



**PDC Energy, Inc.**  
**First Quarter 2022 Groundwater Monitoring Summary**

December 13, 2021

Barrell 41-4 Tank Battery  
NENE Section 4 T6N R64W  
Remediation # 7846

This groundwater monitoring summary has been prepared by Tasman, Inc. for the Barrell 41-4 tank battery.

### **Site History and Background**

On February 10, 2011, a historic hydrocarbon release was discovered beneath tank battery infrastructure during equipment upgrades. Following the discovery, mitigation efforts were initiated and approximately 790 cubic yards of impacted material were removed from the former excavation. Following excavation activities, a 3% mixture of MicroBlaze Emergency Liquid Spill Control was applied to the base of the excavation where impacted soil remained in place. Based on analytical results received from confirmation soil samples collected following the application of the MicroBlaze solution, chemical oxidant (chemox) injections were conducted on April 18, 2012. Supplemental site investigation activities were conducted between September 25, 2012, and November 3, 2017, to delineate remaining hydrocarbon impacted material on site. During supplemental site investigation activities, groundwater was encountered at approximately 36 feet below ground surface (bgs). Between April 18, 2015, and January 10, 2020, fifteen (15) monitoring wells (SS02A-R2, BH03 – BH16) were installed to delineate dissolve-phase hydrocarbon impacts and establish point of compliance (POC) on site.

### **Groundwater Monitoring Activities**

On February 25, 2022, groundwater monitoring was conducted at all 15 monitoring well locations (BH03 – BH16, and SS02A-R2). Fifteen groundwater samples were submitted to Summit Scientific Laboratory for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene (TMB) 1,3,5-TMB by EPA Method 8260B, total dissolved solids (TDS) by Method SM 2540C, and chloride and sulfate anions by EPA Method 300.0.

First quarter 2022 analytical results indicated that organic compound concentrations were in compliance with the applicable COGCC Table 915-1 groundwater standards in all monitoring well locations. Additionally, inorganic parameters were in compliance with the applicable COGCC Table 915-1 regulatory standards or within 1.25x the background concentration of the up-gradient monitoring well (BH08) in all monitoring well locations. Sample locations and corresponding analytical results are illustrated on Figures 1 and 2. Groundwater elevation data is illustrated on Figure 3. Analytical results are summarized in Tables 1 and 2. The laboratory report is included as Attachment A.



## Current Remediation Strategy and Path Forward

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 second quarter 2022.

Second quarter 2022 groundwater sampling will be conducted during May 2022.

BH05		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	35.69	36.46

BH04		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	35.84	37.97

BH03		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	35.44	36.32

BH06		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	35.80	36.65

BH08		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	35.47	36.35

BH07		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	35.37	36.22

SS02A-R2		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	38.63	39.54

BH12		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	2.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	7.5
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	35.65	36.34

BH13		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	35.73	36.44

BH14		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	35.66	36.32

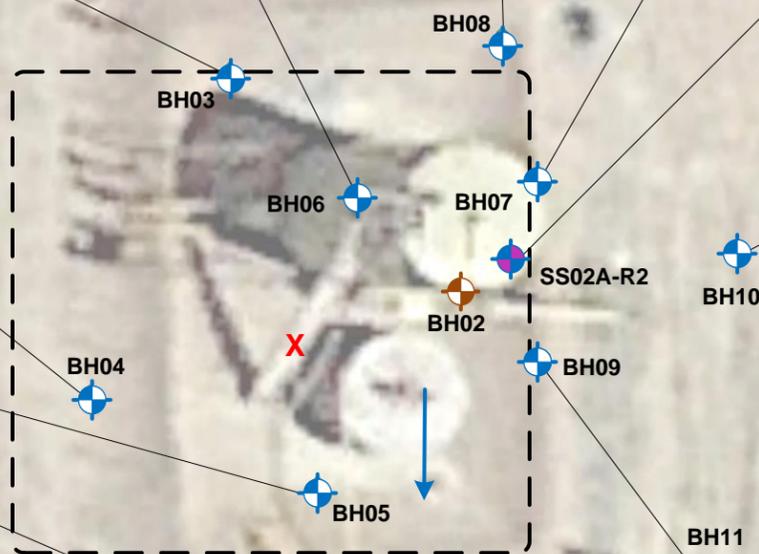
BH15		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	35.66	36.29

BH10		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	33.16	35.95

BH11		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	35.52	36.24

BH09		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	35.40	36.20

BH16		
Compound (µg/L)	11/4/2021	2/25/2022
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	35.55	36.15



**Legend**

- - - Excavation Extent – LTE (2011)
- X Point of Release
- Angled Remediation Well Location (Collected via Trimble GPS)
- Monitoring Well Location (Collected via Trimble GPS)
- Angled Monitoring Well Location (Collected via Trimble GPS)
- Groundwater Flow Direction (1Q22)

**Notes**

All locations are approximate unless otherwise noted.

Monitoring well SS02A-R2 is an angled monitoring well with the terminus located southwest of the well monument, beneath the above ground storage tank.

Red text denotes an exceedance of COGCC standards

COGCC – Colorado Oil and Gas Conservation Commission

TMB - Trimethylbenzene

ft. bgs – Feet below ground surface

µg/L – Micrograms per liter

GPS – Global Positioning System

0 ft. 15 ft. 30 ft.

Image Source: Google Earth; 2019 Google  
Projection: WGS 84 UTM Zone 13 North

DATE:	March 17, 2022
DESIGNED BY:	C. Hamlin
DRAWN BY:	S. Anderson

**Tasman, Inc.**  
6855 W. 119<sup>th</sup> Ave.  
Broomfield, CO 80020

**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**

BH03		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	11.2	3.30
Sulfate	<b>675</b>	<b>402</b>
TDS	971	902
Depth to Water (ft. bgs)	35.44	36.32

BH08		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	40.2	24.3
Sulfate	1,770	1,180
TDS	1,830	1,630
Depth to Water (ft. bgs)	35.47	36.35

BH07		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	49.2	36.3
Sulfate	<b>1,720</b>	<b>1,050</b>
TDS	1,890	1,550
Depth to Water (ft. bgs)	35.37	36.22

SS02A-R2		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	16.4	9.50
Sulfate	<b>834</b>	<b>601</b>
TDS	1,090	1,110
Depth to Water (ft. bgs)	38.63	39.54

BH06		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	15.8	7.70
Sulfate	<b>916</b>	<b>646</b>
TDS	1,110	1,080
Depth to Water (ft. bgs)	35.80	36.65

BH10		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	49.6	4.80
Sulfate	<b>1,700</b>	139
TDS	1,800	425
Depth to Water (ft. bgs)	33.16	35.95

BH04		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	16.6	5.80
Sulfate	<b>666</b>	<b>439</b>
TDS	1,020	986
Depth to Water (ft. bgs)	35.84	37.97

BH05		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	44.2	28.7
Sulfate	<b>957</b>	<b>689</b>
TDS	1,230	1,200
Depth to Water (ft. bgs)	35.69	36.46

BH09		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	28.8	17.6
Sulfate	<b>972</b>	<b>887</b>
TDS	1,270	1,370
Depth to Water (ft. bgs)	35.40	36.20

BH13		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	<b>341</b>	241
Sulfate	<b>1,020</b>	<b>652</b>
TDS	1,650	1,650
Depth to Water (ft. bgs)	35.73	36.44

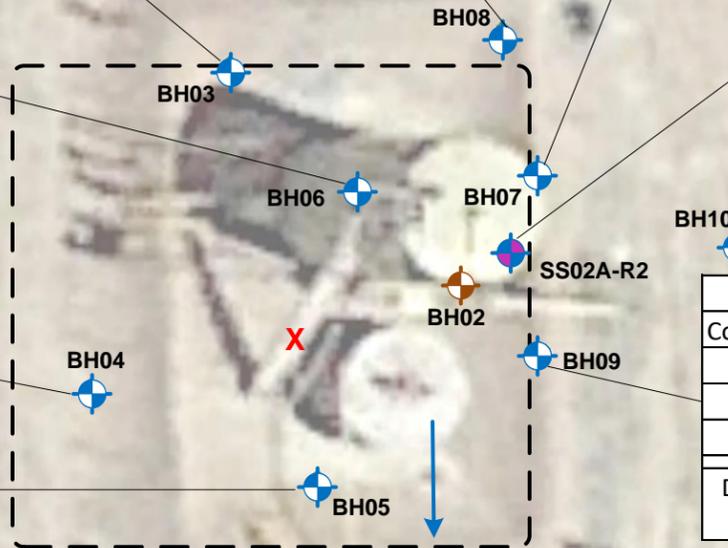
BH15		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	<b>284</b>	131
Sulfate	<b>843</b>	<b>585</b>
TDS	1,440	1,320
Depth to Water (ft. bgs)	35.66	36.29

BH12		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	173	72.1
Sulfate	<b>293</b>	150
TDS	1,110	982
Depth to Water (ft. bgs)	35.65	36.34

BH11		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	111	35.9
Sulfate	<b>1,400</b>	<b>1,120</b>
TDS	1,580	1,610
Depth to Water (ft. bgs)	35.52	36.24

BH14		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	4.80	4.50
Sulfate	<b>783</b>	<b>577</b>
TDS	1,050	1,060
Depth to Water (ft. bgs)	35.66	36.32

BH16		
Compound (mg/L)	11/4/2021	2/25/2022
Chloride	23.4	38.5
Sulfate	<b>649</b>	<b>312</b>
TDS	1,050	1,040
Depth to Water (ft. bgs)	35.55	36.15



**Legend**

- Excavation Extent – LTE (2011)
- Point of Release
- Angled Remediation Well Location (Collected via Trimble GPS)
- Monitoring Well Location (Collected via Trimble GPS)
- Angled Monitoring Well Location (Collected via Trimble GPS)
- Groundwater Flow Direction (1Q22)

**Notes**

All locations are approximate unless otherwise noted.

Monitoring well SS02A-R2 is an angled monitoring well with the terminus located southwest of the well monument, beneath the above ground storage tank.

GPS – Global Positioning System  
 mg/L – Milligrams per liter  
 TDS – Total dissolved solids

Red text – exceedances of COGCC Table 915-1 standards.

Bold text – exceedances of COGCC Table 915-1 standards but within 1.25x BCKG concentration

COGCC – Colorado Oil and Gas Conservation Commission

BCKG – Background

0 ft. 15 ft. 30 ft.

Image Source: Google Earth; 2019 Google  
 Projection: WGS 84 UTM Zone 13 North

DATE: March 17, 2022

DESIGNED BY: C. Hamlin

DRAWN BY: S. Anderson



**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**  
**(INORGANIC PARAMETERS)**

**FIGURE**  
**2**



**Legend**

- Excavation Extent – LTE (2011)
- Point of Release
- Angled Remediation Well Location (Collected via Trimble GPS)
- Monitoring Well Location (Collected via Trimble GPS)
- Angled Monitoring Well Location (Collected via Trimble GPS)
- Groundwater Elevation Contour (Dashed where inferred)
- 4821.71 Groundwater Elevation (ft. AMSL)
- Groundwater Flow Direction (1Q22)

**Notes**

All locations are approximate unless otherwise noted.

Monitoring well SS02A-R2 is an angled monitoring well with the terminus located southwest of the well monument, beneath the above ground storage tank.

ft. AMSL – Feet Above Mean Sea Level

GPS – Global Positioning System

0 ft.      15 ft.      30 ft.

Image Source: Google Earth; 2019 Google  
Projection: WGS 84 UTM Zone 13 North

DATE: March 3, 2022

DESIGNED BY: C. Hamlin

DRAWN BY: L. Reed



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

**GROUNDWATER  
ELEVATION CONTOUR  
MAP (2/25/2022)**

**FIGURE  
3**

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

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Naphthalene (µg/L)	1,2,4-TMB (µg/L)	1,3,5-TMB (µg/L)	Depth to Water <sup>(2)</sup> (ft.)	Groundwater Elevation (ft. AMSL)
<b>COGCC Table 915-1 Groundwater Standard (µg/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	<b>140</b>	<b>67</b>	<b>67</b>	-	-
SS02A-R2	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	38.42	4819.75
SS02A-R2	5/25/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	39.09	4819.08
SS02A-R2	8/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	38.82	4819.35
SS02A-R2	11/4/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	38.63	4819.54
SS02A-R2	2/25/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	39.54	4818.63
BH03	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.26	4823.21
BH03	5/25/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.88	4822.59
BH03	8/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.29	4823.18
BH03	11/4/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.44	4823.03
BH03	2/25/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.32	4822.15
BH04	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.66	4823.12
BH04	5/25/2021	3.6	2.4	1.7	5.4	<1.0	1.8	2.1	36.26	4822.52
BH04	8/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.79	4822.99
BH04	11/4/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.84	4822.94
BH04	2/25/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	37.97	4822.13
BH05	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.48	4823.11
BH05	5/25/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.08	4822.51
BH05	8/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.66	4822.93
BH05	11/4/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.69	4822.90
BH05	2/25/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.46	4822.13
BH06	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.61	4823.19
BH06	5/25/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.24	4822.56
BH06	8/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.71	4823.09
BH06	11/4/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.80	4823.00
BH06	2/25/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.65	4822.15
BH07	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.19	4823.17
BH07	5/25/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.80	4822.56
BH07	8/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.30	4823.06
BH07	11/4/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.37	4822.99
BH07	2/25/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.22	4822.14
BH08	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.29	4823.21
BH08	5/25/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.95	4822.55
BH08	8/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.36	4823.14
BH08	11/4/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.47	4823.03
BH08	2/25/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.35	4822.15
BH09	2/3/2021	<b>110</b>	<1.0	<1.0	<2.0	1.8	<1.0	<1.0	35.19	4823.13
BH09	5/25/2021	<b>120</b>	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.79	4822.53
BH09	8/6/2021	<b>320</b>	<1.0	1.1	<2.0	<1.0	<1.0	2.3	35.35	4822.97
BH09	11/4/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.40	4822.92
BH09	2/25/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.20	4822.12
BH10	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	34.94	4823.15
BH10	5/25/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.58	4822.51
BH10	8/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.08	4823.01
BH10	11/4/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	33.16	4824.93
BH10	2/25/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.95	4822.14
BH11	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.31	4823.04
BH11	5/25/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.92	4822.43
BH11	8/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.51	4822.84
BH11	11/4/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.52	4822.83
BH11	2/25/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.24	4822.11
BH12	2/3/2021	<1.0	<1.0	<1.0	<2.0	1.4	<1.0	<1.0	35.44	4823.01

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

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Naphthalene (µg/L)	1,2,4-TMB (µg/L)	1,3,5-TMB (µg/L)	Depth to Water <sup>(2)</sup> (ft.)	Groundwater Elevation (ft. AMSL)
<b>COGCC Table 915-1 Groundwater Standard (µg/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	<b>140</b>	<b>67</b>	<b>67</b>	-	-
BH12	5/25/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.03	4822.42
BH12	8/6/2021	<b>8.1</b>	<1.0	<1.0	<2.0	3.2	<1.0	<1.0	35.67	4822.78
BH12	11/4/2021	2.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.65	4822.80
BH12	2/25/2022	<1.0	<1.0	<1.0	<2.0	7.5	<1.0	<1.0	36.34	4822.11
BH13	2/3/2021	1.2	<1.0	<1.0	<2.0	5.0	<1.0	<1.0	35.52	4823.03
BH13	5/25/2021	1.7	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.12	4822.43
BH13	8/6/2021	<1.0	<1.0	<1.0	<2.0	4.2	<1.0	<1.0	35.72	4822.83
BH13	11/4/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.73	4822.82
BH13	2/25/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.44	4822.11
BH14	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.44	4822.88
BH14	5/25/2021	1.9	1.4	<1.0	<2.0	<1.0	<1.0	<1.0	36.03	4822.29
BH14	8/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.71	4822.61
BH14	11/4/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.66	4822.66
BH14	2/25/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.32	4822.00
BH15	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.44	4822.89
BH15	5/25/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	37.00	4821.33
BH15	8/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.69	4822.64
BH15	11/4/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.66	4822.67
BH15	2/25/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.29	4822.04
BH16	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.30	4822.89
BH16	5/25/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.86	4822.33
BH16	8/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.58	4822.61
BH16	11/4/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.55	4822.64
BH16	2/25/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	36.15	4822.04

**Notes:**

- Groundwater standards referenced from 2 CCR 404-1, Table 915-1, January 15, 2021.
  - 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 to reflect depth of water from ground surface.
- TMB = Trimethylbenzene  
COGCC = Colorado Oil and Gas Conservation Commission  
µg/L = Micrograms per liter  
(<) = Analytical result is less than the indicated laboratory reporting limit.  
ft. = Feet  
AMSL = Above Mean Sea Level  
**BOLD** = Analytical result is in exceedance of applicable standard.

**TABLE 2**  
**BARRELL 41-4 TANK BATTERY**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**  
**INORGANIC PARAMETERS**

Sample ID	Date Sampled	TDS (unit)	Chloride Ion (mg/L)	Sulfate Ion (mg/L)	Depth to Water ( <sup>2</sup> ) (ft.)	Groundwater Elevation (ft. AMSL)
<b>COGCC Table 915-1 Groundwater Standard (mg/L) <sup>(1)</sup></b>		<b>&lt;1.25 x BCKG</b>	<b>250 or &lt;1.25 x BCKG</b>	<b>250 or &lt;1.25 x BCKG</b>	-	-
SS02A-R2	2/3/2021	838	19.6	1,080	38.42	4819.75
SS02A-R2	5/25/2021	NR	NR	NR	39.09	4819.08
SS02A-R2	8/6/2021	1,070	2.00	<b>943</b>	38.82	4819.35
SS02A-R2	11/4/2021	1,090	16.4	<b>834</b>	38.63	4819.54
SS02A-R2	2/25/2022	1,110	9.50	<b>601</b>	39.54	4818.63
<hr/>						
BH03	2/3/2021	849	25.6	1,080	35.26	4823.21
BH03	5/25/2021	NR	NR	NR	35.88	4822.59
BH03	8/6/2021	1,030	9.20	<b>809</b>	35.29	4823.18
BH03	11/4/2021	971	11.2	<b>675</b>	35.44	4823.03
BH03	2/25/2022	902	3.30	<b>402</b>	36.32	4822.15
<hr/>						
BH04	2/3/2021	724	31.4	739	35.66	4823.12
BH04	5/25/2021	NR	NR	NR	36.26	4822.52
BH04	8/6/2021	1,010	7.40	<b>600</b>	35.79	4822.99
BH04	11/4/2021	1,020	16.6	<b>666</b>	35.84	4822.94
BH04	2/25/2022	986	5.80	<b>439</b>	37.97	4822.13
<hr/>						
BH05	2/3/2021	799	41.4	932	35.48	4823.11
BH05	5/25/2021	NR	NR	NR	36.08	4822.51
BH05	8/6/2021	1,150	6.40	<b>903</b>	35.66	4822.93
BH05	11/4/2021	1,230	44.2	<b>957</b>	35.69	4822.90
BH05	2/25/2022	1,200	28.7	<b>689</b>	36.46	4822.13
<hr/>						
BH06	2/3/2021	928	24.2	1,410	35.61	4823.19
BH06	5/25/2021	NR	NR	NR	36.24	4822.56
BH06	8/6/2021	1,230	5.00	<b>1,130</b>	35.71	4823.09
BH06	11/4/2021	1,110	15.8	<b>916</b>	35.80	4823.00
BH06	2/25/2022	1,080	7.70	<b>646</b>	36.65	4822.15
<hr/>						
BH07	2/3/2021	1,110	44.8	1,890	35.19	4823.17
BH07	5/25/2021	NR	NR	NR	35.80	4822.56
BH07	8/6/2021	1,620	26.4	<b>1,590</b>	35.30	4823.06
BH07	11/4/2021	1,890	49.2	<b>1,720</b>	35.37	4822.99
BH07	2/25/2022	1,550	36.3	<b>1,050</b>	36.22	4822.14
<hr/>						
BH08	2/3/2021	1,280	53.4	2,460	35.29	4823.21
BH08	5/25/2021	NR	NR	NR	35.95	4822.55
BH08	8/6/2021	2,260	32.2	2,130	35.36	4823.14
BH08	11/4/2021	1,830	40.2	1,770	35.47	4823.03

**TABLE 2**  
**BARRELL 41-4 TANK BATTERY**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**  
**INORGANIC PARAMETERS**

Sample ID	Date Sampled	TDS (unit)	Chloride Ion (mg/L)	Sulfate Ion (mg/L)	Depth to Water ( <sup>2</sup> ) (ft.)	Groundwater Elevation (ft. AMSL)
<b>COGCC Table 915-1 Groundwater Standard (mg/L) <sup>(1)</sup></b>		<b>&lt;1.25 x BCKG</b>	<b>250 or &lt;1.25 x BCKG</b>	<b>250 or &lt;1.25 x BCKG</b>	-	-
BH08	2/25/2022	1,630	24.3	1,180	36.35	4822.15
BH09	2/3/2021	1,030	44.6	1,750	35.19	4823.13
BH09	5/25/2021	NR	NR	NR	35.79	4822.53
BH09	8/6/2021	1,330	18.2	<b>1,140</b>	35.35	4822.97
BH09	11/4/2021	1,270	28.8	<b>972</b>	35.40	4822.92
BH09	2/25/2022	1,370	17.6	<b>887</b>	36.20	4822.12
BH10	2/3/2021	1,240	46.4	2,080	34.94	4823.15
BH10	5/25/2021	NR	NR	NR	35.58	4822.51
BH10	8/6/2021	1,950	24.8	<b>1,890</b>	35.08	4823.01
BH10	11/4/2021	1,800	49.6	<b>1,700</b>	33.16	4824.93
BH10	2/25/2022	425	4.80	139	35.95	4822.14
BH11	2/3/2021	1,160	71.4	1,660	35.31	4823.04
BH11	5/25/2021	NR	NR	NR	35.92	4822.43
BH11	8/6/2021	1,630	23.4	<b>1,580</b>	35.51	4822.84
BH11	11/4/2021	1,580	111	<b>1,400</b>	35.52	4822.83
BH11	2/25/2022	1,610	35.9	<b>1,120</b>	36.24	4822.11
BH12	2/3/2021	702	140	151	35.44	4823.01
BH12	5/25/2021	NR	NR	NR	36.03	4822.42
BH12	8/6/2021	987	99.8	118	35.67	4822.78
BH12	11/4/2021	1,110	173	<b>293</b>	35.65	4822.80
BH12	2/25/2022	982	72.1	150	36.34	4822.11
BH13	2/3/2021	1,420	<b>615</b>	989	35.52	4823.03
BH13	4/1/2021	NR	NR	NR	NM	NM
BH13	5/25/2021	NR	NR	NR	36.12	4822.43
BH13	8/6/2021	1,580	<b>252</b>	<b>1,130</b>	35.72	4822.83
BH13	11/4/2021	1,650	<b>341</b>	<b>1,020</b>	35.73	4822.82
BH13	2/25/2022	1,650	241	<b>652</b>	36.44	4822.11
BH14	2/3/2021	733	13.4	820	35.44	4822.88
BH14	5/25/2021	NR	NR	NR	36.03	4822.29
BH14	8/6/2021	1,000	4.65	<b>754</b>	35.71	4822.61
BH14	11/4/2021	1,050	4.80	<b>783</b>	35.66	4822.66
BH14	2/25/2022	1,060	4.50	<b>577</b>	36.32	4822.00
BH15	2/3/2021	798	21.6	958	35.44	4822.89
BH15	5/25/2021	NR	NR	NR	37.00	4821.33

**TABLE 2**  
**BARRELL 41-4 TANK BATTERY**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**  
**INORGANIC PARAMETERS**

Sample ID	Date Sampled	TDS (unit)	Chloride Ion (mg/L)	Sulfate Ion (mg/L)	Depth to Water <sup>(2)</sup> (ft.)	Groundwater Elevation (ft. AMSL)
<b>COGCC Table 915-1 Groundwater Standard (mg/L) <sup>(1)</sup></b>		<b>&lt;1.25 x BCKG</b>	<b>250 or &lt;1.25 x BCKG</b>	<b>250 or &lt;1.25 x BCKG</b>	-	-
BH15	8/6/2021	1,180	103	<b>883</b>	35.69	4822.64
BH15	11/4/2021	1,440	<b>284</b>	<b>843</b>	35.66	4822.67
BH15	2/25/2022	1,320	131	<b>585</b>	36.29	4822.04
BH16	2/3/2021	924	23.2	1,190	35.30	4822.89
BH16	5/25/2021	NR	NR	NR	35.86	4822.33
BH16	8/6/2021	1,190	21.8	<b>980</b>	35.58	4822.61
BH16	11/4/2021	1,050	23.4	<b>649</b>	35.55	4822.64
BH16	2/25/2022	1,040	38.5	<b>312</b>	36.15	4822.04

**Notes:**

1. Groundwater standards referenced from 2 CCR 404-1, Table 915-1, January 15, 2021.

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 to reflect depth of water from ground surface.

TDS = Total dissolved solids

COGCC = Colorado Oil and Gas Conservation Commission

mg/L = Milligrams per liter

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

ft. = Feet

AMSL = Above Mean Sea Level

**BOLD** = Analytical result is in exceedance of applicable standard.

**BOLD** = Analytical result is in exceedance of applicable standard, within 1.25x concentration of the up-gradient monitoring well.

  = Up-gradient well location

NR = Not Reported. Inorganic groundwater analytical results omitted due to laboratory error. Case narrative provided the attached laboratory analytical report.

## Attachment A

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

March 07, 2022

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Barrell 41-4

Work Order #2202343

Enclosed are the results of analyses for samples received by Summit Scientific on 02/25/22 14:20. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Muri Premer". The signature is written in a cursive style with a large, stylized 'M' and 'P'.

Muri Premer

Project Manager



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

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

**Reported:**  
03/07/22 12:54

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH03	2202343-01	Water	02/25/22 11:49	02/25/22 14:20
BH04	2202343-02	Water	02/25/22 11:46	02/25/22 14:20
BH05	2202343-03	Water	02/25/22 11:23	02/25/22 14:20
BH06	2202343-04	Water	02/25/22 11:35	02/25/22 14:20
BH07	2202343-05	Water	02/25/22 10:37	02/25/22 14:20
BH08	2202343-06	Water	02/25/22 10:23	02/25/22 14:20
BH09	2202343-07	Water	02/25/22 12:03	02/25/22 14:20
BH10	2202343-08	Water	02/25/22 10:50	02/25/22 14:20
BH11	2202343-09	Water	02/25/22 11:11	02/25/22 14:20
BH12	2202343-10	Water	02/25/22 11:15	02/25/22 14:20
BH13	2202343-11	Water	02/25/22 11:30	02/25/22 14:20
BH14	2202343-12	Water	02/25/22 10:21	02/25/22 14:20
BH15	2202343-13	Water	02/25/22 10:42	02/25/22 14:20
BH16	2202343-14	Water	02/25/22 10:56	02/25/22 14:20
SS02A-R2	2202343-15	Water	02/25/22 11:02	02/25/22 14:20

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

2202343.1

S<sub>2</sub>

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310

Page 1 of 2

Client: PDC / Tasman Geosciences Project Manager: Mark Langhust  
 Address: 6855 W. 119th Ave. E-Mail: mark.langhust@pdc.com  
 City/State/Zip: Broomfield / CO / 80020  
 Phone: 303-487-1228 Project Name: Barrell 41-4  
 Sampler Name: Ben Wagner Project Number:

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested						Special Instructions	
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	\$260 BTEX	Naphthalene	1,2,4-TMB	1,3,5-TMB	TDS		Chloride
1	BH03	2/25/22	1149	5	3				X				X	X	X	X	X	X	
2	BH04		1146																
3	BH05		1123																
4	BH06		1135																
5	BH07		1037																
6	BH08		1023																
7	BH09		1203																
8	BH10		1050																
9	BH11		1111																
10	BH12		1115																

Relinquished by: <u>BA</u>	Date/Time: <u>2/25/22</u> <u>1420</u>	Received by: <u>Tasman's Lock Box</u>	Date/Time: <u>2/25/22</u> <u>1420</u>	Turn Around Time (Check) <input type="checkbox"/> Same Day 72 hours <input checked="" type="checkbox"/> 24 hours Standard <input type="checkbox"/> 48 hours Sample Integrity: Temperature Upon Receipt: <u>0.7</u> Samples Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	Notes:
Relinquished by: <u>Tasman's Lock Box</u>	Date/Time:	Received by: <u>[Signature]</u>	Date/Time: <u>2/25/22</u> <u>1420</u>		
Relinquished by:	Date/Time:	Received by:	Date/Time:		

# Summit Scientific

2202343.2

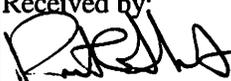
S<sub>2</sub>

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310

Page 2 of 2

Client: PDC / Tasman Geosciences Project Manager: Mark Longhurst  
 Address: 6855 W. 119th Ave. E-Mail: mark.longhurst@pdc.p.com  
 City/State/Zip: Broomfield / CO / 80020  
 Phone: 303-487-1228 Project Name: Barrell 41-4  
 Sampler Name: Ben Wagner Project Number:

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested						Special Instructions	
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	8260 BTEX	Naphthalene	1,2,4-TMB	1,3,5-TMB	TDS		Chloride
1	BH13	2/25/22	1130	4	3				X				X	X	X	X	X	X	
2	BH14		1021																
3	BH15		1042																
4	BH16		1056																
5	SSO2A-R2		1102																
6																			
7																			
8																			
9																			
10																			

Relinquished by: 	Date/Time: 2/25/22 1420	Received by: Tasman's Lock Box	Date/Time: 2/25/22 1420	Turn Around Time (Check) <input type="checkbox"/> Same Day 72 hours <input checked="" type="checkbox"/> 24 hours Standard <input type="checkbox"/> 48 hours Sample Integrity: Temperature Upon Receipt: 0.7 Samples Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	Notes:
Relinquished by: Tasman's Lock Box	Date/Time:	Received by: 	Date/Time: 2/25/22 1420		
Relinquished by:	Date/Time:	Received by:	Date/Time:		

S<sub>2</sub>

2202343

2/2  
Sample Receipt Checklist

S2 Work Order# \_\_\_\_\_

Client: ABC/Tasman Client Project ID: Barrell 41-4

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

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

Temp (°C) 0.7

Thermometer ID: G86A9201901378

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

Additional Comments (if any):

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

[Signature]  
Custodian Printed Name or Initials

2.25.22  
Date/Time



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

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

**Reported:**  
03/07/22 12:54

**BH03**  
**2202343-01 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 11:49**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/25/22 11:49**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		106 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.9 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 11:49**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>3.30</b>	0.0600		mg/L	1	BFC0032	03/02/22	03/02/22	EPA 300.0	
Sulfate	<b>402</b>	30.0		"	100	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 11:49**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Total Dissolved Solids</b>	<b>902</b>	10.0		mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

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

**Reported:**  
03/07/22 12:54

**BH04**  
**2202343-02 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 11:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **02/25/22 11:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		110 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.4 %	21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 11:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloride	<b>5.80</b>	0.0600	mg/L	1	BFC0032	03/02/22	03/02/22	EPA 300.0	
Sulfate	<b>439</b>	30.0	"	100	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 11:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Total Dissolved Solids</b>	<b>986</b>	10.0	mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

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

**Reported:**  
03/07/22 12:54

**BH05**  
**2202343-03 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 11:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/25/22 11:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		108 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.7 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 11:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>28.7</b>	6.00		mg/L	100	BFC0032	03/02/22	03/02/22	EPA 300.0	
Sulfate	<b>689</b>	30.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 11:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Total Dissolved Solids</b>	<b>1200</b>	10.0		mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

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

**Reported:**  
03/07/22 12:54

**BH06**  
**2202343-04 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 11:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/25/22 11:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		109 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		106 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.6 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 11:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>7.70</b>	6.00		mg/L	100	BFC0032	03/02/22	03/02/22	EPA 300.0	
Sulfate	<b>646</b>	30.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 11:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Total Dissolved Solids</b>	<b>1080</b>	10.0		mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

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

**Reported:**  
03/07/22 12:54

**BH07**  
**2202343-05 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **02/25/22 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.2 %	21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloride	<b>36.3</b>	6.00	mg/L	100	BFC0032	03/02/22	03/02/22	EPA 300.0	
Sulfate	<b>1050</b>	30.0	"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Dissolved Solids	<b>1550</b>	10.0	mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

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

**Reported:**  
03/07/22 12:54

**BH08**  
**2202343-06 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 10:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/25/22 10:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		112 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		107 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.3 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 10:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>24.3</b>	6.00		mg/L	100	BFC0032	03/02/22	03/02/22	EPA 300.0	
Sulfate	<b>1180</b>	30.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 10:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	<b>1630</b>	10.0		mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

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

**Reported:**  
03/07/22 12:54

**BH09**  
**2202343-07 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 12:03**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/25/22 12:03**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		107 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 12:03**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>17.6</b>	6.00		mg/L	100	BFC0032	03/02/22	03/02/22	EPA 300.0	
Sulfate	<b>887</b>	30.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 12:03**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Total Dissolved Solids</b>	<b>1370</b>	10.0		mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

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

**Reported:**  
03/07/22 12:54

**BH10**  
**2202343-08 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 10:50**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/25/22 10:50**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		107 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		106 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.1 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 10:50**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>4.80</b>	0.0600		mg/L	1	BFC0032	03/02/22	03/02/22	EPA 300.0	
Sulfate	<b>139</b>	30.0		"	100	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 10:50**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Total Dissolved Solids</b>	<b>425</b>	10.0		mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

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

**Reported:**  
03/07/22 12:54

**BH11**  
**2202343-09 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 11:11**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/25/22 11:11**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		110 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.6 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 11:11**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>35.9</b>	6.00		mg/L	100	BFC0032	03/02/22	03/02/22	EPA 300.0	
Sulfate	<b>1120</b>	30.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 11:11**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Total Dissolved Solids</b>	<b>1610</b>	10.0		mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

Project: Barrell 41-4

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
03/07/22 12:54

**BH12**  
**2202343-10 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>7.5</b>	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **02/25/22 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		106 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.7 %	21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Chloride</b>	<b>72.1</b>	6.00	mg/L	100	BFC0032	03/02/22	03/02/22	EPA 300.0	
<b>Sulfate</b>	<b>150</b>	30.0	"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Total Dissolved Solids</b>	<b>982</b>	10.0	mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

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

**Reported:**  
03/07/22 12:54

**BH13**  
**2202343-11 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/25/22 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		108 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.8 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>241</b>	6.00		mg/L	100	BFC0032	03/02/22	03/02/22	EPA 300.0	
Sulfate	<b>652</b>	30.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Total Dissolved Solids</b>	<b>1650</b>	10.0		mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

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

**Reported:**  
03/07/22 12:54

**BH14**  
**2202343-12 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 10:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **02/25/22 10:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.7 %	21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 10:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloride	<b>4.50</b>	0.0600	mg/L	1	BFC0032	03/02/22	03/02/22	EPA 300.0	
Sulfate	<b>577</b>	30.0	"	100	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 10:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Total Dissolved Solids</b>	<b>1060</b>	10.0	mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

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

**Reported:**  
03/07/22 12:54

**BH15**  
**2202343-13 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 10:42**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/25/22 10:42**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		112 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		106 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.9 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 10:42**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>131</b>	6.00		mg/L	100	BFC0032	03/02/22	03/02/22	EPA 300.0	
Sulfate	<b>585</b>	30.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 10:42**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Total Dissolved Solids</b>	<b>1320</b>	10.0		mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

Project: Barrell 41-4

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
03/07/22 12:54

**BH16**  
**2202343-14 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 10:56**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/25/22 10:56**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		109 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.4 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 10:56**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>38.5</b>	6.00		mg/L	100	BFC0032	03/02/22	03/02/22	EPA 300.0	
Sulfate	<b>312</b>	30.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 10:56**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Total Dissolved Solids</b>	<b>1040</b>	10.0		mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

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

**Reported:**  
03/07/22 12:54

**SS02A-R2**  
**2202343-15 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/25/22 11:02**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFB0328	02/28/22	03/01/22	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/25/22 11:02**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		109 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		104 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.7 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/25/22 11:02**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>9.50</b>	6.00		mg/L	100	BFC0032	03/02/22	03/02/22	EPA 300.0	
Sulfate	<b>601</b>	30.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/25/22 11:02**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Total Dissolved Solids</b>	<b>1110</b>	10.0		mg/L	1	BFB0323	02/28/22	02/28/22	SM2540C	

Summit Scientific

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

Project: Barrell 41-4

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
03/07/22 12:54

### Volatile Organic Compounds by EPA Method 8260B - Quality Control

#### Summit Scientific

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

#### Batch BFB0328 - EPA 5030 Water MS

##### Blank (BFB0328-BLK1)

Prepared: 02/28/22 Analyzed: 03/01/22

Benzene	ND	1.0	ug/l								
Toluene	ND	1.0	"								
Ethylbenzene	ND	1.0	"								
Xylenes (total)	ND	2.0	"								
Naphthalene	ND	1.0	"								
1,2,4-Trimethylbenzene	ND	1.0	"								
1,3,5-Trimethylbenzene	ND	1.0	"								
<i>Surrogate: 1,2-Dichloroethane-d4</i>	14.5		"	13.3		109		23-173			
<i>Surrogate: Toluene-d8</i>	14.1		"	13.3		106		20-170			
<i>Surrogate: 4-Bromofluorobenzene</i>	12.9		"	13.3		96.7		21-167			

##### LCS (BFB0328-BS1)

Prepared: 02/28/22 Analyzed: 03/01/22

Benzene	35.6	1.0	ug/l	41.7		85.5		51-132			
Toluene	42.6	1.0	"	41.7		102		51-138			
Ethylbenzene	40.9	1.0	"	41.7		98.2		58-146			
m,p-Xylene	81.5	2.0	"	83.3		97.8		57-144			
o-Xylene	41.1	1.0	"	41.7		98.5		53-146			
Naphthalene	43.1	1.0	"	41.7		103		70-130			
1,2,4-Trimethylbenzene	43.0	1.0	"	41.7		103		70-130			
1,3,5-Trimethylbenzene	47.0	1.0	"	41.7		113		70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	15.5		"	13.3		117		23-173			
<i>Surrogate: Toluene-d8</i>	14.1		"	13.3		106		20-170			
<i>Surrogate: 4-Bromofluorobenzene</i>	13.9		"	13.3		104		21-167			

##### Matrix Spike (BFB0328-MS1)

Source: 2202329-01

Prepared: 02/28/22 Analyzed: 03/01/22

Benzene	35.2	1.0	ug/l	41.7	ND	84.4		34-141			
Toluene	42.4	1.0	"	41.7	ND	102		27-151			
Ethylbenzene	41.6	1.0	"	41.7	ND	99.8		29-160			
m,p-Xylene	83.7	2.0	"	83.3	ND	100		20-166			
o-Xylene	42.1	1.0	"	41.7	ND	101		33-159			
Naphthalene	45.1	1.0	"	41.7	ND	108		70-130			
1,2,4-Trimethylbenzene	43.6	1.0	"	41.7	ND	105		70-130			
1,3,5-Trimethylbenzene	47.7	1.0	"	41.7	ND	114		70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	15.4		"	13.3		116		23-173			
<i>Surrogate: Toluene-d8</i>	13.9		"	13.3		105		20-170			
<i>Surrogate: 4-Bromofluorobenzene</i>	13.4		"	13.3		100		21-167			

Summit Scientific

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

Project: Barrell 41-4

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
 03/07/22 12:54

**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		

**Batch BFB0328 - EPA 5030 Water MS**

**Matrix Spike Dup (BFB0328-MSD1)**

Source: 2202329-01

Prepared: 02/28/22 Analyzed: 03/01/22

Benzene	36.2	1.0	ug/l	41.7	ND	86.9	34-141	2.94	30	
Toluene	42.7	1.0	"	41.7	ND	103	27-151	0.846	30	
Ethylbenzene	42.2	1.0	"	41.7	ND	101	29-160	1.50	30	
m,p-Xylene	83.5	2.0	"	83.3	ND	100	20-166	0.179	30	
o-Xylene	43.2	1.0	"	41.7	ND	104	33-159	2.53	30	
Naphthalene	48.7	1.0	"	41.7	ND	117	70-130	7.61	30	
1,2,4-Trimethylbenzene	45.3	1.0	"	41.7	ND	109	70-130	3.87	30	
1,3,5-Trimethylbenzene	48.5	1.0	"	41.7	ND	116	70-130	1.77	30	
Surrogate: 1,2-Dichloroethane-d4	16.0		"	13.3		120	23-173			
Surrogate: Toluene-d8	14.3		"	13.3		107	20-170			
Surrogate: 4-Bromofluorobenzene	13.9		"	13.3		104	21-167			

Summit Scientific

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

Project: Barrell 41-4

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 03/07/22 12:54

**Anions by EPA Method 300.0 - Quality Control**  
**Summit Scientific**

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

**Batch BFC0032 - General Preparation**

**Blank (BFC0032-BLK1)**

Prepared: 03/02/22 Analyzed: 03/03/22

Chloride	ND	0.0600	mg/L							
Sulfate	ND	0.300	"							

**LCS (BFC0032-BS1)**

Prepared & Analyzed: 03/02/22

Chloride	2.96	0.0600	mg/L	3.00	98.6	90-110			
Sulfate	14.7	0.300	"	15.0	97.9	90-110			

**Duplicate (BFC0032-DUP1)**

Source: 2202343-01

Prepared & Analyzed: 03/02/22

Chloride	6.20	6.00	mg/L		3.30		61.1	20	QR-03
Sulfate	405	30.0	"		402		0.693	20	

**Matrix Spike (BFC0032-MS1)**

Source: 2202343-01

Prepared & Analyzed: 03/02/22

Chloride	294	6.00	mg/L	300	3.30	97.0	80-120		
Sulfate	2020	30.0	"	1500	402	108	80-120		

Summit Scientific

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

Project: Barrell 41-4

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 03/07/22 12:54

**Total Dissolved Solids by SM2540C - Quality Control**  
**Summit Scientific**

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

**Batch BFB0323 - General Preparation**

**Blank (BFB0323-BLK1)**

Prepared & Analyzed: 02/28/22

Total Dissolved Solids                      ND                      10.0                      mg/L

**Duplicate (BFB0323-DUP1)**

**Source: 2202331-01**

Prepared & Analyzed: 02/28/22

Total Dissolved Solids                      644                      10.0                      mg/L                      638                      0.999                      20

Summit Scientific

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

Project: Barrell 41-4

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
03/07/22 12:54

### Notes and Definitions

- QR-03 The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
- 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