

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

June 23, 2020

Heather Shideman

Extraction Oil&Gas

370 17th Street Suite 5300

Denver, CO 80202

RE: BWSE/GWA_Vetting_15_H

Work Order # 2006135

Enclosed are the results of analyses for samples received by Summit Scientific on 06/11/20 12:20. 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_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582

Project Manager: Heather Shideman

Reported:
06/23/20 10:57

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BW_Herman_224760_A	2006135-01	Water	06/11/20 11:16	06/11/20 12:20

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.

Summit Scientific

2006135



4653 Table Mountain Drive ♦ Golden, Colorado 80403
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, Kolbi.Olson@apexcos.com
City/State/Zip: Greeley, CO 80634 **cc:** jcarlisle@extractionog.com
Phone: (970) 576-3446 **Project Name:** BWSE/GWA_Vetting_15_H
Sampler Name: *Heather Shideman* **Project No.:** AFE # 17148 **Facility ID** 758582

ID	Field ID / Point of Collection	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested						Special Instructions		
					HCl	HNO3	None	H2SO4 Other (Specify)	Groundwater	Soil	Air-Canister Serial #	Other (Specify)	COGCC 609 minus Isotopes								
1	BW_Herman_224760_A SWNW_15_5N_65W	20/06/11	1116	13	X	X		X					X	X	X						Sample Frequency: 1SUB
	Temperature, field:	16.8	°C																		
	pH, field:	7.27	s.u.																		
	Conductivity, field:	966	uS/cm																		
	ORP, field:	192.4	mV																		
	Dissolved Oxygen, field:	3.52	mg/L																		
	Turbidity, field:	0.77	NTU																		
Relinquished by: <i>[Signature]</i> Date/Time: 20/06/11 12:20				Received by: <i>[Signature]</i> Date/Time: 06-11-20 12:20				Turn Around Time (Check) Same Day ___ 72 hours ___ 24 hours ___ Standard <u>X</u> 48 hours ___						Notes:							
Relinquished by: Date/Time:				Received by: Date/Time:				Sample Integrity: Temperature Upon Receipt: 0.1 Intact: <u>(Yes)</u> No													

Sample Receipt Checklist

2006135

S2 Work Order _____

Client: Apex/XOG Client Project ID: BWSE/GWA_Vetting_15_H

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

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

Temp (°C)	0.1
-----------	-----

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.	✓			On Ice
Were all samples received intact ⁽¹⁾ ?	✓			
Was adequate sample volume provided ⁽¹⁾ ?	✓			
If custody seals are present, are they intact ⁽¹⁾ ?			✓	
Are samples with holding times due within 48 hours sample due within 48 hours present?	X		✓ N/A	pH, anions
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	✓			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	✓			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	✓			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	✓			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.		✓		
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	✓			H2SO4 HNO3 HCl
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ? Record the pH in Comments.	✓			
If dissolved metals are requested, were samples field filtered?		✓		

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


Signature of Custodian

6/11/20
Date/Time



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582
Project Manager: Heather Shideman

Reported:
06/23/20 10:57

BW_Herman_224760_A
SWNW_15_5N_65W
2006135-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/11/20 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0010	mg/L	1	2006188	06/12/20	06/17/20	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: **06/11/20 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		86.8 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/11/20 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	0.100	mg/L	1	2006209	06/16/20	06/16/20	EPA 8015M	

Date Sampled: **06/11/20 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		90.6 %	44.8-129		"	"	"	"	

Dissolved Gases by RSK-175

Date Sampled: **06/11/20 11:16**

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

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582
Project Manager: Heather Shideman

Reported:
06/23/20 10:57

BW_Herman_224760_A
SWNW_15_5N_65W
2006135-01 (Water)

Summit Scientific

Dissolved Gases by RSK-175

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Methane	ND	0.010	mg/L	1	2006192	06/12/20	06/12/20	RSK-175 mod	
Ethane	ND	0.010	"	"	"	"	"	"	
Propane	ND	0.010	"	"	"	"	"	"	

Date Sampled: **06/11/20 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: Ethene		107 %	70-130		"	"	"	"	

Dissolved Metals by EPA Method 200.8

Date Sampled: **06/11/20 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	83.7	0.0500	mg/L	1	2006203	06/15/20	06/15/20	EPA 200.8	
Iron	ND	0.0100	"	"	"	"	"	"	
Magnesium	40.4	0.0500	"	"	"	"	"	"	
Manganese	ND	0.00100	"	"	"	"	"	"	
Potassium	3.73	0.0500	"	"	"	"	"	"	
Sodium	60.3	0.0500	"	"	"	"	"	"	
Barium	0.0635	0.00100	"	"	"	"	"	"	
Boron	0.166	0.0100	"	"	"	"	"	"	
Selenium	0.00193	0.00100	"	"	"	"	"	"	
Strontium	1.11	0.0100	"	"	"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **06/11/20 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bromide	0.332	0.200	mg/L	1	2006160	06/11/20	06/11/20	EPA 300.0	
Chloride	24.4	5.00	"	50	"	"	"	"	
Fluoride	0.450	0.200	"	1	"	"	"	"	
Sulfate	141	15.0	"	50	"	"	"	"	
Nitrate as N	3.02	0.100	"	1	"	"	"	"	
Nitrite as N	ND	0.100	"	"	"	"	"	"	
Nitrate/Nitrite as N	3.02	0.200	"	"	"	"	"	"	

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582

Project Manager: Heather Shideman

Reported:
06/23/20 10:57

BW_Herman_224760_A
SWNW_15_5N_65W
2006135-01 (Water)

Summit Scientific

Anions by EPA Method 300.0

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **06/11/20 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Alkalinity	215	10.0	mg/L as CaCO3	1	2006143	06/11/20	06/15/20	SM2320-B	
Carbonate	ND	10.0	"	"	"	"	"	"	
Bicarbonate	215	10.0	"	"	"	"	"	"	

Conventional Chemistry Parameters by APHA/EPA Methods

Date Sampled: **06/11/20 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Phosphorus - Total	0.0690	0.0500	mg/L	1	2006243	06/16/20	06/17/20	SM4500-P-E	

Specific Conductance by SM2510B

Date Sampled: **06/11/20 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1050	1.00	umhos/cm	1	2006182	06/12/20	06/12/20	SM2510B	

Total Dissolved Solids by SM2540C

Date Sampled: **06/11/20 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Dissolved Solids	518	10.0	mg/L	1	2006183	06/12/20	06/12/20	SM2540C	

pH by SM4500

Date Sampled: **06/11/20 11:16**

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

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582

Project Manager: Heather Shideman

Reported:
06/23/20 10:57

BW_Herman_224760_A
SWNW_15_5N_65W
2006135-01 (Water)

Summit Scientific

pH by SM4500

pH	7.29	1.00	pH Units	1	2006217	06/11/20	06/16/20	SM4500-H+ B
----	------	------	----------	---	---------	----------	----------	-------------

Biological Activity Reaction Test

Date Sampled: **06/11/20 11:16**

Analyte	Result	Reporting			Batch	Prepared	Analyzed	Method	Notes
		Limit	Units	Dilution					
Iron Related Bacteria	2200	25.0	CFU/ml	1	2006226	06/16/20	06/22/20	BART	
Sulfate Reducing Bacteria	1400	200	"	"	"	"	"	"	
Slime Forming Bacteria	2500	500	"	"	"	"	"	"	

Field Data

Date Sampled: **06/11/20 11:16**

Analyte	Result	Reporting			Batch	Prepared	Analyzed	Method	Notes
		Limit	Units	Dilution					
Specific Conductance (EC)	966		uS/cm	1	2006178	06/11/20	06/11/20	Field Method	
Temperature	16.8		Degrees C	"	"	"	"	"	
Oxidation/Reduction Potential	192.4		mv	"	"	"	"	"	
Dissolved Oxygen	3.52		mg/L	"	"	"	"	"	
Turbidity	0.77		NTU	"	"	"	"	"	
pH	7.27		SU	"	"	"	"	"	

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582
Project Manager: Heather Shideman

Reported:
06/23/20 10:57

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 2006188 - EPA 5030 Water MS

Blank (2006188-BLK1)

Prepared: 06/12/20 Analyzed: 06/16/20

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	0.0144		"	0.0133		108		23-173		
Surrogate: Toluene-d8	0.0131		"	0.0133		98.6		20-170		
Surrogate: 4-Bromofluorobenzene	0.0116		"	0.0133		86.7		21-167		

LCS (2006188-BS1)

Prepared: 06/12/20 Analyzed: 06/16/20

Benzene	0.0197	0.0010	mg/L	0.0333		59.1		51-132		
Toluene	0.0234	0.0010	"	0.0333		70.3		51-138		
Ethylbenzene	0.0257	0.0010	"	0.0333		77.0		58-146		
m,p-Xylene	0.0490	0.0020	"	0.0667		73.5		57-144		
o-Xylene	0.0248	0.0010	"	0.0333		74.4		53-146		
Surrogate: 1,2-Dichloroethane-d4	0.0146		"	0.0133		109		23-173		
Surrogate: Toluene-d8	0.0130		"	0.0133		97.7		20-170		
Surrogate: 4-Bromofluorobenzene	0.0113		"	0.0133		84.5		21-167		

Matrix Spike (2006188-MS1)

Source: 2006108-02

Prepared: 06/12/20 Analyzed: 06/16/20

Benzene	0.0213	0.0010	mg/L	0.0333	ND	63.9		34-141		
Toluene	0.0247	0.0010	"	0.0333	ND	74.2		27-151		
Ethylbenzene	0.0271	0.0010	"	0.0333	ND	81.4		29-160		
m,p-Xylene	0.0512	0.0020	"	0.0667	ND	76.7		20-166		
o-Xylene	0.0258	0.0010	"	0.0333	ND	77.4		33-159		
Surrogate: 1,2-Dichloroethane-d4	0.0154		"	0.0133		116		23-173		
Surrogate: Toluene-d8	0.0130		"	0.0133		97.7		20-170		
Surrogate: 4-Bromofluorobenzene	0.0122		"	0.0133		91.4		21-167		

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582

Project Manager: Heather Shideman

Reported:
06/23/20 10:57

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 2006188 - EPA 5030 Water MS

Matrix Spike Dup (2006188-MSD1)

Source: 2006108-02

Prepared: 06/12/20 Analyzed: 06/16/20

Benzene	0.0212	0.0010	mg/L	0.0333	ND	63.7	34-141	0.376	32	
Toluene	0.0244	0.0010	"	0.0333	ND	73.4	27-151	1.14	25	
Ethylbenzene	0.0271	0.0010	"	0.0333	ND	81.4	29-160	0.0369	50	
m,p-Xylene	0.0496	0.0020	"	0.0667	ND	74.4	20-166	3.14	36	
o-Xylene	0.0252	0.0010	"	0.0333	ND	75.7	33-159	2.16	26	
Surrogate: 1,2-Dichloroethane-d4	0.0156		"	0.0133		117	23-173			
Surrogate: Toluene-d8	0.0132		"	0.0133		98.9	20-170			
Surrogate: 4-Bromofluorobenzene	0.0110		"	0.0133		82.8	21-167			

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582
Project Manager: Heather Shideman

Reported:
06/23/20 10:57

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 2006209 - EPA 3520B

Blank (2006209-BLK1)

Prepared & Analyzed: 06/16/20

C10-C28 (DRO)	ND	0.100	mg/L							
Surrogate: o-Terphenyl	0.0249		"	0.0250		99.7	44.8-129			

LCS (2006209-BS1)

Prepared & Analyzed: 06/16/20

C10-C28 (DRO)	1.05	0.100	mg/L	1.00		105	70-130			
Surrogate: o-Terphenyl	0.0239		"	0.0250		95.6	44.8-129			

LCS Dup (2006209-BSD1)

Prepared & Analyzed: 06/16/20

C10-C28 (DRO)	1.04	0.100	mg/L	1.00		104	70-130	0.632	200	
Surrogate: o-Terphenyl	0.0221		"	0.0250		88.6	44.8-129			

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582
Project Manager: Heather Shideman

Reported:
06/23/20 10:57

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 2006192 - GC

Blank (2006192-BLK1)

Prepared & Analyzed: 06/12/20

Methane	ND	0.010	mg/L								
Ethane	ND	0.010	"								
Propane	ND	0.010	"								
Surrogate: Ethene	0.0411		"	0.0364		113	70-130				

LCS (2006192-BS1)

Prepared & Analyzed: 06/12/20

Methane	0.034	0.010	mg/L	0.0428		79.5	70-130				
Ethane	0.083	0.010	"	0.0798		104	70-130				
Propane	0.12	0.010	"	0.139		85.5	70-130				
Surrogate: Ethene	0.0914		"	0.0728		126	70-130				

Duplicate (2006192-DUP1)

Source: 2006121-01

Prepared & Analyzed: 06/12/20

Methane	ND	0.010	mg/L		ND					30	
Ethane	ND	0.010	"		ND					30	
Propane	ND	0.010	"		ND					30	
Surrogate: Ethene	0.0361		"	0.0364		99.2	70-130				

Matrix Spike (2006192-MS1)

Source: 2006121-01

Prepared & Analyzed: 06/12/20

Methane	0.032	0.010	mg/L	0.0428	ND	75.1	70-130				
Ethane	0.079	0.010	"	0.0798	ND	98.8	70-130				
Propane	0.11	0.010	"	0.139	ND	81.0	70-130				
Surrogate: Ethene	0.0809		"	0.0728		111	70-130				

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582

Project Manager: Heather Shideman

Reported:
06/23/20 10:57

Dissolved Metals by EPA Method 200.8 - Quality Control
Summit Scientific

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

Batch 2006203 - EPA 200.8

Blank (2006203-BLK1)

Prepared & Analyzed: 06/15/20

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 (2006203-BS1)

Prepared & Analyzed: 06/15/20

Calcium	5.41	0.0500	mg/L	5.00	108	85-115				
Iron	4.86	0.0100	"	5.00	97.3	85-115				
Magnesium	5.29	0.0500	"	5.00	106	85-115				
Manganese	0.511	0.00100	"	0.500	102	85-115				
Potassium	5.57	0.0500	"	5.00	111	85-115				
Sodium	5.21	0.0500	"	5.00	104	85-115				
Barium	0.516	0.00100	"	0.500	103	85-115				
Boron	2.54	0.0100	"	2.50	102	85-115				
Selenium	0.0511	0.00100	"	0.0500	102	85-115				
Strontium	0.506	0.0100	"	0.500	101	85-115				

Duplicate (2006203-DUP1)

Source: 2006135-01

Prepared & Analyzed: 06/15/20

Calcium	81.9	0.0500	mg/L		83.7		2.24	20		
Iron	0.00799	0.0100	"		0.00872		8.73	20		
Magnesium	39.2	0.0500	"		40.4		3.03	20		
Manganese	0.000321	0.00100	"		0.000343		6.81	20		
Potassium	3.58	0.0500	"		3.73		4.09	20		
Sodium	58.2	0.0500	"		60.3		3.51	20		
Barium	0.0614	0.00100	"		0.0635		3.35	20		
Boron	0.153	0.0100	"		0.166		8.50	20		
Selenium	0.00235	0.00100	"		0.00193		19.9	20		
Strontium	1.09	0.0100	"		1.11		1.77	20		

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582
Project Manager: Heather Shideman

Reported:
06/23/20 10:57

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 2006203 - EPA 200.8

Matrix Spike (2006203-MS1)

Source: 2006135-01

Prepared & Analyzed: 06/15/20

Calcium	88.4	0.0500	mg/L	5.00	83.7	94.1	70-130			
Iron	4.79	0.0100	"	5.00	0.00872	95.5	70-130			
Magnesium	44.0	0.0500	"	5.00	40.4	72.9	70-130			
Manganese	0.502	0.00100	"	0.500	0.000343	100	70-130			
Potassium	8.82	0.0500	"	5.00	3.73	102	70-130			
Sodium	66.1	0.0500	"	5.00	60.3	117	70-130			
Barium	0.561	0.00100	"	0.500	0.0635	99.6	70-130			
Boron	2.57	0.0100	"	2.50	0.166	96.1	70-130			
Selenium	0.0520	0.00100	"	0.0500	0.00193	100	70-130			
Strontium	1.54	0.0100	"	0.500	1.11	87.2	70-130			

Matrix Spike Dup (2006203-MSD1)

Source: 2006135-01

Prepared & Analyzed: 06/15/20

Calcium	87.9	0.0500	mg/L	5.00	83.7	82.5	70-130	0.660	25
Iron	4.85	0.0100	"	5.00	0.00872	96.9	70-130	1.39	25
Magnesium	44.4	0.0500	"	5.00	40.4	80.1	70-130	0.806	25
Manganese	0.508	0.00100	"	0.500	0.000343	102	70-130	1.18	25
Potassium	8.90	0.0500	"	5.00	3.73	104	70-130	0.891	25
Sodium	65.6	0.0500	"	5.00	60.3	106	70-130	0.809	25
Barium	0.567	0.00100	"	0.500	0.0635	101	70-130	0.977	25
Boron	2.62	0.0100	"	2.50	0.166	98.2	70-130	2.05	25
Selenium	0.0527	0.00100	"	0.0500	0.00193	102	70-130	1.43	25
Strontium	1.57	0.0100	"	0.500	1.11	92.2	70-130	1.61	25

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582
Project Manager: Heather Shideman

Reported:
06/23/20 10:57

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 2006160 - General Preparation

Blank (2006160-BLK1)

Prepared & Analyzed: 06/11/20

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 (2006160-BS1)

Prepared & Analyzed: 06/11/20

Bromide	10.8	0.200	mg/L	10.0	108	90-110				
Chloride	3.19	0.100	"	3.00	106	90-110				
Fluoride	2.16	0.200	"	2.00	108	90-110				
Sulfate	16.0	0.300	"	15.0	107	90-110				
Nitrate as N	3.19	0.100	"	3.00	106	90-110				
Nitrite as N	3.19	0.100	"	3.00	106	90-110				

Duplicate (2006160-DUP1)

Source: 2006121-01

Prepared & Analyzed: 06/11/20

Bromide	1.39	0.200	mg/L	1.22			12.5	20		
Chloride	62.1	0.100	"	48.5			24.6	20		QM-02
Fluoride	2.14	0.200	"	2.10			1.65	20		
Sulfate	ND	0.300	"	881				20		
Nitrate as N	8.51	0.100	"	8.14			4.46	20		
Nitrite as N	ND	0.100	"	ND				20		
Nitrate/Nitrite as N	ND	0.200	"	8.14				20		

Matrix Spike (2006160-MS1)

Source: 2006121-01

Prepared & Analyzed: 06/11/20

Bromide	9.94	0.200	mg/L	10.0	1.22	87.2	80-120			
Chloride	65.8	0.100	"	3.00	48.5	577	80-120			QM-02
Fluoride	3.96	0.200	"	2.00	2.10	92.9	80-120			
Sulfate	ND	0.300	"	15.0	881	NR	80-120			QM-02
Nitrate as N	10.9	0.100	"	3.00	8.14	91.3	80-120			
Nitrite as N	2.70	0.100	"	3.00	ND	90.1	80-120			

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582
Project Manager: Heather Shideman

Reported:
06/23/20 10:57

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

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

Batch 2006143 - General Preparation

Blank (2006143-BLK1)

Prepared: 06/11/20 Analyzed: 06/15/20

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

LCS (2006143-BS1)

Prepared: 06/11/20 Analyzed: 06/15/20

Total Alkalinity	110	10.0	mg/L as CaCO3	100		110	80-120			
------------------	-----	------	---------------	-----	--	-----	--------	--	--	--

Duplicate (2006143-DUP1)

Source: 2006121-01

Prepared: 06/11/20 Analyzed: 06/15/20

Total Alkalinity	440	10.0	mg/L as CaCO3		450			2.25	20	
Carbonate	ND	10.0	"		ND				20	
Bicarbonate	440	10.0	"		450			2.25	20	

Matrix Spike (2006143-MS1)

Source: 2006121-01

Prepared: 06/11/20 Analyzed: 06/15/20

Total Alkalinity	540	10.0	mg/L as CaCO3	100	450	90.0	70-130			
------------------	-----	------	---------------	-----	-----	------	--------	--	--	--

Matrix Spike Dup (2006143-MSD1)

Source: 2006121-01

Prepared: 06/11/20 Analyzed: 06/15/20

Total Alkalinity	540	10.0	mg/L as CaCO3	100	450	90.0	70-130	0.00	20	
------------------	-----	------	---------------	-----	-----	------	--------	------	----	--

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582
Project Manager: Heather Shideman

Reported:
06/23/20 10:57

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 2006243 - General Preparation

Blank (2006243-BLK1)

Prepared: 06/16/20 Analyzed: 06/17/20

Phosphorus - Total ND 0.0500 mg/L

LCS (2006243-BS1)

Prepared: 06/16/20 Analyzed: 06/17/20

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

Duplicate (2006243-DUP1)

Source: 2006135-01

Prepared: 06/16/20 Analyzed: 06/17/20

Phosphorus - Total 0.0700 0.0500 mg/L 0.0690 1.44 20

Matrix Spike (2006243-MS1)

Source: 2006135-01

Prepared: 06/16/20 Analyzed: 06/17/20

Phosphorus - Total 1.01 0.0500 mg/L 1.00 0.0690 93.9 70-130

Matrix Spike Dup (2006243-MSD1)

Source: 2006135-01

Prepared: 06/16/20 Analyzed: 06/17/20

Phosphorus - Total 1.02 0.0500 mg/L 1.00 0.0690 94.7 70-130 0.791 20

Summit Scientific

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





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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582
 Project Manager: Heather Shideman

Reported:
 06/23/20 10:57

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 2006182 - General Preparation

Blank (2006182-BLK1)

Prepared & Analyzed: 06/12/20

Specific Conductance (EC) ND 1.00 umhos/cm

Duplicate (2006182-DUP1)

Source: 2006135-01

Prepared & Analyzed: 06/12/20

Specific Conductance (EC) 1060 1.00 umhos/cm 1050 0.380 20

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582
 Project Manager: Heather Shideman

Reported:
 06/23/20 10:57

Total Dissolved Solids by SM2540C - Quality Control
Summit Scientific

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

Batch 2006183 - General Preparation

Blank (2006183-BLK1)

Prepared & Analyzed: 06/12/20

Total Dissolved Solids ND 10.0 mg/L

Duplicate (2006183-DUP1)

Source: 2006135-01

Prepared & Analyzed: 06/12/20

Total Dissolved Solids 518 10.0 mg/L 518 0.0193 20

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582
 Project Manager: Heather Shideman

Reported:
 06/23/20 10:57

pH by SM4500 - Quality Control
Summit Scientific

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

Batch 2006217 - General Preparation

LCS (2006217-BS1)

Prepared: 06/11/20 Analyzed: 06/16/20

pH	9.21	1.00	pH Units	9.18	100	90-110
----	------	------	----------	------	-----	--------

Duplicate (2006217-DUP1)

Source: 2006140-01

Prepared: 06/11/20 Analyzed: 06/16/20

pH	7.90	1.00	pH Units	7.65	3.22	20
----	------	------	----------	------	------	----

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582

Project Manager: Heather Shideman

Reported:

06/23/20 10:57

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 2006226 - General Preparation

Blank (2006226-BLK1)

Prepared: 06/16/20 Analyzed: 06/22/20

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

Summit Scientific

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



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

Project: BWSE/GWA_Vetting_15_H

Project Number: AFE #17148 Fad ID 758582

Project Manager: Heather Shideman

Reported:
06/23/20 10:57

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