



PDC Energy, Inc.
Fourth Quarter 2024 Groundwater Monitoring Summary

February 13, 2025

Former Eckhardt 43-34 Wellhead
NESE Section 34 T5N R64W
Remediation # 21647

This groundwater monitoring summary has been prepared by Tasman, Inc. for the former Eckhardt 43-34 wellhead.

Site History and Background

On March 11, 2022, a historic hydrocarbon release was discovered adjacent to the former wellhead during decommissioning activities. Following the discovery, mitigation activities were initiated and approximately 8 cubic yards of impacted material were removed from location. During excavation activities, groundwater was encountered within the excavation at approximately 6.5 feet below ground surface (bgs). On October 10, 2022, five monitoring wells (BH01 – BH05) were installed to confirm the absence of dissolved-phase hydrocarbon impacts within and adjacent to the former excavation extent. Per the approved Supplemental Form 27 (Document No. 403221432), chloride and sulfate anions, and total dissolved solids (TDS) were removed from the quarterly sampling and analysis plan following the fourth quarter 2022. Per the approved Supplemental Form 27 (Document No. 403478996), benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene (TMB) and 1,3,5-TMB were removed from the quarterly sampling and analysis plan following the third quarter 2023. In the fourth quarter of 2024, PDC will begin analyzing all groundwater samples for benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene (TMB), and 1,3,5-TMB, chloride and sulfate anions, TDS, dissolved arsenic and dissolved lead.

Groundwater Monitoring Activities

On November 12, 2024, groundwater monitoring was conducted at four of the five monitoring wells (BH01, BH02, BH04, and BH05). Four groundwater samples were submitted to Summit Scientific Laboratory for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene (TMB), and 1,3,5-TMB by EPA Method 8260B, chloride and sulfate anions by EPA Method 300.0, total dissolved solids (TDS) by Method SM 2540C, dissolved arsenic and dissolved lead in accordance with Table 915-1 standards.

A groundwater sample was not collected from monitoring well BH03 due to the well being dry at the time of the fourth quarter monitoring event.

Fourth quarter 2024 analytical results indicated that organic compound concentrations were in compliance with the applicable regulatory standards in all four sampled monitoring well locations. Additionally, inorganic parameters and dissolved metals concentrations were in compliance with the applicable regulatory standards or within 1.25x the background concentrations of the up/cross-gradient monitoring well (BH04) in all sampled monitoring well locations. Sample locations and corresponding analytical results are illustrated in 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 an attachment to the Supplemental Form 27.

Current Remediation Activities and Path Forward

In the third quarter 2023, four consecutive quarters of organic compound concentrations in compliance with the applicable ECMC Table 915-1 regulatory standards were achieved, and groundwater sampling at the Site was subsequently discontinued. However, four consecutive quarters of compliance of inorganic and dissolved metals concentrations had not yet been achieved. Per the COA issued on the Supplemental Form 27 (Document No. 403841299) groundwater monitoring has re-initiated for all organic and inorganic parameters, dissolved arsenic and dissolved lead, beginning in November 2024.

Arsenic and lead concentrations in soil will be re-evaluated following the receipt of analytical results from further groundwater monitoring.

In the fourth quarter of 2022, monitored natural attenuation (MNA) was selected as the remediation strategy for this site and will remain the selected remediation strategy through the First quarter 2025.

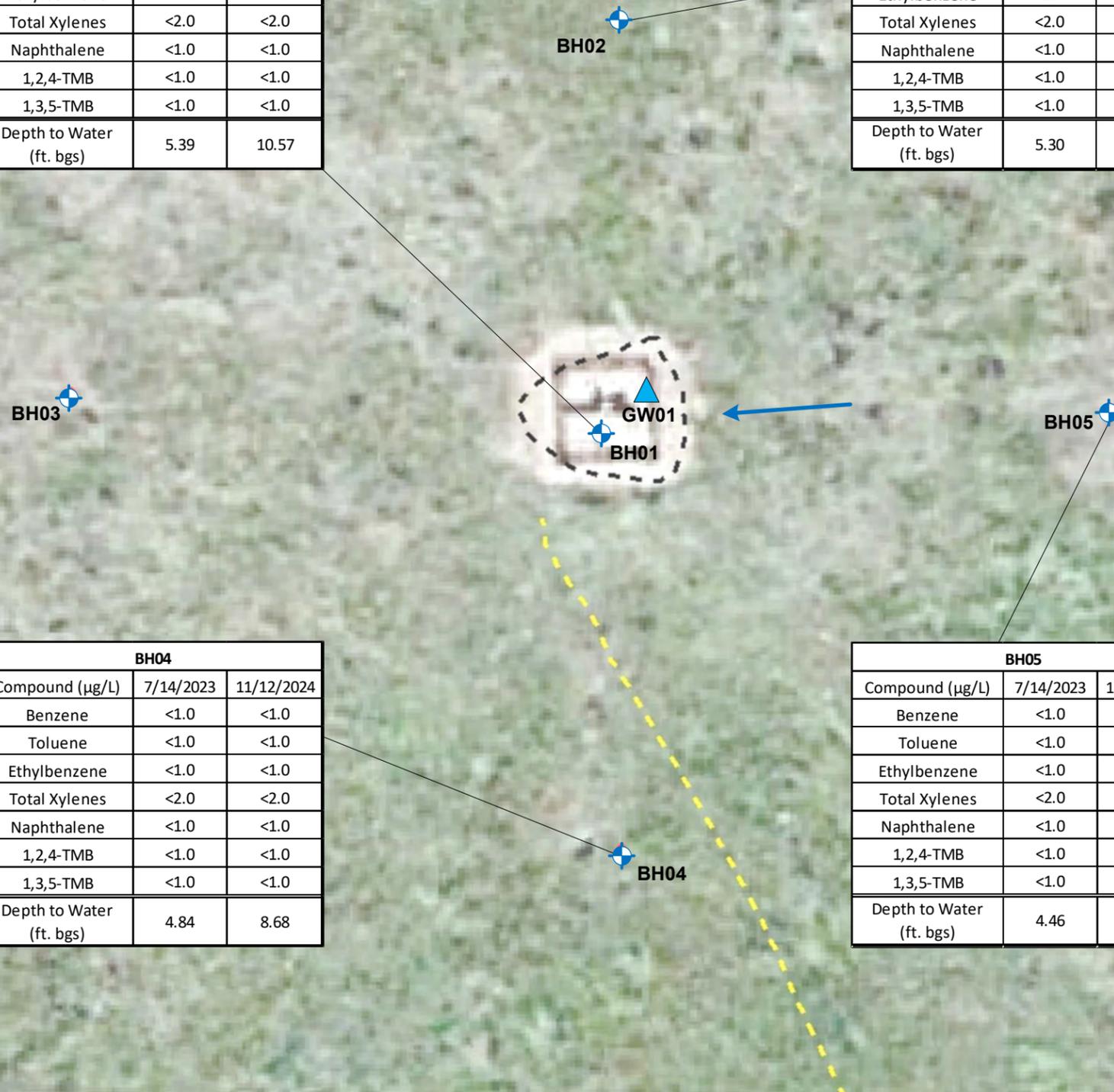
First quarter 2025 groundwater sampling will be conducted in February 2025.

BH01		
Compound (µg/L)	7/14/2023	11/12/2024
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)	5.39	10.57

BH02		
Compound (µg/L)	7/14/2023	11/12/2024
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)	5.30	9.55

BH04		
Compound (µg/L)	7/14/2023	11/12/2024
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)	4.84	8.68

BH05		
Compound (µg/L)	7/14/2023	11/12/2024
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)	4.46	8.52



Legend

- Excavation Extent (Collected via Trimble GPS)
- Underground Flowline Location (Collected via Trimble GPS)
- Excavation Groundwater Sample Location
- Monitoring Well Location (Collected via Trimble GPS)
- Groundwater Flow Direction (4Q24)

Notes

All locations are approximate unless otherwise noted.
TMB – Trimethylbenzene
µg/L – Micrograms per liter
NM – Not Measured
ft. bgs – Feet below ground surface
GPS – Global Positioning System

0 ft. 15 ft. 30 ft.

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

DATE: December 19, 2024

DESIGNED BY: C. Hamlin

DRAWN BY: J. Adams

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6855 W. 119th Ave.
Broomfield, CO 80020

PDC Energy, Inc. – DJ Basin
Former Eckhardt 43-34 Wellhead
NESE, Section 34, Township 5 North, Range 64 West
Weld County, Colorado

GROUNDWATER ANALYTICAL RESULTS MAP (ORGANICS)

FIGURE 1

BH01		
Compound (mg/L)	5/9/2024	11/12/2024
TDS	Removed From Sampling Plan	3,550
Chloride		854
Sulfate		1,450
Dissolved Arsenic	0.810	1.60
Dissolved Lead	<0.500	1.54
Depth to Water (ft. bgs)	5.15	10.57

BH02		
Compound (mg/L)	5/9/2024	11/12/2024
TDS	Removed From Sampling Plan	2,470
Chloride		769
Sulfate		1,440
Dissolved Arsenic	0.805	0.945
Dissolved Lead	<.500	<0.500
Depth to Water (ft. bgs)	4.29	9.55

BH03
NM

BH02

BH01
GW01

BH05

BH04		
Compound (mg/L)	5/9/2024	11/12/2024
TDS	Removed From Sampling Plan	6,970
Chloride		1,850
Sulfate		2,950
Dissolved Arsenic	2.18	1.56
Dissolved Lead	<0.500	0.520
Depth to Water (ft. bgs)	3.82	8.68

BH05		
Compound (mg/L)	5/9/2024	11/12/2024
TDS	Removed From Sampling Plan	3,980
Chloride		738
Sulfate		1,720
Dissolved Arsenic	1.76	1.59
Dissolved Lead	<0.500	1.76
Depth to Water (ft. bgs)	4.12	8.52

BH04

Legend

- Excavation Extent (Collected via Trimble GPS)
- Underground Flowline Location (Collected via Trimble GPS)
- Excavation Groundwater Sample Location
- Monitoring Well Location (Collected via Trimble GPS)
- Groundwater Flow Direction (4Q24)

Notes

All locations are approximate unless otherwise noted.

mg/L – Milligrams per liter

TDS – Total dissolved solids

NM – Not Measured

Black bold text denotes an exceedance of ECMC Table 915-1 standards, but within 1.25x the BKG concentration

ECMC – Colorado Energy and Carbon Management Commission

BKG – Background

ft. AMSL – Feet Above Mean Sea Level

GPS – Global Positioning System

0 ft. 15 ft. 30 ft.

Image Source: Google Earth; June 2021
Projection: WGS 84 UTM Zone 13 North

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GROUNDWATER ANALYTICAL RESULTS MAP (INORGANIC PARAMETERS)

FIGURE 2



Legend

- Excavation Extent (Collected via Trimble GPS)
- Underground Flowline Location (Collected via Trimble GPS)
- Excavation Groundwater Sample Location
- Monitoring Well Location (Collected via Trimble GPS)
- Groundwater Elevation Contour (Dashed where inferred)
- Groundwater Flow Direction (4Q24)

Notes

All locations are approximate unless otherwise noted.
 ft. AMSL – Feet Above Mean Sea Level
 GPS – Global Positioning System

0 ft. 15 ft. 30 ft.

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

DATE: November 14, 2024

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**GROUNDWATER
 ELEVATION CONTOUR
 MAP (11/12/2024)**

**FIGURE
 3**

TABLE 1
PDC ENERGY, INC. - 69175
FORMER ECKHARDT 43-34 WELLHEAD - WELD COUNTY, COLORADO
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	-	-
GW01	3/11/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	~6.5	NA
BH01	10/21/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	9.10	4603.56
BH01	1/19/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	7.84	4604.82
BH01	4/19/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.40	4606.26
BH01	7/14/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.39	4607.27
BH01	11/12/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	10.57	4602.09
BH02	10/21/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	9.07	4603.57
BH02	1/19/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	7.98	4604.66
BH02	4/19/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.59	4606.05
BH02	7/14/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.30	4607.34
BH02	11/12/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	9.55	4603.09
BH03	10/21/2022	Dry - Not Sampled								
BH03	1/19/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	8.25	4605.01
BH03	4/19/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.73	4606.53
BH03	7/14/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.81	4607.45
BH03	11/12/2024	Dry - Not Sampled								
BH04	10/21/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	8.20	4603.84
BH04	1/19/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.83	4605.21
BH04	4/19/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.30	4606.74
BH04	7/14/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.84	4607.20
BH04	11/12/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	8.68	4603.36
BH05	10/21/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	7.91	4603.52
BH05	1/19/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	6.78	4604.65
BH05	4/19/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	5.51	4605.92
BH05	7/14/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4.46	4606.97
BH05	11/12/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	8.52	4602.91

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

ECMC = Colorado 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

TABLE 2
PDC ENERGY, INC - 69175
FORMER ECKHARDT 43-34 WELLHEAD - WELD COUNTY, COLORADO
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE
INORGANIC PARAMETERS AND DISSOLVED METALS

Sample ID	Date Sampled	TDS (unit)	Chloride (mg/L)	Sulfate Ion (mg/L)	Dissolved Arsenic ⁽³⁾ (µg/L)	Dissolved Lead ⁽³⁾ (µg/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	10	50	-	-
BH01	10/21/2022	2,840	917	1,170	NA	NA	9.10	4603.56
BH01 ⁽⁴⁾	5/9/2024	<i>Inorganics Removed From Sampling Plan</i>			0.810	<0.500	5.15	4607.51
BH01	11/12/2024	3,550	854	1,450	1.60	1.54	10.57	4602.09
BH02	10/21/2022	2,520	762	1,100	NA	NA	9.07	4603.57
BH02 ⁽⁴⁾	5/9/2024	<i>Inorganics Removed From Sampling Plan</i>			0.805	<0.500	4.29	4608.35
BH02	11/12/2024	2,470	769	1,440	0.945	<0.500	9.55	4603.09
BH03	10/21/2022	Not Sampled - Dry			NA	NA	Dry	Dry
BH03 ⁽⁴⁾	5/9/2024	<i>Inorganics Removed From Sampling Plan</i>			0.685	<0.500	5.14	4608.12
BH03	11/12/2024	Dry - Not Sampled						
BH04	10/21/2022	3,360	1,130	1,870	NA	NA	8.20	4603.84
BH04 ⁽⁴⁾	5/9/2024	<i>Inorganics Removed From Sampling Plan</i>			2.18	<0.500	3.82	4608.22
BH04	11/12/2024	6,970	1,850	2,950	1.56	0.520	8.68	4603.36
BH05	10/21/2022	2,760	833	1,330	NA	NA	7.91	4603.52
BH05 ⁽⁴⁾	5/9/2024	<i>Inorganics Removed From Sampling Plan</i>			1.76	<0.500	4.12	4607.31
BH05	11/12/2024	3,980	738	1,720	1.59	1.76	8.52	4602.91

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.
 - Dissolved arsenic and lead groundwater standards referenced from the 5 CCR 1002-41, Regulation No. 41, Table 1, Domestic Water Supply Standards, January 31, 2013.
 - In May 2024, a confirmation groundwater sampling event was conducted following the results of the January 2024 SSI, wherein five groundwater samples were collected from the existing monitoring wells onsite (BH01-BH05) and submitted for laboratory analysis of dissolved arsenic and lead.
- SSI = Supplemental Site Investigation
TDS = Total dissolved solids
ECMC = Colorado 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-gradient well location used for background concentration.
 = Up-gradient well location used for historic background concentration.
- BOLD** = Analytical result is in exceedance of applicable standard, but below 1.25x background concentration.