

**TABLE 1
FORMER BOOTH 11, 12, 21, 22-31U & 31AU TANK BATTERY
SOIL ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Depth (ft. bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH ⁽²⁾ (mg/kg)	pH (units)	EC (mmhos/cm)
COGCC Table 910-1 Soil Standard (mg/kg) ⁽¹⁾			0.17	85	100	175	23	500	6-9	<4
SS01 @ 5'	5/22/2020	5	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	7.59	0.280

Notes:

- Standards for soil are taken from 2 CCR 404-1, Table 910-1, effective May 1, 2018.
 - TPH - Total volatile and extractable petroleum hydrocarbons. Value calculated by adding GRO and DRO concentrations.
- COGCC = Colorado Oil and Gas Conservation Commission
 (<) = Analytical result is less than the indicated laboratory reporting limit.
 GRO = Total volatile petroleum hydrocarbons - gasoline range organics
 DRO = Total extractable petroleum hydrocarbons - diesel range organics
 mg/kg = Milligrams per kilogram
 ft. = Feet
 bgs = Below ground surface
 EC = Electrical conductivity
 mmhos/cm = millimhos per centimeter

TABLE 2
FORMER BOOTH 11, 12, 21, 22-31U & 31AU TANK BATTERY
VOC CONCENTRATIONS SUMMARY TABLE

Sample ID	Date Sampled	Depth (ft. bgs)	Sample Location ⁽¹⁾	Field Measured VOC Concentration ⁽²⁾ (ppm)
SS01 @ 5'	5/22/2020	5	Base	7.3
SS02 @ 3'	5/22/2020	3	North Sidewall	3.5
SS03 @ 3'	5/22/2020	3	West Sidewall	4.6
SS04 @ 3'	5/22/2020	3	South Sidewall	2.7
SS05 @ 3'	5/22/2020	3	East Sidewall	2.3

Notes:

1. Refers to the sample location within the excavation area below the former produced water vessel.

2. Volatile organic compound (VOC) concentrations are measured in the field using a photoionization detector (PID).

ft. = Feet

bgs = Below ground surface

ppm = Parts per million

= Sample submitted for laboratory analysis.

ATTACHMENT A

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

June 01, 2020

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Booth 11,12,21,22-31U&31AU

Work Order #2005244

Enclosed are the results of analyses for samples received by Summit Scientific on 05/22/20 16:00. 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, stylized initial "M".

Muri Premer For Paul Shrewsbury
President



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

Project: Booth 11,12,21,22-31U&31AU

Project Number: [none]

Project Manager: Mark Longhurst

Reported:
06/01/20 16:03

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01@5'	2005244-01	Soil	05/22/20 10:40	05/22/20 16:00

Summit Scientific

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

Summit Scientific

2005244

4653 Table Mountain Drive ♦ Golden, Colorado 80403
303-277-9310

Page 1 of 1

Client: PDC/Tasman Project Manager: Mark Longhurst
 Address: _____ E-Mail: mark.longhurst@pdce.com
 City/State/Zip: _____
 Phone: _____ Project Name: Booth 11, 12, 21, 22-3U, 3AU
 Sampler Name: Max Dahlgren Project Number: _____

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested					Special Instructions	
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	GBTEXN	TPH-DRO	PH, EC	On Hold		
1	SS01 @ 5'	5/22/20	1040	1			X			X			X	X	X			
2	SS02 @ 3'		1045				X			X						X		
3	SS03 @ 3'		1050				X			X						X		
4	SS04 @ 3'		1055				X			X						X		
5	SS05 @ 3'		1100				X			X						X		
6																		
7																		
8																		
9																		
10																		

Relinquished by: <u>[Signature]</u>	Date/Time: <u>5/22/20 1230 1600</u>	Received by: <u>[Signature]</u>	Date/Time: <u>05/22/2020 1600</u>	Turn Around Time (Check) Same Day _____ 72 hours _____ 24 hours _____ Standard <u>X</u> 48 hours _____ Sample Integrity: Temperature Upon Receipt: <u>42</u> Samples Intact: <u>Yes</u> No	Notes:
Relinquished by:	Date/Time:	Received by:	Date/Time:		
Relinquished by:	Date/Time:	Received by:	Date/Time:		

Sample Receipt Checklist

S2 Work Order 2005244

Client: PDC Hagan Client Project ID: Booth 11, 12, 21, 22, 31, 4, 3/A

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

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

Temp (°C)	<u>4.2</u>
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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 ⁽¹⁾ ? 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"/>			
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect			<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ? Record the pH in Comments.			<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	

Additional Comments (if any):

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

[Signature]
Custodian Printed Name or Initials

[Signature]
Signature of Custodian

5/22/20
Date/Time



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

Project: Booth 11,12,21,22-31U&31AU

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
06/01/20 16:03

SS01@5'
2005244-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/22/20 10:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	2005355	05/29/20	05/29/20	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **05/22/20 10:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		65.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.8 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/22/20 10:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2005356	05/29/20	05/30/20	EPA 8015M	

Date Sampled: **05/22/20 10:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		117 %	30-150		"	"	"	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/22/20 10:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.59		pH Units	1	2005313	05/27/20	05/27/20	EPA 9045D	

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 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Booth 11,12,21,22-31U&31AU

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 06/01/20 16:03

SS01@5'
2005244-01 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Specific Conductance by EPA Method 120.1

Date Sampled: **05/22/20 10:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Specific Conductance (EC)	0.280	0.0100		mmhos/cm	1	2005314	05/27/20	05/27/20	EPA 120.1	

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1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Booth 11,12,21,22-31U&31AU

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
06/01/20 16:03

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 2005355 - EPA 5030 Soil MS

Blank (2005355-BLK1)

Prepared & Analyzed: 05/29/20

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Naphthalene	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0228		"	0.0400		56.9		23-173		
Surrogate: Toluene-d8	0.0413		"	0.0400		103		20-170		
Surrogate: 4-Bromofluorobenzene	0.0358		"	0.0400		89.6		21-167		

LCS (2005355-BS1)

Prepared & Analyzed: 05/29/20

Benzene	0.0878	0.0020	mg/kg	0.100		87.8		70-130		
Toluene	0.0881	0.0050	"	0.100		88.1		70-130		
Ethylbenzene	0.0892	0.0050	"	0.100		89.2		70-130		
m,p-Xylene	0.164	0.010	"	0.200		81.9		70-130		
o-Xylene	0.0810	0.0050	"	0.100		81.0		70-130		
Surrogate: 1,2-Dichloroethane-d4	0.0199		"	0.0400		49.8		23-173		
Surrogate: Toluene-d8	0.0428		"	0.0400		107		20-170		
Surrogate: 4-Bromofluorobenzene	0.0371		"	0.0400		92.8		21-167		

Matrix Spike (2005355-MS1)

Source: 2005244-01

Prepared & Analyzed: 05/29/20

Benzene	0.0880	0.0020	mg/kg	0.100	ND	88.0		70-130		
Toluene	0.0854	0.0050	"	0.100	ND	85.4		70-130		
Ethylbenzene	0.0856	0.0050	"	0.100	ND	85.6		70-130		
m,p-Xylene	0.153	0.010	"	0.200	0.00333	74.9		70-130		
o-Xylene	0.0773	0.0050	"	0.100	ND	77.3		70-130		
Surrogate: 1,2-Dichloroethane-d4	0.0185		"	0.0400		46.3		23-173		
Surrogate: Toluene-d8	0.0418		"	0.0400		105		20-170		
Surrogate: 4-Bromofluorobenzene	0.0357		"	0.0400		89.3		21-167		

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 Denver CO, 80203

Project: Booth 11,12,21,22-31U&31AU

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 06/01/20 16:03

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 2005355 - EPA 5030 Soil MS

Matrix Spike Dup (2005355-MSD1)	Source: 2005244-01			Prepared & Analyzed: 05/29/20						
Benzene	0.0861	0.0020	mg/kg	0.100	ND	86.1	70-130	2.14	30	
Toluene	0.0839	0.0050	"	0.100	ND	83.9	70-130	1.84	30	
Ethylbenzene	0.0819	0.0050	"	0.100	ND	81.9	70-130	4.48	30	
m,p-Xylene	0.150	0.010	"	0.200	0.00333	73.5	70-130	1.80	30	
o-Xylene	0.0766	0.0050	"	0.100	ND	76.6	70-130	0.897	30	
Surrogate: 1,2-Dichloroethane-d4	0.0185		"	0.0400		46.2	23-173			
Surrogate: Toluene-d8	0.0411		"	0.0400		103	20-170			
Surrogate: 4-Bromofluorobenzene	0.0352		"	0.0400		88.0	21-167			

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 Denver CO, 80203

Project: Booth 11,12,21,22-31U&31AU

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 06/01/20 16:03

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 2005356 - EPA 3550A

Blank (2005356-BLK1)

Prepared: 05/29/20 Analyzed: 05/30/20

C10-C28 (DRO) ND 50 mg/kg

LCS (2005356-BS1)

Prepared: 05/29/20 Analyzed: 05/30/20

C10-C28 (DRO) 607 50 mg/kg 500 121 70-130

Matrix Spike (2005356-MS1)

Source: 2005244-01

Prepared: 05/29/20 Analyzed: 05/30/20

C10-C28 (DRO) 597 50 mg/kg 500 42.6 111 70-130

Matrix Spike Dup (2005356-MSD1)

Source: 2005244-01

Prepared: 05/29/20 Analyzed: 05/30/20

C10-C28 (DRO) 616 50 mg/kg 500 42.6 115 70-130 3.09 20

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

Project: Booth 11,12,21,22-31U&31AU

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 06/01/20 16:03

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 2005313 - General Preparation

LCS (2005313-BS1)

Prepared & Analyzed: 05/27/20

pH	9.19	pH Units	9.18	100	95-105
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Duplicate (2005313-DUP1)

Source: 2005244-01

Prepared & Analyzed: 05/27/20

pH	7.57	pH Units	7.59	0.264	20
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 Denver CO, 80203

Project: Booth 11,12,21,22-31U&31AU

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 06/01/20 16:03

Specific Conductance by EPA Method 120.1 - Quality Control
Summit Scientific

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

Batch 2005314 - General Preparation

Blank (2005314-BLK1)

Prepared & Analyzed: 05/27/20

Specific Conductance (EC) ND 0.0100 mmhos/cm

LCS (2005314-BS1)

Prepared & Analyzed: 05/27/20

Specific Conductance (EC) 0.772 0.0100 mmhos/cm 0.750 103 90-110

Duplicate (2005314-DUP1)

Source: 2005244-01

Prepared & Analyzed: 05/27/20

Specific Conductance (EC) 0.289 0.0100 mmhos/cm 0.280 3.18 20

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1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Booth 11,12,21,22-31U&31AU

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
06/01/20 16:03

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