



March 30, 2023

Peterson Energy Operating, Inc.

Ryan Dornbos

PO Box 2169

Loveland CO 80539

Project Name - Church Pit

Project Number - [none]

Attached are your analytical results for Church Pit received by Origins Laboratory, Inc. March 21, 2023. This project is associated with Origins project number Y303516-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Peterson Energy Operating, Inc.

PO Box 2169

Loveland CO 80539

Ryan Dornbos

Project Number: [none]

Project: Church Pit

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BREACH	Y303516-01	Soil	March 20, 2023 15:30	03/21/2023 09:08
BACKGROUND	Y303516-02	Soil	March 20, 2023 15:30	03/21/2023 09:08

Origins Laboratory, Inc.



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Peterson Energy Operating, Inc.
PO Box 2169
Loveland CO 80539

Ryan Dornbos
Project Number: [none]
Project: Church Pit

ORIGINS LABORATORY, INC

www.originslaboratory.com

430351V

page | of |

Client: PETERSON ENERGY
Address: PO BOX 2169
LOVELAND CO 80539
Telephone Number: 303 915 1074
Email Address: RYAN@PEOPERATING.COM
RYAN@PEOPERATING.COM

Fax: 303.265.9645

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions	
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summ #			Other
BREACH	3/21/13	1530	3	X				X				X	1
BACKGROUNDS	3/21/13	1530	3	X				X				X	2
													3
													4
													5
													6
													7
													8
													9
													10

Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Turnaround Time:
RYAN DORNOS	3/21/13	908	[Signature]	3/21/13	908	Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input checked="" type="checkbox"/>

Date Results Needed

Temp Received- 0

Origins Laboratory, Inc.

Bynon

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Peterson Energy Operating, Inc.

PO Box 2169

Loveland

CO

80539

Ryan Dornbos

Project Number: [none]

Project: Church Pit

Origins Laboratory

F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: 4303516

Client: PE Operating

Client Project ID: Church Pit

Checklist Completed by: EHS

Shipped Via: HD

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 3/21/23

Airbill #: NA

Matrix(s) Received: (Check all that apply): ☒ Soil/Solid ☐ Water ☐ Other: _____

Cooler Number/Temperature: 1 / 16.0 °C 1 / _____ °C 1 / _____ °C (Describe)

Thermometer ID: 7004

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace (> ¼ inch bubble) 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 and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄) / (pH >10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) [Signature]

3/21/23
Date/Time Reviewed

Origins Laboratory, Inc.

[Signature]

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Peterson Energy Operating, Inc.

PO Box 2169

Loveland CO 80539

Ryan Dornbos

Project Number: [none]

Project: Church Pit

BREACH

3/20/2023 3:30:00PM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.

Y303516-01 (Soil)

Metals by Saturated Paste by EPA 6010

Calcium	1.32	0.499	meq/L	10	[CALC]	03/27/2023	03/29/2023
Magnesium	ND	0.823	"	"	"	"	"
Sodium	ND	0.435	"	"	"	"	"

SAR by 20B Saturated Paste

SAR	0.304		SAR	1	B3C2702	"	"
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Table 915 metals by EPA 6020B

Arsenic	2.10	0.0913	mg/kg	10	B3C2223	03/22/2023	03/23/2023
Barium	90.8	9.13	"	"	"	"	"
Cadmium	ND	0.0913	"	"	"	"	"
Copper	ND	9.13	"	"	"	"	"
Lead	ND	9.13	"	"	"	"	"
Nickel	ND	9.13	"	"	"	"	"
Selenium	ND	0.0913	"	"	"	"	"
Silver	ND	0.0913	"	"	"	"	"
Zinc	ND	91.3	"	"	"	"	"

Total Metals by 7196A

Chromium, Hexavalent	ND	2.44	5	mg/Kg	1	L672583	03/20/2023	03/28/2023
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PO Box 2169

Loveland CO 80539

Ryan Dornbos

Project Number: [none]

Project: Church Pit

BACKGROUND

3/20/2023 3:30:00PM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.

Y303516-02 (Soil)

Metals by Saturated Paste by EPA 6010

Calcium	ND	0.499	meq/L	10	[CALC]	03/27/2023	03/29/2023
Magnesium	ND	0.823	"	"	"	"	"
Sodium	1.32	0.435	"	"	"	"	"

SAR by 20B Saturated Paste

SAR	2.47		SAR	1	B3C2702	"	"
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Table 915 metals by EPA 6020B

Arsenic	1.58	0.0932	mg/kg	10	B3C2223	03/22/2023	03/23/2023
Barium	53.2	9.32	"	"	"	"	"
Cadmium	ND	0.0932	"	"	"	"	"
Copper	ND	9.32	"	"	"	"	"
Lead	ND	9.32	"	"	"	"	"
Nickel	ND	9.32	"	"	"	"	"
Selenium	ND	0.0932	"	"	"	"	"
Silver	ND	0.0932	"	"	"	"	"
Zinc	ND	93.2	"	"	"	"	"

Total Metals by 7196A

Chromium, Hexavalent	ND	1.22	2.5	mg/Kg	1	L672583	03/20/2023	03/28/2023
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Ryan Dornbos
Project Number: [none]
Project: Church Pit

Metals by EPA 6000/7000 Series Methods - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B3C2223 - EPA 3050B

Blank (B3C2223-BLK1)

Prepared: 03/22/2023 Analyzed: 03/23/2023

Arsenic	ND	0.000100	mg/kg
Barium	ND	0.0100	"
Cadmium	ND	0.000100	"
Copper	ND	0.0100	"
Lead	ND	0.0100	"
Nickel	ND	0.0100	"
Selenium	ND	0.000100	"
Silver	ND	0.000100	"
Zinc	ND	0.100	"

LCS (B3C2223-BS1)

Prepared: 03/22/2023 Analyzed: 03/23/2023

Arsenic	0.0516	0.000100	mg/kg	0.0500	103	80-120
Barium	5.20	0.0100	"	5.00	104	80-120
Cadmium	0.0523	0.000100	"	0.0500	105	80-120
Copper	0.534	0.0100	"	0.500	107	80-120
Lead	0.0510	0.0100	"	0.0500	102	80-120
Nickel	0.0506	0.0100	"	0.0500	101	80-120
Selenium	0.0501	0.000100	"	0.0500	100	80-120
Silver	0.0455	0.000100	"	0.0500	91.1	80-120
Zinc	0.510	0.100	"	0.500	102	80-120

Matrix Spike (B3C2223-MS1)

Source: Y303564-01

Prepared: 03/22/2023 Analyzed: 03/23/2023

Arsenic	5.74	0.0872	mg/kg	4.36	2.07	84.2	75-125
Barium	533	8.72	"	436	93.7	101	75-125
Cadmium	4.50	0.0872	"	4.36	0.190	98.9	75-125
Copper	50.0	8.72	"	43.6	7.98	96.3	75-125
Lead	12.7	8.72	"	4.36	7.02	130	75-125

QM-07

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Project Number: [none]

Project: Church Pit

Metals by EPA 6000/7000 Series Methods - Quality Control

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B3C2223 - EPA 3050B

Matrix Spike (B3C2223-MS1)

Source: Y303564-01

Prepared: 03/22/2023 Analyzed: 03/23/2023

Nickel	12.8	8.72	mg/kg	4.36	8.10	108	75-125			
Selenium	3.91	0.0872	"	4.36	0.0957	87.5	75-125			
Silver	3.77	0.0872	"	4.36	0.0243	85.9	75-125			
Zinc	73.4	87.2	"	43.6	30.2	99.3	75-125			

Matrix Spike Dup (B3C2223-MSD1)

Source: Y303564-01

Prepared: 03/22/2023 Analyzed: 03/23/2023

Arsenic	6.79	0.0932	mg/kg	4.66	2.07	101	75-125	16.9	20	
Barium	587	9.32	"	466	93.7	106	75-125	9.63	20	
Cadmium	5.17	0.0932	"	4.66	0.190	107	75-125	13.8	20	
Copper	55.1	9.32	"	46.6	7.98	101	75-125	9.79	20	
Lead	11.5	9.32	"	4.66	7.02	97.0	75-125	9.56	20	
Nickel	12.6	9.32	"	4.66	8.10	95.9	75-125	1.94	20	
Selenium	4.28	0.0932	"	4.66	0.0957	89.9	75-125	9.07	20	
Silver	4.27	0.0932	"	4.66	0.0243	91.1	75-125	12.3	20	
Zinc	75.4	93.2	"	46.6	30.2	97.2	75-125	2.68	20	

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Project Number: [none]
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Classical Chemistry Parameters - Quality Control Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B3C2702 - Saturated Paste Metals

Blank (B3C2702-BLK1)

Prepared: 03/27/2023 Analyzed: 03/29/2023

SAR	0.00		SAR
Calcium PPM	ND	10.0	mg/L
Magnesium PPM	ND	10.0	"
Sodium PPM	ND	10.0	"

Duplicate (B3C2702-DUP1)

Source: Y303631-01

Prepared: 03/27/2023 Analyzed: 03/29/2023

Calcium PPM	123	10.0	mg/L	122	0.684	50
SAR	0.00		SAR	5.51	200	200
Magnesium PPM	49.6	10.0	mg/L	50.1	1.09	50
Sodium PPM	279	10.0	"	286	2.52	50

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Total Metals by 7196A - Quality Control Waypoint Analytical, LLC.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch L672583 -										
DUP (L 86714-DUP)	Source: 86714				Prepared: Analyzed: 03/28/2023					
Chromium, Hexavalent	ND	0.5	mg/Kg		<0.500		-	0	20	
MS (L 86714-MS)	Source: 86714				Prepared: Analyzed: 03/28/2023					
Chromium, Hexavalent	35.3	2.5	mg/Kg	38.9	<1.22	91	75-125			
LCS (LCS)					Prepared: Analyzed: 03/28/2023					
Chromium, Hexavalent	7.31	0.5	mg/Kg	8		91	75-125			
LRB (LRB)					Prepared: Analyzed: 03/28/2023					
Chromium, Hexavalent	ND	0.5	mg/Kg				-			

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Ryan Dornbos
Project Number: [none]
Project: Church Pit

Notes and Definitions

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported on a wet weight basis.

Calculated results may use J-flag data (instead of reported "ND") as part of calculation to provide a more accurate result.

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