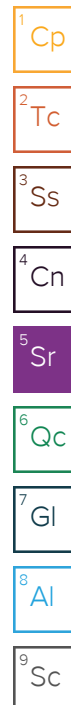
Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	11/02/2016 19:59	WG922908

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	11/04/2016 00:50	WG923251
Toluene	ND		0.00500	1	11/04/2016 00:50	WG923251
Ethylbenzene	ND		0.000500	1	11/04/2016 00:50	WG923251
Total Xylene	ND		0.00150	1	11/04/2016 00:50	WG923251
TPH (GC/FID) Low Fraction	ND		0.100	1	11/04/2016 00:50	WG923251
(S) a,a,a-Trifluorotoluene(FID)	92.6		59.0-128		11/04/2016 00:50	WG923251
(S) a,a,a-Trifluorotoluene(PID)	84.8		54.0-144		11/04/2016 00:50	WG923251

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	192		40.0	10	11/04/2016 11:39	WG923689
C28-C40 Oil Range	177		40.0	10	11/04/2016 11:39	WG923689
(S) o-Terphenyl	115		50.0-150		11/04/2016 11:39	WG923689





Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	14.2		1	11/08/2016 03:39	WG922935

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.88		1	11/08/2016 08:44	WG922755

Sample Narrative:

9045D L869693-04 WG922755: 8.88 at 20.2c

Wet Chemistry by Method 9050AMod

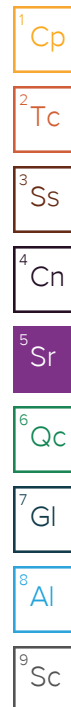
Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	11/02/2016 19:59	WG922908

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	11/04/2016 01:13	WG923251
Toluene	ND		0.00500	1	11/04/2016 01:13	WG923251
Ethylbenzene	0.00395		0.000500	1	11/04/2016 01:13	WG923251
Total Xylene	0.00577		0.00150	1	11/04/2016 01:13	WG923251
TPH (GC/FID) Low Fraction	0.307		0.100	1	11/04/2016 01:13	WG923251
(S) a,a,a-Trifluorotoluene(FID)	84.6		59.0-128		11/04/2016 01:13	WG923251
(S) a,a,a-Trifluorotoluene(PID)	78.3		54.0-144		11/04/2016 01:13	WG923251

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	4570		200	50	11/04/2016 12:30	WG923689
C28-C40 Oil Range	2070		200	50	11/04/2016 12:30	WG923689
(S) o-Terphenyl	0.000	J7	50.0-150		11/04/2016 12:30	WG923689





Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	10.3		1	11/08/2016 03:42	WG922935

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.36		1	11/08/2016 08:44	WG922755

Sample Narrative:

9045D L869693-05 WG922755: 9.36 at 20.1c

Wet Chemistry by Method 9050AMod

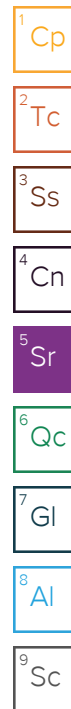
Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	11/02/2016 19:59	WG922908

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	11/04/2016 01:35	WG923251
Toluene	ND		0.00500	1	11/04/2016 01:35	WG923251
Ethylbenzene	ND		0.000500	1	11/04/2016 01:35	WG923251
Total Xylene	ND		0.00150	1	11/04/2016 01:35	WG923251
TPH (GC/FID) Low Fraction	ND		0.100	1	11/04/2016 01:35	WG923251
(S) a,a,a-Trifluorotoluene(FID)	87.8		59.0-128		11/04/2016 01:35	WG923251
(S) a,a,a-Trifluorotoluene(PID)	82.5		54.0-144		11/04/2016 01:35	WG923251

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	1240		40.0	10	11/04/2016 11:51	WG923689
C28-C40 Oil Range	661		40.0	10	11/04/2016 11:51	WG923689
(S) o-Terphenyl	114		50.0-150		11/04/2016 11:51	WG923689





L869670-07 Original Sample (OS) • Duplicate (DUP)

(OS) L869670-07 11/08/16 08:44 • (DUP) WG922755-3 11/08/16 08:44

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.15	7.12	1	0.420		1

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L869696-06 Original Sample (OS) • Duplicate (DUP)

(OS) L869696-06 11/08/16 08:44 • (DUP) WG922755-4 11/08/16 08:44

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.80	8.81	1	0.114		1

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

(LCS) WG922755-1 11/08/16 08:44 • (LCSD) WG922755-2 11/08/16 08:44

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	6.11	6.12	6.12	100	100	98.4-102			0.000	1

Method Blank (MB)

(MB) WG922908-1 11/02/16 19:59

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	umhos/cm		umhos/cm	umhos/cm
Specific Conductance	1.03			

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

L869687-03 Original Sample (OS) • Duplicate (DUP)

(OS) L869687-03 11/02/16 19:59 • (DUP) WG922908-4 11/02/16 19:59

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	umhos/cm	umhos/cm		%		%
Specific Conductance	706	706	1	0.000		20

L869696-10 Original Sample (OS) • Duplicate (DUP)

(OS) L869696-10 11/02/16 19:59 • (DUP) WG922908-5 11/02/16 19:59

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	umhos/cm	umhos/cm		%		%
Specific Conductance	868	868	1	0.000		20

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

(LCS) WG922908-2 11/02/16 19:59 • (LCSD) WG922908-3 11/02/16 19:59

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	umhos/cm	umhos/cm	umhos/cm	%	%	%			%	%
Specific Conductance	542	548	548	101	101	90.0-110			0.000	20



Method Blank (MB)

(MB) R3175830-5 11/03/16 13:47

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	U		0.000150	0.00500
Ethylbenzene	U		0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID) 98.9			59.0-128	
(S) a,a,a-Trifluorotoluene(PID) 92.7			54.0-144	

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

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

(LCS) R3175830-1 11/03/16 11:57 • (LCSD) R3175830-2 11/03/16 12:19

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	0.0486	0.0507	97.1	101	70.0-130			4.26	20
Toluene	0.0500	0.0483	0.0498	96.5	99.6	70.0-130			3.12	20
Ethylbenzene	0.0500	0.0496	0.0518	99.1	104	70.0-130			4.37	20
Total Xylene	0.150	0.152	0.158	102	105	70.0-130			3.55	20
(S) a,a,a-Trifluorotoluene(FID)				97.6	97.9	59.0-128				
(S) a,a,a-Trifluorotoluene(PID)				101	102	54.0-144				

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

(LCS) R3175830-3 11/03/16 12:41 • (LCSD) R3175830-4 11/03/16 13:03

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	5.58	5.68	101	103	63.5-137			1.77	20
(S) a,a,a-Trifluorotoluene(FID)				99.6	99.9	59.0-128				
(S) a,a,a-Trifluorotoluene(PID)				109	109	54.0-144				

L869687-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L869687-01 11/03/16 15:23 • (MS) R3175830-6 11/03/16 19:48 • (MSD) R3175830-7 11/03/16 20:10

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	0.0500	0.000501	0.0351	0.0257	69.2	50.3	1	49.7-127		J3	31.2	23.5
Toluene	0.0500	ND	0.0294	0.0172	57.3	32.8	1	49.8-132		J3 J6	52.6	23.5
Ethylbenzene	0.0500	ND	0.0231	0.00949	45.7	18.5	1	40.8-141		J3 J6	83.4	23.8
Total Xylene	0.150	ND	0.0737	0.0310	48.6	20.1	1	41.2-140	J6	J3 J6	81.7	23.7
(S) a,a,a-Trifluorotoluene(FID)					94.6	94.3		59.0-128				



L869687-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L869687-01 11/03/16 15:23 • (MS) R3175830-6 11/03/16 19:48 • (MSD) R3175830-7 11/03/16 20:10												
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
(S) a,a,a-Trifluorotoluene(PID)					93.5	91.0		54.0-144				

L869687-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L869687-01 11/03/16 15:23 • (MS) R3175830-8 11/03/16 20:32 • (MSD) R3175830-9 11/03/16 20:54												
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
TPH (GC/FID) Low Fraction	5.50	ND	2.36	1.20	42.9	21.8	1	28.5-138		J3 J6	65.3	23.6
(S) a,a,a-Trifluorotoluene(FID)					93.1	91.2		59.0-128				
(S) a,a,a-Trifluorotoluene(PID)					98.5	92.8		54.0-144				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3175891-1 11/04/16 09:39

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	119			50.0-150

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

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

(LCS) R3175891-2 11/04/16 09:53 • (LCSD) R3175891-3 11/04/16 10:05

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 %
C10-C28 Diesel Range	60.0	44.5	47.2	74.1	78.7	50.0-150			5.93	20
(S) o-Terphenyl				126	127	50.0-150				



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
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.
(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.
Rec.	Recovery.

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.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



ESC Lab Sciences 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.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee ¹⁴	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

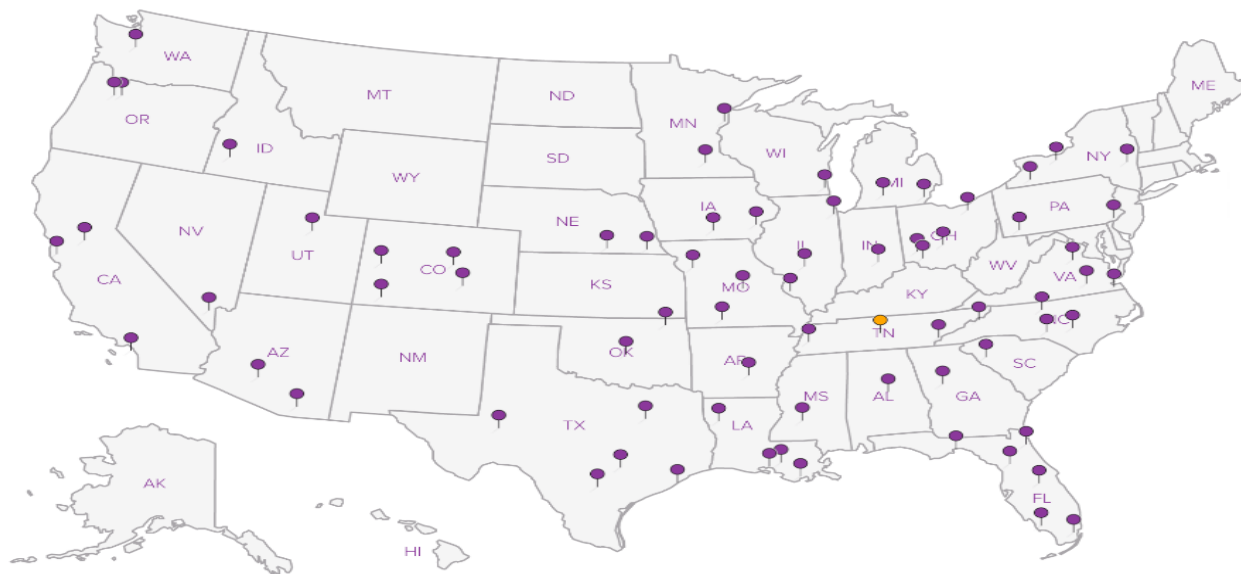
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

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

Our Locations

ESC Lab Sciences 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. **ESC Lab Sciences performs all testing at our central laboratory.**



Company Name/Address:

Nicholson GeoSolutions. LLC.3433 E. Lake Dr.
Centennial, CO 80121

Billing Information:

Terry Pape
HRM Resources
410 17th St. Suite 1600
Denver, CO 80202

Report to:

Dave Nicholson

Email To:

dknicholson@q.com

Project

Description: Anderson No. 1

City/State

Collected:

Phone: 303-601-2023

Client Project #

Lab Project #

Fax:

Collected by (print):

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)

Date Results Needed

D. Nicholson

Same Day 200%

Next Day 100%

Two Day 50%

Three Day 25%

Email? No ☒ YesFAX? ☒ No ☐ YesNo.
of
CntrsImmediately
Packed on Ice N ☒ Y

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time		TVPH/BTEX - 4oz Soil Jar	TEPH - 4oz Soil Jar (Diesel + motor oil)	SAR - 4oz Soil Jar	pH/SPCON - 4oz Soil Jar								
And-LF-1	Grab	SS		10/29	1400	4	X	X	X	X								
And-LF-2	Grab	SS			1405	4	X	X	X	X								
And-LF-3	Grab	SS			1410	4	X	X	X	X								
And-LF-4	Grab	SS			1415	4	X	X	X	X								
And-LF-5	Grab	SS			1420	4	X	X	X	X								
	Grab	SS				4												
	Grab	SS				4												
	Grab	SS				4												
	Grab	SS				4												
	Grab	SS				4												

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

Remarks:

Relinquished by: (Signature)

Date:

Time:

Received by: (Signature)

pH _____ Temp _____

Flow _____ Other _____

Hold #

Relinquished by: (Signature)

Date:

Time:

Received by: (Signature)

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

Condition: (lab use only)

Relinquished by: (Signature)

Date:

Time:

Received for lab by: (Signature)

Temp: 2.6 °C Bottles Received: 20/402

Date: 11-1-16 Time: 9:00

COC Seal Intact: ☐ Y ☒ N ☒ NA

pH Checked:

NCF:

Chain of Custody Page 1 of 1


ESC
 L.A.B S.C.I.E.N.C.E.S

YOUR LAB OF CHOICE

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

L# 1869603

G037

Acctnum: NICEOCCO

Template:

Prelogin:

TSR:

Cooler:

Shipped Via:

Rem./Contaminant Sample # (lab only)



L·A·B S·C·I·E·N·C·E·S

YOUR LAB OF CHOICE

Cooler Receipt Form

Client: <u>HMR6D00</u>	SDG# <u>L869693</u>		
Cooler Received/Opened On: <u>11/</u> / <u>16</u>	Temperature Upon Receipt: <u>26</u> °C		
Received By: <u>Rickey Mosley</u>			
Signature: <u><i>Rickey Mosley</i></u>			
Receipt Check List			
	Yes	No	N/A
Were custody seals on outside of cooler and intact?			✓
Were custody papers properly filled out?	✓		
Did all bottles arrive in good condition?	✓		
Were correct bottles used for the analyses requested?	✓		
Was sufficient amount of sample sent in each bottle?	✓		
Were all applicable sample containers correctly preserved and checked for preservation? (Any not in accepted range noted on COC)			✓
If applicable, was an observable VOA headspace present?			✓
Non Conformance Generated. (If yes see attached NCF)			