



June 26, 2018

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

Subject: Work Completion Report – Remedial Investigation
HIGHLAND-63N68W /21SESE “Highland 1”
COGCC Location ID: 319248
SESE, Section 21, T3N-R68W
40.206755/-105.001227
Weld County, Colorado

Dear Mr. Ford:

Apex Companies LLC (Apex) has prepared this work completion report to document remedial investigation activities conducted in support of equipment removal and final reclamation of the Highland 1 Tank Battery location (319248) in Mead, Weld County, Colorado. These efforts included field screening of disturbed soils following production equipment removal, soil sampling, and excavation oversight to support the closure of a partially buried produced water vessel and well plugging and abandonment (P&A). These efforts were completed under an approved Form 27 - Site Investigation and Remediation Workplan (401269627) with remediation project number 10178, and an approved Form 19 – Spill/Release Report (401274411) with an approved Spill/Release Point ID number 450504, both assigned by the Colorado Oil and Gas Conservation Commission (COGCC).

Remedial Investigation

Between May 4, 2017 and May 25, 2017, Apex Field Coordinators collected and field-screened twenty-seven (27) discrete soil samples from the base and sidewalls of the excavation completed in support of facility decommissioning and final reclamation activities. Field-screening was conducted using a photoionization detector (PID), and observations of staining and odor. A single 5-point composite soil sample was collected from a stockpile of overburden soil excavated during source removal. Collected soil samples were submitted for laboratory analysis in accordance with the approved remediation workplan and spill/release report. All submitted soil samples were analyzed for total volatile and extractable petroleum hydrocarbons (TPH).

Nineteen (19) of the twenty-seven (27) samples were also analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX). Additionally, ten (10) of the twenty-seven (27) samples were analyzed for electrical conductivity (EC), sodium adsorption ratio (SAR), and pH. The laboratory reports and an analytical summary table for all collected soil samples is attached to this document.

Groundwater was encountered in the southeast corner on May 24, 2018 while conducting additional source removal and confirmation soil sample collection from the base of the excavation. The groundwater was allowed to recharge overnight, and a sample was collected on the following day (May 25, 2018) and submitted to a laboratory for analysis of BTEX. The laboratory report and an analytical summary table for the groundwater sample is attached to this document. The final extent of the excavation was approximately seventy-one (71) feet by forty-three (43) feet with an average depth of fourteen (14) feet. All impacted soils were removed and hauled to Waste Connection's Front Range Landfill for disposal.

In addition to characterization efforts of the excavation, the Apex Field Coordinator completed a visual assessment of the site in support of the larger reclamation effort. The assessment looked for soil staining, salt accumulation, stressed vegetation, or other signs of soil impacts at the surface or near any recently disturbed soils.

Results

Base soil samples B01@6' and B03@11', and sidewall soil samples W03@7' and S04@11', exceeded the COGCC Table 910-1 allowable limit for TPH. Base samples B01@6' and B04@15' also exceeded the allowable limit for the inorganic constituent pH, but both samples were collected below the agronomic zone and do not present a concern for revegetation of the site. After additional excavation and source removal, clearance was obtained in the final excavation extent by all other base and sidewall soil samples where constituents of concern were either below laboratory detection limits or below the COGCC Table 910-1 allowable limits. The groundwater sample (GW01@14') was also below the COGCC Table 910-1 allowable limits for BTEX.

No other indications of soil or groundwater impacts were noted during the site investigation.

Conclusions

Field observations and laboratory analysis of clearance soil and groundwater samples confirm that impacts associated with the operation of the partially buried produced water vessel have been removed. There is no remaining evidence of any recent or historic release of hydrocarbons related to the operation of this tank battery location, or other onsite evidence of impacts (soil staining, salt accumulation, stressed vegetation) related to the operation of this well pad.

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 970-261-1127.

Sincerely,
Apex Companies, LLC



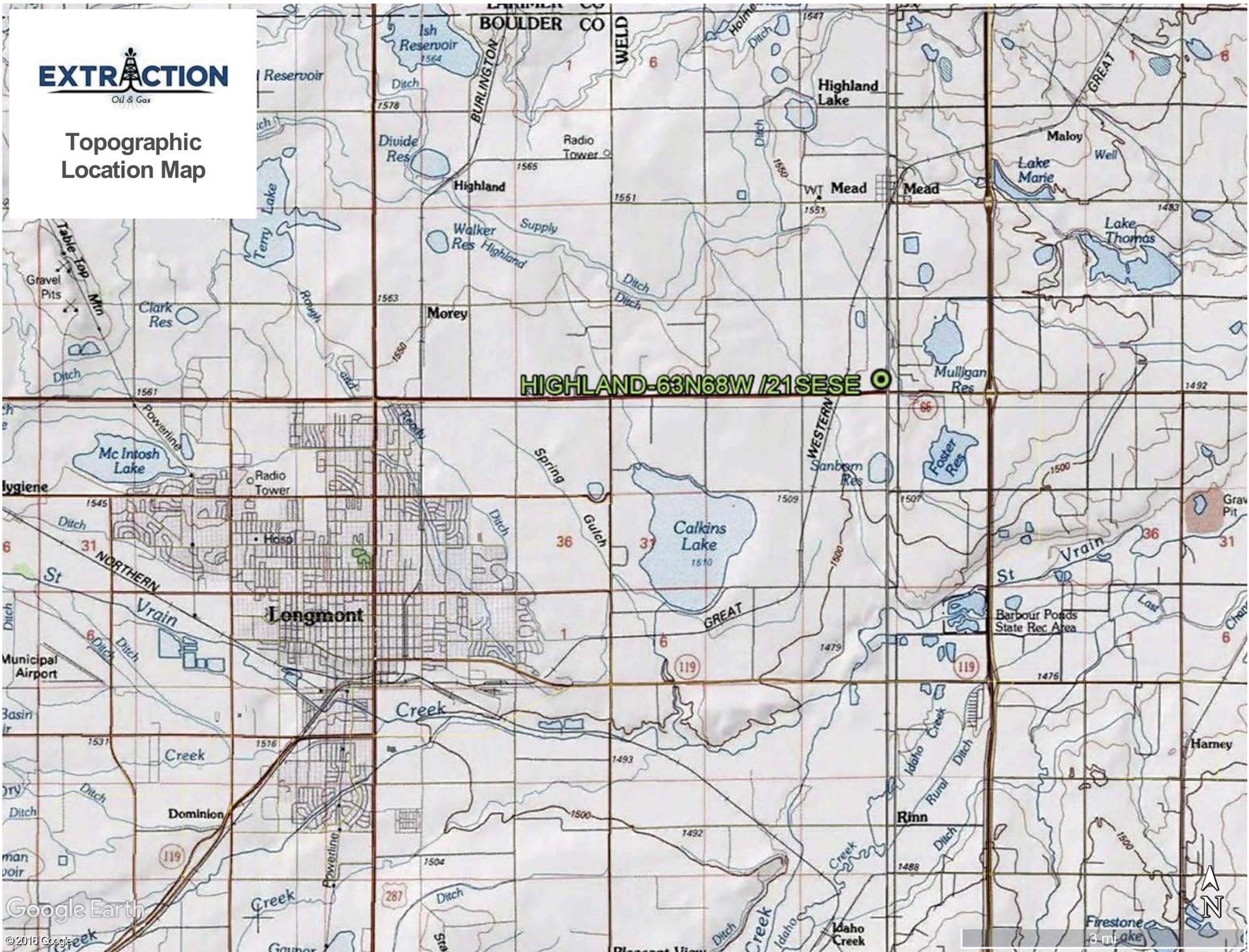
Chris Hines
Project Manager

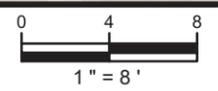
Attachments:

1. Topographic Location Map
2. Site Diagram
3. Soil Laboratory Results Summary Table
4. Groundwater Laboratory Results Summary Table
5. Laboratory Reports



Topographic Location Map





Legal Description: SESE, Sec 21, T3N R68W
County: Weld
Land Use: Non-cropland
Topography: 3-5% Slopes
Run-Off Risk: Low
Soil Type: Colby loam
Receiving Waters: Unnamed ditch

* Sample IDs in Purple font indicates a regulatory exceedance.

- Soil Sample (5/4/2017)
- Soil Sample (5/5/2017)
- Soil Sample (5/8/2017)
- Soil Sample (5/15/2017)
- Soil Sample (5/16/2017)
- Soil Sample (5/24/2017)
- Soil Sample (5/25/2017)
- Groundwater Sample (5/25/2017)
- ▨ Excavation (5/4/2017)
- ▨ Excavation (5/5/2017)
- ▨ Excavation (5/8/2017)
- ▨ Excavation (5/15/2017)
- ▨ Excavation (5/16/2017)
- ▨ Excavation (5/24/2017)
- ▨ Excavation (5/25/2017)
- Former Crude Oil Tank
- Former Vault
- ▭ Existing Equipment
- ▭ Former Equipment
- ▭ Former Secondary Containment



Highland 1 Site Diagram

Service Layer Credits:
 Google Earth, Inc.



Laboratory Results Summary Table (Soil)

6/25/2018

COGCC Allowable Concentration (Soil) -->			Organic Compounds (mg/kg)							(mmhos/cm)	Units	(pH Units)
Location	Sample Date	Sample ID	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	EC (<4 mmhos/cm or 2x background)	SAR (calculation)	pH
			500			0.17	85	100	175	4	12	(6-9)
Highland 1	5/4/17	B01@6'	780	420	360	<0.0020	<0.0050	0.0065	<0.0050	1.78	4.85	9.35
Highland 1	5/4/17	B04@15'	62.5	56	6.5	<0.0020	<0.0050	<0.0050	<0.0050	1.17	7.24	9.76
Highland 1	5/4/17	B03@11'	1730	1000	730	<0.0020	<0.0050	<0.0050	<0.0050	1.81	0.307	8.03
Highland 1	5/5/17	N04@10'	<0.5	<0.5	<50	<0.0020	<0.0050	<0.0050	<0.0050	0.464	0.490	8.17
Highland 1	5/8/17	B06@10'	<0.5	<0.5	<50	<0.0020	<0.0050	<0.0050	<0.0050	0.426	0.321	8.57
Highland 1	5/8/17	N05@7'	<0.5	<0.5	<50	<0.0020	<0.0050	<0.0050	<0.0050	0.351	0.387	8.48
Highland 1	5/8/17	B05@10'	<0.5	<0.5	<50	<0.0020	<0.0050	<0.0050	<0.0050	0.460	0.286	8.43
Highland 1	5/8/17	N06@7'	<0.5	<0.5	<50	<0.0020	<0.0050	<0.0050	<0.0050	0.370	1.47	8.46
Highland 1	5/8/17	N07@7'	<0.5	<0.5	<50	<0.0020	<0.0050	<0.0050	<0.0050	0.356	0.274	8.56
Highland 1	5/8/17	E01@7'	<0.5	<0.5	<50	<0.0020	<0.0050	<0.0050	<0.0050	0.280	0.465	8.61
Highland 1	5/15/17	B07@15'	<0.5	<0.5	<50	<0.0020	<0.0050	<0.0050	<0.0050			
Highland 1	5/15/17	S01@14'	93	11	82	<0.0020	<0.0050	<0.0050	<0.0050			
Highland 1	5/15/17	W02@14'	6.7	6.7	<50	<0.0020	<0.0050	<0.0050	<0.0050			
Highland 1	5/15/17	W03@7'	543	43	500	<0.0020	<0.0050	<0.0050	<0.0050			
Highland 1	5/15/17	B08@15'	4.3	4.3	<50	<0.0020	<0.0050	<0.0050	<0.0050			
Highland 1	5/15/17	W04@9'	56.9	6.9	50	<0.0020	<0.0050	<0.0050	<0.0050			
Highland 1	5/16/17	E02@6'	<0.5	<0.5	<50	<0.0020	<0.0050	<0.0050	<0.0050			
Highland 1	5/16/17	E03@8'	82.5	1.5	81	<0.0020	<0.0050	<0.0050	<0.0050			
Highland 1	5/24/17	B09@13'	<0.5	<0.5	<50							
Highland 1	5/24/17	W05@11'	<0.5	<0.5	<50							
Highland 1	5/24/17	S02@11'	207.13	7.13	200							
Highland 1	5/24/17	B10@14'	<0.5	<0.5	<50							
Highland 1	5/24/17	B11@14'	<0.5	<0.5	<50							
Highland 1	5/24/17	B12@14'	<0.5	<0.5	<50							
Highland 1	5/24/17	S03@11'	403.7	33.7	370							
Highland 1	5/24/17	C01	<0.5	<0.5	<50							
Highland 1	5/24/17	S04@11'	816	176	640							
Highland 1	5/25/17	S05@10'	161	41	120	<0.0020	<0.0050	<0.0050	<0.0050			



Laboratory Results Summary Table (Groundwater)

6/26/2018

			Organic Compounds (mg/L)			
COGCC Concentration Levels (mg/L)			0.005	1	0.7	10
Location	Sample Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes - total
Highland 1	5/25/17	GW01@14'	0.0034	0.013	0.0028	0.047

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

May 12, 2017

Blake Ford
Extraction Oil & Gas
570 17th St. Suite 550
Denver, CO 80202
RE: Highlands #1

Enclosed are the results of analyses for samples received by Summit Scientific on 05/04/17 17:05. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Paul Shrewsbury', with a stylized, cursive script.

Paul Shrewsbury
President



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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/12/17 13:30

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01@6'	1705062-01	Soil	05/04/17 09:52	05/04/17 17:05
B04@15'	1705062-02	Soil	05/04/17 14:40	05/04/17 17:05
B03@11'	1705062-03	Soil	05/04/17 15:14	05/04/17 17:05

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: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/12/17 13:30

Summit Scientific

1705002

741 Corporate Circle Suite 1 ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933 Fax

Page 1 of 1

Client: Extraction Oil & Gas- Blake Ford

Address: 370 17th Street, Suite 5300

City/State/Zip: Denver, Colorado 80202

Phone: 970.778.5956

Fax:

Sampler Name: Kevin Krench

Project Manager: Chris Hines- 970.261.1127

E-Mail: BFord@extractionog.com, Chris.Hines@apexcos.com, Jhickey@apexcos.com

Project Name: Highlands #1

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	PAH	PH, SAR, EC	RCR48 Metals	Hold*	
B01@6	5/4/17	0952	2			X			X			X	X	X	X	X		* Run if TPH>500ppm, or benzene>0.21ppm Report per Paul, COGCC Table 910-1. Call Chris Hines with Questions. (970-261-1127)
B03@11	↓	1410	↓			X			X			X	X	X	X	X		
B04@15	↓	1514	↓			X			X			X	X	X	X	X		
Relinquished by: <i>[Signature]</i> Date/Time: 5/4/17 3:05 PM				Received by: <i>[Signature]</i> Date/Time: 5-4-17 17:05				Turn Around Time (Check)				Notes:						
Relinquished by: <i>[Signature]</i> Date/Time: 5-4-17 18:00				Received by:				Same Day <input type="checkbox"/>				72 Hours <input type="checkbox"/>				ON 10		
Relinquished by:				Received in Lab by:				24 Hours <input type="checkbox"/>				Standard <input checked="" type="checkbox"/>						
Relinquished by:				Received in Lab by:				48 Hours <input type="checkbox"/>				Sample Integrity:						
								Temperature Upon Receipt: 10.2				Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>						

www.s2scientific.com



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

Project: Highlands #1

Project Number: [none]
 Project Manager: Blake Ford

Reported:
 05/12/17 13:30

Sample Receipt Checklist

S2 Work Order: 1705062
 Client: Extraction Oil Client Project ID: Highlands #1
 Shipped Via: _____ Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)
 Matrix (check all that apply): Air Soil/Solid Water Other: _____
(Describe)

Cooler ID					
Temp (°C)	10.2				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ?	<input checked="" type="checkbox"/>			on ice
NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.				
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				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Record the pH in Comments.				
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.

Paul S. [Signature]
 Custodian Printed Name

[Signature]
 Signature or Initials of Custodian

5-4-17 1800
 Date/Time

[Signature]



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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/12/17 13:30

B01@6'
1705062-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/04/17 09:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	360	50	mg/kg	1	1705076	05/08/17	05/09/17	8015M	

Date Sampled: **05/04/17 09:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		103 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/04/17 09:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705080	05/08/17	05/09/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.0065	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	420	50	"	100	"	"	05/09/17	"	

Date Sampled: **05/04/17 09:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		100 %	23-173		"	"	05/09/17	"	
<i>Surrogate: Toluene-d8</i>		119 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		230 %	21-167		"	"	"	"	S-02

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

Date Sampled: **05/04/17 09:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	3250	12.3	mg/kg dry	1	1705069	05/08/17	05/08/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	381	6.14	"	"	"	"	"	"	

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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: Highlands #1

Project Number: [none]
 Project Manager: Blake Ford

Reported:
 05/12/17 13:30

B01@6'
1705062-01 (Soil)

Summit Scientific

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium	1210	6.14	mg/kg dry	1	1705069	05/08/17	05/08/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Sodium Adsorption Ratio	4.85		units	"	1705095	05/09/17	05/09/17	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/04/17 09:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	81.4		%	1	1705092	05/09/17	05/10/17	% calculation	
pH	9.35	0.100	pH Units	"	1705090	05/09/17	05/09/17	EPA 9045	
Specific Conductance (EC)	1.78	0.0100	mmhos/cm	"	1705091	05/09/17	05/09/17	SM 2510B	

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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/12/17 13:30

B04@15'
1705062-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/04/17 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	56	50	mg/kg	1	1705076	05/08/17	05/09/17	8015M	

Date Sampled: **05/04/17 14:40**

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

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/04/17 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705080	05/08/17	05/09/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	6.5	0.50	"	"	"	"	"	"	

Date Sampled: **05/04/17 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		102 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	21-167		"	"	"	"	

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

Date Sampled: **05/04/17 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	459	11.4	mg/kg dry	1	1705069	05/08/17	05/08/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	169	5.72	"	"	"	"	"	"	

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
 Project Manager: Blake Ford

Reported:
 05/12/17 13:30

B04@15'
1705062-02 (Soil)

Summit Scientific

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

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium	764	5.72	mg/kg dry	1	1705069	05/08/17	05/08/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Sodium Adsorption Ratio	7.24		units	"	1705095	05/09/17	05/09/17	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/04/17 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1.17	0.0100	mmhos/cm	1	1705091	05/09/17	05/09/17	SM 2510B	
% Solids	87.4		%	"	1705092	05/09/17	05/10/17	% calculation	
pH	9.76	0.100	pH Units	"	1705090	05/09/17	05/09/17	EPA 9045	

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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/12/17 13:30

B03@11'
1705062-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/04/17 15:14**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	730	50	mg/kg	1	1705076	05/08/17	05/09/17	8015M	

Date Sampled: **05/04/17 15:14**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		112 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/04/17 15:14**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705080	05/08/17	05/09/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	1000	50	"	100	"	"	05/09/17	"	

Date Sampled: **05/04/17 15:14**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	05/09/17	"	
Surrogate: Toluene-d8		91.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		244 %	21-167		"	"	"	"	S-02

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

Date Sampled: **05/04/17 15:14**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	1270	12.3	mg/kg dry	1	1705069	05/08/17	05/08/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	295	6.13	"	"	"	"	"	"	

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: Highlands #1

Project Number: [none]
 Project Manager: Blake Ford

Reported:
 05/12/17 13:30

B03@11'
1705062-03 (Soil)

Summit Scientific

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium	51.8	6.13	mg/kg dry	1	1705069	05/08/17	05/08/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Sodium Adsorption Ratio	0.307		units	"	1705095	05/09/17	05/09/17	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/04/17 15:14**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.03	0.100	pH Units	1	1705090	05/09/17	05/09/17	EPA 9045	
Specific Conductance (EC)	1.81	0.0100	mmhos/cm	"	1705091	05/09/17	05/09/17	SM 2510B	
% Solids	81.6		%	"	1705092	05/09/17	05/10/17	% calculation	

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: Highlands #1

Project Number: [none]
 Project Manager: Blake Ford

Reported:
 05/12/17 13:30

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1705076 - EPA 3550A

Blank (1705076-BLK1)				Prepared & Analyzed: 05/08/17							
C10-C28 (DRO)	ND	50	mg/kg								
Surrogate: <i>o</i> -Terphenyl	13.2		"	12.5		106	30-150				
LCS (1705076-BS1)				Prepared & Analyzed: 05/08/17							
C10-C28 (DRO)	655	50	mg/kg	499		131	73-134				
Surrogate: <i>o</i> -Terphenyl	13.3		"	12.5		107	30-150				
Matrix Spike (1705076-MS1)				Source: 1705045-01		Prepared: 05/08/17		Analyzed: 05/09/17			
C10-C28 (DRO)	1160	50	mg/kg	499	ND	233	50-148				QM-07
Surrogate: <i>o</i> -Terphenyl	12.9		"	12.5		103	30-150				
Matrix Spike Dup (1705076-MSD1)				Source: 1705045-01		Prepared: 05/08/17		Analyzed: 05/09/17			
C10-C28 (DRO)	924	50	mg/kg	499	ND	185	50-148	22.7	20		QM-07
Surrogate: <i>o</i> -Terphenyl	12.5		"	12.5		100	30-150				

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: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/12/17 13:30

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

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

Batch 1705080 - EPA 5030 Soil MS

Blank (1705080-BLK1)

Prepared: 05/08/17 Analyzed: 05/09/17

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	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0405</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0398</i>		<i>"</i>	<i>0.0400</i>		<i>99.4</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0396</i>		<i>"</i>	<i>0.0400</i>		<i>99.0</i>	<i>21-167</i>			

LCS (1705080-BS1)

Prepared: 05/08/17 Analyzed: 05/09/17

Benzene	0.107	0.0020	mg/kg	0.100		107	58-130			
Toluene	0.118	0.0050	"	0.100		118	61-134			
Ethylbenzene	0.124	0.0050	"	0.0992		125	74-139			
m,p-Xylene	0.231	0.010	"	0.200		116	73-137			
o-Xylene	0.117	0.0050	"	0.0980		120	73-141			
Xylenes (total)	0.348	0.0050	"				30-150			
Gasoline Range Hydrocarbons	2.66	0.50	"				30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0399</i>		<i>"</i>	<i>0.0400</i>		<i>99.8</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0402</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0389</i>		<i>"</i>	<i>0.0400</i>		<i>97.4</i>	<i>21-167</i>			

Matrix Spike (1705080-MS1)

Source: 1705045-01

Prepared: 05/08/17 Analyzed: 05/09/17

Benzene	0.108	0.0020	mg/kg	0.100	ND	108	30-131			
Toluene	0.121	0.0050	"	0.100	ND	121	30-134			
Ethylbenzene	0.126	0.0050	"	0.0992	ND	127	22-153			
m,p-Xylene	0.233	0.010	"	0.200	ND	117	10-159			
o-Xylene	0.120	0.0050	"	0.0980	ND	123	31-151			
Xylenes (total)	0.353	0.0050	"		ND		30-150			
Gasoline Range Hydrocarbons	2.67	0.50	"		ND		30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0424</i>		<i>"</i>	<i>0.0400</i>		<i>106</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0401</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0394</i>		<i>"</i>	<i>0.0400</i>		<i>98.6</i>	<i>21-167</i>			

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
 Project Manager: Blake Ford

Reported:
 05/12/17 13:30

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

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

Batch 1705080 - EPA 5030 Soil MS

Matrix Spike Dup (1705080-MSD1)	Source: 1705045-01			Prepared: 05/08/17		Analyzed: 05/09/17				
Benzene	0.109	0.0020	mg/kg	0.100	ND	109	30-131	1.30	34	
Toluene	0.120	0.0050	"	0.100	ND	120	30-134	0.174	30	
Ethylbenzene	0.128	0.0050	"	0.0992	ND	129	22-153	1.96	24	
m,p-Xylene	0.239	0.010	"	0.200	ND	120	10-159	2.83	68	
o-Xylene	0.122	0.0050	"	0.0980	ND	125	31-151	1.78	38	
Xylenes (total)	0.362	0.0050	"		ND		30-150	2.48	20	
Gasoline Range Hydrocarbons	2.80	0.50	"		ND		30-150	4.79	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0418</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0398</i>		<i>"</i>	<i>0.0400</i>		<i>99.5</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0396</i>		<i>"</i>	<i>0.0400</i>		<i>98.9</i>	<i>21-167</i>			

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/12/17 13:30

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

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

Batch 1705069 - General Preparation

Blank (1705069-BLK1)

Prepared & Analyzed: 05/08/17

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

LCS (1705069-BS1)

Prepared & Analyzed: 05/08/17

Calcium	478	10.0	mg/kg wet	500	95.7	82.9-118			
Magnesium	463	5.00	"	500	92.7	77.1-123			
Sodium	462	5.00	"	500	92.4	71-129			

Duplicate (1705069-DUP1)

Source: 1705015-01

Prepared & Analyzed: 05/08/17

Calcium	2360	11.0	mg/kg dry	2560			7.97	200	
Magnesium	412	5.50	"	431			4.65	200	
Sodium	148	5.50	"	159			6.79	200	

Matrix Spike (1705069-MS1)

Source: 1705015-01

Prepared & Analyzed: 05/08/17

Calcium	3020	11.0	mg/kg dry	550	2560	84.7	75-125		
Magnesium	853	5.50	"	550	431	76.6	75-125		
Sodium	619	5.50	"	550	159	83.8	75-125		

Matrix Spike Dup (1705069-MSD1)

Source: 1705015-01

Prepared & Analyzed: 05/08/17

Calcium	3070	11.0	mg/kg dry	550	2560	92.6	75-125	1.44	25
Magnesium	864	5.50	"	550	431	78.7	75-125	1.37	25
Sodium	636	5.50	"	550	159	86.8	75-125	2.63	25

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/12/17 13:30

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

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

Batch 1705090 - General Preparation

LCS (1705090-BS1)					Prepared & Analyzed: 05/09/17					
pH	8.01	0.100	pH Units	8.00	100	95-105				
Duplicate (1705090-DUP1)					Source: 1705015-01 Prepared & Analyzed: 05/09/17					
pH	8.74	0.100	pH Units	9.64	9.79	20				

Batch 1705091 - General Preparation

Blank (1705091-BLK1)					Prepared & Analyzed: 05/09/17					
Specific Conductance (EC)	ND	0.0100	mmhos/cm							
LCS (1705091-BS1)					Prepared & Analyzed: 05/09/17					
Specific Conductance (EC)	0.750	0.0100	mmhos/cm	0.750	100	90-110				
Duplicate (1705091-DUP1)					Source: 1705015-01 Prepared & Analyzed: 05/09/17					
Specific Conductance (EC)	1.09	0.0100	mmhos/cm	1.10	0.910	20				

Batch 1705092 - General Preparation

Duplicate (1705092-DUP1)					Source: 1705058-01 Prepared: 05/09/17 Analyzed: 05/10/17					
% Solids	84.6		%	81.3	3.98	20				

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/12/17 13:30

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

May 12, 2017

Chris Hines
Extraction Oil & Gas
570 17th St. Suite 550
Denver, CO 80202
RE: Highlands #1

Enclosed are the results of analyses for samples received by Summit Scientific on 05/05/17 16:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

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

Paul Shrewsbury
President

S₂

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/12/17 15:09

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
N04@10'	1705068-01	Soil	05/05/17 12:48	05/05/17 16:00

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.



S₂

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/12/17 15:09

Sample Receipt Checklist

S2 Work Order: 1705068

Client: Extraction Oil Client Project ID: Highlands #1

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

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

Cooler ID					
Temp (°C)	<u>21.6</u>				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ? NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.	<input checked="" type="checkbox"/>			
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			<u>on ice</u>
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⁾ ? 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⁾ ? 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.

Paul S. Newberry
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

5-5-17 1605
Date/Time

[Signature]



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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/12/17 15:09

N04@10'
1705068-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/05/17 12:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705076	05/08/17	05/09/17	8015M	

Date Sampled: **05/05/17 12:48**

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

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/05/17 12:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705080	05/08/17	05/09/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **05/05/17 12:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		100 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.0 %	21-167		"	"	"	"	

Semivolatile Organic Compounds by EPA Method 8270D SIM

Date Sampled: **05/05/17 12:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	1705089	05/09/17	05/10/17	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/12/17 15:09

N04@10'
1705068-01 (Soil)

Summit Scientific

Semivolatile Organic Compounds by EPA Method 8270D SIM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzo (a) anthracene	ND	0.00500	mg/kg	1	1705089	05/09/17	05/10/17	EPA 8270D SIM	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Naphthalene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **05/05/17 12:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		83.4 %	30-150		"	"	"	"	
Surrogate: Fluoranthene-d10		86.5 %	30-150		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **05/05/17 12:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.13	0.228	mg/kg dry	1	1705099	05/10/17	05/10/17	EPA 6020A	
Barium	21.8	0.457	"	"	"	"	"	"	
Cadmium	ND	0.114	"	"	"	"	"	"	
Chromium	9.84	0.571	"	"	"	"	"	"	
Copper	10.0	0.571	"	"	"	"	"	"	
Lead	11.0	0.228	"	"	"	"	"	"	
Nickel	11.9	0.114	"	"	"	"	"	"	
Selenium	ND	0.457	"	"	"	"	"	"	
Silver	ND	0.114	"	"	"	"	"	"	
Zinc	54.4	11.4	"	"	"	"	"	"	

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/12/17 15:09

N04@10'
1705068-01 (Soil)

Summit Scientific

Total Mercury by EPA Method 7471

Date Sampled: **05/05/17 12:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Mercury	ND	0.0571	mg/kg dry	1	1705072	05/08/17	05/09/17	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: **05/05/17 12:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.300	mg/kg dry	1	1705094	05/09/17	05/12/17	EPA 7196	

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

Date Sampled: **05/05/17 12:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	164	11.4	mg/kg dry	1	1705069	05/08/17	05/08/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	163	5.71	"	"	"	"	"	"	
Sodium	39.5	5.71	"	"	"	"	"	"	
Sodium Adsorption Ratio	0.490		units	"	1705095	05/09/17	05/09/17	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/05/17 12:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.464	0.0100	mmhos/cm	1	1705091	05/09/17	05/09/17	SM 2510B	
pH	8.17	0.100	pH Units	"	1705090	05/09/17	05/09/17	EPA 9045	
% Solids	87.6		%	"	1705092	05/09/17	05/10/17	% calculation	

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/12/17 15:09

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1705076 - EPA 3550A

Blank (1705076-BLK1)

Prepared & Analyzed: 05/08/17

C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	13.2		"	12.5		106	30-150				

LCS (1705076-BS1)

Prepared & Analyzed: 05/08/17

C10-C28 (DRO)	655	50	mg/kg	499		131	73-134				
<i>Surrogate: o-Terphenyl</i>	13.3		"	12.5		107	30-150				

Matrix Spike (1705076-MS1)

Source: 1705045-01

Prepared: 05/08/17 Analyzed: 05/09/17

C10-C28 (DRO)	1160	50	mg/kg	499	ND	233	50-148				QM-07
<i>Surrogate: o-Terphenyl</i>	12.9		"	12.5		103	30-150				

Matrix Spike Dup (1705076-MSD1)

Source: 1705045-01

Prepared: 05/08/17 Analyzed: 05/09/17

C10-C28 (DRO)	924	50	mg/kg	499	ND	185	50-148	22.7	20		QM-07
<i>Surrogate: o-Terphenyl</i>	12.5		"	12.5		100	30-150				

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/12/17 15:09

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

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

Batch 1705080 - EPA 5030 Soil MS

Blank (1705080-BLK1)

Prepared: 05/08/17 Analyzed: 05/09/17

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	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0405</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0398</i>		<i>"</i>	<i>0.0400</i>		<i>99.4</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0396</i>		<i>"</i>	<i>0.0400</i>		<i>99.0</i>	<i>21-167</i>			

LCS (1705080-BS1)

Prepared: 05/08/17 Analyzed: 05/09/17

Benzene	0.107	0.0020	mg/kg	0.100		107	58-130			
Toluene	0.118	0.0050	"	0.100		118	61-134			
Ethylbenzene	0.124	0.0050	"	0.0992		125	74-139			
m,p-Xylene	0.231	0.010	"	0.200		116	73-137			
o-Xylene	0.117	0.0050	"	0.0980		120	73-141			
Xylenes (total)	0.348	0.0050	"				30-150			
Gasoline Range Hydrocarbons	2.66	0.50	"				30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0399</i>		<i>"</i>	<i>0.0400</i>		<i>99.8</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0402</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0389</i>		<i>"</i>	<i>0.0400</i>		<i>97.4</i>	<i>21-167</i>			

Matrix Spike (1705080-MS1)

Source: 1705045-01

Prepared: 05/08/17 Analyzed: 05/09/17

Benzene	0.108	0.0020	mg/kg	0.100	ND	108	30-131			
Toluene	0.121	0.0050	"	0.100	ND	121	30-134			
Ethylbenzene	0.126	0.0050	"	0.0992	ND	127	22-153			
m,p-Xylene	0.233	0.010	"	0.200	ND	117	10-159			
o-Xylene	0.120	0.0050	"	0.0980	ND	123	31-151			
Xylenes (total)	0.353	0.0050	"		ND		30-150			
Gasoline Range Hydrocarbons	2.67	0.50	"		ND		30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0424</i>		<i>"</i>	<i>0.0400</i>		<i>106</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0401</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0394</i>		<i>"</i>	<i>0.0400</i>		<i>98.6</i>	<i>21-167</i>			

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
 Project Manager: Chris Hines

Reported:
 05/12/17 15:09

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

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

Batch 1705080 - EPA 5030 Soil MS

Matrix Spike Dup (1705080-MSD1)	Source: 1705045-01			Prepared: 05/08/17	Analyzed: 05/09/17					
Benzene	0.109	0.0020	mg/kg	0.100	ND	109	30-131	1.30	34	
Toluene	0.120	0.0050	"	0.100	ND	120	30-134	0.174	30	
Ethylbenzene	0.128	0.0050	"	0.0992	ND	129	22-153	1.96	24	
m,p-Xylene	0.239	0.010	"	0.200	ND	120	10-159	2.83	68	
o-Xylene	0.122	0.0050	"	0.0980	ND	125	31-151	1.78	38	
Xylenes (total)	0.362	0.0050	"		ND		30-150	2.48	20	
Gasoline Range Hydrocarbons	2.80	0.50	"		ND		30-150	4.79	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0418</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0398</i>		<i>"</i>	<i>0.0400</i>		<i>99.5</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0396</i>		<i>"</i>	<i>0.0400</i>		<i>98.9</i>	<i>21-167</i>			

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/12/17 15:09

Semivolatile Organic Compounds by EPA Method 8270D SIM - Quality Control
Summit Scientific

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

Batch 1705089 - EPA 5030 Soil MS

Blank (1705089-BLK1)

Prepared: 05/09/17 Analyzed: 05/10/17

Acenaphthene	ND	0.00500	mg/kg							
Anthracene	ND	0.00500	"							
Benzo (a) anthracene	ND	0.00500	"							
Benzo (b) fluoranthene	ND	0.00500	"							
Benzo (k) fluoranthene	ND	0.00500	"							
Benzo (a) pyrene	ND	0.00500	"							
Chrysene	ND	0.00500	"							
Dibenz (a,h) anthracene	ND	0.00500	"							
Fluoranthene	ND	0.00500	"							
Fluorene	ND	0.00500	"							
Indeno (1,2,3-cd) pyrene	ND	0.00500	"							
Naphthalene	ND	0.00500	"							
Pyrene	ND	0.00500	"							
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.0277		"	0.0333		83.2	30-150			
<i>Surrogate: Fluoranthene-d10</i>	0.0282		"	0.0333		84.5	30-150			

LCS (1705089-BS1)

Prepared: 05/09/17 Analyzed: 05/10/17

Acenaphthene	0.0293	0.00500	mg/kg	0.0333		87.8	48-131			
Anthracene	0.0301	0.00500	"	0.0333		90.2	48-135			
Benzo (a) anthracene	0.0290	0.00500	"	0.0333		87.1	37-142			
Benzo (b) fluoranthene	0.0192	0.00500	"	0.0333		57.7	35-139			
Benzo (k) fluoranthene	0.0186	0.00500	"	0.0333		55.9	30-139			
Benzo (a) pyrene	0.0189	0.00500	"	0.0333		56.7	41-132			
Chrysene	0.0286	0.00500	"	0.0333		85.8	30-136			
Dibenz (a,h) anthracene	0.0168	0.00500	"	0.0333		50.4	24-127			
Fluoranthene	0.0264	0.00500	"	0.0333		79.2	50-139			
Fluorene	0.0287	0.00500	"	0.0333		86.2	50-130			
Indeno (1,2,3-cd) pyrene	0.0166	0.00500	"	0.0333		49.8	26-139			
Naphthalene	0.0302	0.00500	"	0.0333		90.6	40-135			
Pyrene	0.0288	0.00500	"	0.0333		86.4	39-141			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.0304		"	0.0333		91.3	50-150			
<i>Surrogate: Fluoranthene-d10</i>	0.0290		"	0.0333		87.1	50-150			

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/12/17 15:09

Semivolatile Organic Compounds by EPA Method 8270D SIM - Quality Control
Summit Scientific

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

Batch 1705089 - EPA 5030 Soil MS

Matrix Spike (1705089-MS1)	Source: 1705068-01			Prepared: 05/09/17		Analyzed: 05/10/17				
Acenaphthene	0.0228	0.00500	mg/kg	0.0333	ND	68.5	27-140			
Anthracene	0.0237	0.00500	"	0.0333	ND	71.2	23-144			
Benzo (a) anthracene	0.0231	0.00500	"	0.0333	ND	69.4	12-168			
Benzo (b) fluoranthene	0.0157	0.00500	"	0.0333	ND	47.1	10-170			
Benzo (k) fluoranthene	0.0153	0.00500	"	0.0333	ND	45.8	11-150			
Benzo (a) pyrene	0.0150	0.00500	"	0.0333	ND	45.1	11-162			
Chrysene	0.0229	0.00500	"	0.0333	ND	68.7	10-167			
Dibenz (a,h) anthracene	0.0136	0.00500	"	0.0333	ND	40.9	10-128			
Fluoranthene	0.0222	0.00500	"	0.0333	ND	66.6	18-157			
Fluorene	0.0231	0.00500	"	0.0333	ND	69.3	37-133			
Indeno (1,2,3-cd) pyrene	0.0133	0.00500	"	0.0333	ND	39.9	10-161			
Naphthalene	0.0230	0.00500	"	0.0333	ND	69.1	10-157			
Pyrene	0.0228	0.00500	"	0.0333	ND	68.4	10-166			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0248</i>		"	<i>0.0333</i>		<i>74.5</i>	<i>50-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0258</i>		"	<i>0.0333</i>		<i>77.3</i>	<i>50-150</i>			

Matrix Spike Dup (1705089-MSD1)	Source: 1705068-01			Prepared: 05/09/17		Analyzed: 05/10/17				
Acenaphthene	0.0271	0.00500	mg/kg	0.0333	ND	81.3	27-140	17.1	15	QM-07
Anthracene	0.0282	0.00500	"	0.0333	ND	84.6	23-144	17.2	29	
Benzo (a) anthracene	0.0273	0.00500	"	0.0333	ND	81.9	12-168	16.4	65	
Benzo (b) fluoranthene	0.0183	0.00500	"	0.0333	ND	54.9	10-170	15.3	18	
Benzo (k) fluoranthene	0.0180	0.00500	"	0.0333	ND	53.9	11-150	16.3	32	
Benzo (a) pyrene	0.0177	0.00500	"	0.0333	ND	53.1	11-162	16.3	27	
Chrysene	0.0267	0.00500	"	0.0333	ND	80.1	10-167	15.4	88	
Dibenz (a,h) anthracene	0.0160	0.00500	"	0.0333	ND	48.0	10-128	16.1	20	
Fluoranthene	0.0256	0.00500	"	0.0333	ND	76.8	18-157	14.2	31	
Fluorene	0.0274	0.00500	"	0.0333	ND	82.1	37-133	16.9	16	QM-07
Indeno (1,2,3-cd) pyrene	0.0160	0.00500	"	0.0333	ND	47.9	10-161	18.2	22	
Naphthalene	0.0278	0.00500	"	0.0333	ND	83.3	10-157	18.6	24	
Pyrene	0.0263	0.00500	"	0.0333	ND	78.8	10-166	14.2	57	
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0313</i>		"	<i>0.0333</i>		<i>94.0</i>	<i>50-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0313</i>		"	<i>0.0333</i>		<i>93.8</i>	<i>50-150</i>			

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/12/17 15:09

Total Metals by EPA Method 6020 - Dry Weight Basis - Quality Control
Summit Scientific

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

Batch 1705099 - EPA 3050B

Blank (1705099-BLK1)

Prepared & Analyzed: 05/10/17

Arsenic	ND	0.200	mg/kg wet							
Barium	ND	0.400	"							
Cadmium	ND	0.100	"							
Chromium	ND	0.500	"							
Copper	ND	0.500	"							
Lead	ND	0.200	"							
Nickel	ND	0.100	"							
Selenium	ND	0.400	"							
Silver	ND	0.100	"							
Zinc	ND	10.0	"							

LCS (1705099-BS1)

Prepared & Analyzed: 05/10/17

Arsenic	37.3	0.200	mg/kg wet	40.0	93.3	56.9-110
Barium	36.6	0.400	"	40.0	91.4	59.3-113
Cadmium	1.93	0.100	"	2.00	96.5	63.1-113
Chromium	37.0	0.500	"	40.0	92.5	57.4-110
Copper	38.5	0.500	"	40.0	96.3	64.6-110
Lead	18.9	0.200	"	20.0	94.3	64-110
Nickel	36.7	0.100	"	40.0	91.9	63.2-110
Selenium	3.81	0.400	"	4.00	95.2	55.2-110
Silver	1.85	0.100	"	2.00	92.5	53.1-114
Zinc	39.9	10.0	"	40.0	99.7	62-110

Duplicate (1705099-DUP1)

Source: 1705095-01

Prepared & Analyzed: 05/10/17

Arsenic	1.45	0.229	mg/kg dry	1.50	3.00	20
Barium	213	0.458	"	211	0.976	20
Cadmium	4.80	0.114	"	4.68	2.37	20
Chromium	7.83	0.572	"	8.04	2.65	20
Copper	21.5	0.572	"	21.8	1.58	20
Lead	158	0.229	"	155	1.42	20
Nickel	6.46	0.114	"	6.62	2.37	20
Selenium	0.328	0.458	"	0.351	7.00	20
Silver	0.242	0.114	"	0.255	4.95	20
Zinc	1540	11.4	"	1550	0.582	20

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

Project: Highlands #1

Project Number: [none]
 Project Manager: Chris Hines

Reported:
 05/12/17 15:09

Total Metals by EPA Method 6020 - Dry Weight Basis - Quality Control
Summit Scientific

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

Batch 1705099 - EPA 3050B

Matrix Spike (1705099-MS1)

Source: 1705095-01

Prepared & Analyzed: 05/10/17

Arsenic	21.6	0.229	mg/kg dry	45.8	1.50	43.9	75-125				QM-07
Barium	120	0.458	"	45.8	211	NR	75-125				QM-07
Cadmium	8.63	0.114	"	2.29	4.68	172	75-125				QM-07
Chromium	47.8	0.572	"	45.8	8.04	86.9	75-125				
Copper	69.7	0.572	"	45.8	21.8	105	75-125				
Lead	249	0.229	"	22.9	155	409	75-125				QM-07
Nickel	45.3	0.114	"	45.8	6.62	84.5	75-125				
Selenium	4.12	0.458	"	4.58	0.351	82.4	75-125				
Silver	2.25	0.114	"	2.29	0.255	87.2	75-125				
Zinc	1880	11.4	"	45.8	1550	712	75-125				QM-07

Matrix Spike Dup (1705099-MSD1)

Source: 1705095-01

Prepared & Analyzed: 05/10/17

Arsenic	18.2	0.229	mg/kg dry	45.8	1.50	36.6	75-125	16.8	25		QM-07
Barium	161	0.458	"	45.8	211	NR	75-125	29.3	25		QM-07
Cadmium	7.02	0.114	"	2.29	4.68	102	75-125	20.6	25		
Chromium	47.8	0.572	"	45.8	8.04	87.0	75-125	0.0965	25		
Copper	69.0	0.572	"	45.8	21.8	103	75-125	0.999	25		
Lead	216	0.229	"	22.9	155	266	75-125	14.1	25		QM-07
Nickel	46.1	0.114	"	45.8	6.62	86.3	75-125	1.82	25		
Selenium	4.25	0.458	"	4.58	0.351	85.3	75-125	3.12	25		
Silver	2.37	0.114	"	2.29	0.255	92.5	75-125	5.26	25		
Zinc	1360	11.4	"	45.8	1550	NR	75-125	31.7	25		QM-07

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
 Project Manager: Chris Hines

Reported:
 05/12/17 15:09

Total Mercury by EPA Method 7471 - Quality Control
Summit Scientific

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

Batch 1705072 - EPA 7471A

Blank (1705072-BLK1)

Prepared: 05/08/17 Analyzed: 05/09/17

Mercury ND 0.0500 mg/kg wet

LCS (1705072-BS1)

Prepared: 05/08/17 Analyzed: 05/09/17

Mercury 0.462 0.0500 mg/kg wet 0.500 92.3 80-120

Duplicate (1705072-DUP1)

Source: 1705015-01

Prepared: 05/08/17 Analyzed: 05/09/17

Mercury 0.00604 0.0550 mg/kg dry 0.00560 7.56 20

Matrix Spike (1705072-MS1)

Source: 1705015-01

Prepared: 05/08/17 Analyzed: 05/09/17

Mercury 0.485 0.0550 mg/kg dry 0.550 0.00560 87.2 80-120

Matrix Spike Dup (1705072-MSD1)

Source: 1705015-01

Prepared: 05/08/17 Analyzed: 05/09/17

Mercury 0.495 0.0550 mg/kg dry 0.550 0.00560 89.0 80-120 1.95 20

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/12/17 15:09

Hexavalent Chromium by EPA 7196 - Quality Control
Summit Scientific

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

Batch 1705094 - 3060A_Mod

Blank (1705094-BLK1)			Prepared: 05/09/17 Analyzed: 05/12/17							
Chromium, Hexavalent	ND	0.300	mg/kg wet							
LCS (1705094-BS1)			Prepared: 05/09/17 Analyzed: 05/12/17							
Chromium, Hexavalent	19.8	0.300	mg/kg wet	19.9		99.1	85-115			
Duplicate (1705094-DUP1)			Source: 1705061-01 Prepared: 05/09/17 Analyzed: 05/12/17							
Chromium, Hexavalent	ND	0.300	mg/kg dry		ND				20	
Matrix Spike (1705094-MS1)			Source: 1705061-01 Prepared: 05/09/17 Analyzed: 05/12/17							
Chromium, Hexavalent	23.8	0.300	mg/kg dry	24.7	ND	96.5	85-115			
Matrix Spike (1705094-MS2)			Source: 1705083-01 Prepared: 05/09/17 Analyzed: 05/12/17							
Chromium, Hexavalent	17.5	0.300	mg/kg dry	22.8	ND	76.6	85-115			QM-Cr
Post Spike (1705094-PS1)			Source: 1705061-01 Prepared: 05/09/17 Analyzed: 05/12/17							
Chromium, Hexavalent	0.496		mg/kg	0.498	0.00	99.5	85-115			

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: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/12/17 15:09

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

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

Batch 1705069 - General Preparation

Blank (1705069-BLK1)

Prepared & Analyzed: 05/08/17

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

LCS (1705069-BS1)

Prepared & Analyzed: 05/08/17

Calcium	478	10.0	mg/kg wet	500	95.7	82.9-118			
Magnesium	463	5.00	"	500	92.7	77.1-123			
Sodium	462	5.00	"	500	92.4	71-129			

Duplicate (1705069-DUP1)

Source: 1705015-01

Prepared & Analyzed: 05/08/17

Calcium	2360	11.0	mg/kg dry	2560			7.97	200	
Magnesium	412	5.50	"	431			4.65	200	
Sodium	148	5.50	"	159			6.79	200	

Matrix Spike (1705069-MS1)

Source: 1705015-01

Prepared & Analyzed: 05/08/17

Calcium	3020	11.0	mg/kg dry	550	2560	84.7	75-125		
Magnesium	853	5.50	"	550	431	76.6	75-125		
Sodium	619	5.50	"	550	159	83.8	75-125		

Matrix Spike Dup (1705069-MSD1)

Source: 1705015-01

Prepared & Analyzed: 05/08/17

Calcium	3070	11.0	mg/kg dry	550	2560	92.6	75-125	1.44	25
Magnesium	864	5.50	"	550	431	78.7	75-125	1.37	25
Sodium	636	5.50	"	550	159	86.8	75-125	2.63	25

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/12/17 15:09

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

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

Batch 1705090 - General Preparation

LCS (1705090-BS1)					Prepared & Analyzed: 05/09/17					
pH	8.01	0.100	pH Units	8.00	100	95-105				
Duplicate (1705090-DUP1)					Source: 1705015-01		Prepared & Analyzed: 05/09/17			
pH	8.74	0.100	pH Units	9.64	9.79	20				

Batch 1705091 - General Preparation

Blank (1705091-BLK1)					Prepared & Analyzed: 05/09/17					
Specific Conductance (EC)	ND	0.0100	mmhos/cm							
LCS (1705091-BS1)					Prepared & Analyzed: 05/09/17					
Specific Conductance (EC)	0.750	0.0100	mmhos/cm	0.750	100	90-110				
Duplicate (1705091-DUP1)					Source: 1705015-01		Prepared & Analyzed: 05/09/17			
Specific Conductance (EC)	1.09	0.0100	mmhos/cm	1.10	0.910	20				

Batch 1705092 - General Preparation

Duplicate (1705092-DUP1)					Source: 1705058-01		Prepared: 05/09/17 Analyzed: 05/10/17			
% Solids	84.6		%	81.3	3.98	20				

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/12/17 15:09

Notes and Definitions

- QM-Cr The matrix spike was outside (low) the normal quality control recovery windows. This is a common occurrence for this method since interferences in the sample can cause the hexavalent chromium to be reduced to other forms of chromium.
- 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

May 15, 2017

Chris Hines
Extraction Oil & Gas
570 17th St. Suite 550
Denver, CO 80202
RE: Highlands #1

Enclosed are the results of analyses for samples received by Summit Scientific on 05/08/17 17:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

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

Paul Shrewsbury
President



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

Project: Highlands #1

Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B06@10'	1705083-01	Soil	05/08/17 11:48	05/08/17 17:45
N05@7'	1705083-02	Soil	05/08/17 11:58	05/08/17 17:45
B05@10'	1705083-03	Soil	05/08/17 12:26	05/08/17 17:45
N06@7'	1705083-04	Soil	05/08/17 12:30	05/08/17 17:45
N07@7'	1705083-05	Soil	05/08/17 12:35	05/08/17 17:45
E01@7'	1705083-06	Soil	05/08/17 12:37	05/08/17 17:45

Summit Scientific

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

Project: Highlands #1

Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

Summit Scientific

1705083

741 Corporate Circle Suite 1 • Golden, Colorado 80401
303-277-9310 • 303-374-5933 Fax

Page 1 of 1

Client: Extraction Oil & Gas- Blake Ford
Address: 370 17th Street, Suite 5300
City/State/Zip: Denver, Colorado 80202
Phone: 970.778.5956 Fax:
Sampler Name: Brian Gibson

Project Manager: Chris Hines- 970.261.1127
E-Mail: BFord@extractionog.com, Chris.Hines@apexcos.com, Jhickey@apexcos.com
Project Name: Highland #1
Project Number: 744.1608.01/079/002

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	PAH	pH, SAR, EC	PCB/Ag-Metals 910		TH010
B06010'	5/8/17	1148	1			X						X	X	X	X	X		* Run if TPH>500ppm, or benzene>0.21ppm Report per Paul, COGCC Table 910-1. Call Chris Hines with Questions (970-261-1127)
N0507'		1158																
B05010'		1226																
N0607'		1230																
N0707'		1235																
E0107'		1237																
Relinquished by:				Date/Time: 5/8/17 7:45	Received by:				Date/Time: 5-8-17 1748	Turn Around Time (Check)			Notes: ONIC					
Relinquished by:				Date/Time:	Received by:				Date/Time:	Same Day <input type="checkbox"/>			72 Hours <input type="checkbox"/>					
Relinquished by:				Date/Time:	Received by:				Date/Time:	24 Hours <input type="checkbox"/>			Standard <input checked="" type="checkbox"/>					
Relinquished by:				Date/Time:	Received by:				Date/Time:	48 Hours <input type="checkbox"/>			Sample Integrity:					
										Temperature Upon Receipt: 29			Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>					

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S₂

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

Project: Highlands #1

Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

Sample Receipt Checklist

S2 Work Order: 1705083

Client: Extraction Oil Client Project ID: Highlands #1

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

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

Cooler ID					
Temp (°C)	2.9				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.				
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			ON ICE
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"/>		<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, H ₂ SO ₄ , NaOH, HNO ₃ , 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.				

Paul Stewart
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

5-8-17
Date/Time

[Signature]



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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

B06@10'
1705083-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/08/17 11:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705086	05/09/17	05/10/17	8015M	

Date Sampled: **05/08/17 11:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		108 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/08/17 11:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705104	05/10/17	05/10/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **05/08/17 11:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

Semivolatile Organic Compounds by EPA Method 8270D SIM

Date Sampled: **05/08/17 11:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	1705089	05/09/17	05/10/17	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

B06@10'
1705083-01 (Soil)

Summit Scientific

Semivolatile Organic Compounds by EPA Method 8270D SIM

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Benzo (a) anthracene	ND	0.00500	mg/kg	1	1705089	05/09/17	05/10/17	EPA 8270D SIM
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"
Chrysene	ND	0.00500	"	"	"	"	"	"
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"
Fluoranthene	ND	0.00500	"	"	"	"	"	"
Fluorene	ND	0.00500	"	"	"	"	"	"
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"
Naphthalene	ND	0.00500	"	"	"	"	"	"
Pyrene	ND	0.00500	"	"	"	"	"	"

Date Sampled: **05/08/17 11:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		73.1 %	30-150		"	"	"	"	
Surrogate: Fluoranthene-d10		74.3 %	30-150		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **05/08/17 11:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.06	0.229	mg/kg dry	1	1705099	05/10/17	05/10/17	EPA 6020A	
Barium	27.3	0.458	"	"	"	"	"	"	
Cadmium	ND	0.114	"	"	"	"	"	"	
Chromium	8.57	0.572	"	"	"	"	"	"	
Copper	8.62	0.572	"	"	"	"	"	"	
Lead	10.1	0.229	"	"	"	"	"	"	
Nickel	10.6	0.114	"	"	"	"	"	"	
Selenium	ND	0.458	"	"	"	"	"	"	
Silver	ND	0.114	"	"	"	"	"	"	
Zinc	45.5	11.4	"	"	"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

B06@10'
1705083-01 (Soil)

Summit Scientific

Total Mercury by EPA Method 7471

Date Sampled: **05/08/17 11:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Mercury	ND	0.0572	mg/kg dry	1	1705109	05/10/17	05/11/17	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: **05/08/17 11:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.300	mg/kg dry	1	1705094	05/09/17	05/12/17	EPA 7196	

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

Date Sampled: **05/08/17 11:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	456	11.4	mg/kg dry	1	1705093	05/09/17	05/09/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	259	5.72	"	"	"	"	"	"	
Sodium	34.6	5.72	"	"	"	"	"	"	
Sodium Adsorption Ratio	0.321		units	"	1705098	05/10/17	05/11/17	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/08/17 11:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.57	0.100	pH Units	1	1705123	05/11/17	05/12/17	EPA 9045	
% Solids	87.4		%	"	1705092	05/09/17	05/10/17	% calculation	
Specific Conductance (EC)	0.426	0.0100	mmhos/cm	"	1705126	05/11/17	05/12/17	SM 2510B	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

N05@7'
1705083-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/08/17 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705086	05/09/17	05/10/17	8015M	

Date Sampled: **05/08/17 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		99.1 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/08/17 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705104	05/10/17	05/10/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **05/08/17 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		113 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Semivolatile Organic Compounds by EPA Method 8270D SIM

Date Sampled: **05/08/17 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	1705089	05/09/17	05/10/17	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

N05@7'
1705083-02 (Soil)

Summit Scientific

Semivolatile Organic Compounds by EPA Method 8270D SIM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzo (a) anthracene	ND	0.00500	mg/kg	1	1705089	05/09/17	05/10/17	EPA 8270D SIM	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Naphthalene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **05/08/17 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		85.7 %	30-150		"	"	"	"	
Surrogate: Fluoranthene-d10		80.9 %	30-150		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **05/08/17 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.31	0.233	mg/kg dry	1	1705099	05/10/17	05/10/17	EPA 6020A	
Barium	44.7	0.465	"	"	"	"	"	"	
Cadmium	ND	0.116	"	"	"	"	"	"	
Chromium	9.34	0.581	"	"	"	"	"	"	
Copper	10.0	0.581	"	"	"	"	"	"	
Lead	10.9	0.233	"	"	"	"	"	"	
Nickel	12.3	0.116	"	"	"	"	"	"	
Selenium	ND	0.465	"	"	"	"	"	"	
Silver	ND	0.116	"	"	"	"	"	"	
Zinc	50.0	11.6	"	"	"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

N05@7'
1705083-02 (Soil)

Summit Scientific

Total Mercury by EPA Method 7471

Date Sampled: **05/08/17 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Mercury	ND	0.0581	mg/kg dry	1	1705109	05/10/17	05/11/17	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: **05/08/17 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	4.65	0.300	mg/kg dry	1	1705094	05/09/17	05/12/17	EPA 7196	

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

Date Sampled: **05/08/17 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	505	11.6	mg/kg dry	1	1705093	05/09/17	05/09/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	204	5.81	"	"	"	"	"	"	
Sodium	40.8	5.81	"	"	"	"	"	"	
Sodium Adsorption Ratio	0.387		units	"	1705098	05/10/17	05/11/17	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/08/17 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.48	0.100	pH Units	1	1705123	05/11/17	05/12/17	EPA 9045	
% Solids	86.0		%	"	1705092	05/09/17	05/10/17	% calculation	
Specific Conductance (EC)	0.351	0.0100	mmhos/cm	"	1705126	05/11/17	05/12/17	SM 2510B	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

B05@10'
1705083-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/08/17 12:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705086	05/09/17	05/10/17	8015M	

Date Sampled: **05/08/17 12:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		110 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/08/17 12:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705104	05/10/17	05/10/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **05/08/17 12:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

Semivolatile Organic Compounds by EPA Method 8270D SIM

Date Sampled: **05/08/17 12:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	1705089	05/09/17	05/10/17	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	

Summit Scientific

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

Project: Highlands #1

Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

B05@10'
1705083-03 (Soil)

Summit Scientific

Semivolatile Organic Compounds by EPA Method 8270D SIM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzo (a) anthracene	ND	0.00500	mg/kg	1	1705089	05/09/17	05/10/17	EPA 8270D SIM	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Naphthalene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **05/08/17 12:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		86.2 %	30-150		"	"	"	"	
Surrogate: Fluoranthene-d10		84.0 %	30-150		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **05/08/17 12:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	1.95	0.232	mg/kg dry	1	1705099	05/10/17	05/10/17	EPA 6020A	
Barium	48.3	0.463	"	"	"	"	"	"	
Cadmium	ND	0.116	"	"	"	"	"	"	
Chromium	11.6	0.579	"	"	"	"	"	"	
Copper	11.0	0.579	"	"	"	"	"	"	
Lead	11.6	0.232	"	"	"	"	"	"	
Nickel	12.9	0.116	"	"	"	"	"	"	
Selenium	ND	0.463	"	"	"	"	"	"	
Silver	ND	0.116	"	"	"	"	"	"	
Zinc	56.4	11.6	"	"	"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

B05@10'
1705083-03 (Soil)

Summit Scientific

Total Mercury by EPA Method 7471

Date Sampled: **05/08/17 12:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Mercury	ND	0.0579	mg/kg dry	1	1705109	05/10/17	05/11/17	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: **05/08/17 12:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.300	mg/kg dry	1	1705094	05/09/17	05/12/17	EPA 7196	

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

Date Sampled: **05/08/17 12:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	647	11.6	mg/kg dry	1	1705093	05/09/17	05/09/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	279	5.79	"	"	"	"	"	"	
Sodium	34.5	5.79	"	"	"	"	"	"	
Sodium Adsorption Ratio	0.286		units	"	1705098	05/10/17	05/11/17	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/08/17 12:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.460	0.0100	mmhos/cm	1	1705126	05/11/17	05/12/17	SM 2510B	
% Solids	86.3		%	"	1705092	05/09/17	05/10/17	% calculation	
pH	8.43	0.100	pH Units	"	1705123	05/11/17	05/12/17	EPA 9045	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

N06@7'
1705083-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/08/17 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705086	05/09/17	05/10/17	8015M	

Date Sampled: **05/08/17 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		102 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/08/17 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705104	05/10/17	05/10/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **05/08/17 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		110 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		81.2 %	21-167		"	"	"	"	

Semivolatile Organic Compounds by EPA Method 8270D SIM

Date Sampled: **05/08/17 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	1705089	05/09/17	05/10/17	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

N06@7'
1705083-04 (Soil)

Summit Scientific

Semivolatile Organic Compounds by EPA Method 8270D SIM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzo (a) anthracene	ND	0.00500	mg/kg	1	1705089	05/09/17	05/10/17	EPA 8270D SIM	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Naphthalene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **05/08/17 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		82.9 %	30-150		"	"	"	"	
Surrogate: Fluoranthene-d10		81.7 %	30-150		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **05/08/17 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.30	0.235	mg/kg dry	1	1705099	05/10/17	05/10/17	EPA 6020A	
Barium	35.1	0.471	"	"	"	"	"	"	
Cadmium	ND	0.118	"	"	"	"	"	"	
Chromium	9.52	0.588	"	"	"	"	"	"	
Copper	10.0	0.588	"	"	"	"	"	"	
Lead	10.9	0.235	"	"	"	"	"	"	
Nickel	11.8	0.118	"	"	"	"	"	"	
Selenium	ND	0.471	"	"	"	"	"	"	
Silver	ND	0.118	"	"	"	"	"	"	
Zinc	51.2	11.8	"	"	"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

N06@7'
1705083-04 (Soil)

Summit Scientific

Total Mercury by EPA Method 7471

Date Sampled: **05/08/17 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Mercury	ND	0.0588	mg/kg dry	1	1705109	05/10/17	05/11/17	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: **05/08/17 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.300	mg/kg dry	1	1705094	05/09/17	05/12/17	EPA 7196	

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

Date Sampled: **05/08/17 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	319	11.8	mg/kg dry	1	1705093	05/09/17	05/09/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	222	5.88	"	"	"	"	"	"	
Sodium	140	5.88	"	"	"	"	"	"	
Sodium Adsorption Ratio	1.47		units	"	1705098	05/10/17	05/11/17	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/08/17 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	85.0		%	1	1705092	05/09/17	05/10/17	% calculation	
Specific Conductance (EC)	0.370	0.0100	mmhos/cm	"	1705126	05/11/17	05/12/17	SM 2510B	
pH	8.46	0.100	pH Units	"	1705123	05/11/17	05/12/17	EPA 9045	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

N07@7'
1705083-05 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/08/17 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705086	05/09/17	05/10/17	8015M	

Date Sampled: **05/08/17 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		102 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/08/17 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705104	05/10/17	05/10/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **05/08/17 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		110 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

Semivolatile Organic Compounds by EPA Method 8270D SIM

Date Sampled: **05/08/17 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	1705089	05/09/17	05/10/17	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

N07@7'
1705083-05 (Soil)

Summit Scientific

Semivolatile Organic Compounds by EPA Method 8270D SIM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzo (a) anthracene	ND	0.00500	mg/kg	1	1705089	05/09/17	05/10/17	EPA 8270D SIM	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Naphthalene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **05/08/17 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		82.7 %	30-150		"	"	"	"	
Surrogate: Fluoranthene-d10		78.8 %	30-150		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **05/08/17 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.00	0.230	mg/kg dry	1	1705099	05/10/17	05/10/17	EPA 6020A	
Barium	40.3	0.459	"	"	"	"	"	"	
Cadmium	ND	0.115	"	"	"	"	"	"	
Chromium	9.49	0.574	"	"	"	"	"	"	
Copper	9.13	0.574	"	"	"	"	"	"	
Lead	10.5	0.230	"	"	"	"	"	"	
Nickel	11.5	0.115	"	"	"	"	"	"	
Selenium	ND	0.459	"	"	"	"	"	"	
Silver	ND	0.115	"	"	"	"	"	"	
Zinc	49.9	11.5	"	"	"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

N07@7'
1705083-05 (Soil)

Summit Scientific

Total Mercury by EPA Method 7471

Date Sampled: **05/08/17 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Mercury	ND	0.0574	mg/kg dry	1	1705109	05/10/17	05/11/17	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: **05/08/17 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.300	mg/kg dry	1	1705094	05/09/17	05/12/17	EPA 7196	

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

Date Sampled: **05/08/17 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	670	11.5	mg/kg dry	1	1705093	05/09/17	05/09/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	207	5.74	"	"	"	"	"	"	
Sodium	31.6	5.74	"	"	"	"	"	"	
Sodium Adsorption Ratio	0.274		units	"	1705098	05/10/17	05/11/17	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/08/17 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.56	0.100	pH Units	1	1705123	05/11/17	05/12/17	EPA 9045	
Specific Conductance (EC)	0.356	0.0100	mmhos/cm	"	1705126	05/11/17	05/12/17	SM 2510B	
% Solids	87.1		%	"	1705092	05/09/17	05/10/17	% calculation	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

E01@7'
1705083-06 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/08/17 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705086	05/09/17	05/10/17	8015M	

Date Sampled: **05/08/17 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		107 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/08/17 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705104	05/10/17	05/11/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **05/08/17 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		110 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

Semivolatile Organic Compounds by EPA Method 8270D SIM

Date Sampled: **05/08/17 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	1705089	05/09/17	05/10/17	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	

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

Project: Highlands #1

Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

E01@7'
1705083-06 (Soil)

Summit Scientific

Semivolatile Organic Compounds by EPA Method 8270D SIM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzo (a) anthracene	ND	0.00500	mg/kg	1	1705089	05/09/17	05/10/17	EPA 8270D SIM	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Naphthalene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **05/08/17 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		82.9 %	30-150		"	"	"	"	
Surrogate: Fluoranthene-d10		82.1 %	30-150		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **05/08/17 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.27	0.229	mg/kg dry	1	1705099	05/10/17	05/10/17	EPA 6020A	
Barium	22.1	0.458	"	"	"	"	"	"	
Cadmium	ND	0.115	"	"	"	"	"	"	
Chromium	9.74	0.573	"	"	"	"	"	"	
Copper	9.16	0.573	"	"	"	"	"	"	
Lead	10.7	0.229	"	"	"	"	"	"	
Nickel	11.0	0.115	"	"	"	"	"	"	
Selenium	ND	0.458	"	"	"	"	"	"	
Silver	ND	0.115	"	"	"	"	"	"	
Zinc	51.7	11.5	"	"	"	"	"	"	

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

E01@7'
1705083-06 (Soil)

Summit Scientific

Total Mercury by EPA Method 7471

Date Sampled: **05/08/17 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Mercury	ND	0.0573	mg/kg dry	1	1705109	05/10/17	05/11/17	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: **05/08/17 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.300	mg/kg dry	1	1705094	05/09/17	05/12/17	EPA 7196	

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

Date Sampled: **05/08/17 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	170	11.5	mg/kg dry	1	1705093	05/09/17	05/09/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	143	5.73	"	"	"	"	"	"	
Sodium	34.0	5.73	"	"	"	"	"	"	
Sodium Adsorption Ratio	0.465		units	"	1705098	05/10/17	05/11/17	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/08/17 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.61	0.100	pH Units	1	1705123	05/11/17	05/12/17	EPA 9045	
Specific Conductance (EC)	0.280	0.0100	mmhos/cm	"	1705126	05/11/17	05/12/17	SM 2510B	
% Solids	87.3		%	"	1705092	05/09/17	05/10/17	% calculation	

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

Project: Highlands #1

Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1705086 - EPA 3550A

Blank (1705086-BLK1)

Prepared & Analyzed: 05/09/17

C10-C28 (DRO)	ND	50	mg/kg							
<i>Surrogate: o-Terphenyl</i>	13.1		"	12.5		105	30-150			

LCS (1705086-BS1)

Prepared: 05/09/17 Analyzed: 05/10/17

C10-C28 (DRO)	472	50	mg/kg	499		94.5	73-134			
<i>Surrogate: o-Terphenyl</i>	14.1		"	12.5		113	30-150			

Matrix Spike (1705086-MS1)

Source: 1705083-01

Prepared: 05/09/17 Analyzed: 05/10/17

C10-C28 (DRO)	496	50	mg/kg	499	15.3	96.4	50-148			
<i>Surrogate: o-Terphenyl</i>	14.7		"	12.5		117	30-150			

Matrix Spike Dup (1705086-MSD1)

Source: 1705083-01

Prepared: 05/09/17 Analyzed: 05/10/17

C10-C28 (DRO)	480	50	mg/kg	499	15.3	93.2	50-148	3.27	20	
<i>Surrogate: o-Terphenyl</i>	14.0		"	12.5		112	30-150			

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

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

Batch 1705104 - EPA 5030 Soil MS

Blank (1705104-BLK1)

Prepared & Analyzed: 05/10/17

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	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0420</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0402</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0407</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>21-167</i>			

LCS (1705104-BS1)

Prepared & Analyzed: 05/10/17

Benzene	0.0942	0.0020	mg/kg	0.100		94.2	58-130			
Toluene	0.0990	0.0050	"	0.100		99.0	61-134			
Ethylbenzene	0.0974	0.0050	"	0.0992		98.2	74-139			
m,p-Xylene	0.191	0.010	"	0.200		95.7	73-137			
o-Xylene	0.0969	0.0050	"	0.0980		98.9	73-141			
Xylenes (total)	0.288	0.0050	"				30-150			
Gasoline Range Hydrocarbons	2.01	0.50	"				30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0439</i>		<i>"</i>	<i>0.0400</i>		<i>110</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0398</i>		<i>"</i>	<i>0.0400</i>		<i>99.4</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0408</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>21-167</i>			

Matrix Spike (1705104-MS1)

Source: 1705077-01

Prepared & Analyzed: 05/10/17

Benzene	0.0648	0.0020	mg/kg	0.100	ND	64.8	30-131			
Toluene	0.0563	0.0050	"	0.100	ND	56.3	30-134			
Ethylbenzene	0.0503	0.0050	"	0.0992	ND	50.7	22-153			
m,p-Xylene	0.0984	0.010	"	0.200	ND	49.3	10-159			
o-Xylene	0.0517	0.0050	"	0.0980	ND	52.8	31-151			
Xylenes (total)	0.150	0.0050	"		ND		30-150			
Gasoline Range Hydrocarbons	3.68	0.50	"		4.35		30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0500</i>		<i>"</i>	<i>0.0400</i>		<i>125</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0385</i>		<i>"</i>	<i>0.0400</i>		<i>96.3</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0399</i>		<i>"</i>	<i>0.0400</i>		<i>99.8</i>	<i>21-167</i>			

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

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

Batch 1705104 - EPA 5030 Soil MS

Matrix Spike Dup (1705104-MSD1)	Source: 1705077-01			Prepared & Analyzed: 05/10/17						
Benzene	0.0623	0.0020	mg/kg	0.100	ND	62.3	30-131	3.87	34	
Toluene	0.0537	0.0050	"	0.100	ND	53.7	30-134	4.80	30	
Ethylbenzene	0.0456	0.0050	"	0.0992	ND	45.9	22-153	9.95	24	
m,p-Xylene	0.0852	0.010	"	0.200	ND	42.7	10-159	14.4	68	
o-Xylene	0.0471	0.0050	"	0.0980	ND	48.1	31-151	9.35	38	
Xylenes (total)	0.132	0.0050	"		ND		30-150	12.6	20	
Gasoline Range Hydrocarbons	4.40	0.50	"		4.35		30-150	17.6	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0469</i>		<i>"</i>	<i>0.0400</i>		<i>117</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0382</i>		<i>"</i>	<i>0.0400</i>		<i>95.5</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0420</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>21-167</i>			

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

Semivolatile Organic Compounds by EPA Method 8270D SIM - Quality Control
Summit Scientific

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

Batch 1705089 - EPA 5030 Soil MS

Blank (1705089-BLK1)

Prepared: 05/09/17 Analyzed: 05/10/17

Acenaphthene	ND	0.00500	mg/kg							
Anthracene	ND	0.00500	"							
Benzo (a) anthracene	ND	0.00500	"							
Benzo (b) fluoranthene	ND	0.00500	"							
Benzo (k) fluoranthene	ND	0.00500	"							
Benzo (a) pyrene	ND	0.00500	"							
Chrysene	ND	0.00500	"							
Dibenz (a,h) anthracene	ND	0.00500	"							
Fluoranthene	ND	0.00500	"							
Fluorene	ND	0.00500	"							
Indeno (1,2,3-cd) pyrene	ND	0.00500	"							
Naphthalene	ND	0.00500	"							
Pyrene	ND	0.00500	"							
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.0277		"	0.0333		83.2	30-150			
<i>Surrogate: Fluoranthene-d10</i>	0.0282		"	0.0333		84.5	30-150			

LCS (1705089-BS1)

Prepared: 05/09/17 Analyzed: 05/10/17

Acenaphthene	0.0293	0.00500	mg/kg	0.0333		87.8	48-131			
Anthracene	0.0301	0.00500	"	0.0333		90.2	48-135			
Benzo (a) anthracene	0.0290	0.00500	"	0.0333		87.1	37-142			
Benzo (b) fluoranthene	0.0192	0.00500	"	0.0333		57.7	35-139			
Benzo (k) fluoranthene	0.0186	0.00500	"	0.0333		55.9	30-139			
Benzo (a) pyrene	0.0189	0.00500	"	0.0333		56.7	41-132			
Chrysene	0.0286	0.00500	"	0.0333		85.8	30-136			
Dibenz (a,h) anthracene	0.0168	0.00500	"	0.0333		50.4	24-127			
Fluoranthene	0.0264	0.00500	"	0.0333		79.2	50-139			
Fluorene	0.0287	0.00500	"	0.0333		86.2	50-130			
Indeno (1,2,3-cd) pyrene	0.0166	0.00500	"	0.0333		49.8	26-139			
Naphthalene	0.0302	0.00500	"	0.0333		90.6	40-135			
Pyrene	0.0288	0.00500	"	0.0333		86.4	39-141			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.0304		"	0.0333		91.3	50-150			
<i>Surrogate: Fluoranthene-d10</i>	0.0290		"	0.0333		87.1	50-150			

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

Semivolatile Organic Compounds by EPA Method 8270D SIM - Quality Control
Summit Scientific

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

Batch 1705089 - EPA 5030 Soil MS

Matrix Spike (1705089-MS1)	Source: 1705068-01			Prepared: 05/09/17		Analyzed: 05/10/17				
Acenaphthene	0.0228	0.00500	mg/kg	0.0333	ND	68.5	27-140			
Anthracene	0.0237	0.00500	"	0.0333	ND	71.2	23-144			
Benzo (a) anthracene	0.0231	0.00500	"	0.0333	ND	69.4	12-168			
Benzo (b) fluoranthene	0.0157	0.00500	"	0.0333	ND	47.1	10-170			
Benzo (k) fluoranthene	0.0153	0.00500	"	0.0333	ND	45.8	11-150			
Benzo (a) pyrene	0.0150	0.00500	"	0.0333	ND	45.1	11-162			
Chrysene	0.0229	0.00500	"	0.0333	ND	68.7	10-167			
Dibenz (a,h) anthracene	0.0136	0.00500	"	0.0333	ND	40.9	10-128			
Fluoranthene	0.0222	0.00500	"	0.0333	ND	66.6	18-157			
Fluorene	0.0231	0.00500	"	0.0333	ND	69.3	37-133			
Indeno (1,2,3-cd) pyrene	0.0133	0.00500	"	0.0333	ND	39.9	10-161			
Naphthalene	0.0230	0.00500	"	0.0333	ND	69.1	10-157			
Pyrene	0.0228	0.00500	"	0.0333	ND	68.4	10-166			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0248</i>		"	<i>0.0333</i>		<i>74.5</i>	<i>50-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0258</i>		"	<i>0.0333</i>		<i>77.3</i>	<i>50-150</i>			

Matrix Spike Dup (1705089-MSD1)	Source: 1705068-01			Prepared: 05/09/17		Analyzed: 05/10/17				
Acenaphthene	0.0271	0.00500	mg/kg	0.0333	ND	81.3	27-140	17.1	15	QM-07
Anthracene	0.0282	0.00500	"	0.0333	ND	84.6	23-144	17.2	29	
Benzo (a) anthracene	0.0273	0.00500	"	0.0333	ND	81.9	12-168	16.4	65	
Benzo (b) fluoranthene	0.0183	0.00500	"	0.0333	ND	54.9	10-170	15.3	18	
Benzo (k) fluoranthene	0.0180	0.00500	"	0.0333	ND	53.9	11-150	16.3	32	
Benzo (a) pyrene	0.0177	0.00500	"	0.0333	ND	53.1	11-162	16.3	27	
Chrysene	0.0267	0.00500	"	0.0333	ND	80.1	10-167	15.4	88	
Dibenz (a,h) anthracene	0.0160	0.00500	"	0.0333	ND	48.0	10-128	16.1	20	
Fluoranthene	0.0256	0.00500	"	0.0333	ND	76.8	18-157	14.2	31	
Fluorene	0.0274	0.00500	"	0.0333	ND	82.1	37-133	16.9	16	QM-07
Indeno (1,2,3-cd) pyrene	0.0160	0.00500	"	0.0333	ND	47.9	10-161	18.2	22	
Naphthalene	0.0278	0.00500	"	0.0333	ND	83.3	10-157	18.6	24	
Pyrene	0.0263	0.00500	"	0.0333	ND	78.8	10-166	14.2	57	
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0313</i>		"	<i>0.0333</i>		<i>94.0</i>	<i>50-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0313</i>		"	<i>0.0333</i>		<i>93.8</i>	<i>50-150</i>			

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

Total Metals by EPA Method 6020 - Dry Weight Basis - Quality Control
Summit Scientific

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

Batch 1705099 - EPA 3050B

Blank (1705099-BLK1)

Prepared & Analyzed: 05/10/17

Arsenic	ND	0.200	mg/kg wet							
Barium	ND	0.400	"							
Cadmium	ND	0.100	"							
Chromium	ND	0.500	"							
Copper	ND	0.500	"							
Lead	ND	0.200	"							
Nickel	ND	0.100	"							
Selenium	ND	0.400	"							
Silver	ND	0.100	"							
Zinc	ND	10.0	"							

LCS (1705099-BS1)

Prepared & Analyzed: 05/10/17

Arsenic	37.3	0.200	mg/kg wet	40.0	93.3	56.9-110
Barium	36.6	0.400	"	40.0	91.4	59.3-113
Cadmium	1.93	0.100	"	2.00	96.5	63.1-113
Chromium	37.0	0.500	"	40.0	92.5	57.4-110
Copper	38.5	0.500	"	40.0	96.3	64.6-110
Lead	18.9	0.200	"	20.0	94.3	64-110
Nickel	36.7	0.100	"	40.0	91.9	63.2-110
Selenium	3.81	0.400	"	4.00	95.2	55.2-110
Silver	1.85	0.100	"	2.00	92.5	53.1-114
Zinc	39.9	10.0	"	40.0	99.7	62-110

Duplicate (1705099-DUP1)

Source: 1705095-01

Prepared & Analyzed: 05/10/17

Arsenic	1.45	0.229	mg/kg dry	1.50	3.00	20
Barium	213	0.458	"	211	0.976	20
Cadmium	4.80	0.114	"	4.68	2.37	20
Chromium	7.83	0.572	"	8.04	2.65	20
Copper	21.5	0.572	"	21.8	1.58	20
Lead	158	0.229	"	155	1.42	20
Nickel	6.46	0.114	"	6.62	2.37	20
Selenium	0.328	0.458	"	0.351	7.00	20
Silver	0.242	0.114	"	0.255	4.95	20
Zinc	1540	11.4	"	1550	0.582	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: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

Total Metals by EPA Method 6020 - Dry Weight Basis - Quality Control
Summit Scientific

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

Batch 1705099 - EPA 3050B

Matrix Spike (1705099-MS1)

Source: 1705095-01

Prepared & Analyzed: 05/10/17

Arsenic	21.6	0.229	mg/kg dry	45.8	1.50	43.9	75-125				QM-07
Barium	120	0.458	"	45.8	211	NR	75-125				QM-07
Cadmium	8.63	0.114	"	2.29	4.68	172	75-125				QM-07
Chromium	47.8	0.572	"	45.8	8.04	86.9	75-125				
Copper	69.7	0.572	"	45.8	21.8	105	75-125				
Lead	249	0.229	"	22.9	155	409	75-125				QM-07
Nickel	45.3	0.114	"	45.8	6.62	84.5	75-125				
Selenium	4.12	0.458	"	4.58	0.351	82.4	75-125				
Silver	2.25	0.114	"	2.29	0.255	87.2	75-125				
Zinc	1880	11.4	"	45.8	1550	712	75-125				QM-07

Matrix Spike Dup (1705099-MSD1)

Source: 1705095-01

Prepared & Analyzed: 05/10/17

Arsenic	18.2	0.229	mg/kg dry	45.8	1.50	36.6	75-125	16.8	25		QM-07
Barium	161	0.458	"	45.8	211	NR	75-125	29.3	25		QM-07
Cadmium	7.02	0.114	"	2.29	4.68	102	75-125	20.6	25		
Chromium	47.8	0.572	"	45.8	8.04	87.0	75-125	0.0965	25		
Copper	69.0	0.572	"	45.8	21.8	103	75-125	0.999	25		
Lead	216	0.229	"	22.9	155	266	75-125	14.1	25		QM-07
Nickel	46.1	0.114	"	45.8	6.62	86.3	75-125	1.82	25		
Selenium	4.25	0.458	"	4.58	0.351	85.3	75-125	3.12	25		
Silver	2.37	0.114	"	2.29	0.255	92.5	75-125	5.26	25		
Zinc	1360	11.4	"	45.8	1550	NR	75-125	31.7	25		QM-07

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

Total Mercury by EPA Method 7471 - Quality Control
Summit Scientific

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

Batch 1705109 - EPA 7471A

Blank (1705109-BLK1)			Prepared: 05/10/17 Analyzed: 05/11/17								
Mercury	ND	0.0500	mg/kg wet								
LCS (1705109-BS1)			Prepared: 05/10/17 Analyzed: 05/11/17								
Mercury	0.469	0.0500	mg/kg wet	0.500		93.8	80-120				
Duplicate (1705109-DUP1)			Source: 1705083-01			Prepared: 05/10/17 Analyzed: 05/11/17					
Mercury	0.0288	0.0572	mg/kg dry		0.0316				9.21	20	
Matrix Spike (1705109-MS1)			Source: 1705083-01			Prepared: 05/10/17 Analyzed: 05/11/17					
Mercury	0.576	0.0572	mg/kg dry	0.572	0.0316	95.2	80-120				
Matrix Spike Dup (1705109-MSD1)			Source: 1705083-01			Prepared: 05/10/17 Analyzed: 05/11/17					
Mercury	0.577	0.0572	mg/kg dry	0.572	0.0316	95.4	80-120	0.198		20	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

Hexavalent Chromium by EPA 7196 - Quality Control
Summit Scientific

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

Batch 1705094 - 3060A_Mod

Blank (1705094-BLK1)			Prepared: 05/09/17 Analyzed: 05/12/17								
Chromium, Hexavalent	ND	0.300	mg/kg wet								
LCS (1705094-BS1)			Prepared: 05/09/17 Analyzed: 05/12/17								
Chromium, Hexavalent	19.8	0.300	mg/kg wet	19.9	99.1	85-115					
Duplicate (1705094-DUP1)			Source: 1705061-01			Prepared: 05/09/17 Analyzed: 05/12/17					
Chromium, Hexavalent	ND	0.300	mg/kg dry		ND					20	
Matrix Spike (1705094-MS1)			Source: 1705061-01			Prepared: 05/09/17 Analyzed: 05/12/17					
Chromium, Hexavalent	23.8	0.300	mg/kg dry	24.7	ND	96.5	85-115				
Matrix Spike (1705094-MS2)			Source: 1705083-01			Prepared: 05/09/17 Analyzed: 05/12/17					
Chromium, Hexavalent	17.5	0.300	mg/kg dry	22.8	ND	76.6	85-115				QM-Cr
Post Spike (1705094-PS1)			Source: 1705061-01			Prepared: 05/09/17 Analyzed: 05/12/17					
Chromium, Hexavalent	0.496		mg/kg	0.498	0.00	99.5	85-115				

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

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

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

Batch 1705093 - General Preparation

Blank (1705093-BLK1)

Prepared & Analyzed: 05/09/17

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

LCS (1705093-BS1)

Prepared & Analyzed: 05/09/17

Calcium	527	10.0	mg/kg wet	500	105	82.9-118		
Magnesium	498	5.00	"	500	99.6	77.1-123		
Sodium	498	5.00	"	500	99.6	71-129		

Duplicate (1705093-DUP1)

Source: 1705058-01

Prepared & Analyzed: 05/09/17

Calcium	1400	12.3	mg/kg dry	1270			9.98	200
Magnesium	404	6.15	"	361			11.2	200
Sodium	767	6.15	"	727			5.31	200

Matrix Spike (1705093-MS1)

Source: 1705058-01

Prepared & Analyzed: 05/09/17

Calcium	1860	12.3	mg/kg dry	615	1270	96.5	75-125	
Magnesium	974	6.15	"	615	361	99.6	75-125	
Sodium	1320	6.15	"	615	727	95.8	75-125	

Matrix Spike Dup (1705093-MSD1)

Source: 1705058-01

Prepared & Analyzed: 05/09/17

Calcium	1900	12.3	mg/kg dry	615	1270	103	75-125	2.24	25
Magnesium	966	6.15	"	615	361	98.3	75-125	0.788	25
Sodium	1320	6.15	"	615	727	96.3	75-125	0.244	25

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

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

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

Batch 1705092 - General Preparation

Duplicate (1705092-DUP1)	Source: 1705058-01			Prepared: 05/09/17		Analyzed: 05/10/17					
% Solids	84.6		%		81.3			3.98		20	

Batch 1705123 - General Preparation

LCS (1705123-BS1)				Prepared: 05/11/17		Analyzed: 05/12/17					
pH	6.02	0.100	pH Units	6.00		100	95-105				
Duplicate (1705123-DUP1)	Source: 1705083-01			Prepared: 05/11/17		Analyzed: 05/12/17					
pH	8.61	0.100	pH Units		8.57			0.466		20	

Batch 1705126 - General Preparation

Blank (1705126-BLK1)				Prepared: 05/11/17		Analyzed: 05/12/17					
Specific Conductance (EC)	ND	0.0100	mmhos/cm								
LCS (1705126-BS1)				Prepared: 05/11/17		Analyzed: 05/12/17					
Specific Conductance (EC)	0.750	0.0100	mmhos/cm	0.750		99.9	90-110				
Duplicate (1705126-DUP1)	Source: 1705083-01			Prepared: 05/11/17		Analyzed: 05/12/17					
Specific Conductance (EC)	0.428	0.0100	mmhos/cm		0.426			0.246		20	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Chris Hines

Reported:
05/15/17 08:50

Notes and Definitions

- QM-Cr The matrix spike was outside (low) the normal quality control recovery windows. This is a common occurrence for this method since interferences in the sample can cause the hexavalent chromium to be reduced to other forms of chromium.
- 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

May 17, 2017

Chris Hines
Extraction Oil & Gas
570 17th St. Suite 550
Denver, CO 80202
RE: Highlands #1

Enclosed are the results of analyses for samples received by Summit Scientific on 05/15/17 17:01. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/17/17 06:53

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B07@15'	1705141-01	Soil	05/15/17 11:05	05/15/17 17:01
S01@14'	1705141-02	Soil	05/15/17 11:25	05/15/17 17:01
W02@14'	1705141-03	Soil	05/15/17 12:24	05/15/17 17:01
W03@14'	1705141-04	Soil	05/15/17 15:10	05/15/17 17:01
B08@15'	1705141-05	Soil	05/15/17 15:15	05/15/17 17:01
W04@9'	1705141-06	Soil	05/15/17 16:16	05/15/17 17:01

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/17/17 06:53

Summit Scientific 1705141

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

Page 1 of 1

Client: Extraction Oil & Gas- Blake Ford
Address: 370 17th Street, Suite 5300
City/State/Zip: Denver, Colorado 80202
Phone: 970.778.5956 Fax:
Sampler Name:

Project Manager: Chris Hines- 970.261.1127
E-Mail: BFord@extractionog.com, Chris.Hines@apexc.com, Jhickey@apexc.com
Project Name: Highlands #1
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	PAH	pH, SAR, EC	
B02@ 15'	5/15/17	11:05	2			X				X	X	X	X	X		* Run if TPH > 500ppm, or benzene 0.21-0.17ppm Report per Paul, COGCC Table 910-1. Call Chris Hines with Questions, (970-261-1127) Notes.
S01@ 14'		11:25				X				X	X	X	X	X		
W02@ 14'		12:20				X				X	X	X	X	X		
W03@ 7'		12:10				X				X	X	X	X	X		
B02@ 15'		15:15				X				X	X	X	X	X		
W01@ 9'		16:16				X				X	X	X	X	X		
Relinquished by: <i>TH/ah</i> Date/Time: 5/15/17 5:01 pm				Received by: <i>AS</i> Date/Time: 5-15-17 17:01				Turn Around Time (Check)				Notes: <i>only</i>				
Relinquished by: <i>AS</i> Date/Time: 5-15-17 18:10				Received by:				Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/>				Standard <input checked="" type="checkbox"/>				
Relinquished by:				Received In Lab by:				Sample Integrity:				Temperature Upon Receipt: <i>20.9</i>				
								Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>								

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S₂

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/17/17 06:53

Sample Receipt Checklist

S2 Work Order: 170541

Client: Extraction

Client Project ID: Highland #1

Shipped Via: H.D. on ice
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: _____

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

Cooler ID				
Temp (°C)	20.9 <u>20.9</u>			

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ?	X			on ice
NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.				
Were all samples received intact ⁽¹⁾ ?	✓			
Was adequate sample volume provided ⁽¹⁾ ?	X			
If custody seals are present, are they intact ⁽¹⁾ ?			X	
Are short holding time analytes or samples with HTs due within 48 hours present?			X	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	X			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	X			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	X			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	X			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			X	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?			X	
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⁾ ?			X	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			X	
Additional Comments (if any):				

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

Murip
Custodian Printed Name

AS 5-15-17
Signature or Initials of Custodian

18:10
Date/Time



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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/17/17 06:53

B07@15'
1705141-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/15/17 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705168	05/16/17	05/16/17	8015M	

Date Sampled: **05/15/17 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		105 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/15/17 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705169	05/16/17	05/16/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **05/15/17 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.8 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/17/17 06:53

S01@14'
1705141-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/15/17 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	82	50	mg/kg	1	1705168	05/16/17	05/16/17	8015M	

Date Sampled: **05/15/17 11:25**

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

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/15/17 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705169	05/16/17	05/16/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	11	0.50	"	"	"	"	"	"	

Date Sampled: **05/15/17 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		106 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.4 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		108 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/17/17 06:53

W02@14'
1705141-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/15/17 12:24**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705168	05/16/17	05/16/17	8015M	

Date Sampled: **05/15/17 12:24**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		104 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/15/17 12:24**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705169	05/16/17	05/16/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	6.7	0.50	"	"	"	"	"	"	

Date Sampled: **05/15/17 12:24**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		116 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		90.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		110 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/17/17 06:53

W03@14'
1705141-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/15/17 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	500	50	mg/kg	1	1705168	05/16/17	05/16/17	8015M	

Date Sampled: **05/15/17 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		104 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/15/17 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705169	05/16/17	05/16/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	43	0.50	"	"	"	"	"	"	

Date Sampled: **05/15/17 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		97.9 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		96.4 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		148 %	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: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/17/17 06:53

B08@15'
1705141-05 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/15/17 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705168	05/16/17	05/16/17	8015M	

Date Sampled: **05/15/17 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		108 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/15/17 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705169	05/16/17	05/16/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	4.3	0.50	"	"	"	"	"	"	

Date Sampled: **05/15/17 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		98.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/17/17 06:53

W04@9'
1705141-06 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/15/17 16:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	50	50	mg/kg	1	1705168	05/16/17	05/16/17	8015M	

Date Sampled: **05/15/17 16:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		112 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/15/17 16:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705169	05/16/17	05/16/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	6.9	0.50	"	"	"	"	"	"	

Date Sampled: **05/15/17 16:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		105 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		98.9 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		111 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/17/17 06:53

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1705168 - EPA 3550A

Blank (1705168-BLK1)

Prepared & Analyzed: 05/16/17

C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	12.8		"	12.5		102	30-150				

LCS (1705168-BS1)

Prepared & Analyzed: 05/16/17

C10-C28 (DRO)	491	50	mg/kg	499		98.5	73-134				
<i>Surrogate: o-Terphenyl</i>	12.9		"	12.5		104	30-150				

Matrix Spike (1705168-MS1)

Source: 1705141-01

Prepared & Analyzed: 05/16/17

C10-C28 (DRO)	468	50	mg/kg	499	24.6	88.8	50-148				
<i>Surrogate: o-Terphenyl</i>	12.6		"	12.5		101	30-150				

Matrix Spike Dup (1705168-MSD1)

Source: 1705141-01

Prepared & Analyzed: 05/16/17

C10-C28 (DRO)	465	50	mg/kg	499	24.6	88.2	50-148	0.701	20		
<i>Surrogate: o-Terphenyl</i>	13.0		"	12.5		104	30-150				

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/17/17 06:53

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

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

Batch 1705169 - EPA 5030 Soil MS

Blank (1705169-BLK1)

Prepared & Analyzed: 05/16/17

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	"								
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0402</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>23-173</i>				
<i>Surrogate: Toluene-d8</i>	<i>0.0404</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>20-170</i>				
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0381</i>		<i>"</i>	<i>0.0400</i>		<i>95.2</i>	<i>21-167</i>				

LCS (1705169-BS1)

Prepared & Analyzed: 05/16/17

Benzene	0.0886	0.0020	mg/kg	0.100		88.6	58-130				
Toluene	0.0988	0.0050	"	0.100		98.8	61-134				
Ethylbenzene	0.116	0.0050	"	0.0992		117	74-139				
m,p-Xylene	0.217	0.010	"	0.200		109	73-137				
o-Xylene	0.106	0.0050	"	0.0980		109	73-141				
Xylenes (total)	0.323	0.0050	"				30-150				
Gasoline Range Hydrocarbons	2.81	0.50	"				30-150				
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0408</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>23-173</i>				
<i>Surrogate: Toluene-d8</i>	<i>0.0396</i>		<i>"</i>	<i>0.0400</i>		<i>98.9</i>	<i>20-170</i>				
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0394</i>		<i>"</i>	<i>0.0400</i>		<i>98.6</i>	<i>21-167</i>				

Matrix Spike (1705169-MS1)

Source: 1705141-01

Prepared & Analyzed: 05/16/17

Benzene	0.0879	0.0020	mg/kg	0.100	ND	87.9	30-131				
Toluene	0.0998	0.0050	"	0.100	ND	99.8	30-134				
Ethylbenzene	0.113	0.0050	"	0.0992	ND	114	22-153				
m,p-Xylene	0.213	0.010	"	0.200	ND	107	10-159				
o-Xylene	0.105	0.0050	"	0.0980	ND	107	31-151				
Xylenes (total)	0.318	0.0050	"		ND		30-150				
Gasoline Range Hydrocarbons	2.85	0.50	"		ND		30-150				
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0406</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>23-173</i>				
<i>Surrogate: Toluene-d8</i>	<i>0.0397</i>		<i>"</i>	<i>0.0400</i>		<i>99.2</i>	<i>20-170</i>				
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0399</i>		<i>"</i>	<i>0.0400</i>		<i>99.7</i>	<i>21-167</i>				

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/17/17 06:53

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

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

Batch 1705169 - EPA 5030 Soil MS

Matrix Spike Dup (1705169-MSD1)	Source: 1705141-01			Prepared & Analyzed: 05/16/17						
Benzene	0.0890	0.0020	mg/kg	0.100	ND	89.0	30-131	1.22	34	
Toluene	0.102	0.0050	"	0.100	ND	102	30-134	2.17	30	
Ethylbenzene	0.112	0.0050	"	0.0992	ND	113	22-153	0.426	24	
m,p-Xylene	0.209	0.010	"	0.200	ND	105	10-159	1.95	68	
o-Xylene	0.105	0.0050	"	0.0980	ND	108	31-151	0.314	38	
Xylenes (total)	0.315	0.0050	"		ND		30-150	1.19	20	
Gasoline Range Hydrocarbons	2.82	0.50	"		ND		30-150	1.02	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0409</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0392</i>		<i>"</i>	<i>0.0400</i>		<i>98.1</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0384</i>		<i>"</i>	<i>0.0400</i>		<i>96.0</i>	<i>21-167</i>			

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Chris Hines

Reported:
05/17/17 06:53

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

May 23, 2017

Blake Ford
Extraction Oil & Gas
570 17th St. Suite 550
Denver, CO 80202
RE: Highlands #1

Enclosed are the results of analyses for samples received by Summit Scientific on 05/16/17 16:23. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

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

Paul Shrewsbury
President



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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/23/17 10:20

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
E02@6'	1705166-01	Soil	05/16/17 12:45	05/16/17 16:23
E03@8'	1705166-02	Soil	05/16/17 12:47	05/16/17 16:23

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/23/17 10:20

Summit Scientific

1705166

741 Corporate Circle Suite 1 • Golden, Colorado 80401
303-277-9310 • 303-374-5933 Fax

Page 1 of 1

Client: Extraction Oil & Gas- Blake Ford

Address: 370 17th Street, Suite 5300

City/State/Zip: Denver, Colorado 80202

Phone: 970.778.5956

Fax:

Sampler Name: Kevin Kresch

Project Manager: Chris Hines- 970.261.1127

E-Mail: BFord@extractionog.com, Chris.Hines@apexcscos.com, Jhickey@apexcscos.com

Project Name: Highlands #1

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	PAH	pH, SAR, EC	RCRA8 Metals	Hold*			
ED306	5/16/17	1245	2			X						X	X	X	X					* Run if TPH > 500ppm, or benzene 0.21-0.17ppm Report per Paul, COGCC Table 910-1. Call Chris Hines with Questions. (970-261-1127) Notes:
ED308	✓	1247	2			X						X	X	X	X					
Relinquished by:		Date/Time:		Received by:	Date/Time:	Turn Around Time (Check)														
		5/16/17 4:25pm			5-16-17 16:23	Same Day	<input type="checkbox"/>	72 Hours	<input type="checkbox"/>											
						24 Hours	<input type="checkbox"/>	Standard	<input checked="" type="checkbox"/>											
Relinquished by:		Date/Time:		Received by:	Date/Time:	48 Hours	<input type="checkbox"/>													
		5-16-17 18:00																		
Relinquished by:		Date/Time:		Received in Lab by:	Date/Time:	Sample Integrity:														
						Temperature Upon Receipt:	20.8													
						Intact:	Yes	No												
						<input checked="" type="checkbox"/>	<input type="checkbox"/>									DNIC				

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Summit Scientific

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

Project: Highlands #1

Project Number: [none]
 Project Manager: Blake Ford

Reported:
 05/23/17 10:20

Sample Receipt Checklist

S2 Work Order: 1705164
 Client: Extraction O&G Client Project ID: Highlands #1
 Shipped Via: _____ Airbill #: _____
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)
 Matrix (check all that apply): Air Soil/Solid Water Other: _____
 (Describe)

Cooler ID					
Temp (°C)	20.8				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ?	<input checked="" type="checkbox"/>			once
NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.				
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⁾ ? 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.				

Muril
 Custodian Printed Name

MS 5-16-17
 Signature or Initials of Custodian

10:25
 Date/Time



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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/23/17 10:20

E02@6'
1705166-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/16/17 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705182	05/17/17	05/18/17	8015M	

Date Sampled: **05/16/17 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		106 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/16/17 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705181	05/17/17	05/18/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	05/18/17	"	

Date Sampled: **05/16/17 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		102 %	23-173		"	"	05/18/17	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.7 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/23/17 10:20

E03@8'
1705166-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/16/17 12:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	81	50	mg/kg	1	1705182	05/17/17	05/18/17	8015M	

Date Sampled: **05/16/17 12:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		114 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/16/17 12:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705181	05/17/17	05/18/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	1.5	0.50	"	"	"	"	"	"	

Date Sampled: **05/16/17 12:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		103 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		98.1 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		102 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/23/17 10:20

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1705182 - EPA 3550A

Blank (1705182-BLK1)

Prepared & Analyzed: 05/17/17

C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	13.5		"	12.5		108	30-150				

LCS (1705182-BS1)

Prepared & Analyzed: 05/17/17

C10-C28 (DRO)	516	50	mg/kg	499		103	73-134				
<i>Surrogate: o-Terphenyl</i>	14.3		"	12.5		115	30-150				

Matrix Spike (1705182-MS1)

Source: 1705153-01

Prepared: 05/17/17 Analyzed: 05/18/17

C10-C28 (DRO)	522	50	mg/kg	499	123	80.0	50-148				
<i>Surrogate: o-Terphenyl</i>	14.9		"	12.5		119	30-150				

Matrix Spike Dup (1705182-MSD1)

Source: 1705153-01

Prepared: 05/17/17 Analyzed: 05/18/17

C10-C28 (DRO)	509	50	mg/kg	499	123	77.5	50-148	2.45		20	
<i>Surrogate: o-Terphenyl</i>	17.2		"	12.5		137	30-150				

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/23/17 10:20

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

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

Batch 1705181 - EPA 5030 Soil MS

Blank (1705181-BLK1)

Prepared: 05/17/17 Analyzed: 05/18/17

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	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0414</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0408</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0371</i>		<i>"</i>	<i>0.0400</i>		<i>92.7</i>	<i>21-167</i>			

LCS (1705181-BS1)

Prepared: 05/17/17 Analyzed: 05/18/17

Benzene	0.0887	0.0020	mg/kg	0.100		88.7	58-130			
Toluene	0.0926	0.0050	"	0.100		92.6	61-134			
Ethylbenzene	0.0984	0.0050	"	0.0992		99.2	74-139			
m,p-Xylene	0.189	0.010	"	0.200		94.8	73-137			
o-Xylene	0.0966	0.0050	"	0.0980		98.6	73-141			
Xylenes (total)	0.286	0.0050	"				30-150			
Gasoline Range Hydrocarbons	0.444	0.50	"				30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0412</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0412</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0341</i>		<i>"</i>	<i>0.0400</i>		<i>85.2</i>	<i>21-167</i>			

Matrix Spike (1705181-MS1)

Source: 1705165-05

Prepared: 05/17/17 Analyzed: 05/18/17

Benzene	0.0715	0.0020	mg/kg	0.100	ND	71.5	30-131			
Toluene	0.0750	0.0050	"	0.100	ND	75.0	30-134			
Ethylbenzene	0.0754	0.0050	"	0.0992	ND	76.0	22-153			
m,p-Xylene	0.146	0.010	"	0.200	ND	73.3	10-159			
o-Xylene	0.0743	0.0050	"	0.0980	ND	75.8	31-151			
Xylenes (total)	0.221	0.0050	"		ND		30-150			
Gasoline Range Hydrocarbons	0.333	0.50	"		ND		30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0449</i>		<i>"</i>	<i>0.0400</i>		<i>112</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0401</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0418</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>21-167</i>			

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/23/17 10:20

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

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

Batch 1705181 - EPA 5030 Soil MS

Matrix Spike Dup (1705181-MSD1)	Source: 1705165-05			Prepared: 05/17/17	Analyzed: 05/18/17					
Benzene	0.0687	0.0020	mg/kg	0.100	ND	68.7	30-131	3.98	34	
Toluene	0.0683	0.0050	"	0.100	ND	68.3	30-134	9.38	30	
Ethylbenzene	0.0789	0.0050	"	0.0992	ND	79.6	22-153	4.59	24	
m,p-Xylene	0.150	0.010	"	0.200	ND	75.2	10-159	2.51	68	
o-Xylene	0.0815	0.0050	"	0.0980	ND	83.1	31-151	9.20	38	
Xylenes (total)	0.232	0.0050	"		ND		30-150	4.82	20	
Gasoline Range Hydrocarbons	0.304	0.50	"		ND		30-150	9.19	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0438</i>		<i>"</i>	<i>0.0400</i>		<i>110</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0397</i>		<i>"</i>	<i>0.0400</i>		<i>99.2</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0466</i>		<i>"</i>	<i>0.0400</i>		<i>116</i>	<i>21-167</i>			

Summit Scientific

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

Project: Highlands #1

Project Number: [none]
Project Manager: Blake Ford

Reported:
05/23/17 10:20

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

May 25, 2017

Blake Ford
Extraction Oil & Gas
570 17th St. Suite 550
Denver, CO 80202
RE: Highlands #1

Enclosed are the results of analyses for samples received by Summit Scientific on 05/24/17 19:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



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

Project: Highlands #1

Project Number: 744.1608.01/079/002
Project Manager: Blake Ford

Reported:
05/25/17 06:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B09@13'	1705239-01	Soil	05/24/17 13:00	05/24/17 19:30
W05@11'	1705239-02	Soil	05/24/17 13:06	05/24/17 19:30
S02@11'	1705239-03	Soil	05/24/17 14:09	05/24/17 19:30
B10@14'	1705239-04	Soil	05/24/17 15:50	05/24/17 19:30
B11@14'	1705239-05	Soil	05/24/17 16:09	05/24/17 19:30
B12@14'	1705239-06	Soil	05/24/17 17:40	05/24/17 19:30
S03@11'	1705239-07	Soil	05/24/17 17:45	05/24/17 19:30
C01	1705239-08	Soil	05/24/17 17:50	05/24/17 19:30
S04@11'	1705239-09	Soil	05/24/17 17:50	05/24/17 19:30

Summit Scientific

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

Project: Highlands #1

Project Number: 744.1608.01/079/002
Project Manager: Blake Ford

Reported:
05/25/17 06:43

Summit Scientific 1705239

741 Corporate Circle Suite 1 ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933 Fax

Page 1 of 1

Client: Extraction Oil & Gas- Blake Ford

Address: 370 17th Street, Suite 5300

City/State/Zip: Denver, Colorado 80202

Phone: 970.778.5956 Fax:

Sampler Name: Brian Gibson

Project Manager: Chris Hines- 970.261.1127

E-Mail: BFord@extractionog.com, Chris.Hines@apexcos.com, Jhickey@apexcos.com

Project Name: Highland 1

Project Number: 744.1608.01/079/602

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	PAH	pH, SAR, EC	RCRA8 Metals	Hold*			
B09@13'	5/24/17	1300	2		X			X				X								* Hold: until further notice Report per Paul, COGCC Table 910-1. Call Chris Hines with Questions. (970-261-1127)
W05@11'		1306																		
S02@11'		1409																		
B10@14'		1550																		
B11@14'		1609																		
B12@14'		1740																		
S03@11'		1745																		
C01		1750																		
S04@11'	↓	1750	↓																	
Relinquished by:		Date/Time: 5/24/17 1930	Received by:		Date/Time: 5-24-17 1930	Turn Around Time (Check)			Notes:											
						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"/>														
Relinquished by:		Date/Time:	Received in Lab by:		Date/Time:	Sample Integrity:														
						Temperature Upon Receipt: 16.0														
						Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>														

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S₂

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

Project: Highlands #1

Project Number: 744.1608.01/079/002
Project Manager: Blake Ford

Reported:
05/25/17 06:43

Sample Receipt Checklist

S2 Work Order: 1705239
Client: Extraction O&G Client Project ID: Highlands 1
Shipped Via: _____ Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)
Matrix (check all that apply): Air Soil/Solid Water Other: _____
(Describe)

Cooler ID					
Temp (°C)	16.0				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ?				
NOTE: If samples are delivered the same day of sampling, this requirement is waived 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				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Record the pH in Comments.				
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.				

[Signature]
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

5-24-17
Date/Time

[Signature]



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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Blake Ford

Reported:
05/25/17 06:43

B09@13'
1705239-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/24/17 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705251	05/24/17	05/24/17	8015M	

Date Sampled: **05/24/17 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		102 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/24/17 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	ND	0.500	mg/kg	1	1705246	"	05/24/17	EPA 8260B	

Date Sampled: **05/24/17 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane- <i>d</i> 4		102 %	23-173		"	"	"	"	
Surrogate: Toluene- <i>d</i> 8		97.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.6 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Blake Ford

Reported:
05/25/17 06:43

W05@11'
1705239-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/24/17 13:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705251	05/24/17	05/24/17	8015M	

Date Sampled: **05/24/17 13:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		109 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/24/17 13:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	ND	0.500	mg/kg	1	1705246	"	05/24/17	EPA 8260B	

Date Sampled: **05/24/17 13:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		98.0 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.2 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Blake Ford

Reported:
05/25/17 06:43

S02@11'
1705239-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/24/17 14:09**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	200	50	mg/kg	1	1705251	05/24/17	05/24/17	8015M	

Date Sampled: **05/24/17 14:09**

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

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/24/17 14:09**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	7.13	0.500	mg/kg	1	1705246	"	05/24/17	EPA 8260B	

Date Sampled: **05/24/17 14:09**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		104 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		100 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		174 %	21-167		"	"	"	"	S-02

Summit Scientific

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

Project: Highlands #1
 Project Number: 744.1608.01/079/002
 Project Manager: Blake Ford

Reported:
 05/25/17 06:43

B10@14'
1705239-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/24/17 15:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705251	05/24/17	05/24/17	8015M	

Date Sampled: **05/24/17 15:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		102 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/24/17 15:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	ND	0.500	mg/kg	1	1705246	"	05/24/17	EPA 8260B	

Date Sampled: **05/24/17 15:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.7 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Blake Ford

Reported:
05/25/17 06:43

B11@14'
1705239-05 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/24/17 16:09**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705251	05/24/17	05/24/17	8015M	

Date Sampled: **05/24/17 16:09**

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

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/24/17 16:09**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	ND	0.500	mg/kg	1	1705246	"	05/24/17	EPA 8260B	

Date Sampled: **05/24/17 16:09**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		104 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Blake Ford

Reported:
05/25/17 06:43

B12@14'
1705239-06 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/24/17 17:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705251	05/24/17	05/24/17	8015M	

Date Sampled: **05/24/17 17:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		106 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/24/17 17:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	ND	0.500	mg/kg	1	1705246	"	05/24/17	EPA 8260B	

Date Sampled: **05/24/17 17:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Blake Ford

Reported:
05/25/17 06:43

S03@11'
1705239-07 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/24/17 17:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	370	50	mg/kg	1	1705251	05/24/17	05/24/17	8015M	

Date Sampled: **05/24/17 17:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		99.8 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/24/17 17:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	33.7	0.500	mg/kg	1	1705246	"	05/24/17	EPA 8260B	

Date Sampled: **05/24/17 17:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		117 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		92.8 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		404 %	21-167		"	"	"	"	S-02

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Blake Ford

Reported:
05/25/17 06:43

C01
1705239-08 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/24/17 17:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1705251	05/24/17	05/24/17	8015M	

Date Sampled: **05/24/17 17:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		97.8 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/24/17 17:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	ND	0.500	mg/kg	1	1705246	"	05/24/17	EPA 8260B	

Date Sampled: **05/24/17 17:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		100 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.3 %	21-167		"	"	"	"	

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Blake Ford

Reported:
05/25/17 06:43

S04@11'
1705239-09 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/24/17 17:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	640	50	mg/kg	1	1705251	05/24/17	05/25/17	8015M	

Date Sampled: **05/24/17 17:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		98.0 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/24/17 17:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	176	0.500	mg/kg	1	1705246	"	05/24/17	EPA 8260B	E

Date Sampled: **05/24/17 17:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		134 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		104 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		1120 %	21-167		"	"	"	"	S-02

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Blake Ford

Reported:
05/25/17 06:43

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1705251 - EPA 3550A

Blank (1705251-BLK1)

Prepared & Analyzed: 05/24/17

C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	13.0		"	12.5		104	30-150				

LCS (1705251-BS1)

Prepared & Analyzed: 05/24/17

C10-C28 (DRO)	489	50	mg/kg	499		97.9	73-134				
<i>Surrogate: o-Terphenyl</i>	12.9		"	12.5		103	30-150				

Matrix Spike (1705251-MS1)

Source: 1705235-01

Prepared & Analyzed: 05/24/17

C10-C28 (DRO)	507	50	mg/kg	499	37.4	94.2	50-148				
<i>Surrogate: o-Terphenyl</i>	13.4		"	12.5		107	30-150				

Matrix Spike Dup (1705251-MSD1)

Source: 1705235-01

Prepared & Analyzed: 05/24/17

C10-C28 (DRO)	483	50	mg/kg	499	37.4	89.4	50-148	4.82	20		
<i>Surrogate: o-Terphenyl</i>	12.5		"	12.5		99.8	30-150				

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079/002
Project Manager: Blake Ford

Reported:
05/25/17 06:43

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

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

Batch 1705246 - EPA 5030 Soil MS

Blank (1705246-BLK1)

Prepared & Analyzed: 05/24/17

Gasoline Range Hydrocarbons	ND	0.500	mg/kg								
Surrogate: 1,2-Dichloroethane-d4	0.0412		"	0.0400		103	23-173				
Surrogate: Toluene-d8	0.0393		"	0.0400		98.3	20-170				
Surrogate: 4-Bromofluorobenzene	0.0401		"	0.0400		100	21-167				

LCS (1705246-BS1)

Prepared & Analyzed: 05/24/17

Gasoline Range Hydrocarbons	0.388	0.500	mg/kg				30-150				
Surrogate: 1,2-Dichloroethane-d4	0.0411		"	0.0400		103	23-173				
Surrogate: Toluene-d8	0.0393		"	0.0400		98.3	20-170				
Surrogate: 4-Bromofluorobenzene	0.0416		"	0.0400		104	21-167				

Matrix Spike (1705246-MS1)

Source: 1705231-01

Prepared & Analyzed: 05/24/17

Gasoline Range Hydrocarbons	0.328	0.500	mg/kg		0.282		30-150				
Surrogate: 1,2-Dichloroethane-d4	0.0422		"	0.0400		105	23-173				
Surrogate: Toluene-d8	0.0398		"	0.0400		99.6	20-170				
Surrogate: 4-Bromofluorobenzene	0.0406		"	0.0400		101	21-167				

Matrix Spike Dup (1705246-MSD1)

Source: 1705231-01

Prepared & Analyzed: 05/24/17

Gasoline Range Hydrocarbons	0.357	0.500	mg/kg		0.282		30-150	8.50	20		
Surrogate: 1,2-Dichloroethane-d4	0.0412		"	0.0400		103	23-173				
Surrogate: Toluene-d8	0.0399		"	0.0400		99.7	20-170				
Surrogate: 4-Bromofluorobenzene	0.0402		"	0.0400		101	21-167				

Summit Scientific

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

Project: Highlands #1

Project Number: 744.1608.01/079/002
Project Manager: Blake Ford

Reported:
05/25/17 06:43

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.
- E The concentration indicated for this analyte is an estimated value above the calibration range of the instrument.
- 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

May 26, 2017

Chris Hines
Extraction Oil & Gas
570 17th St. Suite 550
Denver, CO 80202
RE: Highlands #1

Enclosed are the results of analyses for samples received by Summit Scientific on 05/25/17 17:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



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

Project: Highlands #1

Project Number: 744.1608.01/079
Project Manager: Chris Hines

Reported:
05/26/17 09:14

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GW01@14'	1705246-01	Water	05/25/17 15:37	05/25/17 17:45
S05@10'	1705246-02	Soil	05/25/17 15:52	05/25/17 17:45

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.

S₂

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

Project: Highlands #1

Project Number: 744.1608.01/079
Project Manager: Chris Hines

Reported:
05/26/17 09:14

Sample Receipt Checklist

S2 Work Order: 1705246

Client: Extraction - Blake Ford Client Project ID: Highland 1

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

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

Cooler ID					
Temp (°C)	<u>19.6</u>				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ?		<input checked="" type="checkbox"/>		
NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.				
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"/>			<u>HCl</u>
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⁾ ?			<input checked="" type="checkbox"/>	
Record the pH in Comments.				
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.

Wakita
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

5/25/17 1800
Date/Time

[Signature]



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

Project: Highlands #1
 Project Number: 744.1608.01/079
 Project Manager: Chris Hines

Reported:
 05/26/17 09:14

GW01@14'
1705246-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/25/17 15:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	3.4	1.0	ug/l	1	1705268	05/25/17	05/25/17	EPA 8260B	
Toluene	13	1.0	"	"	"	"	"	"	
Ethylbenzene	2.8	1.0	"	"	"	"	"	"	
Xylenes (total)	47	2.0	"	"	"	"	"	"	

Date Sampled: **05/25/17 15:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		111 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		102 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		112 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079
Project Manager: Chris Hines

Reported:
05/26/17 09:14

S05@10'
1705246-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/25/17 15:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	120	50	mg/kg	1	1705270	05/25/17	05/25/17	8015M	

Date Sampled: **05/25/17 15:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		110 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/25/17 15:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1705269	"	05/26/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	41	0.50	"	"	"	"	"	"	

Date Sampled: **05/25/17 15:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		109 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		101 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		165 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Highlands #1

Project Number: 744.1608.01/079
Project Manager: Chris Hines

Reported:
05/26/17 09:14

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1705270 - EPA 3550A

Blank (1705270-BLK1)

Prepared & Analyzed: 05/25/17

C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	13.9		"	12.5		111	30-150				

LCS (1705270-BS1)

Prepared & Analyzed: 05/25/17

C10-C28 (DRO)	532	50	mg/kg	499		107	73-134				
<i>Surrogate: o-Terphenyl</i>	13.5		"	12.5		108	30-150				

Matrix Spike (1705270-MS1)

Source: 1705244-01

Prepared & Analyzed: 05/25/17

C10-C28 (DRO)	539	50	mg/kg	499	33.3	101	50-148				
<i>Surrogate: o-Terphenyl</i>	13.6		"	12.5		109	30-150				

Matrix Spike Dup (1705270-MSD1)

Source: 1705244-01

Prepared & Analyzed: 05/25/17

C10-C28 (DRO)	534	50	mg/kg	499	33.3	100	50-148	0.990	20		
<i>Surrogate: o-Terphenyl</i>	13.4		"	12.5		107	30-150				

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079
Project Manager: Chris Hines

Reported:
05/26/17 09:14

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

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

Batch 1705268 - EPA 5030 Water MS

Blank (1705268-BLK1)

Prepared & Analyzed: 05/25/17

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	13.3		"	13.3		99.5	37-154			
<i>Surrogate: Toluene-d8</i>	13.7		"	13.3		103	45-149			
<i>Surrogate: 4-Bromofluorobenzene</i>	13.3		"	13.3		99.6	45-146			

LCS (1705268-BS1)

Prepared & Analyzed: 05/25/17

Benzene	30.9	1.0	ug/l	33.3		92.8	51-132			
Toluene	34.2	1.0	"	33.3		103	51-138			
Ethylbenzene	37.4	1.0	"	33.1		113	58-146			
m,p-Xylene	70.1	2.0	"	66.5		105	57-144			
o-Xylene	34.6	1.0	"	32.7		106	53-146			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	13.9		"	13.3		104	37-154			
<i>Surrogate: Toluene-d8</i>	13.4		"	13.3		101	45-149			
<i>Surrogate: 4-Bromofluorobenzene</i>	13.7		"	13.3		103	45-146			

Matrix Spike (1705268-MS1)

Source: 1705242-01

Prepared & Analyzed: 05/25/17

Benzene	32.0	1.0	ug/l	33.3	ND	95.9	34-141			
Toluene	33.6	1.0	"	33.3	ND	101	27-151			
Ethylbenzene	38.4	1.0	"	33.1	ND	116	29-160			
m,p-Xylene	71.2	2.0	"	66.5	ND	107	20-166			
o-Xylene	36.0	1.0	"	32.7	ND	110	33-159			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	15.2		"	13.3		114	37-154			
<i>Surrogate: Toluene-d8</i>	13.1		"	13.3		98.3	45-149			
<i>Surrogate: 4-Bromofluorobenzene</i>	13.0		"	13.3		97.4	45-146			

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

Project: Highlands #1
Project Number: 744.1608.01/079
Project Manager: Chris Hines

Reported:
05/26/17 09:14

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

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

Batch 1705268 - EPA 5030 Water MS

Matrix Spike Dup (1705268-MSD1)	Source: 1705242-01			Prepared & Analyzed: 05/25/17						
Benzene	31.6	1.0	ug/l	33.3	ND	94.7	34-141	1.26	32	
Toluene	38.1	1.0	"	33.3	ND	114	27-151	12.6	25	
Ethylbenzene	37.0	1.0	"	33.1	ND	112	29-160	3.77	50	
m,p-Xylene	67.8	2.0	"	66.5	ND	102	20-166	4.81	36	
o-Xylene	32.8	1.0	"	32.7	ND	101	33-159	9.29	26	
Surrogate: 1,2-Dichloroethane-d4	14.8		"	13.3		111	37-154			
Surrogate: Toluene-d8	14.6		"	13.3		110	45-149			
Surrogate: 4-Bromofluorobenzene	12.0		"	13.3		89.8	45-146			

Batch 1705269 - EPA 5030 Soil MS

Blank (1705269-BLK1)	Prepared & Analyzed: 05/25/17									
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	0.0422		"	0.0400		106	23-173			
Surrogate: Toluene-d8	0.0407		"	0.0400		102	20-170			
Surrogate: 4-Bromofluorobenzene	0.0412		"	0.0400		103	21-167			

LCS (1705269-BS1)	Prepared & Analyzed: 05/25/17									
Benzene	0.102	0.0020	mg/kg	0.100		102	58-130			
Toluene	0.119	0.0050	"	0.100		119	61-134			
Ethylbenzene	0.121	0.0050	"	0.0992		122	74-139			
m,p-Xylene	0.222	0.010	"	0.200		111	73-137			
o-Xylene	0.114	0.0050	"	0.0980		117	73-141			
Xylenes (total)	0.337	0.0050	"				30-150			
Gasoline Range Hydrocarbons	2.63	0.50	"				30-150			
Surrogate: 1,2-Dichloroethane-d4	0.0427		"	0.0400		107	23-173			
Surrogate: Toluene-d8	0.0421		"	0.0400		105	20-170			
Surrogate: 4-Bromofluorobenzene	0.0392		"	0.0400		98.1	21-167			

Summit Scientific

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

Project: Highlands #1
Project Number: 744.1608.01/079
Project Manager: Chris Hines

Reported:
05/26/17 09:14

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

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

Batch 1705269 - EPA 5030 Soil MS

Matrix Spike (1705269-MS1)

Source: 1705244-01

Prepared & Analyzed: 05/25/17

Benzene	0.103	0.0020	mg/kg	0.100	ND	103	30-131			
Toluene	0.136	0.0050	"	0.100	0.0208	115	30-134			
Ethylbenzene	0.124	0.0050	"	0.0992	0.00468	120	22-153			
m,p-Xylene	0.240	0.010	"	0.200	0.0314	104	10-159			
o-Xylene	0.124	0.0050	"	0.0980	0.0167	109	31-151			
Xylenes (total)	0.364	0.0050	"		0.0481		30-150			
Gasoline Range Hydrocarbons	3.16	0.50	"		0.833		30-150			
Surrogate: 1,2-Dichloroethane-d4	0.0449		"	0.0400		112	23-173			
Surrogate: Toluene-d8	0.0442		"	0.0400		110	20-170			
Surrogate: 4-Bromofluorobenzene	0.0406		"	0.0400		101	21-167			

Matrix Spike Dup (1705269-MSD1)

Source: 1705244-01

Prepared & Analyzed: 05/25/17

Benzene	0.104	0.0020	mg/kg	0.100	ND	104	30-131	1.04	34
Toluene	0.139	0.0050	"	0.100	0.0208	118	30-134	2.36	30
Ethylbenzene	0.129	0.0050	"	0.0992	0.00468	126	22-153	4.21	24
m,p-Xylene	0.263	0.010	"	0.200	0.0314	116	10-159	9.08	68
o-Xylene	0.135	0.0050	"	0.0980	0.0167	121	31-151	8.81	38
Xylenes (total)	0.398	0.0050	"		0.0481		30-150	8.99	20
Gasoline Range Hydrocarbons	3.44	0.50	"		0.833		30-150	8.63	20
Surrogate: 1,2-Dichloroethane-d4	0.0440		"	0.0400		110	23-173		
Surrogate: Toluene-d8	0.0400		"	0.0400		100	20-170		
Surrogate: 4-Bromofluorobenzene	0.0403		"	0.0400		101	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: Highlands #1
Project Number: 744.1608.01/079
Project Manager: Chris Hines

Reported:
05/26/17 09:14

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