



Blake Ford
Environmental Coordinator
Extraction Oil and Gas, Inc.
370 17th Street, Suite 5300
Denver, Colorado 80202

May 17, 2018

Subject: Work Completion Report – Remedial Investigation

Stromberger 22-E Pad
COGCC Location ID: 444315
SENE, Sec 22, T6N-R67W
40.474235/-104.870861
Unincorporated Weld County, Colorado

Dear Mr. Ford:

Apex Companies LLC (Apex) has prepared this work completion report to document remedial investigation activities conducted in response to a hydrocarbon release and application of fire suppressant chemicals at the Stromberger 22-E Pad location (444315) in Unincorporated Weld County. The remedial investigation included field-screening, soil sampling, and excavation oversight. These efforts were completed under an approved Form 19 (Spill/Release Report), Spill/release Point ID number 453622, assigned by the Colorado Oil and Gas Conservation Commission (COGCC).

Remedial Investigation

On March 2nd, 2018, before any damaged equipment or impacted soils were removed from the facility, an Apex Field Coordinator met on site with Rick Allison, a COGCC Environmental Specialist, and collected three surface soil samples (B01@surface, B02@surface, and B03@0.5') from the most visually impacted area. A photoionization detector (PID) was used to field-screen the soil for volatile organic compounds (VOCs), which measured values between 60 parts per million (ppm) and 508 ppm. Laboratory results confirmed organic constituent concentrations (TPH) above allowable limits at the ground surface. The inorganic constituent, pH, exceeded the allowable range in all three samples.

The excavation of impacted soil began on April 15th, 2018, following the removal of equipment. Stained soil in the northern portion of the impacted area was completely removed to a depth of approximately 6 inches below ground surface (bgs), which exposed an underlying concrete pad. The pad was intact and will be removed during reclamation activities at the site, so no soil samples were collected. South of the concrete pad, the excavation was approximately 175 feet by 50 feet

at the widest point, with a depth between 6 inches and 1-foot bgs. On April 16th, 2018, an Apex Field Coordinator collected 7 confirmation soil samples (B01@1', B02@1', B03@1', B04@1', B05@1', B06@0.5', and B07@0.5') from the excavated area. PID results for all samples were between 0.5 ppm and 70.5 ppm. Laboratory analysis confirmed the inorganic constituent pH exceeded the allowable threshold in soil samples where the excavation was limited to a depth of 6 inches bgs. On April 17th, 2018, the excavation was extended an additional 6 inches bgs, and an Apex Field Coordinator collected two final soil samples to confirm pH exceedances were removed. PID results were less than 1.0 ppm for both samples. Groundwater was not encountered at any time during the investigation. Final excavation dimensions, the location of the concrete pad, and all sample locations are illustrated in the attached site diagram.

Results

Soil samples were submitted for laboratory analysis of COGCC Table 910-1 constituents of concern (TPH-GRO, TPH-DRO, BTEX, pH, EC, SAR). Additionally, all samples were analyzed for ethylene glycol due to the use of fire suppressant chemicals. Results for soil samples collected from the final base of the excavation were within allowable limits for COGCC Table 910-1 constituents of concern and the Colorado Department of Public Health and Environment (CDPHE) groundwater protection value for ethylene glycol. Laboratory results are attached.

Conclusions

Based on field observations and laboratory results, impacted soil at the release area was successfully removed using conventional excavation. No further site assessment is recommended at this time.

If you have any questions about this report, onsite activities, or anything else related to this effort, please don't hesitate to contact me at 307-755-3483.

Sincerely,
Apex Companies, LLC

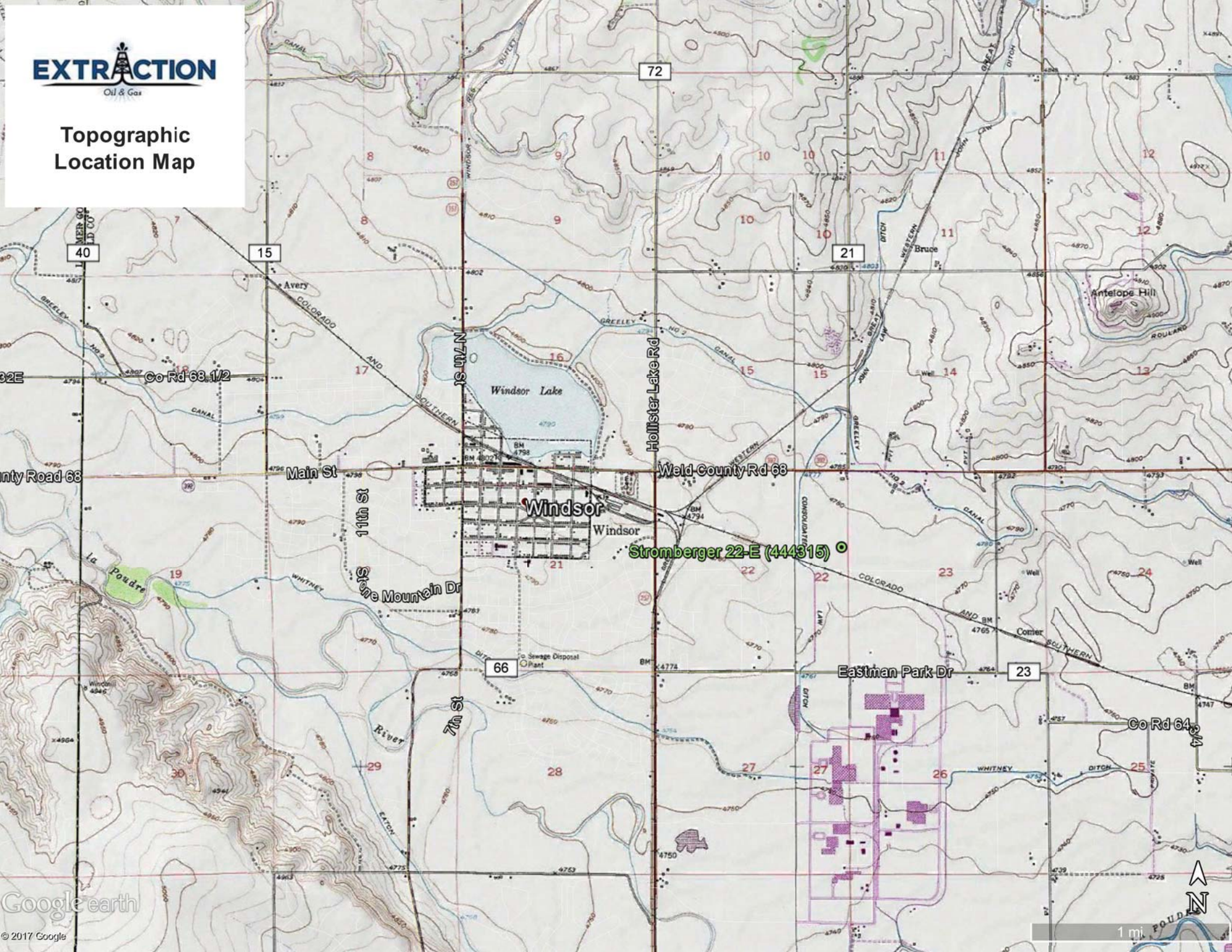


Brian Gibson
Environmental Scientist

Attachments:

1. Topographic Location Map
2. Site Diagram with Laboratory Results Summary Table
3. Laboratory Reports

Topographic
Location Map





Stromberger 22-E Pad (Location ID: 444315) Site Diagram



Legend

- Concrete Pad
- Excavation Boundary
- Soil samples - 03/02/18
- Soil samples - 04/16/18
- Soil samples - 04/17/18

Google Earth

© 2018 Google

		Organics (mg/kg [ppm])							Inorganics			
CDPHE Groundwater Protection Level (Soil) -->									70			
COGCC Allowable Concentration (Soil) -->		500			0.17	85	100	175		4	12	(6-9)
Sample Date:	Matrix Notes [Sample Point - Depth]	TPH (total volatile and extractable petroleum hydrocarbons) (TPH-GRO + TPH-DRO)	TPH-GRO (C6-C10) Low Fraction	TPH-DRO (C10-C28) High Fraction	Benzene	Toluene	Ethylbenzene	Xylenes - Total	Ethylene glycol	EC (<4 mm/bsl or 2x background)	SAR (calculation)	pH
3/2/18	B01@surface	11098	98	11000	0.022	0.11	0.092	0.54	<39	1.25	3.34	10.5
3/2/18	B02@surface	29800	2800	27000	0.42	0.83	0.58	3.3	<38	1.48	2.42	10.8
3/2/18	B03@0.5'	3.9	3.9	<50	0.0034	0.015	0.011	0.084	46.5	3.30	6.86	11.9
4/16/18	B01@1'	50	<0.50	50	<0.0020	<0.0050	<0.0050	<0.0050	<11.9	0.780	0.630	8.4
4/16/18	B02@1'	<50.50	<0.50	<50	<0.0020	<0.0050	<0.0050	<0.0050	<10.2	0.617	1.30	8.8
4/16/18	B03@1'	<50.50	<0.50	<50	<0.0020	<0.0050	<0.0050	<0.0050	<10.9	0.761	1.24	8.5
4/16/18	B04@1'	<50.50	<0.50	<50	<0.0020	<0.0050	<0.0050	<0.0050	<11.4	0.684	1.33	8.8
4/16/18	B05@1'	<50.50	<0.50	<50	<0.0020	<0.0050	<0.0050	<0.0050	<11.2	0.578	0.67	8.6
4/16/18	B06@0.5'	<50.50	<0.50	<50	<0.0020	<0.0050	<0.0050	<0.0050	<9.46	3.82	4.10	12
4/16/18	B07@0.5'	<50.50	<0.50	<50	0.011	0.046	0.0079	0.046	<10.2	3.41	4.06	12
4/17/18	B08@1.0'	<50.50	<0.50	<50	0.11	0.094	0.0057	0.027	<11.1	0.578	1.33	8.8
4/17/18	B09@1.0'	<50.50	<0.50	<50	<0.0020	<0.0050	<0.0050	<0.0050	<12.3	0.444	0.740	8.8

100 ft

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

March 14, 2018

Blake Ford
Extraction Oil & Gas
570 17th St. Suite 550
Denver, CO 80202
RE: Stromberger 22E Pad

Enclosed are the results of analyses for samples received by Summit Scientific on 03/02/18 15:42. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury For Ben Shrewsbury
Laboratory Manager



Extraction Oil & Gas
570 17th St. Suite 550
Denver CO, 80202

Project: Stromberger 22E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
03/14/18 08:34

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01@surface	1803041-01	Soil	03/02/18 09:20	03/02/18 15:42
B02@surface	1803041-02	Soil	03/02/18 09:31	03/02/18 15:42
B03@0.5'	1803041-03	Soil	03/02/18 09:40	03/02/18 15:42

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

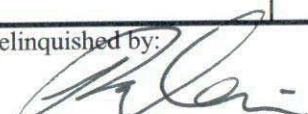
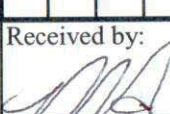
1803041

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

Page 1 of 1

Client: Extraction Oil & Gas
Address: 370 17th Street, Suite 5300
City/State/Zip: Denver, CO 80202
Phone: 970-778-5956 Fax:
Sampler Name: Brian Gibson

Project Manager: Blake Ford
E-Mail: bford@extractionog.com; bgibson@extractionog.com
Project Name: Stromberger 22-E Pad
Project Number:

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:								Special Instructions					
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	TPH (DRO/GRO)	BTEX	pH, EC, SAR	Ethylene glycol									
B01@surface	3/2/2017	9:20	2			X			X				X	X	X	X								
B02@surface	3/3/2017	9:31	2			X			X				X	X	X	X								
B03@0.5'	3/4/2017	9:40	2			X			X				X	X	X	X								
Relinquished by: 				Date/Time: 3/2/18 1542		Received by: 				Date/Time: 3/2/18 1542		Turn Around Time (Check)								Notes: Sample matrix is road base containing a significant amount of gravel and is saturated from snow melt On ice				
Relinquished by:				Date/Time:		Received by:				Date/Time:		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"/>												
Relinquished by:				Date/Time:		Received in Lab by:				Date/Time:		Sample Integrity: Temperature Upon Receipt: 5.3°C Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No												

Sample Receipt Checklist

S2 Work Order: **1803041**

Client: XOG Client Project ID: Stromberger 22-E Pad

Shipped Via: Hand Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

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

Cooler ID					
Temp (°C)	5.3				

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.	✓			
Were all samples received intact ⁽¹⁾ ?	✓			
Was adequate sample volume provided ⁽¹⁾ ?	✓			
If custody seals are present, are they intact ⁽¹⁾ ?			✓	
Are short holding time analytes or samples with HTs due within 48 hours present?			✓	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	✓			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	✓			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	✓			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	✓			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			✓	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?			✓	
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 ⁽¹⁾ ?			✓	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			✓	
Additional Comments (if any):				

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

Nakita
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

3/21/18 1550
Date/Time



Extraction Oil & Gas
570 17th St. Suite 550
Denver CO, 80202

Project: Stromberger 22E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
03/14/18 08:34

B01@surface
1803041-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 03/02/18 09:20									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	11000	50	mg/kg	1	1803054	03/05/18	03/06/18	8015M	

Date Sampled: 03/02/18 09:20									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		270 %	30-150		"	"	"	"	S-02

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 03/02/18 09:20									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.022	0.0020	mg/kg	1	1803052	03/05/18	03/06/18	EPA 8260B	
Toluene	0.11	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.092	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.54	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	98	5.0	"	10	"	"	"	"	

Date Sampled: 03/02/18 09:20									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		114 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		91.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		189 %	21-167		"	"	"	"	S-02

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

Date Sampled: 03/02/18 09:20									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	491	11.2	mg/kg dry	1	1803044	03/05/18	03/05/18	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	55.2	5.58	"	"	"	"	"	"	

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Extraction Oil & Gas
570 17th St. Suite 550
Denver CO, 80202

Project: Stromberger 22E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
03/14/18 08:34

B01@surface
1803041-01 (Soil)

Summit Scientific

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

Sodium	293	5.58 mg/kg dry	1	1803044	03/05/18	03/05/18	EPA 6020/Mod. USDA60 6(2, 3A)
Sodium Adsorption Ratio	3.34	units	"	1803096	03/07/18	03/07/18	"

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/02/18 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	89.6		%	1	1803045	03/05/18	03/07/18	% calculation	
pH	10.5	0.100	pH Units	"	1803049	03/05/18	03/05/18	EPA 9045	

Specific Conductance by EPA120.1

Date Sampled: **03/02/18 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1.25	0.0100	mmhos/cm	1	1803047	03/05/18	03/07/18	EPA 120.1	

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Extraction Oil & Gas
570 17th St. Suite 550
Denver CO, 80202

Project: Stromberger 22E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
03/14/18 08:34

B02@surface
1803041-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/02/18 09:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	27000	50	mg/kg	1	1803054	03/05/18	03/06/18	8015M	

Date Sampled: **03/02/18 09:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		3230 %	30-150		"	"	"	"	S-02

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/02/18 09:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.42	0.0020	mg/kg	1	1803052	03/05/18	03/06/18	EPA 8260B	
Toluene	0.83	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.58	0.0050	"	"	"	"	"	"	
Xylenes (total)	3.3	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	2800	50	"	100	"	"	"	"	

Date Sampled: **03/02/18 09:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		151 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		85.2 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		448 %	21-167		"	"	"	"	S-02

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

Date Sampled: **03/02/18 09:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	632	11.2	mg/kg dry	1	1803044	03/05/18	03/05/18	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	162	5.59	"	"	"	"	"	"	

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Project: Stromberger 22E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
03/14/18 08:34

B02@surface
1803041-02 (Soil)

Summit Scientific

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

Sodium	263	5.59 mg/kg dry	1	1803044	03/05/18	03/05/18	EPA 6020/Mod. USDA60 6(2, 3A)
Sodium Adsorption Ratio	2.42	units	"	1803096	03/07/18	03/07/18	"

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/02/18 09:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	89.4		%	1	1803045	03/05/18	03/07/18	% calculation	
pH	10.8	0.100	pH Units	"	1803049	03/05/18	03/05/18	EPA 9045	

Specific Conductance by EPA120.1

Date Sampled: **03/02/18 09:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1.48	0.0100	mmhos/cm	1	1803047	03/05/18	03/07/18	EPA 120.1	

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Extraction Oil & Gas
570 17th St. Suite 550
Denver CO, 80202

Project: Stromberger 22E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
03/14/18 08:34

B03@0.5'
1803041-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/02/18 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1803054	03/05/18	03/08/18	8015M	

Date Sampled: **03/02/18 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		85.4 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/02/18 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.0034	0.0020	mg/kg	1	1803052	03/05/18	03/07/18	EPA 8260B	
Toluene	0.015	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.011	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.084	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	3.9	0.50	"	"	"	"	"	"	

Date Sampled: **03/02/18 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		89.2 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		110 %	21-167		"	"	"	"	

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

Date Sampled: **03/02/18 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	407	11.3	mg/kg dry	1	1803044	03/05/18	03/05/18	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	450	5.67	"	"	"	"	"	"	

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Extraction Oil & Gas
570 17th St. Suite 550
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Project: Stromberger 22E Pad
Project Number: [none]
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Reported:
03/14/18 08:34

B03@0.5'
1803041-03 (Soil)

Summit Scientific

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

Sodium	436	5.67 mg/kg dry	1	1803044	03/05/18	03/05/18	EPA 6020/Mod. USDA60 6(2, 3A)
Sodium Adsorption Ratio	6.86	units	"	1803096	03/07/18	03/14/18	"

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/02/18 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	11.9	0.100	pH Units	1	1803049	03/05/18	03/05/18	EPA 9045	
% Solids	88.1		%	"	1803045	03/05/18	03/07/18	% calculation	

Specific Conductance by EPA120.1

Date Sampled: **03/02/18 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	3.30	0.0100	mmhos/cm	1	1803047	03/05/18	03/07/18	EPA 120.1	

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Extraction Oil & Gas
570 17th St. Suite 550
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Project: Stromberger 22E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
03/14/18 08:34

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1803054 - EPA 3550A

Blank (1803054-BLK1)

Prepared: 03/05/18 Analyzed: 03/06/18

C10-C28 (DRO) ND 50 mg/kg

Surrogate: o-Terphenyl 11.4 " 12.5 90.9 30-150

LCS (1803054-BS1)

Prepared: 03/05/18 Analyzed: 03/06/18

C10-C28 (DRO) 347 50 mg/kg 399 86.9 73-134

Surrogate: o-Terphenyl 12.4 " 12.5 99.0 30-150

Matrix Spike (1803054-MS1)

Source: 1803032-01

Prepared: 03/05/18 Analyzed: 03/06/18

C10-C28 (DRO) 373 50 mg/kg 399 19.5 88.6 50-148

Surrogate: o-Terphenyl 12.3 " 12.5 98.1 30-150

Matrix Spike Dup (1803054-MSD1)

Source: 1803032-01

Prepared: 03/05/18 Analyzed: 03/06/18

C10-C28 (DRO) 357 50 mg/kg 399 19.5 84.4 50-148 4.58 20

Surrogate: o-Terphenyl 12.9 " 12.5 104 30-150

Summit Scientific

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Extraction Oil & Gas
570 17th St. Suite 550
Denver CO, 80202

Project: Stromberger 22E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
03/14/18 08:34

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 1803052 - EPA 5030 Soil MS

Blank (1803052-BLK1)

Prepared: 03/05/18 Analyzed: 03/06/18

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0366		"	0.0400		91.5	23-173			
Surrogate: Toluene-d8	0.0403		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0339		"	0.0400		84.8	21-167			

LCS (1803052-BS1)

Prepared: 03/05/18 Analyzed: 03/06/18

Benzene	0.0924	0.0020	mg/kg	0.100		92.4	58-130			
Toluene	0.0899	0.0050	"	0.100		89.9	61-134			
Ethylbenzene	0.0935	0.0050	"	0.0992		94.3	74-139			
m,p-Xylene	0.182	0.010	"	0.200		91.4	73-137			
o-Xylene	0.0947	0.0050	"	0.0980		96.7	73-141			
Xylenes (total)	0.277	0.0050	"				30-150			
Gasoline Range Hydrocarbons	2.11	0.50	"				30-150			
Surrogate: 1,2-Dichloroethane-d4	0.0353		"	0.0400		88.3	23-173			
Surrogate: Toluene-d8	0.0422		"	0.0400		105	20-170			
Surrogate: 4-Bromofluorobenzene	0.0327		"	0.0400		81.7	21-167			

Matrix Spike (1803052-MS1)

Source: 1803032-01

Prepared: 03/05/18 Analyzed: 03/06/18

Benzene	0.0285	0.0020	mg/kg	0.100	ND	28.5	30-131			QM-07
Toluene	0.0229	0.0050	"	0.100	ND	22.9	30-134			QM-07
Ethylbenzene	0.0149	0.0050	"	0.0992	ND	15.0	22-153			QM-07
m,p-Xylene	0.0560	0.010	"	0.200	ND	28.0	10-159			
o-Xylene	0.0503	0.0050	"	0.0980	ND	51.4	31-151			
Xylenes (total)	0.106	0.0050	"		ND		30-150			
Gasoline Range Hydrocarbons	1.17	0.50	"		0.854		30-150			
Surrogate: 1,2-Dichloroethane-d4	0.0398		"	0.0400		99.4	23-173			
Surrogate: Toluene-d8	0.0396		"	0.0400		98.9	20-170			
Surrogate: 4-Bromofluorobenzene	0.0362		"	0.0400		90.5	21-167			

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.



Extraction Oil & Gas
570 17th St. Suite 550
Denver CO, 80202

Project: Stromberger 22E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
03/14/18 08:34

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 1803052 - EPA 5030 Soil MS

Matrix Spike Dup (1803052-MSD1)			Source: 1803032-01		Prepared: 03/05/18		Analyzed: 03/06/18			
Benzene	0.0329	0.0020	mg/kg	0.100	ND	32.9	30-131	14.5	34	
Toluene	0.0272	0.0050	"	0.100	ND	27.2	30-134	17.2	30	QM-07
Ethylbenzene	0.0177	0.0050	"	0.0992	ND	17.8	22-153	17.1	24	QM-07
m,p-Xylene	0.0585	0.010	"	0.200	ND	29.3	10-159	4.45	68	
o-Xylene	0.0483	0.0050	"	0.0980	ND	49.3	31-151	4.20	38	
Xylenes (total)	0.107	0.0050	"		ND		30-150	0.450	20	
Gasoline Range Hydrocarbons	1.06	0.50	"		0.854		30-150	10.1	20	
Surrogate: 1,2-Dichloroethane-d4	0.0392		"	0.0400		98.0	23-173			
Surrogate: Toluene-d8	0.0398		"	0.0400		99.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0352		"	0.0400		88.0	21-167			

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.



Extraction Oil & Gas
570 17th St. Suite 550
Denver CO, 80202

Project: Stromberger 22E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
03/14/18 08:34

Soluble Nutrients by EPA 6020/Mod. 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 1803044 - General Preparation

Blank (1803044-BLK1)

Prepared & Analyzed: 03/05/18

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

LCS (1803044-BS1)

Prepared & Analyzed: 03/05/18

Calcium	434	10.0	mg/kg wet	500	86.8	82.9-118
Magnesium	423	5.00	"	500	84.6	77.1-123
Sodium	418	5.00	"	500	83.6	71-129

Duplicate (1803044-DUP1)

Source: 1802273-01

Prepared & Analyzed: 03/05/18

Calcium	3680	13.9	mg/kg dry	4020	8.80	200
Magnesium	769	6.97	"	797	3.60	200
Sodium	219	6.97	"	225	2.80	200

Matrix Spike (1803044-MS1)

Source: 1802273-01

Prepared & Analyzed: 03/05/18

Calcium	4770	13.9	mg/kg dry	697	4020	108	75-125
Magnesium	1470	6.97	"	697	797	97.1	75-125
Sodium	757	6.97	"	697	225	76.2	75-125

Matrix Spike Dup (1803044-MSD1)

Source: 1802273-01

Prepared & Analyzed: 03/05/18

Calcium	4760	13.9	mg/kg dry	697	4020	106	75-125	0.290	25
Magnesium	1460	6.97	"	697	797	95.7	75-125	0.670	25
Sodium	822	6.97	"	697	225	85.7	75-125	8.33	25

Summit Scientific

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Extraction Oil & Gas
570 17th St. Suite 550
Denver CO, 80202

Project: Stromberger 22E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
03/14/18 08:34

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 1803045 - General Preparation

Duplicate (1803045-DUP1) **Source: 1803005-01** Prepared: 03/05/18 Analyzed: 03/07/18

% Solids	85.2		%		85.0			0.228	20	
----------	------	--	---	--	------	--	--	-------	----	--

Batch 1803049 - General Preparation

LCS (1803049-BS1) Prepared & Analyzed: 03/05/18

pH	9.17	0.100	pH Units	9.16	100	95-105				
----	------	-------	----------	------	-----	--------	--	--	--	--

Duplicate (1803049-DUP1) **Source: 1802273-01** Prepared & Analyzed: 03/05/18

pH	7.52	0.100	pH Units		7.54			0.266	20	
----	------	-------	----------	--	------	--	--	-------	----	--

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.



Extraction Oil & Gas
570 17th St. Suite 550
Denver CO, 80202

Project: Stromberger 22E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
03/14/18 08:34

Specific Conductance by EPA120.1 - Quality Control
Summit Scientific

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

Batch 1803047 - General Preparation

Blank (1803047-BLK1)

Prepared: 03/05/18 Analyzed: 03/07/18

Specific Conductance (EC) ND 0.0100 mmhos/cm

LCS (1803047-BS1)

Prepared: 03/05/18 Analyzed: 03/07/18

Specific Conductance (EC) 0.752 0.0100 mmhos/cm 0.750 100 90-110

Duplicate (1803047-DUP1)

Source: 1802273-01

Prepared: 03/05/18 Analyzed: 03/07/18

Specific Conductance (EC) 3.08 0.0100 mmhos/cm 3.08 0.0486 20

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.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Summit Scientific

1803041

SGS Job Number: DA3152

Sampling Date: 03/02/18

Report to:

Summit Scientific
741 Corporate Circle Suite J
Golden, CO 80401
pshrewsbury@s2scientific.com

ATTN: Paul Shrewsbury

Total number of pages in report: 11



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Scott Heideman
Laboratory Director

Client Service contact: Jen Jorschumb 303-425-6021

Certifications: CO (CO00049), ID (CO00049), NE (NE-OS-06-04), ND (R-027), NJ (CO007), OK (D9942)
UT (NELAP CO00049), LA (LA150028), TX (T104704511), WY (8TMS-L)

This report shall not be reproduced, except in its entirety, without the written approval of SGS.
Test results relate only to samples analyzed.

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Sample Summary

Summit Scientific
1803041

Job No: DA3152

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
DA3152-1	03/02/18	09:20	03/05/18	SO	Soil	B01@SURFACE
DA3152-2	03/02/18	09:31	03/05/18	SO	Soil	B02@SURFACE
DA3152-3	03/02/18	09:40	03/05/18	SO	Soil	B03@0.5'

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Summary of Hits



Job Number: DA3152
Account: Summit Scientific
Project: 1803041
Collected: 03/02/18

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

DA3152-1 B01@SURFACE

No hits reported in this sample.

DA3152-2 B02@SURFACE

No hits reported in this sample.

DA3152-3 B03@0.5'

Ethylene Glycol	46.5 J	56	39	mg/kg	SW846 8015B
-----------------	--------	----	----	-------	-------------

Sample Results

Report of Analysis

Report of Analysis

Page 1 of 1

3.1

3

Client Sample ID:	B01@SURFACE	Date Sampled:	03/02/18
Lab Sample ID:	DA3152-1	Date Received:	03/05/18
Matrix:	SO - Soil	Percent Solids:	88.7
Method:	SW846 8015B		
Project:	1803041		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FG12662.D	1	03/07/18 18:21	RB	n/a	n/a	GFG872
Run #2							

	Initial weight	Final Volume
Run #1	2.0 g	10.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
107-21-1	Ethylene Glycol	ND	56	39	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
123-51-3	IsoAmyl Alcohol	89%		47-140%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

3.2

3

Client Sample ID:	B02@SURFACE	Date Sampled:	03/02/18
Lab Sample ID:	DA3152-2	Date Received:	03/05/18
Matrix:	SO - Soil	Percent Solids:	93.0
Method:	SW846 8015B		
Project:	1803041		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FG12663.D	1	03/07/18 18:40	RB	n/a	n/a	GFG872
Run #2							

	Initial weight	Final Volume
Run #1	2.0 g	10.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
107-21-1	Ethylene Glycol	ND	54	38	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
123-51-3	IsoAmyl Alcohol	92%		47-140%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1



Client Sample ID:	B03@0.5'	Date Sampled:	03/02/18
Lab Sample ID:	DA3152-3	Date Received:	03/05/18
Matrix:	SO - Soil	Percent Solids:	88.8
Method:	SW846 8015B		
Project:	1803041		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FG12664.D	1	03/07/18 18:59	RB	n/a	n/a	GFG872
Run #2							

	Initial weight	Final Volume
Run #1	2.0 g	10.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
107-21-1	Ethylene Glycol	46.5	56	39	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
123-51-3	IsoAmyl Alcohol	89%		47-140%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

SGS Accutest Sample Receipt Summary

Job Number: DA3152

Client: SUMMIT SCIENTIFIC

Project: 1803041

Date / Time Received: 3/5/2018 2:10:00 PM

Delivery Method:

Airbill #'s: HD

Cooler Temps (Initial/Adjusted): #1: (5.3/5.3);

Cooler Security

Y or N

- | | | | | | |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cooler Temperature

Y or N

- | | | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun; | |
| 3. Cooler media: | Ice (Bag) | |
| 4. No. Coolers: | 1 | |

Quality Control Preservation

Y or N

N/A

- | | | | |
|---------------------------------|-------------------------------------|-------------------------------------|--------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Samples preserved properly: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Comments

Sample Integrity - Documentation

Y or N

- | | | |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Sample Integrity - Condition

Y or N

- | | | |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample: | Intact | |

Sample Integrity - Instructions

Y or N N/A

- | | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 3. Sufficient volume recvd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. Compositing instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

4.1

4

DA3152: Chain of Custody

Page 2 of 2



Extraction Oil & Gas
570 17th St. Suite 550
Denver CO, 80202

Project: Stromberger 22E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
03/14/18 08:34

Notes and Definitions

S-02	The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.
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

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

April 26, 2018

Blake Ford
Extraction Oil&Gas
370 17th Street Suite 5300
Denver, CO 80202
RE: Stromberger 22-E Pad

Enclosed are the results of analyses for samples received by Summit Scientific on 04/16/18 16:15. 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', is written on a light blue rectangular background.

Paul Shrewsbury For Ben Shrewsbury
President / Laboratory Director



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

Project: Stromberger 22-E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01@1'	1804237-01	Soil	04/16/18 14:45	04/16/18 16:15
B02@1'	1804237-02	Soil	04/16/18 14:48	04/16/18 16:15
B03@1'	1804237-03	Soil	04/16/18 14:50	04/16/18 16:15
B04@1'	1804237-04	Soil	04/16/18 14:53	04/16/18 16:15
B05@1'	1804237-05	Soil	04/16/18 14:55	04/16/18 16:15
B06@0.5'	1804237-06	Soil	04/16/18 14:59	04/16/18 16:15
B07@0.5'	1804237-07	Soil	04/16/18 15:02	04/16/18 16:15

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

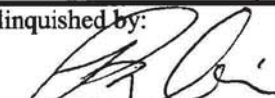
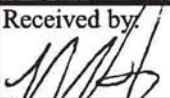
1804237

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

Page 1 of 1

Client: Extraction Oil & Gas
Address: 370 17th Street, Suite 5300
City/State/Zip: Denver, CO 80202
Phone: 720-481-2362 Fax:
Sampler Name: Brian Gibson

Project Manager: Blake Ford
E-Mail: bford@extractionog.com; bgibson@extractionog.com
Project Name: Stromberger 22-E Pad
Project Number:

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:				Special Instructions		
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	TPH (GRO/DRO)	BTEX	pH, EC, SAR		Ethylene glycol	
B01@1'	4/16/18	1445	1			X			X				X	X	X	X	
B02@1'	↓	1448	↓														
B03@1'	↓	1450	↓														
B04@1'	↓	1453	↓														
B05@1'	↓	1455	↓														
B06@0.5'	↓	1459	↓														
B07@0.5'	↓	1502	↓														
Relinquished by: 	Date/Time: 4/16/18 1615	Received by: 	Date/Time: 4/16/18 1615	Turn Around Time (Check)				Notes:									
Relinquished by:	Date/Time:	Received by:	Date/Time:	Same Day	<input checked="" type="checkbox"/>	72 Hours	<input type="checkbox"/>	on re									
				24 Hours	<input type="checkbox"/>	Standard	<input type="checkbox"/>										
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:	48 Hours	<input type="checkbox"/>												
				Sample Integrity:													
				Temperature Upon Receipt: 11.0°C													
				Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>													

Sample Receipt Checklist

S2 Work Order:

1804237

Client:

XOG

Client Project ID:

Stromberger 22-E Pad

Shipped Via:

Hand

Airbill #:

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

Matrix (check all that apply):

Air

☒ Soil/Solid

Water

Other:

(Describe)

Cooler ID					
Temp (°C)	11.0				

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 short holding time analytes or samples with HTs 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⁾ ?			<input checked="" type="checkbox"/>	
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⁾ ?			<input checked="" type="checkbox"/>	
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.

Custodian Printed Name

Nakita

Signature or Initials of Custodian

[Signature]

Date/Time

4/16/18 1605



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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

B01@1'
1804237-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 04/16/18 14:45									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1804125	04/16/18	04/16/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 04/16/18 14:45									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		82.7 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		92.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.7 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 04/16/18 14:45									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	50	50	mg/kg	1	1804126	"	04/16/18	EPA 8015M	

Date Sampled: 04/16/18 14:45									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		96.0 %	30-150		"	"	"	"	

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

Date Sampled: 04/16/18 14:45									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	10200	2.50	mg/kg dry	1	1804121	04/16/18	04/17/18	EPA 6020B	
Magnesium	1570	1.00	"	"	"	"	"	"	

Summit Scientific

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

B01@1'
1804237-01 (Soil)

Summit Scientific

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

Sodium	259	5.00 mg/kg dry	1	1804121	04/16/18	04/17/18	EPA 6020B
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Calculated Analysis

Date Sampled: **04/16/18 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.630	0.100	units	1	1804140	04/17/18	04/17/18	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/16/18 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.780	0.0100	mmhos/cm	1	1804124	04/16/18	04/16/18	EPA 120.1	
% Solids	81.5		%	"	1804122	04/16/18	04/17/18	Calculation	
pH	8.4		pH Units	"	1804123	04/16/18	04/16/18	EPA 9045D	

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

B02@1'
1804237-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/16/18 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1804125	04/16/18	04/16/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/16/18 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		84.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		93.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.2 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/16/18 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1804126	"	04/16/18	EPA 8015M	

Date Sampled: **04/16/18 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		101 %	30-150		"	"	"	"	

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

Date Sampled: **04/16/18 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	9570	2.50	mg/kg dry	1	1804121	04/16/18	04/17/18	EPA 6020B	
Magnesium	1120	1.00	"	"	"	"	"	"	
Sodium	503	5.00	"	"	"	"	"	"	

Summit Scientific

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

B02@1'
1804237-02 (Soil)

Summit Scientific

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

Calculated Analysis

Date Sampled: **04/16/18 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.30	0.100	units	1	1804140	04/17/18	04/17/18	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/16/18 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	85.0		%	1	1804122	04/16/18	04/17/18	Calculation	
Specific Conductance (EC)	0.617	0.0100	mmhos/cm	"	1804124	04/16/18	04/16/18	EPA 120.1	
pH	8.8		pH Units	"	1804123	04/16/18	04/16/18	EPA 9045D	

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

B03@1'
1804237-03 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/16/18 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1804125	04/16/18	04/16/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/16/18 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		85.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.9 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/16/18 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1804126	"	04/16/18	EPA 8015M	

Date Sampled: **04/16/18 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		97.6 %	30-150		"	"	"	"	

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

Date Sampled: **04/16/18 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	147	2.50	mg/kg dry	1	1804121	04/16/18	04/17/18	EPA 6020B	
Magnesium	932	1.00	"	"	"	"	"	"	
Sodium	185	5.00	"	"	"	"	"	"	

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

B03@1'
1804237-03 (Soil)

Summit Scientific

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

Calculated Analysis

Date Sampled: **04/16/18 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.24	0.100	units	1	1804140	04/17/18	04/17/18	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/16/18 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	79.9		%	1	1804122	04/16/18	04/17/18	Calculation	
Specific Conductance (EC)	0.761	0.0100	mmhos/cm	"	1804124	04/16/18	04/16/18	EPA 120.1	
pH	8.5		pH Units	"	1804123	04/16/18	04/16/18	EPA 9045D	

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

B04@1'
1804237-04 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/16/18 14:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1804125	04/16/18	04/16/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/16/18 14:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		84.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.3 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/16/18 14:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1804126	"	04/16/18	EPA 8015M	

Date Sampled: **04/16/18 14:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		99.6 %	30-150		"	"	"	"	

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

Date Sampled: **04/16/18 14:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	9690	2.50	mg/kg dry	1	1804121	04/16/18	04/17/18	EPA 6020B	
Magnesium	1440	1.00	"	"	"	"	"	"	
Sodium	532	5.00	"	"	"	"	"	"	

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

B04@1'
1804237-04 (Soil)

Summit Scientific

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

Calculated Analysis

Date Sampled: **04/16/18 14:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.33	0.100	units	1	1804140	04/17/18	04/17/18	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/16/18 14:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.684	0.0100	mmhos/cm	1	1804124	04/16/18	04/16/18	EPA 120.1	
% Solids	51.1		%	"	1804122	04/16/18	04/17/18	Calculation	
pH	8.8		pH Units	"	1804123	04/16/18	04/16/18	EPA 9045D	

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

B05@1'
1804237-05 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/16/18 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1804125	04/16/18	04/16/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/16/18 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		84.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		92.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.2 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/16/18 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1804126	"	04/17/18	EPA 8015M	

Date Sampled: **04/16/18 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		96.6 %	30-150		"	"	"	"	

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

Date Sampled: **04/16/18 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	7760	2.50	mg/kg dry	1	1804121	04/16/18	04/17/18	EPA 6020B	
Magnesium	1290	1.00	"	"	"	"	"	"	
Sodium	241	5.00	"	"	"	"	"	"	

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

B05@1'
1804237-05 (Soil)

Summit Scientific

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

Calculated Analysis

Date Sampled: **04/16/18 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.670	0.100	units	1	1804140	04/17/18	04/17/18	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/16/18 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	80.7		%	1	1804122	04/16/18	04/17/18	Calculation	
Specific Conductance (EC)	0.578	0.0100	mmhos/cm	"	1804124	04/16/18	04/16/18	EPA 120.1	
pH	8.6		pH Units	"	1804123	04/16/18	04/16/18	EPA 9045D	

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

B06@0.5'
1804237-06 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/16/18 14:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1804125	04/16/18	04/17/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/16/18 14:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		78.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		92.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.6 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/16/18 14:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1804126	"	04/17/18	EPA 8015M	

Date Sampled: **04/16/18 14:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		97.6 %	30-150		"	"	"	"	

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

Date Sampled: **04/16/18 14:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	5640	2.50	mg/kg dry	1	1804121	04/16/18	04/17/18	EPA 6020B	
Magnesium	586	1.00	"	"	"	"	"	"	
Sodium	1210	5.00	"	"	"	"	"	"	

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

B06@0.5'
1804237-06 (Soil)

Summit Scientific

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

Calculated Analysis

Date Sampled: **04/16/18 14:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	4.10	0.100	units	1	1804140	04/17/18	04/17/18	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/16/18 14:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	88.0		%	1	1804122	04/16/18	04/17/18	Calculation	
Specific Conductance (EC)	3.82	0.0100	mmhos/cm	"	1804124	04/16/18	04/16/18	EPA 120.1	
pH	12		pH Units	"	1804123	04/16/18	04/16/18	EPA 9045D	

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

B07@0.5'
1804237-07 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/16/18 15:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.011	0.0020	mg/kg	1	1804125	04/16/18	04/16/18	EPA 8260B	
Toluene	0.046	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.0079	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.046	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/16/18 15:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		83.0 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		92.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.9 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/16/18 15:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1804126	"	04/17/18	EPA 8015M	

Date Sampled: **04/16/18 15:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		98.2 %	30-150		"	"	"	"	

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

Date Sampled: **04/16/18 15:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	6350	2.50	mg/kg dry	1	1804121	04/16/18	04/17/18	EPA 6020B	
Magnesium	654	1.00	"	"	"	"	"	"	
Sodium	1270	5.00	"	"	"	"	"	"	

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

B07@0.5'
1804237-07 (Soil)

Summit Scientific

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

Calculated Analysis

Date Sampled: **04/16/18 15:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	4.06	0.100	units	1	1804140	04/17/18	04/17/18	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/16/18 15:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	86.4		%	1	1804122	04/16/18	04/17/18	Calculation	
Specific Conductance (EC)	3.41	0.0100	mmhos/cm	"	1804124	04/16/18	04/16/18	EPA 120.1	
pH	12		pH Units	"	1804123	04/16/18	04/16/18	EPA 9045D	

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.



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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 1804125 - EPA 5030 Soil MS

Blank (1804125-BLK1)

Prepared & Analyzed: 04/16/18

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0436		"	0.0396	110	23-173				
Surrogate: Toluene-d8	0.0380		"	0.0400	94.9	20-170				
Surrogate: 4-Bromofluorobenzene	0.0389		"	0.0400	97.4	21-167				

LCS (1804125-BS1)

Prepared & Analyzed: 04/16/18

Benzene	0.0739	0.0020	mg/kg	0.100	73.9	61-139				
Toluene	0.0894	0.0050	"	0.100	89.4	64-132				
Ethylbenzene	0.103	0.0050	"	0.100	103	68.7-135				
m,p-Xylene	0.200	0.010	"	0.200	99.8	70.4-129				
o-Xylene	0.102	0.0050	"	0.100	102	66.9-126				
Gasoline Range Hydrocarbons	2.63	0.50	"			0-200				
Surrogate: 1,2-Dichloroethane-d4	0.0442		"	0.0396	112	23-173				
Surrogate: Toluene-d8	0.0385		"	0.0400	96.2	20-170				
Surrogate: 4-Bromofluorobenzene	0.0385		"	0.0400	96.2	21-167				

Matrix Spike (1804125-MS1)

Source: 1804238-01

Prepared & Analyzed: 04/16/18

Benzene	0.0759	0.0020	mg/kg	0.100	ND	75.9	42.9-137			
Toluene	0.0894	0.0050	"	0.100	ND	89.4	42.6-130			
Ethylbenzene	0.102	0.0050	"	0.100	ND	102	39-133			
m,p-Xylene	0.202	0.010	"	0.200	ND	101	34.7-134			
o-Xylene	0.102	0.0050	"	0.100	ND	102	41.3-126			
Gasoline Range Hydrocarbons	2.63	0.50	"		ND		0-200			
Surrogate: 1,2-Dichloroethane-d4	0.0464		"	0.0396	117	23-173				
Surrogate: Toluene-d8	0.0386		"	0.0400	96.6	20-170				
Surrogate: 4-Bromofluorobenzene	0.0391		"	0.0400	97.8	21-167				

Summit Scientific

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

Project: Stromberger 22-E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

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 1804125 - EPA 5030 Soil MS

Matrix Spike Dup (1804125-MSD1)		Source: 1804238-01			Prepared: 04/16/18		Analyzed: 04/17/18			
Benzene	0.0751	0.0020	mg/kg	0.100	ND	75.1	42.9-137	1.03	17.9	
Toluene	0.0863	0.0050	"	0.100	ND	86.3	42.6-130	3.48	11.9	
Ethylbenzene	0.103	0.0050	"	0.100	ND	103	39-133	0.876	30	
m,p-Xylene	0.201	0.010	"	0.200	ND	100	34.7-134	0.358	30	
o-Xylene	0.102	0.0050	"	0.100	ND	102	41.3-126	0.177	30	
Gasoline Range Hydrocarbons	2.78	0.50	"		ND		0-200	5.28	200	
Surrogate: 1,2-Dichloroethane-d4	0.0458		"	0.0396		116	23-173			
Surrogate: Toluene-d8	0.0381		"	0.0400		95.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0388		"	0.0400		96.9	21-167			

Summit Scientific

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

Project: Stromberger 22-E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1804126 - EPA 3550A

Blank (1804126-BLK1)

Prepared: 04/16/18 Analyzed: 04/17/18

C10-C28 (DRO) ND 50 mg/kg

LCS (1804126-BS1)

Prepared: 04/16/18 Analyzed: 04/17/18

C10-C28 (DRO) 489 50 mg/kg 500 97.8 81.4-129

Matrix Spike (1804126-MS1)

Source: 1804238-01

Prepared: 04/16/18 Analyzed: 04/17/18

C10-C28 (DRO) 466 50 mg/kg 500 15.9 90.1 77.8-133

Matrix Spike Dup (1804126-MSD1)

Source: 1804238-01

Prepared: 04/16/18 Analyzed: 04/17/18

C10-C28 (DRO) 489 50 mg/kg 500 15.9 94.5 77.8-133 4.62 8.48

Summit Scientific

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

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 1804121 - General Preparation

Blank (1804121-BLK1)

Prepared: 04/16/18 Analyzed: 04/17/18

Calcium	ND	2.50	mg/kg wet
Magnesium	ND	1.00	"
Sodium	ND	5.00	"

LCS (1804121-BS1)

Prepared: 04/16/18 Analyzed: 04/17/18

Calcium	1120	2.50	mg/kg wet	1000	112	70-130
Magnesium	1180	1.00	"	1000	118	70-130
Sodium	1220	5.00	"	1000	122	70-130

Duplicate (1804121-DUP1)

Source: 1804237-01

Prepared: 04/16/18 Analyzed: 04/17/18

Calcium	11100	2.50	mg/kg dry	10200	8.55	20
Magnesium	1670	1.00	"	1570	5.79	20
Sodium	260	5.00	"	259	0.300	20

Matrix Spike (1804121-MS1)

Source: 1804237-01

Prepared: 04/16/18 Analyzed: 04/17/18

Calcium	11600	2.50	mg/kg dry	1230	10200	111	70-130
Magnesium	2800	1.00	"	1230	1570	100	70-130
Sodium	1680	5.00	"	1230	259	116	70-130

Matrix Spike Dup (1804121-MSD1)

Source: 1804237-01

Prepared: 04/16/18 Analyzed: 04/17/18

Calcium	11600	2.50	mg/kg dry	1230	10200	110	70-130	0.0979	25
Magnesium	2900	1.00	"	1230	1570	108	70-130	3.55	25
Sodium	1670	5.00	"	1230	259	115	70-130	0.866	25

Summit Scientific

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

Project: Stromberger 22-E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
Summit Scientific

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

Batch 1804122 - General Preparation

Duplicate (1804122-DUP1) **Source: 1804237-01** Prepared: 04/16/18 Analyzed: 04/17/18

% Solids	80.6		%		81.5			1.11	20
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Batch 1804123 - General Preparation

Duplicate (1804123-DUP1) **Source: 1804237-01** Prepared & Analyzed: 04/16/18

pH	8.4		pH Units		8.4			0.237	20
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Batch 1804124 - General Preparation

Blank (1804124-BLK1) Prepared & Analyzed: 04/16/18

Specific Conductance (EC)	ND	0.0100	mmhos/cm
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LCS (1804124-BS1) Prepared & Analyzed: 04/16/18

Specific Conductance (EC)	0.750	0.0100	mmhos/cm	80-120
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Duplicate (1804124-DUP1) **Source: 1804237-01** Prepared & Analyzed: 04/16/18

Specific Conductance (EC)	0.758	0.0100	mmhos/cm	0.780	2.93	20
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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.



Fremont
Analytical

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info@fremontanalytical.com

Summit Scientific
Paul Shrewsbury
4653 Table Mountain Dr
Golden, CO 80403

RE: 1804237
Work Order Number: 1804285

April 18, 2018

Attention Paul Shrewsbury:

Fremont Analytical, Inc. received 7 sample(s) on 4/18/2018 for the analyses presented in the following report.

Glycols by SW8015
Sample Moisture (Percent Moisture)

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Chelsea Ward
Project Manager

CC:
Ben Shrewsbury

CLIENT: Summit Scientific
Project: 1804237
Work Order: 1804285

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1804285-001	B01@1'	04/16/2018 2:45 PM	04/18/2018 9:46 AM
1804285-002	B02@1'	04/16/2018 2:48 PM	04/18/2018 9:46 AM
1804285-003	B03@1'	04/16/2018 2:50 PM	04/18/2018 9:46 AM
1804285-004	B04@1'	04/16/2018 2:53 PM	04/18/2018 9:46 AM
1804285-005	B05@1'	04/16/2018 2:55 PM	04/18/2018 9:46 AM
1804285-006	B06@0.5'	04/16/2018 2:59 PM	04/18/2018 9:46 AM
1804285-007	B07@0.5'	04/16/2018 3:02 PM	04/18/2018 9:46 AM

CLIENT: Summit Scientific**Project:** 1804237

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

- * - Flagged value is not within established control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Reporting Limit
- R - High relative percent difference observed

Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate



Analytical Report

Work Order: 1804285
Date Reported: 4/18/2018

CLIENT: Summit Scientific
Project: 1804237

Lab ID: 1804285-001

Client Sample ID: B01@1'

Collection Date: 4/16/2018 2:45:00 PM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Glycols by SW8015</u>				Batch ID: 20433	Analyst: SB	

Ethylene glycol	ND	11.9	mg/Kg-dry	1	4/18/2018 11:59:17 AM
Surr: 2,4,6-Tribromophenol	93.0	50.1 - 124	%Rec	1	4/18/2018 11:59:17 AM

Sample Moisture (Percent Moisture)

Batch ID: R42963 Analyst: NG

Percent Moisture	17.5	0.500	wt%	1	4/18/2018 2:35:48 PM
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Lab ID: 1804285-002

Client Sample ID: B02@1'

Collection Date: 4/16/2018 2:48:00 PM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Glycols by SW8015</u>				Batch ID: 20433	Analyst: SB	

Ethylene glycol	ND	10.2	mg/Kg-dry	1	4/18/2018 12:38:11 PM
Surr: 2,4,6-Tribromophenol	86.4	50.1 - 124	%Rec	1	4/18/2018 12:38:11 PM

Sample Moisture (Percent Moisture)

Batch ID: R42963 Analyst: NG

Percent Moisture	12.3	0.500	wt%	1	4/18/2018 2:35:48 PM
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Work Order: 1804285
Date Reported: 4/18/2018

CLIENT: Summit Scientific
Project: 1804237

Lab ID: 1804285-003

Client Sample ID: B03@1'

Collection Date: 4/16/2018 2:50:00 PM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Glycols by SW8015</u>				Batch ID: 20433		Analyst: SB
Ethylene glycol	ND	10.9		mg/Kg-dry	1	4/18/2018 1:03:53 PM
Surr: 2,4,6-Tribromophenol	89.2	50.1 - 124		%Rec	1	4/18/2018 1:03:53 PM
<u>Sample Moisture (Percent Moisture)</u>				Batch ID: R42963		Analyst: NG
Percent Moisture	18.2	0.500		wt%	1	4/18/2018 2:35:48 PM

Lab ID: 1804285-004

Client Sample ID: B04@1'

Collection Date: 4/16/2018 2:53:00 PM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Glycols by SW8015</u>				Batch ID: 20433		Analyst: SB
Ethylene glycol	ND	11.4		mg/Kg-dry	1	4/18/2018 1:42:41 PM
Surr: 2,4,6-Tribromophenol	95.9	50.1 - 124		%Rec	1	4/18/2018 1:42:41 PM
<u>Sample Moisture (Percent Moisture)</u>				Batch ID: R42963		Analyst: NG
Percent Moisture	18.2	0.500		wt%	1	4/18/2018 2:35:48 PM



Analytical Report

Work Order: 1804285

Date Reported: 4/18/2018

CLIENT: Summit Scientific

Project: 1804237

Lab ID: 1804285-005

Client Sample ID: B05@1'

Collection Date: 4/16/2018 2:55:00 PM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Glycols by SW8015</u>				Batch ID: 20433		Analyst: SB
Ethylene glycol	ND	11.2		mg/Kg-dry	1	4/18/2018 2:09:04 PM
Surr: 2,4,6-Tribromophenol	88.5	50.1 - 124		%Rec	1	4/18/2018 2:09:04 PM
<u>Sample Moisture (Percent Moisture)</u>				Batch ID: R42963		Analyst: NG
Percent Moisture	17.7	0.500		wt%	1	4/18/2018 2:35:48 PM

Lab ID: 1804285-006

Client Sample ID: B06@0.5'

Collection Date: 4/16/2018 2:59:00 PM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Glycols by SW8015</u>				Batch ID: 20433		Analyst: SB
Ethylene glycol	ND	9.46		mg/Kg-dry	1	4/18/2018 2:34:51 PM
Surr: 2,4,6-Tribromophenol	69.6	50.1 - 124		%Rec	1	4/18/2018 2:34:51 PM
<u>Sample Moisture (Percent Moisture)</u>				Batch ID: R42963		Analyst: NG
Percent Moisture	7.44	0.500		wt%	1	4/18/2018 2:35:48 PM



Analytical Report

Work Order: 1804285

Date Reported: 4/18/2018

CLIENT: Summit Scientific

Project: 1804237

Lab ID: 1804285-007

Client Sample ID: B07@0.5'

Collection Date: 4/16/2018 3:02:00 PM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Glycols by SW8015</u>				Batch ID: 20433		Analyst: SB
Ethylene glycol	ND	10.2		mg/Kg-dry	1	4/18/2018 2:47:55 PM
Surr: 2,4,6-Tribromophenol	86.1	50.1 - 124		%Rec	1	4/18/2018 2:47:55 PM
<u>Sample Moisture (Percent Moisture)</u>				Batch ID: R42963		Analyst: NG
Percent Moisture	12.4	0.500		wt%	1	4/18/2018 2:35:48 PM

Work Order: 1804285
CLIENT: Summit Scientific
Project: 1804237

QC SUMMARY REPORT

Glycols by SW8015

Sample ID MB-20433	SampType: MBLK	Units: mg/Kg			Prep Date: 4/18/2018			RunNo: 42968			
Client ID: MBLKS	Batch ID: 20433				Analysis Date: 4/18/2018			SeqNo: 830432			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Ethylene glycol	ND	10.0									
Surr: 2,4,6-Tribromophenol	39.8		32.00		124	50.1	124				

Sample ID 1804285-002ADUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 4/18/2018			RunNo: 42968			
Client ID: B02@1'	Batch ID: 20433				Analysis Date: 4/18/2018			SeqNo: 830425			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Ethylene glycol	ND	10.8						0		30	
Surr: 2,4,6-Tribromophenol	36.1		34.55		105	50.1	124		0		

Sample ID 1804285-001AMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 4/18/2018			RunNo: 42968			
Client ID: B01@1'	Batch ID: 20433				Analysis Date: 4/18/2018			SeqNo: 830422			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Ethylene glycol	135	10.6	211.4	0	63.8	36.1	144				
Surr: 2,4,6-Tribromophenol	33.8		33.83		99.9	50.1	124				

Sample ID 1804285-001AMSD	SampType: MSD	Units: mg/Kg-dry			Prep Date: 4/18/2018			RunNo: 42968			
Client ID: B01@1'	Batch ID: 20433				Analysis Date: 4/18/2018			SeqNo: 830423			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Ethylene glycol	159	10.0	200.6	0	79.2	36.1	144	134.9	16.2	30	
Surr: 2,4,6-Tribromophenol	33.8		32.09		105	50.1	124		0		

Sample ID LCS-20433	SampType: LCS	Units: mg/Kg			Prep Date: 4/18/2018			RunNo: 42968			
Client ID: LCSS	Batch ID: 20433				Analysis Date: 4/18/2018			SeqNo: 830434			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Ethylene glycol	217	10.0	200.0	0	109	54.1	143				
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Work Order: 1804285
CLIENT: Summit Scientific
Project: 1804237

QC SUMMARY REPORT

Glycols by SW8015

Sample ID	LCS-20433	SampType:	LCS	Units:	mg/Kg	Prep Date:	4/18/2018	RunNo:	42968		
Client ID:	LCSS	Batch ID:	20433	Analysis Date:				4/18/2018	SeqNo:	830434	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: 2,4,6-Tribromophenol	44.7		32.00		140	50.1	124				S

NOTES:

S - Outlying surrogate recovery(ies) observed.

Work Order: 1804285
CLIENT: Summit Scientific
Project: 1804237

QC SUMMARY REPORT

Sample Moisture (Percent Moisture)

Sample ID	1804285-001ADUP	SampType:	DUP	Units:	wt%	Prep Date:	4/18/2018	RunNo:	42963		
Client ID:	B01@1'	Batch ID:	R42963	Analysis Date:				4/18/2018	SeqNo:	830239	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	17.5	0.500						17.45	0.202	20	

Client Name: **SUMSCI**
 Logged by: **Brianna Barnes**

Work Order Number: **1804285**
 Date Received: **4/18/2018 9:46:00 AM**

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
 2. How was the sample delivered? FedEx

Log In

3. Coolers are present? Yes ☒ No ☐ NA ☐
 4. Shipping container/cooler in good condition? Yes ☒ No ☐
 5. Custody Seals present on shipping container/cooler?
 (Refer to comments for Custody Seals not intact) Yes ☐ No ☒ Not Required ☐
 6. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
 7. Were all items received at a temperature of >0°C to 10.0°C* Yes ☐ No ☒ NA ☐
Please refer to item information.
 8. Sample(s) in proper container(s)? Yes ☒ No ☐
 9. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
 10. Are samples properly preserved? Yes ☒ No ☐
 11. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
 12. Is there headspace in the VOA vials? Yes ☐ No ☐ NA ☒
 13. Did all samples containers arrive in good condition(unbroken)? Yes ☒ No ☐
 14. Does paperwork match bottle labels? Yes ☒ No ☐
 15. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
 16. Is it clear what analyses were requested? Yes ☒ No ☐
 17. Were all holding times able to be met? Yes ☒ No ☐

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: Date
 By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
 Regarding:
 Client Instructions:

19. Additional remarks:

Item Information

Item #	Temp °C
Cooler	14.3
Sample	13.5

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C



Fremont
Analytical

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: 04/17/18

Page: 1 of 1

Project Name: 1804237

Laboratory Project No (Internal): 1804237

Special Remarks: 1804237

Client: Summit Scientific

Project No:

Address: 741 Corporate Circle, Suite J

Collected by:

City, State, Zip: Golden, CO. 80401

Location:

Telephone: 303-277-9310

Report To (PM):

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Fax:

PM Email: bshrewsbury@s2scientific.com, pshrewsbury@s2scientific.com

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	Phthalate Glycols	Comments
1 B01@1'	04/16/18	14:45	S	✓	
2 B02@1'	04/16/18	14:48	S	✓	
3 B03@1'	04/16/18	14:50	S	✓	
4 B04@1'	04/16/18	14:53	S	✓	
5 B05@1'	04/16/18	14:55	S	✓	
6 B06@0.5'	04/16/18	14:59	S	✓	
7 B07@0.5'	04/16/18	15:02	S	✓	
8					
9					
10					

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

Individual:

**Metals (Circle): ☐ Nitrate ☐ Nitrite ☐ Chloride ☐ Sulfate ☐ Bromide ☐ Phosphate ☐ Fluoride ☐ Nitrate+Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished ☒ Date/Time 4/17/18 1230

Received ☒ Date/Time 4/18/18 0946

Relinquished ☒ Date/Time 4/18/18 0946

Turn-around Time: ☐ Standard ☐ 3 Day ☐ 2 Day ☒ Same Day (Specify)



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

Project: Stromberger 22-E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:47

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

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

April 26, 2018

Blake Ford
Extraction Oil&Gas
370 17th Street Suite 5300
Denver, CO 80202
RE: Stromberger 22-E Pad

Enclosed are the results of analyses for samples received by Summit Scientific on 04/17/18 15:15. 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', is written over a light gray rectangular background.

Paul Shrewsbury For Ben Shrewsbury
President / Laboratory Director



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

Project: Stromberger 22-E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:49

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B08@1.0'	1804253-01	Soil	04/17/18 13:50	04/17/18 15:15
B09@1.0'	1804253-02	Soil	04/17/18 13:55	04/17/18 15:15

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.

1804253

Summit Scientific

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

Page 1 of 1

Client: Extraction Oil & Gas
Address: 370 17th Street, Suite 5300
City/State/Zip: Denver, CO 80202
Phone: 720-481-2362 Fax:
Sampler Name: Brian Gibson

Project Manager: Blake Ford
E-Mail: bford@extractionog.com; bgibson@extractionog.com
Project Name: Stromberger 22-E Pad
Project Number:

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix				Analyze For:								Special Instructions				
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	TPH (GRO/DRO)	BTEX	pH, EC, SAR	Ethylene glycol									
B08@1.0'	4/19/2018	1350	1			X			X				X	X	X	X								
B09@1.0'	4/19/2018	1355	1			X			X				X	X	X	X								
Relinquished by: <i>[Signature]</i> Date/Time: 4/17/19 1515				Received by: <i>[Signature]</i> Date/Time: 4/17/18 1515				Turn Around Time (Check) Same Day <input checked="" type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input type="checkbox"/> 48 Hours <input type="checkbox"/>								Notes: on ice								
Relinquished by:				Received by:				Sample Integrity: Temperature Upon Receipt: 5.6°C Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																
Relinquished by:				Received in Lab by:																				

1804253

Sample Receipt Checklist

S2 Work Order: _____

Client: XOGClient Project ID: Stromberger 22-E PadShipped Via: Hand

Airbill #: _____

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

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

Cooler ID					
Temp (°C)	5.6				

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.	✓			
Were all samples received intact ⁽¹⁾ ?	✓			
Was adequate sample volume provided ⁽¹⁾ ?	✓			
If custody seals are present, are they intact ⁽¹⁾ ?			✓	
Are short holding time analytes or samples with HTs due within 48 hours present?			✓	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	✓			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	✓			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	✓			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	✓			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			✓	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?				
Note the type of preservative in the Comments column – HCl, H ₂ SO ₄ , NaOH, HNO ₃ , ect			✓	
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			✓	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			✓	

Additional Comments (if any):

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.Nakita
Custodian Printed Name[Signature]
Signature or Initials of Custodian4/17/18 1515
Date/Time



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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:49

B08@1.0'
1804253-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 04/17/18 13:50									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.11	0.0020	mg/kg	1	1804142	04/17/18	04/17/18	EPA 8260B	
Toluene	0.094	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.0057	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.027	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 04/17/18 13:50									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		92.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 04/17/18 13:50									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1804143	04/17/18	04/18/18	EPA 8015M	

Date Sampled: 04/17/18 13:50									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		98.6 %	30-150		"	"	"	"	

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

Date Sampled: 04/17/18 13:50									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	3100	2.50	mg/kg dry	1	1804121	04/17/18	04/17/18	EPA 6020B	
Magnesium	1880	1.00	"	"	"	"	"	"	
Sodium	380	5.00	"	"	"	"	"	"	

Summit Scientific

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:49

B08@1.0'
1804253-01 (Soil)

Summit Scientific

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

Calculated Analysis

Date Sampled: **04/17/18 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.33	0.100	units	1	1804146	04/18/18	04/18/18	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/17/18 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.578	0.0100	mmhos/cm	1	1804138	04/17/18	04/17/18	EPA 120.1	
% Solids	83.3		%	"	1804145	04/17/18	04/18/18	Calculation	
pH	8.8		pH Units	"	1804144	04/17/18	04/17/18	EPA 9045D	

Summit Scientific

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:49

B09@1.0'
1804253-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/17/18 13:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1804142	04/17/18	04/17/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/17/18 13:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.9 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/17/18 13:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1804143	04/17/18	04/18/18	EPA 8015M	

Date Sampled: **04/17/18 13:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		96.3 %	30-150		"	"	"	"	

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

Date Sampled: **04/17/18 13:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	2520	2.50	mg/kg dry	1	1804121	04/17/18	04/17/18	EPA 6020B	
Magnesium	1520	1.00	"	"	"	"	"	"	
Sodium	190	5.00	"	"	"	"	"	"	

Summit Scientific

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:49

B09@1.0'
1804253-02 (Soil)

Summit Scientific

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

Calculated Analysis

Date Sampled: **04/17/18 13:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.740	0.100	units	1	1804146	04/18/18	04/18/18	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/17/18 13:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.444	0.0100	mmhos/cm	1	1804138	04/17/18	04/17/18	EPA 120.1	
% Solids	83.1		%	"	1804145	04/17/18	04/18/18	Calculation	
pH	8.8		pH Units	"	1804144	04/17/18	04/17/18	EPA 9045D	

Summit Scientific

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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:49

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 1804142 - EPA 5030 Soil MS

Blank (1804142-BLK1)

Prepared: 04/17/18 Analyzed: 04/18/18

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0425		"	0.0396	107	23-173				
Surrogate: Toluene-d8	0.0379		"	0.0400	94.8	20-170				
Surrogate: 4-Bromofluorobenzene	0.0388		"	0.0400	97.1	21-167				

LCS (1804142-BS1)

Prepared: 04/17/18 Analyzed: 04/18/18

Benzene	0.0747	0.0020	mg/kg	0.100	74.7	61-139				
Toluene	0.0895	0.0050	"	0.100	89.5	64-132				
Ethylbenzene	0.103	0.0050	"	0.100	103	68.7-135				
m,p-Xylene	0.199	0.010	"	0.200	99.7	70.4-129				
o-Xylene	0.103	0.0050	"	0.100	103	66.9-126				
Gasoline Range Hydrocarbons	2.66	0.50	"			0-200				
Surrogate: 1,2-Dichloroethane-d4	0.0431		"	0.0396	109	23-173				
Surrogate: Toluene-d8	0.0382		"	0.0400	95.5	20-170				
Surrogate: 4-Bromofluorobenzene	0.0386		"	0.0400	96.6	21-167				

Matrix Spike (1804142-MS1)

Source: 1804251-01

Prepared: 04/17/18 Analyzed: 04/18/18

Benzene	0.0759	0.0020	mg/kg	0.100	ND	75.9	42.9-137			
Toluene	0.0897	0.0050	"	0.100	ND	89.7	42.6-130			
Ethylbenzene	0.103	0.0050	"	0.100	ND	103	39-133			
m,p-Xylene	0.205	0.010	"	0.200	ND	103	34.7-134			
o-Xylene	0.103	0.0050	"	0.100	ND	103	41.3-126			
Gasoline Range Hydrocarbons	2.66	0.50	"		0.00504		0-200			
Surrogate: 1,2-Dichloroethane-d4	0.0454		"	0.0396	115	23-173				
Surrogate: Toluene-d8	0.0388		"	0.0400	97.0	20-170				
Surrogate: 4-Bromofluorobenzene	0.0395		"	0.0400	98.8	21-167				

Summit Scientific

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

Project: Stromberger 22-E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:49

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 1804142 - EPA 5030 Soil MS

Matrix Spike Dup (1804142-MSD1)		Source: 1804251-01			Prepared: 04/17/18		Analyzed: 04/18/18			
Benzene	0.0767	0.0020	mg/kg	0.100	ND	76.7	42.9-137	1.06	17.9	
Toluene	0.0903	0.0050	"	0.100	ND	90.3	42.6-130	0.600	11.9	
Ethylbenzene	0.106	0.0050	"	0.100	ND	106	39-133	2.96	30	
m,p-Xylene	0.208	0.010	"	0.200	ND	104	34.7-134	1.13	30	
o-Xylene	0.102	0.0050	"	0.100	ND	102	41.3-126	1.18	30	
Gasoline Range Hydrocarbons	2.74	0.50	"		0.00504		0-200	2.88	200	
Surrogate: 1,2-Dichloroethane-d4	0.0442		"	0.0396		112	23-173			
Surrogate: Toluene-d8	0.0382		"	0.0400		95.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0386		"	0.0400		96.5	21-167			

Summit Scientific

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

Project: Stromberger 22-E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:49

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1804143 - EPA 3550A

Blank (1804143-BLK1)

Prepared: 04/17/18 Analyzed: 04/18/18

C10-C28 (DRO) ND 50 mg/kg

LCS (1804143-BS1)

Prepared: 04/17/18 Analyzed: 04/18/18

C10-C28 (DRO) 473 50 mg/kg 500 94.7 81.4-129

Matrix Spike (1804143-MS1)

Source: 1804251-01

Prepared: 04/17/18 Analyzed: 04/18/18

C10-C28 (DRO) 504 50 mg/kg 500 35.3 93.7 77.8-133

Matrix Spike Dup (1804143-MSD1)

Source: 1804251-01

Prepared: 04/17/18 Analyzed: 04/18/18

C10-C28 (DRO) 475 50 mg/kg 500 35.3 88.0 77.8-133 5.82 8.48

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.



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

Project: Stromberger 22-E Pad
Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:49

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 1804121 - General Preparation

Blank (1804121-BLK1)

Prepared: 04/16/18 Analyzed: 04/17/18

Calcium	ND	2.50	mg/kg wet
Magnesium	ND	1.00	"
Sodium	ND	5.00	"

LCS (1804121-BS1)

Prepared: 04/16/18 Analyzed: 04/17/18

Calcium	1120	2.50	mg/kg wet	1000	112	70-130
Magnesium	1180	1.00	"	1000	118	70-130
Sodium	1220	5.00	"	1000	122	70-130

Duplicate (1804121-DUP1)

Source: 1804237-01

Prepared: 04/16/18 Analyzed: 04/17/18

Calcium	11100	2.50	mg/kg dry	10200	8.55	20
Magnesium	1670	1.00	"	1570	5.79	20
Sodium	260	5.00	"	259	0.300	20

Matrix Spike (1804121-MS1)

Source: 1804237-01

Prepared: 04/16/18 Analyzed: 04/17/18

Calcium	11600	2.50	mg/kg dry	1230	10200	111	70-130
Magnesium	2800	1.00	"	1230	1570	100	70-130
Sodium	1680	5.00	"	1230	259	116	70-130

Matrix Spike Dup (1804121-MSD1)

Source: 1804237-01

Prepared: 04/16/18 Analyzed: 04/17/18

Calcium	11600	2.50	mg/kg dry	1230	10200	110	70-130	0.0979	25
Magnesium	2900	1.00	"	1230	1570	108	70-130	3.55	25
Sodium	1670	5.00	"	1230	259	115	70-130	0.866	25

Summit Scientific

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

Project: Stromberger 22-E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:49

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 1804138 - General Preparation

Duplicate (1804138-DUP1) **Source: 1804250-01** Prepared & Analyzed: 04/17/18

Specific Conductance (EC)	5.36	0.0100	mmhos/cm	5.35	0.187	20
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Batch 1804144 - General Preparation

Duplicate (1804144-DUP1) **Source: 1804250-01** Prepared & Analyzed: 04/17/18

pH	8.4		pH Units	8.3	0.240	20
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Batch 1804145 - General Preparation

Duplicate (1804145-DUP1) **Source: 1804166-01** Prepared: 04/17/18 Analyzed: 04/18/18

% Solids	88.1		%	91.0	3.24	20
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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.



Fremont
Analytical

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Summit Scientific
Paul Shrewsbury
4653 Table Mountain Dr
Golden, CO 80403

RE: 1804253
Work Order Number: 1804317

April 19, 2018

Attention Paul Shrewsbury:

Fremont Analytical, Inc. received 2 sample(s) on 4/19/2018 for the analyses presented in the following report.

Glycols by SW8015
Sample Moisture (Percent Moisture)

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Chelsea Ward
Project Manager

CC:
Ben Shrewsbury

CLIENT: Summit Scientific
Project: 1804253
Work Order: 1804317

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1804317-001	B08@1.0'	04/17/2018 1:50 PM	04/19/2018 10:43 AM
1804317-002	B09@1.0'	04/17/2018 1:55 PM	04/19/2018 10:43 AM

CLIENT: Summit Scientific**Project:** 1804253

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

- * - Flagged value is not within established control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Reporting Limit
- R - High relative percent difference observed

Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate



Work Order: 1804317
Date Reported: 4/19/2018

CLIENT: Summit Scientific
Project: 1804253

Lab ID: 1804317-001

Client Sample ID: B08@1.0'

Collection Date: 4/17/2018 1:50:00 PM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Glycols by SW8015</u>				Batch ID: 20447	Analyst: SB	

Ethylene glycol	ND	11.1	mg/Kg-dry	1	4/19/2018 12:39:56 PM
Surr: 2,4,6-Tribromophenol	95.9	50.1 - 124	%Rec	1	4/19/2018 12:39:56 PM

Sample Moisture (Percent Moisture)

Batch ID: R42990 Analyst: NG

Percent Moisture	16.3	0.500	wt%	1	4/19/2018 3:40:02 PM
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Lab ID: 1804317-002

Client Sample ID: B09@1.0'

Collection Date: 4/17/2018 1:55:00 PM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Glycols by SW8015</u>				Batch ID: 20447	Analyst: SB	

Ethylene glycol	ND	12.3	mg/Kg-dry	1	4/19/2018 1:32:02 PM
Surr: 2,4,6-Tribromophenol	85.2	50.1 - 124	%Rec	1	4/19/2018 1:32:02 PM

Sample Moisture (Percent Moisture)

Batch ID: R42990 Analyst: NG

Percent Moisture	19.1	0.500	wt%	1	4/19/2018 3:40:02 PM
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Work Order: 1804317
CLIENT: Summit Scientific
Project: 1804253

QC SUMMARY REPORT

Glycols by SW8015

Sample ID MB-20447	SampType: MBLK	Units: mg/Kg			Prep Date: 4/19/2018			RunNo: 42989			
Client ID: MBLKS	Batch ID: 20447				Analysis Date: 4/19/2018			SeqNo: 830967			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Ethylene glycol	ND	10.0									
Surr: 2,4,6-Tribromophenol	39.0		32.00		122	50.1	124				

Sample ID 1804317-001ADUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 4/19/2018			RunNo: 42989			
Client ID: B08@1.0'	Batch ID: 20447				Analysis Date: 4/19/2018			SeqNo: 830960			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Ethylene glycol	ND	11.1						0		30	
Surr: 2,4,6-Tribromophenol	33.9		35.39		95.9	50.1	124		0		

Sample ID 1804317-001AMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 4/19/2018			RunNo: 42989			
Client ID: B08@1.0'	Batch ID: 20447				Analysis Date: 4/19/2018			SeqNo: 830961			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Ethylene glycol	284	11.0	220.8	0	129	36.1	144				
Surr: 2,4,6-Tribromophenol	38.7		35.32		110	50.1	124				

Sample ID 1804317-001AMSD	SampType: MSD	Units: mg/Kg-dry			Prep Date: 4/19/2018			RunNo: 42989			
Client ID: B08@1.0'	Batch ID: 20447				Analysis Date: 4/19/2018			SeqNo: 830962			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Ethylene glycol	166	11.1	221.6	0	75.1	36.1	144	284.3	52.3	30	R
Surr: 2,4,6-Tribromophenol	32.8		35.45		92.5	50.1	124		0		

NOTES:

R - High RPD observed, spike recoveries are within range.

Work Order: 1804317
CLIENT: Summit Scientific
Project: 1804253

QC SUMMARY REPORT

Glycols by SW8015

Sample ID	LCS-20447	SampType: LCS			Units: mg/Kg		Prep Date: 4/19/2018		RunNo: 42989		
Client ID:	LCSS	Batch ID: 20447			Analysis Date: 4/19/2018				SeqNo: 830966		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ethylene glycol	190	10.0	200.0	0	95.2	54.1	143				
Surr: 2,4,6-Tribromophenol	30.0		32.00		93.7	50.1	124				

Work Order: 1804317
CLIENT: Summit Scientific
Project: 1804253

QC SUMMARY REPORT

Sample Moisture (Percent Moisture)

Sample ID	1804317-001ADUP	SampType:	DUP	Units:	wt%	Prep Date:	4/19/2018	RunNo:	42990		
Client ID:	B08@1.0'	Batch ID:	R42990	Analysis Date:				4/19/2018	SeqNo:	830970	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	14.9	0.500						16.27	8.51	20	

Client Name: **SUMSCI**

Work Order Number: **1804317**

Logged by: **Brianna Barnes**

Date Received: **4/19/2018 10:43:00 AM**

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? FedEx

Log In

3. Coolers are present? Yes ☒ No ☐ NA ☐
4. Shipping container/cooler in good condition? Yes ☒ No ☐
5. Custody Seals present on shipping container/cooler?
(Refer to comments for Custody Seals not intact) Yes ☐ No ☒ Not Required ☐
6. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
7. Were all items received at a temperature of >0°C to 10.0°C* Yes ☐ No ☒ NA ☐

Please refer to item information.

8. Sample(s) in proper container(s)? Yes ☒ No ☐
9. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
10. Are samples properly preserved? Yes ☒ No ☐
11. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
12. Is there headspace in the VOA vials? Yes ☐ No ☐ NA ☒
13. Did all samples containers arrive in good condition(unbroken)? Yes ☒ No ☐
14. Does paperwork match bottle labels? Yes ☒ No ☐
15. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
16. Is it clear what analyses were requested? Yes ☒ No ☐
17. Were all holding times able to be met? Yes ☒ No ☐

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:	<input type="text"/>	Date	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

Item Information

Item #	Temp °C
Cooler	15.5
Sample	10.6

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C



Fremont
Analytical

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: 04/18/18 Page: 1 of 1

Project Name: 1804253

Laboratory Project No (Internal):

1804253

Special Remarks:

Client: Summit Scientific

Project No:

Address: 741 Corporate Circle, Suite J

Collected by:

City, State, Zip: Golden, CO, 80401

Location:

Telephone: 303-277-9310

Report To (PM):

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Fax:

PM Email:

bsnewsbury@ss2scientific.com, psnewsbury@ss2scientific.com

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	Comments
1 B08@1.0'	04/17/18	13:50	S	✓
2 B09@1.0'	04/17/18	13:55	S	✓
3				
4				
5				
6				
7				
8				
9				
10				

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): ☐ Nitrate ☐ Nitrite ☐ Chloride ☐ Sulfate ☐ Bromide ☐ O-Phosphate ☐ Fluoride ☐ Nitrate-Nitrite

***Anions (Circle): ☐ Nitrate ☐ Nitrite ☐ Chloride ☐ Sulfate ☐ Bromide ☐ O-Phosphate ☐ Fluoride ☐ Nitrate-Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished ☒ Date/Time 4/18/18 1345
Received ☒ Date/Time 4/19/18 1043

Turn-around Time: ☒ Standard ☐ 3 Day ☐ 2 Day ☐ Next Day ☒ Same Day (specify)



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

Project: Stromberger 22-E Pad

Project Number: [none]
Project Manager: Blake Ford

Reported:
04/26/18 08:49

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