

**PDC Energy, Inc.**  
**Fourth Quarter 2020 Groundwater Monitoring Summary**

November 3, 2020

Eberle 13-32 CHZ Facility  
NESE Section 32 T1N R66W  
Remediation # 15999

This groundwater monitoring summary has been prepared by Tasman Geosciences, Inc. for the Eberle 13-32 CHZ Facility. Per the agreement outlined in the Form 2 submitted under Document # 400534181, three monitoring wells (BH01 - BH03) were installed to October 19, 2020, to monitor and protect the alluvial groundwater system. Well construction logs are provided in Attachment A.

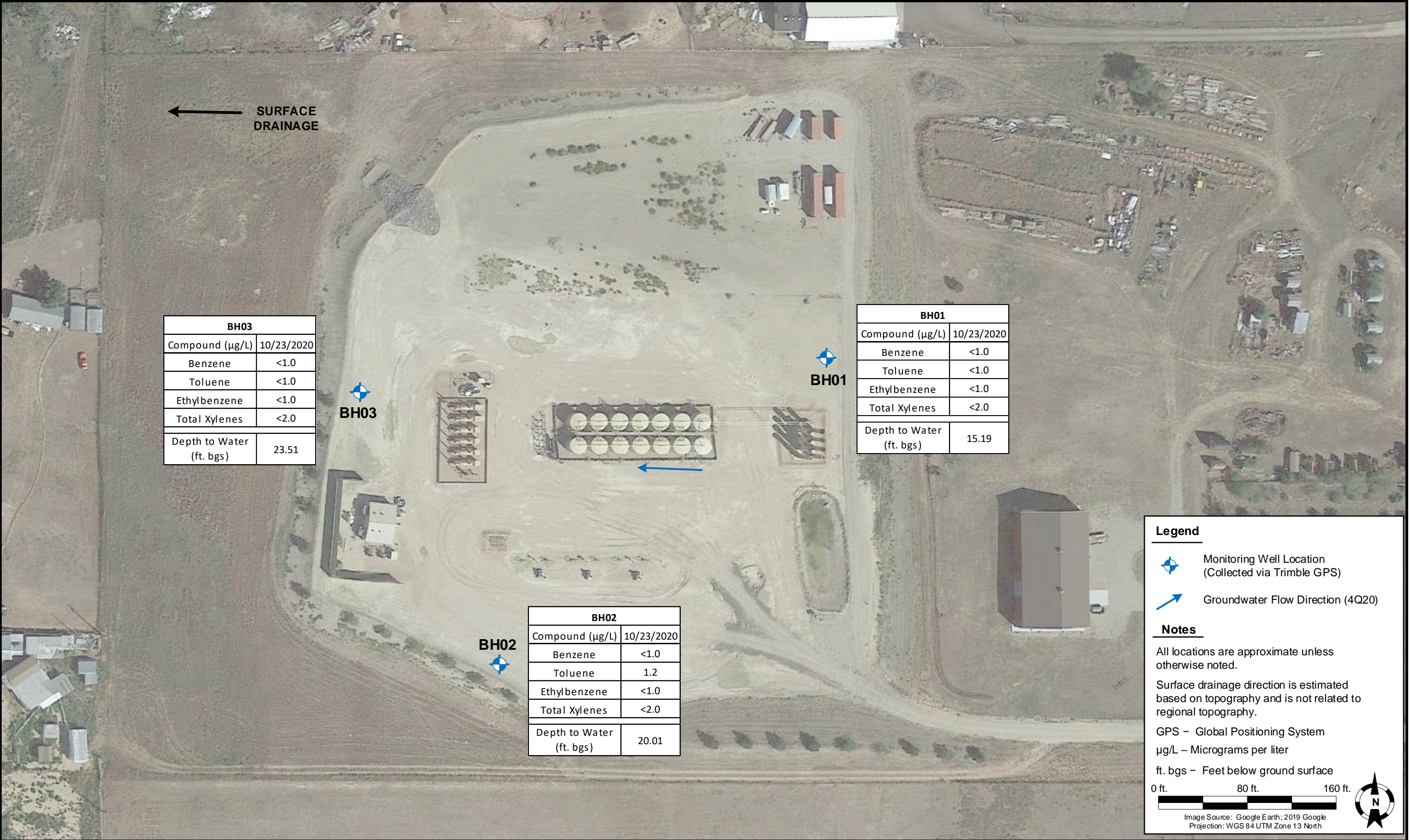
On October 23, 2020, groundwater monitoring was conducted at all three monitoring wells (BH01 – BH03). Three groundwater samples were submitted to Summit Scientific Laboratory for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260B.

Fourth quarter 2020 analytical results indicated that BTEX concentrations were below the applicable COGCC Table 910-1 standards in all three monitoring well locations. Sample locations and corresponding analytical results are illustrated on Figure 1. Groundwater elevation data is illustrated on Figure 2. Groundwater analytical results are summarized in Table 1. The laboratory analytical report is included in Attachment B.

Groundwater monitoring was initiated in the fourth quarter 2020 and will continue to be sampled on a quarterly schedule.

First quarter 2021 groundwater sampling will be conducted in January 2021.









DATE:	November 2, 2020
DESIGNED BY:	C. Hamlin
DRAWN BY:	A. Dahl



**TASMAN**  
GEOSCIENCES

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

**PDC Energy, Inc. – DJ Basin**  
**Eberle 13-32 CHZ Facility**  
NESE, Section 32, Township 1 North, Range 66 West  
Weld County, Colorado

**GROUNDWATER  
ELEVATION CONTOUR  
MAP (10/23/2020)**

**FIGURE  
2**

**TABLE 1**  
**EBERLE 13-32 CHZ FACILITY**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water <sup>(2)</sup> (ft.)	Groundwater Elevation (ft. AMSL)
<b>COGCC Table 910-1 Groundwater Standard (µg/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>		
BH01	10/23/2020	<1.0	<1.0	<1.0	<2.0	15.19	5007.90
BH02	10/23/2020	<1.0	1.2	<1.0	<2.0	20.01	5003.10
BH03	10/23/2020	<1.0	<1.0	<1.0	<2.0	23.51	4999.27

**Notes:**

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective May 1, 2018.
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.

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

## Attachment A





## Borehole Logging Form

BOREHOLE ID: <u>BH01</u>		SITE NAME: <u>Eberle 12-32 CHZ Facility</u>		CLIENT NAME: <u>PDC ENERGY</u>			
Date Completed: <u>10/19/2020</u>		Location: <u>East of prod. facility</u>					
Drilling Company: <u>Tasman Geosciences</u>		Surface Completion: <u>Flush Mount</u>		DTW: <u>-35'</u> TD: <u>40'</u>			
Type of Drill: <u>Powerprobe 9580 - Solid Stem Auger</u>		Geologist: <u>B. Nelson</u>		Project Manager: <u>C. Hamlin</u>			
Bit Size: <u>4 5/8"</u>		Logging Method: <u>N/A</u>					
Well Const. Material: <u>Diameter: 1"</u>		Screen: <u>Sch 40 PVC Slotted 0.10</u>		Riser: <u>Sch 40 PVC Blank</u>			
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1							Pre-cleared via hand auger -No Geology Logged ↓
2							
3							
4							
5							
6							
7							Solid Stem Augering -No Geology Logged
8							
9							↓
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							



## Borehole Logging Form

BOREHOLE ID: BHO1		SITE NAME: Eberle 12-32 CHZ Facility		CLIENT NAME: PDC ENERGY			
Date Completed: 10/19/2020		Location: East of prod facility					
Drilling Company: Tasman Geosciences		Surface Completion: Flush Mount		DTW: -35' TD: 40'			
Type of Drill: Powerprobe 9580 - Solid Stem Auger		Geologist: B. Nelson		Project Manager: C. Hamlin			
Bit Size: 4 5/8"		Logging Method: N/A					
Well Const. Material: Diameter: 1"		Screen: Sch 40 PVC Slotted 0.10		Riser: Sch 40 PVC Blank			
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
26							Solid Stem Augering - No Geology Logged ↓
27							
28							
29							
30							
31							
32							
33							
34							
35							
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49							
50							



## Borehole Logging Form

BOREHOLE ID: <u>BH02</u>		SITE NAME: <u>Eberle 12-32 CHZ Facility</u>		CLIENT NAME: <u>PDC ENERGY</u>			
Date Completed: <u>10/19/2020</u>		Location: <u>South of prod. facility</u>					
Drilling Company: <u>Tasman Geosciences</u>		Surface Completion: <u>Flush Mount</u>		DTW: <u>-34'</u> TD: <u>35'</u>			
Type of Drill: <u>Powerprobe 9580 - Solid Stem Auger</u>		Geologist: <u>B. Nelson</u>		Project Manager: <u>C. Hamlin</u>			
Bit Size: <u>4 5/8"</u>		Logging Method: <u>N/A</u>					
Well Const. Material: <u>Diameter: 1"</u>		Screen: <u>Sch 40 PVC Slotted 0.10</u>		Riser: <u>Sch 40 PVC Blank</u>			
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1							Pre-cleared via hand auger - No Geology Logged ↓
2							
3							
4							
5							
6							
7							Solid Stem Augering - No Geology Logged ↓
8							
9							
10							
11							
12							
13							
14							
15							
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19							
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22							
23							
24							
25							





## Borehole Logging Form

BOREHOLE ID: <u>BH02</u>	SITE NAME: <u>Eberle 12-32 CHZ Facility</u>	CLIENT NAME: <u>PDC ENERGY</u>
Date Completed: <u>10/19/2020</u>	Location: <u>South of prod facility</u>	
Drilling Company: <u>Tasman Geosciences</u>	Surface Completion: <u>Flush Mount</u>	DTW: <u>~34'</u> TD: <u>35'</u>
Type of Drill: <u>Powerprobe 9580 - Solid Stem Auger</u>	Geologist: <u>B. Nelson</u>	Project Manager: <u>C. Hamlin</u>
Bit Size: <u>4 5/8"</u>	Logging Method: <u>N/A</u>	

Well Const. Material: Diameter: 1" Screen: Sch 40 PVC Slotted 0.10 Riser: Sch 40 PVC Blank

Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
26							Solid Stem Augering -No Geology Logged ↓
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
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## Borehole Logging Form

BOREHOLE ID: BH03		SITE NAME: Eberle 12-32 CHZ Facility		CLIENT NAME: PDC ENERGY			
Date Completed: 10/19/2020		Location: West of prod. facility					
Drilling Company: Tasman Geosciences		Surface Completion: Flush Mount		DTW: ~34'		TD: 35'	
Type of Drill: Powerprobe 9580 - Solid Stem Auger		Geologist: B. Nelson		Project Manager: C. Hamlin			
Bit Size: 4 5/8"		Logging Method: N/A					
Well Const. Material: Diameter: 1"		Screen: Sch 40 PVC Slotted 0.10		Riser: Sch 40 PVC Blank			
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1							Pre-cleared via hand auger -No Geology Logged ↓
2							
3							
4							
5							
6							Solid Stem Augering -No Geology Logged ↓
7							
8							
9							
10							
11							
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23							
24							
25							



## Borehole Logging Form

BOREHOLE ID: BH03		SITE NAME: Eberle 12-32 CHZ Facility		CLIENT NAME: PDC ENERGY			
Date Completed: 10/19/2020		Location: West of prod facility					
Drilling Company: Tasman Geosciences		Surface Completion: Flush Mount		DTW: ~34'		TD: 35'	
Type of Drill: Powerprobe 9580 - Solid Stem Auger		Geologist: B. Nelson		Project Manager: C. Hamlin			
Bit Size: 4 5/8"		Logging Method: N/A					
Well Const. Material: Diameter: 1"		Screen: Sch 40 PVC Slotted 0.10		Riser: Sch 40 PVC Blank			
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
26							Solid Stem Augering - No Geology Logged ↓
27							
28							
29							
30							
31							
32							
33							
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50							



## Attachment B

# Summit Scientific

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4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

October 30, 2020

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Eberle 13-32 CHZ Facility

Work Order #2010311

Enclosed are the results of analyses for samples received by Summit Scientific on 10/23/20 17:40. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Shrewsbury', with a stylized, cursive script.

Paul Shrewsbury

President



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

Project: Eberle 13-32 CHZ Facility

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
10/30/20 14:40

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	2010311-01	Water	10/23/20 16:40	10/23/20 17:40
BH02	2010311-02	Water	10/23/20 16:35	10/23/20 17:40
BH03	2010311-03	Water	10/23/20 16:45	10/23/20 17:40

Summit Scientific

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Summit Scientific

Page 1 of 1

Project Manager: Mark Longhurst  
E-Mail: Mark.Longhurst@PDC.E.com  
Project Name: Eberle 13-32 CH2 Facility  
Project Number: N/A

				Preservative				Matrix				Analyze For:								
Sample Description	Date Sampled	Time Sampled	Number of Containers	HCl	HNO <sub>3</sub>	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)									Special Instructions
BH01	10/23/20	1640	3			X		X				BTEX	X							
BH02	10/23/20	1635	3			X		X				X	X							
BH03	10/23/20	1645	3			X		X				X								
Relinquished by: 	Date/Time: 10/23/20 1740	Received by: 	Date/Time: 10/23/20 1740	<b>Turn Around Time (Check)</b>									<b>Notes:</b>							
				Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/>																
				24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/>																
				48 Hours <input type="checkbox"/>																
Relinquished by:	Date/Time:	Received by:	Date/Time:	<b>Sample Integrity:</b>																
				Temperature Upon Receipt: 4.2																
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:	Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																

# Sample Receipt Checklist

S2 Work Order 2010311

Client: POC/TASMAN

Client Project ID: Charge 13-32 CHE Facility

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

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

Temp (°C)	<u>4.2</u>
-----------	------------

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ? NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	<u>X</u>			
Were all samples received intact <sup>(1)</sup> ?	<u>X</u>			
Was adequate sample volume provided <sup>(1)</sup> ?	<u>X</u>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<u>X</u>	
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 <sup>(1)</sup> ?	<u>X</u>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<u>X</u>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<u>X</u>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<u>X</u>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.		<u>X</u>		
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect			<u>X</u>	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.			<u>X</u>	
If dissolved metals are requested, were samples field filtered?			<u>X</u>	

Additional Comments (if any):  
✓

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

Custodian Printed Name or Initials ES

Signature of Custodian [Signature]

Date/Time 10/23/2020



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

Project: Eberle 13-32 CHZ Facility  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
10/30/20 14:40

**BH01**  
**2010311-01 (Water)**

**Summit Scientific**

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

Date Sampled: **10/23/20 16:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BDJ0328	10/26/20	10/27/20	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **10/23/20 16:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		94.4 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		109 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		113 %		21-167		"	"	"	"	

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

Project: Eberle 13-32 CHZ Facility  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
10/30/20 14:40

**BH02**  
**2010311-02 (Water)**

**Summit Scientific**

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

Date Sampled: **10/23/20 16:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	BDJ0328	10/26/20	10/27/20	EPA 8260B	
<b>Toluene</b>	<b>1.2</b>	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **10/23/20 16:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		90.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		104 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		112 %	21-167		"	"	"	"	

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1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Eberle 13-32 CHZ Facility  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
10/30/20 14:40

**BH03**  
**2010311-03 (Water)**

**Summit Scientific**

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

Date Sampled: **10/23/20 16:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	BDJ0328	10/26/20	10/27/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **10/23/20 16:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		84.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		112 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Eberle 13-32 CHZ Facility  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
10/30/20 14:40

## 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 BDJ0328 - EPA 5030 Water MS

##### Blank (BDJ0328-BLK1)

Prepared: 10/26/20 Analyzed: 10/27/20

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	12.3		"	13.3		92.3	23-173			
Surrogate: Toluene-d8	14.2		"	13.3		107	20-170			
Surrogate: 4-Bromofluorobenzene	14.3		"	13.3		108	21-167			

##### LCS (BDJ0328-BS1)

Prepared: 10/26/20 Analyzed: 10/27/20

Benzene	17.3	1.0	ug/l	33.3		51.8	51-132			
Toluene	30.6	1.0	"	33.3		91.8	51-138			
Ethylbenzene	29.4	1.0	"	33.3		88.1	58-146			
m,p-Xylene	61.4	2.0	"	66.7		92.0	57-144			
o-Xylene	33.6	1.0	"	33.3		101	53-146			
Surrogate: 1,2-Dichloroethane-d4	12.0		"	13.3		89.9	23-173			
Surrogate: Toluene-d8	13.6		"	13.3		102	20-170			
Surrogate: 4-Bromofluorobenzene	14.0		"	13.3		105	21-167			

##### Matrix Spike (BDJ0328-MS1)

Source: 2010307-01

Prepared: 10/26/20 Analyzed: 10/27/20

Benzene	17.8	1.0	ug/l	33.3	ND	53.5	34-141			
Toluene	33.6	1.0	"	33.3	ND	101	27-151			
Ethylbenzene	32.1	1.0	"	33.3	ND	96.2	29-160			
m,p-Xylene	65.8	2.0	"	66.7	ND	98.7	20-166			
o-Xylene	36.8	1.0	"	33.3	ND	110	33-159			
Surrogate: 1,2-Dichloroethane-d4	11.6		"	13.3		87.2	23-173			
Surrogate: Toluene-d8	14.1		"	13.3		106	20-170			
Surrogate: 4-Bromofluorobenzene	14.7		"	13.3		110	21-167			

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

Project: Eberle 13-32 CHZ Facility

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
10/30/20 14:40

**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 BDJ0328 - EPA 5030 Water MS**

Matrix Spike Dup (BDJ0328-MSD1)		Source: 2010307-01			Prepared: 10/26/20 Analyzed: 10/27/20					
Benzene	17.4	1.0	ug/l	33.3	ND	52.2	34-141	2.39	30	
Toluene	32.8	1.0	"	33.3	ND	98.4	27-151	2.53	30	
Ethylbenzene	31.2	1.0	"	33.3	ND	93.7	29-160	2.62	30	
m,p-Xylene	66.2	2.0	"	66.7	ND	99.3	20-166	0.606	30	
o-Xylene	35.3	1.0	"	33.3	ND	106	33-159	4.10	30	
Surrogate: 1,2-Dichloroethane-d4	13.5		"	13.3		101	23-173			
Surrogate: Toluene-d8	14.4		"	13.3		108	20-170			
Surrogate: 4-Bromofluorobenzene	14.7		"	13.3		110	21-167			

Summit Scientific

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

Project: Eberle 13-32 CHZ Facility

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
10/30/20 14:40

### Notes and Definitions

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