

HRL Compliance Solutions- CO

Sample Delivery Group: L839011
Samples Received: 06/02/2016
Project Number: HD 9-41 BACKGROUND
Description: Black Hills - Homer Deep 9-41 - Cuttings Remediation
Site: HG 9-41
Report To: Jordan Cario
2385 F ½ Road
Grand Junction, CO 81505

Entire Report Reviewed By:



Shane Gambill

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.



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BACKGROUND 1 6IN L839011-01 Solid

Collected by
Jordan CarioCollected date/time
06/01/16 11:45Received date/time
06/02/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG877553	1	06/03/16 09:23	06/04/16 19:28	BRJ
Metals (ICP) by Method 6010B	WG877368	1	06/02/16 18:33	06/03/16 18:17	BRJ
Wet Chemistry by Method 9045D	WG877310	1	06/03/16 09:44	06/03/16 09:44	KK
Wet Chemistry by Method 9050AMod	WG877610	1	06/03/16 15:40	06/03/16 15:40	AMC

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

BACKGROUND 2 6IN L839011-02 Solid

Collected by
Jordan CarioCollected date/time
06/01/16 11:50Received date/time
06/02/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG877553	1	06/03/16 09:23	06/04/16 19:31	BRJ
Metals (ICP) by Method 6010B	WG877368	1	06/02/16 18:33	06/03/16 18:20	BRJ
Wet Chemistry by Method 9045D	WG877310	1	06/03/16 09:44	06/03/16 09:44	KK
Wet Chemistry by Method 9050AMod	WG877610	1	06/03/16 15:40	06/03/16 15:40	AMC

BACKGROUND 3 6IN L839011-03 Solid

Collected by
Jordan CarioCollected date/time
06/01/16 11:57Received date/time
06/02/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG877553	1	06/03/16 09:23	06/04/16 19:34	BRJ
Metals (ICP) by Method 6010B	WG877368	1	06/02/16 18:33	06/03/16 18:23	BRJ
Wet Chemistry by Method 9045D	WG877310	1	06/03/16 09:44	06/03/16 09:44	KK
Wet Chemistry by Method 9050AMod	WG877610	1	06/03/16 15:40	06/03/16 15:40	AMC



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.

Shane Gambill
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
L839011-01	BACKGROUND 1 6IN	9045D
L839011-02	BACKGROUND 2 6IN	9045D
L839011-03	BACKGROUND 3 6IN	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	0.334		1	06/04/2016 19:28	WG877553

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	6.72		1	06/03/2016 09:44	WG877310

Sample Narrative:

9045D L839011-01 WG877310: 6.72 at 21.7c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	1500		1	06/03/2016 15:40	WG877610

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	10.7		2.00	1	06/03/2016 18:17	WG877368

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.37		1	06/04/2016 19:31	WG877553

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.89		1	06/03/2016 09:44	WG877310

Sample Narrative:

9045D L839011-02 WG877310: 8.89 at 21.5c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	26.8		1	06/03/2016 15:40	WG877610

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	12.5		2.00	1	06/03/2016 18:20	WG877368

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.303		1	06/04/2016 19:34	WG877553

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.54		1	06/03/2016 09:44	WG877310

Sample Narrative:

9045D L839011-03 WG877310: 8.54 at 21.6c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	7.44		1	06/03/2016 15:40	WG877610

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	11.8		2.00	1	06/03/2016 18:23	WG877368

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc



L839008-01 Original Sample (OS) • Duplicate (DUP)

(OS) L839008-01 06/03/16 09:44 • (DUP) WG877310-3 06/03/16 09:44

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.91	8.93	1	0.224		1

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

L839141-03 Original Sample (OS) • Duplicate (DUP)

(OS) L839141-03 06/03/16 09:44 • (DUP) WG877310-4 06/03/16 09:44

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	1.12	1.12	1	0.000		1

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

(LCS) WG877310-1 06/03/16 09:44 • (LCSD) WG877310-2 06/03/16 09:44

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	6.43	6.36	6.36	98.9	98.9	98.4-102			0.000	1

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) WG877610-4 06/03/16 15:40

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	2.00			

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

L839008-01 Original Sample (OS) • Duplicate (DUP)

(OS) L839008-01 06/03/16 15:40 • (DUP) WG877610-1 06/03/16 15:40

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	2430	2430	1	0.123		20

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

(LCS) WG877610-2 06/03/16 15:40 • (LCSD) WG877610-3 06/03/16 15:40

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCSD Result umhos/cm	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Specific Conductance	653	670	672	103	103	90.0-110			0.298	20



Method Blank (MB)

(MB) R3141531-1 06/03/16 15:47

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.65	2.00

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) R3141531-2 06/03/16 15:50 • (LCSD) R3141531-3 06/03/16 15:52

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	100	99.0	99.6	99	100	80-120			1	20

L838995-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L838995-03 06/03/16 15:55 • (MS) R3141531-6 06/03/16 16:02 • (MSD) R3141531-7 06/03/16 16:04

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	1.88	97.2	97.4	95	95	1	75-125			0	20



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
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.
Rec.	Recovery.

Qualifier	Description
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The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



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.**



