



PDC Energy, Inc.
Second Quarter 2023 Groundwater Monitoring Summary

July 12, 2023

Former Churchill 5 Wellhead
NENW Section 28 T5N R64W
Remediation # 20066

This groundwater monitoring summary has been prepared by Tasman, Inc. for the former Churchill 5 wellhead location.

Site History and Background

On October 10, 2021, groundwater was encountered within the former wellhead excavation at approximately 6 feet below ground surface (bgs) during wellhead decommissioning activities. Analytical results received from the groundwater sample (GW05) collected from the base of the excavation indicated that the benzene concentration was in exceedance of the applicable COGCC Table 915-1 regulatory standards. No impacted soil was identified or removed during decommissioning activities. On August 12, 2022, five monitoring wells (BH01 – BH05) were installed to delineate dissolved-phase hydrocarbon impacts within and adjacent to the former excavation extent (Figure 1).

Groundwater Monitoring Activities

On June 1, 2023, groundwater monitoring was conducted at all five monitoring wells (BH01 – BH05). Five 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, sulfate and chloride anions by EPA Method 300.0, and total dissolved solids (TDS) by Method SM 2540C in accordance with Table 915-1 standards.

Second quarter 2023 analytical results indicated that the benzene concentration was in exceedance of the applicable COGCC Table 915-1 regulatory standard in monitoring well BH01. Organic compound concentrations were in compliance with the applicable regulatory standards in the remaining four monitoring well locations. Additionally, inorganic parameters were in compliance with the applicable COGCC Table 915-1 regulatory standards or within 1.25x the background concentrations of the up-gradient monitoring wells (BH03 and BH04) 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. Groundwater analytical results are summarized in Tables 1 and 2. The laboratory analytical report is included in Attachment A.

Current Remediation Activities and Path Forward

Monitored natural attenuation (MNA) was selected as the remediation strategy for this site during the third quarter 2022 and will remain the selected remediation strategy through the third quarter 2023.

Third quarter 2023 groundwater sampling will be conducted in September 2023.

BH02		
Compound (µg/L)	3/3/2023	6/1/2023
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)	6.85	4.45

BH01		
Compound (µg/L)	3/3/2023	6/1/2023
Benzene	<1.0	18
Toluene	<1.0	44
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	6.6
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)	6.43	4.04

BH03		
Compound (µg/L)	3/3/2023	6/1/2023
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)	6.25	3.87

BH05		
Compound (µg/L)	3/3/2023	6/1/2023
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)	6.30	3.94

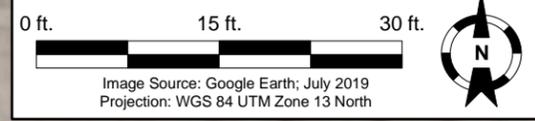
BH04		
Compound (µg/L)	3/3/2023	6/1/2023
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
1,3,5-TMB	<1.0	<1.0
Depth to Water (ft. bgs)	6.50	4.16

Legend

-  Excavation Extent (Collected via Trimble GPS)
-  Monitoring Well Location (Collected via Trimble GPS)
-  Groundwater Flow Direction (2Q23)
-  Excavation Groundwater Sample Location (Collected via Trimble GPS)
-  Underground Flowline Location (Collected via Trimble GPS)

Notes

All locations are approximate unless otherwise noted.
 µg/L – Micrograms per liter
 TMB - Trimethylbenzene
 ft. bgs – Feet below ground surface
 GPS – Global Positioning System
 Red text denotes an exceedance of COGCC standards
 COGCC - Colorado Oil and Gas Conservation Commission



DATE: July 12, 2023
 DESIGNED BY: C. Hamlin
 DRAWN BY: G. Semenza

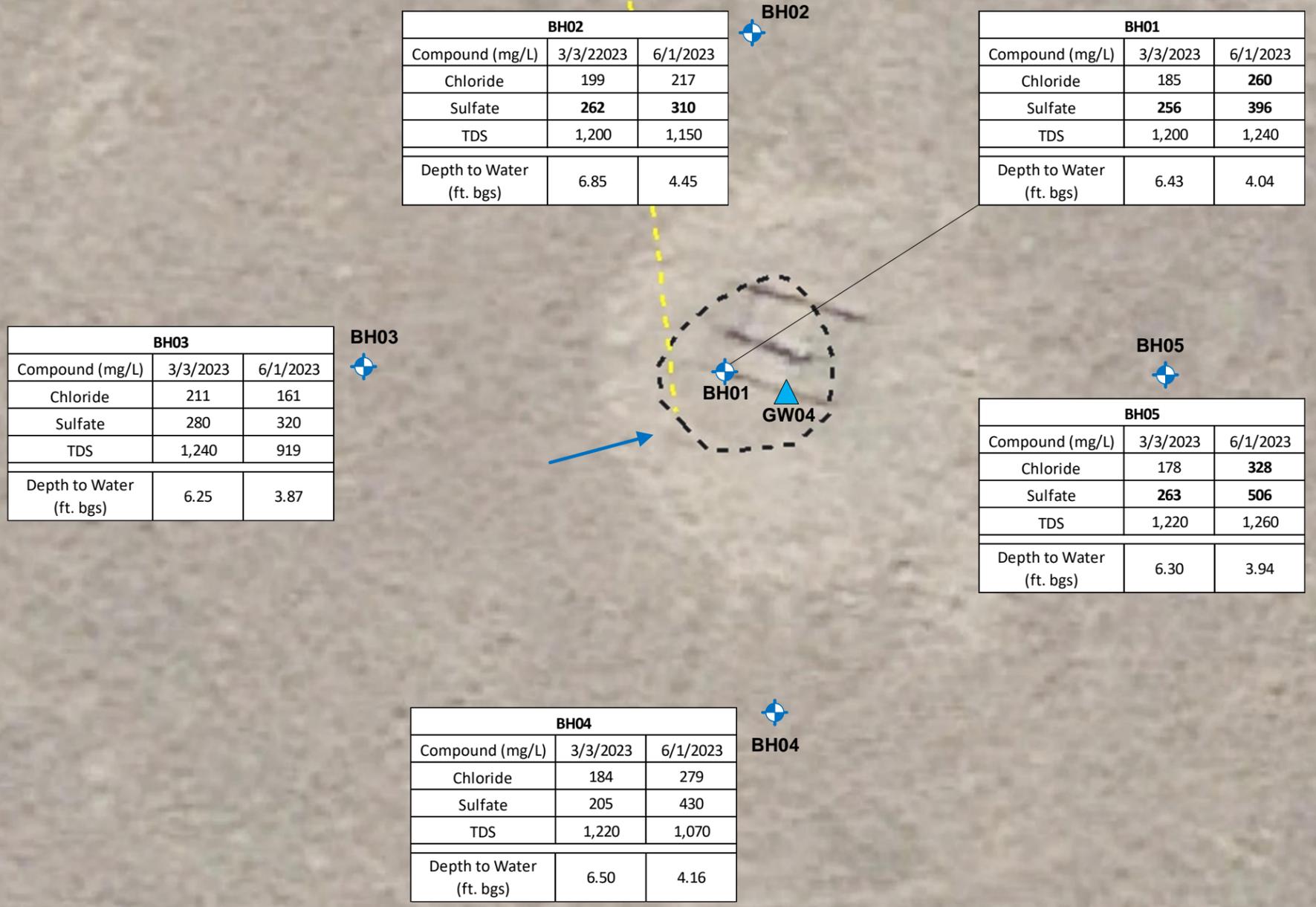


Tasman, Inc.
 6855 W. 119th Ave
 Broomfield, CO 80020

PDC Energy, Inc. – DJ Basin
Former Churchill 5 Wellhead
 NENW, Section 28, Township 5 North, Range 64 West
 Weld County, Colorado

GROUNDWATER
 ANALYTICAL RESULTS
 MAP

FIGURE
 1



Legend

- Excavation Extent (Collected via Trimble GPS)
- Monitoring Well Location (Collected via Trimble GPS)
- Groundwater Flow Direction (2Q23)
- Groundwater Sample Location (Collected via Trimble GPS)
- Underground Flowline Location (Collected via Trimble GPS)

Notes

All locations are approximate unless otherwise noted.

mg/L – Milligrams per liter

TDS – Total dissolved solids

ft. bgs – Feet below ground surface

GPS – Global Positioning System

Black bold text denotes an exceedance of COGCC regulatory standards but within 1.25x the background concentration

COGCC – Colorado Oil and Gas Conservation Commission

0 ft. 15 ft. 30 ft.

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

DATE: July 12, 2023

DESIGNED BY: C. Hamlin

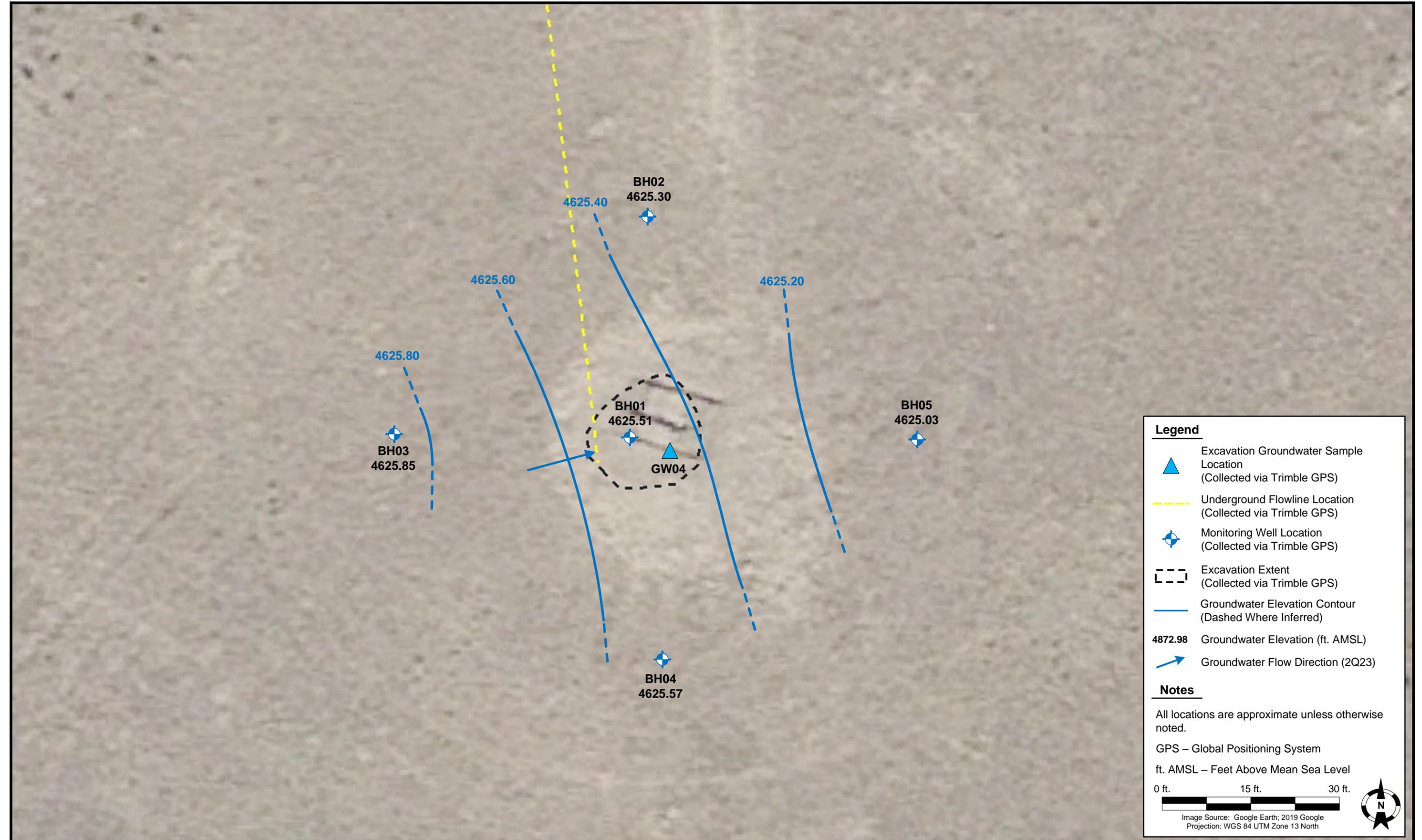
DRAWN BY: G. Semenza

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

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Former Churchill 5 Wellhead
NENW, Section 28, Township 5 North, Range 64 West
Weld County, Colorado

GROUNDWATER ANALYTICAL RESULTS MAP (INORGANIC PARAMATERS)

FIGURE 2



Legend

- Excavation Groundwater Sample Location (Collected via Trimble GPS)
- Underground Flowline Location (Collected via Trimble GPS)
- Monitoring Well Location (Collected via Trimble GPS)
- Excavation Extent (Collected via Trimble GPS)
- Groundwater Elevation Contour (Dashed Where Inferred)
- 4872.98** Groundwater Elevation (ft. AMSL)
- Groundwater Flow Direction (2Q23)

Notes

All locations are approximate unless otherwise noted.

GPS – Global Positioning System

ft. AMSL – Feet Above Mean Sea Level

0 ft. 15 ft. 30 ft.

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

DATE:	June 20, 2023
DESIGNED BY:	C. Hamlin
DRAWN BY:	J. Clonts

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

**PDC Energy, Inc. – DJ Basin
Former Churchill 5 Wellhead**
NENW, Section 28, Township 5 North, Range 64 West
Weld County, Colorado

**GROUNDWATER
ELEVATION CONTOUR
MAP (06/01/2023)**

**FIGURE
3**

TABLE 1
FORMER CHURCHILL 5 WELLHEAD
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	-	-
GW04	10/19/2021	7.1	13	<1.0	11	<1.0	1.3	<1.0	6	NA
BH01	9/14/2022	2.5	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.93	4622.62
BH01	12/28/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.70	4622.85
BH01	3/3/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.43	4623.12
BH01	6/1/2023	18	44	<1.0	6.6	<1.0	<1.0	<1.0	4.04	4625.51
BH02	9/14/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	7.39	4622.36
BH02	12/28/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	7.14	4622.61
BH02	3/3/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.85	4622.90
BH02	6/1/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.45	4625.30
BH03	9/14/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.76	4622.96
BH03	12/28/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.58	4623.14
BH03	3/3/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.25	4623.47
BH03	6/1/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.87	4625.85
BH04	9/14/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	7.06	4622.67
BH04	12/28/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.77	4622.96
BH04	3/3/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.50	4623.23
BH04	6/1/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.16	4625.57
BH05	9/14/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.85	4622.12
BH05	12/28/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.56	4622.41
BH05	3/3/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.30	4622.67
BH05	6/1/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.94	4625.03

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

NA = Not applicable

BOLD = Analytical result in exceedance of applicable COGCC standards

TABLE 2
FORMER CHURCHILL 5 WELLHEAD
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE
INORGANIC PARAMETERS

Sample ID	Date Sampled	TDS (unit)	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	-	-
BH01	9/14/2022	1,220	221	489	6.93	4622.62
BH01	3/3/2023	1,200	185	256	6.43	4623.12
BH01	6/1/2023	1,240	260	396	4.04	4625.51
BH02	9/14/2022	1,200	231	514	7.39	4622.36
BH02	3/3/2023	1,220	199	262	6.85	4622.90
BH02	6/1/2023	1,150	217	310	4.45	4625.30
BH03	9/14/2022	1,200	270	611	6.76	4622.96
BH03	3/3/2023	1,240	211	280	6.25	4623.47
BH03	6/1/2023	919	161	320	3.87	4625.85
BH04	9/14/2022	1,160	238	540	7.06	4622.67
BH04	3/3/2023	1,220	184	205	6.50	4623.23
BH04	6/1/2023	1,070	279	430	4.16	4625.57
BH05	9/14/2022	1,200	220	512	6.85	4622.12
BH05	3/3/2023	1,220	178	263	6.30	4622.67
BH05	6/1/2023	1,260	328	506	3.94	4625.03

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

BCKG = Background

mg/L = Milligrams per liter

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

ft. = Feet

AMSL = Above Mean Sea Level

 = Up- / Cross-gradient well locations used for background concentration.

 = Up- / Cross-gradient well locations used for historic background concentration.

BOLD = Analytical result is in exceedance of applicable COGCC standard but within 1.25x BCKG concentration

Attachment A

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

July 07, 2023

Mark Longhurst

Tasman Geosciences

6855 W. 119th Ave.

Broomfield, CO 80020

RE: PDC - Churchill 5 Wellhead

Work Order #2306595

Enclosed are the results of analyses for samples received by Summit Scientific on 06/28/23 18:25. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Scott Sheely For Paul Shrewsbury

President



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

Project: PDC - Churchill 5 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

Reported:
07/07/23 12:27

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	2306595-01	Water	06/28/23 13:28	06/28/23 18:25
BH02	2306595-02	Water	06/28/23 13:06	06/28/23 18:25
BH03	2306595-03	Water	06/28/23 13:16	06/28/23 18:25
BH04	2306595-04	Water	06/28/23 13:18	06/28/23 18:25
BH05	2306595-05	Water	06/28/23 13:05	06/28/23 18:25

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.



4653 Table Mountain Drive
Golden, CO 80403
303-277-9310

Lab ID	Page 1 of 1
2306595	

Client: PDC PDC / Tasman		Send Data To: Project Manager: Mark Longhurst		Send Invoice To: Company: PDC Energy	
Address: 6855 W 119th Ave		E-Mail: mark.longhurst@PDCE.com		Project Name/Location:	
City/State/Zip: Broomfield / CO / 80220				AFE#:	
Phone: 303-487-1228		Project Name: Churchill 5 Wellhead		PO/Billing Codes:	
Sampler Name: Jordan Hestmark		Project Number:		Contact: Mark Longhurst	

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested							Special Instructions			
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	BTEXN - 8260B	TPH - (C6 - C36)	1,2,4 & 1,3,5 - TMB	Boron - HWS	pH, EC, SAR	PAHs		Metals	TDS, SO4, CI	
1	BH01	6/28/23	1328	1	X				X				X		X					X		
2	BH02		1306	1																		
3	BH03		1316	1																		
4	BH04		1318	1																		
5	BH05		1305	1																		
6																						
7																						
8																						
9																						
10																						
11																						
12																						
13																						
14																						
15																						

Relinquished by: Jordan Hestmark	Date/Time: 6/28/23 1602	Received by: Tasman Lockbox	Date/Time: 6/28/23 1602	TAT Business Days	Field DO	Notes:
				Same Day	Field EC	
Relinquished by: Tasman Lockbox	Date/Time: 6/28/23 1525	Received by: [Signature]	Date/Time: 6/28/23 1825	1 Day	Field ORP	
				2 Days	Field pH	
Relinquished by:	Date/Time:	Received by:	Date/Time:	3 Days	Field Temp.	
				Standard	X Field Turb.	
Temperature Upon Receipt: 21.0	Corrected Temperature: 6	IR gun #:		HNO3 lot #:		

S₂

Sample Receipt Checklist

S2 Work Order# 2308595

Client: Doctorman Client Project ID: Churchill Swellhead

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

-

Matrix (Check all that apply) Air Soil/Solid Water Other

Temp (°C) Thermometer #

	Yes	No	N/A	Comments (if any)
If samples require cooling, is the temperature < 6°C? ⁽¹⁾ NOTE: If samples are delivered the same day of sampling, this requirement is met if there is evidence that cooling has begun.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are samples due within 48 hours present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are water samples with short hold times present? Note the short hold analysis in the comments column - pH, Nitrate/Nitrite, Ferrous Iron (Fe ²⁺), Hexavalent Chromium (Cr ⁶⁺ , Cr VI), COD/BOD, Total Coliform, E. Coli, Total Residual Chlorine (TRC), Dissolved Oxygen	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out Completely? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC? ⁽¹⁾	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Some time stamps did not match
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	HCl
If samples are acid preserved for metals, is the pH ≤ 2? ⁽¹⁾ 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):

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

AS 6/28/23
Custodian Printed Name Date/Time



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

Project: PDC - Churchill 5 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
07/07/23 12:27

BH01
2306595-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/23 13:28**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	18	1.0		ug/l	1	BGF1058	06/29/23	06/29/23	EPA 8260B	
Toluene	44	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	6.6	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **06/28/23 13:28**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	13.2	98.6 %		23-173		"	"	"	"	
Surrogate: Toluene-d8	14.1	106 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	13.1	98.6 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **06/28/23 13:28**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	260	12.0		mg/L	200	BGF1118	06/30/23	07/02/23	EPA 300.0	
Sulfate	396	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **06/28/23 13:28**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	1240	10.0		mg/L	1	BGG0041	07/03/23	07/03/23	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.



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

Project: PDC - Churchill 5 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
07/07/23 12:27

BH02
2306595-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/23 13:06**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BGF1058	06/29/23	06/29/23	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: **06/28/23 13:06**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	12.7	95.5 %		23-173		"	"	"	"	
Surrogate: Toluene-d8	13.9	104 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	13.3	99.5 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **06/28/23 13:06**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	217	12.0		mg/L	200	BGF1118	06/30/23	07/02/23	EPA 300.0	
Sulfate	310	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **06/28/23 13:06**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	1150	10.0		mg/L	1	BGG0041	07/03/23	07/03/23	SM2540C	

Summit Scientific

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

Project: PDC - Churchill 5 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
07/07/23 12:27

BH03
2306595-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/23 13:16**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BGF1058	06/29/23	06/29/23	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: **06/28/23 13:16**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	13.0	97.8 %		23-173		"	"	"	"	
Surrogate: Toluene-d8	14.0	105 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	13.2	98.7 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **06/28/23 13:16**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	161	12.0		mg/L	200	BGF1118	06/30/23	07/02/23	EPA 300.0	
Sulfate	320	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **06/28/23 13:16**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	919	10.0		mg/L	1	BGG0041	07/03/23	07/03/23	SM2540C	

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Project: PDC - Churchill 5 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
07/07/23 12:27

BH04
2306595-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/23 13:18**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BGF1058	06/29/23	06/29/23	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: **06/28/23 13:18**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	12.7	95.5 %		23-173		"	"	"	"	
Surrogate: Toluene-d8	13.9	104 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	13.0	97.5 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **06/28/23 13:18**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	279	12.0		mg/L	200	BGF1118	06/30/23	07/02/23	EPA 300.0	
Sulfate	430	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **06/28/23 13:18**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	1070	10.0		mg/L	1	BGG0041	07/03/23	07/03/23	SM2540C	

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Project: PDC - Churchill 5 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
07/07/23 12:27

BH05
2306595-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/23 13:05**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BGF1058	06/29/23	06/29/23	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: **06/28/23 13:05**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	13.3	99.7 %		23-173		"	"	"	"	
Surrogate: Toluene-d8	14.1	106 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	13.3	99.5 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **06/28/23 13:05**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	328	12.0		mg/L	200	BGF1118	06/30/23	07/02/23	EPA 300.0	
Sulfate	506	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **06/28/23 13:05**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	1260	10.0		mg/L	1	BGG0041	07/03/23	07/03/23	SM2540C	

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Project: PDC - Churchill 5 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
07/07/23 12:27

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 BGF1058 - EPA 5030 Water MS

Blank (BGF1058-BLK1)

Prepared & Analyzed: 06/29/23

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	"								
Surrogate: 1,2-Dichloroethane-d4	13.2		"	13.3		99.1		23-173			
Surrogate: Toluene-d8	14.2		"	13.3		106		20-170			
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		99.3		21-167			

LCS (BGF1058-BS1)

Prepared & Analyzed: 06/29/23

Benzene	39.7	1.0	ug/l	41.7		95.3		51-132			
Toluene	38.7	1.0	"	41.7		92.9		51-138			
Ethylbenzene	41.5	1.0	"	41.7		99.5		58-146			
m,p-Xylene	85.3	2.0	"	83.3		102		57-144			
o-Xylene	43.2	1.0	"	41.7		104		53-146			
Naphthalene	46.1	1.0	"	41.7		111		70-130			
1,2,4-Trimethylbenzene	48.3	1.0	"	41.7		116		70-130			
1,3,5-Trimethylbenzene	49.7	1.0	"	41.7		119		70-130			
Surrogate: 1,2-Dichloroethane-d4	13.6		"	13.3		102		23-173			
Surrogate: Toluene-d8	12.9		"	13.3		96.7		20-170			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.0		21-167			

Matrix Spike (BGF1058-MS1)

Source: 2306595-01

Prepared & Analyzed: 06/29/23

Benzene	42.5	1.0	ug/l	41.7	17.7	59.7		34-141			
Toluene	43.5	1.0	"	41.7	43.7	NR		27-151			QM-07
Ethylbenzene	42.1	1.0	"	41.7	ND	101		29-160			
m,p-Xylene	86.6	2.0	"	83.3	4.73	98.3		20-166			
o-Xylene	43.4	1.0	"	41.7	1.86	99.8		33-159			
Naphthalene	57.6	1.0	"	41.7	ND	138		70-130			QM-07
1,2,4-Trimethylbenzene	49.6	1.0	"	41.7	ND	119		70-130			
1,3,5-Trimethylbenzene	50.2	1.0	"	41.7	ND	121		70-130			
Surrogate: 1,2-Dichloroethane-d4	13.6		"	13.3		102		23-173			
Surrogate: Toluene-d8	12.7		"	13.3		95.5		20-170			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.5		21-167			

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Project: PDC - Churchill 5 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
07/07/23 12:27

Volatile Organic Compounds by EPA Method 8260B - Quality Control

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

Batch BGF1058 - EPA 5030 Water MS

Matrix Spike Dup (BGF1058-MSD1)	Source: 2306595-01			Prepared & Analyzed: 06/29/23							
Benzene	42.3	1.0	ug/l	41.7	17.7	59.1	34-141	0.589	30		
Toluene	43.3	1.0	"	41.7	43.7	NR	27-151	0.622	30	QM-07	
Ethylbenzene	42.1	1.0	"	41.7	ND	101	29-160	0.00	30		
m,p-Xylene	88.2	2.0	"	83.3	4.73	100	20-166	1.76	30		
o-Xylene	44.2	1.0	"	41.7	1.86	102	33-159	1.69	30		
Naphthalene	56.3	1.0	"	41.7	ND	135	70-130	2.20	30	QM-07	
1,2,4-Trimethylbenzene	50.2	1.0	"	41.7	ND	120	70-130	1.24	30		
1,3,5-Trimethylbenzene	51.4	1.0	"	41.7	ND	123	70-130	2.28	30		
Surrogate: 1,2-Dichloroethane-d4	14.0		"	13.3		105	23-173				
Surrogate: Toluene-d8	12.9		"	13.3		96.6	20-170				
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		99.2	21-167				

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Broomfield CO, 80020

Project: PDC - Churchill 5 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
07/07/23 12:27

Anions by EPA Method 300.0 - Quality Control
Summit Scientific

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

Batch BGF1118 - General Preparation

Blank (BGF1118-BLK1)

Prepared: 06/30/23 Analyzed: 07/02/23

Chloride	ND	0.0600	mg/L						
Sulfate	ND	0.300	"						

LCS (BGF1118-BS1)

Prepared: 06/30/23 Analyzed: 07/02/23

Chloride	3.27	0.0600	mg/L	3.00	109	90-110			
Sulfate	16.0	0.300	"	15.0	107	90-110			

Duplicate (BGF1118-DUP1)

Source: 2306555-01

Prepared: 06/30/23 Analyzed: 07/02/23

Chloride	804	12.0	mg/L		836		3.95	20	
Sulfate	844	60.0	"		874		3.49	20	

Matrix Spike (BGF1118-MS1)

Source: 2306555-01

Prepared: 06/30/23 Analyzed: 07/02/23

Chloride	1330	12.0	mg/L	600	836	81.9	80-120		
Sulfate	3590	60.0	"	3000	874	90.6	80-120		

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Project: PDC - Churchill 5 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
07/07/23 12:27

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 BGG0041 - General Preparation

Blank (BGG0041-BLK1)

Prepared & Analyzed: 07/03/23

Total Dissolved Solids ND 10.0 mg/L

Duplicate (BGG0041-DUP1)

Source: 2306591-01

Prepared & Analyzed: 07/03/23

Total Dissolved Solids 1880 10.0 mg/L 1840 1.94 20

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6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Churchill 5 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

Reported:
07/07/23 12:27

Notes and Definitions

- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.
- 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