

PDC Energy, Inc.
First Quarter 2022 Groundwater Monitoring Summary

March 1, 2022

Former Owl Creek 7, 7-5 Tank Battery
NESE Section 5 T6N R64W
Remediation # 16159

This groundwater monitoring summary has been prepared by Tasman, Inc. for the former Owl Creek 7, 7-5 Tank Battery.

Site History and Background

On January 29, 2021, a historic hydrocarbon release was discovered beneath the produced water vessel during decommissioning activities. Following the discovery, mitigation activities were initiated, and between January 29, and February 22, 2021, approximately 2,154 cubic yards of impacted material were removed from the former excavation. During excavation activities, groundwater was encountered within the excavation at approximately 7 feet below ground surface (bgs). Groundwater vacuum recovery activities were conducted concurrent with excavation activities and approximately 220 barrels of groundwater were removed from location. On March 31, 2021, twelve (12) monitoring wells (BH01 – BH12) were installed to confirm the absence of dissolved phase hydrocarbon impacts within and adjacent to the former excavation extent. Per landowner request, monitoring wells BH01 – BH08, and BH10 – BH11 were buried approximately 24 inches bgs. Due to agricultural practices, buried monitoring wells BH01 – BH08 and BH10 – BH11 were destroyed and temporary monitoring wells BH01R, BH02, BH03R – BH06R, BH07 – BH08, BH10R, and BH11 were installed quarterly via hand auger following the second quarter 2021 groundwater monitoring event.

Groundwater Monitoring Activities

On January 27, 2022, groundwater monitoring was conducted at 12 monitoring wells (BH01R, BH02, BH03R—BH06R, BH07—BH09, BH10R, BH11, and BH12). Temporary monitoring wells (BH01R, BH02, BH03R—BH06R, BH07—BH08, BH10R, and BH11) were installed using a hand auger in cultivated land. The wells were purged, sampled, and subsequently abandoned. A GPS point was collected from all temporary monitoring well locations to ensure the groundwater sample locations remains consistent between quarters. Twelve groundwater samples were submitted for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene (TMB), and 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 below the applicable COGCC Table 915-1 groundwater standards in all monitoring well locations. TDS and sulfate and chloride anion concentrations were in exceedance of the applicable COGCC Table 915-1 groundwater standards and above 1.25x the background concentrations collected from the up- and cross-gradient

monitoring wells (BH07, BH09 and BH11 – BH12) in monitoring wells BH03R – BH05R. Sample locations and corresponding analytical results are illustrated on Figures 1 and 2. Groundwater elevation data is illustrated on Figure 3. Groundwater analytical results are summarized in Tables 1 and 2. The laboratory analytical report is included as Attachment A.

Current Remediation Activities and Path Forward

Monitored natural attenuation (MNA) was selected as the remediation strategy for this site during the second quarter 2021 and will remain the selected remediation strategy through the second quarter 2022.

Second quarter 2022 groundwater sampling will be conducted in April 2022.

BH02		
Compound (µg/L)	10/26/2021	1/27/2022
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)	4.82	4.57

BH01R		
Compound (µg/L)	10/26/2021	1/27/2022
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)	4.50	2.44

BH05R		
Compound (µg/L)	10/26/2021	1/27/2022
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)	5.28	4.85

BH11		
Compound (µg/L)	10/26/2021	1/27/2022
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)	4.98	4.85

BH10R		
Compound (µg/L)	10/26/2021	1/27/2022
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)	5.12	5.27

BH03R		
Compound (µg/L)	10/26/2021	1/27/2022
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)	5.35	4.90

BH12		
Compound (µg/L)	10/26/2021	1/27/2022
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)	5.34	5.47

BH04R		
Compound (µg/L)	10/26/2021	1/27/2022
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)	3.98	6.71

BH06R		
Compound (µg/L)	10/26/2021	1/27/2022
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)	4.55	4.61

BH08		
Compound (µg/L)	10/26/2021	1/27/2022
Benzene		<1.0
Toluene		<1.0
Ethylbenzene	Not Sampled Dry	<1.0
Total Xylenes		<2.0
Naphthalene		<1.0
1,2,4-TMB		<1.0
1,3,5-TMB		<1.0
Depth to water (ft. bgs)	Dry	4.68

BH07		
Compound (µg/L)	10/26/2021	1/27/2022
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)	5.10	5.47

BH09		
Compound (µg/L)	10/26/2021	1/27/2022
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)	4.89	5.10



Legend

- Excavation Extent (Collected via Trimble GPS)
- Monitoring Well Location (Collected via Trimble GPS)
- Replacement Monitoring Well Location (Collected via Trimble GPS)
- Groundwater Flow Direction (1Q22)
- Excavation Groundwater Sample Location

Notes

All locations are approximate unless otherwise noted.

GPS – Global Positioning System

TMB – Trimethylbenzene

µg/L – Micrograms per liter

ft. bgs – Feet below ground surface

0 ft. 10 ft. 20 ft.

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

DATE: February 3, 2022

DESIGNED BY: B. Nelson

DRAWN BY: D. Vigil

Tasman, Inc.
6855 West 119th Avenue
Broomfield, CO 80020

PDC Energy, Inc. – DJ Basin
Former Owl Creek 7, 7-5 Tank Battery
NESE, Section 5 Township 6 North, Range 64 West
Weld County, Colorado

**GROUNDWATER
ANALYTICAL RESULTS
MAP**

**FIGURE
1**

BH02		
Compound (mg/L)	10/26/2021	1/27/2022
Chloride	12.2	159
Sulfate	270	156
TDS	590	1,130
Depth to water (ft. bgs)	4.82	4.57

BH01R		
Compound (mg/L)	10/26/2021	1/27/2022
Chloride	11.6	159
Sulfate	241	139
TDS	550	1,060
Depth to water (ft. bgs)	4.50	2.44

BH11		
Compound (mg/L)	10/26/2021	1/27/2022
Chloride	13.2	200
Sulfate	198	146
TDS	512	1,200
Depth to water (ft. bgs)	4.98	4.85

BH04R		
Compound (mg/L)	10/26/2021	1/27/2022
Chloride	130	731
Sulfate	3,420	308
TDS	3,690	2,680
Depth to water (ft. bgs)	3.98	6.71

BH12		
Compound (mg/L)	10/26/2021	1/27/2022
Chloride	7.80	11.8
Sulfate	204	107
TDS	489	624
Depth to water (ft. bgs)	5.34	5.47

BH03R		
Compound (mg/L)	10/26/2021	1/27/2022
Chloride	216	194
Sulfate	1,410	1,370
TDS	1,740	3,280
Depth to water (ft. bgs)	5.35	4.90

BH10R		
Compound (mg/L)	10/26/2021	1/27/2022
Chloride	11.8	224
Sulfate	401	175
TDS	721	1,490
Depth to water (ft. bgs)	5.12	5.27

BH08		
Compound (mg/L)	10/26/2021	1/27/2022
Chloride	Not Sampled	108
Sulfate		160
TDS		1,180
Depth to water (ft. bgs)	Dry	4.68

BH05R		
Compound (mg/L)	10/26/2021	1/27/2022
Chloride	32.8	98.0
Sulfate	383	479
TDS	899	1,690
Depth to water (ft. bgs)	5.28	4.85

BH09		
Compound (mg/L)	10/26/2021	1/27/2022
Chloride	8.20	8.23
Sulfate	274	126
TDS	577	696
Depth to water (ft. bgs)	4.89	5.10

BH06R		
Compound (mg/L)	10/26/2021	1/27/2022
Chloride	15.8	149
Sulfate	266	133
TDS	616	1,080
Depth to water (ft. bgs)	4.55	4.61

BH07		
Compound (mg/L)	10/26/2021	1/27/2022
Chloride	13.0	256
Sulfate	252	177
TDS	582	1,510
Depth to water (ft. bgs)	5.10	5.47

Legend

- Excavation Extent (Collected via Trimble GPS)
- Monitoring Well Location (Collected via Trimble GPS)
- Groundwater Sample Location
- Groundwater Flow Direction (1Q22)

Notes

All locations are approximate unless otherwise noted.
 GPS – Global Positioning System
 mg/L – Milligrams per liter
 TDS – Total dissolved solids

Red text – exceedances of COGCC Table 915-1 standards and above 1.25x BCKG concentration.
 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. 20 ft. 40 ft.

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

DATE: November 29, 2021

DESIGNED BY: B. Nelson

DRAWN BY: J. Marcus

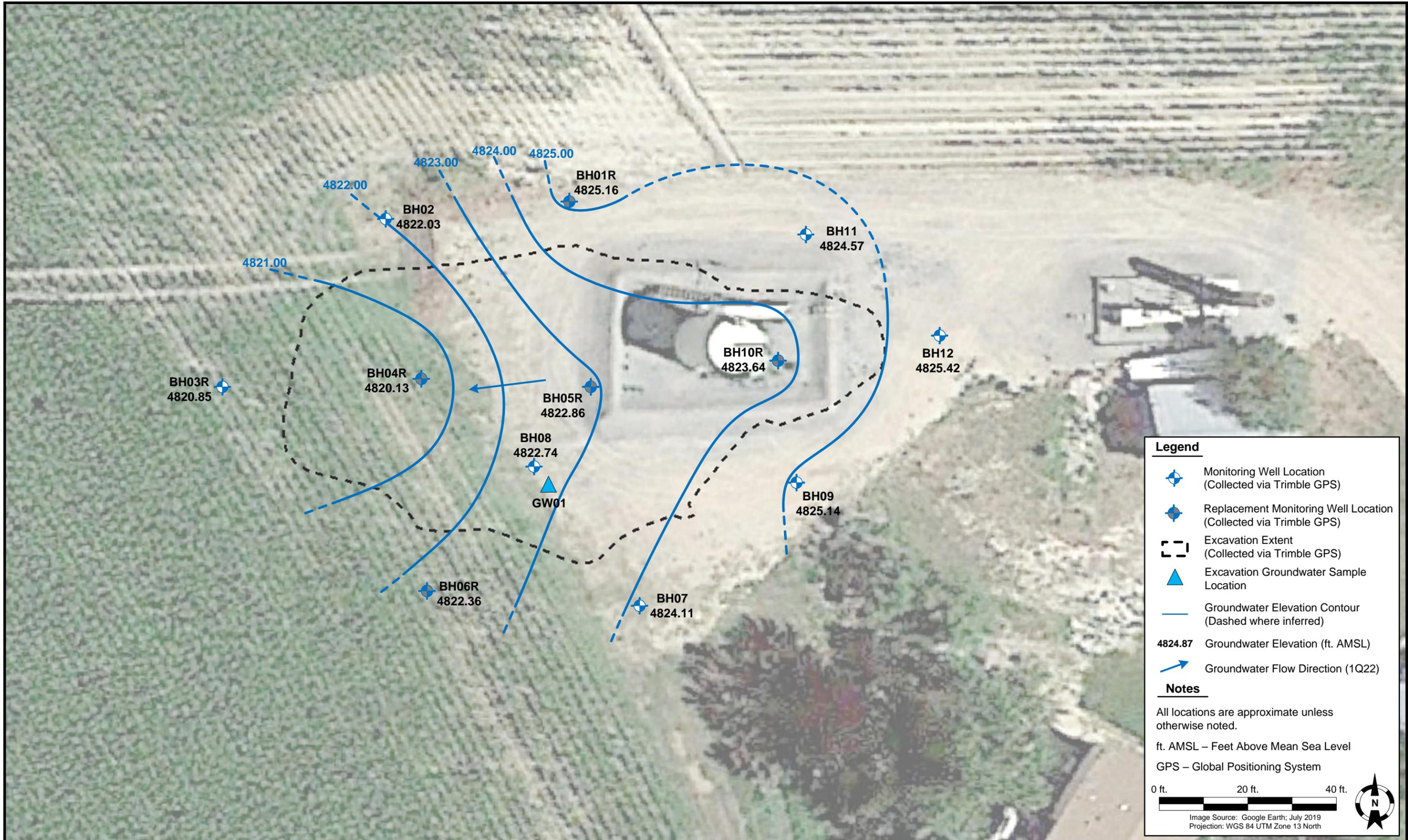


Tasman, Inc.
 6855 W. 119th Ave.
 Broomfield, CO 80020

PDC Energy, Inc. – DJ Basin
Former Owl Creek 7, 7-5 Tank Battery
 NESE, Section 5 Township 6 North, Range 64 West
 Weld County, Colorado

GROUNDWATER ANALYTICAL RESULTS MAP (INORGANIC PARAMETERS)

FIGURE 2



Legend

- Monitoring Well Location (Collected via Trimble GPS)
- Replacement Monitoring Well Location (Collected via Trimble GPS)
- Excavation Extent (Collected via Trimble GPS)
- Excavation Groundwater Sample Location
- Groundwater Elevation Contour (Dashed where inferred)
- 4824.87** Groundwater Elevation (ft. AMSL)
- Groundwater Flow Direction (1Q22)

Notes

All locations are approximate unless otherwise noted.

ft. AMSL – Feet Above Mean Sea Level

GPS – Global Positioning System

0 ft. 20 ft. 40 ft.

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

DATE: January 31, 2022

DESIGNED BY: B. Nelson

DRAWN BY: A. Dahl



Tasman, Inc.
6855 West 119th Avenue
Broomfield, CO 80020

PDC Energy, Inc. – DJ Basin
Former Owl Creek 7, 7-5 Tank Battery
NESE, Section 5 Township 6 North, Range 64 West
Weld County, Colorado

**GROUNDWATER
ELEVATION CONTOUR
MAP (01/27/2022)**

**FIGURE
3**

**TABLE 1
FORMER OWL CREEK 7, 7-5 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 ⁽²⁾ (ft.)	Groundwater Elevation (ft. AMSL)
COGCC Table 915-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	140	67	67	-	-
GW01	2/22/2021	<1.0	<1.0	2.9	5.9	2.8	12	1.8	~6	-
BH01R	4/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	2.92	4824.87
BH01R	7/13/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.64	4825.40
BH01R	10/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.50	4822.80
BH01R	1/27/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	2.44	4825.16
BH02	4/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	NM	NM
BH02	7/13/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.56	4824.45
BH02	10/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.82	4821.39
BH02	1/27/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.57	4822.03
BH03R	4/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	2.81	4822.99
BH03R	7/13/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.27	4823.80
BH03R	10/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.35	4820.16
BH03R	1/27/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.90	4820.85
BH04R	4/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	2.33	4824.69
BH04R	7/13/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	2.48	4825.74
BH04R	10/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.98	4822.51
BH04R	1/27/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.71	4820.13
BH05R	4/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	2.81	4825.06
BH05R	7/13/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	2.93	4826.23
BH05R	10/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.28	4822.06
BH05R	1/27/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.85	4822.86
BH06R	4/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	2.83	4824.25
BH06R	7/13/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	2.52	4825.89
BH06R	10/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.55	4821.90
BH06R	1/27/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.61	4822.36
BH07	4/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	2.90	4825.78
BH07	7/13/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.82	4826.53
BH07	10/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.10	4823.59
BH07	1/27/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.47	4824.11
BH08	4/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	NM	NM
BH08	7/13/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	2.75	4826.03
BH08	10/26/2021	Not Sampled - Dry							Dry	Dry
BH08	1/27/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.68	4822.74
BH09	4/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.64	4826.77
BH09	7/13/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.88	4826.53
BH09	10/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.89	4824.93
BH09	1/27/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.10	4825.14
BH10R	4/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.44	4825.70
BH10R	7/13/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.41	4827.03
BH10R	10/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.12	4823.50
BH10R	1/27/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.27	4823.64
BH11	4/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.16	4826.40
BH11	7/13/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.06	4826.94
BH11	10/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.98	4824.00
BH11	1/27/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.85	4824.57
BH12	4/6/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.68	4827.31
BH12	7/13/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.14	4826.85
BH12	10/26/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.34	4825.65
BH12	1/27/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.47	4825.42

TABLE 1
FORMER OWL CREEK 7, 7-5 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 ⁽²⁾ (ft.)	Groundwater Elevation (ft. AMSL)
COGCC Table 915-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	140	67	67	-	-

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.
- 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
NM = Not Measured

TABLE 2
FORMER OWL CREEK 7, 7-5 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE
INORGANIC PARAMETERS

Sample ID	Date Sampled	TDS (mg/L)	Chloride Ion (mg/L)	Sulfate Ion (mg/L)	Depth to Water ⁽²⁾ (ft.)	Groundwater Elevation (ft. AMSL)
COGCC Table 915-1 Groundwater Standard (mg/L)⁽¹⁾		<1.25 x BCKG	250 or <1.25 x BCKG	250 or <1.25 x BCKG	-	-
BH01R	4/26/2021	1,140	157	254	2.92	4824.87
BH01R	7/13/2021	572	16.2	263	3.64	4825.40
BH01R	10/26/2021	550	11.6	241	4.50	4822.80
BH01R	1/27/2022	1,060	159	139	2.44	4825.16
BH02	4/6/2021	596	4.30	132	NM	NM
BH02	7/13/2021	530	14.4	474	3.56	4824.45
BH02	10/26/2021	590	12.2	270	4.82	4821.39
BH02	1/27/2022	1,130	159	156	4.57	4822.03
BH03R	4/26/2021	1,550	205	237	2.81	4822.99
BH03R	7/13/2021	1,860	292	1,500	3.27	4823.80
BH03R	10/26/2021	1,740	216	1,410	5.35	4820.16
BH03R	1/27/2022	3,280	194	1,370	4.90	4820.85
BH04R	4/26/2021	4,590	740	2,530	2.33	4824.69
BH04R	7/13/2021	2,850	343	2,420	2.48	4825.74
BH04R	10/26/2021	3,690	130	3,420	3.98	4822.51
BH04R	1/27/2022	2,680	731	308	6.71	4820.13
BH05R	4/26/2021	4,290	561	2,610	2.81	4825.06
BH05R	7/13/2021	1,390	85.4	1,280	2.93	4826.23
BH05R	10/26/2021	899	32.8	383	5.28	4822.06
BH05R	1/27/2022	1,690	98.0	479	4.85	4822.86
BH06R	4/26/2021	1,270	172	303	2.83	4824.25
BH06R	7/13/2021	653	19.8	342	2.52	4825.89
BH06R	10/26/2021	616	15.8	266	4.55	4821.90
BH06R	1/27/2022	1,080	149	133	4.61	4822.36
BH07	4/6/2021	561	3.34	125	2.90	4825.78
BH07	7/13/2021	640	21.2	431	3.82	4826.53
BH07	10/26/2021	582	13.0	252	5.10	4823.59
BH07	1/27/2022	1,510	256	177	5.47	4824.11
BH08	4/6/2021	686	6.88	227	NM	NM
BH08	7/13/2021	1,340	47.2	1,100	2.75	4826.03
BH08	10/26/2021	Not Sampled - Dry			Dry	Dry
BH08	1/27/2022	1,180	108	160	4.68	4822.74

TABLE 2
FORMER OWL CREEK 7, 7-5 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE
INORGANIC PARAMETERS

Sample ID	Date Sampled	TDS (mg/L)	Chloride Ion (mg/L)	Sulfate Ion (mg/L)	Depth to Water ⁽²⁾ (ft.)	Groundwater Elevation (ft. AMSL)
COGCC Table 915-1 Groundwater Standard (mg/L)⁽¹⁾		<1.25 x BCKG	250 or <1.25 x BCKG	250 or <1.25 x BCKG	-	-
BH09	4/6/2021	647	6.06	176	3.64	4826.77
BH09	7/13/2021	633	23.8	495	3.88	4826.53
BH09	10/26/2021	577	8.20	274	4.89	4824.93
BH09	1/27/2022	696	8.23	126	5.10	4825.14
BH10R	4/26/2021	1,540	189	410	3.44	4825.70
BH10R	7/13/2021	578	8.60	376	3.41	4827.03
BH10R	10/26/2021	721	11.8	401	5.12	4823.50
BH10R	1/27/2022	1,490	224	175	5.27	4823.64
BH11	4/6/2021	624	9.80	235	3.16	4826.40
BH11	7/13/2021	505	10.0	266	4.06	4826.94
BH11	10/26/2021	512	13.2	198	4.98	4824.00
BH11	1/27/2022	1,200	200	146	4.85	4824.57
BH12	4/6/2021	504	6.74	129	3.68	4827.31
BH12	7/13/2021	528	24.8	439	4.14	4826.85
BH12	10/26/2021	489	7.80	204	5.34	4825.65
BH12	1/27/2022	624	11.8	107	5.47	4825.42

Notes:

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

TDS = Total dissolved solids

COGCC = Colorado Oil and Gas Conservation Commission

BCKG = Background

mg/L = Milligrams per liter

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

NM = Not measured

BOLD = Analytical result is in exceedance of applicable standard but within 1.25x background concentration.

BOLD = Analytical result is in exceedance of applicable standard and above 1.25x background concentration.

 = Up- / cross-gradient well used for background concentration.

Attachment A

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

February 03, 2022

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Owl Creek 7,7-5

Work Order #2201350

Enclosed are the results of analyses for samples received by Summit Scientific on 01/27/22 17:10. 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 For Paul Shrewsbury

President



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

Project: Owl Creek 7,7-5

Project Number: [none]

Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01R	2201350-01	Water	01/27/22 14:11	01/27/22 17:10
BH02	2201350-02	Water	01/27/22 13:58	01/27/22 17:10
BH03R	2201350-03	Water	01/27/22 14:04	01/27/22 17:10
BH04R	2201350-04	Water	01/27/22 14:14	01/27/22 17:10
BH05R	2201350-05	Water	01/27/22 14:01	01/27/22 17:10
BH06R	2201350-06	Water	01/27/22 14:22	01/27/22 17:10
BH07	2201350-07	Water	01/27/22 13:53	01/27/22 17:10
BH08	2201350-08	Water	01/27/22 14:22	01/27/22 17:10
BH09	2201350-09	Water	01/27/22 13:44	01/27/22 17:10
BH10R	2201350-10	Water	01/27/22 14:15	01/27/22 17:10
BH11	2201350-11	Water	01/27/22 13:59	01/27/22 17:10
BH12	2201350-12	Water	01/27/22 13:38	01/27/22 17:10

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

S₂

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

Client: PDC / Tasman Geosciences Project Manager: MARK LONGHURST
 Address: 6855 W. 119th Ave. E-Mail: mark.longhurst@pdc.com
 City/State/Zip: Broomfield / CO/ 80020
 Phone: 303-487-1228 Project Name: OWL CREEK 7, 7-5
 Sampler Name: COLETTE RAMEY Project Number: N/A

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	Sulfate
1	BH01R	04/27/22	1411	4	3			1		✓			✓	✓	✓	✓	✓	✓		
2	BH02		1358	1																
3	BH03R		1404	1																
4	BH04R		1414	1																
5	BH05R		1401	1																
6	BH06R		1422	1																
7	BH07		1353	1																
8	BH08		1422	1																
9	BH09		1344	1																
10	BH10R		1415	1																

Relinquished by: 	Date/Time: <u>1/27/22</u> <u>1710</u>	Received by: <u>Tasman's Lock Box</u>	Date/Time: <u>1/27/22</u> <u>1710</u>	Turn Around Time (Check) <input type="checkbox"/> Same Day 72 hours <input type="checkbox"/> 24 hours <input checked="" type="checkbox"/> Standard <input type="checkbox"/> 48 hours Sample Integrity: Temperature Upon Receipt: <u>4.2</u> Samples Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Notes:
Relinquished by: <u>Tasman's Lock Box</u>	Date/Time:	Received by: 	Date/Time: <u>12722</u> <u>1710</u>		
Relinquished by:	Date/Time:	Received by:	Date/Time:		

S₂

2/2
Sample Receipt Checklist

S2 Work Order# 2201350

Client: Poc/Tasman Client Project ID: Owl Creek 7,7-5

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

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

Temp (°C) 4.2

Thermometer ID: G86A9201901378

	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 if there is evidence that cooling has begun.	-			on ICE
Were all samples received intact ⁽¹⁾ ?	-			
Was adequate sample volume provided ⁽¹⁾ ?	-			
If custody seals are present, are they intact ⁽¹⁾ ?	-			
Are samples with holding times due within 48 hours sample due within 48 hours present?		-		
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	-			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	-			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	-			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	-			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.		-		
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ? Note the type of preservative in the Comments column – HCl, H ₂ SO ₄ , NaOH, HNO ₃ , etc.	-			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.

[Signature]
Custodian Printed Name or Initials

1/27/22
Date/Time



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

Project: Owl Creek 7,7-5

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

BH01R
2201350-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/27/22 14:11**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFA0512	01/31/22	02/02/22	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: **01/27/22 14:11**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		111 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		96.5 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.1 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **01/27/22 14:11**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	159	12.0		mg/L	200	BFA0508	01/31/22	02/02/22	EPA 300.0	
Sulfate	139	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **01/27/22 14:11**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	1060	10.0		mg/L	1	BFA0467	01/28/22	01/28/22	SM2540C	

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

BH02
2201350-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/27/22 13:58**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFA0512	01/31/22	02/02/22	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: **01/27/22 13:58**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		111 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.1 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.3 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **01/27/22 13:58**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	159	12.0		mg/L	200	BFA0508	01/31/22	01/31/22	EPA 300.0	
Sulfate	156	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **01/27/22 13:58**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	1130	10.0		mg/L	1	BFA0467	01/28/22	01/28/22	SM2540C	

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

BH03R
2201350-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/27/22 14:04**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFA0512	01/31/22	02/02/22	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: **01/27/22 14:04**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		112 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		97.1 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.5 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **01/27/22 14:04**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	194	12.0		mg/L	200	BFA0508	01/31/22	01/31/22	EPA 300.0	
Sulfate	1370	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **01/27/22 14:04**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	3280	10.0		mg/L	1	BFA0467	01/28/22	01/28/22	SM2540C	

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

BH04R
2201350-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/27/22 14:14**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFA0512	01/31/22	02/02/22	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: **01/27/22 14:14**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		110 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		97.4 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.4 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **01/27/22 14:14**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	731	12.0		mg/L	200	BFA0508	01/31/22	01/31/22	EPA 300.0	
Sulfate	308	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **01/27/22 14:14**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	2680	10.0		mg/L	1	BFA0467	01/28/22	01/28/22	SM2540C	

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

BH05R
2201350-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/27/22 14:01**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFA0512	01/31/22	02/02/22	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: **01/27/22 14:01**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		115 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		99.0 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.5 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **01/27/22 14:01**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	98.0	12.0		mg/L	200	BFA0508	01/31/22	01/31/22	EPA 300.0	
Sulfate	479	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **01/27/22 14:01**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	1690	10.0		mg/L	1	BFA0467	01/28/22	01/28/22	SM2540C	

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

BH06R
2201350-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/27/22 14:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFA0512	01/31/22	02/02/22	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: **01/27/22 14:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		115 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		99.8 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.0 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **01/27/22 14:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	149	12.0		mg/L	200	BFA0508	01/31/22	01/31/22	EPA 300.0	
Sulfate	133	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **01/27/22 14:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	1080	10.0		mg/L	1	BFA0467	01/28/22	01/28/22	SM2540C	

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

BH07
2201350-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/27/22 13:53**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFA0512	01/31/22	02/02/22	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: **01/27/22 13:53**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		110 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		95.9 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.0 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **01/27/22 13:53**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	256	12.0		mg/L	200	BFA0508	01/31/22	01/31/22	EPA 300.0	
Sulfate	177	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **01/27/22 13:53**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	1510	10.0		mg/L	1	BFA0467	01/28/22	01/28/22	SM2540C	

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

BH08
2201350-08 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/27/22 14:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFA0512	01/31/22	02/02/22	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: **01/27/22 14:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		112 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		96.2 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.1 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **01/27/22 14:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	108	12.0		mg/L	200	BFA0508	01/31/22	01/31/22	EPA 300.0	
Sulfate	160	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **01/27/22 14:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	1180	10.0		mg/L	1	BFA0467	01/28/22	01/28/22	SM2540C	

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

BH09
2201350-09 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/27/22 13:44**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFA0512	01/31/22	02/02/22	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: **01/27/22 13:44**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		114 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.2 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.5 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **01/27/22 13:44**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	8.23	0.0600		mg/L	1	BFA0508	01/31/22	02/02/22	EPA 300.0	
Sulfate	126	60.0		"	200	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **01/27/22 13:44**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	696	10.0		mg/L	1	BFA0467	01/28/22	01/28/22	SM2540C	

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

BH10R
2201350-10 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/27/22 14:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFA0512	01/31/22	02/02/22	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: **01/27/22 14:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		112 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.3 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.4 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **01/27/22 14:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	224	12.0		mg/L	200	BFA0508	01/31/22	01/31/22	EPA 300.0	
Sulfate	175	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **01/27/22 14:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	1490	10.0		mg/L	1	BFA0467	01/28/22	01/28/22	SM2540C	

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

BH11
2201350-11 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/27/22 13:59**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFA0512	01/31/22	02/02/22	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: **01/27/22 13:59**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		114 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		97.9 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.3 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **01/27/22 13:59**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	200	12.0		mg/L	200	BFA0508	01/31/22	01/31/22	EPA 300.0	
Sulfate	146	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **01/27/22 13:59**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	1200	10.0		mg/L	1	BFA0467	01/28/22	01/28/22	SM2540C	

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

BH12
2201350-12 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/27/22 13:38**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BFA0512	01/31/22	02/02/22	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: **01/27/22 13:38**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		113 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.6 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.8 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **01/27/22 13:38**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	11.8	1.20		mg/L	20	BFA0508	01/31/22	01/31/22	EPA 300.0	
Sulfate	107	60.0		"	200	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **01/27/22 13:38**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	624	10.0		mg/L	1	BFA0467	01/28/22	01/28/22	SM2540C	

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch BFA0512 - EPA 5030 Water MS

Blank (BFA0512-BLK1)

Prepared: 01/31/22 Analyzed: 02/02/22

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>	15.2		"	13.3		114	23-173			
<i>Surrogate: Toluene-d8</i>	13.0		"	13.3		97.9	20-170			
<i>Surrogate: 4-Bromofluorobenzene</i>	12.9		"	13.3		96.5	21-167			

LCS (BFA0512-BS1)

Prepared: 01/31/22 Analyzed: 02/02/22

Benzene	38.4	1.0	ug/l	33.3		115	51-132			
Toluene	38.4	1.0	"	33.3		115	51-138			
Ethylbenzene	39.6	1.0	"	33.3		119	58-146			
m,p-Xylene	77.7	2.0	"	66.7		116	57-144			
o-Xylene	39.4	1.0	"	33.3		118	53-146			
Naphthalene	36.4	1.0	"	33.3		109	70-130			
1,2,4-Trimethylbenzene	32.9	1.0	"	33.3		98.8	70-130			
1,3,5-Trimethylbenzene	42.5	1.0	"	33.3		127	70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	15.7		"	13.3		118	23-173			
<i>Surrogate: Toluene-d8</i>	13.2		"	13.3		98.8	20-170			
<i>Surrogate: 4-Bromofluorobenzene</i>	13.3		"	13.3		99.6	21-167			

Matrix Spike (BFA0512-MS1)

Source: 2201350-01

Prepared: 01/31/22 Analyzed: 02/02/22

Benzene	38.7	1.0	ug/l	33.3	ND	116	34-141			
Toluene	39.0	1.0	"	33.3	ND	117	27-151			
Ethylbenzene	40.0	1.0	"	33.3	ND	120	29-160			
m,p-Xylene	77.7	2.0	"	66.7	ND	117	20-166			
o-Xylene	39.0	1.0	"	33.3	ND	117	33-159			
Naphthalene	41.0	1.0	"	33.3	ND	123	70-130			
1,2,4-Trimethylbenzene	33.2	1.0	"	33.3	ND	99.7	70-130			
1,3,5-Trimethylbenzene	42.7	1.0	"	33.3	ND	128	70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	15.7		"	13.3		118	23-173			
<i>Surrogate: Toluene-d8</i>	13.3		"	13.3		99.6	20-170			
<i>Surrogate: 4-Bromofluorobenzene</i>	12.9		"	13.3		96.8	21-167			

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 02/03/22 14:57

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 BFA0512 - EPA 5030 Water MS

Matrix Spike Dup (BFA0512-MSD1)	Source: 2201350-01			Prepared: 01/31/22 Analyzed: 02/02/22							
Benzene	38.4	1.0	ug/l	33.3	ND	115	34-141	0.908	30		
Toluene	38.7	1.0	"	33.3	ND	116	27-151	0.823	30		
Ethylbenzene	39.8	1.0	"	33.3	ND	119	29-160	0.477	30		
m,p-Xylene	78.0	2.0	"	66.7	ND	117	20-166	0.411	30		
o-Xylene	38.1	1.0	"	33.3	ND	114	33-159	2.38	30		
Naphthalene	43.5	1.0	"	33.3	ND	130	70-130	5.99	30		
1,2,4-Trimethylbenzene	33.1	1.0	"	33.3	ND	99.3	70-130	0.452	30		
1,3,5-Trimethylbenzene	42.5	1.0	"	33.3	ND	128	70-130	0.563	30		
Surrogate: 1,2-Dichloroethane-d4	16.3		"	13.3		122	23-173				
Surrogate: Toluene-d8	13.3		"	13.3		100	20-170				
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.9	21-167				

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 02/03/22 14:57

Anions by EPA Method 300.0 - Quality Control
Summit Scientific

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

Batch BFA0508 - General Preparation

Blank (BFA0508-BLK1)

Prepared & Analyzed: 01/31/22

Chloride	ND	0.0600	mg/L						
Sulfate	ND	0.300	"						

LCS (BFA0508-BS1)

Prepared & Analyzed: 01/31/22

Chloride	3.30	0.0600	mg/L	3.00	110	90-110		
Sulfate	14.4	0.300	"	15.0	95.8	90-110		

Duplicate (BFA0508-DUP1)

Source: 2201350-01

Prepared: 01/31/22 Analyzed: 02/02/22

Chloride	144	12.0	mg/L	159		10.0	20
Sulfate	138	60.0	"	139		1.30	20

Matrix Spike (BFA0508-MS1)

Source: 2201350-01

Prepared: 01/31/22 Analyzed: 02/02/22

Chloride	388	12.0	mg/L	600	159	38.0	80-120	QM-05
Sulfate	1060	60.0	"	3000	139	30.6	80-120	QM-05

Summit Scientific

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



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

Project: Owl Creek 7,7-5

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 02/03/22 14:57

Total Dissolved Solids by SM2540C - Quality Control
Summit Scientific

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

Batch BFA0467 - General Preparation

Blank (BFA0467-BLK1)

Prepared & Analyzed: 01/28/22

Total Dissolved Solids ND 10.0 mg/L

Duplicate (BFA0467-DUP1)

Source: 2201349-02

Prepared & Analyzed: 01/28/22

Total Dissolved Solids 1020 10.0 mg/L 1050 2.60 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.



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

Project: Owl Creek 7,7-5

Project Number: [none]

Project Manager: Mark Longhurst

Reported:
02/03/22 14:57

Notes and Definitions

- QM-05 The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The associated LCS and/or LCSD were within acceptance limits, therefore the data are considered valid.
- 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