

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

July 17, 2019

Heather Shideman

Extraction Oil&Gas

370 17th Street Suite 5300

Denver, CO 80202

RE: BWSE/GWA_Coyote_Trails

Work Order # 1907017

Enclosed are the results of analyses for samples received by Summit Scientific on 07/01/19 16:50. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Muri Premier", on a light blue background.

Muri Premier For Ben Shrewsbury

Laboratory Manager



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

Project: BWSE/GWA_Coyote_Trails

Project Number: 17031

Project Manager: Heather Shideman

Reported:
07/17/19 11:46

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BW_Front_Range_Landfill_Surface_Water_SW	1907017-01	Water	07/01/19 13:45	07/01/19 16:50

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.

1907017

Summit Scientific

S₂

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

Page 1 of 1

Client: Extraction Oil and Gas (XOG) Report to: Apex Companies, LLC Project Manager: Heather Shideman
Address: 2234 117th Ave, Ste 106 E-Mail: Rochelle.Carlisle@apexc.com, Heather.Shideman@apexc.com
City/State/Zip: Greeley, CO 80634 cc: bford@extractionog.com
Phone: (970) 576-3446 Project Name: BWSE/GWA Coyote Trails
Sampler Name: *Sosac Serilly* Project No.: AFE # 17031; Code 961.15 Facility ID 7574310

				Preservative				Matrix				Analysis Requested								Special Instructions	
ID	Field ID / Point of Collection	Date Sampled	Time Sampled	# of containers	HCl	HNO ₃	None	Other (Specify)	Surface Water	Soil	Air-Canister #	Other (Specify)	COGCC 609 minus Isotopes								
1	BW Front Range Landfill Surface Water SW SWSE 28 1N 68W	7/1/19	1345	11					X				X	X	X				Sample Frequency: Q3		
	Temperature, field: 28.0 °C																				
	pH, field: 8.54 s.u.																				
	Conductivity, field: 514 uS/cm																				
	ORP, field: 211.7 mV																				
	Dissolved Oxygen, field: 3.98 mg/L																				
	Turbidity, field: 80.3 NTU																				
Relinquished by: <i>Jonis</i>		Date/Time: 7/1/19 4:50 PM		Received by: <i>Quinn</i>		Date/Time: 7-1-19 16:50		Turn Around Time (Check) Same Day <input type="checkbox"/> 72 hours <input type="checkbox"/> 24 hours <input checked="" 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: 13.1 Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No													
Relinquished by:		Date/Time:		Received by:		Date/Time:															

Sample Receipt Checklist

S2 Work Order

1907017

Client:

Apex/XOG

Client Project ID:

B WSE / GMA - Coyote Trails

Shipped Via

(H.D.)

P.U./FedEx/UPS/USPS/Other

Airbill #:

Matrix (check all that apply):

☐ Air

☐ Soil/Solid

☒ Water

☐ Other:

(Describe)

Temp (°C)

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C ⁽¹⁾ ? NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	on ice
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact ⁽¹⁾ ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	HCl
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ? Record the pH in Comments.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Additional Comments (if any):

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

Custodian Printed Name or Initials

AT

Signature of Custodian

[Signature]

Date/Time

7-1-19 16:50



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

Project: BWSE/GWA_Coyote_Trails
Project Number: 17031
Project Manager: Heather Shideman

Reported:
07/17/19 11:46

BW_Front_Range_Landfill_Surface_Water_SW
SWSE_28_1N_68W
1907017-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0010	mg/L	1	1907026	07/02/19	07/04/19	EPA 8260B	
Toluene	ND	0.0010	"	"	"	"	"	"	
Ethylbenzene	ND	0.0010	"	"	"	"	"	"	
m,p-Xylene	ND	0.0020	"	"	"	"	"	"	
o-Xylene	ND	0.0010	"	"	"	"	"	"	
Xylenes (total)	ND	0.0020	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.050	"	"	"	"	"	"	

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		89.7 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.9 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	0.100	mg/L	1	1907086	07/05/19	07/06/19	EPA 8015M	

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		116 %	44.8-129		"	"	"	"	

Dissolved Gases by RSK-175

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							

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Project Number: 17031

Project Manager: Heather Shideman

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07/17/19 11:46

BW_Front_Range_Landfill_Surface_Water_SW
SWSE_28_1N_68W
1907017-01 (Water)

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Dissolved Gases by RSK-175

Methane	0.051	0.010	mg/L	1	1907044	07/02/19	07/05/19	RSK-175 mod
Ethane	ND	0.010	"	"	"	"	"	"
Propane	ND	0.010	"	"	"	"	"	"

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: Ethene		120 %	70-130		"	"	"	"	

Dissolved Metals by EPA Method 200.8

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	18.6	0.0500	mg/L	1	1907040	07/02/19	07/02/19	EPA 200.8	
Iron	1.86	0.0100	"	"	"	"	"	"	
Magnesium	10.6	0.0500	"	"	"	"	"	"	
Manganese	0.0450	0.00100	"	"	"	"	"	"	
Potassium	8.64	0.0500	"	"	"	"	"	"	
Sodium	79.8	0.0500	"	"	"	"	"	"	
Barium	0.0505	0.00100	"	"	"	"	"	"	
Boron	0.0775	0.0100	"	"	"	"	"	"	
Selenium	0.00213	0.00100	"	"	"	"	"	"	
Strontium	0.308	0.0100	"	"	"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bromide	ND	0.200	mg/L	1	1907004	07/02/19	07/02/19	EPA 300.0	
Chloride	11.7	0.100	"	"	"	"	"	"	
Fluoride	0.707	0.200	"	"	"	"	"	"	
Sulfate	13.7	0.300	"	"	"	"	"	"	
Nitrate as N	ND	0.100	"	"	"	"	"	"	
Nitrite as N	ND	0.100	"	"	"	"	"	"	
Nitrate/Nitrite as N	ND	0.200	"	"	"	"	"	"	

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BW_Front_Range_Landfill_Surface_Water_SW
SWSE_28_1N_68W
1907017-01 (Water)

Summit Scientific

Anions by EPA Method 300.0

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Alkalinity	220	10.0	mg/L as CaCO ₃	1	1907075	07/05/19	07/08/19	SM2320-B	
Carbonate	40.0	10.0	"	"	"	"	"	"	
Bicarbonate	180	10.0	"	"	"	"	"	"	

Conventional Chemistry Parameters by APHA/EPA Methods

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Phosphorus - Total	0.0950	0.0500	mg/L	1	1907091	07/05/19	07/08/19	SM4500-P-E	

Specific Conductance by SM2510B

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	451	1.00	umhos/cm	1	1907059	07/03/19	07/03/19	SM2510B	

Total Dissolved Solids by SM2540C

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Dissolved Solids	224	10.0	mg/L	1	1907058	07/03/19	07/03/19	SM2540C	

pH by SM4500

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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BW_Front_Range_Landfill_Surface_Water_SW

SWSE_28_1N_68W

1907017-01 (Water)

Summit Scientific

pH by SM4500

pH	8.96	1.00	pH Units	1	1907035	07/01/19	07/02/19	SM4500-H+ B
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Biological Activity Reaction Test

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Iron Related Bacteria	140000	25.0	CFU/ml	1	1907045	07/02/19	07/16/19	BART	
Sulfate Reducing Bacteria	115000	200	"	"	"	"	"	"	
Slime Forming Bacteria	440000	500	"	"	"	"	"	"	

Field Data

Date Sampled: **07/01/19 13:45**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Specific Conductance (EC)	514		uS/cm	1	1907037	07/01/19	07/01/19	Field Method	
Temperature	28.0		Degrees C	"	"	"	"	"	
Oxidation/Reduction Potential	211.9		mv	"	"	"	"	"	
Dissolved Oxygen	5.98		mg/L	"	"	"	"	"	
Turbidity	80.3		NTU	"	"	"	"	"	
pH	8.57		SU	"	"	"	"	"	

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Reported:
07/17/19 11:46

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 1907026 - EPA 5030 Water MS

Blank (1907026-BLK1)

Prepared: 07/02/19 Analyzed: 07/04/19

Benzene	ND	0.0010	mg/L							
Toluene	ND	0.0010	"							
Ethylbenzene	ND	0.0010	"							
m,p-Xylene	ND	0.0020	"							
o-Xylene	ND	0.0010	"							
Xylenes (total)	ND	0.0020	"							
Gasoline Range Hydrocarbons	ND	0.050	"							
Surrogate: 1,2-Dichloroethane-d4	0.0123		"	0.0133		92.1	23-173			
Surrogate: Toluene-d8	0.0128		"	0.0133		96.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0124		"	0.0133		93.2	21-167			

LCS (1907026-BS1)

Prepared: 07/02/19 Analyzed: 07/04/19

Benzene	0.0273	0.0010	mg/L	0.0333		81.9	51-132			
Toluene	0.0301	0.0010	"	0.0333		90.3	51-138			
Ethylbenzene	0.0320	0.0010	"	0.0333		96.0	58-146			
m,p-Xylene	0.0641	0.0020	"	0.0667		96.1	57-144			
o-Xylene	0.0311	0.0010	"	0.0333		93.4	53-146			
Surrogate: 1,2-Dichloroethane-d4	0.0127		"	0.0133		95.2	23-173			
Surrogate: Toluene-d8	0.0131		"	0.0133		98.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0130		"	0.0133		97.7	21-167			

Matrix Spike (1907026-MS1)

Source: 1906399-03

Prepared: 07/02/19 Analyzed: 07/04/19

Benzene	0.0296	0.0010	mg/L	0.0333	0.00234	81.9	34-141			
Toluene	0.0301	0.0010	"	0.0333	ND	90.3	27-151			
Ethylbenzene	0.0320	0.0010	"	0.0333	ND	96.1	29-160			
m,p-Xylene	0.0645	0.0020	"	0.0667	ND	96.7	20-166			
o-Xylene	0.0307	0.0010	"	0.0333	ND	92.1	33-159			
Surrogate: 1,2-Dichloroethane-d4	0.0132		"	0.0133		98.6	23-173			
Surrogate: Toluene-d8	0.0131		"	0.0133		98.1	20-170			
Surrogate: 4-Bromofluorobenzene	0.0129		"	0.0133		96.8	21-167			

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Project: BWSE/GWA_Coyote_Trails

Project Number: 17031

Project Manager: Heather Shideman

Reported:

07/17/19 11:46

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 1907026 - EPA 5030 Water MS

Matrix Spike Dup (1907026-MSD1)		Source: 1906399-03			Prepared: 07/02/19 Analyzed: 07/04/19					
Benzene	0.0296	0.0010	mg/L	0.0333	0.00234	81.7	34-141	0.237	32	
Toluene	0.0303	0.0010	"	0.0333	ND	90.9	27-151	0.728	25	
Ethylbenzene	0.0323	0.0010	"	0.0333	ND	97.0	29-160	0.901	50	
m,p-Xylene	0.0652	0.0020	"	0.0667	ND	97.7	20-166	1.06	36	
o-Xylene	0.0313	0.0010	"	0.0333	ND	94.0	33-159	2.03	26	
Surrogate: 1,2-Dichloroethane-d4	0.0137		"	0.0133		103	23-173			
Surrogate: Toluene-d8	0.0128		"	0.0133		96.1	20-170			
Surrogate: 4-Bromofluorobenzene	0.0130		"	0.0133		97.1	21-167			

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Project Number: 17031

Project Manager: Heather Shideman

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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 1907086 - EPA 3520B

Blank (1907086-BLK1)

Prepared: 07/05/19 Analyzed: 07/06/19

C10-C28 (DRO)	ND	0.100	mg/L							
Surrogate: o-Terphenyl	0.0227		"	0.0250		90.7	44.8-129			

LCS (1907086-BS1)

Prepared: 07/05/19 Analyzed: 07/06/19

C10-C28 (DRO)	0.823	0.100	mg/L	1.00		82.3	70-130			
Surrogate: o-Terphenyl	0.0259		"	0.0250		104	44.8-129			

Matrix Spike (1907086-MS1)

Source: 1907006-01

Prepared: 07/05/19 Analyzed: 07/06/19

C10-C28 (DRO)	0.810	0.100	mg/L	1.00	ND	81.0	10-159			
Surrogate: o-Terphenyl	0.0254		"	0.0250		102	44.8-129			

Matrix Spike Dup (1907086-MSD1)

Source: 1907006-01

Prepared: 07/05/19 Analyzed: 07/06/19

C10-C28 (DRO)	0.835	0.100	mg/L	1.00	ND	83.5	10-159	3.05	20	
Surrogate: o-Terphenyl	0.0273		"	0.0250		109	44.8-129			

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Project: BWSE/GWA_Coyote_Trails

Project Number: 17031

Project Manager: Heather Shideman

Reported:
07/17/19 11:46

Dissolved Gases by RSK-175 - Quality Control
Summit Scientific

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

Batch 1907044 - GC

Blank (1907044-BLK1)

Prepared: 07/02/19 Analyzed: 07/05/19

Methane	ND	0.010	mg/L							
Ethane	ND	0.010	"							
Propane	ND	0.010	"							
Surrogate: Ethene	0.0462		"	0.0364		127	70-130			

LCS (1907044-BS1)

Prepared: 07/02/19 Analyzed: 07/05/19

Methane	0.043	0.010	mg/L	0.0428		99.6	70-130			
Ethane	0.080	0.010	"	0.0798		99.7	70-130			
Propane	0.11	0.010	"	0.139		82.2	70-130			
Surrogate: Ethene	0.0754		"	0.0728		104	70-130			

Duplicate (1907044-DUP1)

Source: 1907017-01

Prepared: 07/02/19 Analyzed: 07/05/19

Methane	0.050	0.010	mg/L		0.051			0.792	30	
Ethane	ND	0.010	"		ND				30	
Propane	ND	0.010	"		ND				30	
Surrogate: Ethene	0.0430		"	0.0364		118	70-130			

Matrix Spike (1907044-MS1)

Source: 1907017-01

Prepared: 07/02/19 Analyzed: 07/05/19

Methane	0.086	0.010	mg/L	0.0428	0.051	83.5	70-130			
Ethane	0.084	0.010	"	0.0798	ND	105	70-130			
Propane	0.12	0.010	"	0.139	ND	86.5	70-130			
Surrogate: Ethene	0.0822		"	0.0728		113	70-130			

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Project Number: 17031

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Dissolved Metals by EPA Method 200.8 - Quality Control

Summit Scientific

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

Batch 1907040 - EPA 200.8

Blank (1907040-BLK1)

Prepared & Analyzed: 07/02/19

Calcium	ND	0.0500	mg/L
Iron	ND	0.0100	"
Magnesium	ND	0.0500	"
Manganese	ND	0.00100	"
Potassium	ND	0.0500	"
Sodium	ND	0.0500	"
Barium	ND	0.00100	"
Boron	ND	0.0100	"
Selenium	ND	0.00100	"
Strontium	ND	0.0100	"

LCS (1907040-BS1)

Prepared & Analyzed: 07/02/19

Calcium	5.71	0.0500	mg/L	5.00	114	85-115
Iron	5.10	0.0100	"	5.00	102	85-115
Magnesium	5.10	0.0500	"	5.00	102	85-115
Manganese	0.474	0.00100	"	0.500	94.8	85-115
Potassium	5.77	0.0500	"	5.00	115	85-115
Sodium	5.65	0.0500	"	5.00	113	85-115
Barium	0.524	0.00100	"	0.500	105	85-115
Boron	2.64	0.0100	"	2.50	105	85-115
Selenium	0.0467	0.00100	"	0.0500	93.5	85-115
Strontium	0.514	0.0100	"	0.500	103	85-115

Duplicate (1907040-DUP1)

Source: 1907015-01

Prepared & Analyzed: 07/02/19

Calcium	39.8	0.0500	mg/L	40.2	1.02	20
Iron	ND	0.0100	"	ND		20
Magnesium	12.8	0.0500	"	13.5	5.25	20
Manganese	0.0370	0.00100	"	0.0388	4.90	20
Potassium	9.75	0.0500	"	10.3	5.30	20
Sodium	300	0.0500	"	318	5.93	20
Barium	0.0220	0.00100	"	0.0229	4.13	20
Boron	0.612	0.0100	"	0.613	0.193	20
Selenium	0.00638	0.00100	"	0.00690	7.93	20
Strontium	0.232	0.0100	"	0.235	1.31	20

Summit Scientific

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

Project: BWSE/GWA_Coyote_Trails

Project Number: 17031

Project Manager: Heather Shideman

Reported:
07/17/19 11:46

Dissolved Metals by EPA Method 200.8 - Quality Control

Summit Scientific

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

Batch 1907040 - EPA 200.8

Matrix Spike (1907040-MS1)		Source: 1907015-01			Prepared & Analyzed: 07/02/19					
Calcium	44.0	0.0500	mg/L	5.00	40.2	76.6	70-130			
Iron	5.13	0.0100	"	5.00	ND	103	70-130			
Magnesium	17.5	0.0500	"	5.00	13.5	79.3	70-130			
Manganese	0.504	0.00100	"	0.500	0.0388	93.0	70-130			
Potassium	14.0	0.0500	"	5.00	10.3	73.6	70-130			
Sodium	294	0.0500	"	5.00	318	NR	70-130			QM-02
Barium	0.512	0.00100	"	0.500	0.0229	97.7	70-130			
Boron	2.99	0.0100	"	2.50	0.613	95.1	70-130			
Selenium	0.0496	0.00100	"	0.0500	0.00690	85.3	70-130			
Strontium	0.762	0.0100	"	0.500	0.235	105	70-130			

Matrix Spike Dup (1907040-MSD1)		Source: 1907015-01			Prepared & Analyzed: 07/02/19					
Calcium	46.1	0.0500	mg/L	5.00	40.2	120	70-130	4.76	25	
Iron	5.13	0.0100	"	5.00	ND	103	70-130	0.0113	25	
Magnesium	19.6	0.0500	"	5.00	13.5	122	70-130	11.4	25	
Manganese	0.514	0.00100	"	0.500	0.0388	95.0	70-130	1.99	25	
Potassium	15.6	0.0500	"	5.00	10.3	106	70-130	11.0	25	
Sodium	339	0.0500	"	5.00	318	412	70-130	14.0	25	QM-02
Barium	0.533	0.00100	"	0.500	0.0229	102	70-130	4.07	25	
Boron	3.10	0.0100	"	2.50	0.613	99.5	70-130	3.62	25	
Selenium	0.0434	0.00100	"	0.0500	0.00690	72.9	70-130	13.4	25	
Strontium	0.795	0.0100	"	0.500	0.235	112	70-130	4.24	25	

Summit Scientific

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

Project: BWSE/GWA_Coyote_Trails

Project Number: 17031

Project Manager: Heather Shideman

Reported:
07/17/19 11:46

Anions by EPA Method 300.0 - Quality Control

Summit Scientific

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

Batch 1907004 - General Preparation

LCS (1907004-BS1)

Prepared & Analyzed: 07/01/19

Bromide	10.2	0.200	mg/L	10.0	102	90-110
Chloride	3.30	0.100	"	3.00	110	90-110
Fluoride	2.16	0.200	"	2.00	108	90-110
Sulfate	16.2	0.300	"	15.0	108	90-110
Nitrate as N	3.23	0.100	"	3.00	108	90-110
Nitrite as N	3.28	0.100	"	3.00	110	90-110

Duplicate (1907004-DUP1)

Source: 1907001-02

Prepared & Analyzed: 07/01/19

Bromide	ND	0.200	mg/L	1.26		20	
Chloride	ND	0.100	"	44.4		20	QM-02
Fluoride	2.46	0.200	"	2.45		0.367	20
Sulfate	80.7	0.300	"	80.0		0.986	20
Nitrate as N	6.24	0.100	"	6.18		0.967	20
Nitrite as N	0.577	0.100	"	0.578		0.173	20
Nitrate/Nitrite as N	ND	0.200	"	ND			20

Matrix Spike (1907004-MS1)

Source: 1907001-02

Prepared & Analyzed: 07/01/19

Bromide	10.4	0.200	mg/L	10.0	1.26	91.5	80-120	
Chloride	ND	0.100	"	3.00	44.4	NR	80-120	QM-02
Fluoride	4.58	0.200	"	2.00	2.45	107	80-120	
Sulfate	92.1	0.300	"	15.0	80.0	80.7	80-120	
Nitrate as N	8.74	0.100	"	3.00	6.18	85.7	80-120	
Nitrite as N	3.62	0.100	"	3.00	0.578	102	80-120	

Summit Scientific

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Extraction Oil&Gas
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Denver CO, 80202

Project: BWSE/GWA_Coyote_Trails

Project Number: 17031

Project Manager: Heather Shideman

Reported:
07/17/19 11:46

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 1907075 - General Preparation

Blank (1907075-BLK1)

Prepared: 07/05/19 Analyzed: 07/08/19

Total Alkalinity	ND	10.0	mg/L as CaCO3							
Carbonate	ND	10.0	"							
Bicarbonate	ND	10.0	"							

LCS (1907075-BS1)

Prepared: 07/05/19 Analyzed: 07/08/19

Total Alkalinity	110	10.0	mg/L as CaCO3	100		110	80-120			
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Duplicate (1907075-DUP1)

Source: 1907006-01

Prepared: 07/05/19 Analyzed: 07/08/19

Total Alkalinity	350	10.0	mg/L as CaCO3		350			0.00	20	
Carbonate	ND	10.0	"		ND				20	
Bicarbonate	350	10.0	"		350			0.00	20	

Matrix Spike (1907075-MS1)

Source: 1907006-01

Prepared: 07/05/19 Analyzed: 07/08/19

Total Alkalinity	450	10.0	mg/L as CaCO3	100	350	100	70-130			
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Matrix Spike Dup (1907075-MSD1)

Source: 1907006-01

Prepared: 07/05/19 Analyzed: 07/08/19

Total Alkalinity	440	10.0	mg/L as CaCO3	100	350	90.0	70-130	2.25	20	
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Summit Scientific

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

Project: BWSE/GWA_Coyote_Trails

Project Number: 17031

Project Manager: Heather Shideman

Reported:
07/17/19 11:46

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control
Summit Scientific

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

Batch 1907091 - General Preparation

Blank (1907091-BLK1)

Prepared: 07/05/19 Analyzed: 07/08/19

Phosphorus - Total ND 0.0500 mg/L

LCS (1907091-BS1)

Prepared: 07/05/19 Analyzed: 07/08/19

Phosphorus - Total 0.908 0.0500 mg/L 1.00 90.8 80-120

Duplicate (1907091-DUP1)

Source: 1907006-01

Prepared: 07/05/19 Analyzed: 07/08/19

Phosphorus - Total 0.0800 0.0500 mg/L 0.0820 2.47 20

Matrix Spike (1907091-MS1)

Source: 1907006-01

Prepared: 07/05/19 Analyzed: 07/08/19

Phosphorus - Total 1.09 0.0500 mg/L 1.00 0.0820 101 70-130

Matrix Spike Dup (1907091-MSD1)

Source: 1907006-01

Prepared: 07/05/19 Analyzed: 07/08/19

Phosphorus - Total 1.09 0.0500 mg/L 1.00 0.0820 101 70-130 0.0918 20

Summit Scientific

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Extraction Oil&Gas
370 17th Street Suite 5300
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Project: BWSE/GWA_Coyote_Trails

Project Number: 17031

Project Manager: Heather Shideman

Reported:
07/17/19 11:46

Specific Conductance by SM2510B - Quality Control

Summit Scientific

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

Batch 1907059 - General Preparation

Blank (1907059-BLK1)

Prepared & Analyzed: 07/03/19

Specific Conductance (EC) ND 1.00 umhos/cm

Duplicate (1907059-DUP1)

Source: 1907006-01

Prepared & Analyzed: 07/03/19

Specific Conductance (EC) 5140 1.00 umhos/cm 5160 0.447 20

Summit Scientific

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

Project: BWSE/GWA_Coyote_Trails

Project Number: 17031

Project Manager: Heather Shideman

Reported:
07/17/19 11:46

Total Dissolved Solids by SM2540C - Quality Control

Summit Scientific

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

Batch 1907058 - General Preparation

Blank (1907058-BLK1)

Prepared & Analyzed: 07/03/19

Total Dissolved Solids ND 10.0 mg/L

Duplicate (1907058-DUP1)

Source: 1907006-01

Prepared & Analyzed: 07/03/19

Total Dissolved Solids 2540 10.0 mg/L 2480 2.07 20

Summit Scientific

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Extraction Oil&Gas
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Project: BWSE/GWA_Coyote_Trails

Project Number: 17031

Project Manager: Heather Shideman

Reported:
07/17/19 11:46

pH by SM4500 - Quality Control

Summit Scientific

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

Batch 1907035 - General Preparation

LCS (1907035-BS1)

Prepared: 07/01/19 Analyzed: 07/02/19

pH	9.42	1.00	pH Units	9.23	102	90-110
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Duplicate (1907035-DUP1)

Source: 1907016-02

Prepared: 07/01/19 Analyzed: 07/02/19

pH	8.16	1.00	pH Units	8.16	0.00	20
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Summit Scientific

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

Project: BWSE/GWA_Coyote_Trails

Project Number: 17031

Project Manager: Heather Shideman

Reported:

07/17/19 11:46

Biological Activity Reaction Test - Quality Control

Summit Scientific

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

Batch 1907045 - General Preparation

Blank (1907045-BLK1)

Prepared: 07/02/19 Analyzed: 07/16/19

Iron Related Bacteria	ND	25.0	CFU/ml
Sulfate Reducing Bacteria	ND	200	"
Slime Forming Bacteria	ND	500	"

Summit Scientific

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

Project: BWSE/GWA_Coyote_Trails

Project Number: 17031
Project Manager: Heather Shideman

Reported:
07/17/19 11:46

Notes and Definitions

QM-02	The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte inherent in the sample.
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