

**TABLE 1**  
**FORMER GUTTERSEN 11, 22-25 & 25E TANK BATTERY**  
**SOIL ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH <sup>(2)</sup> (mg/kg)	pH (units)	EC (mmhos/cm)
COGCC standards for soil (mg/kg) <sup>(1)</sup>			0.17	85	100	175	23	500	6-9	<4
SS01@4'	1/4/2019	4	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	9.49	0.757
SS02@3'	1/4/2019	3	NA	NA	NA	NA	NA	NA	8.38	0.478
SS03@3'	1/4/2019	3	NA	NA	NA	NA	NA	NA	9.06	0.458
SS04@3'	1/4/2019	3	NA	NA	NA	NA	NA	NA	9.11	0.506
SS05@3'	1/4/2019	3	NA	NA	NA	NA	NA	NA	8.46	0.466

**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

bgs = Below ground surface

EC = Electrical conductivity

mmhos/cm = millimhos per centimeter

NA = Constituent not analyzed.

**BOLD** = Analytical result is in exceedance of COGCC soil standards.

**TABLE 2**  
**FORMER GUTTERSEN 11, 22-25 & 25E TANK BATTERY**  
**VOC CONCENTRATIONS SUMMARY TABLE**

Sample ID	Date Sampled	Depth (feet bgs)	Sample Location <sup>(1)</sup>	Field Measured VOC Concentration <sup>(2)</sup> (ppm)
SS01@4'	1/4/2019	4	Excavation Base	10.7
SS02@3'	1/4/2019	3	North sidewall	5.8
SS03@3'	1/4/2019	3	West sidewall	1.3
SS04@3'	1/4/2019	3	South sidewall	2.4
SS05@3'	1/4/2019	3	East sidewall	0.8

**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).

bgs = Below ground surface

ppm = Parts per million

= Sample submitted for laboratory analysis.

## **ATTACHMENT A**

# Summit Scientific

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4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

January 11, 2019

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Guttersen 11,22-25 & 25E

Enclosed are the results of analyses for samples received by Summit Scientific on 01/04/19 19:20. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Paul Shrewsbury', written in a cursive style.

Paul Shrewsbury For Ben Shrewsbury

Laboratory Manager



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

Project: Guttersen 11,22-25 & 25E

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/11/19 11:58

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01@4'	1901052-01	Soil	01/04/19 11:37	01/04/19 19:20
SS02@3'	1901052-02	Soil	01/04/19 11:40	01/04/19 19:20
SS03@3'	1901052-03	Soil	01/04/19 11:43	01/04/19 19:20
SS04@3'	1901052-04	Soil	01/04/19 11:46	01/04/19 19:20
SS05@3'	1901052-05	Soil	01/04/19 11:58	01/04/19 19:20

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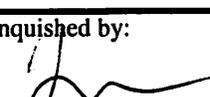
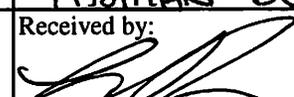
1901052

# Summit Scientific

741 Corporate Circle Suite I ♦ Golden, Colorado 80401  
303-277-9310 ♦ 303-374-5933 Fax

Client: PDC  
Address: \_\_\_\_\_  
City/State/Zip: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Sampler Name: Jake McCarver

Project Manager: Mark Longhurst  
E-Mail: Mark.Longhurst@pdce.com  
Project Name: Guttersen 11, 22-25 & 25E  
Project Number: \_\_\_\_\_

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix				Analyze For:						Special Instructions		
				HCl	HNO <sub>3</sub>	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	GBTEXN (8260)	TPH - DRO	EC / pH		HOLD				
SS01 @ 4'	1/4/2019	11:37	1			X		X				X	X	X						
SS02 @ 3'	1/4/2019	11:40	1			X		X								X				
SS03 @ 3'	1/4/2019	11:43	1			X		X								X				
SS04 @ 3'	1/4/2019	11:46	1			X		X								X				
<del>SS06 @ 3'</del> <b>SS05 @ 3'</b>	1/4/2019	11:58	1			X		X								X				
Relinquished by:  Date/Time: <u>1/04/19</u> <u>16:24</u>				Received by: <u>TASMAN BOX</u> Date/Time: <u>1.4.19</u> <u>1624</u>				Turn Around Time (Check) Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>						Hold SS02-SS06						
Relinquished by: <u>TASMAN BOX</u> Date/Time: <u>1.4.19</u> <u>1920</u>				Received by:  Date/Time: <u>1.4.19</u> <u>1920</u>				Sample Integrity: Temperature Upon Receipt: <u>3.0</u> Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>												
Relinquished by: _____ Date/Time: _____				Received in Lab by: _____ Date/Time: _____																





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

Project: Guttersen 11,22-25 & 25E

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/11/19 11:58

**SS01@4'**  
**1901052-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/04/19 11:37**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	1901048	01/07/19	01/08/19	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: **01/04/19 11:37**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		118 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		99.1 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %		21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/04/19 11:37**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	1901047	01/07/19	01/08/19	EPA 8015M	

Date Sampled: **01/04/19 11:37**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl		100 %		30-150		"	"	"	"	

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

Date Sampled: **01/04/19 11:37**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>pH</b>	<b>9.49</b>			pH Units	1	1901094	01/09/19	01/09/19	EPA 9045D	

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

Project: Guttersen 11,22-25 & 25E

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/11/19 11:58

**SS01@4'**  
**1901052-01 (Soil)**

**Summit Scientific**

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

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/04/19 11:37**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Specific Conductance (EC)	<b>0.757</b>	0.0100		mmhos/cm	1	1901093	01/09/19	01/09/19	EPA 120.1	

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Project: Guttersen 11,22-25 & 25E

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/11/19 11:58

**SS02@3'**  
**1901052-02 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/04/19 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>pH</b>	<b>8.38</b>		pH Units	1	1901112	01/10/19	01/10/19	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/04/19 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.478</b>	0.0100	mmhos/cm	1	1901113	01/10/19	01/10/19	EPA 120.1	

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Project: Guttersen 11,22-25 & 25E

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/11/19 11:58

**SS03@3'**  
**1901052-03 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/04/19 11:43**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>pH</b>	<b>9.06</b>			pH Units	1	1901112	01/10/19	01/10/19	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/04/19 11:43**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Specific Conductance (EC)</b>	<b>0.458</b>	0.0100		mmhos/cm	1	1901113	01/10/19	01/10/19	EPA 120.1	

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Project: Guttersen 11,22-25 & 25E

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/11/19 11:58

**SS04@3'**  
**1901052-04 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/04/19 11:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>pH</b>	<b>9.11</b>		pH Units	1	1901112	01/10/19	01/10/19	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/04/19 11:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.506</b>	0.0100	mmhos/cm	1	1901113	01/10/19	01/10/19	EPA 120.1	

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 1775 Sherman St. STE. 3000  
 Denver CO, 80203

Project: Guttersen 11,22-25 & 25E

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/11/19 11:58

**SS05@3'**  
**1901052-05 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/04/19 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>pH</b>	<b>8.46</b>		pH Units	1	1901112	01/10/19	01/10/19	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/04/19 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.466</b>	0.0100	mmhos/cm	1	1901113	01/10/19	01/10/19	EPA 120.1	

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

Project: Gutttersen 11,22-25 & 25E

Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
01/11/19 11:58

### 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 1901048 - EPA 5030 Soil MS

##### Blank (1901048-BLK1)

Prepared: 01/07/19 Analyzed: 01/08/19

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	0.0392		"	0.0396		98.9	23-173			
Surrogate: Toluene-d8	0.0404		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0387		"	0.0400		96.7	21-167			

##### LCS (1901048-BS1)

Prepared: 01/07/19 Analyzed: 01/08/19

Benzene	0.117	0.0020	mg/kg	0.100		117	70-130			
Toluene	0.127	0.0050	"	0.100		127	70-130			
Ethylbenzene	0.107	0.0050	"	0.100		107	70-130			
m,p-Xylene	0.172	0.010	"	0.200		86.2	70-130			
o-Xylene	0.124	0.0050	"	0.100		124	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0400		"	0.0396		101	23-173			
Surrogate: Toluene-d8	0.0404		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0401		"	0.0400		100	21-167			

##### Matrix Spike (1901048-MS1)

Source: 1901046-01

Prepared: 01/07/19 Analyzed: 01/08/19

Benzene	0.108	0.0020	mg/kg	0.100	ND	108	70-130			
Toluene	0.115	0.0050	"	0.100	ND	115	70-130			
Ethylbenzene	0.127	0.0050	"	0.100	0.00465	122	70-130			
m,p-Xylene	0.249	0.010	"	0.200	0.00945	120	70-130			
o-Xylene	0.117	0.0050	"	0.100	0.00501	112	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0425		"	0.0396		107	23-173			
Surrogate: Toluene-d8	0.0402		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0395		"	0.0400		98.8	21-167			

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

Project: Guttersen 11,22-25 & 25E

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/11/19 11:58

**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 1901048 - EPA 5030 Soil MS**

**Matrix Spike Dup (1901048-MSD1)**

Source: 1901046-01

Prepared: 01/07/19 Analyzed: 01/08/19

Benzene	0.117	0.0020	mg/kg	0.100	ND	117	70-130	8.03	30
Toluene	0.127	0.0050	"	0.100	ND	127	70-130	9.76	30
Ethylbenzene	0.108	0.0050	"	0.100	0.00465	103	70-130	16.4	30
m,p-Xylene	0.266	0.010	"	0.200	0.00945	128	70-130	6.91	30
o-Xylene	0.126	0.0050	"	0.100	0.00501	121	70-130	7.46	30
Surrogate: 1,2-Dichloroethane-d4	0.0413		"	0.0396		104	23-173		
Surrogate: Toluene-d8	0.0390		"	0.0400		97.5	20-170		
Surrogate: 4-Bromofluorobenzene	0.0388		"	0.0400		97.0	21-167		

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

Project: Guttersen 11,22-25 & 25E

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/11/19 11:58

**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 1901047 - EPA 5030 Soil GC**

**Blank (1901047-BLK1)**

Prepared: 01/07/19 Analyzed: 01/08/19

C10-C28 (DRO) ND 50 mg/kg

**LCS (1901047-BS1)**

Prepared: 01/07/19 Analyzed: 01/08/19

C10-C28 (DRO) 599 50 mg/kg 500 120 70-130

**Matrix Spike (1901047-MS1)**

Source: 1901046-01

Prepared: 01/07/19 Analyzed: 01/08/19

C10-C28 (DRO) 604 50 mg/kg 500 37.7 113 70-130

**Matrix Spike Dup (1901047-MSD1)**

Source: 1901046-01

Prepared: 01/07/19 Analyzed: 01/08/19

C10-C28 (DRO) 595 50 mg/kg 500 37.7 111 70-130 1.49 20

Summit Scientific

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

Project: Gutttersen 11,22-25 & 25E

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/11/19 11:58

**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 1901094 - General Preparation**

<b>LCS (1901094-BS1)</b>		Prepared & Analyzed: 01/09/19								
pH	9.25		pH Units	9.23		100	95-105			
<b>Duplicate (1901094-DUP1)</b>		<b>Source: 1901051-01</b>		Prepared & Analyzed: 01/09/19						
pH	8.21		pH Units		8.23			0.243	20	

**Batch 1901112 - General Preparation**

<b>LCS (1901112-BS1)</b>		Prepared & Analyzed: 01/10/19								
pH	9.23		pH Units	9.23		100	95-105			
<b>Duplicate (1901112-DUP1)</b>		<b>Source: 1901046-01</b>		Prepared & Analyzed: 01/10/19						
pH	8.51		pH Units		8.50			0.118	20	

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

Project: Guttersen 11,22-25 & 25E

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/11/19 11:58

**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 1901093 - General Preparation**

**Blank (1901093-BLK1)**

Prepared & Analyzed: 01/09/19

Specific Conductance (EC) ND 0.0100 mmhos/cm

**LCS (1901093-BS1)**

Prepared & Analyzed: 01/09/19

Specific Conductance (EC) 0.794 0.0100 mmhos/cm 0.750 106 90-110

**Duplicate (1901093-DUP1)**

**Source: 1901051-01**

Prepared & Analyzed: 01/09/19

Specific Conductance (EC) 5.16 0.0100 mmhos/cm 5.14 0.291 20

**Batch 1901113 - General Preparation**

**Blank (1901113-BLK1)**

Prepared & Analyzed: 01/10/19

Specific Conductance (EC) ND 0.0100 mmhos/cm

**LCS (1901113-BS1)**

Prepared & Analyzed: 01/10/19

Specific Conductance (EC) 0.793 0.0100 mmhos/cm 0.750 106 90-110

**Duplicate (1901113-DUP1)**

**Source: 1901046-01**

Prepared & Analyzed: 01/10/19

Specific Conductance (EC) 0.441 0.0100 mmhos/cm 0.438 0.501 20

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

Project: Guttersen 11,22-25 & 25E

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/11/19 11:58

### 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