



Nicholson GeoSolutions LLC

3433 East Lake Drive
Centennial, CO 80121

November 14, 2016

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

**Subject: Herzberg No. 1 Landfarm Sampling Results
COGCC Remediation #9055**

Dear Terry:

Nicholson GeoSolutions LLC was retained by HRM Resources II LLC (HRM) to conduct soil sampling of the landfarm on the Herzberg 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 21st, 2016. The landfarm was previously sampled on October 18th, 2015 and May 25th, 2016.

GPS mapping showed that three landfarm cells cover a total of about 0.30 acres and contain an estimated 730 yards of material. A total of 10 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 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), 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 nine of the 10 samples and ranged from 182.7 mg/kg to 57,702 mg/kg. In addition, pH exceeded the standard for one sample. All SAR and conductivity results were below the standards.

Table 1 Herzberg No. 1 Landfarm Sample Results – October 21, 2016

	Table 910-1 Standards	Herzberg LF-1	Herzberg LF-2	Herzberg LF-3	Herzberg LF-4	Herzberg LF-5
TVPH – gasoline range	500 ¹	<0.1 UJ	<0.1 UJ	<0.1 UJ	<0.1 UJ	<0.1 UJ
TEPH – diesel/motor oil range	500 ¹	3,750	7,140	7,360	4,580	182.7
benzene	0.17	0.00109 J	0.000904 J	0.000793 J	0.000685 J	0.000682 J
toluene	85	<0.005 UJ	<0.005 UJ	<0.005 UJ	<0.005 UJ	<0.005 UJ
ethylbenzene	100	<0.0005 UJ	<0.0005 UJ	<0.0005 UJ	<0.0005 UJ	<0.0005 UJ
xylenes	175	<0.0015 UJ	0.00168 J	0.00355 J	<0.0015 UJ	<0.0015 UJ
SAR (ratio)	<12	3.53	4.26	3.81	4.63	1.73
pH (units)	6-9	8.58	8.64	8.76	8.46	8.67
sp. conductance (mmhos/cm)	<4.0	0.895	0.924	0.985	0.872	0.696

	Table 910-1 Standards	Herzberg LF-6	Herzberg LF-7	Herzberg LF-8	Herzberg LF-9	Herzberg LF-10
TVPH – gasoline range	500 ¹	0.64 J	1.29 J	2.29 J	<0.1 UJ	0.292 J
TEPH – diesel/motor oil range	500 ¹	4,050	7,600	57,700	3,243	7,220
benzene	0.17	<0.0005 UJ	<0.0005 UJ	0.00079 J	<0.0005 UJ	<0.0005 UJ
toluene	85	<0.005 UJ	0.00557 J	0.009 J	<0.005 UJ	<0.005 UJ
ethylbenzene	100	<0.0005 UJ	<0.0005 UJ	<0.0005 UJ	<0.0005 UJ	<0.0005 UJ
xylenes	175	0.00974 J	0.0195 J	0.0313 J	<0.0015 UJ	0.00532 J
SAR (ratio)	<12	3.92	5.83	8.00	2.51	2.92
pH (units)	6-9	8.62	8.66	7.59	8.95	9.10
sp. conductance (mmhos/cm)	<4.0	0.916	1.06	0.798	0.719	0.772

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 21st, 2016 samples and the percent difference between the two samples at each sample location. TPH ranged from 3,990 mg/kg to 27,716 mg/kg for the October 2015 samples and from 182.7 mg/kg to 57,700 mg/kg for the October 2016 samples. The TPH concentration was lower for the October 2016 samples at eight of the 10 sample locations and higher at two locations.

Table 2 Comparison of TPH Results, October 18, 2015 and October 21, 2016

Sample Location	TPH (mg/kg) October 18, 2015	TPH (mg/kg) October 21, 2016	%Difference
Herzberg-LF-1	10,557	3,750	-64.5
Herzberg-LF-2	9,718	7,140	-26.5
Herzberg-LF-3	17,100	7,360	-57.0
Herzberg-LF-4	9,000	4,580	-49.1
Herzberg-LF-5	3,990	182.7	-95.4
Herzberg-LF-6	10,752	4,050	-62.3
Herzberg-LF-7	5,323	7,600	42.8
Herzberg-LF-8	27,716	57,700	108.2
Herzberg-LF-9	24,152	3,243	-86.6
Herzberg-LF-10	7,340	7,220	-1.6

Table 3 provides summary statistics for the two sampling events. The average TPH concentration for the 10 samples dropped from 10,073 mg/kg to 4,603 mg/kg between October 18th, 2015 and October 21st, 2016. The median concentration dropped from 9,718 mg/kg to 4,580 mg/kg. Using the results provided above in Table 2, the average % TPH reduction for the overall landfarm was -54.3%.

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

Sample Date	Minimum	Maximum	Average	Median	Average % Difference
Oct 18, 2015	3,990	27,716	10,073	9,718	
Oct 21, 2016	183	57,700	4,603	4,580	-54.3

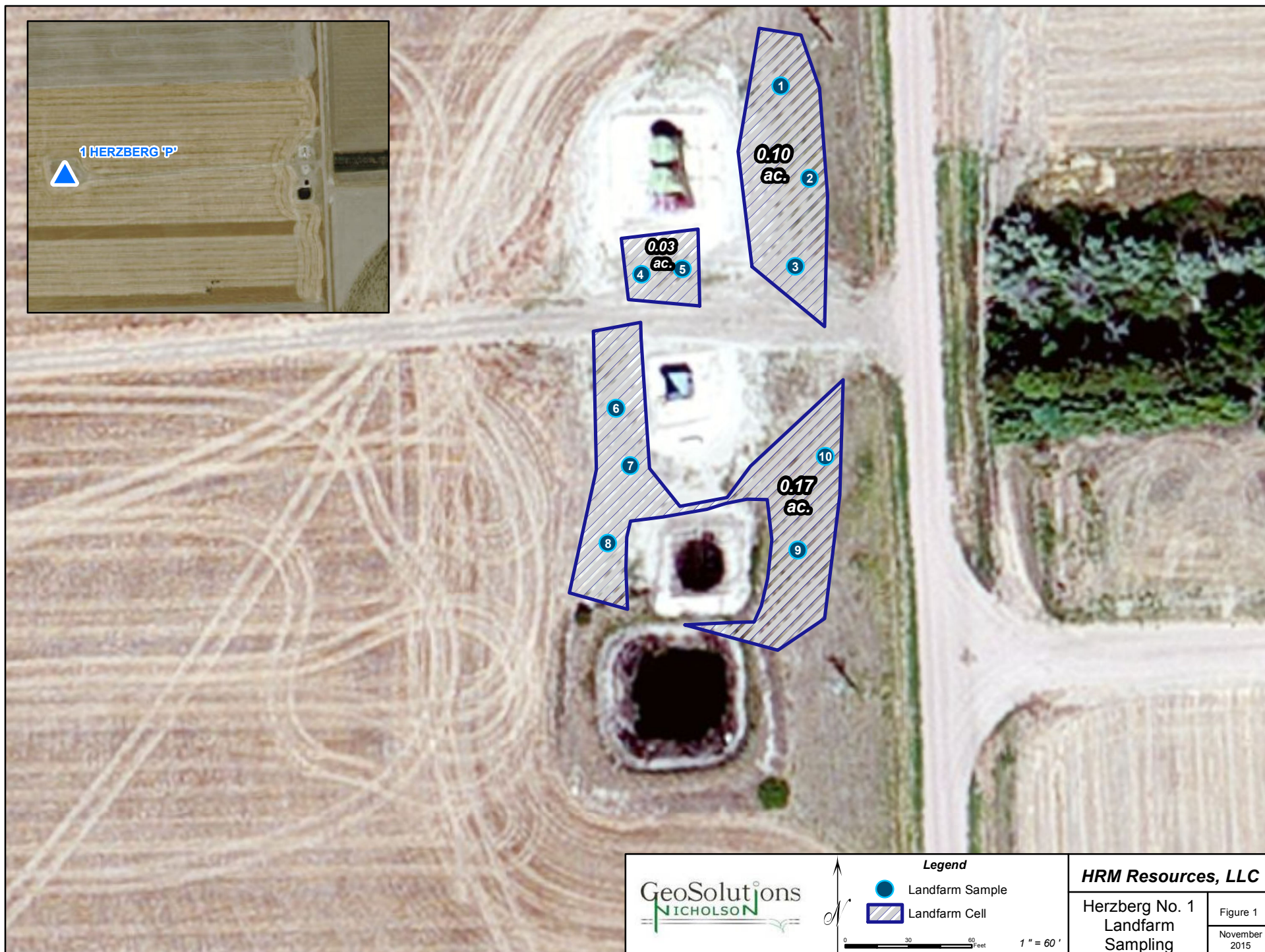
Using the difference between the average TPH concentrations of 5,470 mg/kg, and the time period of 368 days, a biodegradation rate of 14.9 mg/kg-day is obtained. Using these data, approximately 334 days of treatment remain to reach the standard of 500 mg/kg.

Based on the analytical results, bioremediation of the TPH contained in the soils in the landfarm cells at the Herzberg No. 1 lease is occurring. 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



David K. Nicholson, P.G.
Principal Geologist



APPENDIX A
Laboratory Report

HRM Resources, LLC - Denver, CO

Sample Delivery Group: L868068
Samples Received: 10/25/2016
Project Number:
Description: Herzberg 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	5
⁵Sr: Sample Results	6
HERZBERG-LF-1 L868068-01	6
HERZBERG-LF-2 L868068-02	7
HERZBERG-LF-3 L868068-03	8
HERZBERG-LF-4 L868068-04	9
HERZBERG-LF-5 L868068-05	10
HERZBERG-LF-6 L868068-06	11
HERZBERG-LF-7 L868068-07	12
HERZBERG-LF-8 L868068-08	13
HERZBERG-LF-9 L868068-09	14
HERZBERG-LF-10 L868068-10	15
⁶Qc: Quality Control Summary	16
Wet Chemistry by Method 9045D	16
Wet Chemistry by Method 9050AMod	19
Volatile Organic Compounds (GC) by Method 8015/8021	20
Semi-Volatile Organic Compounds (GC) by Method 8015	22
⁷Gl: Glossary of Terms	23
⁸Al: Accreditations & Locations	24
⁹Sc: Chain of Custody	25





HERZBERG-LF-1 L868068-01 Solid

Collected by
Dave Nicholson

Collected date/time
10/21/16 14:10

Received date/time
10/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG920871	1	10/26/16 10:29	10/27/16 08:08	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG921485	50	10/27/16 16:35	10/28/16 03:20	ACM
Volatile Organic Compounds (GC) by Method 8015/8021	WG920755	1	10/25/16 16:02	10/27/16 13:34	DWR
Wet Chemistry by Method 9045D	WG920676	1	10/28/16 13:39	10/28/16 14:36	MHM
Wet Chemistry by Method 9050AMod	WG920655	1	10/26/16 17:49	10/26/16 17:49	MZ

¹ Cp

² Tc

³ Ss

⁴ Cn

HERZBERG-LF-2 L868068-02 Solid

Collected by
Dave Nicholson

Collected date/time
10/21/16 14:15

Received date/time
10/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG920871	1	10/26/16 10:29	10/27/16 08:11	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG921485	50	10/27/16 16:35	10/28/16 03:33	ACM
Volatile Organic Compounds (GC) by Method 8015/8021	WG920755	1	10/25/16 16:02	10/27/16 19:03	DWR
Wet Chemistry by Method 9045D	WG920676	1	10/28/16 13:39	10/28/16 14:36	MHM
Wet Chemistry by Method 9050AMod	WG920655	1	10/26/16 17:49	10/26/16 17:49	MZ

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

HERZBERG-LF-3 L868068-03 Solid

Collected by
Dave Nicholson

Collected date/time
10/21/16 14:20

Received date/time
10/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG920871	1	10/26/16 10:29	10/27/16 08:14	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG921485	50	10/27/16 16:35	10/28/16 03:46	ACM
Volatile Organic Compounds (GC) by Method 8015/8021	WG920755	1	10/25/16 16:02	10/27/16 21:10	DWR
Wet Chemistry by Method 9045D	WG920676	1	10/28/16 13:39	10/28/16 14:36	MHM
Wet Chemistry by Method 9050AMod	WG920655	1	10/26/16 17:49	10/26/16 17:49	MZ

⁹ Sc

HERZBERG-LF-4 L868068-04 Solid

Collected by
Dave Nicholson

Collected date/time
10/21/16 14:25

Received date/time
10/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG920871	1	10/26/16 10:29	10/27/16 08:16	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG921485	50	10/27/16 16:35	10/28/16 03:59	ACM
Volatile Organic Compounds (GC) by Method 8015/8021	WG920755	1	10/25/16 16:02	10/27/16 21:32	DWR
Wet Chemistry by Method 9045D	WG920676	1	10/28/16 13:39	10/28/16 14:36	MHM
Wet Chemistry by Method 9050AMod	WG920655	1	10/26/16 17:49	10/26/16 17:49	MZ

HERZBERG-LF-5 L868068-05 Solid

Collected by
Dave Nicholson

Collected date/time
10/21/16 14:30

Received date/time
10/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG920871	1	10/26/16 10:29	10/27/16 08:19	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG921485	10	10/27/16 16:35	10/28/16 02:17	ACM
Volatile Organic Compounds (GC) by Method 8015/8021	WG920755	1	10/25/16 16:02	10/27/16 21:54	DWR
Wet Chemistry by Method 9045D	WG920676	1	10/28/16 13:39	10/28/16 14:36	MHM
Wet Chemistry by Method 9050AMod	WG920655	1	10/26/16 17:49	10/26/16 17:49	MZ

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



HERZBERG-LF-6 L868068-06 Solid

Collected by
Dave Nicholson

Collected date/time
10/21/16 14:35

Received date/time
10/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG920871	1	10/26/16 10:29	10/27/16 08:22	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG921485	50	10/27/16 16:35	10/28/16 04:13	ACM
Volatile Organic Compounds (GC) by Method 8015/8021	WG920755	1	10/25/16 16:02	10/27/16 22:16	DWR
Wet Chemistry by Method 9045D	WG920676	1	10/28/16 13:39	10/28/16 14:36	MHM
Wet Chemistry by Method 9050AMod	WG920655	1	10/26/16 17:49	10/26/16 17:49	MZ

¹ Cp

² Tc

³ Ss

⁴ Cn

HERZBERG-LF-7 L868068-07 Solid

Collected by
Dave Nicholson

Collected date/time
10/21/16 14:40

Received date/time
10/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG920871	1	10/26/16 10:29	10/27/16 08:25	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG921485	50	10/27/16 16:35	10/28/16 03:07	ACM
Volatile Organic Compounds (GC) by Method 8015/8021	WG920755	1	10/25/16 16:02	10/27/16 22:38	DWR
Wet Chemistry by Method 9045D	WG920676	1	10/28/16 13:39	10/28/16 14:36	MHM
Wet Chemistry by Method 9050AMod	WG920655	1	10/26/16 17:49	10/26/16 17:49	MZ

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

HERZBERG-LF-8 L868068-08 Solid

Collected by
Dave Nicholson

Collected date/time
10/21/16 14:45

Received date/time
10/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG920871	1	10/26/16 10:29	10/27/16 10:08	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG921485	100	10/27/16 16:35	10/28/16 04:26	ACM
Semi-Volatile Organic Compounds (GC) by Method 8015	WG921485	1000	10/27/16 16:35	10/29/16 12:55	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG920755	1	10/25/16 16:02	10/27/16 23:01	DWR
Wet Chemistry by Method 9045D	WG921301	1	10/29/16 13:45	10/29/16 14:36	JJL
Wet Chemistry by Method 9050AMod	WG920655	1	10/26/16 17:49	10/26/16 17:49	MZ

⁹ Sc

HERZBERG-LF-9 L868068-09 Solid

Collected by
Dave Nicholson

Collected date/time
10/21/16 14:50

Received date/time
10/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG920871	1	10/26/16 10:29	10/27/16 10:11	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG921485	10	10/27/16 16:35	10/28/16 02:42	ACM
Volatile Organic Compounds (GC) by Method 8015/8021	WG920755	1	10/25/16 16:02	10/27/16 23:23	DWR
Wet Chemistry by Method 9045D	WG920677	1	10/31/16 14:20	11/01/16 11:13	MHM
Wet Chemistry by Method 9050AMod	WG920655	1	10/26/16 17:49	10/26/16 17:49	MZ

HERZBERG-LF-10 L868068-10 Solid

Collected by
Dave Nicholson

Collected date/time
10/21/16 14:55

Received date/time
10/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG920871	1	10/26/16 10:29	10/27/16 10:13	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG921485	50	10/27/16 16:35	10/28/16 02:54	ACM
Volatile Organic Compounds (GC) by Method 8015/8021	WG920755	1	10/25/16 16:02	10/28/16 00:12	DWR
Wet Chemistry by Method 9045D	WG920677	1	10/31/16 14:20	11/01/16 11:13	MHM
Wet Chemistry by Method 9050AMod	WG920655	1	10/26/16 17:49	10/26/16 17:49	MZ

ACCOUNT:

HRM Resources, LLC - Denver, CO

PROJECT:

SDG:

L868068

DATE/TIME:

11/01/16 14:49

PAGE:

4 of 26



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.

ESC Sample ID	Project Sample ID	Method
L868068-01	HERZBERG-LF-1	9045D
L868068-02	HERZBERG-LF-2	9045D
L868068-03	HERZBERG-LF-3	9045D
L868068-04	HERZBERG-LF-4	9045D
L868068-05	HERZBERG-LF-5	9045D
L868068-06	HERZBERG-LF-6	9045D
L868068-07	HERZBERG-LF-7	9045D
L868068-08	HERZBERG-LF-8	9045D
L868068-09	HERZBERG-LF-9	9045D
L868068-10	HERZBERG-LF-10	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	3.53		1	10/27/2016 08:08	WG920871

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.58		1	10/28/2016 14:36	WG920676

Sample Narrative:

9045D L868068-01 WG920676: 8.58 at 19.8c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	10/26/2016 17:49	WG920655

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.00109	J3 J6	0.000500	1	10/27/2016 13:34	WG920755
Toluene	ND	J3 J6	0.00500	1	10/27/2016 13:34	WG920755
Ethylbenzene	ND	J3 J6	0.000500	1	10/27/2016 13:34	WG920755
Total Xylene	ND	J3 J6	0.00150	1	10/27/2016 13:34	WG920755
TPH (GC/FID) Low Fraction	ND	J6	0.100	1	10/27/2016 13:34	WG920755
(S) a,a,a-Trifluorotoluene(FID)	74.7		59.0-128		10/27/2016 13:34	WG920755
(S) a,a,a-Trifluorotoluene(PID)	70.4		54.0-144		10/27/2016 13:34	WG920755

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	2520		200	50	10/28/2016 03:20	WG921485
C28-C40 Oil Range	1230		200	50	10/28/2016 03:20	WG921485
(S) o-Terphenyl	212	J7	50.0-150		10/28/2016 03:20	WG921485

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	4.26		1	10/27/2016 08:11	WG920871

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.64		1	10/28/2016 14:36	WG920676

Sample Narrative:

9045D L868068-02 WG920676: 8.64 at 19.6c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	10/26/2016 17:49	WG920655

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.000904		0.000500	1	10/27/2016 19:03	WG920755
Toluene	ND		0.00500	1	10/27/2016 19:03	WG920755
Ethylbenzene	ND		0.000500	1	10/27/2016 19:03	WG920755
Total Xylene	0.00168		0.00150	1	10/27/2016 19:03	WG920755
TPH (GC/FID) Low Fraction	ND		0.100	1	10/27/2016 19:03	WG920755
(S) a,a,a-Trifluorotoluene(FID)	84.3		59.0-128		10/27/2016 19:03	WG920755
(S) a,a,a-Trifluorotoluene(PID)	78.3		54.0-144		10/27/2016 19:03	WG920755

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	5010		200	50	10/28/2016 03:33	WG921485
C28-C40 Oil Range	2130		200	50	10/28/2016 03:33	WG921485
(S) o-Terphenyl	97.9	J7	50.0-150		10/28/2016 03:33	WG921485

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.81		1	10/27/2016 08:14	WG920871

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.76		1	10/28/2016 14:36	WG920676

Sample Narrative:

9045D L868068-03 WG920676: 8.76 at 19.9c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	10/26/2016 17:49	WG920655

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.000793		0.000500	1	10/27/2016 21:10	WG920755
Toluene	ND		0.00500	1	10/27/2016 21:10	WG920755
Ethylbenzene	ND		0.000500	1	10/27/2016 21:10	WG920755
Total Xylene	0.00355		0.00150	1	10/27/2016 21:10	WG920755
TPH (GC/FID) Low Fraction	ND		0.100	1	10/27/2016 21:10	WG920755
(S) a,a,a-Trifluorotoluene(FID)	83.6		59.0-128		10/27/2016 21:10	WG920755
(S) a,a,a-Trifluorotoluene(PID)	77.2		54.0-144		10/27/2016 21:10	WG920755

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	5320		200	50	10/28/2016 03:46	WG921485
C28-C40 Oil Range	2040		200	50	10/28/2016 03:46	WG921485
(S) o-Terphenyl	387	J7	50.0-150		10/28/2016 03:46	WG921485

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	4.63		1	10/27/2016 08:16	WG920871

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.46		1	10/28/2016 14:36	WG920676

Sample Narrative:

9045D L868068-04 WG920676: 8.46 at 19.8c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	10/26/2016 17:49	WG920655

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.000685		0.000500	1	10/27/2016 21:32	WG920755
Toluene	ND		0.00500	1	10/27/2016 21:32	WG920755
Ethylbenzene	ND		0.000500	1	10/27/2016 21:32	WG920755
Total Xylene	ND		0.00150	1	10/27/2016 21:32	WG920755
TPH (GC/FID) Low Fraction	ND		0.100	1	10/27/2016 21:32	WG920755
(S) a,a,a-Trifluorotoluene(FID)	90.8		59.0-128		10/27/2016 21:32	WG920755
(S) a,a,a-Trifluorotoluene(PID)	83.2		54.0-144		10/27/2016 21:32	WG920755

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	3120		200	50	10/28/2016 03:59	WG921485
C28-C40 Oil Range	1460		200	50	10/28/2016 03:59	WG921485
(S) o-Terphenyl	182	J7	50.0-150		10/28/2016 03:59	WG921485

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	1.73		1	10/27/2016 08:19	WG920871

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.67		1	10/28/2016 14:36	WG920676

Sample Narrative:

9045D L868068-05 WG920676: 8.67 at 19.7c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	10/26/2016 17:49	WG920655

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.000862		0.000500	1	10/27/2016 21:54	WG920755
Toluene	ND		0.00500	1	10/27/2016 21:54	WG920755
Ethylbenzene	ND		0.000500	1	10/27/2016 21:54	WG920755
Total Xylene	ND		0.00150	1	10/27/2016 21:54	WG920755
TPH (GC/FID) Low Fraction	ND		0.100	1	10/27/2016 21:54	WG920755
(S) a,a,a-Trifluorotoluene(FID)	99.6		59.0-128		10/27/2016 21:54	WG920755
(S) a,a,a-Trifluorotoluene(PID)	91.2		54.0-144		10/27/2016 21:54	WG920755

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	106		40.0	10	10/28/2016 02:17	WG921485
C28-C40 Oil Range	76.7		40.0	10	10/28/2016 02:17	WG921485
(S) o-Terphenyl	114		50.0-150		10/28/2016 02:17	WG921485

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.92		1	10/27/2016 08:22	WG920871

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.62		1	10/28/2016 14:36	WG920676

Sample Narrative:

9045D L868068-06 WG920676: 8.62 at 19.5c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	10/26/2016 17:49	WG920655

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	10/27/2016 22:16	WG920755
Toluene	ND		0.00500	1	10/27/2016 22:16	WG920755
Ethylbenzene	ND		0.000500	1	10/27/2016 22:16	WG920755
Total Xylene	0.00974		0.00150	1	10/27/2016 22:16	WG920755
TPH (GC/FID) Low Fraction	0.640		0.100	1	10/27/2016 22:16	WG920755
(S) a,a,a-Trifluorotoluene(FID)	84.5		59.0-128		10/27/2016 22:16	WG920755
(S) a,a,a-Trifluorotoluene(PID)	77.5		54.0-144		10/27/2016 22:16	WG920755

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	2740		200	50	10/28/2016 04:13	WG921485
C28-C40 Oil Range	1310		200	50	10/28/2016 04:13	WG921485
(S) o-Terphenyl	284	J7	50.0-150		10/28/2016 04:13	WG921485

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	5.83		1	10/27/2016 08:25	WG920871

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.66		1	10/28/2016 14:36	WG920676

Sample Narrative:

9045D L868068-07 WG920676: 8.66 at 19.9c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	10/26/2016 17:49	WG920655

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	10/27/2016 22:38	WG920755
Toluene	0.00557		0.00500	1	10/27/2016 22:38	WG920755
Ethylbenzene	ND		0.000500	1	10/27/2016 22:38	WG920755
Total Xylene	0.0195		0.00150	1	10/27/2016 22:38	WG920755
TPH (GC/FID) Low Fraction	1.29		0.100	1	10/27/2016 22:38	WG920755
(S) a,a,a-Trifluorotoluene(FID)	82.1		59.0-128		10/27/2016 22:38	WG920755
(S) a,a,a-Trifluorotoluene(PID)	75.6		54.0-144		10/27/2016 22:38	WG920755

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	5600		200	50	10/28/2016 03:07	WG921485
C28-C40 Oil Range	2000		200	50	10/28/2016 03:07	WG921485
(S) o-Terphenyl	138	J7	50.0-150		10/28/2016 03:07	WG921485

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	8.00		1	10/27/2016 10:08	WG920871

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.59		1	10/29/2016 14:36	WG921301

Sample Narrative:

9045D L868068-08 WG921301: 7.59 at 20.1

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	10/26/2016 17:49	WG920655

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.000790		0.000500	1	10/27/2016 23:01	WG920755
Toluene	0.00900		0.00500	1	10/27/2016 23:01	WG920755
Ethylbenzene	ND		0.000500	1	10/27/2016 23:01	WG920755
Total Xylene	0.0313		0.00150	1	10/27/2016 23:01	WG920755
TPH (GC/FID) Low Fraction	2.29		0.100	1	10/27/2016 23:01	WG920755
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	94.2		59.0-128		10/27/2016 23:01	WG920755
(S) <i>a,a,a</i> -Trifluorotoluene(PID)	86.6		54.0-144		10/27/2016 23:01	WG920755

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	47600		4000	1000	10/29/2016 12:55	WG921485
C28-C40 Oil Range	10100		400	100	10/28/2016 04:26	WG921485
(S) <i>o</i> -Terphenyl	652	J7	50.0-150		10/28/2016 04:26	WG921485
(S) <i>o</i> -Terphenyl	1700	J7	50.0-150		10/29/2016 12:55	WG921485

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	2.51		1	10/27/2016 10:11	WG920871

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.95		1	11/01/2016 11:13	WG920677

Sample Narrative:

9045D L868068-09 WG920677: 8.95 at 20.2c

Wet Chemistry by Method 9050AMod

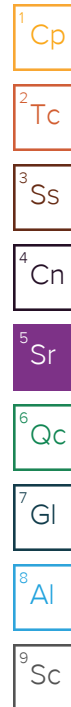
Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	10/26/2016 17:49	WG920655

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	10/27/2016 23:23	WG920755
Toluene	ND		0.00500	1	10/27/2016 23:23	WG920755
Ethylbenzene	ND		0.000500	1	10/27/2016 23:23	WG920755
Total Xylene	ND		0.00150	1	10/27/2016 23:23	WG920755
TPH (GC/FID) Low Fraction	ND		0.100	1	10/27/2016 23:23	WG920755
(S) a,a,a-Trifluorotoluene(FID)	91.2		59.0-128		10/27/2016 23:23	WG920755
(S) a,a,a-Trifluorotoluene(PID)	83.4		54.0-144		10/27/2016 23:23	WG920755

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	2250		40.0	10	10/28/2016 02:42	WG921485
C28-C40 Oil Range	993		40.0	10	10/28/2016 02:42	WG921485
(S) o-Terphenyl	203	J1	50.0-150		10/28/2016 02:42	WG921485





Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.92		1	10/27/2016 10:13	WG920871

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.10		1	11/01/2016 11:13	WG920677

Sample Narrative:

9045D L868068-10 WG920677: 9.10 at 20.0c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		1	10/26/2016 17:49	WG920655

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	10/28/2016 00:12	WG920755
Toluene	ND		0.00500	1	10/28/2016 00:12	WG920755
Ethylbenzene	ND		0.000500	1	10/28/2016 00:12	WG920755
Total Xylene	0.00532		0.00150	1	10/28/2016 00:12	WG920755
TPH (GC/FID) Low Fraction	0.292		0.100	1	10/28/2016 00:12	WG920755
(S) a,a,a-Trifluorotoluene(FID)	84.3		59.0-128		10/28/2016 00:12	WG920755
(S) a,a,a-Trifluorotoluene(PID)	76.7		54.0-144		10/28/2016 00:12	WG920755

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	5100		200	50	10/28/2016 02:54	WG921485
C28-C40 Oil Range	2120		200	50	10/28/2016 02:54	WG921485
(S) o-Terphenyl	35.0	J7	50.0-150		10/28/2016 02:54	WG921485

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



L867981-01 Original Sample (OS) • Duplicate (DUP)

(OS) L867981-01 10/28/16 14:36 • (DUP) WG920676-3 10/28/16 14:36

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.42	7.41	1	0.135		1

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

L868541-01 Original Sample (OS) • Duplicate (DUP)

(OS) L868541-01 10/28/16 14:36 • (DUP) WG920676-4 10/28/16 14:36

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	3.13	3.13	1	0.000		1

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

(LCS) WG920676-1 10/28/16 14:36 • (LCSD) WG920676-2 10/28/16 14:36

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	6.05	6.05	99.0	99.0	98.4-102			0.000	1

⁷ Gl

⁸ Al

⁹ Sc



L868068-09 Original Sample (OS) • Duplicate (DUP)

(OS) L868068-09 11/01/16 11:13 • (DUP) WG920677-3 11/01/16 11:13

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.95	8.94	1	0.112		1

L868154-16 Original Sample (OS) • Duplicate (DUP)

(OS) L868154-16 11/01/16 11:13 • (DUP) WG920677-4 11/01/16 11:13

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	9.14	9.14	1	0.000		1

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

(LCS) WG920677-1 11/01/16 11:13 • (LCSD) WG920677-2 11/01/16 11:13

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

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



L868068-08 Original Sample (OS) • Duplicate (DUP)

(OS) L868068-08 10/29/16 14:36 • (DUP) WG921301-3 10/29/16 14:36

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.59	7.61	1	0.263		1

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

L868949-02 Original Sample (OS) • Duplicate (DUP)

(OS) L868949-02 10/29/16 14:36 • (DUP) WG921301-4 10/29/16 14:36

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.45	7.40	1	0.673		1

⁷ Gl

⁸ Al

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

(LCS) WG921301-1 10/29/16 14:36 • (LCSD) WG921301-2 10/29/16 14:36

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	6.11	6.12	100	100	98.4-102			0.164	1

⁹ Sc



Method Blank (MB)

(MB) WG920655-1 10/26/16 17:49

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	umhos/cm		umhos/cm	umhos/cm
Specific Conductance	1.13			

L868068-01 Original Sample (OS) • Duplicate (DUP)

(OS) L868068-01 10/26/16 17:49 • (DUP) WG920655-4 10/26/16 17:49

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	umhos/cm	umhos/cm		%		%
Specific Conductance	895	896	1	0.112		20

L868154-09 Original Sample (OS) • Duplicate (DUP)

(OS) L868154-09 10/26/16 17:49 • (DUP) WG920655-5 10/26/16 17:49

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	umhos/cm	umhos/cm		%		%
Specific Conductance	797	800	1	0.376		20

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

(LCS) WG920655-2 10/26/16 17:49 • (LCSD) WG920655-3 10/26/16 17:49

	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	559	558	103	103	90.0-110			0.179	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3174103-5 10/27/16 12:23

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	0.000287	J	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) 103			59.0-128	
(S) a,a,a-Trifluorotoluene(PID) 96.2			54.0-144	

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

(LCS) R3174103-1 10/27/16 10:27 • (LCSD) R3174103-2 10/27/16 10:54

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	0.0528	0.0532	106	106	70.0-130			0.870	20
Toluene	0.0500	0.0519	0.0523	104	105	70.0-130			0.730	20
Ethylbenzene	0.0500	0.0531	0.0534	106	107	70.0-130			0.570	20
Total Xylene	0.150	0.164	0.164	109	109	70.0-130			0.0700	20
(S) a,a,a-Trifluorotoluene(FID)				103	103	59.0-128				
(S) a,a,a-Trifluorotoluene(PID)				104	105	54.0-144				

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

(LCS) R3174103-3 10/27/16 11:16 • (LCSD) R3174103-4 10/27/16 11:38

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	6.21	6.40	113	116	63.5-137			3.04	20
(S) a,a,a-Trifluorotoluene(FID)				104	105	59.0-128				
(S) a,a,a-Trifluorotoluene(PID)				113	113	54.0-144				

L868068-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L868068-01 10/27/16 13:34 • (MS) R3174103-6 10/27/16 13:56 • (MSD) R3174103-7 10/27/16 14:18

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	0.00109	0.0135	0.00981	24.8	17.5	1	49.7-127	J6	J3 J6	31.6	23.5
Toluene	0.0500	ND	0.00566	0.00258	8.54	2.38	1	49.8-132	J6	J3 J6	74.8	23.5
Ethylbenzene	0.0500	ND	0.00236	0.000560	3.92	0.324	1	40.8-141	J6	J3 J6	123	23.8
Total Xylene	0.150	ND	0.00726	0.00180	3.91	0.270	1	41.2-140	J6	J3 J6	121	23.7
(S) a,a,a-Trifluorotoluene(FID)					91.6	84.9		59.0-128				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



L868068-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L868068-01 10/27/16 13:34 • (MS) R3174103-6 10/27/16 13:56 • (MSD) R3174103-7 10/27/16 14:18

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
(S) a,a,a-Trifluorotoluene(PID)					85.4	79.8		54.0-144				

L868068-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L868068-01 10/27/16 13:34 • (MS) R3174103-8 10/27/16 14:40 • (MSD) R3174103-9 10/27/16 15:02

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
TPH (GC/FID) Low Fraction	5.50	ND	0.751	0.837	13.6	15.2	1	28.5-138	J6	J6	10.9	23.6
(S) a,a,a-Trifluorotoluene(FID)					81.3	90.8		59.0-128				
(S) a,a,a-Trifluorotoluene(PID)					78.2	87.9		54.0-144				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3174199-1 10/27/16 23:07

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	85.8			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) R3174199-2 10/27/16 23:31 • (LCSD) R3174199-3 10/27/16 23:43

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	42.5	42.1	70.8	70.2	50.0-150			0.780	20
(S) o-Terphenyl				89.7	93.7	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
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
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		

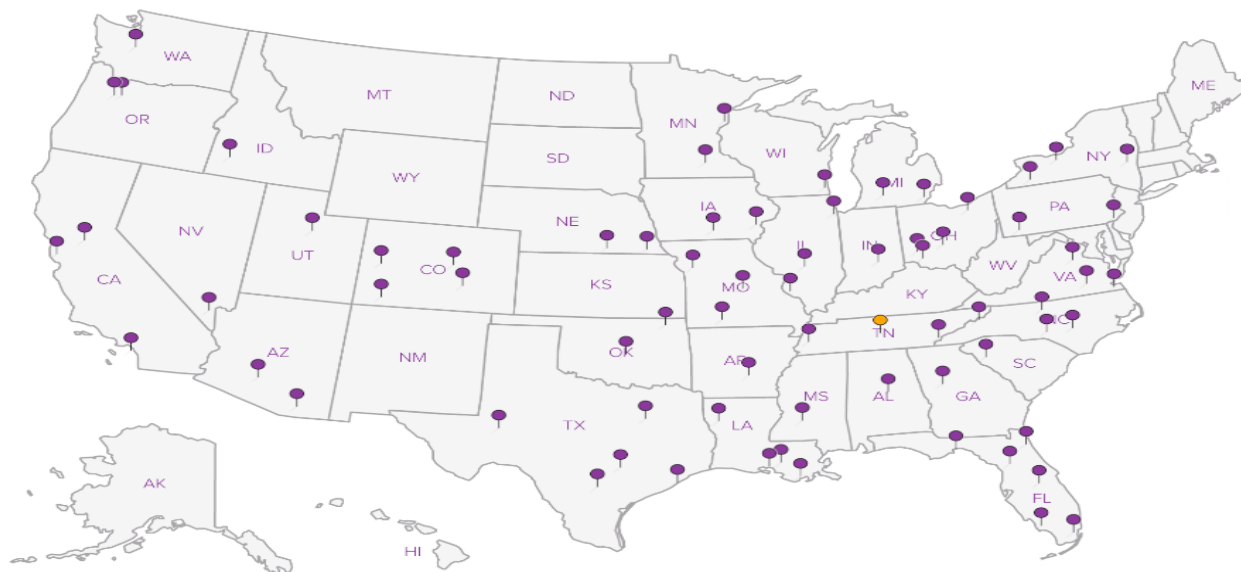
Third Party & Federal Accreditations

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: Herzberg 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)

Same Day 200%

Next Day 100%

Two Day 50%

Three Day 25%

Date Results Needed

Email? ☐ No ☒ YesFAX? ☒ No ☐ YesNo.
of
Cntrs

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs
Herzberg-LF-1	Grab	SS		10/21	1410	4
Herzberg-LF-2	Grab	SS			1415	4
Herzberg-LF-3	Grab	SS			1420	4
Herzberg-LF-4	Grab	SS			1425	4
Herzberg-LF-5	Grab	SS			1430	4
Herzberg-LF-6	Grab	SS			1435	4
Herzberg-LF-7	Grab	SS			1440	4
Herzberg-LF-8	Grab	SS			1445	4
Herzberg-LF-9	Grab	SS			1450	4
Herzberg-LF-10	Grab	SS		10	1455	4

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

Remarks:

Relinquished by: (Signature)

Date:

10/24/16

Time:

1200

Received by: (Signature)

Fedex

Relinquished by: (Signature)

Date:

Time:

Received by: (Signature)

Relinquished by: (Signature)

Date:

Time:

Received for lab by: (Signature)

Analysis / Container / Preservative

TVPH/BTEX - 4oz Soil Jar

TEPH - 4oz Soil Jar (Diesel + Motor oil)

SAR - 4oz Soil Jar

pH/SPCON - 4oz Soil Jar

Chain of Custody

Page 1 of 1



YOUR LAB OF CHOICE

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

L# 868058

Ta D032

Acctnum: NIGEOCCO

Template:

Prelogin:

TSR:

Cooler:

Shipped Via:

Rem./Contaminant Sample # (lab only)

pH _____ Temp _____

Flow _____ Other _____

Hold #

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

Temp: °C Bottles Received:

3.2 40 402

Date: Time:

10-25-16 9:00

Condition: (lab use only)

COC Seal Intact: Y N NA

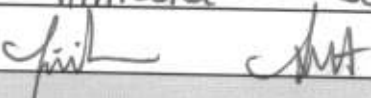
pH Checked: NCF:



L·A·B S·C·I·E·N·C·E·S

YOUR LAB OF CHOICE

Cooler Receipt Form

Client:	HRMRESDCW	SDG#	868068
Cooler Received/Opened On:	10-25-16	Temperature Upon Receipt:	3.2 °C
Received By:	Timiesha Scott		
Signature:			
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)			