

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

May 07, 2020

Heather Shideman

Extraction Oil&Gas

370 17th Street Suite 5300

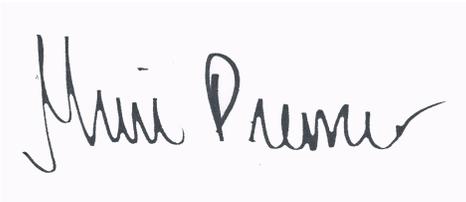
Denver, CO 80202

RE: BWSE/GWA_United_Pad

Work Order # 2004401

Enclosed are the results of analyses for samples received by Summit Scientific on 04/29/20 13:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Muri Premer". The signature is written in a cursive style with a large initial "M" and a long, sweeping underline.

Muri Premer For Paul Shrewsbury

President



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

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 87

Project Manager: Heather Shideman

Reported:
05/07/20 10:58

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BW_Ariniello_95726_A	2004401-01	Water	04/29/20 10:37	04/29/20 13:45

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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.

2004401

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S₂

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.Carlsle@apexc.com, Heather.Shideman@apexc.com, Kolbi.Olson@apexc.com
City/State/Zip: Greeley, CO 80634 **cc:** bford@extractionog.com
Phone: (970) 576-3446 **Project Name:** BWSE/GWA_United_Pad
Sampler Name: ~~Rachel Mat Dougal~~ Jeff Gregg **Project No.:** ALLOC-733, 962, 87 **Facility ID** 760251

ID	Field ID / Point of Collection	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested					Special Instructions		
					HCl	HNO ₃	NaOH + Zn	H ₂ SO ₄	Groundwater	Soil	Air-Canister Serial #	Other (Specify)	COGCC 609	As, Cr, Cu, Pb	Uranium	Hg	Hydrogen Sulfide			
1	BW_Ariniello_95726_A SENE_9_1S_68W	04/29/20	1037	13	X	X	X	X	X					X	X	X	X	X		Sample Frequency: IN
	Temperature, field:		14.9 °C																	
	pH, field:		6.75 s.u.																	
	Conductivity, field:		2565 uS/cm																	
	ORP, field:		136.2 mV																	
	Dissolved Oxygen, field:		0.09 mg/L																	
	Turbidity, field:		166.8 NTU																	
Relinquished by:		Date/Time:		Received by:		Date/Time:		Turn Around Time (Check)				Notes:								
		04/29/2020 13:45				04-29-2020 13:45		Same Day ___ 72 hours ___ 24 hours ___ Standard <u>X</u> 48 hours ___												
Relinquished by:		Date/Time:		Received by:		Date/Time:		Sample Integrity:												
								Temperature Upon Receipt: <u>2.6</u> Intact: <u>Yes</u> No												

www.s2scientific.com

Sample Receipt Checklist

S2 Work Order 2004401

Client: Apex/XOG Client Project ID: BWSE/GWA_United_Pad

Shipped Via: H.D./P.U./FedEx/UPS/USPS/Other Airbill #: _____

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

Temp (°C)	2.6
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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 ⁽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"/>	
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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	pH, anions
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"/>	H2SO4 HNO3 NaOH+Zn
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ? Record the pH in Comments.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<2
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Additional Comments (if any): 				
⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.				

MP
Custodian Printed Name or Initials

Muri Premer
Signature of Custodian

4/29/20
Date/Time



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

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 87
Project Manager: Heather Shideman

Reported:
05/07/20 10:58

BW_Ariniello_95726_A
SENE_9_1S_68W
2004401-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0010	mg/L	1	2005003	05/01/20	05/02/20	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: **04/29/20 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		91.1 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	0.100	mg/L	1	2005016	05/01/20	05/02/20	EPA 8015M	

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		80.4 %	44.8-129		"	"	"	"	

Dissolved Gases by RSK-175

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Project Manager: Heather Shideman

Reported:
05/07/20 10:58

BW_Ariniello_95726_A
SENE_9_1S_68W
2004401-01 (Water)

Summit Scientific

Dissolved Gases by RSK-175

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Methane	ND	0.010	mg/L	1	2005017	05/01/20	05/04/20	RSK-175 mod	
Ethane	ND	0.010	"	"	"	"	"	"	
Propane	ND	0.010	"	"	"	"	"	"	

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: Ethene		95.1 %	70-130		"	"	"	"	

Total Metals by EPA Method 200.8

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Uranium	0.0333	0.000500	mg/L	1	2004378	04/30/20	05/01/20	EPA 200.8	
Arsenic	ND	0.0006000	"	"	"	"	"	"	
Chromium	ND	0.00100	"	"	"	"	"	"	
Copper	0.0693	0.00100	"	"	"	"	"	"	
Lead	ND	0.000500	"	"	"	"	"	"	

Dissolved Metals by EPA Method 200.8

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	160	0.0500	mg/L	1	2004376	04/30/20	04/30/20	EPA 200.8	
Iron	0.0531	0.0100	"	"	"	"	"	"	
Magnesium	49.0	0.0500	"	"	"	"	"	"	
Manganese	0.225	0.00100	"	"	"	"	"	"	
Potassium	5.74	0.0500	"	"	"	"	"	"	
Sodium	469	0.0500	"	"	"	"	"	"	
Barium	0.0126	0.00100	"	"	"	"	"	"	
Boron	0.230	0.0100	"	"	"	"	"	"	
Selenium	0.0122	0.00100	"	"	"	"	"	"	
Strontium	2.22	0.0100	"	"	"	"	"	"	

Total Mercury by EPA 245.1

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05/07/20 10:58

BW_Ariniello_95726_A
SENE_9_1S_68W
2004401-01 (Water)

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Total Mercury by EPA 245.1

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Mercury	ND	0.000200	mg/L	1	2004382	04/30/20	05/01/20	EPA 245.1	

Anions by EPA Method 300.0

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bromide	1.10	0.200	mg/L	1	2004341	04/29/20	04/30/20	EPA 300.0	
Chloride	176	5.00	"	50	"	"	"	"	
Fluoride	1.06	0.200	"	1	"	"	"	"	
Sulfate	1830	15.0	"	50	"	"	"	"	
Nitrate as N	3.35	0.100	"	1	"	"	"	"	
Nitrite as N	ND	0.100	"	"	"	"	"	"	
Nitrate/Nitrite as N	3.35	0.200	"	"	"	"	"	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Alkalinity	360	10.0	mg/L as CaCO3	1	2004371	04/30/20	05/04/20	SM2320-B	
Carbonate	ND	10.0	"	"	"	"	"	"	
Bicarbonate	360	10.0	"	"	"	"	"	"	

Conventional Chemistry Parameters by APHA/EPA Methods

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Phosphorus - Total	0.250	0.0500	mg/L	1	2005015	05/01/20	05/04/20	SM4500-P-E	
Sulfide as H2S	ND	0.200	"	"	2005027	05/04/20	05/04/20	SM4500 S2 F	

Specific Conductance by SM2510B

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SENE_9_1S_68W
2004401-01 (Water)

Summit Scientific

Specific Conductance by SM2510B

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Specific Conductance (EC)	3710	1.00	umhos/cm	1	2004367	04/30/20	04/30/20	SM2510B	

Total Dissolved Solids by SM2540C

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Total Dissolved Solids	1830	10.0	mg/L	1	2004366	04/30/20	04/30/20	SM2540C	

pH by SM4500

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
pH	6.92	1.00	pH Units	1	2005010	04/29/20	05/01/20	SM4500-H+ B	

Biological Activity Reaction Test

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Iron Related Bacteria	35000	25.0	CFU/ml	1	2004383	04/30/20	05/06/20	BART	
Sulfate Reducing Bacteria	6000	200	"	"	"	"	"	"	
Slime Forming Bacteria	13000	500	"	"	"	"	"	"	

Field Data

Date Sampled: **04/29/20 10:37**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Specific Conductance (EC)	2565		uS/cm	1	2005071	04/29/20	04/29/20	Field Method	
Temperature	14.9		Degrees C	"	"	"	"	"	
Turbidity	168.8		NTU	"	"	"	"	"	
Oxidation/Reduction Potential	136.2		mv	"	"	"	"	"	

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 05/07/20 10:58

BW_Ariniello_95726_A
SENE_9_1S_68W
2004401-01 (Water)

Summit Scientific

Field Data

Dissolved Oxygen	0.09	mg/L	1	2005071	04/29/20	04/29/20	Field Method
pH	6.75	SU	"	"	"	"	"

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Reported:
05/07/20 10:58

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 2005003 - EPA 5030 Water MS

Blank (2005003-BLK1)

Prepared: 05/01/20 Analyzed: 05/02/20

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	0.0116		"	0.0133		87.0	23-173			
Surrogate: Toluene-d8	0.0135		"	0.0133		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0138		"	0.0133		103	21-167			

LCS (2005003-BS1)

Prepared: 05/01/20 Analyzed: 05/02/20

Benzene	0.0190	0.0010	mg/L	0.0333		56.9	51-132			
Toluene	0.0270	0.0010	"	0.0333		81.0	51-138			
Ethylbenzene	0.0231	0.0010	"	0.0333		69.3	58-146			
m,p-Xylene	0.0446	0.0020	"	0.0667		66.9	57-144			
o-Xylene	0.0233	0.0010	"	0.0333		70.0	53-146			
Surrogate: 1,2-Dichloroethane-d4	0.0114		"	0.0133		85.1	23-173			
Surrogate: Toluene-d8	0.0138		"	0.0133		104	20-170			
Surrogate: 4-Bromofluorobenzene	0.0138		"	0.0133		104	21-167			

Matrix Spike (2005003-MS1)

Source: 2004373-01

Prepared: 05/01/20 Analyzed: 05/02/20

Benzene	0.0193	0.0010	mg/L	0.0333	ND	57.9	34-141			
Toluene	0.0274	0.0010	"	0.0333	ND	82.4	27-151			
Ethylbenzene	0.0235	0.0010	"	0.0333	ND	70.4	29-160			
m,p-Xylene	0.0454	0.0020	"	0.0667	ND	68.2	20-166			
o-Xylene	0.0239	0.0010	"	0.0333	ND	71.6	33-159			
Surrogate: 1,2-Dichloroethane-d4	0.0119		"	0.0133		89.2	23-173			
Surrogate: Toluene-d8	0.0139		"	0.0133		104	20-170			
Surrogate: 4-Bromofluorobenzene	0.0138		"	0.0133		104	21-167			

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Project Number: ALLOC-733, 962, 87
Project Manager: Heather Shideman

Reported:
05/07/20 10:58

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 2005003 - EPA 5030 Water MS

Matrix Spike Dup (2005003-MSD1)

Source: 2004373-01

Prepared: 05/01/20 Analyzed: 05/02/20

Benzene	0.0185	0.0010	mg/L	0.0333	ND	55.6	34-141	4.02	32
Toluene	0.0267	0.0010	"	0.0333	ND	80.1	27-151	2.77	25
Ethylbenzene	0.0223	0.0010	"	0.0333	ND	67.0	29-160	4.94	50
m,p-Xylene	0.0438	0.0020	"	0.0667	ND	65.7	20-166	3.70	36
o-Xylene	0.0230	0.0010	"	0.0333	ND	69.1	33-159	3.54	26
Surrogate: 1,2-Dichloroethane-d4	0.0126		"	0.0133		94.9	23-173		
Surrogate: Toluene-d8	0.0138		"	0.0133		103	20-170		
Surrogate: 4-Bromofluorobenzene	0.0136		"	0.0133		102	21-167		

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Reported:
05/07/20 10:58

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 2005016 - EPA 3520B

Blank (2005016-BLK1)

Prepared: 05/01/20 Analyzed: 05/02/20

C10-C28 (DRO)	ND	0.100	mg/L								
Surrogate: o-Terphenyl	0.0208		"	0.0250		83.4	44.8-129				

LCS (2005016-BS1)

Prepared: 05/01/20 Analyzed: 05/02/20

C10-C28 (DRO)	0.791	0.100	mg/L	1.00		79.1	70-130				
Surrogate: o-Terphenyl	0.0220		"	0.0250		88.0	44.8-129				

LCS Dup (2005016-BSD1)

Prepared: 05/01/20 Analyzed: 05/02/20

C10-C28 (DRO)	0.824	0.100	mg/L	1.00		82.4	70-130	4.12	200		
Surrogate: o-Terphenyl	0.0196		"	0.0250		78.3	44.8-129				

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Project Number: ALLOC-733, 962, 87
Project Manager: Heather Shideman

Reported:
05/07/20 10:58

Dissolved Gases by RSK-175 - Quality Control
Summit Scientific

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

Batch 2005017 - GC

Blank (2005017-BLK1)

Prepared & Analyzed: 05/01/20

Methane	ND	0.010	mg/L								
Ethane	ND	0.010	"								
Propane	ND	0.010	"								
Surrogate: Ethene	0.0365		"	0.0364		100	70-130				

LCS (2005017-BS1)

Prepared & Analyzed: 05/01/20

Methane	0.031	0.010	mg/L	0.0428		71.6	70-130				
Ethane	0.085	0.010	"	0.0798		107	70-130				
Propane	0.13	0.010	"	0.139		91.2	70-130				
Surrogate: Ethene	0.0836		"	0.0728		115	70-130				

Duplicate (2005017-DUP1)

Source: 2004355-01

Prepared & Analyzed: 05/01/20

Methane	ND	0.010	mg/L		ND					30	
Ethane	ND	0.010	"		ND					30	
Propane	ND	0.010	"		ND					30	
Surrogate: Ethene	0.0310		"	0.0364		85.2	70-130				

Matrix Spike (2005017-MS1)

Source: 2004355-01

Prepared & Analyzed: 05/01/20

Methane	0.030	0.010	mg/L	0.0428	ND	70.4	70-130				
Ethane	0.085	0.010	"	0.0798	ND	106	70-130				
Propane	0.12	0.010	"	0.139	ND	90.0	70-130				
Surrogate: Ethene	0.0791		"	0.0728		109	70-130				

Summit Scientific

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

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 87
Project Manager: Heather Shideman

Reported:
05/07/20 10:58

Total 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 2004378 - EPA 200.8

Blank (2004378-BLK1)

Prepared: 04/30/20 Analyzed: 05/01/20

Uranium	ND	0.000500	mg/L							
Arsenic	ND	0.0006000	"							
Chromium	ND	0.00100	"							
Copper	ND	0.00100	"							
Lead	ND	0.000500	"							

LCS (2004378-BS1)

Prepared: 04/30/20 Analyzed: 05/01/20

Uranium	0.227	0.000500	mg/L	0.250		90.9	85-115			
Arsenic	0.4844	0.0006000	"	0.500		96.9	85-115			
Chromium	0.459	0.00100	"	0.500		91.8	85-115			
Copper	0.453	0.00100	"	0.500		90.6	85-115			
Lead	0.230	0.000500	"	0.250		92.1	85-115			

Duplicate (2004378-DUP1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/01/20

Uranium	0.0213	0.000500	mg/L		0.0217			1.87	20	
Arsenic	ND	0.0006000	"		0.0005806				20	
Chromium	0.000322	0.00100	"		0.000306			5.11	20	
Copper	0.0978	0.00100	"		0.100			2.27	20	
Lead	0.00143	0.000500	"		0.00144			0.452	20	

Matrix Spike (2004378-MS1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/01/20

Uranium	0.253	0.000500	mg/L	0.250	0.0217	92.7	70-130			
Arsenic	0.4848	0.0006000	"	0.500	0.0005806	96.9	70-130			
Chromium	0.462	0.00100	"	0.500	0.000306	92.3	70-130			
Copper	0.554	0.00100	"	0.500	0.100	90.7	70-130			
Lead	0.218	0.000500	"	0.250	0.00144	86.5	70-130			

Matrix Spike Dup (2004378-MSD1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/01/20

Uranium	0.237	0.000500	mg/L	0.250	0.0217	85.9	70-130	6.87	25	
Arsenic	0.4557	0.0006000	"	0.500	0.0005806	91.0	70-130	6.18	25	
Chromium	0.432	0.00100	"	0.500	0.000306	86.4	70-130	6.61	25	
Copper	0.517	0.00100	"	0.500	0.100	83.3	70-130	6.90	25	
Lead	0.203	0.000500	"	0.250	0.00144	80.7	70-130	6.97	25	

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

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 87
Project Manager: Heather Shideman

Reported:
05/07/20 10:58

Dissolved Metals by EPA Method 200.8 - Quality Control
Summit Scientific

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

Batch 2004376 - EPA 200.8

Blank (2004376-BLK1)

Prepared & Analyzed: 04/30/20

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 (2004376-BS1)

Prepared & Analyzed: 04/30/20

Calcium	5.51	0.0500	mg/L	5.00	110	85-115				
Iron	4.96	0.0100	"	5.00	99.1	85-115				
Magnesium	5.59	0.0500	"	5.00	112	85-115				
Manganese	0.550	0.00100	"	0.500	110	85-115				
Potassium	5.27	0.0500	"	5.00	105	85-115				
Sodium	4.99	0.0500	"	5.00	99.7	85-115				
Barium	0.518	0.00100	"	0.500	104	85-115				
Boron	2.61	0.0100	"	2.50	105	85-115				
Selenium	0.0535	0.00100	"	0.0500	107	85-115				
Strontium	0.550	0.0100	"	0.500	110	85-115				

Duplicate (2004376-DUP1)

Source: 2004349-01

Prepared & Analyzed: 04/30/20

Calcium	112	0.0500	mg/L		113		0.518	20		
Iron	0.0472	0.0100	"		0.0484		2.41	20		
Magnesium	20.8	0.0500	"		21.3		2.10	20		
Manganese	1.73	0.00100	"		1.75		1.29	20		
Potassium	8.10	0.0500	"		8.38		3.34	20		
Sodium	71.6	0.0500	"		73.5		2.64	20		
Barium	0.137	0.00100	"		0.137		0.361	20		
Boron	0.0248	0.0100	"		0.0293		16.6	20		
Selenium	ND	0.00100	"		ND			20		
Strontium	1.01	0.0100	"		1.00		0.948	20		

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

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 87
Project Manager: Heather Shideman

Reported:
05/07/20 10:58

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 2004376 - EPA 200.8

Matrix Spike (2004376-MS1)

Source: 2004349-01

Prepared & Analyzed: 04/30/20

Calcium	119	0.0500	mg/L	5.00	113	115	70-130			
Iron	5.08	0.0100	"	5.00	0.0484	101	70-130			
Magnesium	26.0	0.0500	"	5.00	21.3	95.5	70-130			
Manganese	2.25	0.00100	"	0.500	1.75	98.6	70-130			
Potassium	13.0	0.0500	"	5.00	8.38	91.5	70-130			
Sodium	77.8	0.0500	"	5.00	73.5	85.4	70-130			
Barium	0.659	0.00100	"	0.500	0.137	104	70-130			
Boron	2.51	0.0100	"	2.50	0.0293	99.4	70-130			
Selenium	0.0504	0.00100	"	0.0500	ND	101	70-130			
Strontium	1.57	0.0100	"	0.500	1.00	112	70-130			

Matrix Spike Dup (2004376-MSD1)

Source: 2004349-01

Prepared & Analyzed: 04/30/20

Calcium	119	0.0500	mg/L	5.00	113	122	70-130	0.329	25
Iron	5.02	0.0100	"	5.00	0.0484	99.4	70-130	1.27	25
Magnesium	26.3	0.0500	"	5.00	21.3	99.7	70-130	0.804	25
Manganese	2.31	0.00100	"	0.500	1.75	110	70-130	2.62	25
Potassium	13.2	0.0500	"	5.00	8.38	96.7	70-130	2.01	25
Sodium	79.7	0.0500	"	5.00	73.5	124	70-130	2.43	25
Barium	0.648	0.00100	"	0.500	0.137	102	70-130	1.66	25
Boron	2.50	0.0100	"	2.50	0.0293	98.8	70-130	0.587	25
Selenium	0.0509	0.00100	"	0.0500	ND	102	70-130	1.11	25
Strontium	1.59	0.0100	"	0.500	1.00	118	70-130	1.77	25

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

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 87
Project Manager: Heather Shideman

Reported:
05/07/20 10:58

Total Mercury by EPA 245.1 - Quality Control
Summit Scientific

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

Batch 2004382 - EPA 245.1

Blank (2004382-BLK1)

Prepared: 04/30/20 Analyzed: 05/01/20

Mercury ND 0.000200 mg/L

LCS (2004382-BS1)

Prepared: 04/30/20 Analyzed: 05/01/20

Mercury 0.00260 0.000200 mg/L 0.00250 104 85-115

Duplicate (2004382-DUP1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/01/20

Mercury ND 0.000200 mg/L ND 20

Matrix Spike (2004382-MS1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/01/20

Mercury 0.00305 0.000200 mg/L 0.00250 ND 122 70-130

Matrix Spike Dup (2004382-MSD1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/01/20

Mercury 0.00281 0.000200 mg/L 0.00250 ND 112 70-130 8.19 20

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Denver CO, 80202

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 87
Project Manager: Heather Shideman

Reported:
05/07/20 10:58

Anions by EPA Method 300.0 - Quality Control
Summit Scientific

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

Batch 2004341 - General Preparation

Blank (2004341-BLK1)

Prepared & Analyzed: 04/28/20

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 (2004341-BS1)

Prepared & Analyzed: 04/28/20

Bromide	10.8	0.200	mg/L	10.0	108	90-110				
Chloride	3.15	0.100	"	3.00	105	90-110				
Fluoride	2.14	0.200	"	2.00	107	90-110				
Sulfate	16.0	0.300	"	15.0	106	90-110				
Nitrate as N	3.16	0.100	"	3.00	105	90-110				
Nitrite as N	3.12	0.100	"	3.00	104	90-110				

Duplicate (2004341-DUP1)

Source: 2004355-01

Prepared & Analyzed: 04/28/20

Bromide	0.360	0.200	mg/L	0.359			0.278	20		
Chloride	34.0	0.100	"	41.8			20.8	20	QM-02	
Fluoride	4.30	0.200	"	4.32			0.556	20		
Sulfate	366	0.300	"	436			17.5	20		
Nitrate as N	1.26	0.100	"	1.25			0.239	20		
Nitrite as N	0.0450	0.100	"	0.0440			2.25	20		
Nitrate/Nitrite as N	1.25	0.200	"	1.25				20		

Matrix Spike (2004341-MS1)

Source: 2004355-01

Prepared & Analyzed: 04/28/20

Bromide	10.8	0.200	mg/L	10.0	0.359	104	80-120			
Chloride	35.6	0.100	"	3.00	41.8	NR	80-120		QM-02	
Fluoride	6.37	0.200	"	2.00	4.32	102	80-120			
Sulfate	375	0.300	"	15.0	436	NR	80-120		QM-02	
Nitrate as N	4.36	0.100	"	3.00	1.25	104	80-120			
Nitrite as N	2.80	0.100	"	3.00	0.0440	91.8	80-120			

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

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 87
Project Manager: Heather Shideman

Reported:
05/07/20 10:58

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 2004371 - General Preparation

Blank (2004371-BLK1)

Prepared: 04/30/20 Analyzed: 05/04/20

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

LCS (2004371-BS1)

Prepared: 04/30/20 Analyzed: 05/04/20

Total Alkalinity	110	10.0	mg/L as CaCO3	100		110	80-120			
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Duplicate (2004371-DUP1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/04/20

Total Alkalinity	440	10.0	mg/L as CaCO3		440			0.00	20	
Carbonate	ND	10.0	"		ND				20	
Bicarbonate	440	10.0	"		440			0.00	20	

Matrix Spike (2004371-MS1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/04/20

Total Alkalinity	550	10.0	mg/L as CaCO3	100	440	110	70-130			
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Matrix Spike Dup (2004371-MSD1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/04/20

Total Alkalinity	550	10.0	mg/L as CaCO3	100	440	110	70-130	0.00	20	
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Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 87
Project Manager: Heather Shideman

Reported:
05/07/20 10:58

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

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

Batch 2005015 - General Preparation

Blank (2005015-BLK1)											
Prepared: 05/01/20 Analyzed: 05/04/20											
Phosphorus - Total	ND	0.0500	mg/L								
LCS (2005015-BS1)											
Prepared: 05/01/20 Analyzed: 05/04/20											
Phosphorus - Total	1.01	0.0500	mg/L	1.00		101	80-120				
Duplicate (2005015-DUP1)											
Source: 2004355-01 Prepared: 05/01/20 Analyzed: 05/04/20											
Phosphorus - Total	0.00800	0.0500	mg/L		0.00700			13.3	20		
Matrix Spike (2005015-MS1)											
Source: 2004355-01 Prepared: 05/01/20 Analyzed: 05/04/20											
Phosphorus - Total	0.974	0.0500	mg/L	1.00	0.00700	96.7	70-130				
Matrix Spike Dup (2005015-MSD1)											
Source: 2004355-01 Prepared: 05/01/20 Analyzed: 05/04/20											
Phosphorus - Total	0.968	0.0500	mg/L	1.00	0.00700	96.1	70-130	0.618	20		

Batch 2005027 - General Preparation

Blank (2005027-BLK1)											
Prepared & Analyzed: 05/04/20											
Sulfide as H2S	ND	0.200	mg/L								
LCS (2005027-BS1)											
Prepared & Analyzed: 05/04/20											
Sulfide as H2S	1.02	0.200	mg/L	1.00		102	80-120				
Matrix Spike (2005027-MS1)											
Source: 2004355-01 Prepared & Analyzed: 05/04/20											
Sulfide as H2S	0.950	0.200	mg/L	1.00	ND	95.0	75-125				
Matrix Spike Dup (2005027-MSD1)											
Source: 2004355-01 Prepared & Analyzed: 05/04/20											
Sulfide as H2S	0.930	0.200	mg/L	1.00	ND	93.0	75-125	2.13	20		

Summit Scientific

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

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 87
 Project Manager: Heather Shideman

Reported:
 05/07/20 10:58

Specific Conductance by SM2510B - Quality Control
Summit Scientific

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

Batch 2004367 - General Preparation

Blank (2004367-BLK1)

Prepared & Analyzed: 04/30/20

Specific Conductance (EC) ND 1.00 umhos/cm

Duplicate (2004367-DUP1)

Source: 2004373-01

Prepared & Analyzed: 04/30/20

Specific Conductance (EC) 3640 1.00 umhos/cm 3630 0.303 20

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

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 87
 Project Manager: Heather Shideman

Reported:
 05/07/20 10:58

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 2004366 - General Preparation

Blank (2004366-BLK1)

Prepared & Analyzed: 04/30/20

Total Dissolved Solids ND 10.0 mg/L

Duplicate (2004366-DUP1)

Source: 2004373-01

Prepared & Analyzed: 04/30/20

Total Dissolved Solids 1790 10.0 mg/L 1790 0.224 20

Summit Scientific



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

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 87
 Project Manager: Heather Shideman

Reported:
 05/07/20 10:58

pH by SM4500 - Quality Control
Summit Scientific

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

Batch 2005010 - General Preparation

LCS (2005010-BS1)

Prepared: 04/29/20 Analyzed: 05/01/20

pH	9.21	1.00	pH Units	9.18	100	90-110
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Duplicate (2005010-DUP1)

Source: 2004398-01

Prepared: 04/29/20 Analyzed: 05/01/20

pH	7.38	1.00	pH Units	7.37	0.136	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_United_Pad

Project Number: ALLOC-733, 962, 87
 Project Manager: Heather Shideman

Reported:
 05/07/20 10:58

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 2004383 - General Preparation

Blank (2004383-BLK1)

Prepared: 04/30/20 Analyzed: 05/06/20

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_United_Pad

Project Number: ALLOC-733, 962, 87

Project Manager: Heather Shideman

Reported:
05/07/20 10:58

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