PDC Energy, Inc.

Fourth Quarter 2018 Groundwater Monitoring Summary

November 28, 2018

Nelson 11, 21-33 Tank Battery
NWNW Section 33 T5N R67W
Spill Point ID # 448930
Remediation # 10053

This groundwater monitoring summary has been prepared by Tasman Geosciences, Inc. for the Nelson 11, 21-33 tank battery. On October 31, 2018, groundwater monitoring was conducted at all ten monitoring well locations (BH01 – BH03, BH04R, and BH05 – BH10). Ten 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 report is included as Attachment A. Sample locations and corresponding analytical results are illustrated on Figure 1.

Fourth quarter 2018 analytical results indicate that benzene concentrations are above the applicable COGCC Table 910-1 groundwater standard in monitoring well BH04R. BTEX concentrations are below applicable regulatory standards in nine monitoring well locations.

Monitored natural attenuation (MNA) was selected as the remediation strategy for this site during the second quarter 2017. Due to persisting elevated benzene concentrations, enhanced fluid recovery (EFR) and air sparge (AS) was initiated at the site during the first quarter 2018. A summary of the EFR/AS operational data is provided in Table 2. EFR/AS will remain the selected remediation strategy for the site through the first quarter 2019.

First quarter 2019 groundwater sampling will be conducted during January 2019.

COUNTY ROAD 52

SURFACE DRAINAGE

BH07		
Compound (µg/L)	7/10/2018	10/31/2018
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Depth to Water (ft. bgs)	6.24	7.11

BH07

BH06		
Compound (µg/L)	7/10/2018	10/31/2018
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Depth to Water (ft. bgs)	7.15	7.86

BH06

BH03		
Compound (µg/L)	7/10/2018	10/31/2018
Benzene	8.0	3.2
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Depth to Water (ft. bgs)	4.79	5.63

BH02

BH02		
Compound (µg/L)	7/10/2018	10/31/2018
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Depth to Water (ft. bgs)	6.76	7.79

BH08		
Compound (µg/L)	7/10/2018	10/31/2018
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Depth to Water (ft. bgs)	4.53	5.24

BH08

BH03

GW01

X

BH01		
Compound (µg/L)	7/10/2018	10/31/2018
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Depth to Water (ft. bgs)	5.82	6.34

BH01

BH04R		
Compound (µg/L)	7/10/2018	10/31/2018
Benzene	10	21
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	1.1
Total Xylenes	<2.0	5.4
Depth to Water (ft. bgs)	4.73	5.25

BH04R

BH05		
Compound (µg/L)	7/10/2018	10/31/2018
Benzene	1.3	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Depth to Water (ft. bgs)	4.85	5.30

BH05

BH09		
Compound (µg/L)	7/10/2018	10/31/2018
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Depth to Water (ft. bgs)	4.57	5.09

BH09

BH10		
Compound (µg/L)	7/10/2018	10/31/2018
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Depth to Water (ft. bgs)	4.75	5.24

BH10

Legend

- Monitoring Well (Location collected via Trimble GPS)
- Replacement Monitoring Well (Location collected via Trimble GPS)
- Excavation Extent (Location collected via Trimble GPS)
- X — Point of Release
- Excavation Groundwater Sample
- Groundwater Flow Direction (4Q18)

Notes

All locations are approximate unless otherwise noted.

Surface drainage direction is estimated based on topography and is not related to regional topography.

GPS – Global Positioning System

µg/L – Micrograms per liter

ft. bgs – Feet below ground surface

Red text denotes an exceedance of COGCC standards

COGCC - Colorado Oil and Gas Conservation Commission

0 ft. 15 ft. 30 ft.

N

Image Source: Google Earth; 2016 Google
Projection: WGS 84 UTM Zone 13 North

DATE: November 9, 2018

DESIGNED BY: C. Hamlin

DRAWN BY: T. Blessing

TASMAN GEOSCIENCES

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

PDC Energy, Inc. – DJ Basin
Nelson 11, 21-33 Tank Battery
NWNW, Section 33, Township 5 North, Range 67 West
Weld County, Colorado

GROUNDWATER ANALYTICAL RESULTS MAP

FIGURE 1

COUNTY ROAD 52

SURFACE DRAINAGE

BH07
4769.96

BH06
4769.97

4769.90

BH02
4769.29

GW01

BH08
4769.79

BH03
4769.52

BH01
4769.69

4769.70

BH04R
4769.63

BH04

BH05
4769.69

BH09
4769.51

BH10
4769.43

4769.50

4769.30

Legend

- Monitoring Well (Collected via Trimble GPS)
- Monitoring Well - Destroyed (Collected via Trimble GPS)
- Excavation Extent (Collected via Trimble GPS)
- X — Point of Release
- Excavation Groundwater Sample
- Groundwater Elevation Contour (Dashed where inferred)
- 4769.92 — Groundwater Elevation (ft. AMSL)
- Groundwater Flow Direction (4Q18)

Notes

All locations are approximate unless otherwise noted.

Surface drainage direction is estimated based on topography and is not related to regional topography.

GPS – Global Positioning System

Ft. AMSL – Above Mean Seal Level

0 ft. 15 ft. 30 ft.

N

Image Source: Google Earth; 2016 Google
Projection: WGS 84 UTM Zone 13 North

DATE: November 19, 2018 DESIGNED BY: C. Hamlin DRAWN BY: D. Cavinder	TASMAN GEOSCIENCES	**Tasman Geosciences, Inc.** 6899 Pecos Street – Unit C Denver, CO 80221	**PDC Energy, Inc. – DJ Basin** **Nelson 11, 21-33 Tank Battery** NWNW, Section 33, Township 5 North, Range 67 West Weld County, Colorado	GROUNDWATER ELEVATION CONTOUR MAP (10/31/2018)	FIGURE 2

TABLE 1
NELSON 11, 21-33 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	2/6/2017	**210**	350	6.2	360	~ 10	NM
BH01	6/5/2017	<1.0	<1.0	<1.0	<2.0	6.80	4769.41
BH01	7/13/2017	<1.0	<1.0	<1.0	<2.0	5.14	4771.05
BH01	10/2/2017	<1.0	<1.0	<1.0	<2.0	5.15	4771.04
BH01	1/25/2018	<1.0	<1.0	<1.0	<2.0	6.50	4769.69
BH01	4/17/2018	<1.0	<1.0	<1.0	<2.0	7.06	4768.97
BH01	7/10/2018	<1.0	<1.0	<1.0	<2.0	5.82	4770.21
BH01	10/31/2018	<1.0	<1.0	<1.0	<2.0	6.34	4769.69
BH02	6/5/2017	**44**	160	5.3	80	7.62	4769.58
BH02	7/13/2017	<1.0	<1.0	<1.0	<2.0	5.88	4771.31
BH02	10/2/2017	<1.0	<1.0	<1.0	<2.0	6.04	4771.15
BH02	1/25/2018	**11**	<1.0	<1.0	<2.0	7.49	4769.70
BH02	4/17/2018	<1.0	<1.0	<1.0	<2.0	8.17	4768.91
BH02	7/10/2018	<1.0	<1.0	<1.0	<2.0	6.76	4770.32
BH02	10/31/2018	<1.0	<1.0	<1.0	<2.0	7.79	4769.29
BH03	6/5/2017	**61**	310	10	160	5.78	4769.50
BH03	7/13/2017	<1.0	<1.0	<1.0	<2.0	4.02	4771.17
BH03	10/2/2017	**13**	6.6	<1.0	7.1	4.15	4771.04
BH03	1/25/2018	**33**	<1.0	<1.0	<2.0	5.69	4769.50
BH03	4/17/2018	**7.3**	<1.0	<1.0	<2.0	6.16	4768.99
BH03	7/10/2018	**8.0**	<1.0	<1.0	<2.0	4.79	4770.36
BH03	10/31/2018	3.2	<1.0	<1.0	<2.0	5.63	4769.52
BH04	6/5/2017	**220**	**690**	18	260	5.62	4769.40
BH04	7/13/2017	<1.0	<1.0	<1.0	<2.0	4.06	4770.91
BH04	10/2/2017	**63**	<1.0	<1.0	16	4.08	4770.89
BH04[3]	1/25/2018	**350**	<1.0	6.9	30	NM	NM
BH04	1/25/2018	Destroyed					
BH04R	4/17/2018	**43**	<1.0	<1.0	5.1	5.98	4768.90
BH04R	7/10/2018	**10**	<1.0	<1.0	<2.0	4.73	4770.15
BH04R	10/31/2018	**21**	<1.0	1.1	5.4	5.25	4769.63
BH05	6/5/2017	**450**	24	<1.0	26	5.71	4769.39
BH05	7/13/2017	<1.0	<1.0	<1.0	<2.0	4.15	4770.89
BH05	10/2/2017	<1.0	<1.0	<1.0	<2.0	4.14	4770.90
BH05	1/25/2018	**7.9**	<1.0	<1.0	<2.0	5.67	4769.37
BH05	4/17/2018	**10**	<1.0	<1.0	<2.0	6.10	4768.89
BH05	7/10/2018	1.3	<1.0	<1.0	<2.0	4.85	4770.14
BH05	10/31/2018	<1.0	<1.0	<1.0	<2.0	5.30	4769.69

TABLE 1
NELSON 11, 21-33 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**		
BH06	7/13/2017	<1.0	<1.0	<1.0	<2.0	6.33	4771.63
BH06	10/2/2017	<1.0	<1.0	<1.0	<2.0	6.61	4771.35
BH06	1/25/2018	<1.0	<1.0	<1.0	<2.0	8.04	4769.92
BH06	4/17/2018	<1.0	<1.0	<1.0	<2.0	8.70	4769.13
BH06	7/10/2018	<1.0	<1.0	<1.0	<2.0	7.15	4770.68
BH06	10/31/2018	<1.0	<1.0	<1.0	<2.0	7.86	4769.97
BH07	7/13/2017	<1.0	<1.0	<1.0	<2.0	5.61	4771.61
BH07	10/2/2017	<1.0	<1.0	<1.0	<2.0	5.90	4771.32
BH07	1/25/2018	<1.0	<1.0	<1.0	<2.0	7.42	4769.80
BH07	4/17/2018	<1.0	<1.0	<1.0	<2.0	7.87	4769.20
BH07	7/10/2018	<1.0	<1.0	<1.0	<2.0	6.24	4770.83
BH07	10/31/2018	<1.0	<1.0	<1.0	<2.0	7.11	4769.96
BH08	7/13/2017	<1.0	<1.0	<1.0	<2.0	3.89	4771.23
BH08	10/2/2017	<1.0	<1.0	<1.0	<2.0	4.01	4771.11
BH08	1/25/2018	<1.0	<1.0	<1.0	<2.0	5.43	4769.69
BH08	4/17/2018	<1.0	<1.0	<1.0	<2.0	5.96	4769.07
BH08	7/10/2018	<1.0	<1.0	<1.0	<2.0	4.53	4770.50
BH08	10/31/2018	<1.0	<1.0	<1.0	<2.0	5.24	4769.79
BH09	7/13/2017	<1.0	<1.0	<1.0	<2.0	4.03	4770.73
BH09	10/2/2017	<1.0	<1.0	<1.0	<2.0	3.98	4770.78
BH09	1/25/2018	<1.0	<1.0	<1.0	<2.0	5.35	4769.41
BH09	4/17/2018	<1.0	<1.0	<1.0	<2.0	5.76	4768.84
BH09	7/10/2018	<1.0	<1.0	<1.0	<2.0	4.57	4770.03
BH09	10/31/2018	<1.0	<1.0	<1.0	<2.0	5.09	4769.51
BH10	7/13/2017	<1.0	<1.0	<1.0	<2.0	4.11	4770.67
BH10	10/2/2017	<1.0	<1.0	<1.0	<2.0	4.03	4770.75
BH10	1/25/2018	<1.0	<1.0	<1.0	<2.0	5.41	4769.37
BH10	4/17/2018	<1.0	<1.0	<1.0	<2.0	5.91	4768.76
BH10	7/10/2018	<1.0	<1.0	<1.0	<2.0	4.75	4769.92
BH10	10/31/2018	<1.0	<1.0	<1.0	<2.0	5.24	4769.43

TABLE 1
NELSON 11, 21-33 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**		

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 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 BH04's casing was removed during EFR event on January 3, 2018. 1Q18 groundwater sample was collected from the remaining borehole as a grab sample.

COGCC = Colorado Oil and Gas Conservation Commission
µg/L = Micrograms per liter
(<) = Analytical result is less than the indicated laboratory reporting limit.
NM = Not measured
BOLD = Analytical result is in exceedance of COGCC groundwater standards.

TABLE 2
NELSON 11,21-33 TANK BATTERY
EFR / AS OPERATIONAL SUMMARY TABLE

Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Air Injection Pressure (psi)	Average Air Flow Rate (cfm)
First Quarter 2018						
1/3/2018	BH04, BH10	3	100	BH03, BH05, BH07, BH08, BH09	20	14
1/18/2018	BH02, BH03, BH05, BH09, BH10	6	84	BH02, BH03, BH05, BH07, BH08, BH09, BH10	20	14.4
1/31/2018		6	410	BH02, BH05, BH07, BH08, BH09, BH10	20	22
2/13/2018		6	300	BH02, BH03, BH05, BH07, BH08, BH09, BH10	15	10.9
2/27/2018	BH02, BH03, BH04, BH05, BH09, BH10	6	300		20	22
3/14/2018	BH02, BH03, BH04, BH05, BH09	6	180	BH02, BH03, BH04, BH05, BH07, BH09,	20	12.6
3/27/2018		6	170		20	19.4
Quarterly Totals		**39**	**1544**		-	-
Second Quarter 2018						
4/10/2018	BH02, BH03, BH04, BH05, BH09	6	300	BH02, BH03, BH04, BH05, BH07, BH08, BH09, BH10	20	17.4
4/26/2018		6	600		20	15.9
5/9/2018		6	380	BH02, BH03, BH04, BH05, BH07, BH09, BH10	20	18
5/22/2018		6	126		20	18.3
6/6/2018		6	300		20	17.7
6/20/2018		6	300		20	22.3
Quarterly Totals		**36**	**2006**		-	-
Third Quarter 2018						
7/5/2018	BH02, BH03, BH04, BH05, BH09	6	380	BH02, BH03, BH04, BH05, BH07, BH09, BH10	20	15.4
7/17/2018		6	336		20	15
7/30/2018		6	336		20	15
8/13/2018	BH02, BH03, BH05, BH09	6	400	BH02, BH03, BH04, BH05, BH09, BH10	20	18
8/27/2018		6	336		20	15
9/10/2018		6	300		20	16
9/28/2018		5	168		20	15
Quarterly Totals		**41**	**2256**		-	-
Fourth Quarter 2018						
10/10/2018	BH02, BH03, BH05, BH09	6	84	BH02, BH03, BH04, BH05, BH09, BH10	20	15
10/24/2018		6	370		20	20
Quarterly Totals		**12**	**454**		-	-

Notes:
EFR = Enhanced fluid recovery
AS = Air sparge
psi = Pounds per square inch
cfm = Cubic feet per minute

ATTACHMENT A

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

November 06, 2018

Mark Longhurst

PDC Energy

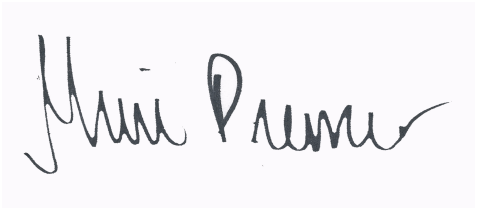
1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Nelson 11, 21-33

Enclosed are the results of analyses for samples received by Summit Scientific on 10/31/18 18:15. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Muri Premer For Ben Shrewsbury

Laboratory Manager

S2

PDC Energy	Project: Nelson 11, 21-33	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	11/06/18 11:01

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1810407-01	Water	10/31/18 11:53	10/31/18 18:15
BH02	1810407-02	Water	10/31/18 12:05	10/31/18 18:15
BH03	1810407-03	Water	10/31/18 11:28	10/31/18 18:15
BH04R	1810407-04	Water	10/31/18 11:35	10/31/18 18:15
BH05	1810407-05	Water	10/31/18 11:19	10/31/18 18:15
BH06	1810407-06	Water	10/31/18 12:08	10/31/18 18:15
BH07	1810407-07	Water	10/31/18 11:55	10/31/18 18:15
BH08	1810407-08	Water	10/31/18 11:07	10/31/18 18:15
BH09	1810407-09	Water	10/31/18 11:17	10/31/18 18:15
BH10	1810407-10	Water	10/31/18 11:06	10/31/18 18:15

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.

1710407

Summit Scientific

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

Client:	PDC / Tasman	Project Manager:	Mark Longhurst
Address:	6899 N Pecos	E-Mail:	mark.longhurst@pdce.com
City/State/Zip:	Denver/CO/80221	Project Name:	Nelson 11, 21-33
Phone:	Max Dahlgren Fax:	Project Number:	
Sampler Name:	Max Dahlgren		

				Preservative				Matrix				Analyze For:									
Sample Description	Date Sampled	Time Sampled	Number of Containers	HCl	HNO_3	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	BTEX									Special Instructions
BH01	10/31/18	1153	3	X				X													
BH02		1205																			
BH03		1128																			
BH04R		1135																			
BH05		1119																			
BH06		1208																			
BH07		1155																			
BH08		1107																			
BH09		1117																			
BH10		1106																			

Relinquished by:	Date/Time: 1815 10/31/18	Received by:	Date/Time: 10.31.18 1815
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:

Turn Around Time (Check)

Same Day		72 Hours	
24 Hours		Standard	X
48 Hours			

Sample Integrity:
Temperature Upon Receipt: 8.5
Intact: Yes [O] No [ ]

Notes:

Sample Receipt Checklist

S2 Work Order 1810407

Client: PDC/Tasman Client Project ID: Nelson 11, 21-33

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)	8.5

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, H2SO4, NaOH, HNO3, 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?			✓	
Additional Comments (if any):				

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

Custodian Printed Name or Initials **Signature of Custodian** 10.31.18 **Date/Time**

S2

PDC Energy	Project: Nelson 11, 21-33	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	11/06/18 11:01

BH01

1810407-01 (Water)

Summit Scientific

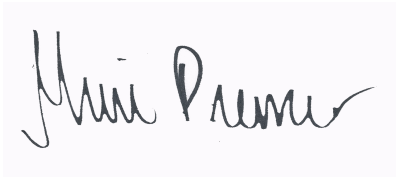
Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/18 11:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1811002	11/01/18	11/04/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **10/31/18 11:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*112 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*99.7 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*120 %*	*21-167*		"	"	"	"	



S2

PDC Energy	Project: Nelson 11, 21-33	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	11/06/18 11:01

BH02

1810407-02 (Water)

Summit Scientific

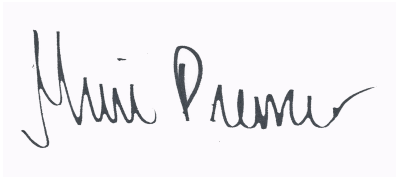
Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/18 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1811002	11/01/18	11/04/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **10/31/18 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*104 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*98.6 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*115 %*	*21-167*		"	"	"	"	



S2

PDC Energy	Project: Nelson 11, 21-33	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	11/06/18 11:01

BH03

1810407-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/18 11:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	**3.2**	1.0	ug/l	1	1811002	11/01/18	11/04/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **10/31/18 11:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*110 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*100 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*118 %*	*21-167*		"	"	"	"	

S2

PDC Energy	Project: Nelson 11, 21-33	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	11/06/18 11:01

BH04R

1810407-04 (Water)

Summit Scientific

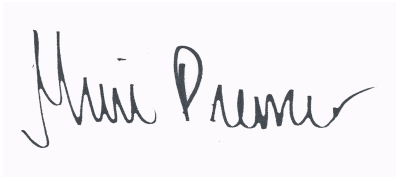
Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/18 11:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	**21**	1.0	ug/l	1	1811002	11/01/18	11/04/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	**1.1**	1.0	"	"	"	"	"	"	
Xylenes (total)	**5.4**	2.0	"	"	"	"	"	"	

Date Sampled: **10/31/18 11:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*108 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*100 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*115 %*	*21-167*		"	"	"	"	



S2

PDC Energy	Project: Nelson 11, 21-33	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	11/06/18 11:01

BH05

1810407-05 (Water)

Summit Scientific

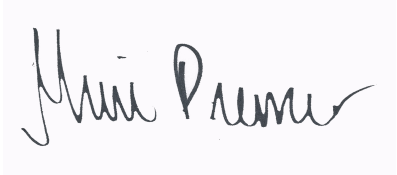
Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/18 11:19**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1811002	11/01/18	11/04/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **10/31/18 11:19**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*109 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*99.2 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*121 %*	*21-167*		"	"	"	"	



S2

PDC Energy	Project: Nelson 11, 21-33	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	11/06/18 11:01

BH06

1810407-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/18 12:08**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1811002	11/01/18	11/04/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **10/31/18 12:08**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*108 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*99.7 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*112 %*	*21-167*		"	"	"	"	

S2

PDC Energy	Project: Nelson 11, 21-33	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	11/06/18 11:01

BH07

1810407-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/18 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1811002	11/01/18	11/04/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **10/31/18 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*116 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*98.6 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*116 %*	*21-167*		"	"	"	"	

S2

PDC Energy	Project: Nelson 11, 21-33	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	11/06/18 11:01

BH08

1810407-08 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/18 11:07**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1811002	11/01/18	11/04/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **10/31/18 11:07**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*108 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*99.2 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*120 %*	*21-167*		"	"	"	"	

S2

PDC Energy	Project: Nelson 11, 21-33	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	11/06/18 11:01

BH09

1810407-09 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/18 11:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1811002	11/01/18	11/03/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **10/31/18 11:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*110 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*99.5 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*89.1 %*	*21-167*		"	"	"	"	

S2

PDC Energy	Project: Nelson 11, 21-33	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	11/06/18 11:01

BH10

1810407-10 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/18 11:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1811002	11/01/18	11/03/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **10/31/18 11:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*109 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*101 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*91.4 %*	*21-167*		"	"	"	"	

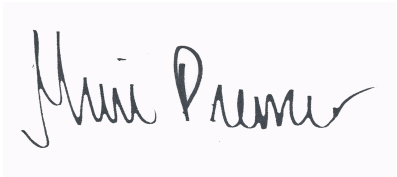
S2

PDC Energy	Project: Nelson 11, 21-33	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	11/06/18 11:01

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1811002 - EPA 5030 Water MS										
Blank (1811002-BLK1)				Prepared: 11/01/18 Analyzed: 11/04/18						
Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	*14.4*		*"*	*13.2*		*109*	*23-173*			
Surrogate: Toluene-d8	*13.7*		*"*	*13.3*		*102*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*15.1*		*"*	*13.3*		*113*	*21-167*			
LCS (1811002-BS1)				Prepared: 11/01/18 Analyzed: 11/04/18						
Benzene	24.2	1.0	ug/l	33.3		72.8	70-130			
Toluene	28.1	1.0	"	33.3		84.3	70-130			
Ethylbenzene	31.2	1.0	"	33.3		93.6	70-130			
m,p-Xylene	61.2	2.0	"	66.7		91.9	70-130			
o-Xylene	31.8	1.0	"	33.3		95.3	70-130			
Surrogate: 1,2-Dichloroethane-d4	*14.0*		*"*	*13.2*		*106*	*23-173*			
Surrogate: Toluene-d8	*13.6*		*"*	*13.3*		*102*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*16.0*		*"*	*13.3*		*120*	*21-167*			
Matrix Spike (1811002-MS1)	**Source: 1810407-01**			Prepared: 11/01/18 Analyzed: 11/04/18						
Benzene	23.7	1.0	ug/l	33.3	ND	71.2	70-130			
Toluene	27.9	1.0	"	33.3	ND	83.7	70-130			
Ethylbenzene	30.8	1.0	"	33.3	ND	92.3	70-130			
m,p-Xylene	60.2	2.0	"	66.7	ND	90.2	70-130			
o-Xylene	31.7	1.0	"	33.3	ND	95.0	70-130			
Surrogate: 1,2-Dichloroethane-d4	*14.0*		*"*	*13.2*		*106*	*23-173*			
Surrogate: Toluene-d8	*13.2*		*"*	*13.3*		*99.1*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*15.6*		*"*	*13.3*		*117*	*21-167*			



S2

PDC Energy	Project: Nelson 11, 21-33	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	11/06/18 11:01

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1811002 - EPA 5030 Water MS										
Matrix Spike Dup (1811002-MSD1)	**Source: 1810407-01**			Prepared: 11/01/18 Analyzed: 11/04/18						
Benzene	24.4	1.0	ug/l	33.3	ND	73.2	70-130	2.74	30	
Toluene	28.0	1.0	"	33.3	ND	83.9	70-130	0.251	30	
Ethylbenzene	31.2	1.0	"	33.3	ND	93.7	70-130	1.48	30	
m,p-Xylene	60.9	2.0	"	66.7	ND	91.3	70-130	1.19	30	
o-Xylene	31.6	1.0	"	33.3	ND	94.7	70-130	0.348	30	
Surrogate: 1,2-Dichloroethane-d4	*14.8*		*"*	*13.2*		*112*	*23-173*			
Surrogate: Toluene-d8	*13.0*		*"*	*13.3*		*97.7*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*16.2*		*"*	*13.3*		*121*	*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	Project: Nelson 11, 21-33	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	11/06/18 11:01

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