



**Brenda F. Zehr**  
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SENT VIA EMAIL

January 18, 2018

Dr. Carlos Lujan, Ph. D.  
Colorado Oil and Gas Conservation Commission, Northwest Region  
796 Megan Avenue, Suite 201  
Rifle, CO 81650

**RE: Wolf Creek 12 3<sup>rd</sup> Quarter 2017 Sampling Report Submittal (Remediation Project REM# 7909)**

Dear Dr. Lujan:

HRL Compliance Solutions, on behalf of Rocky Mountain Natural Gas LLC, sampled Wolf Creek #12 on September 26 and 27, 2017. As requested during our conference call yesterday, HRL's report summarizing this sampling event is attached for your file.

Should you have any questions or concerns with the attached, please contact me at 719.362.6960.

Sincerely,

Brenda F. Zehr  
Sr. Environmental Engineer

Attachment:  
WC#12 Sampling Report dated November 22, 2017

CC: Tom Warnes, RMNG  
Mark Mumby, HRL  
File



November 22, 2017

**Rocky Mountain Natural Gas, LLC  
Wolf Creek 12 Quarterly Groundwater Sampling  
Summary Report – 3<sup>rd</sup> Quarter 2017  
HRL Job #13-113**

## **Introduction**

This summary report presents the site background, groundwater sampling, and analytical summary for the Wolf Creek #12 well pad. This report provides sampling results for the third quarter 2017 sampling event. Field work was conducted on September 26 and 27, 2017.

## **Site Location**

The Wolf Creek #12 well pad is located in the NW ¼, SE ¼ of Section 35, Township 8 South, Range 90 West, of the 6<sup>th</sup> Prime Meridian in the White River National Forest of Pitkin County, Colorado (Latitude 39.314382°, Longitude -107.404220°). Refer to Appendix A, Figure 1 for a map of the Wolf Creek Storage Unit.

## **Background**

The groundwater sampling investigation was performed in response to the new Bureau of Land Management (BLM) *Notice of Order of the BLM Authorized Officer* (WRNF-WC-2017-1) dated June 6, 2017, the approved Colorado Oil and Gas Conservation Commission (COGCC) Form 27 Remediation workplan (Remediation # 1949185), and in accordance with the Sampling and Analysis Plan dated July, 2017. The following report details information from the third quarter sampling event conducted on September 26 and 27, 2017.

## **Groundwater Sampling**

HRL personnel were onsite on September 26 and 27, 2017 to collect groundwater samples from three (3) monitor wells (MW-04, MW-05, and MW-06) in accordance with the new BLM written order. MW-04 was dry and no sample was collected. Monitor wells 05 and 06 were purged prior to sampling. Three (3) samples were collected from these wells utilizing a low flow peristaltic pump and dedicated tubing. A duplicate sample was collected from MW-06 to assess laboratory performance and sample homogeneity through comparison of lab results. Static groundwater levels were measured with a water level indicator and field parameters were collected utilizing a YSI 556 multi-parameter water quality instrument. Refer to Appendix A, Figure 2 for a sample location map.

Each sample was placed into laboratory provided containers, packed in ice, and shipped via overnight delivery to ALS Environmental in Holland, Michigan following laboratory chain-of-custody protocol. Each sample was analyzed for diesel range organics (DRO) and benzene-toluene-ethylbenzene-xylenes (BTEX). All samples were collected and analyzed in accordance with the approved SAP dated July, 2017 and BLM written order WRNF-WC-2017-1.

All field equipment was calibrated to standards prior to use with the manufacturer's calibration guidelines. All field equipment was decontaminated between sample locations using soap and distilled water to minimize the possibility of cross-contamination.

## **Analytical Results**

### **MW-04**

Monitor well was dry. No sample collected.

### **MW-05**

All constituents were non-detect.

### **MW-06**

Benzene results were 1.0 µg/L; total Xylenes were 4.9 µg/L. Both are below the COGCC Table 910-1 standard of 5.0 µg/L for benzene and 1,400 µg/L to 10,000 µg/L for total xylenes. All remaining constituents were non-detect.

### **MW-06 – Duplicate**

Benzene results were non-detect; total Xylene results were 4.4 µg/L which is below the COGCC Table 910-1 standard of 1,400 µg/L to 10,000 µg/L. All remaining constituents were non-detect.

Analytical results are presented in Appendix B, Table 1. Water quality field parameters are presented in Appendix B, Table 2. Raw Analytical data is presented in Appendix C.

## **Conclusion**

Results from the third quarter 2017 sampling event revealed very low benzene and total Xylenes in MW-06. The duplicate sample from MW-06 was non-detect for Benzene and the total Xylene results were very low as well. MW-05 constituents were non-detect and MW-04 was dry. The concentrations of Benzene and Xylene are below Table 910-1 standards for groundwater.

This third quarter sampling event concludes the required BLM sampling program at WC12. No contamination is present above regulatory levels. COGCC indicated in their 9/13/17 Field Inspection Report (Appendix D), if these analytical results indicate compliance with COGCC Table 910-1, their remediation project will be closed. If BLM also concurs with the No Further Action determination, Black Hills will abandon all eight (8) existing monitoring wells to the State Engineers Office Division of Water Resources (DWR) standards. Well abandonment would be completed in the late spring/early summer of 2018.

# **Appendix A**

**Figure 1: Wolf Creek Storage Unit Map**

**Figure 2: Wolf Creek 12 Monitor Well Location Map**



Figure 1: Wolf Creek Storage Unit Map

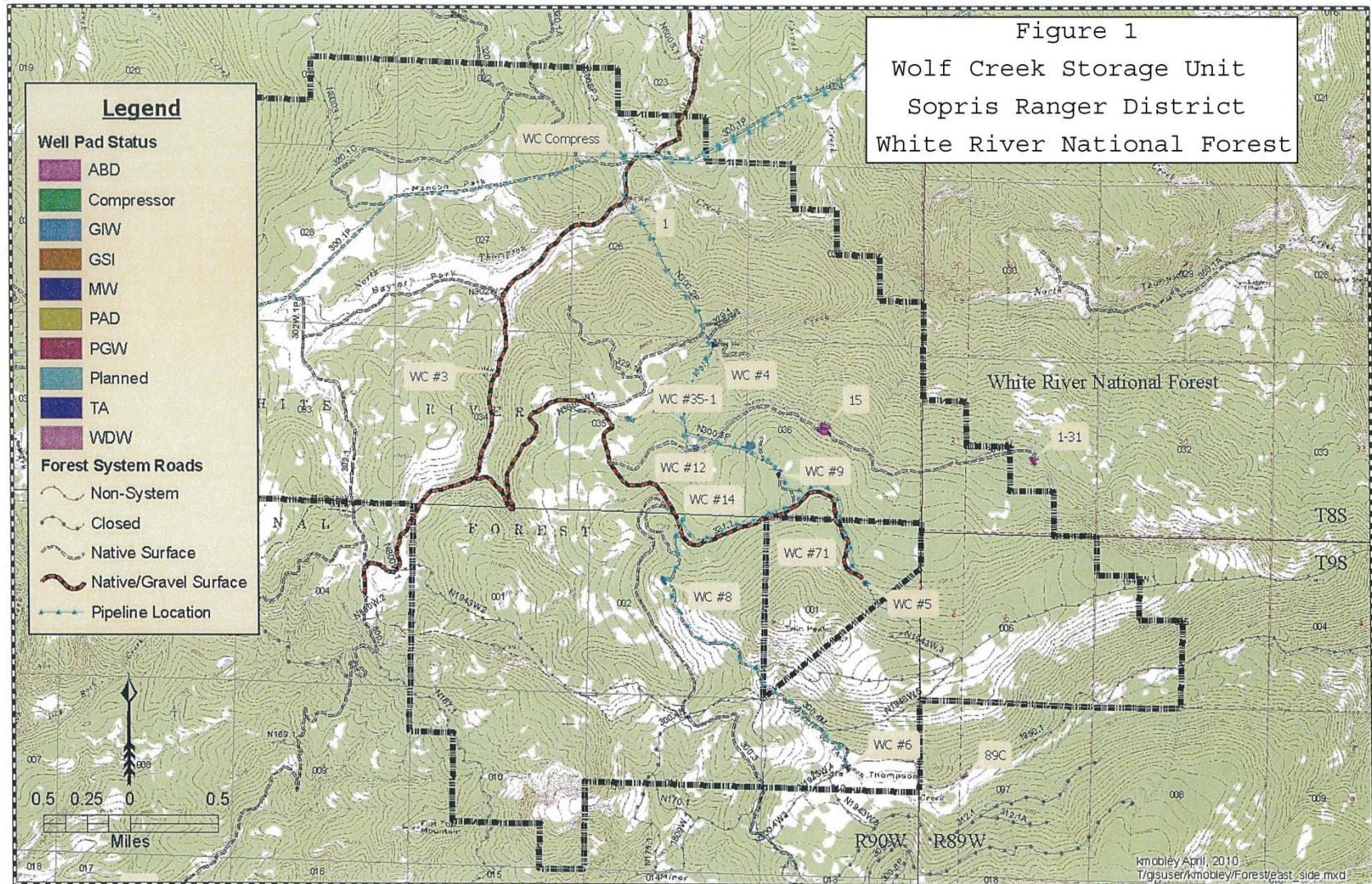
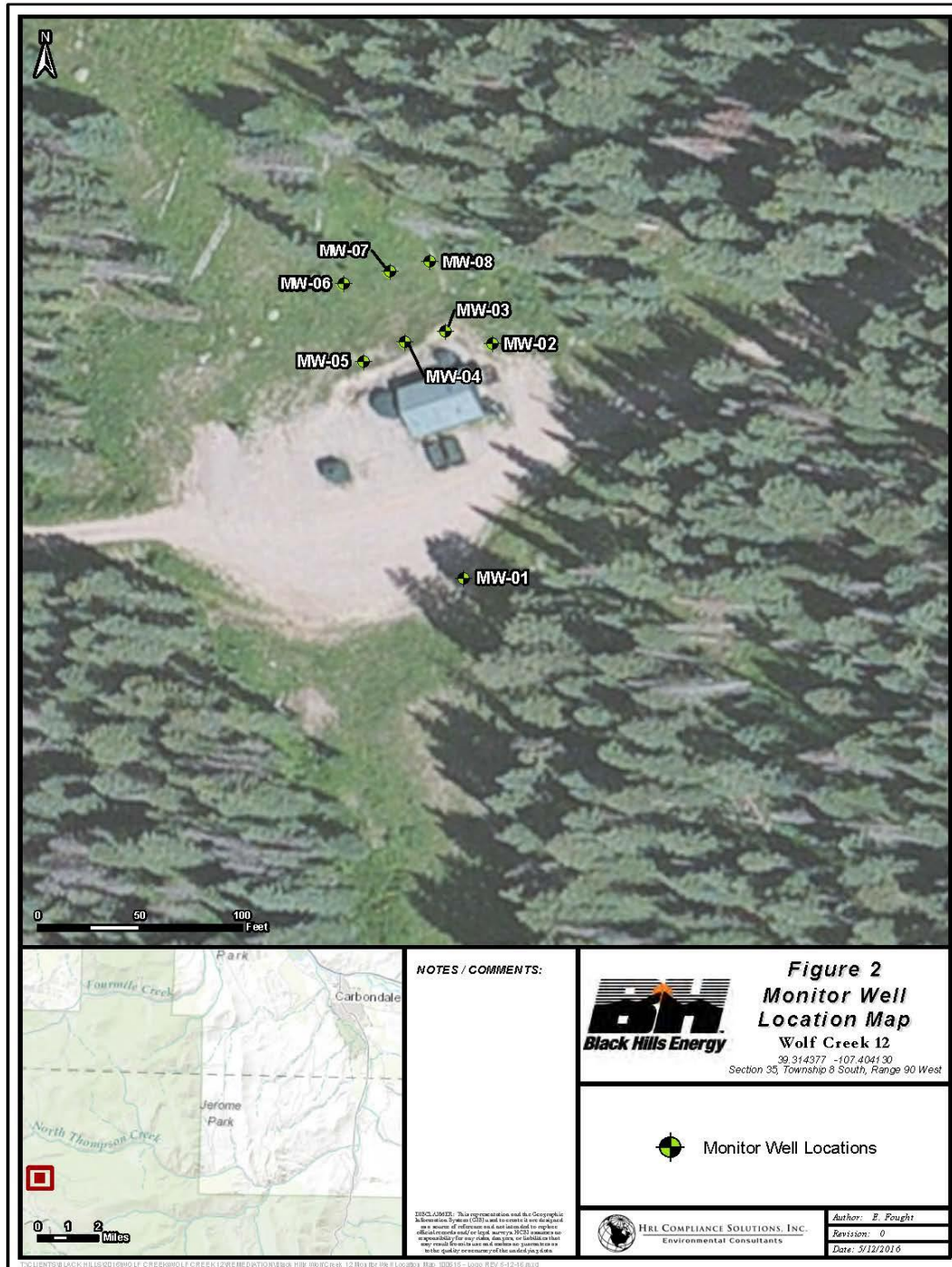




Figure 2: Wolf Creek 12 Monitor Well Location Map



## **Appendix B**

**Table 1: Analytical Lab Results**

**Table 2: Water Quality Field Parameters**

Table 1: Analytical Lab Results

Water Analysis		Exceeds Standard	J = Analyte is present at an estimated concentration between the MDL and Report Limit	U = Analyzed but not detected above the MDL			Method	SW8015M [DRL VI_8015_W]	SW8015 [GRO_8015_W]	SW8015M [ GCFID_8015_W]	SW8015M [ GCFID_8015_W]	SW8015M [ GCFID_8015_W]	SW8015M [ GCFID_8015_W]	SW8260	SW8260	SW8260	SW8260	SW8260	SW8260
N/A = Not Applicable		NT = Not Tested	MDL = Method Detection Limit	ND = Non-Detect			Analyte	DRO (C10- C28)	GRO (C6- C10)	Ethylene glycol	Methanol	Propylene glycol	Triethylene glycol	Benzene	Ethylbenzene	m,p-Xylene	o-Xylene	Toluene	Xylenes, Total
							Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
							COGCC Table 910-1 Standards	Below Detection Level	Below Detection Level	N/A	N/A	N/A	N/A	5	700	N/A	N/A	560 to 1,000	1,400 to 10,000
Sample ID	Well #	Latitude	Longitude	Matrix	Sample Date	WO #	CSEV Standards	N/A	N/A	14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-04	12	39.314551	-107.404095	Groundwater	10/15/2014	1410988-04		3.7	ND	ND	ND	ND	ND	3.1	ND	ND	ND	ND	ND
MW-04	12	39.314551	-107.404095	Groundwater	6/24/2015	15061647-04		2.4	ND	ND	ND	ND	ND	2.3	ND	ND	ND	ND	ND
MW-04	12	39.314551	-107.404095	Groundwater	9/18/2015	15091184-04		2.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-04	12	39.314551	-107.404095	Groundwater	6/29/2016	16061817-04		3.0	ND	ND	ND	ND	ND	2.3	ND	ND	ND	ND	ND
MW-04	12	39.314551	-107.404095	Groundwater	7/7/2017	1707402-01		ND	NT	NT	NT	NT	NT	1.7	ND	ND	ND	ND	ND
MW-04	12	39.314551	-107.404095	Groundwater	9/27/2017	NA		DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
MW-05	12	39.314523	-107.404165	Groundwater	7/18/2014	14071013-03		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-05	12	39.314523	-107.404165	Groundwater	10/15/2014	1410988-05		2.2	ND	ND	ND	ND	ND	2.4	ND	ND	ND	ND	ND
MW-05	12	39.314523	-107.404165	Groundwater	6/24/2015	15061647-05		1.2	ND	ND	ND	ND	ND	2.0	ND	ND	ND	ND	ND
MW-05	12	39.314523	-107.404165	Groundwater	9/18/2015	15091184-05		1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-05	12	39.314523	-107.404165	Groundwater	6/29/2016	16061817-05		1.9	ND	ND	ND	ND	ND	2.5	ND	ND	ND	ND	ND
MW-05	12	39.314523	-107.404165	Groundwater	7/7/2017	1707402-02		ND	NT	NT	NT	NT	NT	1.5	ND	ND	ND	ND	ND
MW-05	12	39.314523	-107.404165	Groundwater	9/27/2017	17091794-01		ND	NT	NT	NT	NT	NT	ND	ND	ND	ND	ND	ND
MW-06	12	39.314627	-107.404203	Groundwater	9/18/2015	15091184-06		1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-06	12	39.314627	-107.404203	Groundwater	6/29/2016	16061817-06		1.7	ND	ND	ND	ND	ND	8.4	2.3	14	ND	ND	14
MW-06	12	39.314627	-107.404203	Groundwater	8/3/2016	1608242-01		0.54	NT	NT	NT	NT	NT	5.4	1.5	7.9	ND	ND	7.9
MW-06	12	39.314627	-107.404203	Groundwater	11/16/2016	L873347-01		0.226	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-06	12	39.314627	-107.404203	Groundwater	7/7/2017	1707402-03		ND	NT	NT	NT	NT	NT	1.2	ND	3.6	ND	ND	3.6
MW-06 Duplicate	12	39.314627	-107.404203	Groundwater	7/7/2017	1707402-04		ND	NT	NT	NT	NT	NT	ND	ND	3.1	ND	ND	3.1
MW-06	12	39.314627	-107.404203	Groundwater	9/27/2017	17091794-02		ND	NT	NT	NT	NT	NT	1.0	ND	4.9	ND	ND	4.9
Duplicate - MW-06	12	39.314627	-107.404203	Groundwater	9/27/2017	17091794-03		ND	NT	NT	NT	NT	NT	ND	ND	4.4	ND	ND	4.4
Trip Blank	N/A	N/A	N/A	Trip Blank	7/18/2014	14071013-04		NT	NT	NT	NT	NT	NT	ND	ND	ND	ND	ND	ND
Trip Blank	N/A	N/A	N/A	Trip Blank	10/15/2014	1410988-07		NT	NT	NT	NT	NT	NT	ND	ND	ND	ND	ND	ND
Trip Blank	N/A	N/A	N/A	Trip Blank	9/18/2015	15091184-10		NT	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Trip Blank	N/A	N/A	N/A	Trip Blank	6/29/2016	16061817-10		NT	NT	NT	NT	NT	NT	ND	ND	ND	ND	ND	ND
Trip Blank	N/A	N/A	N/A	Trip Blank	8/3/2016	1608242-04		NT	NT	NT	NT	NT	NT	ND	ND	ND	ND	ND	ND
Trip Blank	N/A	N/A	N/A	Trip Blank	11/16/2016	L873347-02		NT	ND	NT	NT	NT	NT	ND	ND	ND	ND	ND	ND
Trip Blank	N/A	N/A	N/A	Trip Blank	7/7/2017	1707402-05		NT	NT	NT	NT	NT	NT	ND	ND	ND	ND	ND	ND
Trip Blank	N/A	N/A	N/A	Trip Blank	9/27/2017	17091794-04		NT	NT	NT	NT	NT	NT	ND	ND	ND	ND	ND	ND



Table 2: Water Quality Field Parameters

Rocky Mountain Natural Gas Wolf Creek #12 Water Quality Parameters																						
Sample ID	Well #	Matrix	Latitude	Longitude	Date	Time	Depth to Water (ft.) Below Ground Surface	Depth of Well (ft.) Below Ground Surface	°C	mS/cm <sup>c</sup>	mS/cm	Ω*cm	TDS g/L	Sal	DO %	DO mg/L	pH	pHmV	ORP	Sampled (Y/N)	Notes	
MW-04	12	Groundwater	39.314551	-107.404095	7/8/2014	1448	DRY	9.85	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N	Installed well.	
MW-04	12	Groundwater	39.314551	-107.404095	7/14/2014	1333	DRY	9.85	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N	Dry. Installed flush-mount covers.	
MW-04	12	Groundwater	39.314551	-107.404095	7/18/2014	1149	DRY	9.85	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N	Dry.	
MW-04	12	Groundwater	39.314551	-107.404095	10/15/2014	1115	8.92	9.85	9.73	1.571	1.113	898.6	1.021	0.80	23.5	2.66	6.48	5.4	-8.9	Y	Clear, slight odor. Purged 250mL and collected 1490mL.	
MW-04	12	Groundwater	39.314551	-107.404095	6/24/2015	1447	6.47	9.85	8.66	1.677	1.154	866.7	1.090	0.85	88.9	9.37	6.33	1.0	-16.0	Y	Cloudy, slight odor. Purged 3 casing volumes. Collected apx. 1360 mL.	
MW-04	12	Groundwater	39.314551	-107.404095	9/17/2015	1135	8.06	9.41	9.53	0.918	0.647	1545.6	0.597	0.45	86.6	9.86	7.03	-30.0	-30.6	Y	Mod tan. Slight unrecognizable odor.	
MW-04	12	Groundwater	39.314551	-107.404095	6/29/2016	1014	7.05	9.85	9.87	1.976	1.405	711.8	1.284	1.01	101.2	11.38	6.77	5.4	-52.0	Y	Slightly cloudy. No odor. New flush mount cover installed.	
MW-04	12	Groundwater	39.314551	-107.404095	7/7/2017	1025	7.35	9.85	10.66	1.761	1.279	782.0	1.144	0.90	30.2	3.32	6.88	128.5	52.8	Y	Mild sed/cloudy. No odor. Purged on 7.6.17	
MW-04	12	Groundwater	39.314551	-107.404095	9/27/2017	-	DRY	9.85	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	Dry	
MW-05	12	Groundwater	39.314523	-107.404165	7/8/2014	1452	DRY	9.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N	Installed well.	
MW-05	12	Groundwater	39.314523	-107.404165	7/14/2014	1338	5.50	9.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N	Purged ~ 2.5 gal. Installed flush-mount covers.	
MW-05	12	Groundwater	39.314523	-107.404165	7/18/2014	1203	5.62	9.75	12.57	0.857	0.654	1527.2	0.557	0.42	21.9	2.32	6.55	4.2	79.2	Y	Cloudy, no odor. Apx. 1300 mL collected.	
MW-05	12	Groundwater	39.314523	-107.404165	10/15/2014	1130	6.12	9.75	9.07	1.196	0.832	1201.7	0.777	0.60	44.0	5.05	6.54	2.3	-7.6	Y	Clear, slight odor. Purged ~250mL and collected 1490mL.	
MW-05	12	Groundwater	39.314523	-107.404165	6/24/2015	1438	5.01	9.75	7.28	1.263	0.836	1196.3	8.210	0.63	29.0	3.48	6.34	0.3	22.7	Y	Clear, no odor, Purged 3 casing volumes. Collected apx. 1360 mL.	
MW-05	12	Groundwater	39.314523	-107.404165	9/17/2015	1150	6.00	9.00	10.89	0.722	0.527	1896.6	0.469	0.35	98.7	10.89	7.10	-33.1	-35.5	Y	Tan. Slight unrecognizable odor.	
MW-05	12	Groundwater	39.314523	-107.404165	6/29/2016	957	5.51	9.75	7.94	1.362	0.918	189.3	0.885	0.68	12.9	1.52	6.53	18.2	-31.4	Y	Clear. No odor. Purged 3 casing volumes.	
MW-05	12	Groundwater	39.314523	-107.404165	7/7/2017	1030	5.61	9.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	Mod. Sediment/cloudy. No odor. Unable to collect water quality readings due to lack of sample matrix.	
MW-05	12	Groundwater	39.314523	-107.404165	9/27/2017	1345	7.56	9.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	Slight odor. Very slow recovery. Insufficient water to collect water quality readings.	
MW-06	12	Groundwater	39.314627	-107.404203	9/17/2015	1210	6.80	25.75	9.02	1.802	1.252	798.8	1.171	0.92	43.1	4.96	7.34	-43.2	-29.9	Y	Light tan. No odor.	
MW-06	12	Groundwater	39.314627	-107.404203	6/29/2016	937	6.65	25.75	6.25	1.428	0.917	1090.6	0.928	0.72	14.1	1.73	6.60	14.3	-31.4	Y	Clear. Slight sulphur odor. Collected from 18-20' screen interval.	
MW-06	12	Groundwater	39.314627	-107.404203	8/3/2016	1225	7.20	25.75	6.34	1.449	0.933	1071.5	0.943	0.73	13.6	1.66	6.31	27.5	-37.2	Y	Slightly cloudy. Slight sheen on surface. Installed new tubing. Sulphur odor. Purged 5 gal.	
MW-06	12	Groundwater	39.314627	-107.404203	7/7/2017	1044	7.06	25.74	6.55	1.566	1.017	982.96	1.018	0.79	26.4	3.20	6.71	137.0	157.4	Y	Clear. No odor. Good recovery. Collected duplicate sample. Purged 3 casing volumes on 7/6/17.	
MW-06	12	Groundwater	39.314627	-107.404203	9/27/2017	1410	8.60	25.75	8.94	1.275	0.884	1131.1	0.828	0.64	19.1	2.20	6.71	0.3	-4.3	Y	Fairly clear. Slight odor. Collected duplicate sample. Purged 3 casing volumes on 9/26/17.	

# **Appendix C**

## **Raw Analytical Data**



06-Oct-2017

Mark Mumby  
HRL Compliance Solutions, Inc  
2385 F 1/2 Road  
Grand Junction, CO 81505

Re: **Black Hills - Wolf Creek 12 GW Sample Event**

Work Order: **17091794**

Dear Mark,

ALS Environmental received 4 samples on 29-Sep-2017 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 12.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton".

Electronically approved by: Chad Whelton

Chad Whelton  
Project Manager

Certificate No: MN 998501

### Report of Laboratory Analysis

ADDRESS 3352 128th Ave Holland, Michigan 49424 | PHONE (616) 399-6070 | FAX (616) 399-6185

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

[www.alsglobal.com](http://www.alsglobal.com)

RIGHT SOLUTIONS RIGHT PARTNER

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**Client:** HRL Compliance Solutions, Inc  
**Project:** Black Hills - Wolf Creek 12 GW Sample Event  
**Work Order:** 17091794

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**Work Order Sample Summary**

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<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
17091794-01	MW-05	Groundwater		9/27/2017 13:45	9/29/2017 09:30	<input type="checkbox"/>
17091794-02	MW-06	Groundwater		9/27/2017 14:10	9/29/2017 09:30	<input type="checkbox"/>
17091794-03	Duplicate - MW-06	Groundwater		9/27/2017 14:10	9/29/2017 09:30	<input type="checkbox"/>
17091794-04	Trip Blank	Water		9/27/2017	9/29/2017 09:30	<input type="checkbox"/>

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**Client:** HRL Compliance Solutions, Inc  
**Project:** Black Hills - Wolf Creek 12 GW Sample Event  
**WorkOrder:** 17091794

## **QUALIFIERS, ACRONYMS, UNITS**

<b><u>Qualifier</u></b>	<b><u>Description</u></b>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<b><u>Acronym</u></b>	<b><u>Description</u></b>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<b><u>Units Reported</u></b>	<b><u>Description</u></b>
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

# ALS Group, USA

Date: 06-Oct-17

**Client:** HRL Compliance Solutions, Inc  
**Project:** Black Hills - Wolf Creek 12 GW Sample Event  
**Sample ID:** MW-05  
**Collection Date:** 9/27/2017 01:45 PM

**Work Order:** 17091794  
**Lab ID:** 17091794-01  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			SW8015C	Prep: SW3511 10/4/17 16:12		Analyst: KB
DRO (C10-C28)	ND		0.50	mg/L	1	10/5/2017 04:00 AM
Surr: 4-Terphenyl-d14	75.1		35-161	%REC	1	10/5/2017 04:00 AM
VOLATILE ORGANIC COMPOUNDS			SW8260B			Analyst: BG
Benzene	ND		1.0	µg/L	1	10/4/2017 06:47 AM
Ethylbenzene	ND		1.0	µg/L	1	10/4/2017 06:47 AM
m,p-Xylene	ND		2.0	µg/L	1	10/4/2017 06:47 AM
o-Xylene	ND		1.0	µg/L	1	10/4/2017 06:47 AM
Toluene	ND		1.0	µg/L	1	10/4/2017 06:47 AM
Xylenes, Total	ND		3.0	µg/L	1	10/4/2017 06:47 AM
Surr: 1,2-Dichloroethane-d4	94.0		75-120	%REC	1	10/4/2017 06:47 AM
Surr: 4-Bromofluorobenzene	96.9		80-110	%REC	1	10/4/2017 06:47 AM
Surr: Dibromofluoromethane	91.2		85-115	%REC	1	10/4/2017 06:47 AM
Surr: Toluene-d8	97.8		85-110	%REC	1	10/4/2017 06:47 AM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 06-Oct-17

**Client:** HRL Compliance Solutions, Inc  
**Project:** Black Hills - Wolf Creek 12 GW Sample Event  
**Sample ID:** MW-06  
**Collection Date:** 9/27/2017 02:10 PM

**Work Order:** 17091794  
**Lab ID:** 17091794-02  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>			<b>SW8015C</b>	Prep: SW3511 10/4/17 16:12		Analyst: <b>KB</b>
DRO (C10-C28)	ND		0.50	mg/L	1	10/5/2017 04:29 AM
Surr: 4-Terphenyl-d14	58.4		35-161	%REC	1	10/5/2017 04:29 AM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>			Analyst: <b>BG</b>
<b>Benzene</b>	<b>1.0</b>		<b>1.0</b>	<b>µg/L</b>	1	10/4/2017 07:03 AM
Ethylbenzene	ND		1.0	µg/L	1	10/4/2017 07:03 AM
<b>m,p-Xylene</b>	<b>4.9</b>		<b>2.0</b>	<b>µg/L</b>	1	10/4/2017 07:03 AM
o-Xylene	ND		1.0	µg/L	1	10/4/2017 07:03 AM
Toluene	ND		1.0	µg/L	1	10/4/2017 07:03 AM
<b>Xylenes, Total</b>	<b>4.9</b>		<b>3.0</b>	<b>µg/L</b>	1	10/4/2017 07:03 AM
Surr: 1,2-Dichloroethane-d4	92.8		75-120	%REC	1	10/4/2017 07:03 AM
Surr: 4-Bromofluorobenzene	99.0		80-110	%REC	1	10/4/2017 07:03 AM
Surr: Dibromofluoromethane	93.2		85-115	%REC	1	10/4/2017 07:03 AM
Surr: Toluene-d8	99.1		85-110	%REC	1	10/4/2017 07:03 AM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 06-Oct-17

**Client:** HRL Compliance Solutions, Inc  
**Project:** Black Hills - Wolf Creek 12 GW Sample Event  
**Sample ID:** Duplicate - MW-06  
**Collection Date:** 9/27/2017 02:10 PM

**Work Order:** 17091794  
**Lab ID:** 17091794-03  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			SW8015C	Prep: SW3511 10/4/17 16:12		Analyst: KB
DRO (C10-C28)	ND		0.50	mg/L	1	10/5/2017 04:58 AM
Surr: 4-Terphenyl-d14	78.3		35-161	%REC	1	10/5/2017 04:58 AM
VOLATILE ORGANIC COMPOUNDS			SW8260B			Analyst: BG
Benzene	ND		1.0	µg/L	1	10/4/2017 07:19 AM
Ethylbenzene	ND		1.0	µg/L	1	10/4/2017 07:19 AM
m,p-Xylene	4.4		2.0	µg/L	1	10/4/2017 07:19 AM
o-Xylene	ND		1.0	µg/L	1	10/4/2017 07:19 AM
Toluene	ND		1.0	µg/L	1	10/4/2017 07:19 AM
Xylenes, Total	4.4		3.0	µg/L	1	10/4/2017 07:19 AM
Surr: 1,2-Dichloroethane-d4	93.4		75-120	%REC	1	10/4/2017 07:19 AM
Surr: 4-Bromofluorobenzene	97.4		80-110	%REC	1	10/4/2017 07:19 AM
Surr: Dibromofluoromethane	92.0		85-115	%REC	1	10/4/2017 07:19 AM
Surr: Toluene-d8	97.8		85-110	%REC	1	10/4/2017 07:19 AM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.



**ALS Group, USA****Date:** 06-Oct-17

**Client:** HRL Compliance Solutions, Inc  
**Project:** Black Hills - Wolf Creek 12 GW Sample Event  
**Sample ID:** Trip Blank  
**Collection Date:** 9/27/2017

**Work Order:** 17091794  
**Lab ID:** 17091794-04  
**Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>			Analyst: <b>BG</b>
Benzene	ND		1.0	µg/L	1	10/4/2017 02:48 AM
Ethylbenzene	ND		1.0	µg/L	1	10/4/2017 02:48 AM
m,p-Xylene	ND		2.0	µg/L	1	10/4/2017 02:48 AM
o-Xylene	ND		1.0	µg/L	1	10/4/2017 02:48 AM
Toluene	ND		1.0	µg/L	1	10/4/2017 02:48 AM
Xylenes, Total	ND		3.0	µg/L	1	10/4/2017 02:48 AM
Surr: 1,2-Dichloroethane-d4	91.5		75-120	%REC	1	10/4/2017 02:48 AM
Surr: 4-Bromofluorobenzene	96.0		80-110	%REC	1	10/4/2017 02:48 AM
Surr: Dibromofluoromethane	91.5		85-115	%REC	1	10/4/2017 02:48 AM
Surr: Toluene-d8	99.2		85-110	%REC	1	10/4/2017 02:48 AM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**Client:** HRL Compliance Solutions, Inc  
**Work Order:** 17091794  
**Project:** Black Hills - Wolf Creek 12 GW Sample Event

# QC BATCH REPORT

Batch ID: **108381** Instrument ID **GC8** Method: **SW8015C**

<b>MBLK</b>		Sample ID: <b>DBLKW1-108381-108381</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/4/2017 11:11 PM</b>		
Client ID:		Run ID: <b>GC8_171004B</b>				SeqNo: <b>4679222</b>		Prep Date: <b>10/4/2017</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28) ND 0.10  
*Surr: 4-Terphenyl-d14* 0.029 0 0.0417 0 69.5 35-161 0

<b>LCS</b>		Sample ID: <b>DLCSW1-108381-108381</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/4/2017 11:40 PM</b>		
Client ID:		Run ID: <b>GC8_171004B</b>				SeqNo: <b>4679223</b>		Prep Date: <b>10/4/2017</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28) 4.028 0.10 4.17 0 96.6 60-150 0  
*Surr: 4-Terphenyl-d14* 0.0315 0 0.0417 0 75.5 35-161 0

<b>MS</b>		Sample ID: <b>17091727-04B MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/5/2017 01:07 AM</b>		
Client ID:		Run ID: <b>GC8_171004B</b>				SeqNo: <b>4679224</b>		Prep Date: <b>10/4/2017</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28) 4.222 0.10 4.17 0.147 97.7 60-150 0  
*Surr: 4-Terphenyl-d14* 0.02133 0 0.0417 0 51.2 35-161 0

The following samples were analyzed in this batch:

17091794-01B	17091794-02B	17091794-03B
--------------	--------------	--------------

**Client:** HRL Compliance Solutions, Inc  
**Work Order:** 17091794  
**Project:** Black Hills - Wolf Creek 12 GW Sample Event

## QC BATCH REPORT

Batch ID: **R221393**      Instrument ID **VMS10**      Method: **SW8260B**

MBLK		Sample ID: <b>VLKW3-171003-R221393</b>				Units: <b>µg/L</b>		Analysis Date: <b>10/4/2017 02:00 AM</b>		
Client ID:		Run ID: <b>VMS10_171003B</b>				SeqNo: <b>4676667</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	ND	1.0								
Ethylbenzene	ND	1.0								
m,p-Xylene	ND	2.0								
o-Xylene	ND	1.0								
Toluene	ND	1.0								
Xylenes, Total	ND	3.0								
Surr: 1,2-Dichloroethane-d4	18.09	0	20	0	90.4	75-120	0			
Surr: 4-Bromofluorobenzene	19.19	0	20	0	96	80-110	0			
Surr: Dibromofluoromethane	17.83	0	20	0	89.2	85-115	0			
Surr: Toluene-d8	19.84	0	20	0	99.2	85-110	0			

LCS		Sample ID: <b>VLCSW2-171003-R221393</b>				Units: <b>µg/L</b>		Analysis Date: <b>10/4/2017 01:28 AM</b>		
Client ID:		Run ID: <b>VMS10_171003B</b>				SeqNo: <b>4676666</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	18.4	1.0	20	0	92	85-125	0			
Ethylbenzene	19.95	1.0	20	0	99.8	85-125	0			
m,p-Xylene	40.29	2.0	40	0	101	75-130	0			
o-Xylene	20.53	1.0	20	0	103	80-125	0			
Toluene	19.1	1.0	20	0	95.5	85-125	0			
Xylenes, Total	60.82	3.0	60	0	101	80-126	0			
Surr: 1,2-Dichloroethane-d4	17.17	0	20	0	85.8	75-120	0			
Surr: 4-Bromofluorobenzene	20.87	0	20	0	104	80-110	0			
Surr: Dibromofluoromethane	17.77	0	20	0	88.8	85-115	0			
Surr: Toluene-d8	20.45	0	20	0	102	85-110	0			

MS		Sample ID: <b>17091693-13A MS</b>				Units: <b>µg/L</b>		Analysis Date: <b>10/4/2017 07:34 AM</b>		
Client ID:		Run ID: <b>VMS10_171003B</b>				SeqNo: <b>4676693</b>		Prep Date:		DF: <b>10</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	199.3	10	200	0	99.6	85-125	0			
Ethylbenzene	337.5	10	200	105.8	116	85-125	0			
m,p-Xylene	744.6	20	400	265.4	120	75-130	0			
o-Xylene	232.4	10	200	14	109	80-125	0			
Toluene	202.1	10	200	0	101	85-125	0			
Xylenes, Total	977	30	600	279.4	116	80-126	0			
Surr: 1,2-Dichloroethane-d4	177.9	0	200	0	89	75-120	0			
Surr: 4-Bromofluorobenzene	213.9	0	200	0	107	80-110	0			
Surr: Dibromofluoromethane	181.3	0	200	0	90.6	85-115	0			
Surr: Toluene-d8	203.4	0	200	0	102	85-110	0			

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** HRL Compliance Solutions, Inc  
**Work Order:** 17091794  
**Project:** Black Hills - Wolf Creek 12 GW Sample Event

## QC BATCH REPORT

Batch ID: **R221393**      Instrument ID **VMS10**      Method: **SW8260B**

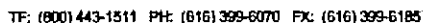
MSD				Sample ID: 17091693-13A MSD			Units: µg/L		Analysis Date: 10/4/2017 07:50 AM	
Client ID:			Run ID: VMS10_171003B			SeqNo: 4676704		Prep Date:		DF: 10
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	194.5	10	200	0	97.2	85-125	199.3	2.44	30	
Ethylbenzene	336.5	10	200	105.8	115	85-125	337.5	0.297	30	
m,p-Xylene	728.3	20	400	265.4	116	75-130	744.6	2.21	30	
o-Xylene	232.2	10	200	14	109	80-125	232.4	0.0861	30	
Toluene	202.2	10	200	0	101	85-125	202.1	0.0495	30	
Xylenes, Total	960.5	30	600	279.4	114	80-126	977	1.7	30	
Surr: 1,2-Dichloroethane-d4	178.4	0	200	0	89.2	75-120	177.9	0.281	30	
Surr: 4-Bromofluorobenzene	212.5	0	200	0	106	80-110	213.9	0.657	30	
Surr: Dibromofluoromethane	179.1	0	200	0	89.6	85-115	181.3	1.22	30	
Surr: Toluene-d8	205.3	0	200	0	103	85-110	203.4	0.93	30	

The following samples were analyzed in this batch:

17091794-01A	17091794-02A	17091794-03A
17091794-04A		

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.





17091794

Form 2022-01

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	<i>M.E. Mumby</i>	M.E. Mumby	9/28/17	12:15
RECEIVED BY	<i>MR</i>	<i>MR</i>	9-28-17	12:15-
RELINQUISHED BY	<i>WA</i>	<i>WA</i>	9-28-17	1830
RECEIVED BY	<i>Keith Wierenga</i>	Keith Wierenga	9/28/17	0930
RELINQUISHED BY				
RECEIVED BY				

Sample Receipt Checklist

Client Name: **HRL**

Date/Time Received: **29-Sep-17 09:30**

Work Order: **17091794**

Received by: **KRW**

Checklist completed by Keith Wurenga  
eSignature

29-Sep-17  
Date

Reviewed by: Chad Whelton  
eSignature

02-Oct-17  
Date

Matrices: **Water**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample(s) received on ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>2.8/2.8 C</u>		<u>SR2</u>
Cooler(s)/Kit(s):	<u></u>		
Date/Time sample(s) sent to storage:	<u>9/29/2017 10:51:13 AM</u>		
Water - VOA vials have zero headspace?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted by:	<u>-</u>		

Login Notes:

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Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:

# **Appendix D**

**COGCC Field Inspection Report (Doc. # 689100067)**

**FORM  
INSP**Rev  
X/15**State of Colorado  
Oil and Gas Conservation Commission**1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
Phone: (303) 894-2100 Fax: (303) 894-2109

Inspection Date:

06/29/2017

Submitted Date:

09/13/2017

Document Number:

689100067**FIELD INSPECTION FORM**
 Loc ID 314170 Inspector Name: LUJAN, CARLOS On-Site Inspection ☐ 2A Doc Num:                     
**Operator Information:**OGCC Operator Number: 100321Name of Operator: ROCKY MTN NATURAL GAS LLC ADBA BLACK HILLSAddress: 1515 WYNKOOP STREET #500City: DENVER State: CO Zip: 80202**Status Summary:**

- ☐ THIS IS A FOLLOW UP INSPECTION
- ☐ FOLLOW UP INSPECTION REQUIRED
- ☒ NO FOLLOW UP INSPECTION REQUIRED

**Findings:**9 Number of Comments0 Number of Corrective Actions☐ Corrective Action Response Requested**Contact Information:**

Contact Name	Phone	Email	Comment
Woolley, Carmia		cwoolley@blm.gov	BLM
Lujan, Carlos		carlos.lujan@state.co.us	EPS, NW Region
Ficklin, Steve		sficklin@blm.gov	BLM
Spencer, Stan		stan.spencer@state.co.us	EPS, NW Region
Fischer, Alex		alex.fischer@state.co.us	Environmental Supervisor, NW
Zehr, Brenda		brenda.zehr@blackhillscorp.com	Blackhills
Mobley, Karla		kkmobley@fs.fed.us	Forest Service

**Inspected Facilities:**

Facility ID	Type	Status	Status Date	Well Class	API Num	Facility Name	Insp Status
112149	PIT				-	WOLF CREEK 12	EI

**General Comment:**

Joint Site inspection conducted with representatives from Blackhills (Brenda Zehr), Forest Service (Karla Mobley), and BLM (Steve Ficklin). Sunny, temp approx. 78 oF. No weeds, junk or staining observed on site. Labels in place. 95 bbls produced water tanks have double wall (Secondary containment). No erosion observed on storm water drainage, access road or pad. Pit ID #112149 was entered in the database during the 1999 inventory but no information exists on file (electronic or COGCC archives). No signs of existence on the pad. Pit Facility ID #112149 has been closed administratively.

Remediation Project REM #7909 is open. Blackhills maintains a network of 5 monitoring wells. Groundwater samples analytical results have been within COGCC Table 910 values. A new round of sampling has been scheduled for October 2017. If analytical results indicate compliance with COGCC Table 910-1, the remediation Project REM #7909 will be closed.

Forest Service and/or BLM may require additional monitoring. When no additional monitoring is required, monitoring wells shall be properly plugged and abandoned in accordance with the State of Colorado, Office of the State Engineer (submitted to the Division of Water Resources).



**Location**Overall Good: ☒

Emergency Contact Number:

Comment:

Corrective Action:

Date: \_\_\_\_\_

Overall Good: ☒**Spills:**

Type	Area	Volume			

In Containment: No

Comment:

☐ Multiple Spills and Releases?**Venting:**

Yes/No			
Comment:			
Corrective Action:		Date:	

**Flaring:**

Type		
Comment:		
Corrective Action:		Date:

**Inspected Facilities**

Facility ID: 112149	Type: PIT	API Number: -	Status:	Insp. Status: EI
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**COGCC Comments**

Comment	User	Date
<p>Pit ID #112149 was entered in the database during the 1999 inventory but no information exists on file (electronic or COGCC archives). No signs of existence on the pad. Pit Facility ID #112149 has been closed administratively.</p> <p>Remediation Project REM #7909 is open. Blackhills maintains a network of 5 monitoring wells. Groundwater samples analytical results have been within COGCC Table 910 values. A new round of sampling has been scheduled for October 2017. If analytical results indicate compliance with COGCC Table 910-1, the remediation Project REM #7909 will be closed.</p> <p>Forest Service and/or BLM may require additional monitoring. When no additional monitoring is required, monitoring wells shall be properly plugged and abandoned in accordance with the State of Colorado, Office of the State Engineer (submitted to the Division of Water Resources).</p>	lujanc	09/13/2017

**Attached Documents**

You can go to COGCC Images (<https://cogcc.state.co.us/weblink/>) and search by document number:

Document Num	Description	URL
689100068	Photo Report WC 12	<a href="http://ogccweblink.state.co.us/DownloadDocumentPDF.aspx?DocumentId=4250016">http://ogccweblink.state.co.us/DownloadDocumentPDF.aspx?DocumentId=4250016</a>