



Thursday, February 23, 2017

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

Re: ALS Workorder: 1702096
Project Name: Burr 222HN
Project Number:

Dear Mr. Woodworth:

Two water samples were received from Great Western Oil and Gas, on 2/7/2017. 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
Shiloh J. Summy
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
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
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



1702096

GC/MS Volatiles:

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

The vial for the sample contained headspace prior to analysis and had a pH > 2 at the time of analysis.

Due to matrix interferences, the sample was analyzed at a dilution. The reporting limits have been adjusted accordingly.

All remaining 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 laboratory control sample criteria were met with the exception of the RPD for methane. Since the recoveries for compound in the laboratory control sample and laboratory control sample duplicate were within control limits, with only the RPD exceeding acceptance criteria, quantitations of target compounds were not compromised. No further action was taken.

All remaining 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.

The vial for sample 1702096-1 contained headspace prior to analysis. The sample had a pH > 2 at the time of analysis.

All remaining 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 samples were 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.

Sample 1702096-2 was analyzed for dissolved metals. The sample was filtered through a 0.45 micron filter and preserved with nitric acid to a pH less than 2 prior to analysis. Sample 1702096-1 did not have a pH less than 2 upon receipt. The sample was preserved with nitric acid to a pH less than 2 upon receipt.

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: 1702096

Client Name: Great Western Oil and Gas

Client Project Name: Burr 222HN

Client Project Number:

Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Burr 222HN	1702096-1		WATER	07-Feb-17	10:00
Burr 222HN	1702096-2		WATER	07-Feb-17	10:00



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 #
 1702094

PAGE of
 DISPOSAL BY LAB or RETURN

TURNAROUND TIME: Great Western SAMPLER: Ty Woodworth

SITE ID: Gar 222HW

EDD FORMAT: _____

PURCHASE ORDER: _____

BILL TO COMPANY: Great Western

INVOICE ATTN TO: _____

ADDRESS: Ty Woodworth

CITY/STATE/ZIP: 2005 Howard Smith Ave East

PHONE: Windsor, CO 80550

FAX: 970-274-9254

E-MAIL: tywoodworth@guage.com

PARAMETER/METHOD REQUEST FOR ANALYSIS

A	Anions alk TDS
B	PS metals
C	TR metals
D	BTEX
E	DRO
F	GRO
G	Dissolved Gases MFP
H	
I	
J	

LAB ID	FIELD ID	MATRIX	SAMPLE DATE	SAMPLE TIME	# OF BOTTLES	PRESERVATIVE	QC	A	B	C	D	E	F	G	H	I	J	SEE NOTES SECTION
①	11672 1L Poly	Water	2/7	10:00 am	1	---		X										
	20782		2/7	10 am	1	X HCL			X									
	250 mL Poly w/ HAD3		2/7	10	3	X HCL					X							
	316457, 316454, 316484		2/7	10	3	X HCL						X						
	316437, 316422, 316507		2/7	10	3	X HCL							X					
	316452, 316453, 316468		2/7	10	3	X HCL								X				
	108444, 108432, 108431		2/7	10	3	---												

Form 2029

RELINQUISHED BY: Ty Woodworth SIGNATURE: Ty Woodworth DATE: 2/7 TIME: 2:42 pm

RECEIVED BY: C. Trumbull DATE: 2-7-17 TIME: 11:12

RELINQUISHED BY: _____

RECEIVED BY: _____

RELINQUISHED BY: _____

RECEIVED BY: _____

REPORT LEVEL / QC REQUIRED

Summary (Standard QC)
LEVEL II (Standard QC)
LEVEL III (Std QC + forms)
LEVEL IV (Std QC + forms + raw)

6 of 19

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



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CONDITION OF SAMPLE UPON RECEIPT FORM

Client: Great Western

Workorder No: 1702094

Project Manager: _____

Initials: COS Date: 2-7-17

1. Does this project require any special handling in addition to standard ALS procedures?		YES	<input checked="" type="radio"/> 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 or other representative documents?		<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible?		<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	<input checked="" type="radio"/> DROP OFF	YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	YES	<input checked="" type="radio"/> NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	YES	<input checked="" type="radio"/> NO
10. Is there sufficient sample for the requested analyses?		<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?		<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?		<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ___ < green pea ___ > green pea	N/A	YES	<input checked="" type="radio"/> NO
15. Do any water samples contain sediment? Amount Amount of sediment: ___ dusting ___ moderate ___ heavy	N/A	YES	<input checked="" type="radio"/> NO
16. Were the samples shipped on ice?		YES	<input checked="" type="radio"/> NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
Cooler #: <u>1</u>			
Temperature (°C): <u>Amb</u>			
No. of custody seals on cooler: <u>0</u>			
External µR/hr reading: <u>NA</u>			
Background µR/hr reading: <u>NA</u>			
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES / NO / NA (If no, see Form 008.)			

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.
 Bottle 1702094-1-14 initial pH 2.2. Added 0.5 ml HNO₃ @ 1430, 2-7-17, Final pH < 2. HNO₃ lot no 137345.
 Bottles 1702094-1-13 and 1702094-2-1 pH 11.
 All VIALS have headspace > green pea, EXCEPT 1702094-1-12 which has NO headspace.

If applicable, was the client contacted? YES / NO / NA Contact: _____ Date/Time: _____
 Project Manager Signature / Date: Shelby Lunny

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SAMPLE SUMMARY REPORT

Client: Great Western Oil and Gas
 Project: Burr 222HN
 Sample ID: Burr 222HN
 Legal Location:
 Collection Date: 2/7/2017 10:00

Date: 23-Feb-17
 Work Order: 1702096
 Lab ID: 1702096-1
 Matrix: WATER
 Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Alkalinity as Calcium Carbonate						
BICARBONATE AS CaCO3	ND		100	MG/L	1	2/20/2017
CARBONATE AS CaCO3	700		100	MG/L	1	2/20/2017
TOTAL ALKALINITY AS CaCO3	1800		100	MG/L	1	2/20/2017
Diesel Range Organics						
Diesel Range Organics	8.8	ZLD	1.5	MG/L	1	2/10/2017 15:38
Surr: O-TERPHENYL	101		63-126	%REC	1	2/10/2017 15:38
Dissolved Gasses						
METHANE	11000		3	UG/L	3	2/14/2017 09:35
ETHANE	2700		6	UG/L	3	2/14/2017 09:35
PROPANE	850		3	UG/L	3	2/14/2017 09:35
Gasoline Range Organics						
GASOLINE RANGE ORGANICS	1.5	G	1	MG/L	10	2/10/2017 12:45
Surr: 2,3,4-TRIFLUOROTOLUENE	95		74-129	%REC	10	2/10/2017 12:45
GC/MS Volatiles						
BENZENE	220		50	UG/L	50	2/7/2017 19:51
TOLUENE	230		50	UG/L	50	2/7/2017 19:51
ETHYLBENZENE	ND		50	UG/L	50	2/7/2017 19:51
M+P-XYLENE	52		50	UG/L	50	2/7/2017 19:51
O-XYLENE	ND		50	UG/L	50	2/7/2017 19:51
TOTAL XYLENES	52		1	UG/L	1	2/7/2017 19:51
Surr: 4-BROMOFLUOROBENZENE	103		85-115	%REC	50	2/7/2017 19:51
Surr: DIBROMOFLUOROMETHANE	102		84-118	%REC	50	2/7/2017 19:51
Surr: TOLUENE-D8	96		85-115	%REC	50	2/7/2017 19:51
Ion Chromatography						
CHLORIDE	8200		100	MG/L	500	2/20/2017 11:36
SULFATE	360		25	MG/L	25	2/15/2017 23:26
Total Recoverable Metals by 200.8						
CALCIUM	360000		1000	UG/L	10	2/13/2017 16:01
POTASSIUM	2200000		1000	UG/L	10	2/13/2017 16:01
MAGNESIUM	ND		100	UG/L	10	2/14/2017 19:58
SODIUM	3600000		1000	UG/L	10	2/13/2017 16:01
Total Dissolved Solids						
TOTAL DISSOLVED SOLIDS	13000		400	MG/L	1	2/9/2017

Client: Great Western Oil and Gas

Date: 23-Feb-17

Project: Burr 222HN

Work Order: 1702096

Sample ID: Burr 222HN

Lab ID: 1702096-2

Legal Location:

Matrix: WATER

Collection Date: 2/7/2017 10:00

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Dissolved Metals by 200.8			EPA200.8		Prep Date: 2/9/2017	PrepBy: AJL2
CALCIUM	350000		1000	UG/L	10	2/13/2017 16:04
POTASSIUM	2200000		1000	UG/L	10	2/13/2017 16:04
MAGNESIUM	ND		100	UG/L	10	2/14/2017 20:01
SODIUM	3600000		1000	UG/L	10	2/13/2017 16:04

Client: Great Western Oil and Gas
Project: Burr 222HN
Sample ID: Burr 222HN
Legal Location:
Collection Date: 2/7/2017 10:00

Date: 23-Feb-17
Work Order: 1702096
Lab ID: 1702096-2
Matrix: WATER
Percent Moisture:

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

Radiochemistry:

- 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.
- LT - Result is less than requested MDC but greater than achieved MDC.
- 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

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Date: 2/23/2017 4:32:

Client: Great Western Oil and Gas

QC BATCH REPORT

Work Order: 1702096

Project: Burr 222HN

Batch ID: **HC170209-100-1** Instrument ID: **FUELS-1** Method: **SW8015M**

LCS		Sample ID: HC170209-100			Units: MG/L		Analysis Date: 2/10/2017 12:31				
Client ID:		Run ID: HC170210-8A					Prep Date: 2/9/2017		DF: 1		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Diesel Range Organics	8.3	0.592	8.22		101	36-150				20	
Surr: O-TERPHENYL	0.784		0.822		95	63-126					

LCSD		Sample ID: HC170209-100			Units: MG/L		Analysis Date: 2/10/2017 12:54				
Client ID:		Run ID: HC170210-8A					Prep Date: 2/9/2017		DF: 1		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Diesel Range Organics	8.6	0.602	8.36		103	36-150		8.3	4	20	
Surr: O-TERPHENYL	0.821		0.836		98	63-126			5		

MB		Sample ID: HC170209-100			Units: MG/L		Analysis Date: 2/10/2017 10:54				
Client ID:		Run ID: HC170210-8A					Prep Date: 2/9/2017		DF: 1		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Diesel Range Organics	ND	0.61									
Surr: O-TERPHENYL	0.783		0.845		93	63-126					

The following samples were analyzed in this batch:

Client: Great Western Oil and Gas
 Work Order: 1702096
 Project: Burr 222HN

QC BATCH REPORT

Batch ID: **HC170210-61-1** Instrument ID: **FUELS-1** Method: **SW8015**

LCS		Sample ID: HC170210-61			Units: MG/L		Analysis Date: 2/10/2017 09:51				
Client ID:		Run ID: HC170210-6A			Prep Date: 2/10/2017		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
GASOLINE RANGE ORGANICS	0.487	0.1	0.5		97	79-118				20	
Surr: 2,3,4-TRIFLUOROTOLUENE	0.0984		0.1		98	74-129					

LCSD		Sample ID: HC170210-61			Units: MG/L		Analysis Date: 2/10/2017 16:48				
Client ID:		Run ID: HC170210-6A			Prep Date: 2/10/2017		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
GASOLINE RANGE ORGANICS	0.48	0.1	0.5		96	79-118		0.487	2	20	
Surr: 2,3,4-TRIFLUOROTOLUENE	0.0912		0.1		91	74-129			8		

MB		Sample ID: HC170210-61			Units: MG/L		Analysis Date: 2/10/2017 10:13				
Client ID:		Run ID: HC170210-6A			Prep Date: 2/10/2017		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	0.091		0.1		91	74-129					

The following samples were analyzed in this batch:

Client: Great Western Oil and Gas
 Work Order: 1702096
 Project: Burr 222HN

QC BATCH REPORT

Batch ID: **HC170214-9-1** Instrument ID: **MEE-1** Method: **RSK175**

LCS		Sample ID: HC170214-9			Units: UG/L		Analysis Date: 2/14/2017 09:04				
Client ID:		Run ID: HC170214-9A			Prep Date: 2/14/2017		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
METHANE	119	1	142		83	80-120				25	
ETHANE	228	2	267		86	80-120				25	
PROPANE	333	1	391		85	80-120				25	

LCSD		Sample ID: HC170214-9			Units: UG/L		Analysis Date: 2/14/2017 10:06				
Client ID:		Run ID: HC170214-9A			Prep Date: 2/14/2017		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
METHANE	155	1	142		109	80-120		119	27	25	+
ETHANE	292	2	267		110	80-120		228	25	25	
PROPANE	423	1	391		108	80-120		333	24	25	

MB		Sample ID: HC170214-9			Units: UG/L		Analysis Date: 2/14/2017 09:09				
Client ID:		Run ID: HC170214-9A			Prep Date: 2/14/2017		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	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: 1702096
Project: Burr 222HN

QC BATCH REPORT

Batch ID: **IP170209-2-2** Instrument ID: **ICPMS2** Method: **EPA200.8**

LCS Sample ID: **IM170209-2** Units: **UG/L** Analysis Date: **2/13/2017 15:25**
 Client ID: Run ID: **IM170213-10A3** Prep Date: **2/9/2017** DF: **10**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
CALCIUM	9310	1000	10000		93	85-115				20	
POTASSIUM	4820	1000	5000		96	85-115				20	
SODIUM	9430	1000	10000		94	85-115				20	

MB Sample ID: **FP170209-2** Units: **UG/L** Analysis Date: **2/13/2017 15:16**
 Client ID: Run ID: **IM170213-10A3** Prep Date: **2/9/2017** DF: **10**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
CALCIUM	ND	1000									
POTASSIUM	ND	1000									
SODIUM	ND	1000									

The following samples were analyzed in this batch:

1702096-1	1702096-2
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Client: Great Western Oil and Gas
Work Order: 1702096
Project: Burr 222HN

QC BATCH REPORT

Batch ID: **IP170209-2-2** Instrument ID: **ICPMS2** Method: **EPA200.8**

LCS Sample ID: **IM170209-2** Units: **UG/L** Analysis Date: **2/14/2017 19:55**
 Client ID: Run ID: **IM170214-11A5** Prep Date: **2/9/2017** DF: **10**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
MAGNESIUM	9830	100	10000		98	85-115				20	

MB Sample ID: **FP170209-2** Units: **UG/L** Analysis Date: **2/14/2017 19:52**
 Client ID: Run ID: **IM170214-11A5** Prep Date: **2/9/2017** DF: **10**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
MAGNESIUM	ND	100									

The following samples were analyzed in this batch:

1702096-1	1702096-2
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Client: Great Western Oil and Gas
 Work Order: 1702096
 Project: Burr 222HN

QC BATCH REPORT

Batch ID: VL170207-4-3 Instrument ID: HPV4 Method: SW8260_25

LCS		Sample ID: VL170207-4			Units: %REC		Analysis Date: 2/7/2017 11:22				
Client ID:		Run ID: VL170207-4A			Prep Date: 2/7/2017		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Surr: 4-BROMOFLUOROBENZENE	25.2		25		101	85-115					
Surr: DIBROMOFLUOROMETHANE	25.9		25		104	84-118					
Surr: TOLUENE-D8	24.4		25		97	85-115					
BENZENE	10.9	1	10		109	83-117				20	
TOLUENE	10.3	1	10		103	82-113				20	
ETHYLBENZENE	9.91	1	10		99	81-113				20	
M+P-XYLENE	20.9	1	20		105	82-115				20	
O-XYLENE	10.1	1	10		101	81-115				20	

LCSD		Sample ID: VL170207-4			Units: %REC		Analysis Date: 2/7/2017 11:45				
Client ID:		Run ID: VL170207-4A			Prep Date: 2/7/2017		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Surr: 4-BROMOFLUOROBENZENE	24.9		25		99	85-115			1		
Surr: DIBROMOFLUOROMETHANE	25.2		25		101	84-118			3		
Surr: TOLUENE-D8	24.3		25		97	85-115			0		
BENZENE	11	1	10		110	83-117		10.9	1	20	
TOLUENE	9.92	1	10		99	82-113		10.3	4	20	
ETHYLBENZENE	9.87	1	10		99	81-113		9.91	0	20	
M+P-XYLENE	20.2	1	20		101	82-115		20.9	4	20	
O-XYLENE	10.1	1	10		101	81-115		10.1	0	20	

MB		Sample ID: VL170207-4			Units: %REC		Analysis Date: 2/7/2017 12:33				
Client ID:		Run ID: VL170207-4A			Prep Date: 2/7/2017		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Surr: 4-BROMOFLUOROBENZENE	24.9		25		100	85-115					
Surr: DIBROMOFLUOROMETHANE	25.8		25		103	84-118					
Surr: TOLUENE-D8	24.2		25		97	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: 1702096
 Project: Burr 222HN

QC BATCH REPORT

Batch ID: **AK170220-1-1** Instrument ID: **NONE** Method: **SM2320B**

LCS		Sample ID: AK170220-1			Units: MG/L		Analysis Date: 2/20/2017				
Client ID:		Run ID: AK170220-1a1			Prep Date: 2/20/2017		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	99.1	5	100		99	85-115				15	

LCSD		Sample ID: AK170220-1			Units: MG/L		Analysis Date: 2/20/2017				
Client ID:		Run ID: AK170220-1a1			Prep Date: 2/20/2017		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	99.5	5	100		99	85-115		99.1	0	15	

MB		Sample ID: AK170220-1			Units: MG/L		Analysis Date: 2/20/2017				
Client ID:		Run ID: AK170220-1a1			Prep Date: 2/20/2017		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	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:

1702096-1

Client: Great Western Oil and Gas
 Work Order: 1702096
 Project: Burr 222HN

QC BATCH REPORT

Batch ID: IC170215-1-1 Instrument ID: IC-2 Method: EPA300.0

LCS		Sample ID: IC170215-1			Units: MG/L		Analysis Date: 2/15/2017 21:10				
Client ID:		Run ID: IC170215-1A1			Prep Date: 2/15/2017		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
CHLORIDE	4.97	0.2	5		99	90-110				15	
SULFATE	19.6	1	20		98	90-110				15	

LCSD		Sample ID: IC170215-1			Units: MG/L		Analysis Date: 2/15/2017 21:55				
Client ID:		Run ID: IC170215-1A1			Prep Date: 2/15/2017		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
CHLORIDE	4.87	0.2	5		97	90-110		4.97	2	15	
SULFATE	19.2	1	20		96	90-110		19.6	2	15	

MB		Sample ID: IC170215-1			Units: MG/L		Analysis Date: 2/15/2017 20:55				
Client ID:		Run ID: IC170215-1A1			Prep Date: 2/15/2017		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
CHLORIDE	ND	0.2									
SULFATE	ND	1									

The following samples were analyzed in this batch:

Client: Great Western Oil and Gas
 Work Order: 1702096
 Project: Burr 222HN

QC BATCH REPORT

Batch ID: **TD170208-1-1** Instrument ID: **Balance** Method: **SM2540C**

LCS		Sample ID: TD170208-1			Units: MG/L		Analysis Date: 2/9/2017				
Client ID:		Run ID: TD170209-1a1			Prep Date: 2/8/2017		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
TOTAL DISSOLVED SOLIDS	395	20	400		99	85-115				5	

MB		Sample ID: TD170208-1			Units: MG/L		Analysis Date: 2/9/2017				
Client ID:		Run ID: TD170209-1a1			Prep Date: 2/8/2017		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
TOTAL DISSOLVED SOLIDS	ND	20									

The following samples were analyzed in this batch: