

# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

August 24, 2018

Blake Ford

Extraction Oil&Gas

370 17th Street Suite 5300

Denver, CO 80202

RE: BWSE/GWA\_Coyote\_Trails

Enclosed are the results of analyses for samples received by Summit Scientific on 08/08/18 16:01. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury For Ben Shrewsbury

Laboratory Manager



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

Project: BWSE/GWA\_Coyote\_Trails

Project Number: AFE#17031 Code 961.15

Project Manager: Blake Ford

**Reported:**  
08/24/18 06:50

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BW_Front_Range_Landfill_Surface_Water_SW_SWSE_28	1808099-01	Water	08/08/18 10:57	08/08/18 16:01

Summit Scientific

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# Summit Scientific

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

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@apexcos.com, Heather.Shideman@apexcos.com  
City/State/Zip: Greeley, CO 80634 cc: bford@extractionog.com  
Phone: (970) 576-3446 Project Name: BWSE/GWA\_Coyote\_Trails  
Sampler Name: Kate Macdonald Project No.: AFE # 17031; Code 961.15 Facility ID

ID	Field ID / Point of Collection	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested				Special Instructions			
					HCl	HNO3	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	8/8/18	1057	11	X	X	X		X					X	X	X				Sample Frequency: Q2-Q3 ps
	Temperature, field:	21.41	°C																	
	pH, field:	6.10	s.u.																	
	Conductivity, field:	391.6	uS/cm																	
	ORP, field:	6.9	mV																	
	Dissolved Oxygen, field:	3.11	mg/L																	
	Turbidity, field:	58.6	NTU																	
Relinquished by:		Date/Time:		Received by:		Date/Time:		Turn Around Time (Check)				Notes:								
		8/8/18 1601				8.8.18 1601		Same Day _____ 72 hours _____ 24 hours <u>X</u> <u>Standard</u> 48 hours _____				Sample Integrity: Temperature Upon Receipt: <u>15.9</u> Intact: <u>Yes</u> No								
Relinquished by:		Date/Time:		Received by:		Date/Time:														
Relinquished by:		Date/Time:		Received by:		Date/Time:														

**Sample Receipt Checklist**

S2 Work Order 1808099

Client: XOG Client Project ID: BWSE/GWA Coyote Trails

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

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

Temp (°C)	<u>15.9</u>
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Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ? NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	✓			
Were all samples received intact <sup>(1)</sup> ?	✓			
Was adequate sample volume provided <sup>(1)</sup> ?	✓			
If custody seals are present, are they intact <sup>(1)</sup> ?			✓	
Are samples with holding times due within 48 hours sample due within 48 hours present?			✓	
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	✓			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	✓			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	✓			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	✓			
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>		✓		
Are samples preserved that require preservation <b>(excluding cooling)</b> <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	✓			<u>HNO3, HCl</u>
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.	✓			<u>pH 8</u>
If dissolved metals are requested, were samples field filtered?			✓	

Additional Comments (if any):

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

UP  
 Custodian Printed Name or Initials

[Signature]  
 Signature of Custodian

8.8.2008 1610  
 Date/Time



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

Project: BWSE/GWA\_Coyote\_Trails

Project Number: AFE#17031 Code 961.15  
Project Manager: Blake Ford

**Reported:**  
08/24/18 06:50

**BW\_Front\_Range\_Landfill\_Surface\_Water\_SW\_SWSE\_28\_1N\_68W**  
**1808099-01 (Water)**

**Summit Scientific**

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

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0010	mg/L	1	1808182	08/14/18	08/14/18	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: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		110 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	0.100	mg/L	1	1808171	08/14/18	08/16/18	EPA 8015M	

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		79.7 %	44.8-129		"	"	"	"	

**Dissolved Gases by RSK-175 mod**

Date Sampled: **08/08/18 10:57**

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**  
**1808099-01 (Water)**

**Summit Scientific**

**Dissolved Gases by RSK-175 mod**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Methane	0.012	0.010	mg/L	1	1808224	08/16/18	08/17/18	RSK-175 mod	
Ethane	ND	0.010	"	"	"	"	"	"	
Propane	ND	0.010	"	"	"	"	"	"	

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: Ethene		103 %	70-130		"	"	"	"	

**Dissolved Metals by EPA Method 200.8**

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	12.8	0.0500	mg/L	1	1808128	08/10/18	08/10/18	EPA 200.8	
Iron	1.28	0.0100	"	"	"	"	"	"	
Magnesium	6.84	0.0500	"	"	"	"	"	"	
Manganese	0.0217	0.00100	"	"	"	"	"	"	
Potassium	6.97	0.0500	"	"	"	"	"	"	
Sodium	54.8	0.0500	"	"	"	"	"	"	
Barium	0.0574	0.00100	"	"	"	"	"	"	
Boron	0.297	0.0100	"	"	"	"	"	"	
Selenium	0.00202	0.00100	"	"	"	"	"	"	
Strontium	0.315	0.0100	"	"	"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bromide	ND	0.200	mg/L	1	1808119	08/09/18	08/09/18	EPA 300.0	
Chloride	11.2	0.100	"	"	"	"	"	"	
Fluoride	0.415	0.200	"	"	"	"	"	"	
Sulfate	87.5	10.0	"	10	"	"	"	"	
Nitrate as N	ND	0.100	"	1	"	"	"	"	
Nitrite as N	ND	0.100	"	"	"	"	"	"	
Nitrate/Nitrite as N	ND	0.200	"	"	"	"	"	"	

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Project Number: AFE#17031 Code 961.15

Project Manager: Blake Ford

**Reported:**  
08/24/18 06:50

**BW\_Front\_Range\_Landfill\_Surface\_Water\_SW\_SWSE\_28\_1N\_68W  
1808099-01 (Water)**

**Summit Scientific**

**Anions by EPA Method 300.0**

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

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Total Alkalinity</b>	<b>80.0</b>	10.0	mg/L as CaCO3	1	1808187	08/15/18	08/15/18	SM2320-B	
Carbonate	ND	10.0	"	"	"	"	"	"	
<b>Bicarbonate</b>	<b>80.0</b>	10.0	"	"	"	"	"	"	

**Conventional Chemistry Parameters by APHA/EPA Methods**

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Phosphorus - Total</b>	<b>0.355</b>	0.0500	mg/L	1	1808168	08/14/18	08/15/18	SM4500-P	

**Specific Conductance by SM2510B**

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>431</b>	1.00	umhos/cm	1	1808178	08/14/18	08/14/18	SM2510B	

**Total Dissolved Solids by SM2540C**

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Total Dissolved Solids</b>	<b>211</b>	10.0	mg/L	1	1808179	"	08/14/18	SM2450C	

**pH by SM4500**

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Project Manager: Blake Ford

**Reported:**  
08/24/18 06:50

**BW\_Front\_Range\_Landfill\_Surface\_Water\_SW\_SWSE\_28\_1N\_68W**  
**1808099-01 (Water)**

**Summit Scientific**

**pH by SM4500**

<b>pH</b>	<b>7.81</b>	1	pH Units	1	1808118	08/08/18	08/08/18	SM4500-H+
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**Biological Activity Reaction Test**

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>Iron Related Bacteria</b>	<b>35000</b>	25.0	CFU/ml	1	1808123	08/09/18	08/23/18	BART	
Sulfate Reducing Bacteria	ND	200	"	"	"	"	"	"	
<b>Slime Forming Bacteria</b>	<b>6000</b>	500	"	"	"	"	"	"	

**Field Data**

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>Specific Conductance (EC)</b>	<b>391.6</b>		uS/cm	1	1808108	08/08/18	08/08/18	Field Method	
<b>Temperature</b>	<b>21.41</b>		°C	"	"	"	"	"	
<b>Oxidation/Reduction Potential</b>	<b>6.9</b>		mv	"	"	"	"	"	
<b>Dissolved Oxygen</b>	<b>3.11</b>		mg/L	"	"	"	"	"	
<b>Turbidity</b>	<b>58.6</b>		NTU	"	"	"	"	"	
<b>pH</b>	<b>6.10</b>		s.u.	"	"	"	"	"	

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Reported:  
08/24/18 06:50

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

#### Summit Scientific

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

#### Batch 1808182 - EPA 5030 Water MS

##### Blank (1808182-BLK1)

Prepared & Analyzed: 08/14/18

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	0.0151		"	0.0132		115		23-173		
Surrogate: Toluene-d8	0.0130		"	0.0133		97.3		20-170		
Surrogate: 4-Bromofluorobenzene	0.0143		"	0.0133		108		21-167		

##### LCS (1808182-BS1)

Prepared & Analyzed: 08/14/18

Benzene	0.0287	0.0010	mg/L	0.0333		86.0		51-132		
Toluene	0.0287	0.0010	"	0.0333		86.2		51-138		
Ethylbenzene	0.0315	0.0010	"	0.0333		94.5		58-146		
m,p-Xylene	0.0563	0.0020	"	0.0667		84.4		57-144		
o-Xylene	0.0299	0.0010	"	0.0333		89.6		53-146		
Surrogate: 1,2-Dichloroethane-d4	0.0154		"	0.0132		117		23-173		
Surrogate: Toluene-d8	0.0136		"	0.0133		102		20-170		
Surrogate: 4-Bromofluorobenzene	0.0146		"	0.0133		109		21-167		

##### Matrix Spike (1808182-MS1)

Source: 1808184-02

Prepared & Analyzed: 08/14/18

Benzene	0.0268	0.0010	mg/L	0.0333	ND	80.4		34-141		
Toluene	0.0269	0.0010	"	0.0333	ND	80.6		27-151		
Ethylbenzene	0.0292	0.0010	"	0.0333	ND	87.6		29-160		
m,p-Xylene	0.0524	0.0020	"	0.0667	ND	78.6		20-166		
o-Xylene	0.0284	0.0010	"	0.0333	ND	85.1		33-159		
Surrogate: 1,2-Dichloroethane-d4	0.0160		"	0.0132		121		23-173		
Surrogate: Toluene-d8	0.0136		"	0.0133		102		20-170		
Surrogate: 4-Bromofluorobenzene	0.0141		"	0.0133		105		21-167		

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**Reported:**  
08/24/18 06:50

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

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

**Batch 1808182 - EPA 5030 Water MS**

<b>Matrix Spike Dup (1808182-MSD1)</b>	<b>Source: 1808184-02</b>			<b>Prepared &amp; Analyzed: 08/14/18</b>						
Benzene	0.0293	0.0010	mg/L	0.0333	ND	88.0	34-141	9.05	32	
Toluene	0.0293	0.0010	"	0.0333	ND	87.9	27-151	8.62	25	
Ethylbenzene	0.0326	0.0010	"	0.0333	ND	97.8	29-160	11.0	50	
m,p-Xylene	0.0574	0.0020	"	0.0667	ND	86.0	20-166	9.08	36	
o-Xylene	0.0312	0.0010	"	0.0333	ND	93.6	33-159	9.50	26	
Surrogate: 1,2-Dichloroethane-d4	0.0155		"	0.0132		117	23-173			
Surrogate: Toluene-d8	0.0134		"	0.0133		100	20-170			
Surrogate: 4-Bromofluorobenzene	0.0141		"	0.0133		106	21-167			

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

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

**Batch 1808171 - EPA 3520B**

**Blank (1808171-BLK1)**

Prepared: 08/14/18 Analyzed: 08/16/18

C10-C28 (DRO)	ND	0.100	mg/L								
Surrogate: <i>o</i> -Terphenyl	0.0216		"	0.0250		86.5	44.8-129				

**LCS (1808171-BS1)**

Prepared: 08/14/18 Analyzed: 08/16/18

C10-C28 (DRO)	0.827	0.100	mg/L	1.00		82.7	70-130				
Surrogate: <i>o</i> -Terphenyl	0.0207		"	0.0250		82.7	44.8-129				

**Matrix Spike (1808171-MS1)**

Source: 1808099-01

Prepared: 08/14/18 Analyzed: 08/16/18

C10-C28 (DRO)	0.928	0.100	mg/L	1.00	ND	92.8	10-159				
Surrogate: <i>o</i> -Terphenyl	0.0218		"	0.0250		87.1	44.8-129				

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**Reported:**  
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**Dissolved Gases by RSK-175 mod - Quality Control**  
**Summit Scientific**

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

**Batch 1808224 - \*\*\* DEFAULT PREP \*\*\***

**Blank (1808224-BLK1)**

Prepared: 08/16/18 Analyzed: 08/17/18

Methane	ND	0.010	mg/L								
Ethane	ND	0.010	"								
Propane	ND	0.010	"								
Surrogate: Ethene	0.0405		"	0.0364		111	70-130				

**LCS (1808224-BS1)**

Prepared: 08/16/18 Analyzed: 08/17/18

Methane	0.042	0.010	mg/L	0.0428		99.1	70-130				
Ethane	0.084	0.010	"	0.0798		105	70-130				
Propane	0.12	0.010	"	0.139		87.2	70-130				
Surrogate: Ethene	0.0842		"	0.0728		116	70-130				

**Duplicate (1808224-DUP1)**

Source: 1808099-01

Prepared: 08/16/18 Analyzed: 08/17/18

Methane	0.013	0.010	mg/L		0.012			9.37	30		
Ethane	0.0042	0.010	"		0.0016			89.7	30		
Propane	0.0063	0.010	"		0.0029			73.9	30		
Surrogate: Ethene	0.0437		"	0.0364		120	70-130				

**Matrix Spike (1808224-MS1)**

Source: 1808099-01

Prepared: 08/16/18 Analyzed: 08/17/18

Methane	0.062	0.010	mg/L	0.0428	0.012	116	70-130				
Ethane	0.093	0.010	"	0.0798	0.0016	115	70-130				
Propane	0.14	0.010	"	0.139	0.0029	96.7	70-130				
Surrogate: Ethene	0.0869		"	0.0728		119	70-130				

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**Dissolved Metals by EPA Method 200.8 - Quality Control**

**Summit Scientific**

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

**Batch 1808128 - EPA 200.8**

**Blank (1808128-BLK1)**

Prepared & Analyzed: 08/10/18

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 (1808128-BS1)**

Prepared & Analyzed: 08/10/18

Calcium	4.53	0.0500	mg/L	5.00	90.7	80-120
Iron	4.60	0.0100	"	5.00	92.0	80-120
Magnesium	5.05	0.0500	"	5.00	101	80-120
Manganese	0.487	0.00100	"	0.500	97.4	80-120
Potassium	4.67	0.0500	"	5.00	93.4	80-120
Sodium	5.03	0.0500	"	5.00	101	80-120
Barium	0.469	0.00100	"	0.500	93.9	80-120
Boron	2.87	0.0100	"	2.50	115	80-120
Selenium	0.0446	0.00100	"	0.0500	89.3	80-120
Strontium	0.495	0.0100	"			80-120

**Duplicate (1808128-DUP1)**

Source: 1808099-01

Prepared & Analyzed: 08/10/18

Calcium	12.8	0.0500	mg/L	12.8	0.136	20
Iron	1.26	0.0100	"	1.28	1.90	20
Magnesium	6.94	0.0500	"	6.84	1.45	20
Manganese	0.0241	0.00100	"	0.0217	10.6	20
Potassium	7.21	0.0500	"	6.97	3.48	20
Sodium	56.1	0.0500	"	54.8	2.37	20
Barium	0.0590	0.00100	"	0.0574	2.61	20
Boron	0.273	0.0100	"	0.297	8.68	20
Selenium	0.00194	0.00100	"	0.00202	3.90	20
Strontium	0.314	0.0100	"	0.315	0.389	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: AFE#17031 Code 961.15  
Project Manager: Blake Ford

**Reported:**  
08/24/18 06:50

**Dissolved Metals by EPA Method 200.8 - Quality Control**  
**Summit Scientific**

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

**Batch 1808128 - EPA 200.8**

<b>Matrix Spike (1808128-MS1)</b>	<b>Source: 1808099-01</b>			<b>Prepared &amp; Analyzed: 08/10/18</b>								
Calcium	17.6	0.0500	mg/L	5.00	12.8	95.7	75-125					
Iron	5.37	0.0100	"	5.00	1.28	81.7	75-125					
Magnesium	11.6	0.0500	"	5.00	6.84	94.6	75-125					
Manganese	0.478	0.00100	"	0.500	0.0217	91.2	75-125					
Potassium	10.9	0.0500	"	5.00	6.97	79.7	75-125					
Sodium	54.6	0.0500	"	5.00	54.8	NR	75-125					QM-02
Barium	0.532	0.00100	"	0.500	0.0574	94.9	75-125					
Boron	2.63	0.0100	"	2.50	0.297	93.2	75-125					
Selenium	0.0487	0.00100	"	0.0500	0.00202	93.3	75-125					
Strontium	0.812	0.0100	"		0.315		75-125					

<b>Matrix Spike Dup (1808128-MSD1)</b>	<b>Source: 1808099-01</b>			<b>Prepared &amp; Analyzed: 08/10/18</b>								
Calcium	16.8	0.0500	mg/L	5.00	12.8	80.6	75-125	4.39	25			
Iron	5.37	0.0100	"	5.00	1.28	81.9	75-125	0.162	25			
Magnesium	11.2	0.0500	"	5.00	6.84	87.4	75-125	3.17	25			
Manganese	0.488	0.00100	"	0.500	0.0217	93.4	75-125	2.26	25			
Potassium	11.2	0.0500	"	5.00	6.97	84.0	75-125	1.97	25			
Sodium	58.0	0.0500	"	5.00	54.8	63.2	75-125	5.93	25			QM-02
Barium	0.532	0.00100	"	0.500	0.0574	94.9	75-125	0.00328	25			
Boron	2.70	0.0100	"	2.50	0.297	96.2	75-125	2.79	25			
Selenium	0.0494	0.00100	"	0.0500	0.00202	94.8	75-125	1.46	25			
Strontium	0.807	0.0100	"		0.315		75-125	0.612	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: AFE#17031 Code 961.15  
Project Manager: Blake Ford

**Reported:**  
08/24/18 06:50

**Anions by EPA Method 300.0 - Quality Control**  
**Summit Scientific**

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

**Batch 1808119 - General Preparation**

**Blank (1808119-BLK1)**

Prepared & Analyzed: 08/09/18

Bromide	ND	0.200	mg/L						
Chloride	ND	0.100	"						
Fluoride	ND	0.200	"						
Sulfate	ND	1.00	"						
Nitrate as N	ND	0.100	"						
Nitrite as N	ND	0.100	"						
Nitrate/Nitrite as N	ND	0.200	"						

**LCS (1808119-BS1)**

Prepared & Analyzed: 08/09/18

Bromide	10.1	0.200	mg/L	10.0	101	90-110
Chloride	2.93	0.100	"	3.00	97.7	90-110
Fluoride	1.81	0.200	"	2.00	90.3	90-110
Sulfate	16.1	1.00	"	15.0	107	90-110
Nitrate as N	2.91	0.100	"	3.00	97.1	90-110
Nitrite as N	2.95	0.100	"	3.00	98.3	90-110

**Duplicate (1808119-DUP1)**

Source: 1808099-01

Prepared & Analyzed: 08/09/18

Bromide	0.0750	0.200	mg/L	0.0700	6.90	200
Chloride	11.3	0.100	"	11.2	0.650	200
Fluoride	0.424	0.200	"	0.415	2.15	200
Sulfate	87.9	1.00	"	87.5	0.383	200
Nitrate as N	ND	0.100	"	ND		200
Nitrite as N	ND	0.100	"	ND		200
Nitrate/Nitrite as N	ND	0.200	"	ND		200

**Matrix Spike (1808119-MS1)**

Source: 1808099-01

Prepared & Analyzed: 08/09/18

Bromide	9.91	0.200	mg/L	10.0	0.0700	98.4	80-120
Chloride	14.4	0.100	"	3.00	11.2	108	80-120
Fluoride	2.09	0.200	"	2.00	0.415	83.7	80-120
Sulfate	100	1.00	"	15.0	87.5	86.0	80-120
Nitrate as N	2.51	0.100	"	3.00	ND	83.6	80-120
Nitrite as N	2.74	0.100	"	3.00	ND	91.4	80-120

Summit Scientific

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

Project: BWSE/GWA\_Coyote\_Trails

Project Number: AFE#17031 Code 961.15  
Project Manager: Blake Ford

**Reported:**  
08/24/18 06:50

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

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

**Batch 1808187 - General Preparation**

**Blank (1808187-BLK1)**

Prepared & Analyzed: 08/15/18

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

**LCS (1808187-BS1)**

Prepared & Analyzed: 08/15/18

Total Alkalinity	90.0	10.0	mg/L as CaCO3	100	90.0	80-120				
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**Duplicate (1808187-DUP1)**

Source: 1808099-01

Prepared & Analyzed: 08/15/18

Total Alkalinity	80.0	10.0	mg/L as CaCO3	80.0	80.0	0.00	20			
Carbonate	ND	10.0	"	ND	ND		20			
Bicarbonate	80.0	10.0	"	80.0	80.0	0.00	20			

**Matrix Spike (1808187-MS1)**

Source: 1808099-01

Prepared & Analyzed: 08/15/18

Total Alkalinity	190	10.0	mg/L as CaCO3	100	80.0	110	70-130			
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**Matrix Spike Dup (1808187-MSD1)**

Source: 1808099-01

Prepared & Analyzed: 08/15/18

Total Alkalinity	180	10.0	mg/L as CaCO3	100	80.0	100	70-130	5.41	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: AFE#17031 Code 961.15  
Project Manager: Blake Ford

**Reported:**  
08/24/18 06:50

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

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

**Batch 1808168 - General Preparation**

**Blank (1808168-BLK1)**

Prepared: 08/14/18 Analyzed: 08/15/18

Phosphorus - Total ND 0.0500 mg/L

**LCS (1808168-BS1)**

Prepared: 08/14/18 Analyzed: 08/15/18

Phosphorus - Total 0.929 0.0500 mg/L 1.00 92.9 80-120

**Duplicate (1808168-DUP1)**

**Source: 1808099-01**

Prepared: 08/14/18 Analyzed: 08/15/18

Phosphorus - Total 0.349 0.0500 mg/L 0.355 1.70 200

**Matrix Spike (1808168-MS1)**

**Source: 1808099-01**

Prepared: 08/14/18 Analyzed: 08/15/18

Phosphorus - Total 1.38 0.0500 mg/L 1.00 0.355 103 70-130

**Matrix Spike Dup (1808168-MSD1)**

**Source: 1808099-01**

Prepared: 08/14/18 Analyzed: 08/15/18

Phosphorus - Total 1.39 0.0500 mg/L 1.00 0.355 104 70-130 0.648 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: AFE#17031 Code 961.15

Project Manager: Blake Ford

**Reported:**  
 08/24/18 06:50

**Specific Conductance by SM2510B - Quality Control**

**Summit Scientific**

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

**Batch 1808178 - General Preparation**

**Duplicate (1808178-DUP1)**

**Source: 1808099-01**

Prepared & Analyzed: 08/14/18

Specific Conductance (EC)	431	1.00	umhos/cm	431		0.139	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: AFE#17031 Code 961.15

Project Manager: Blake Ford

**Reported:**  
 08/24/18 06:50

**Total Dissolved Solids by SM2540C - Quality Control**

**Summit Scientific**

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

**Batch 1808179 - General Preparation**

**Blank (1808179-BLK1)**

Prepared & Analyzed: 08/14/18

Total Dissolved Solids      ND      10.0      mg/L

**Duplicate (1808179-DUP1)**

Source: 1808099-01

Prepared & Analyzed: 08/14/18

Total Dissolved Solids      211      10.0      mg/L      211      0.237      200

Summit Scientific

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

Project: BWSE/GWA\_Coyote\_Trails

Project Number: AFE#17031 Code 961.15

Project Manager: Blake Ford

**Reported:**  
 08/24/18 06:50

**pH by SM4500 - Quality Control**

**Summit Scientific**

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

**Batch 1808118 - General Preparation**

**LCS (1808118-BS1)**

Prepared & Analyzed: 08/08/18

pH	9.17	1	pH Units	9.18	99.9	90-110
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**Duplicate (1808118-DUP1)**

Source: 1808099-01

Prepared & Analyzed: 08/08/18

pH	7.85	1	pH Units	7.81	0.511	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: AFE#17031 Code 961.15  
 Project Manager: Blake Ford

**Reported:**  
 08/24/18 06:50

**Biological Activity Reaction Test - Quality Control**  
**Summit Scientific**

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

**Batch 1808123 - General Preparation**

**Blank (1808123-BLK1)**

Prepared: 08/09/18 Analyzed: 08/23/18

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: AFE#17031 Code 961.15

Project Manager: Blake Ford

**Reported:**  
08/24/18 06:50

### 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