

# Summit Scientific

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4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

April 11, 2019

Heather Shideman

Extraction Oil&Gas

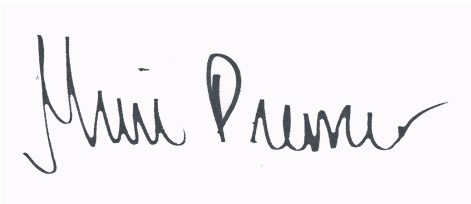
370 17th Street Suite 5300

Denver, CO 80202

RE: BWSE/GWA\_Alma\_1S\_66\_2524

Enclosed are the results of analyses for samples received by Summit Scientific on 03/25/19 19:04. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink on a light blue background. The signature is cursive and reads "Muri Premier".

Muri Premier For Ben Shrewsbury

Laboratory Manager



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

Project: BWSE/GWA\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BW_Henry_55800_F_SESE_25_1S_66W	1903250-01	Water	03/25/19 11:05	03/25/19 19:04

Summit Scientific

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# Summit Scientific

S<sub>2</sub>

1903250

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
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\_Alma\_1S\_66\_2524  
Sampler Name: Josue Sanchez Project No.: ALLOC-473 Facility ID 750095

					Preservative				Matrix				Analysis Requested				Special Instructions	
ID	Field ID / Point of Collection	Date Sampled	Time Sampled	# of containers	HCl	H <sub>2</sub> O <sub>2</sub>	None	Other (Specify)	Groundwater	Soil	Air-Canister Serial #	Other (Specify)	COGCC 609 minus Isotopes					
1	BW_Henry_55800_F	3/25/19	1105		6	1	4		X				X	X	X			Sample Frequency:
	SESE_25_1S_66W																	1SUB
	Temperature, field: 11.19 °C																	
	pH, field: 8.04 s.u.																	
	Conductivity, field: 1107.5 uS/cm																	
	ORP, field: -73.2 mV																	
	Dissolved Oxygen, field: 0.05 mg/L																	
	Turbidity, field: 0.29 NTU																	
Relinquished by: <i>Josue Sanchez</i> Date/Time: 3/25/19 1629					Received by: <i>[Signature]</i> Date/Time: 3-25-19 16:29					Turn Around Time (Check) Same Day <input type="checkbox"/> 72 hours <input type="checkbox"/> 24 hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 hours <input type="checkbox"/>					Notes:			
Relinquished by:					Received by:					Sample Integrity: Temperature Upon Receipt: 64 Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No								
Relinquished by:					Received by:													



1308 Parkland Court Champaign, IL 61821 • (877) 362-4190 • www.isotechlabs.com

1903250

### Send Data and Invoice to

Name: Blake Ford  
Company: Extraction Oil and Gas (XOG)  
Address: 2234 117th Ave, Ste 106  
Greeley, CO 80634  
Phone: (970) 576-3446  
Email: Rochelle.Carlisle@apexcos.com, Heather.Shideman@apexcos.com  
CC:bford@extractionog.com  
Sample Freq: 1SUB  
Facility ID: 750095  
Regulation: 318A.f

Project: BWSE/GWA\_Alma\_1S\_66\_2524

Purchase Order #: ALLOC-473

Location: SESE\_25\_1S\_66W

Sampled By: Jo Suee Soekee

Circle one:

☒ Standard  
☐ Priority  
☐ Rush

Unique ID: BW-Henry-55800-R

### Analysis Requested

NG1

SIW

### Sample Description

Container Number	Sample Identification	Date Sampled	Time	NG1	SIW	Comments
1	BW_Henry_55800_F	3/25/19	1105	X		COGCC Compatible EDD Please report methane gas plot

### Chain-of-Custody Record

Signature	Company	Date	Time
Relinquished by <u>Jo Suee Soekee</u>	Apex Companies, LLC	3/25/19	11:29
Received by <u>[Signature]</u>	Summit SC.	3-25-19	11:40
Relinquished by			
Received by			
Relinquished by			
Received by			



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

Project: BWSE/GWA\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

**BW\_Henry\_55800\_F\_SESE\_25\_1S\_66W**  
**1903250-01 (Water)**

**Summit Scientific**

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

Date Sampled: **03/25/19 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0010	mg/L	1	1903318	03/26/19	03/31/19	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: **03/25/19 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		78.2 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		92.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		91.7 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **03/25/19 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	0.100	mg/L	1	1903397	03/29/19	03/30/19	EPA 8015M	

Date Sampled: **03/25/19 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		96.9 %	44.8-129		"	"	"	"	

**Dissolved Gases by RSK-175**

Date Sampled: **03/25/19 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Summit Scientific

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370 17th Street Suite 5300  
Denver CO, 80202

Project: BWSE/GWA\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

**BW\_Henry\_55800\_F\_SESE\_25\_1S\_66W**  
**1903250-01 (Water)**

**Summit Scientific**

**Dissolved Gases by RSK-175**

Methane	ND	0.010	mg/L	1	1903373	03/28/19	03/31/19	RSK-175 mod
Ethane	ND	0.010	"	"	"	"	"	"
Propane	ND	0.010	"	"	"	"	"	"

Date Sampled: **03/25/19 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: Ethene		106 %	70-130		"	"	"	"	

**Dissolved Metals by EPA Method 200.8**

Date Sampled: **03/25/19 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	20.8	0.0500	mg/L	1	1903343	03/27/19	03/27/19	EPA 200.8	
Iron	0.0182	0.0100	"	"	"	"	"	"	
Magnesium	1.11	0.0500	"	"	"	"	"	"	
Manganese	0.0361	0.00100	"	"	"	"	"	"	
Potassium	1.84	0.0500	"	"	"	"	"	"	
Sodium	342	0.0500	"	"	"	"	"	"	
Barium	0.0205	0.00100	"	"	"	"	"	"	
Boron	0.0727	0.0100	"	"	"	"	"	"	
Selenium	ND	0.00100	"	"	"	"	"	"	
Strontium	0.440	0.0100	"	"	"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **03/25/19 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bromide	0.454	0.200	mg/L	1	1903324	03/26/19	03/26/19	EPA 300.0	
Chloride	51.0	2.00	"	20	"	"	"	"	
Fluoride	0.551	0.200	"	1	"	"	"	"	
Sulfate	501	6.00	"	20	"	"	"	"	
Nitrate as N	ND	0.100	"	1	"	"	"	"	
Nitrite as N	ND	0.100	"	"	"	"	"	"	
Nitrate/Nitrite as N	ND	0.200	"	"	"	"	"	"	

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Denver CO, 80202

Project: BWSE/GWA\_Alma\_1S\_66\_2524  
Project Number: ALLOC-473 Fac ID:750095  
Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

**BW\_Henry\_55800\_F\_SESE\_25\_1S\_66W**  
**1903250-01 (Water)**

**Summit Scientific**

**Anions by EPA Method 300.0**

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

Date Sampled: **03/25/19 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Alkalinity	180	10.0	mg/L as CaCO3	1	1903384	03/29/19	04/01/19	SM2320-B	
Carbonate	20.0	10.0	"	"	"	"	"	"	
Bicarbonate	160	10.0	"	"	"	"	"	"	

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

Date Sampled: **03/25/19 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Phosphorus - Total	ND	0.0500	mg/L	1	1903360	03/28/19	03/29/19	SM4500-P-E	

**Specific Conductance by SM2510B**

Date Sampled: **03/25/19 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1520	1.00	umhos/cm	1	1903358	03/28/19	03/28/19	SM2510B	

**Total Dissolved Solids by SM2540C**

Date Sampled: **03/25/19 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Dissolved Solids	734	10.0	mg/L	1	1903359	03/28/19	03/28/19	SM2540C	

**pH by SM4500**

Date Sampled: **03/25/19 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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370 17th Street Suite 5300  
Denver CO, 80202

Project: BWSE/GWA\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

**BW\_Henry\_55800\_F\_SESE\_25\_1S\_66W**  
**1903250-01 (Water)**

**Summit Scientific**

**pH by SM4500**

pH	8.32	1.00	pH Units	1	1903322	03/25/19	03/25/19	SM4500-H+ B
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**Biological Activity Reaction Test**

Date Sampled: **03/25/19 11:05**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>Iron Related Bacteria</b>	<b>9000</b>	25.0	CFU/ml	1	1903345	03/27/19	04/10/19	BART	
Sulfate Reducing Bacteria	ND	200	"	"	"	"	"	"	
Slime Forming Bacteria	ND	500	"	"	"	"	"	"	

**Field Data**

Date Sampled: **03/25/19 11:05**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>Specific Conductance (EC)</b>	<b>1107.5</b>		uS/cm	1	1903313	03/25/19	03/25/19	Field Method	
<b>Temperature</b>	<b>11.19</b>		Degrees C	"	"	"	"	"	
<b>Oxidation/Reduction Potential</b>	<b>-73.2</b>		mv	"	"	"	"	"	
<b>Dissolved Oxygen</b>	<b>0.05</b>		mg/L	"	"	"	"	"	
<b>Turbidity</b>	<b>0.79</b>		NTU	"	"	"	"	"	
<b>pH</b>	<b>8.24</b>		SU	"	"	"	"	"	

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Project: BWSE/GWA\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

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

### Summit Scientific

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

#### Batch 1903318 - EPA 5030 Water MS

##### Blank (1903318-BLK1)

Prepared: 03/26/19 Analyzed: 03/31/19

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	0.0106		"	0.0133		79.8	23-173			
Surrogate: Toluene-d8	0.0122		"	0.0133		91.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0127		"	0.0133		95.4	21-167			

##### LCS (1903318-BS1)

Prepared: 03/26/19 Analyzed: 03/31/19

Benzene	0.0318	0.0010	mg/L	0.0333		95.6	51-132			
Toluene	0.0334	0.0010	"	0.0333		100	51-138			
Ethylbenzene	0.0347	0.0010	"	0.0333		104	58-146			
m,p-Xylene	0.0726	0.0020	"	0.0667		109	57-144			
o-Xylene	0.0335	0.0010	"	0.0333		101	53-146			
Surrogate: 1,2-Dichloroethane-d4	0.0109		"	0.0133		81.7	23-173			
Surrogate: Toluene-d8	0.0124		"	0.0133		93.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0122		"	0.0133		91.8	21-167			

##### Matrix Spike (1903318-MS1)

Source: 1903250-01

Prepared: 03/26/19 Analyzed: 03/31/19

Benzene	0.0316	0.0010	mg/L	0.0333	ND	94.9	34-141			
Toluene	0.0330	0.0010	"	0.0333	ND	98.9	27-151			
Ethylbenzene	0.0349	0.0010	"	0.0333	ND	105	29-160			
m,p-Xylene	0.0720	0.0020	"	0.0667	ND	108	20-166			
o-Xylene	0.0335	0.0010	"	0.0333	ND	100	33-159			
Surrogate: 1,2-Dichloroethane-d4	0.0110		"	0.0133		82.6	23-173			
Surrogate: Toluene-d8	0.0124		"	0.0133		93.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0124		"	0.0133		93.2	21-167			

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370 17th Street Suite 5300  
Denver CO, 80202

Project: BWSE/GWA\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

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

### Summit Scientific

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

#### Batch 1903318 - EPA 5030 Water MS

Matrix Spike Dup (1903318-MSD1)	Source: 1903250-01			Prepared: 03/26/19 Analyzed: 03/31/19						
Benzene	0.0322	0.0010	mg/L	0.0333	ND	96.8	34-141	1.94	32	
Toluene	0.0337	0.0010	"	0.0333	ND	101	27-151	2.19	25	
Ethylbenzene	0.0349	0.0010	"	0.0333	ND	105	29-160	0.0860	50	
m,p-Xylene	0.0723	0.0020	"	0.0667	ND	108	20-166	0.471	36	
o-Xylene	0.0333	0.0010	"	0.0333	ND	99.8	33-159	0.719	26	
Surrogate: 1,2-Dichloroethane-d4	0.0120		"	0.0133		90.0	23-173			
Surrogate: Toluene-d8	0.0124		"	0.0133		92.9	20-170			
Surrogate: 4-Bromofluorobenzene	0.0124		"	0.0133		92.8	21-167			

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Project: BWSE/GWA\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

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

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

**Batch 1903397 - EPA 3520B**

**Blank (1903397-BLK1)**

Prepared: 03/29/19 Analyzed: 03/30/19

C10-C28 (DRO)	ND	0.100	mg/L							
Surrogate: o-Terphenyl	0.0194		"	0.0250		77.5	44.8-129			

**LCS (1903397-BS1)**

Prepared: 03/29/19 Analyzed: 03/30/19

C10-C28 (DRO)	0.893	0.100	mg/L	1.00		89.3	70-130			
Surrogate: o-Terphenyl	0.0188		"	0.0250		75.4	44.8-129			

**Matrix Spike (1903397-MS1)**

Source: 1903250-01

Prepared: 03/29/19 Analyzed: 03/30/19

C10-C28 (DRO)	0.970	0.100	mg/L	1.00	ND	97.0	10-159			
Surrogate: o-Terphenyl	0.0226		"	0.0250		90.5	44.8-129			

**Matrix Spike Dup (1903397-MSD1)**

Source: 1903250-01

Prepared: 03/29/19 Analyzed: 03/30/19

C10-C28 (DRO)	0.939	0.100	mg/L	1.00	ND	93.9	10-159	3.18	20	
Surrogate: o-Terphenyl	0.0257		"	0.0250		103	44.8-129			

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Project: BWSE/GWA\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

**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 1903373 - GC**

**Blank (1903373-BLK1)**

Prepared: 03/28/19 Analyzed: 03/31/19

Methane	ND	0.010	mg/L							
Ethane	ND	0.010	"							
Propane	ND	0.010	"							
Surrogate: Ethene	0.0322		"	0.0364		88.5	70-130			

**LCS (1903373-BS1)**

Prepared: 03/28/19 Analyzed: 04/01/19

Methane	0.039	0.010	mg/L	0.0428		92.1	70-130			
Ethane	0.078	0.010	"	0.0798		97.2	70-130			
Propane	0.12	0.010	"	0.139		86.1	70-130			
Surrogate: Ethene	0.0767		"	0.0728		105	70-130			

**Duplicate (1903373-DUP1)**

Source: 1903250-01

Prepared: 03/28/19 Analyzed: 03/31/19

Methane	ND	0.010	mg/L		ND				30	
Ethane	ND	0.010	"		ND				30	
Propane	ND	0.010	"		ND				30	
Surrogate: Ethene	0.0364		"	0.0364		100	70-130			

**Matrix Spike (1903373-MS1)**

Source: 1903250-01

Prepared: 03/28/19 Analyzed: 03/31/19

Methane	0.033	0.010	mg/L	0.0428	ND	77.4	70-130			
Ethane	0.059	0.010	"	0.0798	ND	74.0	70-130			
Propane	0.087	0.010	"	0.139	ND	62.7	70-130			QM-07
Surrogate: Ethene	0.0553		"	0.0728		76.0	70-130			

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Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

## 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 1903343 - EPA 200.8

##### Blank (1903343-BLK1)

Prepared & Analyzed: 03/27/19

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 (1903343-BS1)

Prepared & Analyzed: 03/27/19

Calcium	5.52	0.0500	mg/L	5.00	110	85-115
Iron	4.78	0.0100	"	5.00	95.6	85-115
Magnesium	5.49	0.0500	"	5.00	110	85-115
Manganese	0.514	0.00100	"	0.500	103	85-115
Potassium	5.26	0.0500	"	5.00	105	85-115
Sodium	5.51	0.0500	"	5.00	110	85-115
Barium	0.521	0.00100	"	0.500	104	85-115
Boron	2.58	0.0100	"	2.50	103	85-115
Selenium	0.0529	0.00100	"	0.0500	106	85-115
Strontium	0.527	0.0100	"	0.500	105	85-115

##### Duplicate (1903343-DUP1)

Source: 1903250-01

Prepared & Analyzed: 03/27/19

Calcium	19.7	0.0500	mg/L	20.8	5.66	20
Iron	0.0168	0.0100	"	0.0182	7.89	20
Magnesium	1.13	0.0500	"	1.11	1.48	20
Manganese	0.0367	0.00100	"	0.0361	1.74	20
Potassium	1.84	0.0500	"	1.84	0.178	20
Sodium	349	0.0500	"	342	1.96	20
Barium	0.0196	0.00100	"	0.0205	4.31	20
Boron	0.0678	0.0100	"	0.0727	6.97	20
Selenium	ND	0.00100	"	ND		20
Strontium	0.432	0.0100	"	0.440	1.76	20

Summit Scientific

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

Project: BWSE/GWA\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

### 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 1903343 - EPA 200.8

Matrix Spike (1903343-MS1)				Source: 1903250-01		Prepared & Analyzed: 03/27/19				
Calcium	24.6	0.0500	mg/L	5.00	20.8	76.0	70-130			
Iron	4.74	0.0100	"	5.00	0.0182	94.5	70-130			
Magnesium	6.30	0.0500	"	5.00	1.11	104	70-130			
Manganese	0.573	0.00100	"	0.500	0.0361	107	70-130			
Potassium	6.61	0.0500	"	5.00	1.84	95.4	70-130			
Sodium	347	0.0500	"	5.00	342	97.9	70-130			
Barium	0.546	0.00100	"	0.500	0.0205	105	70-130			
Boron	2.50	0.0100	"	2.50	0.0727	97.2	70-130			
Selenium	0.0585	0.00100	"	0.0500	ND	117	70-130			
Strontium	0.978	0.0100	"	0.500	0.440	108	70-130			

Matrix Spike Dup (1903343-MSD1)				Source: 1903250-01		Prepared & Analyzed: 03/27/19				
Calcium	24.6	0.0500	mg/L	5.00	20.8	74.8	70-130	0.254	25	
Iron	4.30	0.0100	"	5.00	0.0182	85.6	70-130	9.82	25	
Magnesium	5.84	0.0500	"	5.00	1.11	94.5	70-130	7.60	25	
Manganese	0.562	0.00100	"	0.500	0.0361	105	70-130	1.88	25	
Potassium	6.24	0.0500	"	5.00	1.84	88.1	70-130	5.65	25	
Sodium	347	0.0500	"	5.00	342	97.3	70-130	0.00813	25	
Barium	0.550	0.00100	"	0.500	0.0205	106	70-130	0.809	25	
Boron	2.29	0.0100	"	2.50	0.0727	88.6	70-130	9.03	25	
Selenium	0.0639	0.00100	"	0.0500	ND	128	70-130	8.87	25	
Strontium	0.970	0.0100	"	0.500	0.440	106	70-130	0.788	25	

Summit Scientific

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

Project: BWSE/GWA\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

## 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 1903324 - General Preparation

##### Blank (1903324-BLK1)

Prepared & Analyzed: 03/26/19

Bromide	ND	0.200	mg/L
Chloride	ND	0.100	"
Fluoride	ND	0.200	"
Sulfate	ND	0.300	"
Nitrate as N	ND	0.100	"
Nitrite as N	ND	0.100	"
Nitrate/Nitrite as N	ND	0.200	"

##### LCS (1903324-BS1)

Prepared & Analyzed: 03/26/19

Bromide	9.20	0.200	mg/L	10.0	92.0	90-110
Chloride	2.76	0.100	"	3.00	91.9	90-110
Fluoride	1.86	0.200	"	2.00	93.0	90-110
Sulfate	14.9	0.300	"	15.0	99.6	90-110
Nitrate as N	3.04	0.100	"	3.00	101	90-110
Nitrite as N	2.94	0.100	"	3.00	98.1	90-110

##### Duplicate (1903324-DUP1)

Source: 1903250-01

Prepared & Analyzed: 03/26/19

Bromide	0.475	0.200	mg/L	0.454	4.52	20	
Chloride	30.2	0.100	"	51.0	51.2	20	QM-02
Fluoride	0.524	0.200	"	0.551	5.02	20	
Sulfate	125	0.300	"	501	120	20	QM-02
Nitrate as N	0.0410	0.100	"	0.0480	15.7	20	
Nitrite as N	ND	0.100	"	ND	20		
Nitrate/Nitrite as N	ND	0.200	"	0.0480	20		

##### Matrix Spike (1903324-MS1)

Source: 1903250-01

Prepared & Analyzed: 03/26/19

Bromide	9.31	0.200	mg/L	10.0	0.454	88.6	80-120	
Chloride	30.2	0.100	"	3.00	51.0	NR	80-120	QM-02
Fluoride	2.48	0.200	"	2.00	0.551	96.4	80-120	
Sulfate	120	0.300	"	15.0	501	NR	80-120	QM-02
Nitrate as N	2.85	0.100	"	3.00	0.0480	93.4	80-120	
Nitrite as N	2.82	0.100	"	3.00	ND	94.0	80-120	

Summit Scientific

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

Project: BWSE/GWA\_Alma\_1S\_66\_2524  
Project Number: ALLOC-473 Fac ID:750095  
Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

**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 1903384 - General Preparation**

**Blank (1903384-BLK1)**

Prepared: 03/29/19 Analyzed: 04/01/19

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

**LCS (1903384-BS1)**

Prepared: 03/29/19 Analyzed: 04/01/19

Total Alkalinity	120	10.0	mg/L as CaCO3	100	120	80-120
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**Duplicate (1903384-DUP1)**

**Source: 1903250-01**

Prepared: 03/29/19 Analyzed: 04/01/19

Total Alkalinity	180	10.0	mg/L as CaCO3	180	0.00	20
Carbonate	20.0	10.0	"	20.0	0.00	20
Bicarbonate	160	10.0	"	160	0.00	20

**Matrix Spike (1903384-MS1)**

**Source: 1903250-01**

Prepared: 03/29/19 Analyzed: 04/01/19

Total Alkalinity	290	10.0	mg/L as CaCO3	100	180	110	70-130
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**Matrix Spike Dup (1903384-MSD1)**

**Source: 1903250-01**

Prepared: 03/29/19 Analyzed: 04/01/19

Total Alkalinity	280	10.0	mg/L as CaCO3	100	180	100	70-130	3.51	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\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

**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 1903360 - General Preparation**

**Blank (1903360-BLK1)**

Prepared: 03/28/19 Analyzed: 03/29/19

Phosphorus - Total ND 0.0500 mg/L

**LCS (1903360-BS1)**

Prepared: 03/28/19 Analyzed: 03/29/19

Phosphorus - Total 1.02 0.0500 mg/L 1.00 102 80-120

**Duplicate (1903360-DUP1)**

**Source: 1903250-01**

Prepared: 03/28/19 Analyzed: 03/29/19

Phosphorus - Total ND 0.0500 mg/L ND 20

**Matrix Spike (1903360-MS1)**

**Source: 1903250-01**

Prepared: 03/28/19 Analyzed: 03/29/19

Phosphorus - Total 0.968 0.0500 mg/L 1.00 ND 96.8 70-130

**Matrix Spike Dup (1903360-MSD1)**

**Source: 1903250-01**

Prepared: 03/28/19 Analyzed: 03/29/19

Phosphorus - Total 0.900 0.0500 mg/L 1.00 ND 90.0 70-130 7.28 20

Summit Scientific

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370 17th Street Suite 5300  
Denver CO, 80202

Project: BWSE/GWA\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

### Specific Conductance by SM2510B - Quality Control

#### Summit Scientific

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

#### Batch 1903358 - General Preparation

##### Blank (1903358-BLK1)

Prepared & Analyzed: 03/28/19

Specific Conductance (EC) ND 1.00 umhos/cm

##### Duplicate (1903358-DUP1)

Source: 1903250-01

Prepared & Analyzed: 03/28/19

Specific Conductance (EC) 1540 1.00 umhos/cm 1520 1.11 20

Summit Scientific

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370 17th Street Suite 5300  
Denver CO, 80202

Project: BWSE/GWA\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

### 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 1903359 - General Preparation

##### Blank (1903359-BLK1)

Prepared & Analyzed: 03/28/19

Total Dissolved Solids ND 10.0 mg/L

##### Duplicate (1903359-DUP1)

Source: 1903250-01

Prepared & Analyzed: 03/28/19

Total Dissolved Solids 750 10.0 mg/L 734 2.04 20

Summit Scientific

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

Project: BWSE/GWA\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

### pH by SM4500 - Quality Control

#### Summit Scientific

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

#### Batch 1903322 - General Preparation

##### LCS (1903322-BS1)

Prepared & Analyzed: 03/25/19

pH	9.27	1.00	pH Units	9.23	100	90-110
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##### Duplicate (1903322-DUP1)

Source: 1903249-01

Prepared & Analyzed: 03/25/19

pH	7.24	1.00	pH Units	7.22	0.277	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\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095

Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

**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 1903345 - General Preparation**

**Blank (1903345-BLK1)**

Prepared: 03/27/19 Analyzed: 04/10/19

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\_Alma\_1S\_66\_2524

Project Number: ALLOC-473 Fac ID:750095  
Project Manager: Heather Shideman

**Reported:**  
04/11/19 12:47

### Notes and Definitions

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.
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