

PDC Energy, Inc.
Fourth Quarter 2017 Groundwater Monitoring Summary

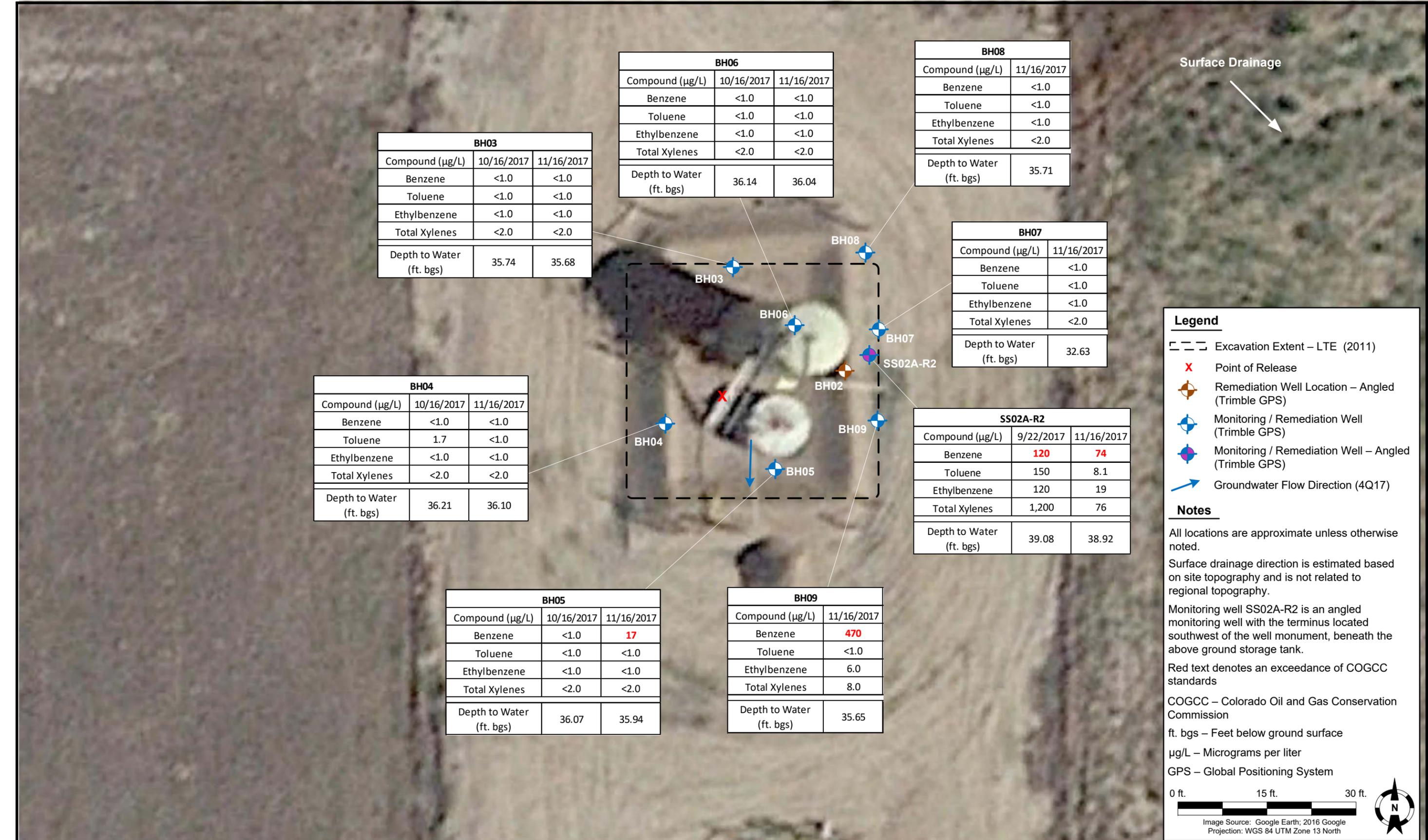
January 24, 2018

Barrell 41-4 Tank Battery
NENE Section 4 T6N R64W
Spill Point ID # 2213128
Remediation # 7846

This groundwater monitoring summary has been prepared by Tasman Geosciences, Inc. for the Barrell 41-4 tank battery. Between September 21 and November 3, 2017, eight monitoring wells (BH03 – BH09, SS02A-R2) were installed to delineate the extent of dissolved phase hydrocarbons in groundwater associated with the release discovered on February 10, 2011. On November 16, 2017, groundwater monitoring was conducted at all eight monitoring well locations (BH03 – BH09, SS02A-R2). Eight groundwater samples were submitted to Summit Scientific Laboratory for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 8260B. Analytical results are summarized in Table 1 and the laboratory reports are included as Attachment A. Sample locations and corresponding analytical results are illustrated on Figure 1. Fourth quarter 2017 analytical results indicate that benzene concentrations are above applicable COGCC Table 910-1 groundwater standards in monitoring wells BH05 and BH09. BTEX concentrations are below applicable regulatory standards in six sample locations.

Monitored natural attenuation (MNA) was selected as the remediation strategy for this site during the fourth quarter 2017 and will remain as the selected remediation strategy through the first quarter 2018, while additional remediation strategies are being evaluated.

First quarter 2018 groundwater sampling will be conducted during February 2018. Plans to install point of compliance wells are in progress and will be included in the first quarter 2018 groundwater sampling event.



DATE: November 27, 2017

DESIGNED BY: C. Hamlin

DRAWN BY: B. Nelson



Tasman Geosciences, Inc.
6899 Pecos Street – Unit C
Denver, CO 80221

PDC Energy, Inc. – DJ Basin
Barrell 41-4 Tank Battery
NENE, Section 4, Township 6 North, Range 64 West
Weld County, Colorado

GROUNDWATER
ANALYTICAL RESULTS
MAP

FIGURE
1

TABLE 1
BARRELL 41-4 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water ⁽²⁾ (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
SS02A-R2 ⁽³⁾	9/22/2017	120	150	120	1,200	39.08
SS02A-R2 ⁽³⁾	11/16/2017	74	8.1	19	76	38.92
BH03	10/16/2017	<1.0	<1.0	<1.0	<2.0	35.74
BH03	11/16/2017	<1.0	<1.0	<1.0	<2.0	35.68
BH04	10/16/2017	<1.0	1.7	<1.0	<2.0	36.21
BH04	11/16/2017	<1.0	<1.0	<1.0	<2.0	36.10
BH05	10/16/2017	<1.0	<1.0	<1.0	<2.0	36.07
BH05	11/16/2017	17	<1.0	<1.0	<2.0	35.94
BH06	10/16/2017	<1.0	<1.0	<1.0	<2.0	36.14
BH06	11/16/2017	<1.0	<1.0	<1.0	<2.0	36.04
BH07	11/16/2017	<1.0	<1.0	<1.0	<2.0	32.63
BH08	11/16/2017	<1.0	<1.0	<1.0	<2.0	35.71
BH09	11/16/2017	470	<1.0	6.0	8.0	35.65

Notes:

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective January 30, 2015.
2. Depth to water measurements were measured from ground surface for excavation samples. Monitoring well measurements were collected from top of casing and adjusted using survey data and product thickness to reflect depth of water from ground surface.
3. Monitoring well SS02A-R2 was drilled as an angled remediation well. Depth to water does not represent correct groundwater elevation.

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = Micrograms per liter

(<) = Analytical result is less than the indicated laboratory reporting limit.

BOLD = Analytical result is in exceedance of COGCC groundwater standards.

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

November 13, 2017

Mark Longhurst
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: Barrell 41-4

Enclosed are the results of analyses for samples received by Summit Scientific on 11/06/17 13:55. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury For Ben Shrewsbury
Laboratory Manager



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Barrell 41-4

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
11/13/17 12:56

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH07@25-27'	1711050-01	Soil	11/02/17 09:29	11/06/17 13:55
BH07@34-35'	1711050-02	Soil	11/02/17 09:47	11/06/17 13:55
BH08@25-27'	1711050-03	Soil	11/02/17 12:06	11/06/17 13:55
BH08@34-35'	1711050-04	Soil	11/02/17 12:39	11/06/17 13:55
BH09@25-27'	1711050-05	Soil	11/03/17 10:06	11/06/17 13:55
BH09@34-35'	1711050-06	Soil	11/03/17 10:41	11/06/17 13:55

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Summit Scientific

1711050

S₂

741 Corporate Circle, Suite J ♦ Golden, Colorado 80401

303-277-9310 ♦ 303-374-5933

Page 1 of 1

Client: PDC Enrgy

Project Manager: Mark Longhurst

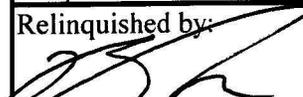
Address: _____ E-Mail: _____

City/State/Zip: _____

Phone: _____ Fax: _____ Project Name: Barrell 41-4

Sampler Name: Brack Nelson Project Number: _____

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested				Special Instructions	
					HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air-Canister #	Other (Specify)						
1	BH07② 25-27'	11/2/17	929	1			X			X								
2	BH07② 34-35'	11/2/17	947	1			X			X								
3	BH08② 25-27'	11/2/17	1206	1			X			X								
4	BH08② 34-35'	11/2/17	1239	1			X			X								
5	BH09② 25-27'	11/3/17	1006	1			X			X								
6	BH09② 34-35'	11/3/17	1041	1			X			X								
7																		
8																		
9																		
10																		

Relinquished by: 	Date/Time: <u>11/3/17 1355</u>	Received by: 	Date/Time: <u>11-3-17 13:55</u>	Turn Around Time (Check) Same Day _____ 72 hours 24 hours _____ Standard <u>X</u> 48 hours _____ Sample Integrity: Temperature Upon Receipt: <u>.4</u> Intact: <u>Yes</u> No	Notes:
Relinquished by: _____	Date/Time: _____	Received by: _____	Date/Time: _____		
Relinquished by: _____	Date/Time: _____	Received by: _____	Date/Time: _____		

1711050

Sample Receipt Checklist

S2 Work Order: _____

Client: PDC ENERGY Client Project ID: BARRELL 41-4

Shipped Via: H.D. ON ICE Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Matrix (check all that apply): Air Soil/Solid Water Other: _____
(Describe)

Cooler ID				
Temp (°C)	<u>.4</u>			

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ? NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.	<input checked="" type="checkbox"/>			
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present?			<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect			<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ? Record the pH in Comments.			<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.

Musi P.
Custodian Printed Name

DA 11-3-17
Signature or Initials of Custodian

15:00
Date/Time



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Barrell 41-4
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
11/13/17 12:56

BH07@25-27'
1711050-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **11/02/17 09:29**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1711094	11/07/17	11/08/17	8015M	

Date Sampled: **11/02/17 09:29**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		101 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/02/17 09:29**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1711092	11/07/17	11/07/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **11/02/17 09:29**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		156 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		166 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.6 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Barrell 41-4
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
11/13/17 12:56

BH07@34-35'
1711050-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **11/02/17 09:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1711094	11/07/17	11/08/17	8015M	

Date Sampled: **11/02/17 09:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		102 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/02/17 09:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1711092	11/07/17	11/08/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **11/02/17 09:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		119 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		86.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.4 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Barrell 41-4
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
11/13/17 12:56

BH08@25-27'
1711050-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **11/02/17 12:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1711094	11/07/17	11/08/17	8015M	

Date Sampled: **11/02/17 12:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		102 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/02/17 12:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1711092	11/07/17	11/08/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **11/02/17 12:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		122 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		119 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Barrell 41-4
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
11/13/17 12:56

BH08@34-35'
1711050-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **11/02/17 12:39**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1711094	11/07/17	11/08/17	8015M	

Date Sampled: **11/02/17 12:39**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		102 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/02/17 12:39**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1711092	11/07/17	11/08/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **11/02/17 12:39**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		120 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.4 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Barrell 41-4
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
11/13/17 12:56

BH09@25-27'
1711050-05 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **11/03/17 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1711094	11/07/17	11/08/17	8015M	

Date Sampled: **11/03/17 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		103 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/03/17 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1711092	11/07/17	11/08/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **11/03/17 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		117 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.4 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Barrell 41-4
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
11/13/17 12:56

BH09@34-35'
1711050-06 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **11/03/17 10:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1711094	11/07/17	11/08/17	8015M	

Date Sampled: **11/03/17 10:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		99.5 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/03/17 10:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1711092	11/07/17	11/08/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **11/03/17 10:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		113 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.4 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Barrell 41-4

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 11/13/17 12:56

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Reporting			Spike Level	Source		%REC		RPD		Notes
	Result	Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch 1711094 - EPA 3550A

Blank (1711094-BLK1)				Prepared: 11/07/17 Analyzed: 11/08/17							
C10-C28 (DRO)	ND	50	mg/kg								
Surrogate: o-Terphenyl	13.1		"	12.5		105	30-150				
LCS (1711094-BS1)				Prepared: 11/07/17 Analyzed: 11/08/17							
C10-C28 (DRO)	547	50	mg/kg	499		110	73-134				
Surrogate: o-Terphenyl	14.2		"	12.5		114	30-150				
Matrix Spike (1711094-MS1)				Source: 1711045-01		Prepared: 11/07/17 Analyzed: 11/08/17					
C10-C28 (DRO)	567	50	mg/kg	499	39.6	106	50-148				
Surrogate: o-Terphenyl	16.1		"	12.5		129	30-150				
Matrix Spike Dup (1711094-MSD1)				Source: 1711045-01		Prepared: 11/07/17 Analyzed: 11/08/17					
C10-C28 (DRO)	528	50	mg/kg	499	39.6	97.9	50-148	7.02		20	
Surrogate: o-Terphenyl	13.9		"	12.5		112	30-150				

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Barrell 41-4

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
11/13/17 12:56

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Result	Reporting		Spike Level	Source Result	%REC		RPD		Notes
		Limit	Units			%REC	Limits	RPD	Limit	

Batch 1711092 - EPA 5030 Soil MS

Blank (1711092-BLK1)

Prepared & Analyzed: 11/07/17

Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0424</i>		<i>"</i>	<i>0.0400</i>		<i>106</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0373</i>		<i>"</i>	<i>0.0400</i>		<i>93.2</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0390</i>		<i>"</i>	<i>0.0400</i>		<i>97.4</i>	<i>21-167</i>			

LCS (1711092-BS1)

Prepared & Analyzed: 11/07/17

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0695	0.0020	"	0.100		69.5	58-130			
Toluene	0.0848	0.0050	"	0.100		84.8	61-134			
Ethylbenzene	0.0909	0.0050	"	0.0992		91.7	74-139			
m,p-Xylene	0.158	0.010	"	0.200		79.4	73-137			
o-Xylene	0.0722	0.0050	"	0.0980		73.7	73-141			
Xylenes (total)	0.231	0.010	"				0-200			
Gasoline Range Hydrocarbons	1.50	0.50	"				30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0453</i>		<i>"</i>	<i>0.0400</i>		<i>113</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0400</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0326</i>		<i>"</i>	<i>0.0400</i>		<i>81.4</i>	<i>21-167</i>			

Matrix Spike (1711092-MS1)

Source: 1711045-01

Prepared & Analyzed: 11/07/17

Naphthalene	0.00330	0.010	mg/kg		ND		10-158			
Benzene	0.0656	0.0020	"	0.100	ND	65.6	30-131			
Toluene	0.0782	0.0050	"	0.100	ND	78.2	30-134			
Ethylbenzene	0.0810	0.0050	"	0.0992	ND	81.6	22-153			
m,p-Xylene	0.213	0.010	"	0.200	0.0535	80.0	10-159			
o-Xylene	0.121	0.0050	"	0.0980	0.0314	91.1	31-151			
Xylenes (total)	0.334	0.010	"		0.0850		30-160			
Gasoline Range Hydrocarbons	3.07	0.50	"		1.90		30-160			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0493</i>		<i>"</i>	<i>0.0400</i>		<i>123</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0400</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0414</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>21-167</i>			

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Barrell 41-4

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 11/13/17 12:56

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC			RPD	Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 1711092 - EPA 5030 Soil MS

Matrix Spike Dup (1711092-MSD1)	Source: 1711045-01			Prepared & Analyzed: 11/07/17						
Naphthalene	ND	0.010	mg/kg	ND	ND	10-158			42	
Benzene	0.0563	0.0020	"	0.100	ND	56.3	30-131	15.2	34	
Toluene	0.0690	0.0050	"	0.100	ND	69.0	30-134	12.5	30	
Ethylbenzene	0.0746	0.0050	"	0.0992	ND	75.2	22-153	8.22	24	
m,p-Xylene	0.177	0.010	"	0.200	0.0535	62.0	10-159	18.4	68	
o-Xylene	0.112	0.0050	"	0.0980	0.0314	82.1	31-151	7.59	38	
Xylenes (total)	0.289	0.010	"		0.0850		30-160	14.4	30	
Gasoline Range Hydrocarbons	2.96	0.50	"		1.90		30-160	3.69	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0469</i>		<i>"</i>	<i>0.0400</i>		<i>117</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0389</i>		<i>"</i>	<i>0.0400</i>		<i>97.2</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0419</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>21-167</i>			

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Barrell 41-4

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
11/13/17 12:56

Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

November 22, 2017

Christine Hamlin
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: Barrell 41-4

Enclosed are the results of analyses for samples received by Summit Scientific on 11/16/17 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ben Shrewsbury', with a long, sweeping horizontal line extending to the right.

Ben Shrewsbury
Laboratory Manager



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Barrell 41-4

Project Number: [none]
Project Manager: Christine Hamlin

Reported:
11/22/17 11:56

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH03	1711227-01	Water	11/16/17 10:20	11/16/17 17:00
BH04	1711227-02	Water	11/16/17 10:10	11/16/17 17:00
BH05	1711227-03	Water	11/16/17 10:41	11/16/17 17:00
BH06	1711227-04	Water	11/16/17 10:20	11/16/17 17:00
BH07	1711227-05	Water	11/16/17 10:45	11/16/17 17:00
BH08	1711227-06	Water	11/16/17 10:20	11/16/17 17:00
BH09	1711227-07	Water	11/16/17 10:30	11/16/17 17:00
SS02A-R2	1711227-08	Water	11/16/17 10:50	11/16/17 17:00

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

1711227

Sample Receipt Checklist

S2 Work Order: _____

Client: PDC/TASMAN Client Project ID: Barrell 41-4Shipped Via: _____ Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)Matrix (check all that apply): Air Soil/Solid Water Other: _____
(Describe)

Cooler ID					
Temp (°C)	3.2				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C ⁽¹⁾ ? NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	<input checked="" type="checkbox"/>			
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present?			<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.		<input checked="" type="checkbox"/>		
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ? Note the type of preservative in the Comments column – HCl, H ₂ SO ₄ , NaOH, HNO ₃ , ect			<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ? Record the pH in Comments.			<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				
⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.				

Murip.
Custodian Printed NameAD 11-16-17
Signature or Initials of Custodian17:30
Date/Time



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Barrell 41-4
 Project Number: [none]
 Project Manager: Christine Hamlin

Reported:
 11/22/17 11:56

BH03
1711227-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/16/17 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1711280	11/21/17	11/21/17	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **11/16/17 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		97.1 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		98.5 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	45-146		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Barrell 41-4
 Project Number: [none]
 Project Manager: Christine Hamlin

Reported:
 11/22/17 11:56

BH04
1711227-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/16/17 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1711280	11/21/17	11/21/17	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **11/16/17 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		94.4 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.8 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		104 %	45-146		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Barrell 41-4
 Project Number: [none]
 Project Manager: Christine Hamlin

Reported:
 11/22/17 11:56

BH05
1711227-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/16/17 10:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	17	1.0	ug/l	1	1711280	11/21/17	11/21/17	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **11/16/17 10:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		94.4 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		96.0 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		103 %	45-146		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Barrell 41-4

Project Number: [none]
 Project Manager: Christine Hamlin

Reported:
 11/22/17 11:56

BH06
1711227-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/16/17 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1711280	11/21/17	11/21/17	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **11/16/17 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.8 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		102 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	45-146		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Barrell 41-4

Project Number: [none]
 Project Manager: Christine Hamlin

Reported:
 11/22/17 11:56

BH07
1711227-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/16/17 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1711280	11/21/17	11/21/17	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **11/16/17 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		97.1 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		98.9 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	45-146		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Barrell 41-4

Project Number: [none]
 Project Manager: Christine Hamlin

Reported:
 11/22/17 11:56

BH08
1711227-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/16/17 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1711280	11/21/17	11/21/17	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **11/16/17 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		96.1 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		97.3 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	45-146		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Barrell 41-4
 Project Number: [none]
 Project Manager: Christine Hamlin

Reported:
 11/22/17 11:56

BH09
1711227-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/16/17 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	470	10	ug/l	10	1711280	11/21/17	11/21/17	EPA 8260B	
Toluene	ND	1.0	"	1	"	"	"	"	
Ethylbenzene	6.0	1.0	"	"	"	"	"	"	
Xylenes (total)	8.0	2.0	"	"	"	"	"	"	

Date Sampled: **11/16/17 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		89.3 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		97.8 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		107 %	45-146		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Barrell 41-4

Project Number: [none]
 Project Manager: Christine Hamlin

Reported:
 11/22/17 11:56

SS02A-R2
1711227-08 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/16/17 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	74	1.0	ug/l	1	1711280	11/21/17	11/21/17	EPA 8260B	
Toluene	8.1	1.0	"	"	"	"	"	"	
Ethylbenzene	19	1.0	"	"	"	"	"	"	
Xylenes (total)	76	2.0	"	"	"	"	"	"	

Date Sampled: **11/16/17 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		97.2 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.2 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		108 %	45-146		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Barrell 41-4
Project Number: [none]
Project Manager: Christine Hamlin

Reported:
11/22/17 11:56

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 1711280 - EPA 5030 Water MS

Blank (1711280-BLK1)

Prepared & Analyzed: 11/20/17

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	14.1		"	13.3		106	37-154			
Surrogate: Toluene-d8	13.6		"	13.3		102	45-149			
Surrogate: 4-Bromofluorobenzene	13.8		"	13.3		103	45-146			

LCS (1711280-BS1)

Prepared & Analyzed: 11/20/17

Benzene	24.6	1.0	ug/l	33.3		74.0	51-132			
Toluene	30.9	1.0	"	33.3		92.6	51-138			
Ethylbenzene	36.8	1.0	"	33.1		111	58-146			
m,p-Xylene	71.8	2.0	"	66.5		108	57-144			
o-Xylene	34.7	1.0	"	32.7		106	53-146			
Surrogate: 1,2-Dichloroethane-d4	14.4		"	13.3		108	37-154			
Surrogate: Toluene-d8	13.4		"	13.3		100	45-149			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		100	45-146			

Matrix Spike (1711280-MS1)

Source: 1711245-01

Prepared & Analyzed: 11/20/17

Benzene	410	1.0	ug/l	33.3	671	NR	34-141			E, QM-07
Toluene	701	1.0	"	33.3	1830	NR	27-151			E, QM-07
Ethylbenzene	191	1.0	"	33.1	224	NR	29-160			QM-07
m,p-Xylene	978	2.0	"	66.5	1060	NR	20-166			E, QM-07
o-Xylene	428	1.0	"	32.7	454	NR	33-159			E, QM-07
Surrogate: 1,2-Dichloroethane-d4	14.6		"	13.3		109	37-154			
Surrogate: Toluene-d8	13.5		"	13.3		101	45-149			
Surrogate: 4-Bromofluorobenzene	13.6		"	13.3		102	45-146			

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 12 of 14



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Barrell 41-4
 Project Number: [none]
 Project Manager: Christine Hamlin

Reported:
 11/22/17 11:56

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC			RPD	Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 1711280 - EPA 5030 Water MS

Matrix Spike Dup (1711280-MSD1)	Source: 1711245-01			Prepared & Analyzed: 11/20/17						
Benzene	361	1.0	ug/l	33.3	671	NR	34-141	12.7	32	E, QM-07
Toluene	639	1.0	"	33.3	1830	NR	27-151	9.25	25	E, QM-07
Ethylbenzene	173	1.0	"	33.1	224	NR	29-160	9.89	50	QM-07
m,p-Xylene	911	2.0	"	66.5	1060	NR	20-166	7.09	36	E, QM-07
o-Xylene	392	1.0	"	32.7	454	NR	33-159	8.78	26	E, QM-07
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>15.6</i>		<i>"</i>	<i>13.3</i>		<i>117</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.1</i>		<i>"</i>	<i>13.3</i>		<i>98.3</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>14.8</i>		<i>"</i>	<i>13.3</i>		<i>111</i>	<i>45-146</i>			

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Barrell 41-4
Project Number: [none]
Project Manager: Christine Hamlin

Reported:
11/22/17 11:56

Notes and Definitions

- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.
- E The concentration indicated for this analyte is an estimated value above the calibration range of the instrument.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference