



ANALYTICAL SUMMARY REPORT

May 22, 2020

Extraction O&G

370 17th Street, Suite 5300

Denver, CO 80202

Work Order: G20040485

Project Name: BWSE

Energy Laboratories Inc. Gillette WY received the following 1 sample for Extraction O&G on 4/29/2020 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
G20040485-001	BW_Joyner_92694	04/27/20 12:19	04/29/20	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: G20040485

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_Joyner_92694
Location: SENE_9_1S_68W
Samp FRQ/Type: IN
Lab ID: G20040485-001

Report Date: 05/22/20
Collection Date: 04/27/20 12:19
Date Received: 04/29/20
Sampled By: Jeff Griggs
Matrix: Aqueous
Tracking Number: 281116

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
CLIENT PROVIDED FIELD PARAMETERS						
Conductivity, field	1915	umhos/cm			FIELD	04/27/20 12:19 / ***
Oxidation-Reduction Potential (ORP)	-2.7	mV			FIELD	04/27/20 12:19 / ***
Oxygen-Dissolved, field	3.17	mg/L			FIELD	04/27/20 12:19 / ***
pH, field	7.17	s.u.			FIELD	04/27/20 12:19 / ***
Temperature °C, field	13.8	°C			FIELD	04/27/20 12:19 / ***
Turbidity, field	7.50	NTU			FIELD	04/27/20 12:19 / ***
*** Performed by Sampler						
NON-METALS						
Organic Carbon, Total (TOC)	9.2	mg/L	0.5		A5310 C	05/01/20 20:11 / eli-ca
RADIONUCLIDES, TOTAL						
Radium 226	0.3	pCi/L			E903.0	05/19/20 10:43 / eli-ca
Radium 226 precision (±)	0.1	pCi/L			E903.0	05/19/20 10:43 / eli-ca
Radium 226 MDC	0.2	pCi/L			E903.0	05/19/20 10:43 / eli-ca
Radium 226 + Radium 228	0.4	pCi/L		U	A7500-RA	05/20/20 16:57 / eli-ca
Radium 226 + Radium 228 precision (±)	0.7	pCi/L			A7500-RA	05/20/20 16:57 / eli-ca
Radium 226 + Radium 228 MDC	1.1	pCi/L			A7500-RA	05/20/20 16:57 / eli-ca
Radium 228	0.1	pCi/L		U	RA-05	05/13/20 10:39 / eli-ca
Radium 228 precision (±)	0.6	pCi/L			RA-05	05/13/20 10:39 / eli-ca
Radium 228 MDC	1.1	pCi/L			RA-05	05/13/20 10:39 / eli-ca

Report RL - Analyte Reporting Limit MCL - Maximum Contaminant Level
Definitions: QCL - Quality Control 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: G20040485

Report Date: 05/20/20

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0							Batch: RA226-9632		
Lab ID: LCS-RA226-9632	Laboratory Control Sample				Run: G542M-2_200504B		05/19/20 10:43		
Radium 226	8.7	pCi/L		82	70	130			
Radium 226 precision (±)	1.7	pCi/L							
Radium 226 MDC	0.20	pCi/L							
Lab ID: MB-RA226-9632	Method Blank				Run: G542M-2_200504B		05/19/20 10:43		
Radium 226	0.04	pCi/L							U
Radium 226 precision (±)	0.1	pCi/L							
Radium 226 MDC	0.2	pCi/L							
Lab ID: C20041027-001BDUP	Sample Duplicate				Run: G542M-2_200504B		05/19/20 10:43		
Radium 226	0.38	pCi/L					25	30	
Radium 226 precision (±)	0.16	pCi/L							
Radium 226 MDC	0.20	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: G20040485

Report Date: 05/20/20

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RA-05							Batch: RA228-6240		
Lab ID: LCS-228-RA226-9632	Laboratory Control Sample				Run: TENNELEC-4_200504A		05/13/20 12:20		
Radium 228	8.0	pCi/L		87	70	130			
Radium 228 precision (±)	1.8	pCi/L							
Radium 228 MDC	1.3	pCi/L							
Lab ID: MB-RA226-9632	Method Blank				Run: TENNELEC-4_200504A		05/13/20 12:20		
Radium 228	0.3	pCi/L							U
Radium 228 precision (±)	0.8	pCi/L							
Radium 228 MDC	1	pCi/L							
Lab ID: C20041027-001BDUP	Sample Duplicate				Run: TENNELEC-4_200504A		05/13/20 10:39		
Radium 228	0.11	pCi/L					160	30	UR
Radium 228 precision (±)	0.67	pCi/L							
Radium 228 MDC	1.1	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 0.67

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: G20040485

Report Date: 05/04/20

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A5310 C							Analytical Run: TOC3-C_200501A		
Lab ID: CCV-11020	Continuing Calibration Verification Standard								05/01/20 19:35
Organic Carbon, Total (TOC)	4.81	mg/L	0.50	96	90	110			
Method: A5310 C							Batch: R257997		
Lab ID: LCS-11031	Laboratory Control Sample								05/01/20 14:15
Organic Carbon, Total (TOC)	5.19	mg/L	0.50	104	90	109			
Lab ID: MBLK	Method Blank								05/01/20 14:50
Organic Carbon, Total (TOC)	ND	mg/L	0.1						
Lab ID: C20041053-008FMS	Sample Matrix Spike								05/01/20 18:10
Organic Carbon, Total (TOC)	54.8	mg/L	2.0	104	90	109			
Lab ID: C20041053-008FMSD	Sample Matrix Spike Duplicate								05/01/20 18:32
Organic Carbon, Total (TOC)	54.1	mg/L	2.0	100	90	109	1.3	20	

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



Work Order Receipt Checklist

Extraction O&G

G20040485

Login completed by: Chantel S. Johnson

Date Received: 4/29/2020

Reviewed by: Misty Stephens

Received by: csj

Reviewed Date: 4/29/2020

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 type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" 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:	15.0°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

PLEASE PRINT - Provide as much information as possible.

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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: H. Shideman, R. Carlisle		Phone/Fax:		Sampler: (Please Print)	
Invoice Address:		Invoice Contact & Phone:		Purchase Order: rochelle.carlisle@apexcos.com		Quote/Bottle Order:	
Extraction Oil and Gas (XOG)		Number of Containers		Sample Type: AWSVB0		Air Water Soils/Solids	
Special Report/Formats - ELI must be notified prior to sample submittal for the following:		Vegetation Bioassay Other		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		Contact ELI prior to RUSH sample submittal for charges and scheduling - See Instruction Page	
SAMPLE IDENTIFICATION		Collection Date		Collection Time		MATRIX	
(Name, Location, Interval, etc.)		BW_Joyner_92684		04/27/2020		1219	
SENE_9_1S_68W		2W		X		X	
Field Parameters		Value		Units		Isotopic Lab:	
Conductivity		1915		uS/cm		IN	
Dissolved Oxygen		3.17		mg/L		IN	
Oxidation Reduction Potential		-2.7		mV		IN	
pH		7.17		S.U.		IN	
Temperature		13.8		°C		IN	
Turbidity		7.50		NTU		IN	
Relinquished by (print):		Date/Time:		Signature:		Received by (print):	
Jett Griggs		04/27/2020/1417		[Signature]		Date/Time:	
Relinquished by (print):		Date/Time:		Signature:		Received by (print):	
Jett Griggs		04/27/2020/1417		[Signature]		Date/Time:	
Custody Record MUST be Signed		Sample Disposal:		Return to Client:		Lab Disposal:	
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 for additional information, downloadable fee schedule, forms, and links.		Received by Laboratory:		Date/Time:		Signature:	
[Signature]		4/29/2020		[Signature]		[Signature]	

LABORATORY USE ONLY

On Test:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Custody Seal:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Signature Match:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Recall Temp:	15.0 °C
Shipped by:	UPS
Cooler (Eps):	Yes