



Thursday, October 20, 2016

Rick Allison
COGCC
1120 Lincoln St. #801
Denver, CO 80203

Re: ALS Workorder: 1609340
Project Name: Upper Pierre Aquifer
Project Number: 076 UPWQ

Dear Mr. Allison:

Two water samples were received from COGCC, on 9/21/2016. The samples were scheduled for the following analyses:

BART

Dissolved Gasses

GC/MS Volatiles

Inorganics

Metals

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



1609340

Due to analyst oversight, the BART test was not documented daily, and needed to be re-analyzed.

GC/MS Volatiles:

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

All compounds in the daily (continuing) calibration verifications were within 20%D with the exception of hexachlorobutadiene which was high. This compound was not detected in the associated samples.

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 matrix spike recoveries were within acceptance criteria with the following exceptions:

Spiked Compound	QC Sample	Direction
Methane	MS	Low
Ethane	MS	Low
Propane	MS	Low

The recoveries of these compounds in the laboratory control sample and laboratory control sample duplicate were within control limits, which suggest that the outliers in the matrix spike may have been due to matrix effects. No further action was taken. Laboratory control sample and laboratory control sample duplicate results have been included.

All remaining acceptance criteria were met.

BART:

The Biological Activity Reaction Test was completed with the Iron-Related Bacteria, Sulfate-Reducing Bacteria, and Slime-Forming Bacteria kit manufactured by Hach Company. The analysis was performed following the manufacturer provided instructions. If the target analyte is not detected (absent), then the sample will be reported with "ND" in the result field. If the target analyte is detected (present), then the sample will be reported with the estimated colony forming units/mL (cfu/mL) as provided by the manufacturer based on the day reaction was observed.

**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 was to be 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.

Sodium Adsorption Ration (SAR) was determined by calculation based on a reference from the client. Calcium, magnesium, and sodium concentrations were determined by ICP, Method 200.8.

$$\text{SAR} = \text{Na} / (((\text{Ca} + \text{Mg}) / 2)^{1/2})$$

The analyte results are the meq/L concentrations based on conversions from their mg/L concentrations. Please note that the SAR value is unitless.

All initial and continuing calibration verifications were within the acceptance criteria for the requested analytes, with the exception of multiple CCVs for boron and sodium. The samples bracketed by these CCVs were re-analyzed with acceptable CCVs.

All remaining acceptance criteria were met.

Inorganics:

The sample was analyzed following MCAWW, 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
pH	150.1	1126
Specific conductance	SM2510B	1128
TDS	160.1	1101
Bromide	300.0 Revision 2.1	1113
Chloride	300.0 Revision 2.1	1113
Fluoride	300.0 Revision 2.1	1113
Nitrate as N	300.0 Revision 2.1	1113
Nitrite as N	300.0 Revision 2.1	1113
Orthophosphate as P	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: 1609340

Client Name: COGCC

Client Project Name: Upper Pierre Aquifer

Client Project Number: 076 UPWQ

Client PO Number: CT2017-739

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
AFB L-01	1609340-1		WATER	20-Sep-16	10:10
Trip Blank	1609340-2		WATER	20-Sep-16	



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

Chain-of-Custody

0.8°C

WORKORDER # 1609340

Form 202r8

PROJECT NAME		PROJECT No.		COMPANY NAME		SEND REPORT TO		ADDRESS		CITY / STATE / ZIP		PHONE		FAX		E-MAIL		SAMPLER		SITE ID		EDD FORMAT		PURCHASE ORDER		BILL TO COMPANY		INVOICE ATTN TO		ADDRESS		CITY / STATE / ZIP		PHONE		FAX		E-MAIL	
Upper Pierre Aquifer		076 UPWQ		COGCC		Rick Allison		1120 Lincoln St, Ste 801		Denver, CO 80203		970-461-2970		970-461-4781		rick.allison@state.co.us		SAF		SAF		COGCC		CT2017-739		COGCC		Rick Allison		1120 Lincoln St, Ste 801		Denver, CO 80203		970-461-2970		970-461-4781		rick.allison@state.co.us	
Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC																																
1	APB L-01	W	9/20/16	1010	10																																		
2	Trip Blank	W																																					

Time Zone (Circle):	EST	CST	MST	PST	Matrix:	O = oil	S = soil	NS = non-soil solid	W = water	L = liquid	E = extract	F = filter
For metals or anions, please detail analytes below.												

Comments:	QC PACKAGE (check below)
Cations/Dissolved Metals - Ca, Fe, Mg, Mn, K, Na, Ba, B, Cr, Se, Sr, Pb Lab Filter Dissolved Metals COGCC will email Site ID to lab for EDD generation Email pdf report, EDD, and invoice to rick.allison@state.co.us	LEVEL I (Standard QC)
	LEVEL II (Std QC + forms)
	LEVEL III (Std QC + forms + raw data)
	LEVEL IV (Std QC + forms + raw data)

RELINQUISHED BY	SIGNATURE	PRINTED NAME	DATE	TIME
RECEIVED BY	[Signature]	Jake Fritz	9/21/16	0800
RELINQUISHED BY	[Signature]	Rebecca Merola	9/21/16	1320
RECEIVED BY				
RELINQUISHED BY				
RECEIVED BY				

Project Name	Project No.	Company Name	Send Report To	Address	City / State / Zip	Phone	Fax	E-Mail	Sampler	Site ID	EDD Format	Purchase Order	Bill To Company	Invoice Attn To	Address	City / State / Zip	Phone	Fax	E-Mail
Upper Pierre Aquifer	076 UPWQ	COGCC	Rick Allison	1120 Lincoln St, Ste 801	Denver, CO 80203	970-461-2970	970-461-4781	rick.allison@state.co.us	SAF	SAF	COGCC	CT2017-739	COGCC	Rick Allison	1120 Lincoln St, Ste 801	Denver, CO 80203	970-461-2970	970-461-4781	rick.allison@state.co.us

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC
1	APB L-01	W	9/20/16	1010	10		
2	Trip Blank	W					

Time Zone (Circle):	EST	CST	MST	PST	Matrix:	O = oil	S = soil	NS = non-soil solid	W = water	L = liquid	E = extract	F = filter
For metals or anions, please detail analytes below.												

Comments:	QC PACKAGE (check below)
Cations/Dissolved Metals - Ca, Fe, Mg, Mn, K, Na, Ba, B, Cr, Se, Sr, Pb Lab Filter Dissolved Metals COGCC will email Site ID to lab for EDD generation Email pdf report, EDD, and invoice to rick.allison@state.co.us	LEVEL I (Standard QC)
	LEVEL II (Std QC + forms)
	LEVEL III (Std QC + forms + raw data)
	LEVEL IV (Std QC + forms + raw data)

RELINQUISHED BY	SIGNATURE	PRINTED NAME	DATE	TIME
RECEIVED BY	[Signature]	Jake Fritz	9/21/16	0800
RELINQUISHED BY	[Signature]	Rebecca Merola	9/21/16	1320
RECEIVED BY				
RELINQUISHED BY				
RECEIVED BY				



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: COGCC

Workorder No: 1609340

Project Manager: ARW

Initials: RR Date: 9/21/16

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	<input checked="" type="radio"/> YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	<input checked="" type="radio"/> YES	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	<input checked="" type="radio"/> YES	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?		<input checked="" type="radio"/> YES	NO
17. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: <input checked="" type="radio"/> #2 <input checked="" type="radio"/> #4	<input checked="" type="radio"/> YES	NO
Cooler #: <u>21</u>			
Temperature (°C): <u>0.8°C</u>			
No. of custody seals on cooler: <u>0</u>			
External µR/hr reading: <u>NA</u>			
Background µR/hr reading: <u>10</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.)			

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

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

Project Manager Signature / Date: [Signature] 9/24/16

1609340

Quicksilver Express Courier
303-232-9800

TRACK : 1664
DATE : Sep 21, 2016
TIME : 12:05
DRIVER : 499
SERVICE : Economy
VEHICLE : Car

FROM : PIVON ENVIRONMENTAL ENGINEERING
: 9100 W. JEWELL AVE.
: LAVERGNE, CO 80232

TO : BLANCA
: ALS ENVIRONMENTAL
: 225 CHANCE DR
: FORT COLLINS, CO 80524
: SAMPLE COLLECTION

CHARGE : PIVON ENVIRONMENTAL ENGINEERING

REF : Y16093401
CITY : BLANCA
INFO : 3 PCS
NOTES : 3 coolers

Weight (lbs): _____ Pieces: _____
Other: _____

RECEIVED BY: 
X: 0281 1320

Liability limited to lesser of \$0.50/lb

Client: COGCC
Project: 076 UPWQ Upper Pierre Aquifer
Sample ID: AFB L-01
Legal Location:
Collection Date: 9/20/2016 10:10

Date: 20-Oct-16
Work Order: 1609340
Lab ID: 1609340-1
Matrix: WATER
Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Alkalinity as Calcium Carbonate						
		SM2320B			Prep Date: 10/3/2016	PrepBy: HMA
BICARBONATE AS CaCO3	110		20	MG/L	1	10/3/2016
CARBONATE AS CaCO3	ND		20	MG/L	1	10/3/2016
TOTAL ALKALINITY AS CaCO3	110		20	MG/L	1	10/3/2016
Biological Activity Reaction Test						
		BART			Prep Date: 10/6/2016	PrepBy: BAS
IRON RELATED BACTERIA	2300		1	cfu/ml	1	10/14/2016
SLIME FORMING BACTERIA	66500		1	cfu/ml	1	10/14/2016
SULFATE REDUCING BACTERIA	ND		1	cfu/ml	1	10/14/2016
Dissolved Gasses						
		RSK175			Prep Date: 9/26/2016	PrepBy: JFN
METHANE	ND		1	UG/L	1	9/26/2016 15:28
ETHANE	ND		2	UG/L	1	9/26/2016 15:28
PROPANE	ND		1	UG/L	1	9/26/2016 15:28
GC/MS Volatiles						
		SW8260_25			Prep Date: 9/22/2016	PrepBy: JXK
DICHLORODIFLUOROMETHANE	ND		1	UG/L	1	9/22/2016 11:37
CHLOROMETHANE	ND		1	UG/L	1	9/22/2016 11:37
VINYL CHLORIDE	ND		1	UG/L	1	9/22/2016 11:37
BROMOMETHANE	ND		1	UG/L	1	9/22/2016 11:37
CHLOROETHANE	ND		1	UG/L	1	9/22/2016 11:37
TRICHLOROFLUOROMETHANE	ND		1	UG/L	1	9/22/2016 11:37
1,1-DICHLOROETHENE	ND		1	UG/L	1	9/22/2016 11:37
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ND		1	UG/L	1	9/22/2016 11:37
ACETONE	ND		10	UG/L	1	9/22/2016 11:37
IODOMETHANE	ND		1	UG/L	1	9/22/2016 11:37
CARBON DISULFIDE	ND		1	UG/L	1	9/22/2016 11:37
METHYLENE CHLORIDE	ND		1	UG/L	1	9/22/2016 11:37
TRANS-1,2-DICHLOROETHENE	ND		1	UG/L	1	9/22/2016 11:37
METHYL TERTIARY BUTYL ETHER	ND		1	UG/L	1	9/22/2016 11:37
1,1-DICHLOROETHANE	ND		1	UG/L	1	9/22/2016 11:37
VINYL ACETATE	ND		2	UG/L	1	9/22/2016 11:37
CIS-1,2-DICHLOROETHENE	ND		1	UG/L	1	9/22/2016 11:37
2-BUTANONE	ND		10	UG/L	1	9/22/2016 11:37
BROMOCHLOROMETHANE	ND		1	UG/L	1	9/22/2016 11:37
CHLOROFORM	ND		1	UG/L	1	9/22/2016 11:37
1,1,1-TRICHLOROETHANE	ND		1	UG/L	1	9/22/2016 11:37
2,2-DICHLOROPROPANE	ND		1	UG/L	1	9/22/2016 11:37
CARBON TETRACHLORIDE	ND		1	UG/L	1	9/22/2016 11:37
1,1-DICHLOROPROPENE	ND		1	UG/L	1	9/22/2016 11:37
1,2-DICHLOROETHANE	ND		1	UG/L	1	9/22/2016 11:37
BENZENE	ND		1	UG/L	1	9/22/2016 11:37
TRICHLOROETHENE	ND		1	UG/L	1	9/22/2016 11:37
1,2-DICHLOROPROPANE	ND		1	UG/L	1	9/22/2016 11:37
DIBROMOMETHANE	ND		1	UG/L	1	9/22/2016 11:37
BROMODICHLOROMETHANE	ND		1	UG/L	1	9/22/2016 11:37
CIS-1,3-DICHLOROPROPENE	ND		1	UG/L	1	9/22/2016 11:37
4-METHYL-2-PENTANONE	ND		10	UG/L	1	9/22/2016 11:37

ALS -- Fort Collins

SAMPLE SUMMARY REPORT

Client: COGCC
Project: 076 UPWQ Upper Pierre Aquifer
Sample ID: AFB L-01
Legal Location:
Collection Date: 9/20/2016 10:10

Date: 20-Oct-16
Work Order: 1609340
Lab ID: 1609340-1
Matrix: WATER
Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOLUENE	ND		1	UG/L	1	9/22/2016 11:37
TRANS-1,3-DICHLOROPROPENE	ND		1	UG/L	1	9/22/2016 11:37
1,1,2-TRICHLOROETHANE	ND		1	UG/L	1	9/22/2016 11:37
2-HEXANONE	ND		10	UG/L	1	9/22/2016 11:37
TETRACHLOROETHENE	ND		1	UG/L	1	9/22/2016 11:37
1,3-DICHLOROPROPANE	ND		1	UG/L	1	9/22/2016 11:37
DIBROMOCHLOROMETHANE	ND		1	UG/L	1	9/22/2016 11:37
1,2-DIBROMOETHANE	ND		1	UG/L	1	9/22/2016 11:37
1-CHLOROHEXANE	ND		1	UG/L	1	9/22/2016 11:37
CHLOROBENZENE	ND		1	UG/L	1	9/22/2016 11:37
1,1,1,2-TETRACHLOROETHANE	ND		1	UG/L	1	9/22/2016 11:37
ETHYLBENZENE	ND		1	UG/L	1	9/22/2016 11:37
M+P-XYLENE	ND		1	UG/L	1	9/22/2016 11:37
O-XYLENE	ND		1	UG/L	1	9/22/2016 11:37
STYRENE	ND		1	UG/L	1	9/22/2016 11:37
BROMOFORM	ND		1	UG/L	1	9/22/2016 11:37
ISOPROPYLBENZENE	ND		1	UG/L	1	9/22/2016 11:37
1,2,3-TRICHLOROPROPANE	ND		1	UG/L	1	9/22/2016 11:37
1,1,2,2-TETRACHLOROETHANE	ND		1	UG/L	1	9/22/2016 11:37
BROMOBENZENE	ND		1	UG/L	1	9/22/2016 11:37
N-PROPYLBENZENE	ND		1	UG/L	1	9/22/2016 11:37
2-CHLOROTOLUENE	ND		1	UG/L	1	9/22/2016 11:37
1,3,5-TRIMETHYLBENZENE	ND		1	UG/L	1	9/22/2016 11:37
4-CHLOROTOLUENE	ND		1	UG/L	1	9/22/2016 11:37
TERT-BUTYLBENZENE	ND		1	UG/L	1	9/22/2016 11:37
1,2,4-TRIMETHYLBENZENE	ND		1	UG/L	1	9/22/2016 11:37
SEC-BUTYLBENZENE	ND		1	UG/L	1	9/22/2016 11:37
1,3-DICHLOROBENZENE	ND		1	UG/L	1	9/22/2016 11:37
P-ISOPROPYLTOLUENE	ND		1	UG/L	1	9/22/2016 11:37
1,4-DICHLOROBENZENE	ND		1	UG/L	1	9/22/2016 11:37
N-BUTYLBENZENE	ND		1	UG/L	1	9/22/2016 11:37
1,2-DICHLOROBENZENE	ND		1	UG/L	1	9/22/2016 11:37
1,2-DIBROMO-3-CHLOROPROPANE	ND		2	UG/L	1	9/22/2016 11:37
1,2,4-TRICHLOROBENZENE	ND		1	UG/L	1	9/22/2016 11:37
HEXACHLOROBUTADIENE	ND		1	UG/L	1	9/22/2016 11:37
NAPHTHALENE	ND		1	UG/L	1	9/22/2016 11:37
1,2,3-TRICHLOROBENZENE	ND		1	UG/L	1	9/22/2016 11:37
Surr: DIBROMOFLUOROMETHANE	99		84-118	%REC	1	9/22/2016 11:37
Surr: TOLUENE-D8	97		85-115	%REC	1	9/22/2016 11:37
Surr: 4-BROMOFLUOROBENZENE	102		85-115	%REC	1	9/22/2016 11:37

Ion Chromatography

EPA300.0

Prep Date: 9/21/2016

PrepBy: SDW

BROMIDE	ND	0.2	MG/L	1	9/22/2016 00:02
CHLORIDE	1.8	0.2	MG/L	1	9/22/2016 00:02
FLUORIDE	0.77	0.1	MG/L	1	9/22/2016 00:02
NITRATE AS N	1	0.2	MG/L	1	9/22/2016 00:02
NITRITE AS N	ND	0.1	MG/L	1	9/22/2016 00:02
ORTHOPHOSPHATE AS P	ND	0.5	MG/L	1	9/22/2016 00:02

ALS -- Fort Collins

SAMPLE SUMMARY REPORT

Client: COGCC
Project: 076 UPWQ Upper Pierre Aquifer
Sample ID: AFB L-01
Legal Location:
Collection Date: 9/20/2016 10:10

Date: 20-Oct-16
Work Order: 1609340
Lab ID: 1609340-1
Matrix: WATER
Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SULFATE	8.4		1	MG/L	1	9/22/2016 00:02
Dissolved Metals by 200.8			EPA200.8		Prep Date: 10/5/2016	PrepBy: BAS
BORON	0.058		0.05	MG/L	10	10/12/2016 18:02
BARIUM	0.085		0.001	MG/L	10	10/11/2016 03:11
CALCIUM	22		1	MG/L	10	10/11/2016 03:11
CHROMIUM	ND		0.01	MG/L	10	10/11/2016 03:11
IRON	ND		0.1	MG/L	10	10/11/2016 03:11
POTASSIUM	5.5		1	MG/L	10	10/11/2016 03:11
MAGNESIUM	7.5		0.1	MG/L	10	10/11/2016 03:11
MANGANESE	0.0029		0.002	MG/L	10	10/11/2016 03:11
SODIUM	15		1	MG/L	10	10/12/2016 18:02
LEAD	ND		0.0005	MG/L	10	10/11/2016 03:11
SODIUM ADSORPTION RATIO	ND		0.26	NU	10	10/12/2016 18:02
SELENIUM	ND		0.001	MG/L	10	10/11/2016 03:11
STRONTIUM	0.33		0.001	MG/L	10	10/11/2016 03:11
pH			EPA150.1		Prep Date: 9/23/2016	PrepBy: HMA
PH	8.11		0.1	pH	1	9/23/2016
Specific Conductance in Water			SM2510B		Prep Date: 9/23/2016	PrepBy: HMA
SPECIFIC CONDUCTIVITY	258		1	umhos/cm	1	9/23/2016
Total Dissolved Solids			EPA160.1		Prep Date: 9/27/2016	PrepBy: HMA
TOTAL DISSOLVED SOLIDS	200		20	MG/L	1	9/28/2016

ALS -- Fort Collins

SAMPLE SUMMARY REPORT

Client: COGCC
Project: 076 UPWQ Upper Pierre Aquifer
Sample ID: Trip Blank
Legal Location:
Collection Date: 9/20/2016

Date: 20-Oct-16
Work Order: 1609340
Lab ID: 1609340-2
Matrix: WATER
Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
GC/MS Volatiles		SW8260_25		Prep Date: 9/22/2016		PrepBy: JXK
DICHLORODIFLUOROMETHANE	ND		1	UG/L	1	9/22/2016 10:33
CHLOROMETHANE	ND		1	UG/L	1	9/22/2016 10:33
VINYL CHLORIDE	ND		1	UG/L	1	9/22/2016 10:33
BROMOMETHANE	ND		1	UG/L	1	9/22/2016 10:33
CHLOROETHANE	ND		1	UG/L	1	9/22/2016 10:33
TRICHLOROFLUOROMETHANE	ND		1	UG/L	1	9/22/2016 10:33
1,1-DICHLOROETHENE	ND		1	UG/L	1	9/22/2016 10:33
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ND		1	UG/L	1	9/22/2016 10:33
ACETONE	ND		10	UG/L	1	9/22/2016 10:33
IODOMETHANE	ND		1	UG/L	1	9/22/2016 10:33
CARBON DISULFIDE	ND		1	UG/L	1	9/22/2016 10:33
METHYLENE CHLORIDE	ND		1	UG/L	1	9/22/2016 10:33
TRANS-1,2-DICHLOROETHENE	ND		1	UG/L	1	9/22/2016 10:33
METHYL TERTIARY BUTYL ETHER	ND		1	UG/L	1	9/22/2016 10:33
1,1-DICHLOROETHANE	ND		1	UG/L	1	9/22/2016 10:33
VINYL ACETATE	ND		2	UG/L	1	9/22/2016 10:33
CIS-1,2-DICHLOROETHENE	ND		1	UG/L	1	9/22/2016 10:33
2-BUTANONE	ND		10	UG/L	1	9/22/2016 10:33
BROMOCHLOROMETHANE	ND		1	UG/L	1	9/22/2016 10:33
CHLOROFORM	ND		1	UG/L	1	9/22/2016 10:33
1,1,1-TRICHLOROETHANE	ND		1	UG/L	1	9/22/2016 10:33
2,2-DICHLOROPROPANE	ND		1	UG/L	1	9/22/2016 10:33
CARBON TETRACHLORIDE	ND		1	UG/L	1	9/22/2016 10:33
1,1-DICHLOROPROPENE	ND		1	UG/L	1	9/22/2016 10:33
1,2-DICHLOROETHANE	ND		1	UG/L	1	9/22/2016 10:33
BENZENE	ND		1	UG/L	1	9/22/2016 10:33
TRICHLOROETHENE	ND		1	UG/L	1	9/22/2016 10:33
1,2-DICHLOROPROPANE	ND		1	UG/L	1	9/22/2016 10:33
DIBROMOMETHANE	ND		1	UG/L	1	9/22/2016 10:33
BROMODICHLOROMETHANE	ND		1	UG/L	1	9/22/2016 10:33
CIS-1,3-DICHLOROPROPENE	ND		1	UG/L	1	9/22/2016 10:33
4-METHYL-2-PENTANONE	ND		10	UG/L	1	9/22/2016 10:33
TOLUENE	ND		1	UG/L	1	9/22/2016 10:33
TRANS-1,3-DICHLOROPROPENE	ND		1	UG/L	1	9/22/2016 10:33
1,1,2-TRICHLOROETHANE	ND		1	UG/L	1	9/22/2016 10:33
2-HEXANONE	ND		10	UG/L	1	9/22/2016 10:33
TETRACHLOROETHENE	ND		1	UG/L	1	9/22/2016 10:33
1,3-DICHLOROPROPANE	ND		1	UG/L	1	9/22/2016 10:33
DIBROMOCHLOROMETHANE	ND		1	UG/L	1	9/22/2016 10:33
1,2-DIBROMOETHANE	ND		1	UG/L	1	9/22/2016 10:33
1-CHLOROHEXANE	ND		1	UG/L	1	9/22/2016 10:33
CHLOROBENZENE	ND		1	UG/L	1	9/22/2016 10:33
1,1,1,2-TETRACHLOROETHANE	ND		1	UG/L	1	9/22/2016 10:33
ETHYLBENZENE	ND		1	UG/L	1	9/22/2016 10:33
M+P-XYLENE	ND		1	UG/L	1	9/22/2016 10:33
O-XYLENE	ND		1	UG/L	1	9/22/2016 10:33

Client: COGCC
Project: 076 UPWQ Upper Pierre Aquifer
Sample ID: Trip Blank
Legal Location:
Collection Date: 9/20/2016

Date: 20-Oct-16
Work Order: 1609340
Lab ID: 1609340-2
Matrix: WATER
Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
STYRENE	ND		1	UG/L	1	9/22/2016 10:33
BROMOFORM	ND		1	UG/L	1	9/22/2016 10:33
ISOPROPYLBENZENE	ND		1	UG/L	1	9/22/2016 10:33
1,2,3-TRICHLOROPROPANE	ND		1	UG/L	1	9/22/2016 10:33
1,1,2,2-TETRACHLOROETHANE	ND		1	UG/L	1	9/22/2016 10:33
BROMOBENZENE	ND		1	UG/L	1	9/22/2016 10:33
N-PROPYLBENZENE	ND		1	UG/L	1	9/22/2016 10:33
2-CHLOROTOLUENE	ND		1	UG/L	1	9/22/2016 10:33
1,3,5-TRIMETHYLBENZENE	ND		1	UG/L	1	9/22/2016 10:33
4-CHLOROTOLUENE	ND		1	UG/L	1	9/22/2016 10:33
TERT-BUTYLBENZENE	ND		1	UG/L	1	9/22/2016 10:33
1,2,4-TRIMETHYLBENZENE	ND		1	UG/L	1	9/22/2016 10:33
SEC-BUTYLBENZENE	ND		1	UG/L	1	9/22/2016 10:33
1,3-DICHLOROBENZENE	ND		1	UG/L	1	9/22/2016 10:33
P-ISOPROPYLTOLUENE	ND		1	UG/L	1	9/22/2016 10:33
1,4-DICHLOROBENZENE	ND		1	UG/L	1	9/22/2016 10:33
N-BUTYLBENZENE	ND		1	UG/L	1	9/22/2016 10:33
1,2-DICHLOROBENZENE	ND		1	UG/L	1	9/22/2016 10:33
1,2-DIBROMO-3-CHLOROPROPANE	ND		2	UG/L	1	9/22/2016 10:33
1,2,4-TRICHLOROBENZENE	ND		1	UG/L	1	9/22/2016 10:33
HEXACHLOROBUTADIENE	ND		1	UG/L	1	9/22/2016 10:33
NAPHTHALENE	ND		1	UG/L	1	9/22/2016 10:33
1,2,3-TRICHLOROBENZENE	ND		1	UG/L	1	9/22/2016 10:33
Surr: DIBROMOFLUOROMETHANE	99		84-118	%REC	1	9/22/2016 10:33
Surr: TOLUENE-D8	96		85-115	%REC	1	9/22/2016 10:33
Surr: 4-BROMOFLUOROBENZENE	103		85-115	%REC	1	9/22/2016 10:33

Client: COGCC
Project: 076 UPWQ Upper Pierre Aquifer
Sample ID: Trip Blank
Legal Location:
Collection Date: 9/20/2016

Date: 20-Oct-16
Work Order: 1609340
Lab ID: 1609340-2
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.	M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.	L - LCS Recovery below lower control limit.
Y2 - Chemical Yield outside default limits.	H - LCS Recovery above upper control limit.
W - DER is greater than Warning Limit of 1.42	P - LCS, Matrix Spike Recovery within control limits.
* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.	N - Matrix Spike Recovery outside control limits
# - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.	NC - Not Calculated for duplicate results less than 5 times MDC
G - Sample density differs by more than 15% of LCS density.	B - Analyte concentration greater than MDC.
D - DER is greater than Control Limit	B3 - Analyte concentration greater than MDC but less than Requested MDC.
M - Requested MDC not met.	
LT - Result is less than requested MDC but greater than achieved 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: 10/20/2016 8:48

Client: COGCC

QC BATCH REPORT

Work Order: 1609340

Project: 076 UPWQ Upper Pierre Aquifer

Batch ID: HC160926-9-1

Instrument ID MEE-1

Method: RSK175

LCS	Sample ID: HC160926-9				Units: UG/L		Analysis Date: 9/26/2016 15:13				
Client ID:	Run ID: HC160926-9A				Prep Date: 9/26/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
METHANE	129	1	142		91	80-120				25	
ETHANE	249	2	267		93	80-120				25	
PROPANE	362	1	391		93	80-120				25	

LCSD	Sample ID: HC160926-9				Units: UG/L		Analysis Date: 9/26/2016 16:20				
Client ID:	Run ID: HC160926-9A				Prep Date: 9/26/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
METHANE	139	1	142		98	80-120		129	7	25	
ETHANE	268	2	267		100	80-120		249	7	25	
PROPANE	390	1	391		100	80-120		362	7	25	

MB	Sample ID: HC160926-9				Units: UG/L		Analysis Date: 9/26/2016 15:19				
Client ID:	Run ID: HC160926-9A				Prep Date: 9/26/2016			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									

MS	Sample ID: 1609340-1				Units: UG/L		Analysis Date: 9/26/2016 15:42				
Client ID: AFB L-01			Run ID: HC160926-9A			Prep Date: 9/26/2016			DF: 1		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
METHANE	46.1	1	71.1	1	65	70-130				25	*
ETHANE	88.7	2	133	2	66	70-130				25	*
PROPANE	130	1	196	1	67	70-130				25	*

The following samples were analyzed in this batch:

1609340-1

Client: COGCC
Work Order: 1609340
Project: 076 UPWQ Upper Pierre Aquifer

QC BATCH REPORT

Batch ID: **IP161005-1-6** Instrument ID **ICPMS2** Method: **EPA200.8**

LCS	Sample ID: IM161005-1				Units: MG/L		Analysis Date: 10/11/2016 02:20				
Client ID:	Run ID: IM161010-13A12				Prep Date: 10/5/2016			DF: 10			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
BARIUM	0.113	0.001	0.1		113	85-115				20	
CALCIUM	10.2	1	10		102	85-115				20	
CHROMIUM	0.54	0.01	0.5		108	85-115				20	
IRON	5.37	0.1	5		107	85-115				20	
LEAD	0.0556	0.0005	0.05		111	85-115				20	
MAGNESIUM	10.8	0.1	10		108	85-115				20	
MANGANESE	0.106	0.002	0.1		106	85-115				20	
POTASSIUM	5.11	1	5		102	85-115				20	
SELENIUM	0.104	0.001	0.1		104	85-115				20	
STRONTIUM	0.106	0.001	0.1		106	85-115				20	

MB		Sample ID: IP161005-1				Units: MG/L		Analysis Date: 10/11/2016 02:17			
Client ID:		Run ID: IM161010-13A12				Prep Date: 10/5/2016			DF: 10		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
BARIUM	ND	0.001									
CALCIUM	ND	1									
CHROMIUM	ND	0.01									
IRON	ND	0.1									
LEAD	ND	0.0005									
MAGNESIUM	ND	0.1									
MANGANESE	ND	0.002									
POTASSIUM	ND	1									
SELENIUM	ND	0.001									
STRONTIUM	ND	0.001									

The following samples were analyzed in this batch:

1609340-1

Client: COGCC
Work Order: 1609340
Project: 076 UPWQ Upper Pierre Aquifer

QC BATCH REPORT

Batch ID: **IP161005-1-6** Instrument ID **ICPMS2** Method: **EPA200.8**

LCS Sample ID: **IM161005-1** Units: **MG/L** Analysis Date: **10/12/2016 16:41**

Client ID: Run ID: **IM161012-10A9** Prep Date: **10/5/2016** DF: **10**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
BORON	1.06	0.05	1		106	85-115				20	
SODIUM	10.3	1	10		103	85-115				20	

MB Sample ID: **IP161005-1** Units: **MG/L** Analysis Date: **10/12/2016 16:38**

Client ID: Run ID: **IM161012-10A9** Prep Date: **10/5/2016** DF: **10**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
BORON	ND	0.05									
SODIUM	ND	1									

The following samples were analyzed in this batch:

1609340-1

Client: COGCC
 Work Order: 1609340
 Project: 076 UPWQ Upper Pierre Aquifer

QC BATCH REPORT

Batch ID: **VL160922-3-1** Instrument ID **HPV1** Method: **SW8260_25**

LCS		Sample ID: VL160922-3			Units: UG/L		Analysis Date: 9/22/2016 09:05				
Client ID:		Run ID: VL160922-3A			Prep Date: 9/22/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
1,1-DICHLOROETHENE	10.7	1	10		107	77-119				20	
BENZENE	10.7	1	10		107	83-117				20	
TRICHLOROETHENE	11.3	1	10		113	83-117				20	
TOLUENE	10.9	1	10		109	82-113				20	
CHLOROBENZENE	11.3	1	10		113	81-113				20	
Surr: DIBROMOFLUOROMETHANE	25		25		100	84-118					
Surr: TOLUENE-D8	23.8		25		95	85-115					
Surr: 4-BROMOFLUOROBENZENE	25.2		25		101	85-115					

LCSD	Sample ID: VL160922-3			Units: UG/L			Analysis Date: 9/22/2016 09:27				
Client ID:	Run ID: VL160922-3A			Prep Date: 9/22/2016			DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
1,1-DICHLOROETHENE	10.6	1	10		106	77-119		10.7	1	20	
BENZENE	10.6	1	10		106	83-117		10.7	1	20	
TRICHLOROETHENE	11.1	1	10		111	83-117		11.3	2	20	
TOLUENE	10.8	1	10		108	82-113		10.9	1	20	
CHLOROBENZENE	11.1	1	10		111	81-113		11.3	2	20	
Surr: DIBROMOFLUOROMETHANE	25		25		100	84-118			0		
Surr: TOLUENE-D8	24.1		25		96	85-115			1		
Surr: 4-BROMOFLUOROBENZENE	24.7		25		99	85-115			2		

Client: COGCC
Work Order: 1609340
Project: 076 UPWQ Upper Pierre Aquifer

QC BATCH REPORT

Batch ID: **VL160922-3-1** Instrument ID: **HPV1** Method: **SW8260_25**

MB Sample ID: **VL160922-3** Units: **UG/L** Analysis Date: **9/22/2016 10:12**
 Client ID: Run ID: **VL160922-3A** Prep Date: **9/22/2016** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
DICHLORODIFLUOROMETHANE	ND	1									
CHLOROMETHANE	ND	1									
VINYL CHLORIDE	ND	1									
BROMOMETHANE	ND	1									
CHLOROETHANE	ND	1									
TRICHLOROFLUOROMETHANE	ND	1									
1,1-DICHLOROETHENE	ND	1									
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ND	1									
ACETONE	ND	10									
IODOMETHANE	ND	1									
CARBON DISULFIDE	ND	1									
METHYLENE CHLORIDE	ND	1									
TRANS-1,2-DICHLOROETHENE	ND	1									
METHYL TERTIARY BUTYL ETHER	ND	1									
1,1-DICHLOROETHANE	ND	1									
VINYL ACETATE	ND	2									
CIS-1,2-DICHLOROETHENE	ND	1									
2-BUTANONE	ND	10									
BROMOCHLOROMETHANE	ND	1									
CHLOROFORM	ND	1									
1,1,1-TRICHLOROETHANE	ND	1									
2,2-DICHLOROPROPANE	ND	1									
CARBON TETRACHLORIDE	ND	1									
1,1-DICHLOROPROPENE	ND	1									
1,2-DICHLOROETHANE	ND	1									
BENZENE	ND	1									
TRICHLOROETHENE	ND	1									
1,2-DICHLOROPROPANE	ND	1									
DIBROMOMETHANE	ND	1									
BROMODICHLOROMETHANE	ND	1									
CIS-1,3-DICHLOROPROPENE	ND	1									
4-METHYL-2-PENTANONE	ND	10									
TOLUENE	ND	1									
TRANS-1,3-DICHLOROPROPENE	ND	1									
1,1,2-TRICHLOROETHANE	ND	1									
2-HEXANONE	ND	10									
TETRACHLOROETHENE	ND	1									
1,3-DICHLOROPROPANE	ND	1									
DIBROMOCHLOROMETHANE	ND	1									
1,2-DIBROMOETHANE	ND	1									

Client: COGCC
Work Order: 1609340
Project: 076 UPWQ Upper Pierre Aquifer

QC BATCH REPORT

Batch ID: **VL160922-3-1** Instrument ID: **HPV1** Method: **SW8260_25**

MB		Sample ID: VL160922-3			Units: UG/L			Analysis Date: 9/22/2016 10:12			
Client ID:		Run ID: VL160922-3A			Prep Date: 9/22/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
1-CHLOROHEXANE	ND	1									
CHLOROBENZENE	ND	1									
1,1,1,2-TETRACHLOROETHANE	ND	1									
ETHYLBENZENE	ND	1									
M+P-XYLENE	ND	1									
O-XYLENE	ND	1									
STYRENE	ND	1									
BROMOFORM	ND	1									
ISOPROPYLBENZENE	ND	1									
1,2,3-TRICHLOROPROPANE	ND	1									
1,1,2,2-TETRACHLOROETHANE	ND	1									
BROMOBENZENE	ND	1									
N-PROPYLBENZENE	ND	1									
2-CHLOROTOLUENE	ND	1									
1,3,5-TRIMETHYLBENZENE	ND	1									
4-CHLOROTOLUENE	ND	1									
TERT-BUTYLBENZENE	ND	1									
1,2,4-TRIMETHYLBENZENE	ND	1									
SEC-BUTYLBENZENE	ND	1									
1,3-DICHLOROBENZENE	ND	1									
P-ISOPROPYLTOLUENE	ND	1									
1,4-DICHLOROBENZENE	ND	1									
N-BUTYLBENZENE	ND	1									
1,2-DICHLOROBENZENE	ND	1									
1,2-DIBROMO-3-CHLOROPROPANE	ND	2									
1,2,4-TRICHLOROBENZENE	ND	1									
HEXACHLOROBUTADIENE	ND	1									
NAPHTHALENE	ND	1									
1,2,3-TRICHLOROBENZENE	ND	1									
Surr: DIBROMOFLUOROMETHANE	24.7		25		99	84-118					
Surr: TOLUENE-D8	24.3		25		97	85-115					
Surr: 4-BROMOFLUOROBENZENE	25.6		25		102	85-115					

The following samples were analyzed in this batch:

1609340-1 1609340-2

Client: COGCC
Work Order: 1609340
Project: 076 UPWQ Upper Pierre Aquifer

QC BATCH REPORT

Batch ID: **AK161003-1-2** Instrument ID **NONE** Method: **SM2320B**

LCS		Sample ID: AK161003-1			Units: MG/L			Analysis Date: 10/3/2016			
Client ID:		Run ID: AK161003-1A1			Prep Date: 10/3/2016			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	399	20	400		100	85-115				15	

LCSD		Sample ID: AK161003-1			Units: MG/L			Analysis Date: 10/3/2016			
Client ID:		Run ID: AK161003-1A1			Prep Date: 10/3/2016			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	402	20	400		100	85-115		399	1	15	

MB		Sample ID: AK161003-1			Units: MG/L			Analysis Date: 10/3/2016			
Client ID:		Run ID: AK161003-1A1			Prep Date: 10/3/2016			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	20									
CARBONATE AS CaCO3	ND	20									
TOTAL ALKALINITY AS CaCO3	ND	20									

The following samples were analyzed in this batch:

1609340-1

Client: COGCC
Work Order: 1609340
Project: 076 UPWQ Upper Pierre Aquifer

QC BATCH REPORT

Batch ID: **IC160921-1-3** Instrument ID **IC-2** Method: **EPA300.0**

LCS	Sample ID: IC160921-1			Units: MG/L		Analysis Date: 9/21/2016 17:53					
Client ID:	Run ID: IC160920-1A1					Prep Date: 9/21/2016			DF: 1		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
FLUORIDE	2.01	0.1	2		101	90-110				15	
CHLORIDE	4.93	0.2	5		99	90-110				15	
NITRITE AS N	1.95	0.1	2		98	90-110				15	
BROMIDE	4.99	0.2	5		100	90-110				15	
NITRATE AS N	4.92	0.2	5		98	90-110				15	
ORTHOPHOSPHATE AS P	1.89	0.5	2		94	90-110				15	
SULFATE	19.5	1	20		97	90-110				15	

LCSD	Sample ID: IC160921-1			Units: MG/L			Analysis Date: 9/21/2016 18:09				
Client ID:	Run ID: IC160920-1A1			Prep Date: 9/21/2016			DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
FLUORIDE	2	0.1	2		100	90-110		2.01	0	15	
CHLORIDE	4.91	0.2	5		98	90-110		4.93	0	15	
NITRITE AS N	1.96	0.1	2		98	90-110		1.95	0	15	
BROMIDE	4.99	0.2	5		100	90-110		4.99	0	15	
NITRATE AS N	4.9	0.2	5		98	90-110		4.92	0	15	
ORTHOPHOSPHATE AS P	1.96	0.5	2		98	90-110		1.89	4	15	
SULFATE	19.7	1	20		99	90-110		19.5	1	15	

MB		Sample ID: IC160921-1				Units: MG/L		Analysis Date: 9/21/2016 17:36			
Client ID:		Run ID: IC160920-1A1				Prep Date: 9/21/2016		DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
FLUORIDE	ND	0.1									
CHLORIDE	ND	0.2									
NITRITE AS N	ND	0.1									
BROMIDE	ND	0.2									
NITRATE AS N	ND	0.2									
ORTHOPHOSPHATE AS P	ND	0.5									
SULFATE	ND	1									

The following samples were analyzed in this batch:

1609340-1

Client: COGCC
Work Order: 1609340
Project: 076 UPWQ Upper Pierre Aquifer

QC BATCH REPORT

Batch ID: **TD160927-1-2** Instrument ID **Balance** Method: **EPA160.1**

DUP		Sample ID: 1609340-1				Units: MG/L		Analysis Date: 9/28/2016			
Client ID: AFB L-01			Run ID: TD160928-1A1			Prep Date: 9/27/2016			DF: 1		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
TOTAL DISSOLVED SOLIDS	198	20						200	1	5	

LCS	Sample ID: TD160927-1				Units: MG/L		Analysis Date: 9/28/2016				
Client ID:	Run ID: TD160928-1A1				Prep Date: 9/27/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
TOTAL DISSOLVED SOLIDS	415	20	400		104	85-115				5	

LCSD	Sample ID: TD160927-1				Units: MG/L		Analysis Date: 9/28/2016				
Client ID:	Run ID: TD160928-1A1				Prep Date: 9/27/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
TOTAL DISSOLVED SOLIDS	427	20	400		107	85-115		415	3	5	

MB		Sample ID: TD160927-1				Units: MG/L		Analysis Date: 9/28/2016			
Client ID:		Run ID: TD160928-1A1				Prep Date: 9/27/2016		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:

1609340-1