



PDC Energy, Inc.
Third Quarter 2023 Groundwater Monitoring Summary

September 25, 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 ECMC 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 September 5, 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.

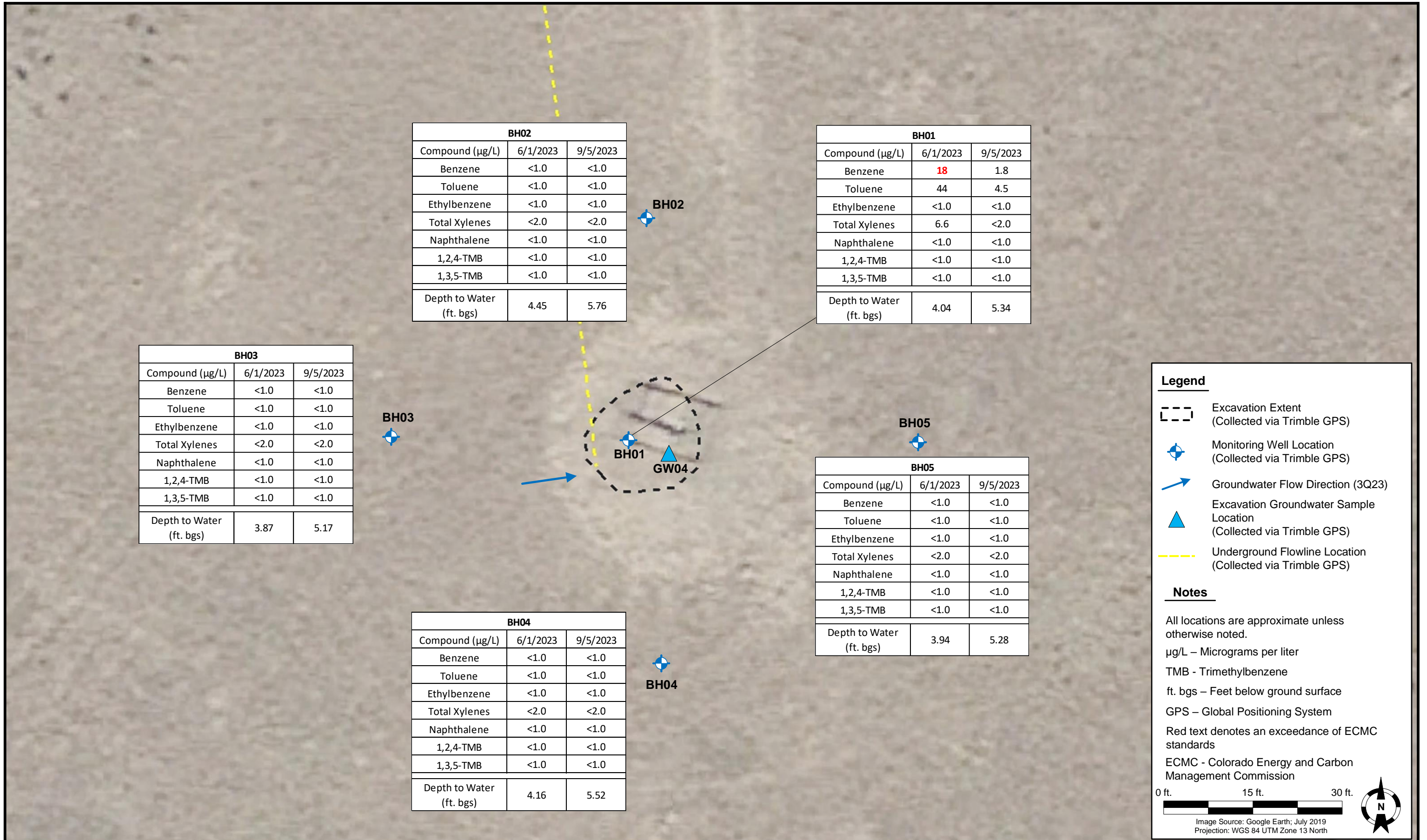
Third quarter 2023 analytical results indicated that the organic compound concentrations were in compliance with the applicable ECMC Table 915-1 regulatory standards in all five monitoring well locations. Additionally, inorganic parameters were in compliance with the applicable ECMC Table 915-1 regulatory 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.

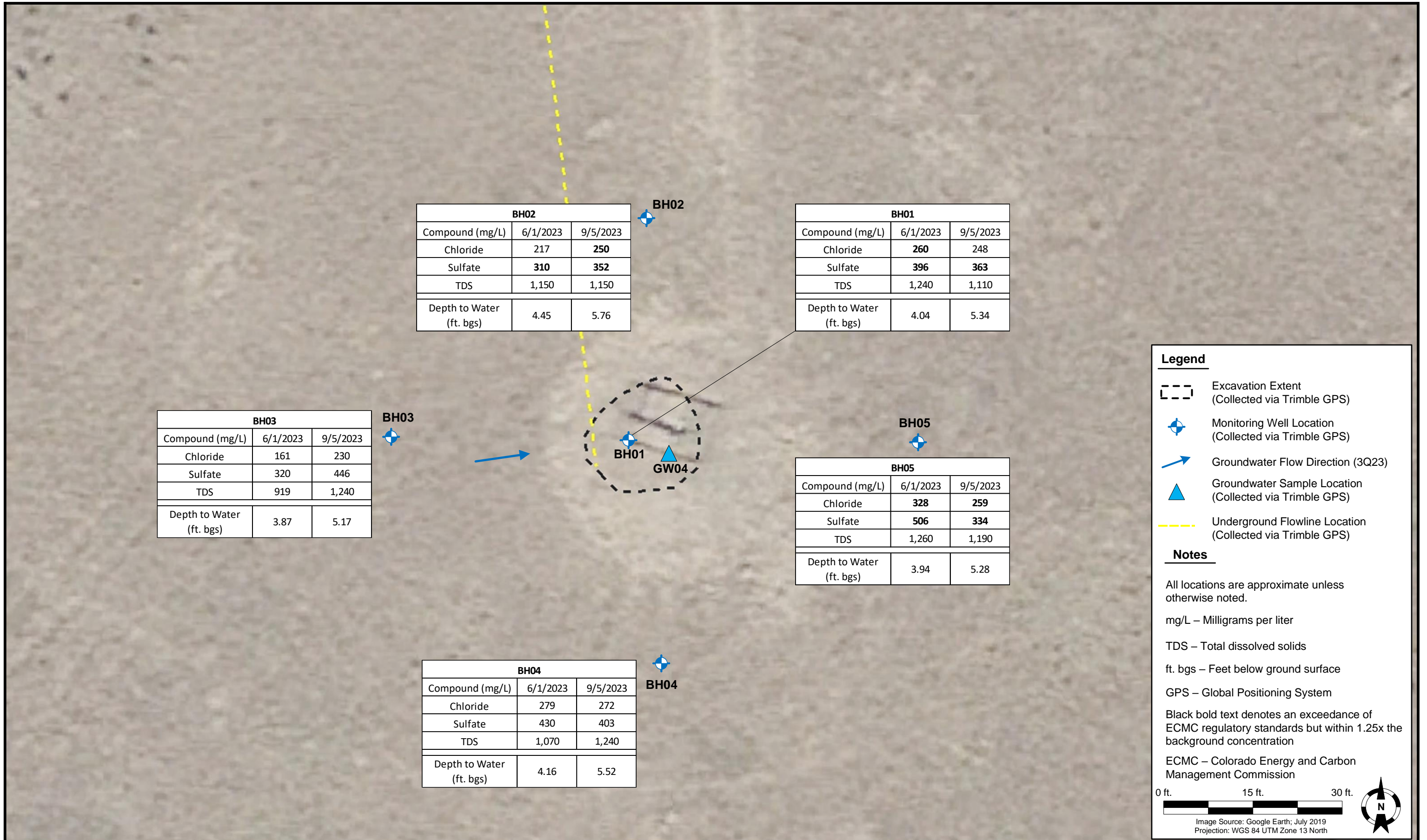
Current Remediation Activities and Path Forward

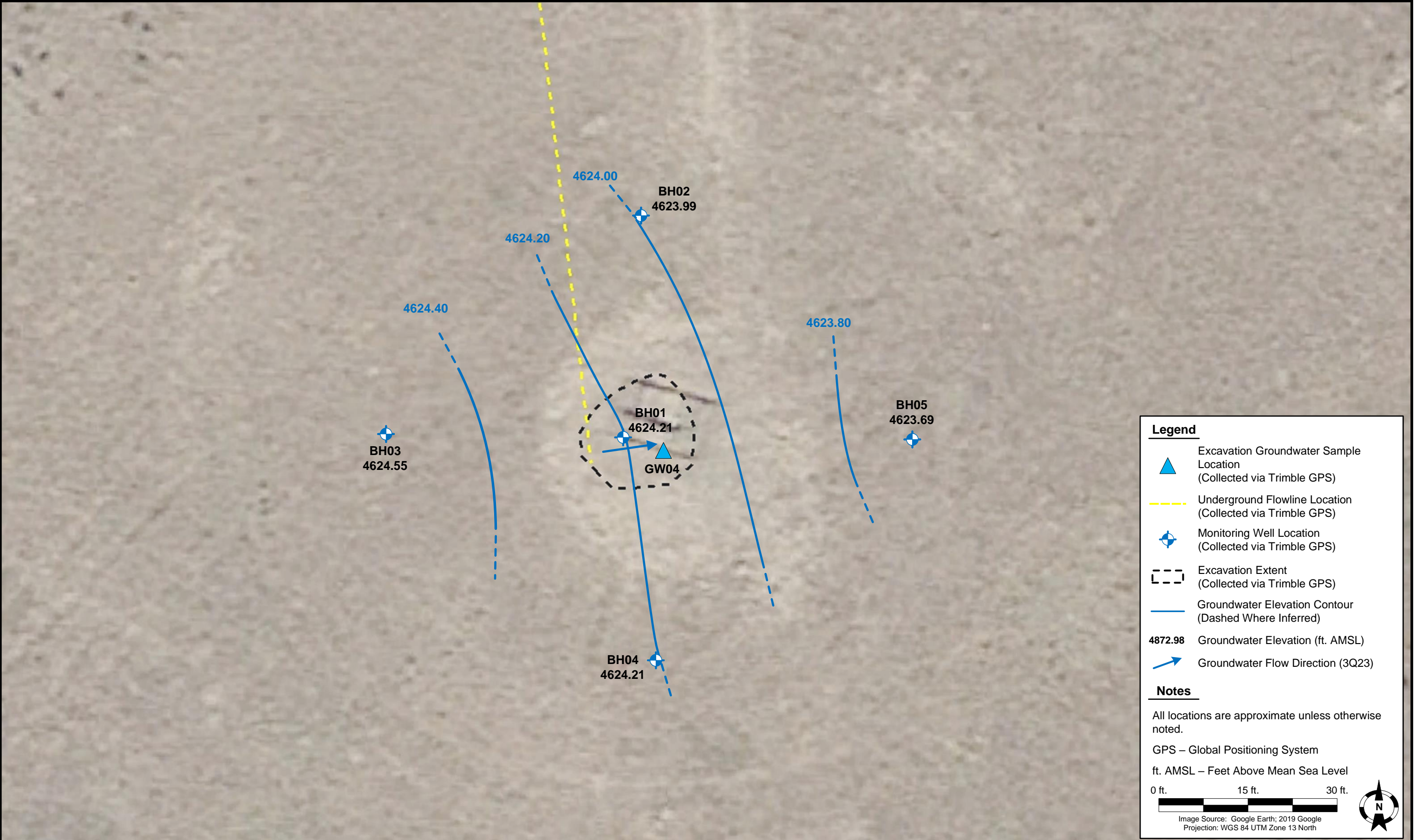
Monitored natural attenuation (MNA) was selected as the remediation strategy for this site during the third quarter 2022 and will remain the selected remediation strategy through the fourth quarter 2023.

During the third quarter 2023, four consecutive quarters of inorganic parameters in compliance with the applicable ECMC regulatory standards were achieved.

Fourth quarter 2023 groundwater sampling will be conducted in December 2023.







DATE:	October 12, 2023
DESIGNED BY:	C. Hamlin
DRAWN BY:	L. Reed

**TASMAN**

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 (09/05/2023)**

**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)
ECMC 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
BH01	9/5/2023	1.8	4.5	<1.0	<2.0	<1.0	<1.0	<1.0	5.34	4624.21
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
BH02	9/5/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.76	4623.99
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
BH03	9/5/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.17	4624.55
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
BH04	9/5/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.52	4624.21
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
BH05	9/5/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.28	4623.69

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
ECMC = Energy and Carbon Management 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 ECMC standards

TABLE 2
FORMER CHURCHILL 5 WELLHEAD
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)
ECMC 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
BH01	9/5/2023	1,110	248	363	5.34	4624.21
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
BH02	9/5/2023	1,150	250	352	5.76	4623.99
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
BH03	9/5/2023	1,240	230	446	5.17	4624.55
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
BH04	9/5/2023	1,240	272	403	5.52	4624.21
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
BH05	9/5/2023	1,190	259	334	5.28	4623.69

TABLE 2
FORMER CHURCHILL 5 WELLHEAD
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)
ECMC Table 915-1 Groundwater Standard (mg/L) ⁽¹⁾		<1.25 x BCKG	250 or <1.25 x BCKG	250 or <1.25 x BCKG	-	-

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

ECMC = Energy and Carbon Management Commission

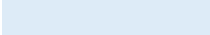
BCKG = Background

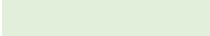
mg/L = Milligrams per liter

(<) = 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.

 = Historic up- / cross-gradient well locations used for background concentration.

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

Attachment A

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

September 14, 2023

Mark Longhurst

Tasman Geosciences

6855 W. 119th Ave.

Broomfield, CO 80020

RE: PDC - Churchill 5 Wellhead

Work Order #2309051

Enclosed are the results of analyses for samples received by Summit Scientific on 09/05/23 17:18. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Jacob Wood". The signature is written in a cursive, flowing style.

Jacob Wood 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:

09/14/23 15:20

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	2309051-01	Water	09/05/23 12:15	09/05/23 17:18
BH02	2309051-02	Water	09/05/23 11:28	09/05/23 17:18
BH03	2309051-03	Water	09/05/23 11:38	09/05/23 17:18
BH04	2309051-04	Water	09/05/23 11:57	09/05/23 17:18
BH05	2309051-05	Water	09/05/23 11:47	09/05/23 17:18

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

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

Lab ID	Page 1 of 1
2309051	

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

					Preservative		Matrix		Analysis Requested							Special Instructions						
ID	Sample Description	Date Sampled	Time Sampled	# of containers	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	PAH - 915	Metals - 915	Cl, TDS, SO4		
1	B1701	9/5/23	1215	4	3		1		X				X		X						X	
2	B1702	↓	1128	↓	↓		↓		↓				↓		↓						↓	
3	B1703		1138																			
4	B1704		1157																			
5	B1705	✓	1147	✓	✓		✓		✓				✓		✓						✓	
6																						
7																						
8																						
9																						
10																						
11																						
12																						
13																						
14																						
15																						

Relinquished by:	Date/Time: 9/5/23 1605	Received by: Tasman Lockbox	Date/Time: 9/5/23 1605	TAT Business Days	Field DO	Notes:
Relinquished by: tasmanlockbox	Date/Time: 9/5/23 1718	Received by:	Date/Time: 9/5/23 1718	Same Day	Field EC	
Relinquished by:	Date/Time:	Received by:	Date/Time:	1 Day	Field ORP	
				2 Days	Field pH	
				3 Days	Field Temp.	
				Standard	X Field Turb.	
Temperature Upon Receipt: 8.2	Corrected Temperature: 8	IR gun #: 1	HNO3 lot #:			

S₂

Sample Receipt Checklist

S2 Work Order# 2309051Client: Portman Client Project ID: Churchhill S wellheadShipped Via: H.D./P.U./FedEx/UPS/USPS/Other ☐ Airbill #: ☐

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------	--------------------------

Matrix (Check all that apply) Air ☐ Soil/Solid ☐ Water ☒ Other ☐Temp (°C) 8.2 Thermometer # 1

	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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no ice
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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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

Custodian Printed Name

9/5/23

Date/Time

4466



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

Project: PDC - Churchill 5 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/14/23 15:20

BH01
2309051-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/05/23 12:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	1.8	1.0		ug/l	1	BGI0127	09/06/23	09/07/23	EPA 8260B	
Toluene	4.5	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: **09/05/23 12:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	12.5	93.8 %		23-173		"	"	"	"	
Surrogate: Toluene-d8	13.8	103 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	13.8	103 %		21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **09/05/23 12:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	248	12.0		mg/L	200	BGI0268	09/11/23	09/13/23	EPA 300.0	
Sulfate	363	60.0		"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **09/05/23 12:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	1110	10.0		mg/L	1	BGI0130	09/06/23	09/06/23	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:
09/14/23 15:20

BH02
2309051-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/05/23 11:28**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	BGI0127	09/06/23	09/07/23	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: **09/05/23 11:28**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4	12.7	95.1 %	23-173		"	"	"	"	
Surrogate: Toluene-d8	13.7	102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	13.8	103 %	21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **09/05/23 11:28**

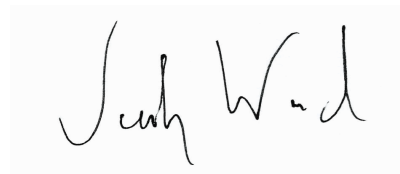
Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Chloride	250	12.0	mg/L	200	BGI0268	09/11/23	09/13/23	EPA 300.0	
Sulfate	352	60.0	"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **09/05/23 11:28**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Total Dissolved Solids	1150	10.0	mg/L	1	BGI0130	09/06/23	09/06/23	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:
09/14/23 15:20

BH03
2309051-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/05/23 11:38**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	BGI0127	09/06/23	09/07/23	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: **09/05/23 11:38**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4	12.4	93.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8	13.8	103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	13.9	104 %	21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **09/05/23 11:38**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Chloride	230	12.0	mg/L	200	BGI0268	09/11/23	09/13/23	EPA 300.0	
Sulfate	446	60.0	"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **09/05/23 11:38**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Total Dissolved Solids	1240	10.0	mg/L	1	BGI0130	09/06/23	09/06/23	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:
09/14/23 15:20

BH04
2309051-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/05/23 11:57**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	BGI0127	09/06/23	09/07/23	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: **09/05/23 11:57**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4	12.5	93.9 %	23-173		"	"	"	"	
Surrogate: Toluene-d8	13.7	103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	14.0	105 %	21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **09/05/23 11:57**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Chloride	272	12.0	mg/L	200	BGI0268	09/11/23	09/13/23	EPA 300.0	
Sulfate	403	60.0	"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **09/05/23 11:57**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Total Dissolved Solids	1240	10.0	mg/L	1	BGI0130	09/06/23	09/06/23	SM2540C	

Summit Scientific

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Tasman Geosciences
6855 W. 119th Ave.
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Project: PDC - Churchill 5 Wellhead
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/14/23 15:20

BH05
2309051-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/05/23 11:47**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	BGI0127	09/06/23	09/07/23	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: **09/05/23 11:47**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4	12.1	90.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8	13.6	102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	13.9	104 %	21-167		"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **09/05/23 11:47**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Chloride	259	12.0	mg/L	200	BGI0268	09/11/23	09/13/23	EPA 300.0	
Sulfate	334	60.0	"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

Date Sampled: **09/05/23 11:47**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Total Dissolved Solids	1190	10.0	mg/L	1	BGI0130	09/06/23	09/06/23	SM2540C	

Summit Scientific

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Tasman Geosciences
6855 W. 119th Ave.
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Project: PDC - Churchill 5 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/14/23 15:20

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch BGI0127 - EPA 5030 Water MS

Blank (BGI0127-BLK1)

Prepared & Analyzed: 09/06/23

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	13.0		"	13.3		97.2	23-173			
Surrogate: Toluene-d8	13.5		"	13.3		101	20-170			
Surrogate: 4-Bromofluorobenzene	14.2		"	13.3		106	21-167			

LCS (BGI0127-BS1)

Prepared & Analyzed: 09/06/23

Benzene	41.3	1.0	ug/l	33.3		124	51-132			
Toluene	40.9	1.0	"	33.3		123	51-138			
Ethylbenzene	42.5	1.0	"	33.3		128	58-146			
m,p-Xylene	79.5	2.0	"	66.7		119	57-144			
o-Xylene	40.2	1.0	"	33.3		120	53-146			
Naphthalene	32.4	1.0	"	33.3		97.4	70-130			
1,2,4-Trimethylbenzene	41.6	1.0	"	33.3		125	70-130			
1,3,5-Trimethylbenzene	42.3	1.0	"	33.3		127	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.0		"	13.3		97.5	23-173			
Surrogate: Toluene-d8	13.9		"	13.3		104	20-170			
Surrogate: 4-Bromofluorobenzene	14.1		"	13.3		106	21-167			

Matrix Spike (BGI0127-MS1)

Source: 2309051-01

Prepared & Analyzed: 09/06/23

Benzene	43.3	1.0	ug/l	33.3	1.76	125	34-141			
Toluene	51.5	1.0	"	33.3	4.52	141	27-151			
Ethylbenzene	42.9	1.0	"	33.3	ND	129	29-160			
m,p-Xylene	78.4	2.0	"	66.7	ND	118	20-166			
o-Xylene	40.8	1.0	"	33.3	ND	122	33-159			
Naphthalene	35.2	1.0	"	33.3	ND	105	70-130			
1,2,4-Trimethylbenzene	42.1	1.0	"	33.3	ND	126	70-130			
1,3,5-Trimethylbenzene	42.6	1.0	"	33.3	ND	128	70-130			
Surrogate: 1,2-Dichloroethane-d4	12.7		"	13.3		95.6	23-173			
Surrogate: Toluene-d8	13.8		"	13.3		103	20-170			
Surrogate: 4-Bromofluorobenzene	13.9		"	13.3		104	21-167			

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:
09/14/23 15:20

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

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

Batch BGI0127 - EPA 5030 Water MS

Matrix Spike Dup (BGI0127-MSD1)		Source: 2309051-01			Prepared & Analyzed: 09/06/23					
Benzene	35.9	1.0	ug/l	33.3	1.76	103	34-141	18.7	30	
Toluene	35.8	1.0	"	33.3	4.52	93.8	27-151	35.9	30	QR-04
Ethylbenzene	29.0	1.0	"	33.3	ND	87.1	29-160	38.6	30	QR-04
m,p-Xylene	53.1	2.0	"	66.7	ND	79.7	20-166	38.5	30	QR-04
o-Xylene	27.8	1.0	"	33.3	ND	83.3	33-159	37.9	30	QR-04
Naphthalene	27.2	1.0	"	33.3	ND	81.5	70-130	25.6	30	
1,2,4-Trimethylbenzene	30.2	1.0	"	33.3	ND	90.6	70-130	32.9	30	QR-04
1,3,5-Trimethylbenzene	30.7	1.0	"	33.3	ND	92.0	70-130	32.7	30	QR-04
Surrogate: 1,2-Dichloroethane-d4		14.4	"	13.3		108	23-173			
Surrogate: Toluene-d8		13.8	"	13.3		104	20-170			
Surrogate: 4-Bromofluorobenzene		13.8	"	13.3		104	21-167			

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Tasman Geosciences
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Broomfield CO, 80020

Project: PDC - Churchill 5 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/14/23 15:20

Anions by EPA Method 300.0 - Quality Control
Summit Scientific

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

Batch BGI0268 - General Preparation

Blank (BGI0268-BLK1)

Prepared: 09/11/23 Analyzed: 09/12/23

Chloride	ND	0.0600	mg/L
Sulfate	ND	0.300	"

LCS (BGI0268-BS1)

Prepared: 09/11/23 Analyzed: 09/12/23

Chloride	2.88	0.0600	mg/L	3.00	96.0	90-110
Sulfate	13.9	0.300	"	15.0	92.5	90-110

Duplicate (BGI0268-DUP1)

Source: 2309015-01

Prepared: 09/11/23 Analyzed: 09/12/23

Chloride	51.2	12.0	mg/L	57.0	10.7	20
Sulfate	529	60.0	"	567	6.90	20

Matrix Spike (BGI0268-MS1)

Source: 2309015-01

Prepared: 09/11/23 Analyzed: 09/12/23

Chloride	618	12.0	mg/L	600	57.0	93.6	80-120
Sulfate	3440	60.0	"	3000	567	95.7	80-120

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:
09/14/23 15:20

Total Dissolved Solids by SM2540C - Quality Control

Summit Scientific

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

Batch BGI0130 - General Preparation

Blank (BGI0130-BLK1)

Prepared & Analyzed: 09/06/23

Total Dissolved Solids ND 10.0 mg/L

Duplicate (BGI0130-DUP1)

Source: 2309051-01

Prepared & Analyzed: 09/06/23

Total Dissolved Solids 1170 10.0 mg/L 1110 4.65 20

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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:
09/14/23 15:20

Notes and Definitions

QR-04	The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance. 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