

**PDC Energy, Inc.**  
Third Quarter 2021 Groundwater Monitoring Summary

August 19, 2021

Former Kristin 1 Wellhead  
NENE Section 24 T4N R67W  
Remediation # 16917

This groundwater monitoring summary has been prepared by Tasman Geosciences, Inc. for the former Kristin 1 Wellhead. On July 7, 2021, five temporary monitoring wells (BH01 – BH05) were advanced via hand auger to confirm the absence of dissolved-phase hydrocarbon impacts within and adjacent to the former excavation extent. Lithologic descriptions and volatile organic compound (VOC) concentrations measured using a photoionization detector (PID) were recorded for each soil borings. Per the Condition of Approval (COA) issued by the COGCC, confirmation soil samples will be collected from the native material adjacent to and below the former excavation to confirm the absence of hydrocarbon impacts. In addition, one sample was collected from the source soil boring SB06, adjacent to the cut and capped well casing. The samples were submitted for laboratory analysis benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1, 2, 4-trimethylbenzene (TMB), 1, 3, 5-TMB, total petroleum hydrocarbons (TPH) [C6-C36], pH, electrical conductivity (EC), sodium adsorption ratio (SAR), boron, anthracene, chrysene, fluorene, fluoranthene, pyrene, arsenic, and selenium. Well completion and boring logs are included in Attachment A.

Soil analytical results collected during the drilling investigation indicated that organic compound concentrations were in compliance with the applicable COGCC Table 915-1 Protection of Groundwater SSLs. Arsenic and selenium concentrations were above the applicable regulatory standards in all five samples collected. Soil analytical results are summarized in Tables 1 through 3. The laboratory report is included in Attachment B.

On July 8, 2021, groundwater monitoring was conducted at all five monitoring wells (BH01 – BH05). Five groundwater samples were submitted to Summit for analysis of BTEX, naphthalene, 1,2,4-TMB, and 1,3,5-TMB by EPA Method 8260B. Additionally, three monitoring wells (BH02, BH04, and BH05) were submitted to Summit for analysis of total dissolved solids (TDS) by Method SM 2540C, chloride, and sulfate anions by EPA Method 300.0.

Third quarter 2021 analytical results indicated that organic compound concentrations were below the applicable COGCC Table 915-1 groundwater standards in all five monitoring wells. Inorganic analytical results indicated that concentrations were below the applicable COGCC Table 9-15 groundwater standards or below 1.25x the background concentration of the up-gradient well (BH04). Sample locations and corresponding analytical results are illustrated on Figure 1.

Groundwater elevation data is illustrated on Figure 2. Analytical results are summarized in Table 4 and Table 5. The laboratory analytical report is included in Attachment B.

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

Fourth quarter 2021 groundwater sampling will be conducted in October 2021.

BH03	
Compound (µg/L)	7/8/2021
Benzene	<1.0
Toluene	<1.0
Ethylbenzene	<1.0
Total Xylenes	<2.0
Naphthalene	<1.0
TMB-1, 2, 4	<1.0
TMB-1, 3, 5	<1.0
Depth to Water (ft. bgs)	3.05

BH05	
Compound (µg/L)	7/8/2021
Benzene	<1.0
Toluene	<1.0
Ethylbenzene	<1.0
Total Xylenes	<2.0
Naphthalene	<1.0
TMB-1, 2, 4	<1.0
TMB-1, 3, 5	<1.0
Depth to Water (ft. bgs)	2.82

BH04	
Compound (µg/L)	7/8/2021
Benzene	<1.0
Toluene	<1.0
Ethylbenzene	<1.0
Total Xylenes	<2.0
Naphthalene	<1.0
TMB-1, 2, 4	<1.0
TMB-1, 3, 5	<1.0
Depth to Water (ft. bgs)	3.07

BH02	
Compound (µg/L)	7/8/2021
Benzene	<1.0
Toluene	<1.0
Ethylbenzene	<1.0
Total Xylenes	<2.0
Naphthalene	<1.0
TMB-1, 2, 4	<1.0
TMB-1, 3, 5	<1.0
Depth to Water (ft. bgs)	3.31

BH01	
Compound (µg/L)	7/8/2021
Benzene	<1.0
Toluene	<1.0
Ethylbenzene	<1.0
Total Xylenes	<2.0
Naphthalene	<1.0
TMB-1, 2, 4	<1.0
TMB-1, 3, 5	<1.0
Depth to Water (ft. bgs)	3.31

BH04

BH05

BH02

BH01

**Legend**

- Excavation Extent (Collected via Trimble GPS)
- Monitoring Well Location (Collected via Trimble GPS)
- Groundwater Flow Direction (3Q21)

**Notes**

All locations are approximate unless otherwise noted.

GPS – Global Positioning System  
 µg/L – Micrograms per liter  
 TMB – Trimethylbenzene  
 ft. bgs – Feet below ground surface

0 ft. 10 ft. 20 ft.

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

DATE: August 19, 2021

DESIGNED BY: C. Hamlin

DRAWN BY: T. Murrel



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

**PDC Energy, Inc. – DJ Basin**  
**Former Kristin 1 Wellhead**  
 NENE, Section 24, Township 4 North, Range 67 West  
 Weld County, Colorado

**GROUNDWATER ANALYTICAL RESULTS MAP**

**FIGURE 1**



**Legend**

- Monitoring Well Location (Collected via Trimble GPS)
- Groundwater Elevation Contour (Dashed where inferred)
- 4716.24** Groundwater Elevation (ft. AMSL)
- Groundwater Flow Direction (3Q21)

**Notes**

All locations are approximate unless otherwise noted.

GPS - Global Positioning System

\* - well not used for contouring purposes

0 ft. 10 ft. 20 ft.

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

DATE: August 12, 2021

DESIGNED BY: B. Nelson

DRAWN BY: C. Ambler

**TASMAN**  
GEOSCIENCES

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

**PDC Energy, Inc. – DJ Basin**  
**Former Kristin 1 Wellhead**  
NENE, Section 24, Township 4 North, Range 67 West  
Weld County, Colorado

**GROUNDWATER  
ELEVATION CONTOUR  
MAP (07/08/2021)**

**FIGURE  
2**

**TABLE 1  
FORMER KRISTIN 1 WELLHEAD  
SOIL ANALYTICAL RESULTS SUMMARY TABLE  
CONTAMINANTS OF CONCERN**

Sample ID	Date Sampled	Depth	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	1, 2, 4-TMB (mg/kg)	1, 3, 5-TMB (mg/kg)	Naphthalene (mg/kg)	TPH <sup>(4)</sup> (mg/kg)	Anthracene (mg/kg)	Chrysene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Pyrene (mg/kg)
Residential SSL <sup>(1,2)</sup>			1.2	490	5.8	58	30	27	2	500	1,800	110	240	240	180
Protection of Groundwater SSL <sup>(1,2,3)</sup>			0.0026	0.69	0.78	9.9	0.0081	0.0087	0.0038	500	5.8	9	8.9	0.54	1.3
WH01 @ 3'	5/12/2021	3 ft. bgs	<b>0.097</b>	0.35	0.034	<0.010	<b>0.049</b>	<b>0.032</b>	<0.0038	7.0	0.216	0.00828	0.0139	0.113	0.0533
SS01 @ 2'	5/14/2021	2 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	NA	NA	NA	NA	NA
SS02 @ 4'	5/14/2021	4 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
SS03 @ 2'	5/14/2021	2 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
SS04 @ 4'	5/14/2021	4 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
SS05 @ 5'	5/14/2021	5 ft. bgs	<0.0020	0.0054	<0.0050	0.023	<0.0050	<b>0.011</b>	<0.0038	1.7	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
SS06 @ 2'	5/14/2021	2 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
SS07 @ 4'	5/14/2021	4 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
SS08 @ 2'	5/14/2021	2 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
SS09 @ 4'	5/14/2021	4 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
SS11 @ 5.5'	5/17/2021	5.5 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
BH01 @ 3'	7/8/2021	3 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
BH02 @ 3'	7/8/2021	3 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
BH03 @ 3'	7/8/2021	3 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
BH04 @ 3'	7/8/2021	3 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
BH05 @ 6'	7/8/2021	6 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500

**Notes:**

- Compounds referenced from the COGCC 2 CCR 404-1, Table 915-1, effective January 15, 2021.
- Soil Screening Levels (SSL) referenced from EPA Regional Screening Levels (EPA RSLs) for Chemical Contaminants at Superfund Sites, effective November 2020.
- SSLs are applicable if a pathway for communication with groundwater is present.
- Value calculated by adding TVPH-GRO, TEPH-DRO, and TEPH-ORO concentrations.

COGCC = Colorado Oil and Gas Conservation Commission

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

TVPH-GRO = Total volatile petroleum hydrocarbons - gasoline range organics

TEPH-DRO = Total extractable petroleum hydrocarbons - diesel range organics

TEPH-ORO = Total extractable petroleum hydrocarbons - oil range organics

mg/kg = Milligrams per kilogram

TMB = Trimethylbenzene

Benzo(k) = Benzo(k)fluoranthene

     = Source material characterization sample

ft. = Feet

bgs = Below ground surface

**BOLD** = Analytical result is in exceedance of applicable standard.

NA = Constituent not analyzed

**TABLE 2**  
**FORMER KRISTIN 1 WELLHEAD**  
**SOIL ANALYTICAL RESULTS SUMMARY TABLE**  
**INORGANIC COMPOUNDS**

Sample ID	Date Sampled	Depth	pH (units)	EC (mmhos/cm)	SAR (units)	Boron (mg/L)
Soil Suitability for Reclamation Standard <sup>(1)</sup>			6-8.3	<4	<6	2
WH01 @ 3'	5/12/2021	3 ft. bgs	<b>8.33</b>	3.24	4.66	0.464
BH01 @ 3'	7/8/2021	3 ft. bgs	8.23	0.836	2.83	0.103
BH02 @ 3'	7/8/2021	3 ft. bgs	8.26	0.896	2.67	0.203
BH03 @ 3'	7/8/2021	3 ft. bgs	8.22	0.837	3.17	0.0647
BH04 @ 3'	7/8/2021	3 ft. bgs	8.25	0.454	2.17	0.0570
BH05 @ 6'	7/8/2021	6 ft. bgs	8.04	2.68	3.68	0.371

**Notes:**

1. Compounds referenced from the COGCC 2 CCR 404-1, Table 915-1, effective January 15, 2021.

COGCC = Colorado Oil and Gas Conservation Commission

EC = Electrical conductivity

SAR = Sodium adsorption ratio

mmhos/cm = millimhos per centimeter

mg/L = milligram per liter

     = Source material characterization sample

ft. = Feet

bgs = Below ground surface

**BOLD** = Analytical result is in exceedance of applicable standard.

**TABLE 3  
FORMER KRISTIN 1 WELLHEAD  
SOIL ANALYTICAL RESULTS SUMMARY TABLE  
METALS**

Sample ID	Date Sampled	Depth	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (VI) (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Zinc (mg/kg)
<b>Residential SSL <sup>(1,2)</sup></b>			<b>0.68</b>	<b>15,000</b>	<b>71</b>	<b>0.3</b>	<b>3,100</b>	<b>400</b>	<b>1,500</b>	<b>390</b>	<b>390</b>	<b>23,000</b>
<b>Protection of Groundwater SSL <sup>(1,2,3)</sup></b>			<b>0.29</b>	<b>82</b>	<b>0.38</b>	<b>0.00067</b>	<b>46</b>	<b>14</b>	<b>26</b>	<b>0.26</b>	<b>0.8</b>	<b>370</b>
WH01 @ 3'	5/12/2021	3 ft. bgs	<b>1.56</b>	71.9	0.246	<0.30 <sup>(4)</sup>	14.4	13.8	4.69	<b>0.584</b>	0.130	47.9
BH01 @ 3'	7/8/2021	3 ft. bgs	<b>1.12</b>	NA	NA	NA	NA	NA	NA	<b>0.633</b>	NA	NA
BH02 @ 3'	7/8/2021	3 ft. bgs	<b>0.413</b>	NA	NA	NA	NA	NA	NA	<b>0.747</b>	NA	NA
BH03 @ 3'	7/8/2021	3 ft. bgs	<b>0.344</b>	NA	NA	NA	NA	NA	NA	<b>0.591</b>	NA	NA
BH04 @ 3'	7/8/2021	3 ft. bgs	<b>0.344</b>	NA	NA	NA	NA	NA	NA	<b>0.383</b>	NA	NA
BH05 @ 6'	7/8/2021	6 ft. bgs	<b>3.62</b>	NA	NA	NA	NA	NA	NA	<b>1.01</b>	NA	NA
BHKG02 @ 3'	7/8/2021	3 ft. bgs	<0.210	NA	NA	NA	NA	NA	NA	<b>0.344</b>	NA	NA

**Notes:**

1. Compounds referenced from the COGCC 2 CCR 404-1, Table 915-1, effective January 15, 2021.
2. Soil Screening Levels (SSL) referenced from EPA Regional Screening Levels (EPA RSLs) for Chemical Contaminants at Superfund Sites, effective November 2020.
3. SSLs are applicable if a pathway for communication with groundwater is present.
4. Compound falls within COGCC Table 915-1 Footnote 9.

COGCC = Colorado Oil and Gas Conservation Commission

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

mg/kg = Milligrams per kilogram

  = Source material characterization sample

ft. = Feet

bgs = Below ground surface

**BOLD** = Analytical result is in exceedance of applicable standard.

**TABLE 4**  
**FORMER KRISTIN 1 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 <sup>(2)</sup> (ft.)	Groundwater Elevation (ft. AMSL)
<b>COGCC Table 915-1 Groundwater Standard (µg/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	<b>140</b>	<b>67</b>	<b>67</b>	<b>-</b>	<b>-</b>
GW01	5/12/2021	280	83	110	1,900	43	160	130	3.5	NA
BH01	7/8/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.31	4706.52
BH02	7/8/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.31	4706.48
BH03	7/8/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.05	4706.50
BH04	7/8/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	3.07	4706.55
BH05	7/8/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	2.82	4706.81

**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  
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

**TABLE 5**  
**FORMER KRISTIN 1 WELLHEAD**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**  
**INORGANIC PARAMETERS**

Sample ID	Date Sampled	TDS (unit)	Chloride Ion (mg/L)	Sulfate Ion (mg/L)
<b>COGCC Table 915-1 Groundwater Standard (mg/L) <sup>(1)</sup></b>		<b>&lt;1.25 x BCKG</b>	<b>250 or &lt;1.25 x BCKG</b>	<b>250 or &lt;1.25 x BCKG</b>
BH02	7/8/2021	680	98.2	<b>582</b>
BH04	7/8/2021	864	145	<b>610</b>
BH05	7/8/2021	658	139	<b>572</b>

**Notes:**

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

TDS = Total dissolved solids

COGCC = Colorado Oil and Gas Conservation Commission

BCKG = Background

mg/L = Milligrams per liter

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

Up-gradient well location used for background concentration.

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

**BOLD** = Analytical result is in exceedance of applicable standard.

## Attachment A

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

September 14, 2021

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Kristin 1 Wellhead

Work Order #2107097

Enclosed are the results of analyses for samples received by Summit Scientific on 07/08/21 17:45. 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', written in a cursive style.

Paul Shrewsbury

President



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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01@3'	2107097-01	Soil	07/08/21 11:42	07/08/21 17:45
BH02@3'	2107097-02	Soil	07/08/21 11:45	07/08/21 17:45
BH03@3'	2107097-03	Soil	07/08/21 11:25	07/08/21 17:45
BH04@3'	2107097-04	Soil	07/08/21 11:22	07/08/21 17:45
BH05@6'	2107097-05	Soil	07/08/21 12:00	07/08/21 17:45
BKG02@3'	2107097-06	Soil	07/08/21 12:06	07/08/21 17:45

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.*



**Sample Receipt Checklist**

S2 Work Order 2107097

Client: PDC / Tasman Client Project ID: Kristin / Wellhead

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

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

Temp (°C)	4
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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.	✓			On ice.
Were all samples received intact <sup>(1)</sup> ?	✓			
Was adequate sample volume provided <sup>(1)</sup> ?	✓			
If custody seals are present, are they intact <sup>(1)</sup> ?			✓	
Are samples with holding times due within 48 hours sample due within 48 hours present?	✓			Same day.
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	✓			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	✓			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	✓			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	✓			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			✓	
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			✓	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.			✓	
If dissolved metals are requested, were samples field filtered?			✓	

Additional Comments (if any):

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

JB  
Custodian Printed Name or Initials

*John Ben*  
Signature of Custodian

7/8/21  
Date/Time



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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH01@3'**  
**2107097-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **07/08/21 11:42**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	BEG0150	07/08/21	07/08/21	EPA 8260B	
Toluene	ND	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
Xylenes (total)	ND	0.010		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
Naphthalene	ND	0.0038		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50		"	"	"	"	"	"	

Date Sampled: **07/08/21 11:42**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		98.6 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %		21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **07/08/21 11:42**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	BEG0151	07/08/21	07/08/21	EPA 8015M	
C28-C36 (ORO)	ND	50		"	"	"	"	"	"	

Date Sampled: **07/08/21 11:42**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl		85.8 %		30-150		"	"	"	"	

**PAH by EPA Method 8270D SIM**

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH01@3'**  
**2107097-01 (Soil)**

**Summit Scientific**

**PAH by EPA Method 8270D SIM**

Date Sampled: **07/08/21 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEG0200	07/13/21	07/15/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **07/08/21 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		55.9 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		62.8 %	40-150		"	"	"	"	

**Total Metals by EPA 6020B Hot Water Soluble Extraction**

Date Sampled: **07/08/21 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Boron</b>	<b>0.103</b>	0.0100	mg/L	1	BEG0159	07/09/21	07/10/21	EPA 6020B	

**Total Metals by EPA 6020B**

Date Sampled: **07/08/21 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH01@3'**  
**2107097-01 (Soil)**

**Summit Scientific**

**Total Metals by EPA 6020B**

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	1.12	0.200	mg/kg dry	1	BEG0164	07/09/21	07/10/21	EPA 6020B	
Selenium	0.633	0.260	"	"	"	"	"	"	

**Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction**

Date Sampled: **07/08/21 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	35.2	0.0518	mg/L dry	1	BEG0160	07/09/21	07/13/21	EPA 6020B	
Magnesium	14.0	0.0518	"	"	"	"	"	"	
Sodium	78.4	0.0518	"	"	"	"	"	"	

**Calculated Analysis**

Date Sampled: **07/08/21 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	2.83	0.00100	units	1	BEG0213	07/13/21	07/13/21	Calculation	

**Physical Parameters by APHA/ASTM/EPA Methods**

Date Sampled: **07/08/21 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	96.6		%	1	BEG0157	07/09/21	07/09/21	Calculation	

**Specific Conductance by EPA Method 120.1, Saturated Paste Extraction**

Date Sampled: **07/08/21 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.836	0.0100	mmhos/cm	1	BEG0175	07/12/21	07/12/21	EPA 120.1	

**Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction**

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
 09/14/21 08:16

**BH01@3'**  
**2107097-01 (Soil)**

**Summit Scientific**

**Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction**

Date Sampled: **07/08/21 11:42**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>pH</b>	<b>8.23</b>		pH Units	1	BEG0174	07/12/21	07/12/21	EPA 9045D	

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH02@3'**  
**2107097-02 (Soil)**

**Summit Scientific**

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

Date Sampled: **07/08/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BEG0150	07/08/21	07/08/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **07/08/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		100 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **07/08/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BEG0151	07/08/21	07/08/21	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **07/08/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		93.7 %	30-150		"	"	"	"	

**PAH by EPA Method 8270D SIM**

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH02@3'**  
**2107097-02 (Soil)**

**Summit Scientific**

**PAH by EPA Method 8270D SIM**

Date Sampled: **07/08/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEG0200	07/13/21	07/16/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **07/08/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		52.8 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		42.1 %	40-150		"	"	"	"	

**Total Metals by EPA 6020B Hot Water Soluble Extraction**

Date Sampled: **07/08/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Boron</b>	<b>0.203</b>	0.0100	mg/L	1	BEG0159	07/09/21	07/10/21	EPA 6020B	

**Total Metals by EPA 6020B**

Date Sampled: **07/08/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH02@3'**  
**2107097-02 (Soil)**

**Summit Scientific**

**Total Metals by EPA 6020B**

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.413	0.200	mg/kg dry	1	BEG0164	07/09/21	07/10/21	EPA 6020B	
Selenium	0.747	0.260	"	"	"	"	"	"	

**Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction**

Date Sampled: **07/08/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	52.8	0.0522	mg/L dry	1	BEG0160	07/09/21	07/13/21	EPA 6020B	
Magnesium	22.7	0.0522	"	"	"	"	"	"	
Sodium	92.0	0.0522	"	"	"	"	"	"	

**Calculated Analysis**

Date Sampled: **07/08/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	2.67	0.00100	units	1	BEG0213	07/13/21	07/13/21	Calculation	

**Physical Parameters by APHA/ASTM/EPA Methods**

Date Sampled: **07/08/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	95.8		%	1	BEG0157	07/09/21	07/09/21	Calculation	

**Specific Conductance by EPA Method 120.1, Saturated Paste Extraction**

Date Sampled: **07/08/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.896	0.0100	mmhos/cm	1	BEG0175	07/12/21	07/12/21	EPA 120.1	

**Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction**

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
 09/14/21 08:16

**BH02@3'**  
**2107097-02 (Soil)**

**Summit Scientific**

**Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction**

Date Sampled: **07/08/21 11:45**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>pH</b>	<b>8.26</b>		pH Units	1	BEG0174	07/12/21	07/12/21	EPA 9045D	

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH03@3'**  
**2107097-03 (Soil)**

**Summit Scientific**

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

Date Sampled: **07/08/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BEG0150	07/08/21	07/08/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **07/08/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		98.0 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **07/08/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BEG0151	07/08/21	07/08/21	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **07/08/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		87.2 %	30-150		"	"	"	"	

**PAH by EPA Method 8270D SIM**

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH03@3'**  
**2107097-03 (Soil)**

**Summit Scientific**

**PAH by EPA Method 8270D SIM**

Date Sampled: **07/08/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEG0200	07/13/21	07/16/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **07/08/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		65.7 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		48.1 %	40-150		"	"	"	"	

**Total Metals by EPA 6020B Hot Water Soluble Extraction**

Date Sampled: **07/08/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Boron</b>	<b>0.0647</b>	0.0100	mg/L	1	BEG0159	07/09/21	07/10/21	EPA 6020B	

**Total Metals by EPA 6020B**

Date Sampled: **07/08/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH03@3'**  
**2107097-03 (Soil)**

**Summit Scientific**

**Total Metals by EPA 6020B**

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.344	0.200	mg/kg dry	1	BEG0164	07/09/21	07/10/21	EPA 6020B	
Selenium	0.591	0.260	"	"	"	"	"	"	"

**Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction**

Date Sampled: **07/08/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	40.0	0.0546	mg/L dry	1	BEG0160	07/09/21	07/13/21	EPA 6020B	
Magnesium	18.6	0.0546	"	"	"	"	"	"	
Sodium	96.7	0.0546	"	"	"	"	"	"	

**Calculated Analysis**

Date Sampled: **07/08/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	3.17	0.00100	units	1	BEG0213	07/13/21	07/13/21	Calculation	

**Physical Parameters by APHA/ASTM/EPA Methods**

Date Sampled: **07/08/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	91.5		%	1	BEG0157	07/09/21	07/09/21	Calculation	

**Specific Conductance by EPA Method 120.1, Saturated Paste Extraction**

Date Sampled: **07/08/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.837	0.0100	mmhos/cm	1	BEG0175	07/12/21	07/12/21	EPA 120.1	

**Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction**

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
 09/14/21 08:16

**BH03@3'**  
**2107097-03 (Soil)**

**Summit Scientific**

**Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction**

Date Sampled: **07/08/21 11:25**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>pH</b>	<b>8.22</b>		pH Units	1	BEG0174	07/12/21	07/12/21	EPA 9045D	

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH04@3'**  
**2107097-04 (Soil)**

**Summit Scientific**

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

Date Sampled: **07/08/21 11:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BEG0150	07/08/21	07/08/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **07/08/21 11:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		105 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **07/08/21 11:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BEG0151	07/08/21	07/08/21	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **07/08/21 11:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		88.7 %	30-150		"	"	"	"	

**PAH by EPA Method 8270D SIM**

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH04@3'**  
**2107097-04 (Soil)**

**Summit Scientific**

**PAH by EPA Method 8270D SIM**

Date Sampled: **07/08/21 11:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEG0200	07/13/21	07/16/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **07/08/21 11:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		64.9 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		53.8 %	40-150		"	"	"	"	

**Total Metals by EPA 6020B Hot Water Soluble Extraction**

Date Sampled: **07/08/21 11:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Boron</b>	<b>0.0570</b>	0.0100	mg/L	1	BEG0159	07/09/21	07/10/21	EPA 6020B	

**Total Metals by EPA 6020B**

Date Sampled: **07/08/21 11:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH04@3'**  
**2107097-04 (Soil)**

**Summit Scientific**

**Total Metals by EPA 6020B**

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.344	0.200	mg/kg dry	1	BEG0164	07/09/21	07/10/21	EPA 6020B	
Selenium	0.383	0.260	"	"	"	"	"	"	

**Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction**

Date Sampled: **07/08/21 11:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	23.4	0.0531	mg/L dry	1	BEG0160	07/09/21	07/13/21	EPA 6020B	
Magnesium	9.83	0.0531	"	"	"	"	"	"	
Sodium	49.7	0.0531	"	"	"	"	"	"	

**Calculated Analysis**

Date Sampled: **07/08/21 11:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	2.17	0.00100	units	1	BEG0213	07/13/21	07/13/21	Calculation	

**Physical Parameters by APHA/ASTM/EPA Methods**

Date Sampled: **07/08/21 11:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	94.1		%	1	BEG0157	07/09/21	07/09/21	Calculation	

**Specific Conductance by EPA Method 120.1, Saturated Paste Extraction**

Date Sampled: **07/08/21 11:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.454	0.0100	mmhos/cm	1	BEG0175	07/12/21	07/12/21	EPA 120.1	

**Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction**

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
 09/14/21 08:16

**BH04@3'**  
**2107097-04 (Soil)**

**Summit Scientific**

**Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction**

Date Sampled: **07/08/21 11:22**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>pH</b>	<b>8.25</b>		pH Units	1	BEG0174	07/12/21	07/12/21	EPA 9045D	

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH05@6'**  
**2107097-05 (Soil)**

**Summit Scientific**

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

Date Sampled: **07/08/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BEG0150	07/08/21	07/08/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **07/08/21 12:00**

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

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **07/08/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BEG0151	07/08/21	07/08/21	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **07/08/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		89.9 %	30-150		"	"	"	"	

**PAH by EPA Method 8270D SIM**

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH05@6'**  
**2107097-05 (Soil)**

**Summit Scientific**

**PAH by EPA Method 8270D SIM**

Date Sampled: **07/08/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEG0200	07/13/21	07/16/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
<b>Benzo (b) fluoranthene</b>	<b>0.00866</b>	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
<b>Fluoranthene</b>	<b>0.00932</b>	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
<b>Pyrene</b>	<b>0.00695</b>	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **07/08/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		52.7 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		40.3 %	40-150		"	"	"	"	

**Total Metals by EPA 6020B Hot Water Soluble Extraction**

Date Sampled: **07/08/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Boron</b>	<b>0.371</b>	0.0100	mg/L	1	BEG0159	07/09/21	07/10/21	EPA 6020B	

**Total Metals by EPA 6020B**

Date Sampled: **07/08/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BH05@6'**  
**2107097-05 (Soil)**

**Summit Scientific**

**Total Metals by EPA 6020B**

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	3.62	0.200	mg/kg dry	1	BEG0164	07/09/21	07/10/21	EPA 6020B	
Selenium	1.01	0.260	"	"	"	"	"	"	"

**Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction**

Date Sampled: **07/08/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	309	0.0612	mg/L dry	1	BEG0160	07/09/21	07/13/21	EPA 6020B	
Magnesium	75.1	0.0612	"	"	"	"	"	"	
Sodium	278	0.0612	"	"	"	"	"	"	

**Calculated Analysis**

Date Sampled: **07/08/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	3.68	0.00100	units	1	BEG0213	07/13/21	07/13/21	Calculation	

**Physical Parameters by APHA/ASTM/EPA Methods**

Date Sampled: **07/08/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	81.7		%	1	BEG0157	07/09/21	07/09/21	Calculation	

**Specific Conductance by EPA Method 120.1, Saturated Paste Extraction**

Date Sampled: **07/08/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	2.68	0.0100	mmhos/cm	1	BEG0175	07/12/21	07/12/21	EPA 120.1	

**Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction**

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
 09/14/21 08:16

**BH05@6'**  
**2107097-05 (Soil)**

**Summit Scientific**

**Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction**

Date Sampled: **07/08/21 12:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>pH</b>	<b>8.04</b>		pH Units	1	BEG0174	07/12/21	07/12/21	EPA 9045D	

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**BKG02@3'**  
**2107097-06 (Soil)**

**Summit Scientific**

**Total Metals by EPA 6020B**

Date Sampled: **07/08/21 12:06**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	ND	0.210	mg/kg dry	1	BEG0164	07/09/21	07/10/21	EPA 6020B	
<b>Barium</b>	<b>23.3</b>	0.419	"	"	"	"	"	"	"
Cadmium	ND	0.210	"	"	"	"	"	"	"
<b>Copper</b>	<b>1.00</b>	0.419	"	"	"	"	"	"	"
<b>Lead</b>	<b>1.64</b>	0.210	"	"	"	"	"	"	"
<b>Nickel</b>	<b>1.08</b>	0.419	"	"	"	"	"	"	"
<b>Selenium</b>	<b>0.344</b>	0.273	"	"	"	"	"	"	"
Silver	ND	0.0210	"	"	"	"	"	"	"
<b>Zinc</b>	<b>5.85</b>	0.419	"	"	"	"	"	"	"

**Hexavalent Chromium by EPA Method 7196**

Date Sampled: **07/08/21 12:06**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BEG0195	07/12/21	07/12/21	EPA 7196A	

**Physical Parameters by APHA/ASTM/EPA Methods**

Date Sampled: **07/08/21 12:06**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>% Solids</b>	<b>95.4</b>		%	1	BEG0157	07/09/21	07/09/21	Calculation	

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

### Volatile Organic Compounds by EPA Method 8260B - Quality Control

#### Summit Scientific

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

#### Batch BEG0150 - EPA 5030 Soil MS

##### Blank (BEG0150-BLK1)

Prepared & Analyzed: 07/08/21

Benzene	ND	0.0020	mg/kg								
Toluene	ND	0.0050	"								
Ethylbenzene	ND	0.0050	"								
Xylenes (total)	ND	0.010	"								
1,2,4-Trimethylbenzene	ND	0.0050	"								
1,3,5-Trimethylbenzene	ND	0.0050	"								
Naphthalene	ND	0.0038	"								
Gasoline Range Hydrocarbons	ND	0.50	"								
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0465</i>		<i>"</i>	<i>0.0400</i>		<i>116</i>		<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0332</i>		<i>"</i>	<i>0.0400</i>		<i>83.0</i>		<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0331</i>		<i>"</i>	<i>0.0400</i>		<i>82.7</i>		<i>21-167</i>			

##### LCS (BEG0150-BS1)

Prepared & Analyzed: 07/08/21

Benzene	0.120	0.0020	mg/kg	0.125		96.0		70-130			
Toluene	0.119	0.0050	"	0.125		95.3		70-130			
Ethylbenzene	0.133	0.0050	"	0.125		106		70-130			
m,p-Xylene	0.262	0.010	"	0.250		105		70-130			
o-Xylene	0.121	0.0050	"	0.125		96.9		70-130			
1,2,4-Trimethylbenzene	0.129	0.0050	"	0.125		103		70-130			
1,3,5-Trimethylbenzene	0.130	0.0050	"	0.125		104		70-130			
Naphthalene	0.143	0.0038	"	0.125		114		70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0464</i>		<i>"</i>	<i>0.0400</i>		<i>116</i>		<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0333</i>		<i>"</i>	<i>0.0400</i>		<i>83.2</i>		<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0326</i>		<i>"</i>	<i>0.0400</i>		<i>81.4</i>		<i>21-167</i>			

##### Matrix Spike (BEG0150-MS1)

Source: 2107097-01

Prepared & Analyzed: 07/08/21

Benzene	0.118	0.0020	mg/kg	0.125	ND	94.2		70-130			
Toluene	0.116	0.0050	"	0.125	ND	93.2		70-130			
Ethylbenzene	0.125	0.0050	"	0.125	ND	99.7		70-130			
m,p-Xylene	0.247	0.010	"	0.250	ND	98.6		70-130			
o-Xylene	0.117	0.0050	"	0.125	ND	93.6		70-130			
1,2,4-Trimethylbenzene	0.121	0.0050	"	0.125	ND	96.8		70-130			
1,3,5-Trimethylbenzene	0.120	0.0050	"	0.125	ND	96.1		70-130			
Naphthalene	0.140	0.0038	"	0.125	ND	112		70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0476</i>		<i>"</i>	<i>0.0400</i>		<i>119</i>		<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0333</i>		<i>"</i>	<i>0.0400</i>		<i>83.2</i>		<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0330</i>		<i>"</i>	<i>0.0400</i>		<i>82.6</i>		<i>21-167</i>			

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
 09/14/21 08:16

**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 BEG0150 - EPA 5030 Soil MS**

Matrix Spike Dup (BEG0150-MSD1)	Source: 2107097-01			Prepared & Analyzed: 07/08/21							
Benzene	0.120	0.0020	mg/kg	0.125	ND	96.0	70-130	1.92	30		
Toluene	0.118	0.0050	"	0.125	ND	94.7	70-130	1.61	30		
Ethylbenzene	0.128	0.0050	"	0.125	ND	102	70-130	2.42	30		
m,p-Xylene	0.252	0.010	"	0.250	ND	101	70-130	2.30	30		
o-Xylene	0.120	0.0050	"	0.125	ND	96.2	70-130	2.71	30		
1,2,4-Trimethylbenzene	0.125	0.0050	"	0.125	ND	99.9	70-130	3.15	30		
1,3,5-Trimethylbenzene	0.124	0.0050	"	0.125	ND	99.0	70-130	3.00	30		
Naphthalene	0.158	0.0038	"	0.125	ND	127	70-130	12.0	30		
Surrogate: 1,2-Dichloroethane-d4	0.0479		"	0.0400		120	23-173				
Surrogate: Toluene-d8	0.0330		"	0.0400		82.4	20-170				
Surrogate: 4-Bromofluorobenzene	0.0329		"	0.0400		82.2	21-167				

Summit Scientific

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

Project: Kristin 1 Wellhead  
 Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 09/14/21 08:16

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

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

**Batch BEG0151 - EPA 3550A**

**Blank (BEG0151-BLK1)**

Prepared & Analyzed: 07/08/21

C10-C28 (DRO)	ND	50	mg/kg							
C28-C36 (ORO)	ND	50	"							

**LCS (BEG0151-BS1)**

Prepared & Analyzed: 07/08/21

C10-C28 (DRO)	497	50	mg/kg	500	99.3	70-130				
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**Matrix Spike (BEG0151-MS1)**

Source: 2107095-01

Prepared & Analyzed: 07/08/21

C10-C28 (DRO)	482	50	mg/kg	500	27.3	90.9	70-130			
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**Matrix Spike Dup (BEG0151-MSD1)**

Source: 2107095-01

Prepared & Analyzed: 07/08/21

C10-C28 (DRO)	479	50	mg/kg	500	27.3	90.4	70-130	0.555	20	
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Summit Scientific

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



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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**PAH by EPA Method 8270D SIM - Quality Control**

**Summit Scientific**

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

**Batch BEG0200 - EPA 5030 Soil MS**

**Blank (BEG0200-BLK1)**

Prepared: 07/13/21 Analyzed: 07/15/21

Acenaphthene	ND	0.00500	mg/kg							
Anthracene	ND	0.00500	"							
Benzo (a) anthracene	ND	0.00500	"							
Benzo (a) pyrene	ND	0.00500	"							
Benzo (b) fluoranthene	ND	0.00500	"							
Benzo (k) fluoranthene	ND	0.00500	"							
Chrysene	ND	0.00500	"							
Dibenz (a,h) anthracene	ND	0.00500	"							
Fluoranthene	ND	0.00500	"							
Fluorene	ND	0.00500	"							
Indeno (1,2,3-cd) pyrene	ND	0.00500	"							
Pyrene	ND	0.00500	"							
1-Methylnaphthalene	ND	0.00500	"							
2-Methylnaphthalene	ND	0.00500	"							
Surrogate: 2-Methylnaphthalene-d10	0.0188		"	0.0333		56.3	40-150			
Surrogate: Fluoranthene-d10	0.0235		"	0.0333		70.5	40-150			

**LCS (BEG0200-BS1)**

Prepared: 07/13/21 Analyzed: 07/15/21

Acenaphthene	0.0277	0.00500	mg/kg	0.0333		83.0	31-137			
Anthracene	0.0269	0.00500	"	0.0333		80.6	30-120			
Benzo (a) anthracene	0.0255	0.00500	"	0.0333		76.5	30-120			
Benzo (a) pyrene	0.0253	0.00500	"	0.0333		76.0	30-120			
Benzo (b) fluoranthene	0.0363	0.00500	"	0.0333		109	30-120			
Benzo (k) fluoranthene	0.0388	0.00500	"	0.0333		117	30-120			
Chrysene	0.0276	0.00500	"	0.0333		82.7	30-120			
Dibenz (a,h) anthracene	0.0229	0.00500	"	0.0333		68.7	30-120			
Fluoranthene	0.0219	0.00500	"	0.0333		65.6	30-120			
Fluorene	0.0290	0.00500	"	0.0333		87.0	30-120			
Indeno (1,2,3-cd) pyrene	0.0226	0.00500	"	0.0333		67.8	30-120			
Pyrene	0.0455	0.00500	"	0.0333		137	35-142			
1-Methylnaphthalene	0.0267	0.00500	"	0.0333		80.0	35-142			
2-Methylnaphthalene	0.0236	0.00500	"	0.0333		70.7	35-142			
Surrogate: 2-Methylnaphthalene-d10	0.0275		"	0.0333		82.6	40-150			
Surrogate: Fluoranthene-d10	0.0232		"	0.0333		69.7	40-150			

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**PAH by EPA Method 8270D SIM - Quality Control**

**Summit Scientific**

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

**Batch BEG0200 - EPA 5030 Soil MS**

<b>Matrix Spike (BEG0200-MS1)</b>	<b>Source: 2107034-01</b>			Prepared: 07/13/21 Analyzed: 07/15/21					
Acenaphthene	0.0307	0.00500	mg/kg	0.0333	ND	92.1	31-137		
Anthracene	0.0313	0.00500	"	0.0333	ND	94.0	30-120		
Benzo (a) anthracene	0.0283	0.00500	"	0.0333	ND	85.0	30-120		
Benzo (a) pyrene	0.0290	0.00500	"	0.0333	ND	87.0	30-120		
Benzo (b) fluoranthene	0.0278	0.00500	"	0.0333	ND	83.5	30-120		
Benzo (k) fluoranthene	0.0304	0.00500	"	0.0333	ND	91.1	30-120		
Chrysene	0.0300	0.00500	"	0.0333	ND	90.0	30-120		
Dibenz (a,h) anthracene	0.0266	0.00500	"	0.0333	ND	79.8	30-120		
Fluoranthene	0.0240	0.00500	"	0.0333	ND	71.9	30-120		
Fluorene	0.0322	0.00500	"	0.0333	ND	96.6	30-120		
Indeno (1,2,3-cd) pyrene	0.0267	0.00500	"	0.0333	ND	80.1	30-120		
Pyrene	0.0236	0.00500	"	0.0333	ND	70.9	35-142		
1-Methylnaphthalene	0.0302	0.00500	"	0.0333	ND	90.5	15-130		
2-Methylnaphthalene	0.0274	0.00500	"	0.0333	ND	82.3	15-130		
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0295</i>	<i>"</i>	<i>"</i>	<i>0.0333</i>	<i>"</i>	<i>88.4</i>	<i>40-150</i>		
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0260</i>	<i>"</i>	<i>"</i>	<i>0.0333</i>	<i>"</i>	<i>78.1</i>	<i>40-150</i>		

<b>Matrix Spike Dup (BEG0200-MSD1)</b>	<b>Source: 2107034-01</b>			Prepared: 07/13/21 Analyzed: 07/15/21					
Acenaphthene	0.0281	0.00500	mg/kg	0.0333	ND	84.2	31-137	8.98	30
Anthracene	0.0306	0.00500	"	0.0333	ND	91.8	30-120	2.42	30
Benzo (a) anthracene	0.0311	0.00500	"	0.0333	ND	93.2	30-120	9.17	30
Benzo (a) pyrene	0.0292	0.00500	"	0.0333	ND	87.6	30-120	0.743	30
Benzo (b) fluoranthene	0.0303	0.00500	"	0.0333	ND	91.0	30-120	8.58	30
Benzo (k) fluoranthene	0.0254	0.00500	"	0.0333	ND	76.2	30-120	17.8	30
Chrysene	0.0288	0.00500	"	0.0333	ND	86.5	30-120	4.02	30
Dibenz (a,h) anthracene	0.0345	0.00500	"	0.0333	ND	103	30-120	25.7	30
Fluoranthene	0.0279	0.00500	"	0.0333	ND	83.8	30-120	15.2	30
Fluorene	0.0288	0.00500	"	0.0333	ND	86.5	30-120	11.1	30
Indeno (1,2,3-cd) pyrene	0.0351	0.00500	"	0.0333	ND	105	30-120	27.2	30
Pyrene	0.0284	0.00500	"	0.0333	ND	85.1	35-142	18.2	30
1-Methylnaphthalene	0.0278	0.00500	"	0.0333	ND	83.4	15-130	8.21	50
2-Methylnaphthalene	0.0253	0.00500	"	0.0333	ND	75.9	15-130	7.99	50
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0280</i>	<i>"</i>	<i>"</i>	<i>0.0333</i>	<i>"</i>	<i>84.0</i>	<i>40-150</i>		
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0306</i>	<i>"</i>	<i>"</i>	<i>0.0333</i>	<i>"</i>	<i>91.7</i>	<i>40-150</i>		

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 09/14/21 08:16

**Total Metals by EPA 6020B Hot Water Soluble Extraction - Quality Control**  
**Summit Scientific**

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

**Batch BEG0159 - EPA 3050B**

<b>Blank (BEG0159-BLK1)</b>				Prepared: 07/09/21 Analyzed: 07/10/21							
Boron	ND	0.0100	mg/L								
<b>LCS (BEG0159-BS1)</b>				Prepared: 07/09/21 Analyzed: 07/10/21							
Boron	5.38	0.0100	mg/L	5.00	108	80-120					
<b>Duplicate (BEG0159-DUP1)</b>				<b>Source: 2107090-04</b>		Prepared: 07/09/21 Analyzed: 07/10/21					
Boron	0.160	0.0100	mg/L		0.219			31.3	20		QR-03
<b>Matrix Spike (BEG0159-MS1)</b>				<b>Source: 2107090-04</b>		Prepared: 07/09/21 Analyzed: 07/10/21					
Boron	5.31	0.0100	mg/L	5.00	0.219	102	75-125				
<b>Matrix Spike Dup (BEG0159-MSD1)</b>				<b>Source: 2107090-04</b>		Prepared: 07/09/21 Analyzed: 07/10/21					
Boron	5.87	0.0100	mg/L	5.00	0.219	113	75-125	10.1	25		

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 09/14/21 08:16

**Total Metals by EPA 6020B - Quality Control**  
**Summit Scientific**

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

**Batch BEG0164 - EPA 3050B**

**Blank (BEG0164-BLK1)**

Prepared: 07/09/21 Analyzed: 07/10/21

Arsenic	ND	0.200	mg/kg wet							
Arsenic	ND	0.200	"							
Barium	ND	0.400	"							
Cadmium	ND	0.200	"							
Copper	ND	0.400	"							
Lead	ND	0.200	"							
Nickel	ND	0.400	"							
Selenium	ND	0.260	"							
Selenium	ND	0.260	"							
Silver	ND	0.0200	"							
Zinc	ND	0.400	"							

**LCS (BEG0164-BS1)**

Prepared: 07/09/21 Analyzed: 07/10/21

Arsenic	42.4	0.200	mg/kg wet	40.0	106	80-120				
Arsenic	42.4	0.200	"	40.0	106	80-120				
Barium	42.2	0.400	"	40.0	106	80-120				
Cadmium	2.08	0.200	"	2.00	104	80-120				
Copper	40.9	0.400	"	40.0	102	80-120				
Lead	19.8	0.200	"	20.0	99.0	80-120				
Nickel	40.3	0.400	"	40.0	101	80-120				
Selenium	3.84	0.260	"	4.00	96.1	80-120				
Selenium	3.84	0.260	"	4.00	96.1	80-120				
Silver	2.01	0.0200	"	2.00	100	80-120				
Zinc	42.4	0.400	"	40.0	106	80-120				

**Duplicate (BEG0164-DUP1)**

Source: 2107085-01

Prepared: 07/09/21 Analyzed: 07/10/21

Arsenic	4.23	0.219	mg/kg dry		4.41	4.25	20			
Arsenic	4.23	0.200	"		4.41	4.25	20			
Barium	24.0	0.437	"		31.8	28.1	20			QR-04
Cadmium	0.0630	0.219	"		0.0788	22.3	20			QR-04
Copper	5.59	0.437	"		6.55	15.8	20			
Lead	8.36	0.219	"		8.83	5.49	20			
Nickel	8.08	0.437	"		9.44	15.5	20			
Selenium	0.944	0.260	"		1.14	18.8	20			
Selenium	0.944	0.284	"		1.14	18.8	20			
Silver	0.0165	0.0219	"		0.0206	22.1	20			QR-04
Zinc	38.0	0.437	"		40.3	5.83	20			

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

**Total Metals by EPA 6020B - Quality Control**  
**Summit Scientific**

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

**Batch BEG0164 - EPA 3050B**

**Matrix Spike (BEG0164-MS1)**

Source: 2107085-01

Prepared: 07/09/21 Analyzed: 07/10/21

Arsenic	50.7	0.219	mg/kg dry	43.7	4.41	106	75-125			
Arsenic	50.7	0.200	"	43.7	4.41	106	75-125			
Barium	72.5	0.437	"	43.7	31.8	93.1	75-125			
Cadmium	2.52	0.219	"	2.19	0.0788	111	75-125			
Copper	52.5	0.437	"	43.7	6.55	105	75-125			
Lead	31.0	0.219	"	21.9	8.83	102	75-125			
Nickel	54.5	0.437	"	43.7	9.44	103	75-125			
Selenium	5.01	0.284	"	4.37	1.14	88.4	75-125			
Selenium	5.01	0.260	"	4.37	1.14	88.4	75-125			
Silver	2.34	0.0219	"	2.19	0.0206	106	75-125			
Zinc	85.2	0.437	"	43.7	40.3	103	75-125			

**Matrix Spike Dup (BEG0164-MSD1)**

Source: 2107085-01

Prepared: 07/09/21 Analyzed: 07/10/21

Arsenic	50.4	0.219	mg/kg dry	43.7	4.41	105	75-125	0.500	25
Arsenic	50.4	0.200	"	43.7	4.41	105	75-125	0.500	25
Barium	81.3	0.437	"	43.7	31.8	113	75-125	11.3	25
Cadmium	2.52	0.219	"	2.19	0.0788	111	75-125	0.0330	25
Copper	52.8	0.437	"	43.7	6.55	106	75-125	0.638	25
Lead	31.9	0.219	"	21.9	8.83	106	75-125	2.84	25
Nickel	54.2	0.437	"	43.7	9.44	102	75-125	0.495	25
Selenium	4.91	0.284	"	4.37	1.14	86.3	75-125	1.88	25
Selenium	4.91	0.260	"	4.37	1.14	86.3	75-125	1.88	25
Silver	2.34	0.0219	"	2.19	0.0206	106	75-125	0.210	25
Zinc	88.4	0.437	"	43.7	40.3	110	75-125	3.68	25

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 09/14/21 08:16

**Hexavalent Chromium by EPA Method 7196 - Quality Control**  
**Summit Scientific**

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

**Batch BEG0195 - 3060A Mod**

**Blank (BEG0195-BLK1)**

Prepared & Analyzed: 07/12/21

Chromium, Hexavalent      ND      0.30 mg/kg wet

**LCS (BEG0195-BS1)**

Prepared & Analyzed: 07/12/21

Chromium, Hexavalent      27.0      0.30 mg/kg wet      25.0      108      80-120

**Duplicate (BEG0195-DUP1)**

**Source: 2107097-06**

Prepared & Analyzed: 07/12/21

Chromium, Hexavalent      ND      0.30 mg/kg dry      ND      20

**Matrix Spike (BEG0195-MS1)**

**Source: 2107097-06**

Prepared & Analyzed: 07/12/21

Chromium, Hexavalent      27.3      0.30 mg/kg dry      26.2      ND      104      75-125

**Matrix Spike Dup (BEG0195-MSD1)**

**Source: 2107097-06**

Prepared & Analyzed: 07/12/21

Chromium, Hexavalent      27.3      0.30 mg/kg dry      26.2      ND      104      75-125      0.00      20

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
 09/14/21 08:16

**Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction - Quality Control**

**Summit Scientific**

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

**Batch BEG0160 - General Preparation**

**Blank (BEG0160-BLK1)**

Prepared: 07/09/21 Analyzed: 07/13/21

Calcium	ND	0.0500	mg/L wet							
Magnesium	ND	0.0500	"							
Sodium	ND	0.0500	"							

**LCS (BEG0160-BS1)**

Prepared: 07/09/21 Analyzed: 07/13/21

Calcium	5.04	0.0500	mg/L wet	5.00	101	70-130				
Magnesium	5.25	0.0500	"	5.00	105	70-130				
Sodium	4.50	0.0500	"	5.00	90.0	70-130				

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
 09/14/21 08:16

**Physical Parameters by APHA/ASTM/EPA Methods - Quality Control**

**Summit Scientific**

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

**Batch BEG0157 - General Preparation**

**Duplicate (BEG0157-DUP1)**

**Source: 2106543-01**

Prepared & Analyzed: 07/09/21

% Solids	84.3		%		84.3			0.00		20	
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Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 09/14/21 08:16

**Specific Conductance by EPA Method 120.1, Saturated Paste Extraction - Quality Control**  
**Summit Scientific**

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

**Batch BEG0175 - General Preparation**

**Blank (BEG0175-BLK1)**

Prepared & Analyzed: 07/12/21

Specific Conductance (EC)      ND      0.0100    mmhos/cm

**LCS (BEG0175-BS1)**

Prepared & Analyzed: 07/12/21

Specific Conductance (EC)      0.141      0.0100    mmhos/cm      0.150      93.9      90-110

**Duplicate (BEG0175-DUP1)**

**Source: 2107097-01**

Prepared & Analyzed: 07/12/21

Specific Conductance (EC)      0.836      0.0100    mmhos/cm      0.836      0.0718      20

Summit Scientific

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



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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
 09/14/21 08:16

**Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction - Quality Control**

**Summit Scientific**

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

**Batch BEG0174 - General Preparation**

**LCS (BEG0174-BS1)**

Prepared & Analyzed: 07/12/21

pH	9.31		pH Units	9.21	101	95-105
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**Duplicate (BEG0174-DUP1)**

Source: 2107097-01

Prepared & Analyzed: 07/12/21

pH	8.23		pH Units	8.23	0.00	20
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Summit Scientific

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



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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
09/14/21 08:16

### 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.
- QR-03 The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. 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

# Summit Scientific

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4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

July 16, 2021

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Kristin 1 Wellhead

Work Order #2107107

Enclosed are the results of analyses for samples received by Summit Scientific on 07/08/21 17:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Muri Premer". The signature is written in a cursive style with a large initial 'M' and a long, sweeping underline.

Muri Premer For Paul Shrewsbury  
President



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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
07/16/21 15:49

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	2107107-01	Water	07/08/21 13:40	07/08/21 17:45
BH02	2107107-02	Water	07/08/21 13:54	07/08/21 17:45
BH03	2107107-03	Water	07/08/21 13:35	07/08/21 17:45
BH04	2107107-04	Water	07/08/21 13:50	07/08/21 17:45
BH05	2107107-05	Water	07/08/21 14:02	07/08/21 17:45

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.*



2107107

Sample Receipt Checklist

S2 Work Order \_\_\_\_\_

Client: PDC / Tasman Client Project ID: Kristin I Wellhad

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

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

Temp (°C)	4
-----------	---

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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	On ice.
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact <sup>(1)</sup> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<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) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	HCl
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? 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):

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

JB  
Custodian Printed Name or Initials

[Signature]  
Signature of Custodian

7/8/21  
Date/Time



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

Project: Kristin 1 Wellhead  
 Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 07/16/21 15:49

**BH01**  
**2107107-01 (Water)**

**Summit Scientific**

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

Date Sampled: **07/08/21 13:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BEG0166	07/09/21	07/10/21	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: **07/08/21 13:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		95.8 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		97.6 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
07/16/21 15:49

**BH02**  
**2107107-02 (Water)**

**Summit Scientific**

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

Date Sampled: **07/08/21 13:54**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BEG0166	07/09/21	07/10/21	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: **07/08/21 13:54**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		93.9 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.5 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		109 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **07/08/21 13:54**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>98.2</b>	12.0		mg/L	200	BEG0236	07/14/21	07/15/21	EPA 300.0	
Sulfate	<b>582</b>	60.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **07/08/21 13:54**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	<b>680</b>	10.0		mg/L	1	BEG0226	07/14/21	07/14/21	SM2540C	

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
 07/16/21 15:49

**BH03**  
**2107107-03 (Water)**

**Summit Scientific**

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

Date Sampled: **07/08/21 13:35**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	1.0	ug/l	1	BEG0166	07/09/21	07/10/21	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: **07/08/21 13:35**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		93.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.1 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
07/16/21 15:49

**BH04**  
**2107107-04 (Water)**

**Summit Scientific**

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

Date Sampled: **07/08/21 13:50**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BEG0166	07/09/21	07/10/21	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: **07/08/21 13:50**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		96.2 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		99.1 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.2 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **07/08/21 13:50**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>145</b>	12.0		mg/L	200	BEG0236	07/14/21	07/15/21	EPA 300.0	
Sulfate	<b>610</b>	60.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **07/08/21 13:50**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	<b>864</b>	10.0		mg/L	1	BEG0226	07/14/21	07/14/21	SM2540C	

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
07/16/21 15:49

**BH05**  
**2107107-05 (Water)**

**Summit Scientific**

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

Date Sampled: **07/08/21 14:02**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BEG0166	07/09/21	07/10/21	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: **07/08/21 14:02**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		95.8 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.9 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.4 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **07/08/21 14:02**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>139</b>	12.0		mg/L	200	BEG0236	07/14/21	07/15/21	EPA 300.0	
Sulfate	<b>572</b>	60.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **07/08/21 14:02**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Total Dissolved Solids</b>	<b>658</b>	10.0		mg/L	1	BEG0226	07/14/21	07/14/21	SM2540C	

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
07/16/21 15:49

### Volatile Organic Compounds by EPA Method 8260B - Quality Control

#### Summit Scientific

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

#### Batch BEG0166 - EPA 5030 Water MS

##### Blank (BEG0166-BLK1)

Prepared: 07/09/21 Analyzed: 07/10/21

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	12.2		"	13.3		91.9	23-173			
Surrogate: Toluene-d8	13.1		"	13.3		98.2	20-170			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.7	21-167			

##### LCS (BEG0166-BS1)

Prepared: 07/09/21 Analyzed: 07/10/21

Benzene	41.9	1.0	ug/l	41.7		100	51-132			
Toluene	41.0	1.0	"	41.7		98.5	51-138			
Ethylbenzene	41.2	1.0	"	41.7		98.9	58-146			
m,p-Xylene	81.6	2.0	"	83.3		97.9	57-144			
o-Xylene	39.9	1.0	"	41.7		95.7	53-146			
Naphthalene	36.6	1.0	"	41.7		87.8	70-130			
1,2,4-Trimethylbenzene	34.6	1.0	"	41.7		83.1	70-130			
1,3,5-Trimethylbenzene	42.5	1.0	"	41.7		102	70-130			
Surrogate: 1,2-Dichloroethane-d4	12.8		"	13.3		95.8	23-173			
Surrogate: Toluene-d8	13.4		"	13.3		101	20-170			
Surrogate: 4-Bromofluorobenzene	13.0		"	13.3		97.8	21-167			

##### Matrix Spike (BEG0166-MS1)

Source: 2107042-01

Prepared: 07/09/21 Analyzed: 07/10/21

Benzene	41.8	1.0	ug/l	41.7	ND	100	34-141			
Toluene	42.0	1.0	"	41.7	ND	101	27-151			
Ethylbenzene	42.7	1.0	"	41.7	ND	102	29-160			
m,p-Xylene	84.3	2.0	"	83.3	ND	101	20-166			
o-Xylene	40.5	1.0	"	41.7	ND	97.2	33-159			
Naphthalene	42.2	1.0	"	41.7	6.40	85.8	70-130			
1,2,4-Trimethylbenzene	36.1	1.0	"	41.7	ND	86.7	70-130			
1,3,5-Trimethylbenzene	44.4	1.0	"	41.7	ND	107	70-130			
Surrogate: 1,2-Dichloroethane-d4	12.9		"	13.3		96.8	23-173			
Surrogate: Toluene-d8	13.3		"	13.3		99.8	20-170			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.3	21-167			

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
 07/16/21 15:49

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**

**Summit Scientific**

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

**Batch BEG0166 - EPA 5030 Water MS**

Matrix Spike Dup (BEG0166-MSD1)	Source: 2107042-01			Prepared: 07/09/21 Analyzed: 07/10/21						
Benzene	41.8	1.0	ug/l	41.7	ND	100	34-141	0.120	30	
Toluene	41.4	1.0	"	41.7	ND	99.3	27-151	1.49	30	
Ethylbenzene	43.1	1.0	"	41.7	ND	103	29-160	0.910	30	
m,p-Xylene	86.2	2.0	"	83.3	ND	103	20-166	2.21	30	
o-Xylene	42.0	1.0	"	41.7	ND	101	33-159	3.61	30	
Naphthalene	44.1	1.0	"	41.7	6.40	90.4	70-130	4.43	30	
1,2,4-Trimethylbenzene	36.3	1.0	"	41.7	ND	87.0	70-130	0.359	30	
1,3,5-Trimethylbenzene	44.6	1.0	"	41.7	ND	107	70-130	0.382	30	
Surrogate: 1,2-Dichloroethane-d4	12.6		"	13.3		94.7	23-173			
Surrogate: Toluene-d8	12.9		"	13.3		96.8	20-170			
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		99.0	21-167			

Summit Scientific

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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
 07/16/21 15:49

**Anions by EPA Method 300.0 - Quality Control**

**Summit Scientific**

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

**Batch BEG0236 - General Preparation**

**Blank (BEG0236-BLK1)**

Prepared: 07/14/21 Analyzed: 07/15/21

Chloride	ND	0.0600	mg/L						
Sulfate	ND	0.300	"						

**LCS (BEG0236-BS1)**

Prepared: 07/14/21 Analyzed: 07/15/21

Chloride	3.22	0.0600	mg/L	3.00	108	90-110		
Sulfate	16.1	0.300	"	15.0	108	90-110		

**Duplicate (BEG0236-DUP1)**

Source: 2107107-02

Prepared: 07/14/21 Analyzed: 07/15/21

Chloride	91.6	12.0	mg/L		98.2		6.95	20
Sulfate	551	60.0	"		582		5.43	20

**Matrix Spike (BEG0236-MS1)**

Source: 2107107-02

Prepared: 07/14/21 Analyzed: 07/15/21

Chloride	663	12.0	mg/L	600	98.2	94.1	80-120	
Sulfate	3600	60.0	"	3000	582	101	80-120	

Summit Scientific

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



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

Project: Kristin 1 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

**Reported:**  
 07/16/21 15:49

**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 BEG0226 - General Preparation**

**Blank (BEG0226-BLK1)**

Prepared & Analyzed: 07/14/21

Total Dissolved Solids      ND      10.0      mg/L

**Duplicate (BEG0226-DUP1)**

Source: 2107107-02

Prepared & Analyzed: 07/14/21

Total Dissolved Solids      681      10.0      mg/L      680      0.0588      20

Summit Scientific

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

Project: Kristin 1 Wellhead  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
07/16/21 15:49

### 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

## Attachment B



## Borehole Logging Form

BOREHOLE ID: <b>BH01</b>	SITE NAME: <b>Kribin 2 Wellhead</b>	CLIENT NAME: <b>PDC ENERGY</b>
Date Completed: <b>7/8/21</b>	Location: <b>S POC</b>	
Drilling Company: <b>Tasman</b>	Surface Completion: <b>N/A</b>	DTW: <b>3'</b> TD: <b>5'</b>
Type of Drill: <b>Hand Auger</b>	Geologist: <b>M. Dahlgren</b>	Project Manager: <b>B. Nelson</b>
Bit Size <b>2 3/8"</b>	Logging Method:	

Well Const. Material: Diameter: **1"** Screen: **Sch 40 PVC Slotted 0.01** Riser: **Sch 40 PVC Blank**

Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1		↑	↑	0.2		SM	Brown Silty Sand, moderately sorted, fine med grain, dry, no odor
2		↑	↑	0.0		SM	Tan Silty Sand, poorly sorted, fine - coarse grain, dry, no odor
3		HA	90%	0.0	BH01@3'		↓
4		↓	↓	0.0	11.42	SM	- Same as above, saturated
5		↓	↓	0.0			↓
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							



# Borehole Logging Form

BOREHOLE ID: BH02      SITE NAME: Kristine Wellhead      CLIENT NAME: PDC ENERGY  
 Date Completed: 7/8/21      Location: E POC  
 Drilling Company: Tasman      Surface Completion: N/A      DTW: 3'      TD: 5'  
 Type of Drill: Hand Auger      Geologist: M. Dahlgren      Project Manager: B. Nelson  
 Bit Size 2 3/8"      Logging Method:

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

Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description	
1		↑	↑	0.2		SM	-Brown Silty Sand, moderately sorted, fine-med grain, dry, no odor	
2				0.0		SM	-Tan Silty Sand, poorly sorted, fine-coarse grain, dry, no odor	
3		HA	100%	0.0	BH0203		↓	
4					0.0	11:45	SM	Same as above, saturated
5		↓	↓	0.2				↓
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## Borehole Logging Form

BOREHOLE ID: <b>BH03</b>	SITE NAME: <b>Kristina wellhead</b>	CLIENT NAME: <b>PDC ENERGY</b>
Date Completed: <b>7/8/21</b>	Location: <b>N POC</b>	
Drilling Company: <b>Tasman</b>	Surface Completion: <b>N/A</b>	DTW: <b>3'</b> TD: <b>5'</b>
Type of Drill: <b>Hand Auger</b>	Geologist: <b>M. Dahlgren</b>	Project Manager: <b>B. Nelson</b>
Bit Size <b>2 3/8"</b>	Logging Method:	

Well Const. Material: Diameter: **1"** Screen: **Sch 40 PVC Slotted 0.01Riser**: **Sch 40 PVC Blank**

Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description	
1		↑	↑	0.0		SM	Brown Silty Sand, moderately sorted Fine-Med grain, Dry, no odor	
2		↑	↑	0.0		SM	Tan Silty Sand, poorly sorted Fine-Coarse grain, Dry, no odor	
3		HA	90%	0.0	BH03@3 11.25	SM	Same as above, moist	
4		↓	↓	0.0			↓	Same as above, saturated
5		↓	↓	0.0			↓	
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# Borehole Logging Form

**BOREHOLE ID:** BH04      **SITE NAME:** Kristin 1 Wellhead      **CLIENT NAME:** PDC ENERGY  
**Date Completed:** 7/8/21      **Location:** W POC  
**Drilling Company:** Tasman      **Surface Completion:** N/A      **DTW:** 3'      **TD:** 5'  
**Type of Drill:** Hand Auger      **Geologist:** M. Dahlgren      **Project Manager:** B. Nelson  
**Bit Size:** 2 3/8"      **Logging Method:**

**Well Const. Material:** Diameter: 4"      **Screen:** Sch 40 PVC Slotted      **Riser:** Sch 40 PVC Blank

Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1	[Well Completion Diagram]	↑	↑	0.0		SM	Brown Silty Sand, Moderately Sorted
2				0.0		SM	Fine-Med grain Dry, no odor
3		HA	90%	0.0	BH04 23	SM	Tan Silty Sand, Poorly Sorted
4		↓	↓	0.2	11.22		Fine-coarse grain, Dry, no odor
5		↓	↓	0.2			↓
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## Borehole Logging Form

BOREHOLE ID: <b>BH05</b>	SITE NAME: <b>Kristin 1 Wellhead</b>	CLIENT NAME: <b>PDC ENERGY</b>
Date Completed: <b>4/8/21</b>	Location: <b>Source</b>	
Drilling Company: <b>Tasman</b>	Surface Completion: <b>N/A</b>	DTW: <b>3.5'</b> TD: <b>6'</b>
Type of Drill: <b>Hand Auger</b>	Geologist: <b>M. Dahlgren</b>	Project Manager: <b>B. Nelson</b>
Bit Size <b>2 3/8"</b>	Logging Method:	
Well Const. Material: Diameter: <b>4"</b> Screen: <b>Sch 40 PVC Slotted 0.01</b> Riser: <b>Sch 40 PVC Blank</b>		

Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description	
1		↑	↑	0.2		SM	-Brown Silty Sand, moderately sorted Fine-Med grain, Dry, No odor ↓	
2		↑	↑	0.1		SM	-Brown Silty Sand, poorly sorted, Fine-Coarse grain, Dry, No odor ↓	
3		HA	90%	0.0				Same as above, moist ↓
4		↓	↓	↓	0.4		SM	-Same as above, saturated, some -Black organic staining, no odor ↓
5		↓	↓	↓	0.5		SM	Same as above, No staining ↓
6		↓	↓	↓	0.7	BH05@6' 12:00		↓
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