



June 26, 2018

Blake Ford  
Environmental Coordinator  
Extraction Oil & Gas  
370 17<sup>th</sup> 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

A handwritten signature in black ink, appearing to read 'Chris Hines', with a horizontal line extending from the end.

Chris Hines  
Project Manager

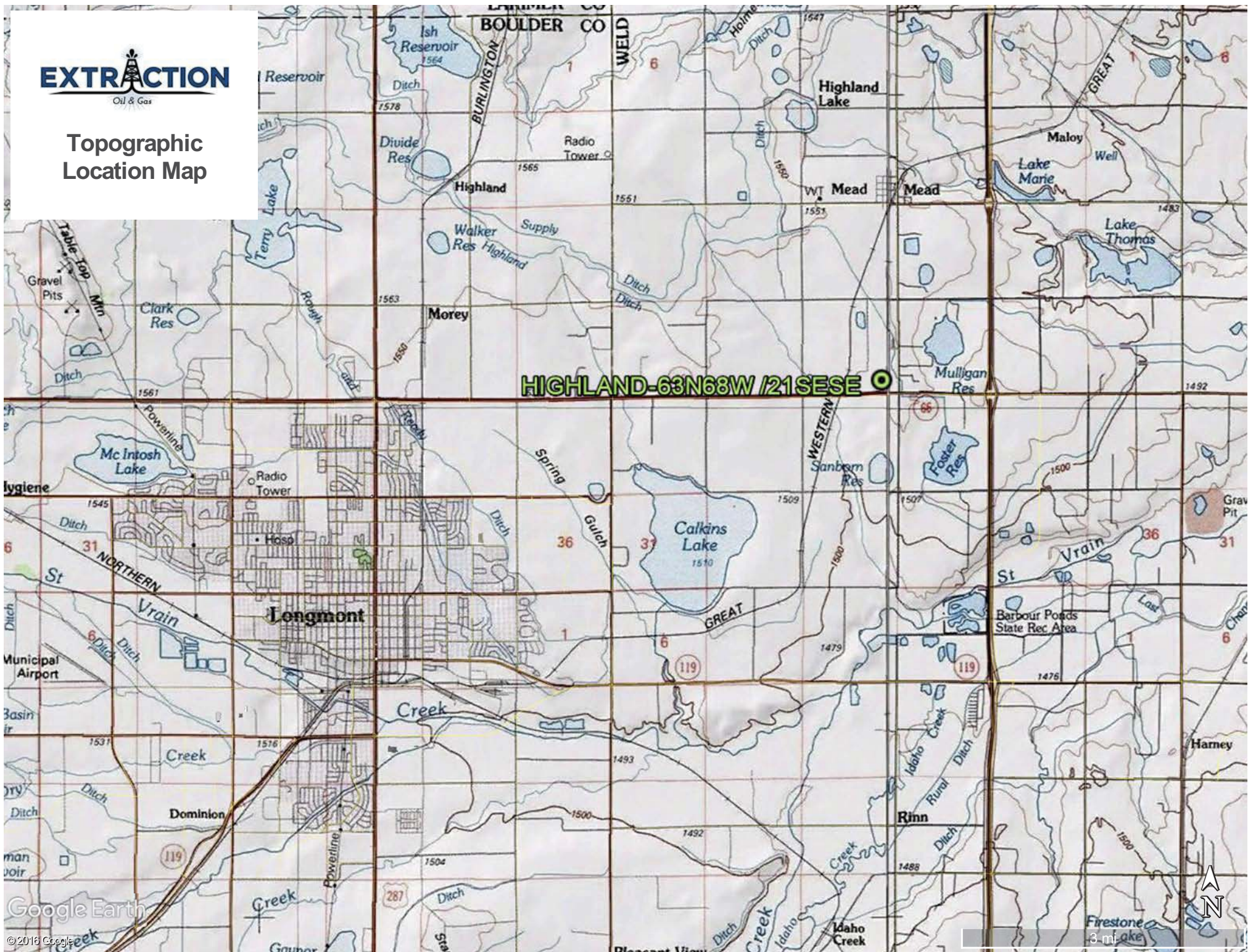
**Attachments:**

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





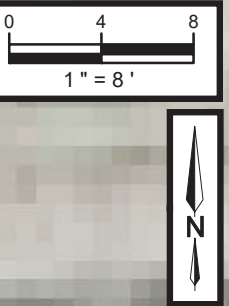
## Topographic Location Map























Google Earth

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\* Sample IDs in Purple font indicates a regulatory exceedance.

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



## Highland 1 Site Diagram

Service Layer Credits:  
Google Earth, Inc.

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
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

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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 'P. 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

### Sample Receipt Checklist

S2 Work Order: 1705062

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)	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 <sup>(1)</sup> ?	<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<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) <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect				
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			<input 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):				
<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.				

Custodian Printed Name

Signature or Initials of Custodian

Date/Time

5-4-17 1800



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: <b>05/04/17 09:52</b>									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>360</b>	50	mg/kg	1	1705076	05/08/17	05/09/17	8015M	

Date Sampled: <b>05/04/17 09:52</b>									
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: <b>05/04/17 09:52</b>									
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	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.0065</b>	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>420</b>	50	"	100	"	"	05/09/17	"	

Date Sampled: <b>05/04/17 09:52</b>									
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: <b>05/04/17 09:52</b>									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>3250</b>	12.3	mg/kg dry	1	1705069	05/08/17	05/08/17	EPA 6020/Mod. USDA60 6(2, 3A)	
<b>Magnesium</b>	<b>381</b>	6.14	"	"	"	"	"	"	

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

**B01@6'**  
**1705062-01 (Soil)**

**Summit Scientific**

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

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
<b>C10-C28 (DRO)</b>	<b>56</b>	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
<i>Surrogate: o-Terphenyl</i>		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	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>6.5</b>	0.50	"	"	"	"	"	"	

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		102 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.5 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		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
<b>Calcium</b>	<b>459</b>	11.4	mg/kg dry	1	1705069	05/08/17	05/08/17	EPA 6020/Mod. USDA60 6(2, 3A)	
<b>Magnesium</b>	<b>169</b>	5.72	"	"	"	"	"	"	

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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**

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	"	"	"	"	"	"	

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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**

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

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

**Batch 1705076 - EPA 3550A**

**Blank (1705076-BLK1)**

Prepared & Analyzed: 05/08/17

C10-C28 (DRO) ND 50 mg/kg

Surrogate: o-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: o-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: o-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: o-Terphenyl 12.5 " 12.5 100 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:  
05/12/17 13:30

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

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

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

**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			
Surrogate: 1,2-Dichloroethane-d4	0.0399		"	0.0400		99.8	23-173			
Surrogate: Toluene-d8	0.0402		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0389		"	0.0400		97.4	21-167			

**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			
Surrogate: 1,2-Dichloroethane-d4	0.0424		"	0.0400		106	23-173			
Surrogate: Toluene-d8	0.0401		"	0.0400		100	20-170			
Surrogate: 4-Bromofluorobenzene	0.0394		"	0.0400		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: [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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**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	
Surrogate: 1,2-Dichloroethane-d4	0.0418		"	0.0400		104	23-173			
Surrogate: Toluene-d8	0.0398		"	0.0400		99.5	20-170			
Surrogate: 4-Bromofluorobenzene	0.0396		"	0.0400		98.9	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:**  
05/12/17 13:30

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

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

**Batch 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		
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1705090 - General Preparation

LCS (1705090-BS1)

Prepared & Analyzed: 05/09/17

pH	8.01	0.100	pH Units	8.00	100	95-105
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Duplicate (1705090-DUP1)

Source: 1705015-01

Prepared & Analyzed: 05/09/17

pH	8.74	0.100	pH Units	9.64	9.79	20
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Batch 1705091 - General Preparation

Blank (1705091-BLK1)

Prepared & Analyzed: 05/09/17

Specific Conductance (EC)	ND	0.0100	mmhos/cm
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LCS (1705091-BS1)

Prepared & Analyzed: 05/09/17

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

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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 'P. 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: 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

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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

### Sample Receipt Checklist

S2 Work Order: 1705068

Client: Extraction Oil

Client Project ID: Highlands #1

Shipped Via: H/D

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

Airbill #: \_\_\_\_\_

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 <sup>(1)</sup> ?	<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			<u>on ice</u>
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? <b>if yes, contact client and note in narrative.</b>			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect				
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			<input 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):				

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

Paul S. Hines  
Custodian Printed Name

[Signature]  
Signature or Initials of Custodian

5-5-17 1605  
Date/Time



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

Project: Highlands #1  
Project Number: [none]  
Project Manager: Chris Hines

Reported:  
05/12/17 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: o-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

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
<b>Arsenic</b>	<b>2.13</b>	0.228	mg/kg dry	1	1705099	05/10/17	05/10/17	EPA 6020A	
<b>Barium</b>	<b>21.8</b>	0.457	"	"	"	"	"	"	
Cadmium	ND	0.114	"	"	"	"	"	"	
<b>Chromium</b>	<b>9.84</b>	0.571	"	"	"	"	"	"	
<b>Copper</b>	<b>10.0</b>	0.571	"	"	"	"	"	"	
<b>Lead</b>	<b>11.0</b>	0.228	"	"	"	"	"	"	
<b>Nickel</b>	<b>11.9</b>	0.114	"	"	"	"	"	"	
Selenium	ND	0.457	"	"	"	"	"	"	
Silver	ND	0.114	"	"	"	"	"	"	
<b>Zinc</b>	<b>54.4</b>	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	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**Batch 1705076 - EPA 3550A**

**Blank (1705076-BLK1)**

Prepared & Analyzed: 05/08/17

C10-C28 (DRO) ND 50 mg/kg

Surrogate: o-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: o-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: o-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: o-Terphenyl 12.5 " 12.5 100 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:  
05/12/17 15:09

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

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

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

**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			
Surrogate: 1,2-Dichloroethane-d4	0.0399		"	0.0400		99.8	23-173			
Surrogate: Toluene-d8	0.0402		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0389		"	0.0400		97.4	21-167			

**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			
Surrogate: 1,2-Dichloroethane-d4	0.0424		"	0.0400		106	23-173			
Surrogate: Toluene-d8	0.0401		"	0.0400		100	20-170			
Surrogate: 4-Bromofluorobenzene	0.0394		"	0.0400		98.6	21-167			

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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: 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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**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	
Surrogate: 1,2-Dichloroethane-d4	0.0418		"	0.0400		104	23-173			
Surrogate: Toluene-d8	0.0398		"	0.0400		99.5	20-170			
Surrogate: 4-Bromofluorobenzene	0.0396		"	0.0400		98.9	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:  
05/12/17 15:09

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

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

**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	"

Surrogate: 2-Methylnaphthalene-d10

0.0277

"

0.0333

83.2

30-150

Surrogate: Fluoranthene-d10

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

Surrogate: 2-Methylnaphthalene-d10

0.0304

"

0.0333

91.3

50-150

Surrogate: Fluoranthene-d10

0.0290

"

0.0333

87.1

50-150

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: 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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

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	
Surrogate: 2-Methylnaphthalene-d10	0.0248		"	0.0333		74.5	50-150	
Surrogate: Fluoranthene-d10	0.0258		"	0.0333		77.3	50-150	

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	
Surrogate: 2-Methylnaphthalene-d10	0.0313		"	0.0333		94.0	50-150			
Surrogate: Fluoranthene-d10	0.0313		"	0.0333		93.8	50-150			

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:**  
05/12/17 15:09

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

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

**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

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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		
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

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

**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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**Batch 1705094 - 3060A\_Mod**

<b>Blank (1705094-BLK1)</b>				Prepared: 05/09/17 Analyzed: 05/12/17						
Chromium, Hexavalent	ND	0.300	mg/kg wet							
<b>LCS (1705094-BS1)</b>				Prepared: 05/09/17 Analyzed: 05/12/17						
Chromium, Hexavalent	19.8	0.300	mg/kg wet	19.9		99.1	85-115			
<b>Duplicate (1705094-DUP1)</b>				Source: 1705061-01 Prepared: 05/09/17 Analyzed: 05/12/17						
Chromium, Hexavalent	ND	0.300	mg/kg dry		ND				20	
<b>Matrix Spike (1705094-MS1)</b>				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			
<b>Matrix Spike (1705094-MS2)</b>				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
<b>Post Spike (1705094-PS1)</b>				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	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**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

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

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

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

Batch 1705090 - General Preparation

LCS (1705090-BS1)

Prepared & Analyzed: 05/09/17

pH	8.01	0.100	pH Units	8.00	100	95-105
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Duplicate (1705090-DUP1)

Source: 1705015-01

Prepared & Analyzed: 05/09/17

pH	8.74	0.100	pH Units	9.64	9.79	20
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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
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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
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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: 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 'P. 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: 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

### Sample Receipt Checklist

S2 Work Order: 1705083

Client: Extraction O.I.

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 <sup>(1)</sup> ?	<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			ON ICE
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<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) <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect				
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			<input 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):				
_____				
_____				

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

Paul Struss  
Custodian Printed Name

[Signature]  
Signature or Initials of Custodian

5-8-17  
Date/Time



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

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
<b>Arsenic</b>	<b>2.06</b>	0.229	mg/kg dry	1	1705099	05/10/17	05/10/17	EPA 6020A	
<b>Barium</b>	<b>27.3</b>	0.458	"	"	"	"	"	"	
Cadmium	ND	0.114	"	"	"	"	"	"	
<b>Chromium</b>	<b>8.57</b>	0.572	"	"	"	"	"	"	
<b>Copper</b>	<b>8.62</b>	0.572	"	"	"	"	"	"	
<b>Lead</b>	<b>10.1</b>	0.229	"	"	"	"	"	"	
<b>Nickel</b>	<b>10.6</b>	0.114	"	"	"	"	"	"	
Selenium	ND	0.458	"	"	"	"	"	"	
Silver	ND	0.114	"	"	"	"	"	"	
<b>Zinc</b>	<b>45.5</b>	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: o-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**

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
<b>Arsenic</b>	<b>2.31</b>	0.233	mg/kg dry	1	1705099	05/10/17	05/10/17	EPA 6020A	
<b>Barium</b>	<b>44.7</b>	0.465	"	"	"	"	"	"	
Cadmium	ND	0.116	"	"	"	"	"	"	
<b>Chromium</b>	<b>9.34</b>	0.581	"	"	"	"	"	"	
<b>Copper</b>	<b>10.0</b>	0.581	"	"	"	"	"	"	
<b>Lead</b>	<b>10.9</b>	0.233	"	"	"	"	"	"	
<b>Nickel</b>	<b>12.3</b>	0.116	"	"	"	"	"	"	
Selenium	ND	0.465	"	"	"	"	"	"	
Silver	ND	0.116	"	"	"	"	"	"	
<b>Zinc</b>	<b>50.0</b>	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	<b>4.65</b>	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	<b>505</b>	11.6	mg/kg dry	1	1705093	05/09/17	05/09/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	<b>204</b>	5.81	"	"	"	"	"	"	
Sodium	<b>40.8</b>	5.81	"	"	"	"	"	"	
Sodium Adsorption Ratio	<b>0.387</b>		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	<b>8.48</b>	0.100	pH Units	1	1705123	05/11/17	05/12/17	EPA 9045	
% Solids	<b>86.0</b>		%	"	1705092	05/09/17	05/10/17	% calculation	
Specific Conductance (EC)	<b>0.351</b>	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: o-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

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
<b>Arsenic</b>	<b>1.95</b>	0.232	mg/kg dry	1	1705099	05/10/17	05/10/17	EPA 6020A	
<b>Barium</b>	<b>48.3</b>	0.463	"	"	"	"	"	"	
Cadmium	ND	0.116	"	"	"	"	"	"	
<b>Chromium</b>	<b>11.6</b>	0.579	"	"	"	"	"	"	
<b>Copper</b>	<b>11.0</b>	0.579	"	"	"	"	"	"	
<b>Lead</b>	<b>11.6</b>	0.232	"	"	"	"	"	"	
<b>Nickel</b>	<b>12.9</b>	0.116	"	"	"	"	"	"	
Selenium	ND	0.463	"	"	"	"	"	"	
Silver	ND	0.116	"	"	"	"	"	"	
<b>Zinc</b>	<b>56.4</b>	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	

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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: o-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	"	"	"	"	"	"	

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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

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
<b>Arsenic</b>	<b>2.30</b>	0.235	mg/kg dry	1	1705099	05/10/17	05/10/17	EPA 6020A	
<b>Barium</b>	<b>35.1</b>	0.471	"	"	"	"	"	"	
Cadmium	ND	0.118	"	"	"	"	"	"	
<b>Chromium</b>	<b>9.52</b>	0.588	"	"	"	"	"	"	
<b>Copper</b>	<b>10.0</b>	0.588	"	"	"	"	"	"	
<b>Lead</b>	<b>10.9</b>	0.235	"	"	"	"	"	"	
<b>Nickel</b>	<b>11.8</b>	0.118	"	"	"	"	"	"	
Selenium	ND	0.471	"	"	"	"	"	"	
Silver	ND	0.118	"	"	"	"	"	"	
<b>Zinc</b>	<b>51.2</b>	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: o-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	"	"	"	"	"	"	

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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**

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
<b>Arsenic</b>	<b>2.00</b>	0.230	mg/kg dry	1	1705099	05/10/17	05/10/17	EPA 6020A	
<b>Barium</b>	<b>40.3</b>	0.459	"	"	"	"	"	"	
Cadmium	ND	0.115	"	"	"	"	"	"	
<b>Chromium</b>	<b>9.49</b>	0.574	"	"	"	"	"	"	
<b>Copper</b>	<b>9.13</b>	0.574	"	"	"	"	"	"	
<b>Lead</b>	<b>10.5</b>	0.230	"	"	"	"	"	"	
<b>Nickel</b>	<b>11.5</b>	0.115	"	"	"	"	"	"	
Selenium	ND	0.459	"	"	"	"	"	"	
Silver	ND	0.115	"	"	"	"	"	"	
<b>Zinc</b>	<b>49.9</b>	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	<b>670</b>	11.5	mg/kg dry	1	1705093	05/09/17	05/09/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	<b>207</b>	5.74	"	"	"	"	"	"	
Sodium	<b>31.6</b>	5.74	"	"	"	"	"	"	
Sodium Adsorption Ratio	<b>0.274</b>		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	<b>8.56</b>	0.100	pH Units	1	1705123	05/11/17	05/12/17	EPA 9045	
Specific Conductance (EC)	<b>0.356</b>	0.0100	mmhos/cm	"	1705126	05/11/17	05/12/17	SM 2510B	
% Solids	<b>87.1</b>		%	"	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: o-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	"	"	"	"	"	"	

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**

**Semivolatile Organic Compounds by EPA Method 8270D SIM**

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
<b>Arsenic</b>	<b>2.27</b>	0.229	mg/kg dry	1	1705099	05/10/17	05/10/17	EPA 6020A	
<b>Barium</b>	<b>22.1</b>	0.458	"	"	"	"	"	"	
Cadmium	ND	0.115	"	"	"	"	"	"	
<b>Chromium</b>	<b>9.74</b>	0.573	"	"	"	"	"	"	
<b>Copper</b>	<b>9.16</b>	0.573	"	"	"	"	"	"	
<b>Lead</b>	<b>10.7</b>	0.229	"	"	"	"	"	"	
<b>Nickel</b>	<b>11.0</b>	0.115	"	"	"	"	"	"	
Selenium	ND	0.458	"	"	"	"	"	"	
Silver	ND	0.115	"	"	"	"	"	"	
<b>Zinc</b>	<b>51.7</b>	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

**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	<b>170</b>	11.5	mg/kg dry	1	1705093	05/09/17	05/09/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	<b>143</b>	5.73	"	"	"	"	"	"	
Sodium	<b>34.0</b>	5.73	"	"	"	"	"	"	
Sodium Adsorption Ratio	<b>0.465</b>		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	<b>8.61</b>	0.100	pH Units	1	1705123	05/11/17	05/12/17	EPA 9045	
Specific Conductance (EC)	<b>0.280</b>	0.0100	mmhos/cm	"	1705126	05/11/17	05/12/17	SM 2510B	
% Solids	<b>87.3</b>		%	"	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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**Batch 1705086 - EPA 3550A**

**Blank (1705086-BLK1)**

Prepared & Analyzed: 05/09/17

C10-C28 (DRO) ND 50 mg/kg

Surrogate: o-Terphenyl 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

Surrogate: o-Terphenyl 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

Surrogate: o-Terphenyl 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

Surrogate: o-Terphenyl 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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

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

**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			
Surrogate: 1,2-Dichloroethane-d4	0.0439		"	0.0400		110	23-173			
Surrogate: Toluene-d8	0.0398		"	0.0400		99.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0408		"	0.0400		102	21-167			

**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			
Surrogate: 1,2-Dichloroethane-d4	0.0500		"	0.0400		125	23-173			
Surrogate: Toluene-d8	0.0385		"	0.0400		96.3	20-170			
Surrogate: 4-Bromofluorobenzene	0.0399		"	0.0400		99.8	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: 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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**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	
Surrogate: 1,2-Dichloroethane-d4	0.0469		"	0.0400		117	23-173			
Surrogate: Toluene-d8	0.0382		"	0.0400		95.5	20-170			
Surrogate: 4-Bromofluorobenzene	0.0420		"	0.0400		105	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: 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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**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	"

Surrogate: 2-Methylnaphthalene-d10	0.0277		"	0.0333	83.2	30-150
Surrogate: Fluoranthene-d10	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

Surrogate: 2-Methylnaphthalene-d10	0.0304		"	0.0333	91.3	50-150
Surrogate: Fluoranthene-d10	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**

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

**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		
Surrogate: 2-Methylnaphthalene-d10	0.0248		"	0.0333		74.5	50-150		
Surrogate: Fluoranthene-d10	0.0258		"	0.0333		77.3	50-150		

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	QM-07
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	
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	
Surrogate: 2-Methylnaphthalene-d10	0.0313		"	0.0333		94.0	50-150			
Surrogate: Fluoranthene-d10	0.0313		"	0.0333		93.8	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

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

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

**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: 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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1705094 - 3060A\_Mod

<b>Blank (1705094-BLK1)</b>					Prepared: 05/09/17 Analyzed: 05/12/17					
Chromium, Hexavalent	ND	0.300	mg/kg wet							
<b>LCS (1705094-BS1)</b>					Prepared: 05/09/17 Analyzed: 05/12/17					
Chromium, Hexavalent	19.8	0.300	mg/kg wet	19.9		99.1	85-115			
<b>Duplicate (1705094-DUP1)</b>					Source: 1705061-01 Prepared: 05/09/17 Analyzed: 05/12/17					
Chromium, Hexavalent	ND	0.300	mg/kg dry		ND				20	
<b>Matrix Spike (1705094-MS1)</b>					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			
<b>Matrix Spike (1705094-MS2)</b>					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
<b>Post Spike (1705094-PS1)</b>					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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**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

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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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**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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**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				
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**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	
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**Batch 1705126 - General Preparation**

**Blank (1705126-BLK1)**      Prepared: 05/11/17      Analyzed: 05/12/17

Specific Conductance (EC)	ND	0.0100	mmhos/cm							
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**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				
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**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	
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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: 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,

A handwritten signature in black ink, appearing to read 'P. 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: 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

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:

Page 1 of 1

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix		Analyze For:								Special Instructions
				HCl	HNO <sub>3</sub>	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	TPH (DRO & GRO)	BTEX	PAH	pH, SAR, EC	RCRA8 Metals	Hold*	
B012 15'	5/15/17	1105	2														* 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:  only	
S012 14'		1125																
W020 14'		1225																
W030 7'		1210																
B030 15'		1515																
W040 9'		1616																
Relinquished by:	Date/Time:	Received by:	Date/Time:	Turn Around Time (Check)														
1/1/17	5/15/17 5:01 pm	5-15-17 17:01		Same Day		72 Hours												
Relinquished by:	Date/Time:	Received by:	Date/Time:	24 Hours		Standard												
1/1/17	5-15-17 18:10			48 Hours														
Relinquished by:	Date/Time:	Received In Lab by:	Date/Time:	Sample Integrity:														
				Temperature Upon Receipt: 20.9														
				Intact: Yes No														

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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: 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)	<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			<u>on ice</u>
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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<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) <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H <sub>2</sub> SO <sub>4</sub> , NaOH, HNO <sub>3</sub> , ect			<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			<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.				

Murip  
Custodian Printed Name

S-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: o-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
<b>C10-C28 (DRO)</b>	<b>82</b>	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
Surrogate: o-Terphenyl		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	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>11</b>	0.50	"	"	"	"	"	"	

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

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

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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: o-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		"	"	"	"	

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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
Surrogate: o-Terphenyl		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
Surrogate: 1,2-Dichloroethane-d4		97.9 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		148 %	21-167		"	"	"	"	

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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

**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: o-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
Surrogate: o-Terphenyl		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
Surrogate: 1,2-Dichloroethane-d4		105 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		111 %	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

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

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

**Batch 1705168 - EPA 3550A**

**Blank (1705168-BLK1)**

Prepared & Analyzed: 05/16/17

C10-C28 (DRO) ND 50 mg/kg

Surrogate: o-Terphenyl 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

Surrogate: o-Terphenyl 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

Surrogate: o-Terphenyl 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

Surrogate: o-Terphenyl 13.0 " 12.5 104 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: 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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

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

**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			
Surrogate: 1,2-Dichloroethane-d4	0.0408		"	0.0400		102	23-173			
Surrogate: Toluene-d8	0.0396		"	0.0400		98.9	20-170			
Surrogate: 4-Bromofluorobenzene	0.0394		"	0.0400		98.6	21-167			

**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			
Surrogate: 1,2-Dichloroethane-d4	0.0406		"	0.0400		102	23-173			
Surrogate: Toluene-d8	0.0397		"	0.0400		99.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0399		"	0.0400		99.7	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

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

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

**Batch 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	
Surrogate: 1,2-Dichloroethane-d4	0.0409		"	0.0400		102	23-173			
Surrogate: Toluene-d8	0.0392		"	0.0400		98.1	20-170			
Surrogate: 4-Bromofluorobenzene	0.0384		"	0.0400		96.0	21-167			

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: 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

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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 'P. 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:**  
05/23/17 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

*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:  
05/23/17 10:20

### Sample Receipt Checklist

S2 Work Order: 1705164

Client: Extraction O&G

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)	<u>20.8</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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			<u>once</u>
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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<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) <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect				
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			<input 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):				

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

Murphy  
Custodian Printed Name

MS 5-16-17  
Signature or Initials of Custodian

16:25  
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: o-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

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:  
05/23/17 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
Surrogate: o-Terphenyl		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
Surrogate: 1,2-Dichloroethane-d4		103 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.1 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	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: Blake Ford

Reported:  
05/23/17 10:20

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

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

**Batch 1705182 - EPA 3550A**

**Blank (1705182-BLK1)**

Prepared & Analyzed: 05/17/17

C10-C28 (DRO) ND 50 mg/kg

Surrogate: o-Terphenyl 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

Surrogate: o-Terphenyl 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

Surrogate: o-Terphenyl 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

Surrogate: o-Terphenyl 17.2 " 12.5 137 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:  
05/23/17 10:20

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

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

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

**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			
Surrogate: 1,2-Dichloroethane-d4	0.0412		"	0.0400		103	23-173			
Surrogate: Toluene-d8	0.0412		"	0.0400		103	20-170			
Surrogate: 4-Bromofluorobenzene	0.0341		"	0.0400		85.2	21-167			

**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			
Surrogate: 1,2-Dichloroethane-d4	0.0449		"	0.0400		112	23-173			
Surrogate: Toluene-d8	0.0401		"	0.0400		100	20-170			
Surrogate: 4-Bromofluorobenzene	0.0418		"	0.0400		105	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: 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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**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	
Surrogate: 1,2-Dichloroethane-d4	0.0438		"	0.0400		110	23-173			
Surrogate: Toluene-d8	0.0397		"	0.0400		99.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0466		"	0.0400		116	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: 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

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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,

A handwritten signature in black ink, appearing to read 'P. 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: 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

*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: Blake Ford

**Reported:**  
05/25/17 06:43

## Summit Scientific 1705239

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:

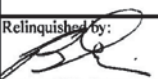
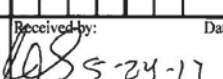
Sampler Name: Brian Gibson

**Project Manager:** Chris Hines- 970.261.1127

E-Mail: [BFord@extractionog.com](mailto:BFord@extractionog.com), [Chris.Hines@apexcoss.com](mailto:Chris.Hines@apexcoss.com), [Jhickey@apexcoss.com](mailto:Jhickey@apexcoss.com)

Project Name: Highland 1

Project Number: 744.11208.01/079/002

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative					Matrix		Analyze For:							Special Instructions
				HCl	HNO <sub>3</sub>	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													X			
B11@14'		1809																
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)				Same Day <input checked="" type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input type="checkbox"/> 48 Hours <input type="checkbox"/>				Notes:						
Relinquished by:	Date/Time:	Received by:	Date/Time:	Sample Integrity:				Temperature Upon Receipt: 16.0 Inact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>										
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:															

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

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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

### Sample Receipt Checklist

S2 Work Order: 1705239  
Client: Extraction Oil & Gas 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)	<u>16.0</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 <sup>(1)</sup> ?	<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<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) <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H <sub>2</sub> SO <sub>4</sub> , NaOH, HNO <sub>3</sub> , ect				
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			<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):				
<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.				

Lozano  
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: o-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-d4		102 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		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: o-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		"	"	"	"	

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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
Surrogate: o-Terphenyl		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
Surrogate: 1,2-Dichloroethane-d4		104 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		174 %	21-167		"	"	"	"	S-02

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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: o-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		"	"	"	"	

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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: o-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		"	"	"	"	

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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: o-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		"	"	"	"	

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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
Surrogate: o-Terphenyl		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
Surrogate: 1,2-Dichloroethane-d4		117 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		92.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		404 %	21-167		"	"	"	"	S-02

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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: o-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
Surrogate: o-Terphenyl		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
Surrogate: 1,2-Dichloroethane-d4		134 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		104 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		1120 %	21-167		"	"	"	"	S-02

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

**Batch 1705251 - EPA 3550A**

**Blank (1705251-BLK1)**

Prepared & Analyzed: 05/24/17

C10-C28 (DRO)	ND	50	mg/kg							
Surrogate: o-Terphenyl	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			
Surrogate: o-Terphenyl	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			
Surrogate: o-Terphenyl	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	
Surrogate: o-Terphenyl	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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**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				

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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

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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,

A handwritten signature in black ink, appearing to read 'P. 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: 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.*

A handwritten signature in black ink, appearing to be 'MSH'.



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 <sup>(1)</sup> ?		<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<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) <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			<u>HCl</u>
Note the type of preservative in the Comments column – HCl, H <sub>2</sub> SO <sub>4</sub> , NaOH, HNO <sub>3</sub> , ect				
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			<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):				

<sup>(1)</sup> 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
Surrogate: 1,2-Dichloroethane-d4		111 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		102 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		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
Surrogate: o-Terphenyl		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
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		165 %	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  
Project Manager: Chris Hines

**Reported:**  
05/26/17 09:14

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

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

**Batch 1705270 - EPA 3550A**

**Blank (1705270-BLK1)**

Prepared & Analyzed: 05/25/17

C10-C28 (DRO) ND 50 mg/kg

Surrogate: o-Terphenyl 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

Surrogate: o-Terphenyl 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

Surrogate: o-Terphenyl 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

Surrogate: o-Terphenyl 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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**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	"							
Surrogate: 1,2-Dichloroethane-d4	13.3		"	13.3		99.5	37-154			
Surrogate: Toluene-d8	13.7		"	13.3		103	45-149			
Surrogate: 4-Bromofluorobenzene	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			
Surrogate: 1,2-Dichloroethane-d4	13.9		"	13.3		104	37-154			
Surrogate: Toluene-d8	13.4		"	13.3		101	45-149			
Surrogate: 4-Bromofluorobenzene	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			
Surrogate: 1,2-Dichloroethane-d4	15.2		"	13.3		114	37-154			
Surrogate: Toluene-d8	13.1		"	13.3		98.3	45-149			
Surrogate: 4-Bromofluorobenzene	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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**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			

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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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**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			

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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