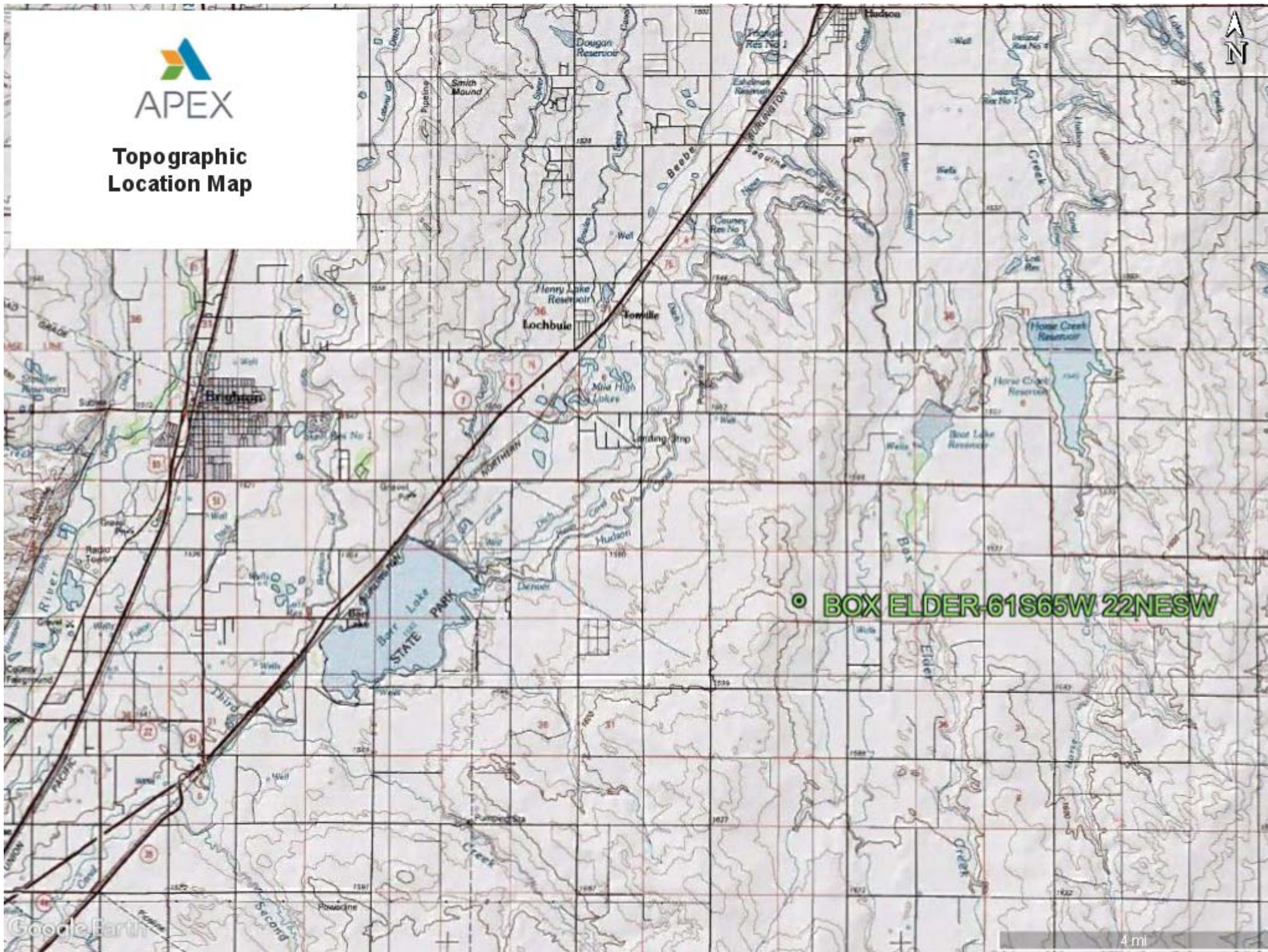








## Topographic Location Map





## Laboratory Results Summary Table

			Organic Compounds (mg/kg)					(mmhos/cm)	Units	(pH Units)
COGCC Allowable Concentration (Soil) -->			500	0.17	85	100	175	4	12	(6-9)
Location	Sample Date	Sample ID	TPH (total volatile and extractable petroleum hydrocarbons) (TPH-GRO + TPH-DRO)	Benzene	Toluene	Ethylbenzene	Xylenes - total	EC (<4 mmhos/cm or 2x background)	SAR (calculation)	pH
Box Elder Farms HH 22-3J	8/13/18	B01@4'	<0.50	<0.0020	<0.0050	<0.0050	<0.010			
Box Elder Farms HH 22-3J	8/13/18	N01@3'	<0.50	<0.0020	<0.0050	<0.0050	<0.010	0.358	<0.100	8.29

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

August 16, 2018

Maggie Graham

Extraction Oil&Gas

370 17th Street Suite 5300

Denver, CO 80202

RE: Box Elder HH 22-3J

Enclosed are the results of analyses for samples received by Summit Scientific on 08/13/18 15:22. 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', with a stylized, cursive script.

Paul Shrewsbury For Ben Shrewsbury

Laboratory Manager





Extraction Oil&Gas  
370 17th Street Suite 5300  
Denver CO, 80202

Project: Box Elder HH 22-3J

Project Number: 1800270-6000-940.88

Project Manager: Maggie Graham

**Reported:**  
08/16/18 09:56

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01@4'	1808162-01	Soil	08/10/18 11:05	08/13/18 15:22
N01@3'	1808162-04	Soil	08/10/18 11:12	08/13/18 15:22

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

Page 1 of 1

Sampler Name: Caitlin Thomas

Project Number: 1800270 - 6000 - 940.88

[www.s2scientific.com](http://www.s2scientific.com)

1808162

## Sample Receipt Checklist

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

Client: APEX Companies, LLC Client Project ID: Box Elder HH 27-BJShipped Via: Hand Airbill #: \_\_\_\_\_  
(UPS, FedEx, Hand Delivered, Pick-up, etc.)Matrix (check all that apply): ☐ Air ☒ Soil/Solid ☐ Water ☐ Other: \_\_\_\_\_  
(Describe)

Temp (°C)	<u>4.9</u>
-----------	------------

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> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.				
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 type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
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> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Record the pH in Comments.				
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.

UP  
Custodian Printed Name or Initials[Signature]  
Signature of Custodian8-13-18 1650  
Date/Time



Extraction Oil&Gas  
370 17th Street Suite 5300  
Denver CO, 80202

Project: Box Elder HH 22-3J  
Project Number: 1800270-6000-940.88  
Project Manager: Maggie Graham

**Reported:**  
08/16/18 09:56

**B01@4'**  
**1808162-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **08/10/18 11:05**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1808154	08/13/18	08/14/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **08/10/18 11:05**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **08/10/18 11:05**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1808158	08/13/18	08/14/18	EPA 8015M	

Date Sampled: **08/10/18 11:05**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		86.8 %	30-150		"	"	"	"	

Summit Scientific

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Extraction Oil&Gas  
370 17th Street Suite 5300  
Denver CO, 80202

Project: Box Elder HH 22-3J  
Project Number: 1800270-6000-940.88  
Project Manager: Maggie Graham

**Reported:**  
08/16/18 09:56

**N01@3'**  
**1808162-04 (Soil)**

**Summit Scientific**

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

Date Sampled: **08/10/18 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1808154	08/13/18	08/14/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **08/10/18 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		104 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.1 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **08/10/18 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1808158	08/13/18	08/14/18	EPA 8015M	

Date Sampled: **08/10/18 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		90.6 %	30-150		"	"	"	"	

**Soluble Nutrients by EPA 6020/USDA60 6(2, 3A) - Dry Weight Basis**

Date Sampled: **08/10/18 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	4240	11.2	mg/kg dry	1	1808194	08/15/18	08/15/18	EPA 6020B	
Magnesium	525	5.62	"	"	"	"	"	"	
Sodium	25.1	5.62	"	"	"	"	"	"	

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Extraction Oil&Gas  
370 17th Street Suite 5300  
Denver CO, 80202

Project: Box Elder HH 22-3J  
Project Number: 1800270-6000-940.88  
Project Manager: Maggie Graham

**Reported:**  
08/16/18 09:56

**N01@3'**  
**1808162-04 (Soil)**

**Summit Scientific**

**Soluble Nutrients by EPA 6020/USDA60 6(2, 3A) - Dry Weight Basis**

**Calculated Analysis**

Date Sampled: **08/10/18 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	ND	0.100	units	1	1808207	08/16/18	08/16/18	Calculation	

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

Date Sampled: **08/10/18 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	<b>89.0</b>		%	1	1808186	08/15/18	08/15/18	Calculation	
pH	<b>8.29</b>		pH Units	"	1808155	08/13/18	08/14/18	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **08/10/18 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	<b>0.358</b>	0.0100	mmhos/cm	1	1808153	08/13/18	08/13/18	EPA 120.1	

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Extraction Oil&Gas  
370 17th Street Suite 5300  
Denver CO, 80202

Project: Box Elder HH 22-3J  
Project Number: 1800270-6000-940.88  
Project Manager: Maggie Graham

**Reported:**  
08/16/18 09:56

## 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 1808154 - EPA 5030 Soil MS

##### Blank (1808154-BLK1)

Prepared: 08/13/18 Analyzed: 08/14/18

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0433		"	0.0396	109	23-173				
Surrogate: Toluene-d8	0.0398		"	0.0400	99.4	20-170				
Surrogate: 4-Bromofluorobenzene	0.0440		"	0.0400	110	21-167				

##### LCS (1808154-BS1)

Prepared: 08/13/18 Analyzed: 08/14/18

Benzene	0.135	0.0020	mg/kg	0.150	90.0	70-130				
Toluene	0.127	0.0050	"	0.150	84.9	70-130				
Ethylbenzene	0.114	0.0050	"	0.150	76.2	70-130				
m,p-Xylene	0.229	0.010	"	0.300	76.3	70-130				
o-Xylene	0.136	0.0050	"	0.150	90.7	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0440		"	0.0396	111	23-173				
Surrogate: Toluene-d8	0.0390		"	0.0400	97.6	20-170				
Surrogate: 4-Bromofluorobenzene	0.0391		"	0.0400	97.8	21-167				

##### Matrix Spike (1808154-MS1)

Source: 1808162-01

Prepared: 08/13/18 Analyzed: 08/14/18

Benzene	0.0958	0.0020	mg/kg	0.100	ND	95.8	70-130			
Toluene	0.0889	0.0050	"	0.100	ND	88.9	70-130			
Ethylbenzene	0.0791	0.0050	"	0.100	ND	79.1	70-130			
m,p-Xylene	0.158	0.010	"	0.200	ND	79.1	70-130			
o-Xylene	0.0947	0.0050	"	0.100	ND	94.7	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0464		"	0.0396	117	23-173				
Surrogate: Toluene-d8	0.0395		"	0.0400	98.8	20-170				
Surrogate: 4-Bromofluorobenzene	0.0400		"	0.0400	99.9	21-167				

Summit Scientific

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Extraction Oil&Gas  
370 17th Street Suite 5300  
Denver CO, 80202

Project: Box Elder HH 22-3J

Project Number: 1800270-6000-940.88

Project Manager: Maggie Graham

**Reported:**  
08/16/18 09:56

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

### Summit Scientific

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

#### Batch 1808154 - EPA 5030 Soil MS

Matrix Spike Dup (1808154-MSD1)		Source: 1808162-01			Prepared: 08/13/18 Analyzed: 08/14/18					
Benzene	0.107	0.0020	mg/kg	0.100	ND	107	70-130	10.7	30	
Toluene	0.0989	0.0050	"	0.100	ND	98.9	70-130	10.7	30	
Ethylbenzene	0.0886	0.0050	"	0.100	ND	88.6	70-130	11.3	30	
m,p-Xylene	0.178	0.010	"	0.200	ND	88.9	70-130	11.6	30	
o-Xylene	0.106	0.0050	"	0.100	ND	106	70-130	11.2	30	
Surrogate: 1,2-Dichloroethane-d4	0.0454		"	0.0396		115	23-173			
Surrogate: Toluene-d8	0.0394		"	0.0400		98.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0398		"	0.0400		99.5	21-167			

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Extraction Oil&Gas  
370 17th Street Suite 5300  
Denver CO, 80202

Project: Box Elder HH 22-3J

Project Number: 1800270-6000-940.88

Project Manager: Maggie Graham

**Reported:**  
08/16/18 09:56

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

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

**Batch 1808158 - EPA 3550A**

**Blank (1808158-BLK1)**

Prepared: 08/13/18 Analyzed: 08/14/18

C10-C28 (DRO) ND 50 mg/kg

**LCS (1808158-BS1)**

Prepared: 08/13/18 Analyzed: 08/14/18

C10-C28 (DRO) 492 50 mg/kg 500 98.4 70-130

**Matrix Spike (1808158-MS1)**

**Source: 1808160-01**

Prepared: 08/13/18 Analyzed: 08/14/18

C10-C28 (DRO) 487 50 mg/kg 500 84.3 80.6 70-130

**Matrix Spike Dup (1808158-MSD1)**

**Source: 1808160-01**

Prepared: 08/13/18 Analyzed: 08/14/18

C10-C28 (DRO) 521 50 mg/kg 500 84.3 87.4 70-130 6.76 20

Summit Scientific

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Extraction Oil&Gas  
370 17th Street Suite 5300  
Denver CO, 80202

Project: Box Elder HH 22-3J  
Project Number: 1800270-6000-940.88  
Project Manager: Maggie Graham

**Reported:**  
08/16/18 09:56

**Soluble Nutrients by EPA 6020/USDA60 6(2, 3A) - Dry Weight Basis - Quality Control**

**Summit Scientific**

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

**Batch 1808194 - General Preparation**

**Blank (1808194-BLK1)**

Prepared & Analyzed: 08/15/18

Calcium	ND	10.0	mg/kg wet
Magnesium	ND	5.00	"
Sodium	ND	5.00	"

**LCS (1808194-BS1)**

Prepared & Analyzed: 08/15/18

Calcium	434	10.0	mg/kg wet	500	86.9	70-130
Magnesium	472	5.00	"	500	94.5	70-130
Sodium	478	5.00	"	500	95.6	70-130

**Duplicate (1808194-DUP1)**

Source: 1808162-04

Prepared & Analyzed: 08/15/18

Calcium	3840	11.2	mg/kg dry	4240	9.83	20
Magnesium	493	5.62	"	525	6.29	20
Sodium	20.6	5.62	"	25.1	19.9	20

**Matrix Spike (1808194-MS1)**

Source: 1808162-04

Prepared & Analyzed: 08/15/18

Calcium	4770	11.2	mg/kg dry	562	4240	95.5	70-130
Magnesium	991	5.62	"	562	525	83.0	70-130
Sodium	519	5.62	"	562	25.1	88.0	70-130

**Matrix Spike Dup (1808194-MSD1)**

Source: 1808162-04

Prepared & Analyzed: 08/15/18

Calcium	4750	11.2	mg/kg dry	562	4240	90.9	70-130	0.543	25
Magnesium	979	5.62	"	562	525	80.8	70-130	1.24	25
Sodium	507	5.62	"	562	25.1	85.9	70-130	2.27	25

Summit Scientific

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Extraction Oil&Gas  
370 17th Street Suite 5300  
Denver CO, 80202

Project: Box Elder HH 22-3J

Project Number: 1800270-6000-940.88

Project Manager: Maggie Graham

**Reported:**  
08/16/18 09:56

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

#### Summit Scientific

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

#### Batch 1808155 - General Preparation

##### LCS (1808155-BS1)

Prepared & Analyzed: 08/13/18

pH	9.2		pH Units	9.18	99.8	95-105
----	-----	--	----------	------	------	--------

##### Duplicate (1808155-DUP1)

Source: 1808165-02

Prepared & Analyzed: 08/13/18

pH	8.6		pH Units	8.6	0.233	20
----	-----	--	----------	-----	-------	----

#### Batch 1808186 - General Preparation

##### Duplicate (1808186-DUP1)

Source: 1808146-01

Prepared & Analyzed: 08/15/18

% Solids	88.8		%	88.8	0.0261	20
----------	------	--	---	------	--------	----

Summit Scientific

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Extraction Oil&Gas  
370 17th Street Suite 5300  
Denver CO, 80202

Project: Box Elder HH 22-3J  
Project Number: 1800270-6000-940.88  
Project Manager: Maggie Graham

**Reported:**  
08/16/18 09:56

**Specific Conductance by EPA Method 120.1 - Quality Control**  
**Summit Scientific**

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

**Batch 1808153 - General Preparation**

**Blank (1808153-BLK1)**

Prepared & Analyzed: 08/13/18

Specific Conductance (EC) ND 0.0100 mmhos/cm

**LCS (1808153-BS1)**

Prepared & Analyzed: 08/13/18

Specific Conductance (EC) 0.750 0.0100 mmhos/cm 0.750 99.9 90-110

**Duplicate (1808153-DUP1)**

**Source: 1808162-04**

Prepared & Analyzed: 08/13/18

Specific Conductance (EC) 0.359 0.0100 mmhos/cm 0.358 0.404 20

Summit Scientific

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Extraction Oil&Gas  
370 17th Street Suite 5300  
Denver CO, 80202

Project: Box Elder HH 22-3J

Project Number: 1800270-6000-940.88  
Project Manager: Maggie Graham

**Reported:**  
08/16/18 09:56

### 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