



## ANALYTICAL SUMMARY REPORT

May 22, 2020

Extraction O&G

370 17th Street, Suite 5300

Denver, CO 80202

Work Order: G20040495

Project Name: BWSE

Energy Laboratories Inc. Gillette WY received the following 1 sample for Extraction O&G on 4/30/2020 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
G20040495-001	BW_Ariniello_95726_A	04/29/20 10:37	04/30/20	Aqueous	Carbon, Total Organic Client Provided Field Parameters Radium 226 + Radium 228 Radium 226, Total Radium 228, Total

The analyses presented in this report were performed by Energy Laboratories, Inc., 400 W. Boxelder Rd., Gillette, WY 82718, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these tests results, please contact your Project Manager.

Report Approved By:



**CLIENT:** Extraction O&G  
**Project:** BWSE  
**Work Order:** G20040495

**Report Date:** 05/22/20

## CASE NARRATIVE

---

Tests associated with analyst identified as ELI-CA were subcontracted to Energy Laboratories, 2393 Salt Creek Hwy., Casper, WY, EPA Number WY00002.



## LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

**Client:** Extraction O&G  
**Site Name:** GWA\_United\_Pad  
**Project:** BWSE  
**Client Sample ID:** BW\_Ariniello\_95726\_A  
**Location:** SENE\_9\_1S\_68W  
**Samp FRQ/Type:** IN  
**Lab ID:** G20040495-001

**Report Date:** 05/22/20  
**Collection Date:** 04/29/20 10:37  
**Date Received:** 04/30/20  
**Sampled By:** Jeff Griggs  
**Matrix:** Aqueous  
**Tracking Number:** 281308

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
<b>CLIENT PROVIDED FIELD PARAMETERS</b>						
Conductivity, field	2565	umhos/cm			FIELD	04/29/20 10:37 / ***
Oxidation-Reduction Potential (ORP)	136.2	mV			FIELD	04/29/20 10:37 / ***
Oxygen-Dissolved, field	0.09	mg/L			FIELD	04/29/20 10:37 / ***
pH, field	6.75	s.u.			FIELD	04/29/20 10:37 / ***
Temperature °C, field	14.9	°C			FIELD	04/29/20 10:37 / ***
Turbidity, field	166.87	NTU			FIELD	04/29/20 10:37 / ***
*** Performed by Sampler						
<b>NON-METALS</b>						
Organic Carbon, Total (TOC)	10.8	mg/L	0.5		A5310 C	05/04/20 18:08 / eli-ca
<b>RADIONUCLIDES, TOTAL</b>						
Radium 226	0.7	pCi/L			E903.0	05/19/20 10:57 / eli-ca
Radium 226 precision (±)	0.2	pCi/L			E903.0	05/19/20 10:57 / eli-ca
Radium 226 MDC	0.2	pCi/L			E903.0	05/19/20 10:57 / eli-ca
Radium 226 + Radium 228	2.1	pCi/L			A7500-RA	05/20/20 16:57 / eli-ca
Radium 226 + Radium 228 precision (±)	1	pCi/L			A7500-RA	05/20/20 16:57 / eli-ca
Radium 226 + Radium 228 MDC	1.5	pCi/L			A7500-RA	05/20/20 16:57 / eli-ca
Radium 228	1.4	pCi/L		U	RA-05	05/13/20 12:42 / eli-ca
Radium 228 precision (±)	1	pCi/L			RA-05	05/13/20 12:42 / eli-ca
Radium 228 MDC	1.5	pCi/L			RA-05	05/13/20 12:42 / eli-ca

**Report Definitions:** RL - Analyte Reporting Limit  
QCL - Quality Control Limit  
U - Not detected at Minimum Detectable Concentration (MDC)

MCL - Maximum Contaminant Level  
ND - Not detected at the Reporting Limit (RL)



## QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Extraction O&G

Work Order: G20040495

Report Date: 05/21/20

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E903.0</b>							Batch: RA226-9633		
<b>Lab ID: LCS-RA226-9633</b>	Laboratory Control Sample				Run: TENNELEC-4_200504B		05/19/20 10:57		
Radium 226	9.6	pCi/L		90	70	130			
Radium 226 precision (±)	1.9	pCi/L							
Radium 226 MDC	0.18	pCi/L							
<b>Lab ID: MB-RA226-9633</b>	Method Blank				Run: TENNELEC-4_200504B		05/19/20 10:57		
Radium 226	0.07	pCi/L							U
Radium 226 precision (±)	0.1	pCi/L							
Radium 226 MDC	0.2	pCi/L							
<b>Lab ID: C20050044-001FDUP</b>	Sample Duplicate				Run: TENNELEC-4_200504B		05/19/20 10:57		
Radium 226	1.2	pCi/L					30	30	R
Radium 226 precision (±)	0.32	pCi/L							
Radium 226 MDC	0.20	pCi/L							

- Duplicate RPD is outside of the acceptance range for this analysis. However, the RER is less than the limit of 2.0, the RER result is 0.81.

### Qualifiers:

RL - Analyte Reporting Limit

R - Relative Percent Difference (RPD) exceeds advisory limit

ND - Not detected at the Reporting Limit (RL)

U - Not detected at Minimum Detectable Concentration (MDC)



## QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Extraction O&G

Work Order: G20040495

Report Date: 05/21/20

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: RA-05</b>							Batch: RA228-6241		
<b>Lab ID: LCS-228-RA226-9633</b>	Laboratory Control Sample				Run: TENNELEC-3_200504B		05/13/20 12:42		
Radium 228	11	pCi/L		116	70	130			
Radium 228 precision (±)	2.2	pCi/L							
Radium 228 MDC	1.4	pCi/L							
<b>Lab ID: MB-RA226-9633</b>	Method Blank				Run: TENNELEC-3_200504B		05/13/20 12:42		
Radium 228	0.5	pCi/L							U
Radium 228 precision (±)	0.9	pCi/L							
Radium 228 MDC	1	pCi/L							
<b>Lab ID: C20050044-001FDUP</b>	Sample Duplicate				Run: TENNELEC-3_200504B		05/13/20 12:42		
Radium 228	2.6	pCi/L					20	30	
Radium 228 precision (±)	1.1	pCi/L							
Radium 228 MDC	1.6	pCi/L							

### Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

U - Not detected at Minimum Detectable Concentration (MDC)



## QA/QC Summary Report

Prepared by Casper, WY Branch

**Client:** Extraction O&G

**Work Order:** G20040495

**Report Date:** 05/05/20

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A5310 C							Analytical Run: TOC3-C_200504A		
Lab ID: CCV-11020	Continuing Calibration Verification Standard								05/04/20 14:08
Organic Carbon, Total (TOC)	5.14	mg/L	0.50	103	90	110			
Method: A5310 C							Batch: R258039		
Lab ID: LCS-11031	Laboratory Control Sample								05/04/20 13:13
Organic Carbon, Total (TOC)	5.32	mg/L	0.50	106	90	109			
Lab ID: MBLK	Method Blank								05/04/20 13:52
Organic Carbon, Total (TOC)	ND	mg/L	0.1						
Lab ID: C20050014-001DMS	Sample Matrix Spike								05/04/20 14:44
Organic Carbon, Total (TOC)	9.43	mg/L	0.50	110	90	109			S
Lab ID: C20050014-001DMSD	Sample Matrix Spike Duplicate								05/04/20 15:05
Organic Carbon, Total (TOC)	9.28	mg/L	0.50	106	90	109	1.7	20	

### Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

S - Spike recovery outside of advisory limits



# Work Order Receipt Checklist

Extraction O&G

G20040495

Login completed by: Chantel S. Johnson

Date Received: 4/30/2020

Reviewed by: Misty Stephens

Received by: csj

Reviewed Date: 5/4/2020

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	17.0°C Melted Ice		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input type="checkbox"/>

## Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

## Contact and Corrective Action Comments:

None



# Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT - Provide as much information as possible.

Company Name:		Project Name: PWS, Permit, Etc.		Sample Origin State:		EPA/State Compliance:	
Extraction Oil and Gas (XOG)		BWSE/GWA United Pad		CO		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Report Mail Address:		Contact Name:		Phone/Fax:		Sampler: (Please Print) Jeff Gries	
Extraction Oil and Gas (XOG)/Apex		H. Shideman, R. Carlisle		rochelle.carlisle@apexcos.com		Quote/Bottle Order:	
Invoice Address:		Invoice Contact & Phone:		Purchase Order:		Shipped by: FedEx	
Extraction Oil and Gas (XOG)		ALLCO-733, 962, 87		Contact ELU prior to RUSH sample submittal for charges and scheduling - See Instruction Page		Cooler Dtg:	
Special Report/Formats - ELI must be notified prior to sample submittal for the following:		Number of Containers		ANALYSIS REQUESTED		RUSH	
<input type="checkbox"/> DW <input type="checkbox"/> A2LA <input checked="" type="checkbox"/> EDD/EDT (Electronic Data) <input type="checkbox"/> GSA <input type="checkbox"/> POTW/WWTP <input type="checkbox"/> State: <input type="checkbox"/> LEVEL IV <input type="checkbox"/> Other: <input type="checkbox"/> NELAC 13 6		Sample Type: A W S V B O Air Water Soils/Solids Vegetation Bioassay Other		Ra 226 & 228, Total		Comments: Contact ELU prior to RUSH sample submittal for charges and scheduling - See Instruction Page	
SAMPLE IDENTIFICATION		Collection Date		Collection Time		Matrix	
(Name, Location, Interval, etc.)		BW_Ainiello_95726_A		04/28/2020		1037	
SENE_9_1S_68W		2W		X		X	
Field Parameters		Value		Units		Isotopic Lab:	
Conductivity		2565		uS/cm			
Dissolved Oxygen		0.09		mg/L			
Oxidation Reduction Potential		136.2		mV			
pH		6.75		S.U.			
Temperature		14.9		°C			
Turbidity		166.81		NTU			
Relinquished by (print):		Date/Time:		Signature:		Received by (print):	
Jeff Gries		04/28/2020/1402		[Signature]		Date/Time:	
Relinquished by (print):		Date/Time:		Signature:		Received by (print):	
Sample Disposal:		Return to Client:		Lab Disposal:		Date/Time:	
Signed		Must be signed		Signature:		Signature:	

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.

This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.

Visit our web site at [www.energylab.com](http://www.energylab.com) for additional information, downloadable fee schedule, forms, and links.