



Tuesday, October 15, 2019

Ty Woodworth
Great Western Oil and Gas
2005 Howard Smith Ave East
Windsor, CO 80550

Re: ALS Workorder: 1909598
Project Name: Schaefer LD 13-032 HN
Project Number:

Dear Mr. Woodworth:

Two water samples were received from Great Western Oil and Gas, on 9/30/2019. The samples were scheduled for the following analyses:

- Dissolved Gasses
- GC/MS Volatiles
- Inorganics
- Metals
- Total Extractable Petroleum Hydrocarbons (Diesel)
- Total Volatile Petroleum Hydrocarbons (Gasoline)

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Katie M. O'Brien
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280



1909598

GC/MS Volatiles:

The sample was analyzed using GC/MS following the current revision of SOP 525 based on SW-846 Method 8260C.

All acceptance criteria were met.

Dissolved Gasses:

The sample was prepared and analyzed according to method RSK-175 procedures and the current revision of SOP 449.

All acceptance criteria were met.

GRO:

The sample was analyzed following the current revision of SOP 425 generally based on SW-846 Methods 8000C and 8015D. TVPH is a multicomponent mixture and is quantitated by summing the entire carbon range, rather than individual peaks. The carbon range integrated in this test extends from C6 to C10.

All acceptance criteria were met.

DRO:

The sample was analyzed following the current revision of SOP 406 generally based on SW-846 Methods 8000C and 8015D. TEPH is a multicomponent mixture and is quantitated by summing the entire carbon range, rather than individual peaks. The carbon range integrated in this test extends from C10 to C28.

All acceptance criteria were met.

Metals:

The sample was analyzed following Methods for the Determination of Metals in Environmental Samples – Supplement 1 procedures. Analysis by ICPMS followed method 200.8 and the current revision of SOP 827.

The sample for dissolved metals could not be filtered and thus was cancelled.

All acceptance criteria were met.



Inorganics:

The sample was analyzed following EMSL and Standard Method procedures for the current revisions of the following SOPs and methods:

<u>Analyte</u>	<u>Method</u>	<u>SOP #</u>
Alkalinity	SM2320B	1106
Bicarbonate	SM2320B	1106
Carbonate	SM2320B	1106
TDS	SM2540C	1101
Chloride	300.0 Revision 2.1	1113
Sulfate	300.0 Revision 2.1	1113

All acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1909598

Client Name: Great Western Oil and Gas

Client Project Name: Schaefer LD 13-032 HN

Client Project Number:

Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
13-032 HW A through E, and G	1909598-1		WATER	28-Sep-19	14:45
13-032 HW F	1909598-2		WATER	28-Sep-19	14:45



ALS Environmental

225 Commerce Drive, Fort Collins, Colorado 80524
TF: (800) 443-1511 PH: (970) 490-1511 FX: (970) 490-1522

Chain-of-Custody

Turnaround time for samples received after 2 p.m. will be calculated beginning from the next business day.
Turnaround time for samples received Saturday will be calculated beginning from the next business day.

ALS WORKORDER #		1909598	
PAGE	of	DISPOSAL	BY LAB or RETURN

TURNAROUND TIME	SAMPLER	SITE ID	EDD FORMAT	PURCHASE ORDER	BILL TO COMPANY	INVOICE ATTN TO	ADDRESS	CITY/STATE/ZIP	PHONE	FAX	E-MAIL	MATRIX	SAMPLE DATE	SAMPLE TIME	# OF BOTTLES	PRESERVATIVE	QC	A	B	C	D	E	F	G	H	I	J	SEE NOTES SECTION
		Schaefer LD B-032HN			GWOG	Ty Woodworth	Max Trehels				twoodworth@gwoyco.com	W	9/28/19	14:50	3	---		X										
											mtrehels@gwoyco.com	W	9/28/19	15:02	3	HCL		X										
												W	9/28/19	15:00	3	HCL		X										
												W	9/28/19	14:50	3	HCL			X									
												W	9/28/19	14:45	1	---												
												W	9/28/19	14:45	1	---												
												W	9/28/19	14:45	1	HND?								X				

RELINQUISHED BY	SIGNATURE	PRINTED NAME	DATE	TIME
RECEIVED BY	<i>Max Trehels</i>	Max Trehels	9/28/19	13:55
RELINQUISHED BY	<i>C. Trehels</i>	C. Trehels	9-30-19	13:55
RECEIVED BY				
RELINQUISHED BY				
RECEIVED BY				

Form 202-9

Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

REPORT LEVEL / QC REQUIRED

Summary (Standard QC)

LEVEL II (Standard QC)

LEVEL III (Std QC + forms)

LEVEL IV (Std QC + forms + raw)

Facility ID 458705

6 of 18

0.6 °C

PRESERVATION KEY 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaOH/ZnAcetate 6-NaHSO4 7-4°C 8-Other



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: Great Western Oil

Workorder No: 1909598

Project Manager: KMO

Initials: EE

Date: 9/30/19

1. Are airbills / shipping documents present and/or removable?		<input checked="" type="radio"/> DROP OFF	YES	NO			
2. Are custody seals on shipping containers intact?		<input checked="" type="radio"/> NONE	YES	NO *			
3. Are custody seals on sample containers intact?		<input checked="" type="radio"/> NONE	YES	NO *			
4. Is there a COC (chain-of-custody) present?			<input checked="" type="radio"/> YES	NO *			
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)			<input checked="" type="radio"/> YES	NO *			
6. Are short-hold samples present?			YES	<input checked="" type="radio"/> NO			
7. Are all samples within holding times for the requested analyses?			<input checked="" type="radio"/> YES	NO *			
8. Were all sample containers received intact? (not broken or leaking)			<input checked="" type="radio"/> YES	NO *			
9. Is there sufficient sample for the requested analyses?			<input checked="" type="radio"/> YES	NO *			
10. Are all samples in the proper containers for the requested analyses?			<input checked="" type="radio"/> YES	NO *			
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)	N/A		<input checked="" type="radio"/> YES	NO *			
12. Are all aqueous non-preserved samples pH 4-9?	N/A		YES	<input checked="" type="radio"/> NO *			
13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)	N/A		YES	<input checked="" type="radio"/> NO			
14. Were the samples shipped on ice?			<input checked="" type="radio"/> YES	NO			
15. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*:	#1	#3	#4	RAD ONLY	<input checked="" type="radio"/> YES	NO
Cooler #: <u>1</u>							
Temperature (°C): <u>0.6</u>							
No. of custody seals on cooler: <u>0</u>							
External µR/hr reading: <u>N/A</u>							
Background µR/hr reading: <u>13</u>							
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES / NO / <input checked="" type="radio"/> NA (If no, see Form 008.)							

* Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

see manual 12) ... 9598-1-13 and -2-1 both have pH ~ 10
13) all vials have significant headspace

All client bottle ID's vs ALS lab ID's double-checked by: EE

If applicable, was the client contacted? YES / NO / NA Contact: _____ Date/Time: _____

Project Manager Signature / Date: [Signature] 10/1/19

Client: Great Western Oil and Gas
 Project: Schaefer LD 13-032 HN
 Sample ID: 13-032 HW A through E, and G
 Legal Location:
 Collection Date: 9/28/2019 14:45

Date: 15-Oct-19
 Work Order: 1909598
 Lab ID: 1909598-1
 Matrix: WATER
 Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Alkalinity as Calcium Carbonate			SM2320B			Prep Date: 10/3/2019 PrepBy: KJS
BICARBONATE AS CaCO3	ND		20	MG/L	1	10/3/2019
CARBONATE AS CaCO3	350		20	MG/L	1	10/3/2019
TOTAL ALKALINITY AS CaCO3	360		20	MG/L	1	10/3/2019
Diesel Range Organics			SW8015M			Prep Date: 10/9/2019 PrepBy: LML
Diesel Range Organics	55	D	0.51	MG/L	1	10/9/2019 22:03
Surr: O-TERPHENYL	99		63-126	%REC	1	10/9/2019 22:03
Dissolved Gasses			RSK175			Prep Date: 10/1/2019 PrepBy: LML
METHANE	2200		1	UG/L	1	10/1/2019 16:30
ETHANE	540		2	UG/L	1	10/1/2019 16:30
PROPANE	370		1	UG/L	1	10/1/2019 16:30
Gasoline Range Organics			SW8015			Prep Date: 10/7/2019 PrepBy: LML
GASOLINE RANGE ORGANICS	1.3	G	0.1	MG/L	1	10/7/2019 17:06
Surr: 2,3,4-TRIFLUOROTOLUENE	98		74-129	%REC	1	10/7/2019 17:06
GC/MS Volatiles			SW8260_25			Prep Date: 10/1/2019 PrepBy: JXK
BENZENE	150		50	UG/L	50	10/1/2019 13:41
TOLUENE	290		50	UG/L	50	10/1/2019 13:41
ETHYLBENZENE	72		50	UG/L	50	10/1/2019 13:41
M+P-XYLENE	230		50	UG/L	50	10/1/2019 13:41
O-XYLENE	140		50	UG/L	50	10/1/2019 13:41
TOTAL XYLENES	360		1	UG/L	1	10/1/2019 13:41
Surr: 4-BROMOFLUOROBENZENE	98		85-115	%REC	50	10/1/2019 13:41
Surr: DIBROMOFLUOROMETHANE	101		84-118	%REC	50	10/1/2019 13:41
Surr: TOLUENE-D8	100		85-115	%REC	50	10/1/2019 13:41
Ion Chromatography			EPA300.0			Prep Date: 10/8/2019 PrepBy: NJJ
CHLORIDE	6500		100	MG/L	500	10/9/2019 12:34
SULFATE	1000		100	MG/L	100	10/8/2019 19:44
Total Recoverable Metals by 200.8			EPA200.8			Prep Date: 10/4/2019 PrepBy: JML
CALCIUM	2900000		1000	UG/L	10	10/9/2019 09:32
POTASSIUM	290000		1000	UG/L	10	10/9/2019 09:32
MAGNESIUM	8100		100	UG/L	10	10/9/2019 09:32
SODIUM	640000		1000	UG/L	10	10/9/2019 09:32
Total Dissolved Solids			SM2540C			Prep Date: 10/3/2019 PrepBy: KJS
TOTAL DISSOLVED SOLIDS	11000		400	MG/L	1	10/4/2019

Client: Great Western Oil and Gas
Project: Schaefer LD 13-032 HN
Sample ID: 13-032 HW F
Legal Location:
Collection Date: 9/28/2019 14:45

Date: 15-Oct-19
Work Order: 1909598
Lab ID: 1909598-2
Matrix: WATER
Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
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Explanation of Qualifiers

Radiochemistry:

- "Report Limit" is the MDC
- U or ND - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- * - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- # - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.
- G - Sample density differs by more than 15% of LCS density.
- D - DER is greater than Control Limit
- M - Requested MDC not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits
- NC - Not Calculated for duplicate results less than 5 times MDC
- B - Analyte concentration greater than MDC.
- B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

- B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).
- U or ND - Indicates that the compound was analyzed for but not detected.
- E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.
- M - Duplicate injection precision was not met.
- N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.
- Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.
- * - Duplicate analysis (relative percent difference) not within control limits.
- S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

- U or ND - Indicates that the compound was analyzed for but not detected.
- B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.
- E - Analyte concentration exceeds the upper level of the calibration range.
- J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).
- A - A tentatively identified compound is a suspected aldol-condensation product.
- X - The analyte was diluted below an accurate quantitation level.
- * - The spike recovery is equal to or outside the control criteria used.
- + - The relative percent difference (RPD) equals or exceeds the control criteria.
- G - A pattern resembling gasoline was detected in this sample.
- D - A pattern resembling diesel was detected in this sample.
- M - A pattern resembling motor oil was detected in this sample.
- C - A pattern resembling crude oil was detected in this sample.
- 4 - A pattern resembling JP-4 was detected in this sample.
- 5 - A pattern resembling JP-5 was detected in this sample.
- H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.
- L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.
- Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
 - gasoline
 - JP-8
 - diesel
 - mineral spirits
 - motor oil
 - Stoddard solvent
 - bunker C

ALS -- Fort Collins

Date: 10/15/2019 1:58

Client: Great Western Oil and Gas
 Work Order: 1909598
 Project: Schaefer LD 13-032 HN

QC BATCH REPORT

Batch ID: **HC191001-91-1** Instrument ID **MEE-1** Method: **RSK175**

LCS Sample ID: **HC191001-91** Units: **UG/L** Analysis Date: **10/1/2019 16:34**
 Client ID: Run ID: **HC191001-9A** Prep Date: **10/1/2019** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
METHANE	157	1	142		110	80-120				25	
ETHANE	284	2	267		107	80-120				25	
PROPANE	397	1	391		101	80-120				25	

LCSD Sample ID: **HC191001-91** Units: **UG/L** Analysis Date: **10/1/2019 16:47**
 Client ID: Run ID: **HC191001-9A** Prep Date: **10/1/2019** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
METHANE	160	1	142		113	80-120		157	2	25	
ETHANE	285	2	267		107	80-120		284	0	25	
PROPANE	406	1	391		104	80-120		397	2	25	

MB Sample ID: **HC191001-91** Units: **UG/L** Analysis Date: **10/1/2019 15:47**
 Client ID: Run ID: **HC191001-9A** Prep Date: **10/1/2019** DF: **1**

Analyte	Result	ReportLimit										Qual
METHANE	ND	1										
ETHANE	ND	2										
PROPANE	ND	1										

The following samples were analyzed in this batch:

Client: Great Western Oil and Gas
 Work Order: 1909598
 Project: Schaefer LD 13-032 HN

QC BATCH REPORT

Batch ID: **HC191007-61-1** Instrument ID **FUELS-1** Method: **SW8015**

LCS Sample ID: **HC191007-61** Units: **MG/L** Analysis Date: **10/7/2019 12:32**
 Client ID: Run ID: **HC191007-6A** Prep Date: **10/7/2019** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
GASOLINE RANGE ORGANICS	0.506	0.1	0.5		101	79-118				20	
Surr: 2,3,4-TRIFLUOROTOLUENE	0.0991		0.1		99	74-129					

LCSD Sample ID: **HC191007-61** Units: **MG/L** Analysis Date: **10/7/2019 18:29**
 Client ID: Run ID: **HC191007-6A** Prep Date: **10/7/2019** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
GASOLINE RANGE ORGANICS	0.501	0.1	0.5		100	79-118		0.506	1	20	
Surr: 2,3,4-TRIFLUOROTOLUENE	0.0984		0.1		98	74-129			1		

MB Sample ID: **HC191007-61** Units: **MG/L** Analysis Date: **10/7/2019 12:54**
 Client ID: Run ID: **HC191007-6A** Prep Date: **10/7/2019** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
GASOLINE RANGE ORGANICS	ND	0.1									
Surr: 2,3,4-TRIFLUOROTOLUENE	0.102				102	74-129					

The following samples were analyzed in this batch:

Client: Great Western Oil and Gas
 Work Order: 1909598
 Project: Schaefer LD 13-032 HN

QC BATCH REPORT

Batch ID: **HC191009-82-1** Instrument ID **FUELS-1** Method: **SW8015M**

LCS		Sample ID: HC191009-82			Units: MG/L		Analysis Date: 10/9/2019 20:37				
Client ID:		Run ID: HC191009-8A			Prep Date: 10/9/2019		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Diesel Range Organics	7.46	0.533	8.33		90	36-150				20	
Surr: O-TERPHENYL	1.7		1.67		102	63-126					

LCSD		Sample ID: HC191009-82			Units: MG/L		Analysis Date: 10/9/2019 20:58				
Client ID:		Run ID: HC191009-8A			Prep Date: 10/9/2019		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Diesel Range Organics	7.83	0.533	8.33		94	36-150		7.46	5	20	
Surr: O-TERPHENYL	1.67		1.67		100	63-126			2		

The following samples were analyzed in this batch:

1909598-1

Client: Great Western Oil and Gas
Work Order: 1909598
Project: Schaefer LD 13-032 HN

QC BATCH REPORT

Batch ID: **HC191009-82-1** Instrument ID **FUELS-1** Method: **SW8015M**

MB Sample ID: **HC191009-82** Units: **MG/L** Analysis Date: **10/10/2019 13:19**
Client ID: Run ID: **HC191010-8A** Prep Date: **10/9/2019** DF: **1**

Analyte	Result	ReportLimit	Qual
Diesel Range Organics	ND	0.53	
Surr: O-TERPHENYL	1.57		94 63-126

The following samples were analyzed in this batch:

Client: Great Western Oil and Gas
 Work Order: 1909598
 Project: Schaefer LD 13-032 HN

QC BATCH REPORT

Batch ID: **IP191004-4-1** Instrument ID **ICPMS2** Method: **EPA200.8**

LCS Sample ID: **IM191004-4** Units: **UG/L** Analysis Date: **10/9/2019 09:23**
 Client ID: Run ID: **IM191009-10A4** Prep Date: **10/4/2019** DF: **10**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
CALCIUM	10000	1000	10000		100	85-115				20	
MAGNESIUM	9330	100	10000		93	85-115				20	
POTASSIUM	4670	1000	5000		93	85-115				20	
SODIUM	9340	1000	10000		93	85-115				20	

MB Sample ID: **IP191004-4** Units: **UG/L** Analysis Date: **10/9/2019 09:17**
 Client ID: Run ID: **IM191009-10A4** Prep Date: **10/4/2019** DF: **10**

Analyte	Result	ReportLimit	Qual
CALCIUM	ND	1000	
MAGNESIUM	ND	100	
POTASSIUM	ND	1000	
SODIUM	ND	1000	

The following samples were analyzed in this batch:

1909598-1

Client: Great Western Oil and Gas
 Work Order: 1909598
 Project: Schaefer LD 13-032 HN

QC BATCH REPORT

Batch ID: VL191001-3-3 Instrument ID: HPV3 Method: SW8260_25

LCS		Sample ID: VL191001-3			Units: %REC		Analysis Date: 10/1/2019 11:24				
Client ID:		Run ID: VL191001-3A			Prep Date: 10/1/2019		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Surr: 4-BROMOFLUOROBENZENE	24.2		25		97	85-115					
Surr: DIBROMOFLUOROMETHANE	25.4		25		102	84-118					
Surr: TOLUENE-D8	25.7		25		103	85-115					
BENZENE	10.7	1	10		107	83-117				20	
TOLUENE	11	1	10		110	82-113				20	
ETHYLBENZENE	10.9	1	10		109	81-113				20	
M+P-XYLENE	22.1	1	20		110	82-115				20	
O-XYLENE	10.8	1	10		108	81-115				20	

LCSD		Sample ID: VL191001-3			Units: %REC		Analysis Date: 10/1/2019 11:45				
Client ID:		Run ID: VL191001-3A			Prep Date: 10/1/2019		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Surr: 4-BROMOFLUOROBENZENE	25		25		100	85-115			3		
Surr: DIBROMOFLUOROMETHANE	25.5		25		102	84-118			0		
Surr: TOLUENE-D8	25.2		25		101	85-115			2		
BENZENE	11	1	10		110	83-117		10.7	3	20	
TOLUENE	11.1	1	10		111	82-113		11	2	20	
ETHYLBENZENE	11.1	1	10		111	81-113		10.9	2	20	
M+P-XYLENE	22.7	1	20		114	82-115		22.1	3	20	
O-XYLENE	10.9	1	10		109	81-115		10.8	1	20	

MB		Sample ID: VL191001-3			Units: %REC		Analysis Date: 10/1/2019 12:58				
Client ID:		Run ID: VL191001-3A			Prep Date: 10/1/2019		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Surr: 4-BROMOFLUOROBENZENE	25				100	85-115					
Surr: DIBROMOFLUOROMETHANE	25.7				103	84-118					
Surr: TOLUENE-D8	25.5				102	85-115					
BENZENE	ND	1									
TOLUENE	ND	1									
ETHYLBENZENE	ND	1									
M+P-XYLENE	ND	1									
O-XYLENE	ND	1									
TOTAL XYLENES	ND	1									

The following samples were analyzed in this batch:

Client: Great Western Oil and Gas
Work Order: 1909598
Project: Schaefer LD 13-032 HN

QC BATCH REPORT

Batch ID: **AK191003-1-1** Instrument ID **NONE** Method: **SM2320B**

LCS Sample ID: **AK191003-1** Units: **MG/L** Analysis Date: **10/3/2019**
 Client ID: Run ID: **AK191003-1a1** Prep Date: **10/3/2019** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
TOTAL ALKALINITY AS CaCO3	110	5	100		110	85-115				15	

MB Sample ID: **AK191003-1** Units: **MG/L** Analysis Date: **10/3/2019**
 Client ID: Run ID: **AK191003-1a1** Prep Date: **10/3/2019** DF: **1**

Analyte	Result	ReportLimit	Qual
BICARBONATE AS CaCO3	ND	5	
CARBONATE AS CaCO3	ND	5	
TOTAL ALKALINITY AS CaCO3	ND	5	

The following samples were analyzed in this batch:

1909598-1

Client: Great Western Oil and Gas
 Work Order: 1909598
 Project: Schaefer LD 13-032 HN

QC BATCH REPORT

Batch ID: **IC191008-1-1** Instrument ID **IC3** Method: **EPA300.0**

LCS		Sample ID: IC191008-1			Units: MG/L		Analysis Date: 10/8/2019 13:21				
Client ID:		Run ID: IC191008-1a1			Prep Date: 10/8/2019		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
CHLORIDE	10.4	0.2	10		104	90-110				15	
SULFATE	51.9	1	50		104	90-110				15	

LCSD		Sample ID: IC191008-1			Units: MG/L		Analysis Date: 10/8/2019 15:51				
Client ID:		Run ID: IC191008-1a1			Prep Date: 10/8/2019		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
CHLORIDE	10	0.2	10		100	90-110		10.4	4	15	
SULFATE	50.1	1	50		100	90-110		51.9	4	15	

MB		Sample ID: IC191008-1			Units: MG/L		Analysis Date: 10/8/2019 13:35					
Client ID:		Run ID: IC191008-1a1			Prep Date: 10/8/2019		DF: 1					
Analyte	Result	ReportLimit										Qual
CHLORIDE	ND	0.2										
SULFATE	ND	1										

The following samples were analyzed in this batch:

Client: Great Western Oil and Gas
Work Order: 1909598
Project: Schaefer LD 13-032 HN

QC BATCH REPORT

Batch ID: **TD191003-1-1** Instrument ID **Balance** Method: **SM2540C**

LCS Sample ID: **TD191003-1** Units: **MG/L** Analysis Date: **10/4/2019**
 Client ID: Run ID: **TD191003-1a1** Prep Date: **10/3/2019** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
TOTAL DISSOLVED SOLIDS	399	20	400		100	85-115				30	

MB Sample ID: **TD191003-1** Units: **MG/L** Analysis Date: **10/4/2019**
 Client ID: Run ID: **TD191003-1a1** Prep Date: **10/3/2019** DF: **1**

Analyte	Result	ReportLimit	Qual
TOTAL DISSOLVED SOLIDS	ND	20	

The following samples were analyzed in this batch:

1909598-1
