

TABLE 1
ARMSTEAD #1 WELLHEAD
SOIL ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH ⁽²⁾ (mg/kg)
COGCC standards for soil (mg/kg) ⁽¹⁾			0.17	85	100	175	23	500
SS01 @ 5'	4/22/2016	5	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS02 @ 5'	4/22/2016	5	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS03 @ 5'	4/22/2016	5	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS04 @ 5'	4/22/2016	5	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50

Notes:

1. Standards for soil are taken from 2 CCR 404-1, Table 910-1, effective January 30, 2015.

2. TPH - Total volatile and extractable petroleum hydrocarbons. Value calculated by adding GRO and DRO concentrations.

COGCC = Colorado Oil and Gas Conservation Commission

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

GRO = Total volatile petroleum hydrocarbons - gasoline range organics

DRO = Total extractable petroleum hydrocarbons - diesel range organics

mg/kg = Milligrams per kilogram

bgs = Below ground surface

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

TABLE 2
ARMSTEAD #1 WELLHEAD
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 (feet bgs)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
GW01	4/27/2016	<1.0	<1.0	<1.0	5.2	~ 7

Notes:

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective January 30, 2015.

COGCC = Colorado Oil and Gas Conservation Commission

µg/L= Micrograms per liter

bgs = Below ground surface

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

NM = Not measured

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

April 27, 2016

Mark Longhurst
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: Armstead #1 Well head

Enclosed are the results of analyses for samples received by Summit Scientific on 04/22/16 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



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

Project: Armstead #1 Well head

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/27/16 14:13

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01@5'	1604193-01	Soil	04/22/16 12:35	04/22/16 17:00
SS02@5'	1604193-02	Soil	04/22/16 12:40	04/22/16 17:00
SS03@5'	1604193-03	Soil	04/22/16 12:45	04/22/16 17:00
SS04@5'	1604193-04	Soil	04/22/16 12:45	04/22/16 17:00

Summit Scientific

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

Project: Armstead #1 Well head

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/27/16 14:13

Sample Receipt Checklist

S2 Work Order: 1604193

Client: DDC Kasman Client Project ID: Armstead #1 Well Head

Shipped Via: pick-up Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

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

Cooler ID					
Temp (°C)	<u>5.2°C</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⁾ ?			<input checked="" type="checkbox"/>	
<small>NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.</small>				
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⁾ ?			<input checked="" type="checkbox"/>	
<small>Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect</small>				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
<small>Record the pH in Comments.</small>				
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.

Nakita
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

4/27/16 14:13
Date/Time

[Signature]



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

Project: Armstead #1 Well head

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/27/16 14:13

SS01@5'
1604193-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/22/16 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604267	04/25/16	04/26/16	8015M	

Date Sampled: **04/22/16 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		99.9 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/22/16 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1604268	04/25/16	04/27/16	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: **04/22/16 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.6 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Armstead #1 Well head

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/27/16 14:13

SS02@5'
1604193-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/22/16 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604267	04/25/16	04/26/16	8015M	

Date Sampled: **04/22/16 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		93.8 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/22/16 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1604268	04/25/16	04/27/16	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: **04/22/16 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.9 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Armstead #1 Well head

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/27/16 14:13

SS03@5'
1604193-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 04/22/16 12:45

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604267	04/25/16	04/26/16	8015M	

Date Sampled: 04/22/16 12:45

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		97.3 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 04/22/16 12:45

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1604268	04/25/16	04/27/16	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: 04/22/16 12:45

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Armstead #1 Well head

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/27/16 14:13

SS04@5'
1604193-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/22/16 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604267	04/25/16	04/26/16	8015M	

Date Sampled: **04/22/16 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		97.0 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/22/16 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1604268	04/25/16	04/27/16	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: **04/22/16 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		110 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.0 %	21-167		"	"	"	"	

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

Project: Armstead #1 Well head

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/27/16 14:13

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 1604267 - EPA 3550A

Blank (1604267-BLK1)

Prepared & Analyzed: 04/25/16

C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	12.0		"	12.5	96.1	30-150					

LCS (1604267-BS1)

Prepared & Analyzed: 04/25/16

C10-C28 (DRO)	525	50	mg/kg	499	105	73-134					
<i>Surrogate: o-Terphenyl</i>	13.4		"	12.5	107	30-150					

Matrix Spike (1604267-MS1)

Source: 1604200-01

Prepared & Analyzed: 04/25/16

C10-C28 (DRO)	533	50	mg/kg	473	37.0	105	50-148				
<i>Surrogate: o-Terphenyl</i>	13.2		"	11.9	111	30-150					

Matrix Spike Dup (1604267-MSD1)

Source: 1604200-01

Prepared & Analyzed: 04/25/16

C10-C28 (DRO)	543	50	mg/kg	484	37.0	104	50-148	1.87	13		
<i>Surrogate: o-Terphenyl</i>	13.3		"	12.1	110	30-150					

Summit Scientific

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

Project: Armstead #1 Well head

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/27/16 14:13

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 1604268 - EPA 5030 Soil MS

Blank (1604268-BLK1)

Prepared & Analyzed: 04/25/16

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>0.0400</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0405</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0401</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>21-167</i>			

LCS (1604268-BS1)

Prepared & Analyzed: 04/25/16

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.101	0.0020	"	0.100		101	58-130			
Toluene	0.101	0.0050	"	0.100		101	61-134			
Ethylbenzene	0.103	0.0050	"	0.0992		104	74-139			
m,p-Xylene	0.147	0.010	"	0.200		73.7	73-137			
o-Xylene	0.0949	0.0050	"	0.0980		96.8	73-141			
Xylenes (total)	0.201	0.010	"				0-200			
Gasoline Range Hydrocarbons	1.34	0.50	"				30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0372</i>		<i>"</i>	<i>0.0400</i>		<i>93.0</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0443</i>		<i>"</i>	<i>0.0400</i>		<i>111</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0423</i>		<i>"</i>	<i>0.0400</i>		<i>106</i>	<i>21-167</i>			

Matrix Spike (1604268-MS1)

Source: 1604200-01

Prepared & Analyzed: 04/25/16

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.114	0.0020	"	0.100	ND	114	30-131			
Toluene	0.111	0.0050	"	0.100	ND	111	30-134			
Ethylbenzene	0.122	0.0050	"	0.0992	ND	123	22-153			
m,p-Xylene	0.125	0.010	"	0.200	ND	62.8	10-159			
o-Xylene	0.113	0.0050	"	0.0980	ND	115	31-151			
Xylenes (total)	0.238	0.010	"		ND		30-160			
Gasoline Range Hydrocarbons	1.70	0.50	"		ND		30-160			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0429</i>		<i>"</i>	<i>0.0400</i>		<i>107</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0420</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0410</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>21-167</i>			

Summit Scientific

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

Project: Armstead #1 Well head

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/27/16 14:13

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 1604268 - EPA 5030 Soil MS

Matrix Spike Dup (1604268-MSD1)	Source: 1604200-01			Prepared & Analyzed: 04/25/16						
Naphthalene	ND	0.010	mg/kg	ND	ND	10-158			42	
Benzene	0.122	0.0020	"	0.100	ND	122	30-131	6.31	34	
Toluene	0.122	0.0050	"	0.100	ND	122	30-134	8.95	30	
Ethylbenzene	0.133	0.0050	"	0.0992	ND	134	22-153	8.26	24	
m,p-Xylene	0.136	0.010	"	0.200	ND	68.3	10-159	8.34	68	
o-Xylene	0.124	0.0050	"	0.0980	ND	127	31-151	9.89	38	
Xylenes (total)	0.261	0.010	"		ND		30-160	9.08	30	
Gasoline Range Hydrocarbons	1.91	0.50	"		ND		30-160	11.2	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0474</i>		<i>"</i>	<i>0.0400</i>		<i>119</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0412</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0418</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>21-167</i>			

Summit Scientific

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

Project: Armstead #1 Well head

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/27/16 14:13

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

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

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

April 28, 2016

Mark Longhurst
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: Armstead #1 Well head

Enclosed are the results of analyses for samples received by Summit Scientific on 04/27/16 15:29. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



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

Project: Armstead #1 Well head

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/28/16 06:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GW01	1604235-01	Water	04/27/16 14:50	04/27/16 15:29

Summit Scientific *1604235*

S₂

741 Corporate Circle, Suite J ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933

Page 1 of 1

Client: *PDC/Tasman* Project Manager: *Mark Longhurst*
Address: _____ E-Mail: _____
City/State/Zip: _____
Phone: _____ Fax: _____ Project Name: *Armstead #1 Well Head*
Sampler Name: *Eric Siegel* Project Number: _____

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested				Special Instructions	
					HCl	HNO3	None	Other (Specify)	Groundwater	Soil	Air-Canister #	Other (Specify)	8260 BTEX				
1	GW01	4/27/16	14:50	3	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>				
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Relinquished by: <i>E. Siegel</i>	Date/Time: <i>4/27/16 15:28</i>	Received by: <i>[Signature]</i>	Date/Time: <i>4-27-16 15:29</i>	Turn Around Time (Check)	Notes:
				Same Day <input checked="" type="checkbox"/> 72 hours —	
				24 hours — Standard —	
				48 hours —	
Relinquished by: <i>[Signature]</i>	Date/Time: <i>4-27-16 17:45</i>	Received by:	Date/Time:	Sample integrity:	
				Temperature Upon Receipt: <u>0</u>	
				Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	

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

Project: Armstead #1 Well head

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/28/16 06:43

GW01
1604235-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/27/16 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1604296	04/27/16	04/27/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	5.2	1.0	"	"	"	"	"	"	

Date Sampled: **04/27/16 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		106 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		98.5 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		106 %	45-146		"	"	"	"	

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

Project: Armstead #1 Well head

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/28/16 06:43

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 1604296 - EPA 5030 Water MS

Blank (1604296-BLK1)

Prepared & Analyzed: 04/27/16

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.6		"	13.3		102	37-154			
Surrogate: Toluene-d8	13.1		"	13.3		98.4	45-149			
Surrogate: 4-Bromofluorobenzene	14.2		"	13.3		106	45-146			

LCS (1604296-BS1)

Prepared & Analyzed: 04/27/16

Benzene	29.8	1.0	ug/l	33.3		89.3	51-132			
Toluene	29.4	1.0	"	33.3		88.1	51-138			
Ethylbenzene	39.7	1.0	"	33.1		120	58-146			
m,p-Xylene	76.2	2.0	"	66.5		114	57-144			
o-Xylene	36.3	1.0	"	32.7		111	53-146			
Surrogate: 1,2-Dichloroethane-d4	14.0		"	13.3		105	37-154			
Surrogate: Toluene-d8	13.0		"	13.3		97.4	45-149			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		100	45-146			

Matrix Spike (1604296-MS1)

Source: 1604217-01

Prepared & Analyzed: 04/27/16

Benzene	30.1	1.0	ug/l	33.3	ND	90.2	34-141			
Toluene	29.3	1.0	"	33.3	ND	87.8	27-151			
Ethylbenzene	40.0	1.0	"	33.1	ND	121	29-160			
m,p-Xylene	76.2	2.0	"	66.5	ND	114	20-166			
o-Xylene	36.5	1.0	"	32.7	ND	112	33-159			
Surrogate: 1,2-Dichloroethane-d4	14.5		"	13.3		109	37-154			
Surrogate: Toluene-d8	13.0		"	13.3		97.2	45-149			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		101	45-146			

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

Project: Armstead #1 Well head

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/28/16 06:43

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 1604296 - EPA 5030 Water MS

Matrix Spike Dup (1604296-MSD1)	Source: 1604217-01			Prepared & Analyzed: 04/27/16						
Benzene	31.0	1.0	ug/l	33.3	ND	92.9	34-141	2.92	32	
Toluene	30.6	1.0	"	33.3	ND	91.7	27-151	4.31	25	
Ethylbenzene	40.7	1.0	"	33.1	ND	123	29-160	1.91	50	
m,p-Xylene	77.4	2.0	"	66.5	ND	116	20-166	1.54	36	
o-Xylene	37.1	1.0	"	32.7	ND	114	33-159	1.66	26	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>16.1</i>		<i>"</i>	<i>13.3</i>		<i>121</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.5</i>		<i>"</i>	<i>13.3</i>		<i>101</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.6</i>		<i>"</i>	<i>13.3</i>		<i>102</i>	<i>45-146</i>			

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

Project: Armstead #1 Well head

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/28/16 06:43

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

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