

PDC Energy, Inc.
Fourth Quarter 2018 Groundwater Monitoring Summary

January 14, 2019

Former J&L Farms 14, 24-29 Tank Battery
SWSW Section 29 T6N R63W
Spill Point ID # 451446
Remediation # 10537

This groundwater monitoring summary has been prepared by Tasman Geosciences, Inc. for the former J&L Farms 14, 24-29 tank battery. Per the Condition of Approval (COA) issued by the COGCC on August 22, 2018, two (2) monitoring wells (BH10 and BH11) were installed on October 8, 2018, to establish down-gradient point of compliance (POC). On December 6, 2018, groundwater monitoring was conducted at all eleven monitoring well locations (BH01 – BH11). Eleven groundwater samples were submitted to Summit Scientific Laboratory for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 8260B.

Fourth quarter 2018 analytical results indicate that BTEX concentrations are above the applicable COGCC Table 910-1 groundwater standards in monitoring wells BH05, BH06, BH08, and BH09. BTEX concentrations are below applicable regulatory standards in seven monitoring wells.

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 2019.

First quarter 2019 groundwater sampling will be conducted during March 2019. Analytical results are summarized in Table 1 and the laboratory report is included as Attachment A. Sample locations and corresponding analytical results are illustrated on Figure 1. Groundwater elevation data is summarized on Figure 2.

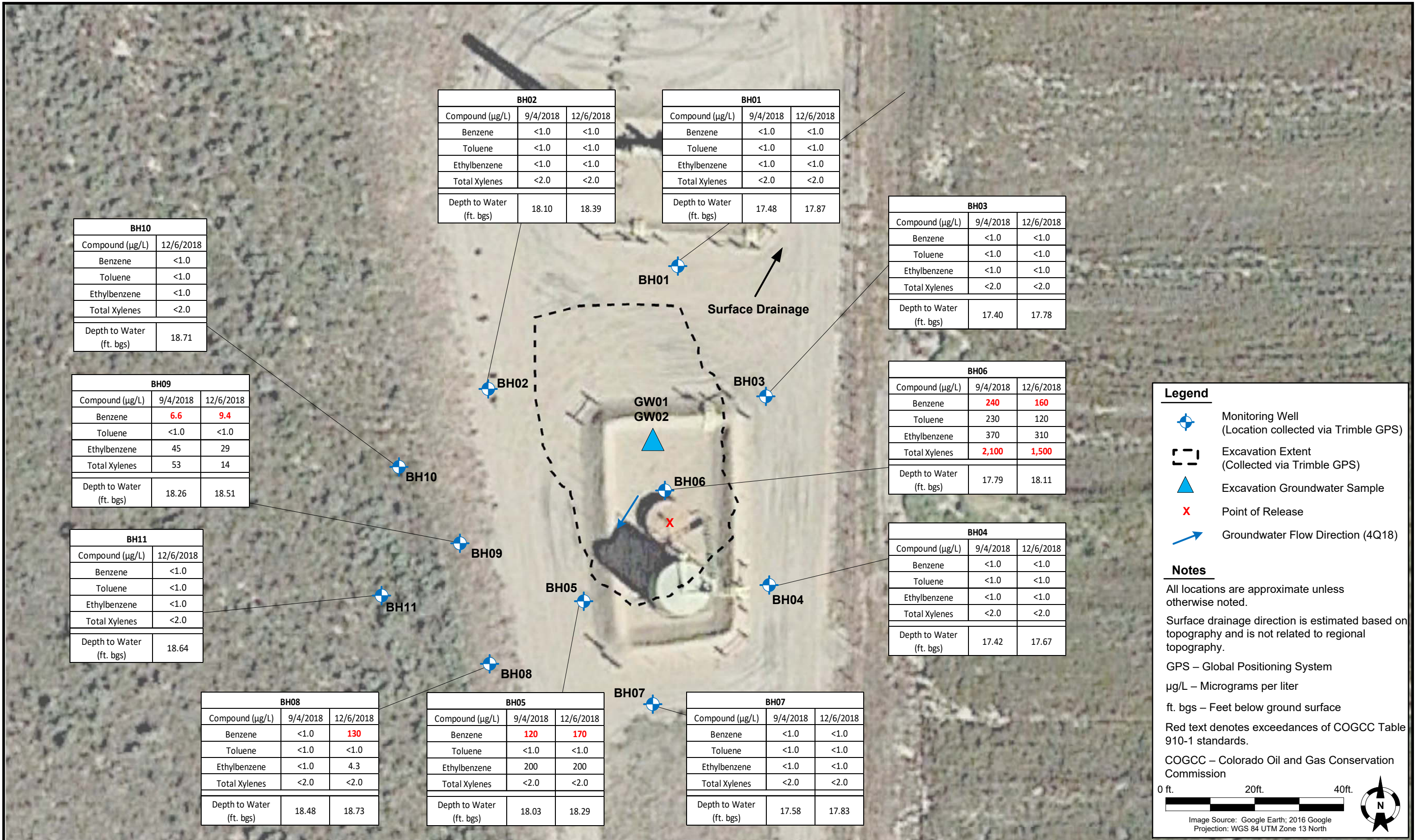




TABLE 1
FORMER J&L FARMS 14, 24-29 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water ⁽²⁾ (feet)	Groundwater Elevation (ft AMSL)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400		
GW01	8/31/2017	6.4	<1.0	<1.0	<2.0	~ 18	NM
GW02	9/5/2017	60	3.4	2.2	170	~ 18	NM
BH01	12/13/2017	<1.0	<1.0	<1.0	<2.0	16.91	4644.06
BH01	3/28/2018	<1.0	<1.0	<1.0	<2.0	17.94	4643.18
BH01	6/20/2018	<1.0	<1.0	<1.0	<2.0	18.00	4643.12
BH01	9/4/2018	<1.0	<1.0	<1.0	<2.0	17.48	4643.64
BH01	12/6/2018	<1.0	<1.0	<1.0	<2.0	17.87	4643.25
BH02	12/13/2017	<1.0	<1.0	<1.0	<2.0	17.91	4643.82
BH02	3/28/2018	<1.0	<1.0	<1.0	<2.0	18.61	4642.97
BH02	6/20/2018	<1.0	<1.0	<1.0	<2.0	18.61	4642.97
BH02	9/4/2018	<1.0	<1.0	<1.0	<2.0	18.10	4643.48
BH02	12/6/2018	<1.0	<1.0	<1.0	<2.0	18.39	4643.19
BH03	12/13/2017	<1.0	<1.0	<1.0	<2.0	16.93	4644.07
BH03	3/28/2018	<1.0	<1.0	<1.0	<2.0	17.79	4643.22
BH03	6/20/2018	<1.0	<1.0	<1.0	<2.0	17.87	4643.14
BH03	9/4/2018	<1.0	<1.0	<1.0	<2.0	17.40	4643.61
BH03	12/6/2018	<1.0	<1.0	<1.0	<2.0	17.78	4643.23
BH04	12/13/2017	<1.0	<1.0	<1.0	<2.0	16.78	4643.99
BH04	3/28/2018	<1.0	<1.0	<1.0	<2.0	17.63	4643.15
BH04	6/20/2018	<1.0	<1.0	<1.0	<2.0	17.74	4643.04
BH04	9/4/2018	<1.0	<1.0	<1.0	<2.0	17.42	4643.36
BH04	12/6/2018	<1.0	<1.0	<1.0	<2.0	17.67	4643.11
BH05	12/13/2017	67	<1.0	260	300	17.44	4643.74
BH05	3/28/2018	<1.0	<1.0	<1.0	<2.0	18.31	4642.90
BH05	6/20/2018	6.7	<1.0	18	8.8	18.35	4642.86
BH05	9/4/2018	120	<1.0	200	<2.0	18.03	4643.18
BH05	12/6/2018	170	<1.0	200	<2.0	18.29	4642.92
BH06 ⁽³⁾	12/13/2017	490	540	600	2,700	17.26	4643.96
BH06 ⁽³⁾	3/28/2018	250	48	220	1,200	18.11	4643.09
BH06 ⁽³⁾	6/20/2018	240	170	390	2,100	18.22	4642.98
BH06 ⁽³⁾	9/4/2018	240	230	370	2,100	17.79	4643.41
BH06 ^(3 4)	12/6/2018	160	120	310	1,500	18.11	4643.09
BH07	3/28/2018	<1.0	<1.0	<1.0	<2.0	17.75	4642.99
BH07	6/20/2018	<1.0	<1.0	<1.0	<2.0	17.86	4642.88
BH07	9/4/2018	<1.0	<1.0	<1.0	<2.0	17.58	4643.16

TABLE 1
FORMER J&L FARMS 14, 24-29 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)	Groundwater Elevation (ft AMSL)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400		
BH07	12/6/2018	<1.0	<1.0	<1.0	<2.0	17.83	4642.91
BH08	3/28/2018	<1.0	<1.0	<1.0	<2.0	18.67	4642.89
BH08	6/20/2018	<1.0	<1.0	<1.0	<2.0	18.83	4642.73
BH08	9/4/2018	<1.0	<1.0	<1.0	<2.0	18.48	4643.08
BH08	12/6/2018	130	<1.0	4.3	<2.0	18.73	4642.83
BH09	3/28/2018	<1.0	<1.0	<1.0	<2.0	18.52	4642.90
BH09	6/20/2018	46	<1.0	69	30	18.65	4642.77
BH09	9/4/2018	6.6	<1.0	45	53	18.26	4643.16
BH09	12/6/2018	9.4	<1.0	29	14	18.51	4642.91
BH10	12/6/2018	<1.0	<1.0	<1.0	<2.0	18.71	4642.93
BH11	12/6/2018	<1.0	<1.0	<1.0	<2.0	18.64	4643.27

Notes:

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective May 1, 2018.
2. Depth to water measurements were measured from top of casing or ground surface for monitoring well samples and excavation samples respectively. Subsequent 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. Sheen observed on groundwater.
4. The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = Micrograms per liter

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

ft AMSL = Feet Above Mean Sea Level

NM = Not measured

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

ATTACHMENT A

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

December 16, 2018

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: J&L Farms 14, 24-29

Enclosed are the results of analyses for samples received by Summit Scientific on 12/06/18 18:40. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to be 'P. Shrewsbury', written in a cursive style.

Paul Shrewsbury For Ben Shrewsbury

Laboratory Manager



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

Project: J&L Farms 14, 24-29

Project Number: [none]

Project Manager: Mark Longhurst

Reported:
12/16/18 10:39

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1812089-01	Water	12/06/18 11:26	12/06/18 18:40
BH02	1812089-02	Water	12/06/18 11:36	12/06/18 18:40
BH03	1812089-03	Water	12/06/18 11:46	12/06/18 18:40
BH04	1812089-04	Water	12/06/18 11:53	12/06/18 18:40
BH05	1812089-05	Water	12/06/18 12:26	12/06/18 18:40
BH06	1812089-06	Water	12/06/18 12:27	12/06/18 18:40
BH07	1812089-07	Water	12/06/18 11:40	12/06/18 18:40
BH08	1812089-08	Water	12/06/18 11:28	12/06/18 18:40
BH09	1812089-09	Water	12/06/18 12:06	12/06/18 18:40
BH10	1812089-10	Water	12/06/18 12:30	12/06/18 18:40
BH11	1812089-11	Water	12/06/18 12:11	12/06/18 18:40

Summit Scientific

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Summit Scientific

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303-277-9310 ♦ 303-374-5933 Fax

1812089.1

Page 1 of 2

Client: PDC / Tasman Geosciences
Address: 6899 Pecos St, Unit C
City/State/Zip: Denver, CO 80221
Phone: 303-487-1228 Fax:
Sampler Name: Alison Dahl, Brian Fabel

Project Manager: Mark Longhurst
E-Mail: mark.longhurst@pdce.com
Project Name: J & L Farms 14.24-29
Project Number: N/A

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:										Special Instructions				
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	BTEX - 8260													
BH01	12/6/2018	1126	3	X				X				X													
BH02		1136																							
BH03		1146																							
BH04		1153																							
BH05		1226																							
BH06		1227																							
BH07		1140																							
BH08		1128																							
BH09		1206																							
BH10		1230																							

Relinquished by: <u>Alison Dahl</u>	Date/Time: <u>12/6/2018 1840</u>	Received by: <u>[Signature]</u>	Date/Time: <u>12.6.18 1840</u>	Turn Around Time (Check) Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>	Notes:
Relinquished by:	Date/Time:	Received by:	Date/Time:	Sample Integrity: Temperature Upon Receipt: <u>2.0</u> Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:		

1812089.2

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Page 2 of 2

Client:	PDC / Tasman Geosciences	
Address:	6899 Pecos St, Unit C	
City/State/Zip:	Denver, CO 80221	
Phone:	303-487-1228	Fax:
Sampler Name:	Alison Dahl, Brian Gabel	

Project Manager:	Mark Longhurst
E-Mail:	mark.longhurst@pdce.com
Project Name:	J&L Farms 14.24-29
Project Number:	N/A

				Preservative				Matrix		Analyze For:								Special Instructions		
Sample Description	Date Sampled	Time Sampled	Number of Containers	HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	BTEX - 8260								
B H11	12/6/2018	1211	3	X				X				X								
Relinquished by: <i>Alvin D. Hall</i>				Date/Time: <i>12/6/2018 1840</i>				Received by: <i>[Signature]</i>				Date/Time: <i>12-6-18 1840</i>				Turn Around Time (Check)				Notes:
																Same Day <input type="checkbox"/> 72 Hours <input checked="" type="checkbox"/> 24 Hours <input type="checkbox"/> Standard 48 Hours <input type="checkbox"/>				
Relinquished by:				Date/Time:				Received by:				Date/Time:								
Relinquished by:				Date/Time:				Received in Lab by:				Date/Time:				Sample Integrity: Temperature Upon Receipt: <i>2.0</i> Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

Sample Receipt Checklist

S2 Work Order 89

Client: PDC/Tasman Client Project ID: Jic Farms 14, 24-29

Shipped Via: H.D./P.U./FedEx/UPS/USPS/Other P.U. Airbill #: _____

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

Temp (°C)	2.0
-----------	-----

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.	✓			
Were all samples received intact ⁽¹⁾ ?	✓			
Was adequate sample volume provided ⁽¹⁾ ?	✓			
If custody seals are present, are they intact ⁽¹⁾ ?			✓	
Are samples with holding times due within 48 hours sample due within 48 hours present?			✓	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	✓			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	✓			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	✓			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	✓			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.		✓		
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	✓			HCl
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ? Record the pH in Comments.			✓	
If dissolved metals are requested, were samples field filtered?			✓	
<u>Additional Comments (if any):</u>				

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

Custodian Printed Name or Initials

Signature of Custodian

12.6.18 1900
Date/Time



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

Project: J&L Farms 14, 24-29

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/16/18 10:39

BH01
1812089-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/06/18 11:26**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1812106	12/07/18	12/14/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **12/06/18 11:26**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		94.3 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.0 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.5 %		21-167		"	"	"	"	

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1775 Sherman St. STE. 3000
Denver CO, 80203

Project: J&L Farms 14, 24-29

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/16/18 10:39

BH02
1812089-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/06/18 11:36**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1812106	12/07/18	12/14/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/06/18 11:36**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

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Denver CO, 80203

Project: J&L Farms 14, 24-29

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/16/18 10:39

BH03
1812089-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/06/18 11:46**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1812106	12/07/18	12/14/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/06/18 11:46**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		100 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.5 %	21-167		"	"	"	"	

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Project: J&L Farms 14, 24-29

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/16/18 10:39

BH04
1812089-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/06/18 11:53**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1812106	12/07/18	12/14/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/06/18 11:53**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.5 %	21-167		"	"	"	"	

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PDC Energy
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Denver CO, 80203

Project: J&L Farms 14, 24-29

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/16/18 10:39

BH05
1812089-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/06/18 12:26**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	170	1.0		ug/l	1	1812106	12/07/18	12/14/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	200	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **12/06/18 12:26**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		80.8 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %		21-167		"	"	"	"	

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

Project: J&L Farms 14, 24-29

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/16/18 10:39

BH06
1812089-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/06/18 12:27**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	160	1.0		ug/l	1	1812106	12/07/18	12/14/18	EPA 8260B	
Toluene	120	1.0		"	"	"	"	"	"	
Ethylbenzene	310	1.0		"	"	"	"	"	"	
Xylenes (total)	1500	20		"	10	"	"	12/14/18	"	

Date Sampled: **12/06/18 12:27**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		134 %		23-173		"	"	12/14/18	"	
Surrogate: Toluene-d8		90.3 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		202 %		21-167		"	"	"	"	S-02

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

Project: J&L Farms 14, 24-29

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/16/18 10:39

BH07
1812089-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/06/18 11:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1812106	12/07/18	12/14/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/06/18 11:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.8 %	21-167		"	"	"	"	

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

Project: J&L Farms 14, 24-29

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/16/18 10:39

BH08
1812089-08 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/06/18 11:28**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	130	1.0		ug/l	1	1812106	12/07/18	12/14/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	4.3	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **12/06/18 11:28**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		85.4 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		99.1 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %		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: J&L Farms 14, 24-29

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/16/18 10:39

BH09
1812089-09 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/06/18 12:06**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	9.4	1.0	ug/l	1	1812106	12/07/18	12/14/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	29	1.0	"	"	"	"	"	"	
Xylenes (total)	14	2.0	"	"	"	"	"	"	

Date Sampled: **12/06/18 12:06**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		95.0 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.5 %	21-167		"	"	"	"	

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

Project: J&L Farms 14, 24-29

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/16/18 10:39

BH10
1812089-10 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/06/18 12:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1812106	12/07/18	12/14/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/06/18 12:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		98.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.0 %	21-167		"	"	"	"	

Summit Scientific

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

Project: J&L Farms 14, 24-29

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/16/18 10:39

BH11
1812089-11 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/06/18 12:11**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1812106	12/07/18	12/14/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/06/18 12:11**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		99.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Summit Scientific

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Denver CO, 80203

Project: J&L Farms 14, 24-29

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/16/18 10:39

Volatile Organic Compounds by EPA Method 8260B - Quality Control

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

Batch 1812106 - EPA 5030 Water MS

Blank (1812106-BLK1)

Prepared: 12/07/18 Analyzed: 12/10/18

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.0		"	13.2		98.1	23-173			
Surrogate: Toluene-d8	13.3		"	13.3		100	20-170			
Surrogate: 4-Bromofluorobenzene	13.5		"	13.3		101	21-167			

LCS (1812106-BS1)

Prepared: 12/07/18 Analyzed: 12/10/18

Benzene	38.3	1.0	ug/l	33.3		115	70-130			
Toluene	38.0	1.0	"	33.3		114	70-130			
Ethylbenzene	41.5	1.0	"	33.3		124	70-130			
m,p-Xylene	77.4	2.0	"	66.7		116	70-130			
o-Xylene	36.1	1.0	"	33.3		108	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.2		"	13.2		100	23-173			
Surrogate: Toluene-d8	13.6		"	13.3		102	20-170			
Surrogate: 4-Bromofluorobenzene	14.2		"	13.3		106	21-167			

Matrix Spike (1812106-MS1)

Source: 1812054-01

Prepared: 12/07/18 Analyzed: 12/10/18

Benzene	41.7	1.0	ug/l	33.3	2.91	116	70-130			
Toluene	38.2	1.0	"	33.3	ND	115	70-130			
Ethylbenzene	43.4	1.0	"	33.3	1.17	127	70-130			
m,p-Xylene	79.1	2.0	"	66.7	ND	119	70-130			
o-Xylene	37.6	1.0	"	33.3	ND	113	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.3		"	13.2		101	23-173			
Surrogate: Toluene-d8	13.6		"	13.3		102	20-170			
Surrogate: 4-Bromofluorobenzene	13.9		"	13.3		104	21-167			

Summit Scientific

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Denver CO, 80203

Project: J&L Farms 14, 24-29

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/16/18 10:39

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

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

Batch 1812106 - EPA 5030 Water MS

Matrix Spike Dup (1812106-MSD1)	Source: 1812054-01			Prepared: 12/07/18 Analyzed: 12/10/18						
Benzene	43.3	1.0	ug/l	33.3	2.91	121	70-130	3.60	30	
Toluene	39.7	1.0	"	33.3	ND	119	70-130	3.82	30	
Ethylbenzene	43.1	1.0	"	33.3	1.17	126	70-130	0.717	30	
m,p-Xylene	79.5	2.0	"	66.7	ND	119	70-130	0.441	30	
o-Xylene	37.4	1.0	"	33.3	ND	112	70-130	0.507	30	
Surrogate: 1,2-Dichloroethane-d4	14.4		"	13.2		109	23-173			
Surrogate: Toluene-d8	13.8		"	13.3		104	20-170			
Surrogate: 4-Bromofluorobenzene	14.6		"	13.3		109	21-167			

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Project: J&L Farms 14, 24-29

Project Number: [none]
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12/16/18 10:39

Notes and Definitions

S-02	The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.
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