

October 08, 2021

Chaco Energy

Matt Nelson

455 Sherman St

Denver

CO 80203

Project Name - Horn

Project Number - [none]

Attached are your analytical results for Horn received by Origins Laboratory, Inc. September 23, 2021. This project is associated with Origins project number Y109501-01.

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



Chaco Energy
455 Sherman St
Denver CO 80203

Matt Nelson
Project Number: [none]
Project: Horn

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
H1-6	Y109501-01	Water	September 22, 2021 11:00	09/23/2021 10:15

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Chaco Energy
 455 Sherman St
 Denver CO 80203

Matt Nelson
 Project Number: [none]
 Project: Horn

Origins Laboratory

Sample Receipt Checklist

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

Origins Work Order: 4109501

Client: Chaco
 Client Project ID: Horn

Checklist Completed by: dm
 Date/time completed: 9-23-21

Shipped Via: HD
 (URS, FedEx, Hand Delivered, Pick-up, etc.)
 Airbill #: N/A

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

Cooler Number/Temperature: 1 20 °C 1 °C 1 °C (Describe) °C

Thermometer ID: T003

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"/>		
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" 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 checked="" type="checkbox"/>		
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?		<input checked="" type="checkbox"/>		<u>NO2 / NO3</u> <u>NO TESTS / client info</u>
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 with date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		<input checked="" 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 HNO3, HCL, H2SO4) / (pH > 10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)	<input checked="" type="checkbox"/>			<u>HCL, HNO3, H2SO4</u> <u>not checked</u>
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): dm

Date/Time Reviewed: 9-23-21

Origins Laboratory, Inc.

Jefe Pellegrini

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Chaco Energy
 455 Sherman St
 Denver CO 80203

Matt Nelson
 Project Number: [none]
 Project: Horn

H1-6

9/22/2021 11:00:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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GEL Laboratories, LLC
Y109501-01 (Water)

Alkalinity by SM 2320B

Alkalinity, Total as CaCO ₃	1180	4.00	mg/L	1	2178603	RXB5	09/22/2021	10/01/2021	
Bicarbonate alkalinity (CaCO ₃)	1180	4.00	"	"	"	RXB5	"	"	
Carbonate alkalinity (CaCO ₃)	ND	4.00	"	"	"	RXB5	"	"	U

Anions by IC 300.0

Chloride	280	6.25	mg/L	25	B112314	JMA	09/23/2021	09/24/2021	
Fluoride	6.81	1.00	"	10	"	JMA	"	09/24/2021	
Bromide	2.10	1.00	"	"	"	JMA	"	"	
Sulfate	3.56	2.50	"	"	"	JMA	"	"	
Nitrate	ND	1.00	"	"	"	JMA	"	"	
Nitrite	ND	1.00	"	"	"	JMA	"	"	

DRO/ORO by EPA 8015D

Diesel (C10-C28)	2.98	2.50	mg/L	1	B112425	KDK	09/24/2021	09/29/2021	
Residual Range Organics (C28-C40)	ND	5.00	"	"	"	KDK	"	"	Ua

Surrogate: *o*-Terphenyl 129% 50-150 " " "

GBTEX + Naphthalene by EPA 8260D

Gasoline Range Hydrocarbons	2220	400	ug/L	4	B112408	KDK	09/24/2021	09/30/2021	
Benzene	8.68	4.00	"	"	"	KDK	"	"	

Origins Laboratory, Inc.



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Chaco Energy
 455 Sherman St
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Matt Nelson
 Project Number: [none]
 Project: Horn

H1-6

9/22/2021 11:00:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	---------	----------	----------	-------

Origins Laboratory, Inc.
Y109501-01 (Water)

GBTEX + Naphthalene by EPA 8260D

Toluene	27.8	4.00	ug/L	4	B112408	KDK	09/24/2021	09/30/2021	
Ethylbenzene	27.0	4.00	"	"	"	KDK	"	"	
Xylenes, total	196	4.00	"	"	"	KDK	"	"	
Naphthalene	ND	28.0	"	"	"	KDK	"	"	Ua
Napthalenes - Total	ND	28.0	"	"	"	KDK	"	"	Ua

Surrogate: 1,2-Dichloroethane-d4	79.6 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	100 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	105 %	70-130			"	"	"	"	

pH in Water by EPA 9040C

pH	7.53		pH Units	1	B112319	JSM	09/23/2021	09/24/2021	
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Radium 226 by EPA 903.1

Radium-226	0.935	1.00	pCi/L	1	2178728	LXP1	09/22/2021	10/06/2021	
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Radium 228 by EPA 904.0

Radium-228	0.505	3.00	pCi/L	1	2178727	JXC9	"	10/06/2021	U
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	483	5.00	uS/cm	1	B112320	JSM	09/23/2021	09/24/2021	
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H1-6

9/22/2021 11:00:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y109501-01 (Water)

Total Dissolved Solids by 2540C

Total Dissolved Solids	1820	5.00	mg/L	"	B112502	SCL	09/25/2021	09/27/2021	
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Total Metals by EPA 200.8

Barium	0.182	0.00400	mg/L	1	2178547	BAJ	09/28/2021	09/29/2021	
Boron	1.95	0.300	"	20	"	BAJ	"	09/30/2021	
Calcium	1.45	0.200	"	1	"	BAJ	"	09/29/2021	
Iron	0.204	0.100	"	"	"	BAJ	"	"	
Magnesium	0.206	0.0300	"	"	"	BAJ	"	"	
Manganese	0.00906	0.00500	"	"	"	BAJ	"	"	
Potassium	5.06	0.300	"	"	"	BAJ	"	"	
Selenium	ND	0.00500	"	"	"	BAJ	"	10/02/2021	U
Sodium	690	5.00	"	20	"	BAJ	"	09/29/2021	
Strontium	0.103	0.0100	"	1	"	BAJ	"	"	

Total Phosphorus by EPA 365.4

Phosphorus, Total as P	0.146	0.0500	mg/L	1	2180792	KLP1	10/01/2021	10/04/2021	
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Total Suspended Solids by 2540D

Total Suspended Solids	9.00	5.00	mg/L	1	B112503	SCL	09/25/2021	09/27/2021	
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Chaco Energy
 455 Sherman St
 Denver CO 80203

Matt Nelson
 Project Number: [none]
 Project: Horn

Volatile Organic Compounds by GC/MS SW846 8260D - 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 B112408 - EPA 5030B (Water)

Blank (B112408-BLK1)

Prepared: 09/24/2021 Analyzed: 09/29/2021

Gasoline Range Hydrocarbons	ND	100	ug/L							Ua
Benzene	ND	1.00	"							Ua
Toluene	ND	1.00	"							Ua
Ethylbenzene	ND	1.00	"							Ua
Xylenes, total	ND	1.00	"							Ua
Naphthalene	ND	7.00	"							Ua
Naphthalenes - Total	ND	7.00	"							Ua
<i>Surrogate: 1,2-Dichloroethane-d4</i>	56		"	62.5	89.1		70-130			
<i>Surrogate: Toluene-d8</i>	66		"	62.5	105		70-130			
<i>Surrogate: 4-Bromofluorobenzene</i>	69		"	62.5	110		70-130			

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Volatile Organic Compounds by GC/MS SW846 8260D - 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 B112408 - EPA 5030B (Water)

LCS (B112408-BS1)

Prepared: 09/24/2021 Analyzed: 09/29/2021

Benzene	26.7	1.00	ug/L	25.0		107	70-130			
Toluene	30.4	1.00	"	25.0		122	70-130			
Ethylbenzene	30.8	1.00	"	25.0		123	70-130			
m,p-Xylene	62.0	2.00	"	50.0		124	70-130			
o-Xylene	29.5	1.00	"	25.0		118	70-130			
Naphthalene	24.6	7.00	"	25.0		98.3	70-130			
Surrogate: 1,2-Dichloroethane-d4	55		"	62.5		88.7	70-130			
Surrogate: Toluene-d8	66		"	62.5		106	70-130			
Surrogate: 4-Bromofluorobenzene	68		"	62.5		110	70-130			

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Volatile Organic Compounds by GC/MS SW846 8260D - 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 B112408 - EPA 5030B (Water)

Matrix Spike (B112408-MS1)	Source: Y109528-02			Prepared: 09/24/2021 Analyzed: 09/29/2021						
Benzene	18.9	1.00	ug/L	25.0	75.6	70-130				
Toluene	19.0	1.00	"	25.0	76.0	70-130				
Ethylbenzene	20.5	1.00	"	25.0	81.9	70-130				
m,p-Xylene	40.5	2.00	"	50.0	80.9	70-130				
o-Xylene	20.7	1.00	"	25.0	82.6	70-130				
Naphthalene	21.2	7.00	"	25.0	84.7	70-130				
Surrogate: 1,2-Dichloroethane-d4	55		"	62.5	88.0	70-130				
Surrogate: Toluene-d8	66		"	62.5	106	70-130				
Surrogate: 4-Bromofluorobenzene	68		"	62.5	108	70-130				

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 455 Sherman St
 Denver CO 80203

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 Project Number: [none]
 Project: Horn

Volatile Organic Compounds by GC/MS SW846 8260D - 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 B112408 - EPA 5030B (Water)

Matrix Spike Dup (B112408-MSD1)	Source: Y109528-02			Prepared: 09/24/2021 Analyzed: 09/29/2021						
Benzene	26.9	1.00	ug/L	25.0	107	70-130	34.8	20	QR-03	
Toluene	28.7	1.00	"	25.0	115	70-130	40.7	20	QR-03	
Ethylbenzene	33.6	1.00	"	25.0	134	70-130	48.5	20	QM-07, QR-03	
m,p-Xylene	64.2	2.00	"	50.0	128	70-130	45.3	20	QR-03	
o-Xylene	29.8	1.00	"	25.0	119	70-130	36.1	20	QR-03	
Naphthalene	18.4	7.00	"	25.0	73.6	70-130	14.1	20		
Surrogate: 1,2-Dichloroethane-d4	46		"	62.5	73.1	70-130				
Surrogate: Toluene-d8	70		"	62.5	112	70-130				
Surrogate: 4-Bromofluorobenzene	69		"	62.5	110	70-130				

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 Project Number: [none]
 Project: Horn

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B112425 - EPA 3511 Mod.										
Blank (B112425-BLK1)										
					Prepared: 09/24/2021 Analyzed: 09/29/2021					
Diesel (C10-C28)	ND	2.50	mg/L							Ua
Residual Range Organics (C28-C40)	ND	5.00	"							Ua
Surrogate: o-Terphenyl	3.3		"	5.00		65.9	50-150			

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Jen Pellegrini, Project Manager

Chaco Energy
 455 Sherman St
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 Project Number: [none]
 Project: Horn

Extractable Petroleum Hydrocarbons by 8015D - 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 B112425 - EPA 3511 Mod.

LCS (B112425-BS1)

Prepared: 09/24/2021 Analyzed: 09/29/2021

Diesel (C10-C28)	143	2.50	mg/L	117		122	70-130			
Residual Range Organics (C28-C40)	108	5.00	"	117		92.3	70-130			
Surrogate: o-Terphenyl	3.0		"	5.00		60.3	50-150			

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Jen Pellegrini, Project Manager

Chaco Energy
 455 Sherman St
 Denver CO 80203

Matt Nelson
 Project Number: [none]
 Project: Horn

Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B112425 - EPA 3511 Mod.										
LCS Dup (B112425-BSD1)										
					Prepared: 09/24/2021 Analyzed: 09/29/2021					
Diesel (C10-C28)	141	2.50	mg/L	117		121	70-130	1.41	20	
Residual Range Organics (C28-C40)	111	5.00	"	117		95.5	70-130	3.45	20	
Surrogate: o-Terphenyl	6.6		"	5.00		131	50-150			

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 Project: Horn

Extractable Petroleum Hydrocarbons by 8015D - 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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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 B1I2314 - Filter .45um non acidified

Blank (B1I2314-BLK1)

Prepared: 09/23/2021 Analyzed: 09/23/2021

Chloride	ND	0.250	mg/L							
Fluoride	ND	0.100	"							
Bromide	ND	0.100	"							
Sulfate	ND	0.250	"							
Nitrate	0.172	0.100	"							
Nitrite	ND	0.100	"							

LCS (B1I2314-BS1)

Prepared: 09/23/2021 Analyzed: 09/23/2021

Chloride	3.87	0.250	mg/L	4.00		96.8	90-110			
Fluoride	3.99	0.100	"	4.00		99.7	90-110			
Bromide	3.92	0.100	"	4.00		98.0	90-110			
Sulfate	3.84	0.250	"	4.00		95.9	90-110			
Nitrate	3.98	0.100	"	4.00		99.5	90-110			
Nitrite	3.83	0.100	"	4.00		95.7	90-110			

Matrix Spike (B1I2314-MS1)

Source: Y109493-01

Prepared: 09/23/2021 Analyzed: 09/23/2021

Chloride	896		mg/L	500	408	97.5	80-120			
Fluoride	504		"	500	0.572	101	80-120			
Bromide	490		"	500	3.41	97.4	80-120			
Sulfate	496		"	500	18.3	95.5	80-120			
Nitrate	491		"	500	0.0385	98.2	80-120			
Nitrite	473		"	500	0.00	94.6	80-120			

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 Project: Horn

Classical Chemistry Parameters - Quality Control
Origins Laboratory, Inc.

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

Batch B112314 - Filter .45um non acidified

Matrix Spike Dup (B112314-MSD1)		Source: Y109493-01			Prepared: 09/23/2021 Analyzed: 09/23/2021					
Chloride	897		mg/L	500	408	97.7	80-120	0.134	20	
Fluoride	508		"	500	0.572	101	80-120	0.667	20	
Bromide	496		"	500	3.41	98.4	80-120	1.03	20	
Sulfate	500		"	500	18.3	96.3	80-120	0.774	20	
Nitrate	494		"	500	0.0385	98.8	80-120	0.596	20	
Nitrite	476		"	500	0.00	95.1	80-120	0.506	20	

Batch B112319 - NO PREP

Duplicate (B112319-DUP1)		Source: Y109493-01			Prepared: 09/23/2021 Analyzed: 09/24/2021					
pH	7.94		pH Units		7.83			1.40	200	

Batch B112320 - NO PREP

Blank (B112320-BLK1)					Prepared: 09/23/2021 Analyzed: 09/24/2021					
Specific Conductance (EC)	0.617	5.00	uS/cm							
Duplicate (B112320-DUP1)		Source: Y109493-01			Prepared: 09/23/2021 Analyzed: 09/24/2021					
Specific Conductance (EC)	356	5.00	uS/cm		355			0.206	10	

Batch B112502 - NO PREP

Blank (B112502-BLK1)					Prepared: 09/25/2021 Analyzed: 09/27/2021					
Total Dissolved Solids	6.00	5.00	mg/L							

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Classical Chemistry Parameters - Quality Control
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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B112502 - NO PREP										
LCS (B112502-BS1)					Prepared: 09/25/2021 Analyzed: 09/27/2021					
Total Dissolved Solids	1020	5.00	mg/L	1000		102	85-115			
Duplicate (B112502-DUP1)		Source: Y109491-21			Prepared: 09/25/2021 Analyzed: 09/27/2021					
Total Dissolved Solids	2380	5.00	mg/L		2500			4.95	20	
Batch B112503 - NO PREP										
Blank (B112503-BLK1)					Prepared: 09/25/2021 Analyzed: 09/27/2021					
Total Suspended Solids	ND	5.00	mg/L							
LCS (B112503-BS1)					Prepared: 09/25/2021 Analyzed: 09/27/2021					
Total Suspended Solids	91.0	5.00	mg/L	100		91.0	85-115			
Duplicate (B112503-DUP1)		Source: Y109499-01			Prepared: 09/25/2021 Analyzed: 09/27/2021					
Total Suspended Solids	5.00	5.00	mg/L		ND				20	

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Chaco Energy
 455 Sherman St
 Denver CO 80203

Matt Nelson
 Project Number: [none]
 Project: Horn

Alkalinity by SM 2320B - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2178603 -										
LCS (1204918388-BKS)					Prepared: Analyzed: 10/01/2021					
Alkalinity, Total as CaCO3	102	4.00	mg/L	100		102	90-110			
DUP (1204922228 D)					Source: 557310002 Prepared: Analyzed: 10/01/2021					
Alkalinity, Total as CaCO3	314	4.00	mg/L		302		0-20	3.9	20	
Carbonate alkalinity (CaCO3)	ND	4.00	"		<1.45		0-20	0	20	U
Bicarbonate alkalinity (CaCO3)	314	4.00	"		302		0-20	3.9	20	
MS (1204922229 S)					Source: 557310002 Prepared: Analyzed: 10/01/2021					
Alkalinity, Total as CaCO3	418	4.00	mg/L	100	302	116	80-120			

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Chaco Energy
 455 Sherman St
 Denver CO 80203

Matt Nelson
 Project Number: [none]
 Project: Horn

Radium 226 by EPA 903.1 - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2178728 -										
BLANK (1204918726-BLK)					Prepared: Analyzed: 10/06/2021					
Radium-226	0.268	1.00	pCi/L				-			U
DUP (1204918727 D)		Source: 556842001			Prepared: Analyzed: 10/06/2021					
Radium-226	0.467	1.00	pCi/L		0.837		0-20	56.8	20	
MS (1204918728 S)		Source: 556842001			Prepared: Analyzed: 10/06/2021					
Radium-226	252	1.00	pCi/L	264	0.837	95.2	75-125			
LCS (1204918729-BKS)		Prepared: Analyzed: 10/06/2021								
Radium-226	26.3	1.00	pCi/L	26.9		97.5	75-125			

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Chaco Energy
 455 Sherman St
 Denver CO 80203

Matt Nelson
 Project Number: [none]
 Project: Horn

Radium 228 by EPA 904.0 - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2178727 -										
BLANK (1204918723-BLK)					Prepared: Analyzed: 10/06/2021					
Radium-228	1.98	3.00	pCi/L				-			U
DUP (1204918724 D)		Source: 556837001			Prepared: Analyzed: 10/06/2021					
Radium-228	1.49	3.00	pCi/L		4.86		0-20	106	20	U
LCS (1204918725-BKS)					Prepared: Analyzed: 10/06/2021					
Radium-228	43.6	3.00	pCi/L	50.6		86.1	75-125			

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Jen Pellegrini, Project Manager

Chaco Energy
 455 Sherman St
 Denver CO 80203

Matt Nelson
 Project Number: [none]
 Project: Horn

Total Metals by EPA 200.8 - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 2178547 - EPA 200.2

BLANK (1204918265-BLK)

Prepared: 09/28/2021 Analyzed: 09/29/2021

Selenium	ND	0.00500	mg/L				-			U
Barium	ND	0.00400	"				-			U
Boron	ND	0.0150	"				-			U
Calcium	ND	0.200	"				-			U
Iron	ND	0.100	"				-			U
Magnesium	ND	0.0300	"				-			U
Potassium	ND	0.300	"				-			U
Sodium	ND	0.250	"				-			U
Strontium	ND	0.0100	"				-			U
Manganese	ND	0.00500	"				-			U

LCS (1204918266-BKS)

Prepared: 09/28/2021 Analyzed: 09/29/2021

Sodium	2.05	0.250	mg/L	2.00	102	85-115				
Boron	0.0996	0.0150	"	0.100	99.6	85-115				
Calcium	1.99	0.200	"	2.00	99.7	85-115				
Iron	1.90	0.100	"	2.00	94.9	85-115				
Magnesium	2.10	0.0300	"	2.00	105	85-115				
Manganese	0.0476	0.00500	"	0.0500	95.2	85-115				
Potassium	1.93	0.300	"	2.00	96.5	85-115				
Selenium	0.0502	0.00500	"	0.0500	100	85-115				
Barium	0.0503	0.00400	"	0.0500	101	85-115				
Strontium	0.0504	0.0100	"	0.0500	101	85-115				

DUP (1204918267 D)

Source: 556837001

Prepared: 09/28/2021 Analyzed: 09/29/2021

Calcium	1.53	0.200	mg/L	1.53	0-20	0.134	20			
Boron	1.95	0.300	"	2.00	0-20	2.54	20			
Barium	0.192	0.00400	"	0.190	0-20	0.973	20			

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Chaco Energy
 455 Sherman St
 Denver CO 80203

Matt Nelson
 Project Number: [none]
 Project: Horn

Total Metals by EPA 200.8 - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 2178547 - EPA 200.2

DUP (1204918267 D)		Source: 556837001			Prepared: 09/28/2021 Analyzed: 09/29/2021					
Strontium	0.109	0.0100	mg/L		0.108		0-20	1.06	20	
Sodium	733	5.00	"		765		0-20	4.3	20	
Selenium	ND	0.00500	"		<0.00200		0-20	81	20	U
Potassium	5.29	0.300	"		5.24		0-20	0.944	20	
Magnesium	0.213	0.0300	"		0.208		0-20	1.92	20	
Iron	0.192	0.100	"		0.190		0-20	1.19	20	
Manganese	0.0108	0.00500	"		0.00883		0-20	20.2	20	
MS (1204918268 S)		Source: 556837001			Prepared: 09/28/2021 Analyzed: 09/29/2021					
Sodium	698	5.00	mg/L	2.00	765	0	75-125			
Strontium	0.156	0.0100	"	0.0500	0.108	94.6	75-125			
Barium	0.227	0.00400	"	0.0500	0.190	73.7	75-125			
Boron	2.02	0.300	"	0.100	2.00	0	75-125			
Calcium	3.33	0.200	"	2.00	1.53	90	75-125			
Iron	1.90	0.100	"	2.00	0.190	85.3	75-125			
Magnesium	2.07	0.0300	"	2.00	0.208	93.2	75-125			
Manganese	0.0519	0.00500	"	0.0500	0.00883	86.1	75-125			
Potassium	6.89	0.300	"	2.00	5.24	82.3	75-125			
Selenium	0.0415	0.00500	"	0.0500	<0.00200	82.2	75-125			

Origins Laboratory, Inc.



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Chaco Energy
 455 Sherman St
 Denver CO 80203

Matt Nelson
 Project Number: [none]
 Project: Horn

Total Phosphorus by EPA 365.4 - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2180792 - EPA 365.4 Prep										
BLANK (1204922793-BLK)					Prepared: 10/01/2021 Analyzed: 10/04/2021					
Phosphorus, Total as P	0.0355	0.0500	mg/L				-			J
LCS (1204922794-BKS)					Prepared: 10/01/2021 Analyzed: 10/04/2021					
Phosphorus, Total as P	0.932	0.0500	mg/L	1.00		93.2	80-123			
DUP (1204922797 D)					Source: 556466001 Prepared: 10/01/2021 Analyzed: 10/04/2021					
Phosphorus, Total as P	0.852	0.200	mg/L		0.876		0-36	2.78	36	
MS (1204922798 S)					Source: 556466001 Prepared: 10/01/2021 Analyzed: 10/04/2021					
Phosphorus, Total as P	4.28	0.200	mg/L	4.00	0.876	85.1	66-140			
MSD (1204922801 SD)					Source: 556466001 Prepared: 10/01/2021 Analyzed: 10/04/2021					
Phosphorus, Total as P	4.44	0.200	mg/L	4.00	0.876	89.1	66-140	3.67	20	

Origins Laboratory, Inc.



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Chaco Energy
455 Sherman St
Denver CO 80203

Matt Nelson
Project Number: [none]
Project: Horn

Notes and Definitions

Ua Sample is Non-Detect.

U Result not detected above the detection limit

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.

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

J Greater than the detection limit but less than the reporting limit

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager