



DEPARTMENT OF NATURAL RESOURCES

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Certified USPS Mail Receipt #7011 3500 0000 8456 5496

Bruce Brotemarkle and Margie Sturtevant
17080 County Road 32
Platteville, CO 80651

Re: Water Well Sampling Results
Brotemarkle Water Well DWR Permit No. 162136
COGCC Sample Facility ID 752811 (Project Facility ID 434043)

Dear Brotemarkle and Ms. Sturtevant:

The Colorado Oil and Gas Conservation Commission (COGCC) is conducting an investigation of the potential presence of methane in water produced from domestic water wells in your area. You agreed to allow COGCC to collect a sample from your water well, and on September 5, 2013, COGCC Staff conducted a field visit to visually inspect the water well, purge water from the well and to collect a water sample. The water sample was analyzed for general organic and inorganic constituents, and dissolved gasses. This letter summarizes the water quality results.

FIELD TESTING

The water sample was collected from an outdoor hydrant off the northwest corner of the house. The valve on the hydrant was turned on at approximately 9:50 a.m. and allowed to run for 20 minutes at a rate of approximately 5 gallons per minute. The water was clear and odorless with a slight effervescence. The sample was collected in laboratory certified containers at 10:10 a.m. The containers were labeled, placed on ice in a cooler, and delivered to ALS Environmental in Fort Collins, Colorado with a chain-of-custody form.

DISCUSSION OF ANALYTICAL RESULTS

The Water Quality Control Commission (WQCC) of the Colorado Department of Public Health and Environment (CDPHE) established "Domestic Use – Quality" Human Health Standards and Secondary Drinking Water Standards in Regulation 41 "The Basic Standards for Groundwater" (5CCR 1002-41). It is important to note that these standards were established for **municipal public drinking water supplies**, and that people often use and consume groundwater from private wells that exceeds these standards. The COGCC is an implementing agency of the groundwater standards for impacts associated with oil and gas exploration and production activities.

Analytical data for the sample from your water well was compared to the CDPHE Human Health Standards and Secondary Drinking Water Standards in the table provided as Attachment 1. The complete laboratory analytical report is provided as Attachment 2. None of the parameters that COGCC analyzed and that have CDPHE Human Health Standards were detected in the sample collected from your water well.

METHANE GAS ANALYSIS

Dissolved methane was detected in the sample from your domestic water well at a concentration of 0.19 milligrams per liter (mg/l) (ppm).

Methane gas alone is physiologically inert and non-toxic to humans. Normal breath exhalation contains methane at a ratio of 1 to 99 parts per million. Based on the results of extensive testing for methane gas in water wells throughout Colorado, concentrations of methane gas below 1 mg/l are considered harmless, with concern for possible hazards from the methane increasing at concentrations in well waters at or exceeding 7 mg/l. The sample collected from your domestic water well indicated the presence of methane at 0.19 mg/l, below the current accepted standard for methane. The presence of methane in drinking water does not present a known health hazard to humans or other animals via ingestion; however, methane in domestic water supplies can be associated with undesirable and potentially serious side effects. Methane gas dissolved in water "exsolves" when exposed to the atmosphere and dissipates rapidly because it is lighter than air. This is often responsible for the "fizzing" observed in water wells that contain methane gas. If the methane occurs at a high enough concentration and if it is allowed to accumulate in a confined space, such as a well pit, crawl space, closet, etc., an explosion hazard can be established. In addition, if methane concentrations in well water are high, bubbles of free gas form within the water and cause the well pump to cavitate and no longer bring water to the surface. Methane gas occurs naturally and is common in water wells in Colorado. Methane is commonly found as a gas in coal or black shale seams in the subsurface. Methane is also often found as a byproduct of the decay of organic matter, and the presence of bacteria in water wells can provide favorable conditions for the production of methane (either from the activity or decay of bacteria).

The sample from your domestic water well was submitted for isotopic analysis to determine whether the methane is of biogenic or thermogenic origin. Results of the analysis showed the methane detected in your domestic water well to be of biogenic origin.

INORGANIC ANALYTICAL RESULTS

The sample collected from your water well had concentrations of sulfate and total dissolved solids (TDS) which exceed CDPHE Secondary Drinking Water Standards.

Total Dissolved Solids (TDS) was detected in the sample from your domestic well at a concentration of 1,700 milligram per liter (mg/l).

CDPHE has established a TDS standard for human drinking water of 500 mg/l. The standard is called the secondary drinking water standard and is based on the aesthetic quality of the water (such as taste and odor) and is intended as a guideline for public water supply systems and is not an enforceable standard. TDS concentrations are related to the presence of naturally occurring elements and chemical compounds such as chloride, sodium, potassium, calcium, magnesium, and sulfate.

- **Sulfate** was detected in the sample from your domestic well at a concentration of 820 mg/l.

The CDPHE sulfate (SO_4) domestic supply drinking water standard for human drinking water is 250mg/l. Although CDPHE does not have an agricultural standard for sulfate, other agencies recommend a concentration below 1,500 mg/l for livestock watering. Waters containing high concentrations of sulfate, typically caused by the leaching of natural deposits of magnesium sulfate (Epsom salts) or sodium sulfate (Glauber's salt), may be undesirable because of their laxative effects.

The sample from your well was also analyzed for boron, calcium, magnesium, phosphorus, potassium, sodium, strontium, bromide, alkalinity content, specific conductivity and sodium adsorption ratio. There are no CDPHE drinking water standards for these parameters. A sodium concentration of 20 milligrams per liter is often recommended by some physicians for patients on salt restricted diets or those suffering from hypertension or heart disease.

VOLATILE ORGANIC COMPOUNDS ANALYTICAL RESULTS

A target list of 69 volatile organic compounds (VOC) was utilized during analysis of water from your well. Certain VOCs (benzene, toluene, ethylbenzene, total xylenes, and naphthalene) can be one indication of contamination or impacts from oil and gas operations or other hydrocarbon sources. The VOCs were not detected above the detection limits in the sample collected from your water well.

CONCLUSIONS

The concentration of total dissolved solids and sulfate detected in your well water were above the secondary drinking water standards established by the Water Quality Control Commission (WQCC) of the Colorado Department of Public Health and the Environment.

No volatile organic compounds were detected in the sample collected from your water well.

Of all the parameters analyzed in the sample from your water well, none exceeded the CDPHE human health based standards for domestic water supplies. The COGCC maintains a water quality database where the results from your water well sample will be recorded.

Based on the results of this sampling, it does not appear that your water well has been impacted by oil and gas activity at this time.

If you have any questions or would like to discuss these matters further, please contact me at 970-461-2970 or by email at rick.allison@state.co.us.

Sincerely,

Colorado Oil and Gas Conservation Commission



Ann C. Eckman, PG, *for*
Richard Allison, PG
Environmental Protection Specialist – Northeast Colorado

Enclosures Attachment 1 Analytical Summary Table
 Attachment 2 Laboratory Analytical Report
 Attachment 3 Well Permit

cc: Matt Lepore, COGCC Director w/o attachments
 Jim Milne, COGCC Environmental Manager w/o attachments
 John Axelson, COGCC Environmental Supervisor w/o attachments

TABLE 1
ANALYTICAL SUMMARY
Water Well Sample - Brotemarkle Water Well
Project Facility #434043

Parameter	Water Well Sample			
	Sample Date		CDPHE Standards	
	September 6, 2013			
	Result	Domestic Water Supply - Human Health Standards	Agricultural Standards	Units
Arsenic	ND	0.05	0.1	mg/l
Barium	0.0095	2.0	NS	mg/l
Cadmium	NA	0.005	0.01	mg/l
Chromium	ND	0.1	0.1	mg/l
Fluoride	0.32	4.0	2	mg/l
Lead	ND	0.05	0.1	mg/l
Nitrite	NA	1.0	10	mg/l
Nitrate	ND	10.0	100	mg/l
Total Nitrite/Nitrate	ND	10.0	100	mg/l
Selenium	ND	0.05	0.02	mg/l
Silver	NA	0.05	NS	mg/l
Strontium	0.5	NS	NS	mg/l
Uranium	NA	0.03	NS	mg/l
Benzene	ND	0.005	NS	mg/l
Toluene	ND	0.56	NS	mg/l
Ethylbenzene	ND	0.7	NS	mg/l
Total Xylenes	ND	1.4	NS	mg/l
	Result	Domestic Water Supply - Drinking Water (Secondary) Standards	Agricultural Standards	Units
Chloride	77	250	NS	mg/l
Copper	NA	1	0.2	mg/l
Iron	ND	0.3	5	mg/l
Manganese	0.038	0.05	0.2	mg/l
pH	8.36	6.5 - 8.5	6.5 - 8.5	No units
Sulfate	820	250	NS	mg/l
Total Dissolved Solids	1700	500	*1500	mg/l
Boron	ND	NS	0.75	mg/l
Calcium	17	NS	NS	mg/l
Magnesium	3.2	NS	NS	mg/l
Phosphorus	ND	NS	NS	mg/l
Potassium	3	NS	NS	mg/l
Sodium	570	NS	NS	mg/l
Bromide	1.1	NS	NS	mg/l
Carbonate	ND	NS	NS	mg/l
Bicarbonate	320	NS	NS	mg/l
Total Alkalinity	320	NS	NS	mg/l
Conductivity	2.57	NS	NS	mmhos/cm
Sodium Adsorption Ratio	33	NS	NS	No units
Methane	0.19	NS	NS	mg/l

Notes

CDPHE Standards	Water Quality Control Commission 5 CCR 1002-41, Regulation No. 41 - The Basic Standards For Gr
mg/l	Milligrams per liter (equals parts per million).
mmhos/cm	millimhos per centimeer
NA	Not analyzed.
ND	Not detected.
NS	No Standard.
**	Health Advisory.
	Human health standard.
	Secondary standard.

Anion / Cation Summary Report

Lab ID: **1309081-1**

QC Type: SMP

Field ID Brotemarkle 162136

Analyte	Final Result	Report Units	mEq
BICARBONATE AS CaCO3	317.0172	MG/L	6.34
CARBONATE AS CaCO3	20	MG/L	0.00
CHLORIDE	77.37832	MG/L	2.18
FLUORIDE	0.3190552	MG/L	0.02
NITRATE/NITRITE AS N	0.01	MG/L	0.00
SULFATE	821.0269	MG/L	17.09
Anion Result Sum	1235.75		

Analyte	Final Result	Report Units	mEq
CALCIUM	17.08964	MG/L	0.85
IRON	0.1	MG/L	0.00
MAGNESIUM	3.19547	MG/L	0.26
MANGANESE	0.03788	MG/L	0.00
POTASSIUM	2.99571	MG/L	0.08
SODIUM	565.5112	MG/L	24.60
Cation Result Sum	588.93		

Total Result: **1824.68** MG/L
TDS Result: **1730.000** MG/L
RPD: 5.33%

Anion mEq Sum: **25.63**
Cation mEq Sum: **25.79**
RPD: 0.64%

Below is a list of Lab IDs for this Order Number that were logged in for metals analyses. Note: if this area is empty then either no metals analyses were requested or the cations of interest were not requested.

1309081-1



Total Extractable Petroleum Hydrocarbons (Diesel)

Case Narrative

COGCC

Water Wells Sec23 3N 66W -- 434043

Work Order Number: 1309081

1. This report consists of 1 water sample. The sample was received intact by ALS on 09/06/2013. The sample was received at 10.0° Celsius.
2. The water sample was extracted by adding hexane to the water sample and shaking the resulting two phase solution according to the current revision of SOP 603, which was developed at ALS. The hydrocarbons partition into the hexane layer, which is then removed for analysis.
3. 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.
4. All initial and continuing calibration criteria were met.
5. The method blank associated with this project was below the reporting limit, but above the MDL for diesel range organics. No diesel or other fuel pattern was present in the method blank. Typically, small fluctuations in the detector baseline are responsible for this type of low level analytical result with no observable fuel pattern.
6. All laboratory control sample and laboratory control sample duplicate recoveries and RPDs were within the acceptance criteria.
7. Per method requirements, matrix QC was performed for this analysis. Since a sample from this order number was not the selected quality control (QC) sample, matrix specific QC results are not included in this report.
8. The sample was extracted and analyzed within the established holding time.



9. All surrogate recoveries were within acceptable limits with the following exceptions:

Surrogate	Sample	Direction
O-terphenyl	MB and LCSD	High

The sample was non-detect for TEPH/DRO. All spike recoveries in the batch were within limits. No further action was taken.

10. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in the current revision of SOP 939.

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.

Mindy Norton

Mindy Norton
Organics Primary Data Reviewer

9/12/13

Date

Joe Nette

Organics Final Data Reviewer

9-12-13

Date



ALS
Data Qualifier Flags
Fuels

- G:** This flag indicates that a pattern resembling gasoline was detected in this sample.
- D:** This flag indicates that a pattern resembling diesel was detected in this sample.
- M:** This flag indicates that a pattern resembling motor oil was detected in this sample.
- C:** This flag indicates that a pattern resembling crude oil was detected in this sample.
- 4:** This flag indicates that a pattern resembling JP-4 was detected in this sample.
- 5:** This flag indicates that a pattern resembling JP-5 was detected in this sample.
- H:** This flag indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.
- L:** This flag 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
- Multiple flags may be used to indicate the presence of more than one product or component.



ALS
Data Qualifier Flags
Chromatography and Mass Spectrometry

- U or ND:** This flag indicates that the compound was analyzed for but not detected.
- J:** This flag indicates an estimated value. This flag is used as follows : (1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the reporting limit (RL) but greater than the method detection limit (MDL); (3) when the data indicate the presence of a compound that meets the identification criteria, and the result is less than the RL but greater than the MDL; and (4) the reported value is estimated.
- B:** This flag is used when the analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user. This flag shall be used for a tentatively identified compound (TIC) as well as for a positively identified target compound.
- E:** This flag identifies compounds whose concentration exceeds the upper level of the calibration range.
- A:** This flag indicates that a tentatively identified compound is a suspected aldol-condensation product.
- X:** This flag indicates that the analyte was diluted below an accurate quantitation level.
- *:** This flag indicates that a spike recovery is outside the control criteria.
- +:** This flag indicates that the relative percent difference (RPD) exceeds the control criteria.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1309081

Client Name: COGCC

Client Project Name: Water Wells Sec23 3N 66W

Client Project Number: 434043

Client PO Number: PHA 14-22

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Brotemarkle 162136	1309081-1		WATER	06-Sep-13	10:10



Chain-of-Custody

Chain-of-Custody

Form 202r8

1809081

WORKORDER

[illegible]

*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: Cations/ Dissolved Metals - Ca, Fe, Mg, Mn, K, Na, Ba, B, Cr, Se, Sr Lab Filter Dissolved Metals COC will email Site ID to lab for EDD generation Email pdf report, EDD, and invoice to rick.allison@state.co.us	QC PACKAGE (check below)	
	x	LEVEL II (Standard QC)
		LEVEL III (Std QC + forms)
		LEVEL IV (Std QC + forms + raw data)
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035		



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: COGCC

Workorder No: 1309081

Project Manager: ARW

Initials: LAS Date: 9/6/13

1. Does this project require any special handling in addition to standard ALS procedures?		YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES	NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible?		<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		<u>YES</u>	NO
7. Were airbills / shipping documents present and/or removable?	<u>DROP OFF</u>	YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	<u>YES</u>	NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	<u>YES</u>	NO
10. Is there sufficient sample for the requested analyses?		<u>YES</u>	NO
11. Were all samples placed in the proper containers for the requested analyses?		<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?		<u>YES</u>	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		<u>YES</u>	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	N/A	YES	<u>NO</u> *
15. Do any water samples contain sediment? Amount of sediment: <u> </u> dusting <u> </u> moderate <u> </u> heavy	Amount N/A	YES	<u>NO</u>
16. Were the samples shipped on ice?		<u>YES</u>	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> #4 RAD ONLY		YES	<u>NO</u> *
Cooler #: <u>1</u>			
Temperature (°C): <u>10.0°</u>			
No. of custody seals on cooler: <u>0</u>			
External µR/hr reading: <u>N/A</u>			
Background µR/hr reading: <u>11</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.

*14 1309081-1-3 VOC }
 1-8 RSK } all arrived with headspace ≤ pea-size
 1-9 }
 ↓
 ↓

*17 samples collected same day as arrival at lab, temp OK

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

Project Manager Signature / Date: 9/9/13

Diesel Range Organics

Method SW8015MD

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: EX130909-1MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09-Sep-13

Date Analyzed: 10-Sep-13

Prep Method: METHOD

Prep Batch: EX130909-1

QCBatchID: EX130909-1-1

Run ID: HC130910-3A

Cleanup: NONE

Basis: N/A

File Name: F3F47274

Sample Aliquot: 160 ml

Final Volume: 4 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
68334-30-5	Diesel Range Organics	1	0.15	0.5	J	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
84-15-1	O-TERPHENYL	1.25	*	1.25	100	51 - 97

Data Package ID: HCD1309081-1

Date Printed: Thursday, September 12, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.658

Diesel Range Organics

Method SW8015M Revision D

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136
Lab ID:	1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 09-Sep-13

Date Analyzed: 11-Sep-13

Prep Method: METHOD

Prep Batch: EX130909-1

QCBatchID: EX130909-1-1

Run ID: HC130910-3A

Cleanup: NONE

Basis: As Received

File Name: F3F47285

Analyst: Joel F. Nolte

Sample Aliquot: 160 ML

Final Volume: 4 ML

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
68334-30-5	Diesel Range Organics	1	0.5	0.5	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
84-15-1	O-TERPHENYL	1.12		1.25	89	51 - 97

Data Package ID: HCD1309081-1

Diesel Range Organics

Method SW8015MD

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: EX130909-1LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/09/2013

Date Analyzed: 09/10/2013

Prep Method: METHOD

Prep Batch: EX130909-1

QCBatchID: EX130909-1-1

Run ID: HC130910-3A

Cleanup: NONE

Basis: N/A

File Name: F3F47275

Sample Aliquot: 160 ml

Final Volume: 4 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
68334-30-5	Diesel Range Organics	10	10.2	0.5		102	36 - 150%

Lab ID: EX130909-1LCSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/09/2013

Date Analyzed: 09/11/2013

Prep Method: METHOD

Prep Batch: EX130909-1

QCBatchID: EX130909-1-1

Run ID: HC130910-3A

Cleanup: NONE

Basis: N/A

File Name: F3F47276

Sample Aliquot: 160 ml

Final Volume: 4 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
68334-30-5	Diesel Range Organics	10	10.4	0.5		104	20	3

Surrogate Recovery LCS/LCSD

CASNO	Target Analyte	Spike Added	LCS % Rec.	LCS Flag	LCSD % Rec.	LCSD Flag	Control Limits
84-15-1	O-TERPHENYL	1.25	97		100	*	51 - 97

Data Package ID: HCD1309081-1



Total Volatile Petroleum Hydrocarbons (Gasoline) Case Narrative

COGCC

Water Wells Sec23 3N 66W -- 434043

Work Order Number: 1309081

1. This report consists of 1 water sample. The sample was received intact by ALS on 09/06/2013. The sample was received at 10.0° Celsius.

The water sample was free of head space prior to analysis.

The sample had a pH < 2 at the time of analysis.

2. The sample was prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water sample was prepared by heating and purging 5ml using purge and trap procedures based on Method 5030C. The calibration curve was also prepared using the heated purge.
3. 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.
4. All initial and continuing calibration criteria were met.
5. The method blank associated with this project was below the MDL for gasoline range organics.
6. All laboratory control sample and laboratory control sample duplicate recoveries and RPDs were within the acceptance criteria.
7. Per method requirements, matrix QC was performed for this analysis. Since a sample from this order number was not the selected quality control (QC) sample, matrix specific QC results are not included in this report.



8. The sample was extracted and analyzed within the established holding time.
9. All surrogate recoveries were within acceptance criteria.
10. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in the current revision of SOP 939.

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.

Mindy Norton
Mindy Norton
Organics Primary Data Reviewer

9/12/13
Date

Joel Nicks
Organics Final Data Reviewer

9-16-13
Date



ALS
Data Qualifier Flags
Fuels

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- M:** This flag indicates that a pattern resembling motor oil was detected in this sample.
- H:** This flag indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.
- L:** This flag 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-4
JP-8
diesel
mineral spirits
motor oil
Stoddard solvent
bunker C
- Multiple flags may be used to indicate the presence of more than one product or component.



ALS
Data Qualifier Flags
Chromatography and Mass Spectrometry

- U or ND:** This flag indicates that the compound was analyzed for but not detected.
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- A:** This flag indicates that a tentatively identified compound is a suspected aldol-condensation product.
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ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1309081

Client Name: COGCC

Client Project Name: Water Wells Sec23 3N 66W

Client Project Number: 434043

Client PO Number: PHA 14-22

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Brotemarkle 162136	1309081-1		WATER	06-Sep-13	10:10



Chain-of-Custody

Chain-of-Custody

Form 202r8

1806081

WORKORDER

R ALLISON

[illegible][illegible]

*Time Zone (Circle): EST CST MST PST Matrix: Q = 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 Lab Filter Dissolved Metals COC will email Site ID to lab for EDD generation Email pdf report, EDD, and invoice to rick.allison@state.co.us	<input checked="" type="checkbox"/> LEVEL II (Standard QC) <input type="checkbox"/> LEVEL III (Std QC + forms) <input type="checkbox"/> LEVEL IV (Std QC + forms + raw data)
	<input type="checkbox"/> Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: COGIC

Workorder No: 1309081

Project Manager: ARW

Initials: LAS Date: 9/6/13

1. Does this project require any special handling in addition to standard ALS procedures?		YES	NO
2. Are custody seals on shipping containers intact?	NONE	YES	NO
3. Are Custody seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		YES	NO
5. Are the COC and bottle labels complete and legible?		YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	YES	NO
10. Is there sufficient sample for the requested analyses?		YES	NO
11. Were all samples placed in the proper containers for the requested analyses?		YES	NO
12. Are all samples within holding times for the requested analyses?		YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		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	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	NO
16. Were the samples shipped on ice?		YES	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4 RAD ONLY		YES	NO
Cooler #: 1			
Temperature (°C): 10.0°			
No. of custody seals on cooler: 0			
External µR/hr reading: N/A			
Background µR/hr reading: 11			
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.

*14 1309081-1-3 voa
 ↓ 1-8 RSK
 ↓ 1-9 ↓
 } all arrived with headspace \leq pea-size

(*) 17 samples collected same day as arrival at lab, temp OK

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

Project Manager Signature / Date: [Signature] 9/9/13

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

Form 201r24.xls (06/04/2012)

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Gasoline Range Organics

Method SW8015D

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: HC130909-6MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09-Sep-13

Date Analyzed: 09-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: HC130909-6

QCBatchID: HC130909-6-1

Run ID: HC130909-6A

Cleanup: NONE

Basis: N/A

File Name: 09939.dat

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
8006-61-9	GASOLINE RANGE ORGANICS	1	0.1	0.1	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
193533-92-5	2,3,4-TRIFLUOROTOLUENE	0.0808		0.1	81	74 - 129

Data Package ID: HCG1309081-1

Date Printed: Thursday, September 12, 2013

ALS Environmental -- FC

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LIMS Version: 6.658

Gasoline Range Organics

Method SW8015 Revision D

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136
Lab ID:	1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 09-Sep-13

Date Analyzed: 09-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: HC130909-6

QCBatchID: HC130909-6-1

Run ID: HC130909-6A

Cleanup: NONE

Basis: As Received

File Name: 09965.dat

Analyst: Tyler Knaebel

Sample Aliquot: 5 ML

Final Volume: 5 ML

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
8006-61-9	GASOLINE RANGE ORGANICS	1	0.1	0.1	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
193533-92-5	2,3,4-TRIFLUOROTOLUENE	0.0883		0.1	88	74 - 129

Data Package ID: HCG1309081-1

Gasoline Range Organics

Method SW8015D

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: HC130909-6LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/09/2013

Date Analyzed: 09/09/2013

Prep Method: SW5030C

Prep Batch: HC130909-6

QCBatchID: HC130909-6-1

Run ID: HC130909-6A

Cleanup: NONE

Basis: N/A

File Name: 09949.dat

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
8006-61-9	GASOLINE RANGE ORGANICS	1	1.02	0.1		102	79 - 118%

Lab ID: HC130909-6LCSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/09/2013

Date Analyzed: 09/09/2013

Prep Method: SW5030C

Prep Batch: HC130909-6

QCBatchID: HC130909-6-1

Run ID: HC130909-6A

Cleanup: NONE

Basis: N/A

File Name: 09960.dat

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
8006-61-9	GASOLINE RANGE ORGANICS	1	0.973	0.1		97	20	4

Surrogate Recovery LCS/LCSD

CASNO	Target Analyte	Spike Added	LCS % Rec.	LCS Flag	LCSD % Rec.	LCSD Flag	Control Limits
193533-92-	2,3,4-TRIFLUOROTOLUENE	0.1	92		91		74 - 129

Data Package ID: HCG1309081-1

Date Printed: Thursday, September 12, 2013

ALS Environmental -- FC

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Inorganics

Case Narrative

COGCC

Water Wells Sec23 3N 66W -- 434043

Work Order Number: 1309081

1. This report consists of 1 water sample.
2. The sample was received intact at 10.0° Celsius by ALS on 09/06/13.
3. The sample had been correctly preserved for the requested analyses.
4. The sample was prepared for analysis based on Methods for the Chemical Analysis of Waters and Wastes (MCAWW), May 1994 procedures and Environmental Monitoring Systems Laboratory (EMSL) Rev 2.1 procedures.
5. The sample was analyzed following MCAWW and EMSL procedures for the current revisions of the following SOPs and methods:

<u>Analyte</u>	<u>Method</u>	<u>SOP #</u>
Alkalinity	310.1	1106
Bicarbonate	310.1	1106
Carbonate	310.1	1106
Nitrate/nitrite as N	353.2 Revision 2.0	1127
pH	150.1	1126
Total phosphorus	365.2	1119
Specific conductance	120.1	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
Sulfate	300.0 Revision 2.1	1113

6. All standards and solutions were used within their recommended shelf life.
7. The sample was prepared and analyzed within the established hold time for each analysis.



All in house quality control procedures were followed, as described below.

8. General quality control procedures.

- n A preparation (method) blank and laboratory control sample (LCS) were prepared and analyzed with the samples in each applicable preparation batch.
- n The method blank associated with each applicable batch was below the reporting limit for the requested analytes.
- n All laboratory control sample criteria were met.
- n All initial and continuing calibration blanks were below the reporting limit for the requested analytes.
- n All initial and continuing calibration verifications were within the acceptance criteria for the requested analytes.

9. Matrix specific quality control procedures.

Per method requirements, matrix QC was performed for each analysis. Since a sample from this order number was not the selected quality control (QC) sample, matrix specific QC results are not included in this report.

10. Electrical conductivity screening indicated that the concentration of dissolved salts was high in the sample. Therefore, it was necessary to dilute the sample prior to injection into the ion chromatograph in order to minimize the amount of salts loaded into the analytical column.

It was necessary to further dilute the sample in order to bring the chloride and sulfate concentrations into the analytical range of the ion chromatograph (IC).

Reduced aliquots were taken of the sample for the alkalinity, bicarbonate, and carbonate analysis. Reporting limits were elevated accordingly.

A reduced aliquot was taken of the sample for the TDS analysis. Reporting limits were elevated accordingly.

11. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in the current revision of SOP 939.



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.

Megan Johnstone

Megan Johnstone
Inorganics Primary Data Reviewer

9/16/13

Date

[Signature]

Inorganics Final Data Reviewer

9/16/13

Date



Inorganic Data Reporting Qualifiers

The following qualifiers are used by the laboratory when reporting results of inorganic analyses.

- Concentration qualifier -- If the analyte was analyzed for but not detected a "U" is entered.
- QC qualifier -- Specified entries and their meanings are as follows:
 - N - Spiked sample recovery not within control limits.
 - * - Duplicate analysis (relative percent difference) not within control limits.
 - Z - Calibration spike recovery not within control limits.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1309081

Client Name: COGCC

Client Project Name: Water Wells Sec23 3N 66W

Client Project Number: 434043

Client PO Number: PHA 14-22

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Brotemarkle 162136	1309081-1		WATER	06-Sep-13	10:10



Chain-of-Custody

Chain-of-Custody

Form 202r8

1806081

WORKORDER

[illegible]

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

For metals or anions, please detail analytes below.

Comments: Cations/ Dissolved Metals - Ca, Fe, Mg, Mn, K, Na, Ba, B, Cr, Se, Sr & Lab Filter Dissolved Metals COCACC will email Site ID to lab for EDD generation Email pdf report, EDD, and invoice to rick.allison@state.co.us	QC PACKAGE (check below)	
	x	LEVEL II (Standard QC)
		LEVEL III (Std QC + forms)
		LEVEL IV (Std QC + forms + raw data)
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035		



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: COGCC

Workorder No: 1309081

Project Manager: ARW

Initials: LAS Date: 9/6/13

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	<input checked="" type="radio"/> NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES	<input checked="" type="radio"/> NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
5. Are the COC and bottle labels complete and legible?		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> 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	<input checked="" type="radio"/> NO
7. Were airbills / shipping documents present and/or removable?	<input checked="" type="radio"/> DROP OFF	YES	<input checked="" type="radio"/> NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
10. Is there sufficient sample for the requested analyses?		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
12. Are all samples within holding times for the requested analyses?		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	N/A	YES	<input checked="" type="radio"/> NO *
15. Do any water samples contain sediment? Amount of sediment: <u> </u> dusting <u> </u> moderate <u> </u> heavy	Amount N/A	YES	<input checked="" type="radio"/> NO
16. Were the samples shipped on ice?		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <input checked="" type="radio"/> #2 <input type="radio"/> #4 <input type="radio"/> RAD ONLY		YES	<input checked="" type="radio"/> NO *
Cooler #: <u>1</u>			
Temperature (°C): <u>10.0°</u>			
No. of custody seals on cooler: <u>0</u>			
External µR/hr reading: <u>N/A</u>			
Background µR/hr reading: <u>11</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.

*14 1309081-1-3 VOC }
 1-8 RSK } all arrived with headspace ≤ pea-size
 1-9 ↓

*17 samples collected same day as arrival at lab, temp OK

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

Project Manager Signature / Date: 9/9/13

BICARBONATE AS CaCO₃

Method EPA310.1

Sample Results

Lab Name: ALS Environmental -- FC
Client Name: COGCC
Client Project ID: Water Wells Sec23 3N 66W 434043
Work Order Number: 1309081 **Final Volume:** 100 ml
Reporting Basis: As Received **Matrix:** WATER
Prep Method: METHOD **Result Units:** MG/L
Analyst: Kristen A. Middleton

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit LOD/LOQ	Flag	Sample Aliquot
Brotemarkle 162136	1309081-1	09/06/2013	09/11/2013	09/11/2013	N/A	1	320	20		25 ml

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: ak1309081-1

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

LIMS Version: 6.658

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CARBONATE AS CaCO₃

Method EPA310.1

Sample Results

Lab Name: ALS Environmental -- FC
Client Name: COGCC
Client Project ID: Water Wells Sec23 3N 66W 434043
Work Order Number: 1309081 Final Volume: 100 ml
Reporting Basis: As Received Matrix: WATER
Prep Method: METHOD Result Units: MG/L
Analyst: Kristen A. Middleton

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit LOD/LOQ	Flag	Sample Aliquot
Brotemarkle 162136	1309081-1	09/06/2013	09/11/2013	09/11/2013	N/A	1	20	20	U	25 ml

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *ak1309081-1*

TOTAL ALKALINITY AS CaCO3

Method EPA310.1

Sample Results

Lab Name: ALS Environmental -- FC
Client Name: COGCC
Client Project ID: Water Wells Sec23 3N 66W 434043
Work Order Number: 1309081 Final Volume: 100 ml
Reporting Basis: As Received Matrix: WATER
Prep Method: METHOD Result Units: MG/L
Analyst: Kristen A. Middleton

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit LOD/LOQ	Flag	Sample Aliquot
Brotemarkle 162136	1309081-1	09/06/2013	09/11/2013	09/11/2013	N/A	1	320	20		25 ml

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *ak1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

LIMS Version: 6.658

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Nitrate/Nitrite as N

Method EPA353.2 Revision 2.0

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136	Sample Matrix:	WATER	Prep Batch:	NN130909-2	Analyst:	Peter Workman
Lab ID:	1309081-1	% Moisture:	N/A	QCBatchID:	NN130909-2-1	Sample Aliquot:	5 ML
		Date Collected:	06-Sep-13	Run ID:	NN130909-1A1	Final Volume:	5 ML
		Date Extracted:	09-Sep-13	Cleanup:	NONE	Result Units:	MG/L
		Date Analyzed:	09-Sep-13	Basis:	As Received	Clean DF:	1
		Prep Method:	NONE	File Name:	0909NOX.FDT		

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
1-005	NITRATE/NITRITE AS N	1	0.01	0.01	U	

Data Package ID: *nn1309081-1*

pH

Method EPA150.1

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136
Lab ID:	1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 10-Sep-13

Date Analyzed: 10-Sep-13

Prep Method: NONE

Prep Batch: PH130910-2

QCBatchID: PH130910-2-1

Run ID: PH130910-1A

Cleanup: NONE

Basis: As Received

File Name:

Analyst: Kristin L. Ratajczak

Sample Aliquot: 20 ML

Final Volume: 20 ML

Result Units: pH

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
10-29-7	PH AnalysisTime: 13:10	1	8.36	0.1		

Data Package ID: *ph1309081-1*

Total Phosphorus as P

Method EPA365.2

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136
Lab ID:	1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 12-Sep-13

Date Analyzed: 12-Sep-13

Prep Method: METHOD

Prep Batch: TP130912-1

QCBatchID: TP130912-1-1

Run ID: TP130912-1A

Cleanup: NONE

Basis: As Received

File Name: Manual Entry

Analyst: Tyler Knaebel

Sample Aliquot: 50 ML

Final Volume: 50 ML

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
7723-14-0	TOTAL PHOSPHORUS	1	0.05	0.05	U	

Data Package ID: *tp1309081-1*

Specific Conductance in Water

Method EPA120.1

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136
Lab ID:	1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 10-Sep-13

Date Analyzed: 10-Sep-13

Prep Method: METHOD

Prep Batch: SC130910-1

QCBatchID: SC130910-1-1

Run ID: SC130910-1A

Cleanup: NONE

Basis: As Received

File Name:

Analyst: Kristen A. Middleton

Sample Aliquot: 45 ML

Final Volume: 45 ML

Result Units: umhos/cm

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
10-34-4	SPECIFIC CONDUCTIVITY AnalysisTime: 12:15	1	2570	1		

Data Package ID: sc1309081-1

Total Dissolved Solids

Method EPA160.1

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136	Sample Matrix:	WATER	Prep Batch:	TD130910-1	Analyst:	Kristen A. Middleton
Lab ID:	1309081-1	% Moisture:	N/A	QCBatchID:	TD130910-1-2	Sample Aliquot:	50 ML
		Date Collected:	06-Sep-13	Run ID:	TD130911-1A	Final Volume:	50 ML
		Date Extracted:	10-Sep-13	Cleanup:	NONE	Result Units:	MG/L
		Date Analyzed:	11-Sep-13	Basis:	As Received	Clean DF:	1
		Prep Method:	METHOD	File Name:	Manual Entry		

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
10-33-3	TOTAL DISSOLVED SOLIDS	1	1700	40		

Data Package ID: *td1309081-1*

Ion Chromatography

Method EPA300.0 Revision 2.1

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136
Lab ID:	1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 10-Sep-13

Date Analyzed: 10-Sep-13

Prep Method: NONE

Prep Batch: IC130910-1

QCBatchID: IC130910-1-1

Run ID: IC130910-1A1

Cleanup: NONE

Basis: As Received

File Name: 30910_025.dxd

Analyst: Alex J. Devonald

Sample Aliquot: 5 ML

Final Volume: 5 ML

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
16984-48-8	FLUORIDE AnalysisTime: 20:14	2	0.32	0.2		
16887-00-6	CHLORIDE AnalysisTime: 21:38	25	77	5		
24959-67-9	BROMIDE AnalysisTime: 20:14	2	1.1	0.4		
14808-79-8	SULFATE AnalysisTime: 21:38	25	820	25		

Data Package ID: *ic1309081-1*

BICARBONATE AS CaCO₃

Method EPA310.1

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: AK130911-2MB

Sample Matrix: WATER

% Moisture: N/A

Prep Batch: AK130911-2

QCBatchID: AK130911-2-1

Run ID: AK130911-1A

Cleanup: NONE

Basis: N/A

Sample Aliquot: 100 ml

Final Volume: 100 ml

Result Units: MG/L

Lab ID	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit LOD/LOQ	Flag
AK130911-2MB	9/11/2013	09/11/2013	N/A	1	5	5	U

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *ak1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

LIMS Version: 6.658

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CARBONATE AS CaCO₃

Method EPA310.1

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: AK130911-2MB

Sample Matrix: WATER

% Moisture: N/A

Prep Batch: AK130911-2

QCBatchID: AK130911-2-1

Run ID: AK130911-1A

Cleanup: NONE

Basis: N/A

Sample Aliquot: 100 ml

Final Volume: 100 ml

Result Units: MG/L

Lab ID	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit LOD/LOQ	Flag
AK130911-2MB	9/11/2013	09/11/2013	N/A	1	5	5	U

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *ak1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

LIMS Version: 6.658

Page 2 of 3

TOTAL ALKALINITY AS CaCO3

Method EPA310.1

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: AK130911-2MB

Sample Matrix: WATER

% Moisture: N/A

Prep Batch: AK130911-2

QCBatchID: AK130911-2-1

Run ID: AK130911-1A

Cleanup: NONE

Basis: N/A

Sample Aliquot: 100 ml

Final Volume: 100 ml

Result Units: MG/L

Lab ID	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit LOD/LOQ	Flag
AK130911-2MB	9/11/2013	09/11/2013	N/A	1	5	5	U

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *ak1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

LIMS Version: 6.658

Page 3 of 3

TOTAL ALKALINITY AS CaCO₃

Method EPA310.1

Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: AK130911-2LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/11/2013

Date Analyzed: 09/11/2013

Prep Batch: AK130911-2

QCBatchID: AK130911-2-1

Run ID: AK130911-1A

Cleanup: NONE

Basis: N/A

Sample Aliquot: 100 ml

Final Volume: 100 ml

Result Units: MG/L

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
	TOTAL ALKALINITY AS CaCO ₃	100	97.1	5		97	85 - 115

Data Package ID: *ak1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

LIMS Version: 6.658

Page 1 of 1

Nitrate/Nitrite as N

Method EPA353.2 Revision 2.0

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: NN130909-2MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09-Sep-13

Date Analyzed: 09-Sep-13

Prep Method: NONE

Prep Batch: NN130909-2

QCBatchID: NN130909-2-1

Run ID: NN130909-1A1

Cleanup: NONE

Basis: N/A

File Name: 0909NOX.FDT

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
1-005	NITRATE/NITRITE AS N	1	0.01	0.01	U	

Data Package ID: *nn1309081-1*

Nitrate/Nitrite as N

Method EPA353.2 Revision 2.0

Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: NN130909-2LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/09/2013

Date Analyzed: 09/09/2013

Prep Method: NONE

Prep Batch: NN130909-2

QCBatchID: NN130909-2-1

Run ID: NN130909-1A1

Cleanup: NONE

Basis: N/A

File Name: 0909NOX.FDT

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
1-005	NITRATE/NITRITE AS N	0.5	0.51	0.01		102	90 - 110%

Data Package ID: *nn1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.658

Total Phosphorus as P

Method EPA365.2

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: TP130912-1MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 12-Sep-13

Date Analyzed: 12-Sep-13

Prep Method: METHOD

Prep Batch: TP130912-1

QCBatchID: TP130912-1-1

Run ID: TP130912-1A

Cleanup: NONE

Basis: N/A

File Name: Manual Entry

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
7723-14-0	TOTAL PHOSPHORUS	1	0.05	0.05	U	

Data Package ID: *tp1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.658

Total Phosphorus as P

Method EPA365.2

Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: TP130912-1LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/12/2013

Date Analyzed: 09/12/2013

Prep Method: METHOD

Prep Batch: TP130912-1

QCBatchID: TP130912-1-1

Run ID: TP130912-1A

Cleanup: NONE

Basis: N/A

File Name: Manual Entry

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7723-14-0	TOTAL PHOSPHORUS	0.5	0.521	0.05		104	80 - 120%

Data Package ID: *tp1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.658

Total Dissolved Solids

Method EPA160.1

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: TD130910-1MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 10-Sep-13

Date Analyzed: 11-Sep-13

Prep Method: METHOD

Prep Batch: TD130910-1

QCBatchID: TD130910-1-2

Run ID: TD130911-1A

Cleanup: NONE

Basis: N/A

File Name: Manual Entry

Sample Aliquot: 100 ml

Final Volume: 100 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
10-33-3	TOTAL DISSOLVED SOLIDS	1	20	20	U	

Data Package ID: *td1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.658

Total Dissolved Solids

Method EPA160.1

Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: TD130910-1LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/10/2013

Date Analyzed: 09/11/2013

Prep Method: METHOD

Prep Batch: TD130910-1

QCBatchID: TD130910-1-2

Run ID: TD130911-1A

Cleanup: NONE

Basis: N/A

File Name: Manual Entry

Sample Aliquot: 100 ml

Final Volume: 100 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
10-33-3	TOTAL DISSOLVED SOLIDS	400	400	20		100	85 - 115%

Data Package ID: *td1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.658

Ion Chromatography

Method EPA300.0 Revision 2.1

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: IC130910-1MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 10-Sep-13

Date Analyzed: 10-Sep-13

Prep Method: NONE

Prep Batch: IC130910-1

QCBatchID: IC130910-1-1

Run ID: IC130910-1A1

Cleanup: NONE

Basis: N/A

File Name: 30910_014.dxd

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
16984-48-8	FLUORIDE	1	0.1	0.1	U	
16887-00-6	CHLORIDE	1	0.2	0.2	U	
24959-67-9	BROMIDE	1	0.2	0.2	U	
14808-79-8	SULFATE	1	1	1	U	

Data Package ID: ic1309081-1

Ion Chromatography

Method EPA300.0 Revision 2.1

Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: IC130910-1LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/10/2013

Date Analyzed: 09/10/2013

Prep Method: NONE

Prep Batch: IC130910-1

QCBatchID: IC130910-1-1

Run ID: IC130910-1A1

Cleanup: NONE

Basis: N/A

File Name: 30910_013.dxd

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
16984-48-8	FLUORIDE	2	2.05	0.1		103	90 - 110%
16887-00-6	CHLORIDE	5	5.06	0.2		101	90 - 110%
24959-67-9	BROMIDE	5	5.37	0.2		107	90 - 110%
14808-79-8	SULFATE	20	20	1		100	90 - 110%

Data Package ID: *ic1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.658



Metals

Case Narrative

COGCC

Water Wells Sec23 3N 66W -- 434043

Work Order Number: 1309081

1. This report consists of 1 water sample.
2. The sample was received intact at 10°C by ALS on 09/06/13.
3. 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.
4. The sample was prepared and analyzed based on Methods for the Determination of Metals in Environmental Samples – Supplement 1 procedures.

For analysis by ICP-MS, the sample was digested following method 200.2 and the current revision of SOP 806.

5. Analysis by ICP-MS followed method 200.8 and the current revision of SOP 827.
6. All standards and solutions are NIST traceable and were used within their recommended shelf life.
7. The sample was prepared and analyzed within the established hold time.

All in house quality control procedures were followed, as described below.

8. General quality control procedures.
 - A filter (method) blank and laboratory control sample were filtered, preserved, and digested at the same time as the sample.
 - The preparation (method) blank associated with this digestion batch was below the reporting limit for the requested analytes.
 - All laboratory control sample criteria were met.



- All initial and continuing calibration blanks were below the reporting limit for the requested analytes, with the exceptions of CCB2 and CCB3 for strontium. The samples bracketed by these CCBs contained more than ten times the concentrations of strontium that was detected in the CCBs.
- All initial and continuing calibration verifications were within the acceptance criteria for the requested analytes.
- The interference check samples associated with Method 200.8 were analyzed.

9. Matrix specific quality control procedures.

Per method requirements, matrix QC was performed for this analysis. Since a sample from this order number was not the selected quality control (QC) sample, matrix specific QC results are not included in this report.

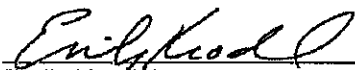
10. It is a standard practice that samples for ICP-MS are analyzed at a dilution.

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

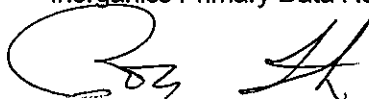
$$SAR = Na / (((Ca + Mg) / 2)^{1/2})$$

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

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.


Emily Knodel
Inorganics Primary Data Reviewer

9/19/13
Date


Inorganics Final Data Reviewer

9/19/13
Date



Inorganic Data Reporting Qualifiers

The following qualifiers are used by the laboratory when reporting results of inorganic analyses.

- Result qualifier -- If the analyte was analyzed for but not detected a "U" is entered.
- QC qualifier -- Specified entries and their meanings are as follows:
 - 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.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1309081

Client Name: COGCC

Client Project Name: Water Wells Sec23 3N 66W

Client Project Number: 434043

Client PO Number: PHA 14-22

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Brotemarkle 162136	1309081-1		WATER	06-Sep-13	10:10



ALS Environmental

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

Chain-of-Custody

Form 20218

WORKORDER # 1309081									
PAGE 1 of 1									
By Lab or Return to Client									
DISPOSAL									
Nitrate-Nitrite as N									
Cations/ Dissolved Metals - see comments									
Anions - Br Cl F SO4 P									
Volatile Organic Compounds									
TEPH - GRO and DRO									
Sodium Adsorption Ratio									
pH									
Conductivity									
Total Dissolved Solids									
Alkaline Group									
Dissolved Gases - Methane, Ethane, Prop									
TURNAROUND									
DATE									
SAMPLER Rick Allison									
SITE ID									
EDD FORMAT COGCC									
PURCHASE ORDER PHA 14-22									
BILL TO COMPANY COGCC									
INVOICE ATTN TO Rick Allison									
ADDRESS 1120 Lincoln St, Ste 801									
CITY / STATE / ZIP Denver, CO 80203									
PHONE 970-461-2970									
FAX 970-461-4781									
E-MAIL rick.allison@state.co.us									
Matrix									
Sample Date 9/6/13									
Sample Time 1010									
# Bottles									
Pres. QC									
Field ID									
Brotemarkle 162136									
Lab ID									
1									

*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,	x LEVEL II (Standard QC)
Sr Lab Filter Dissolved Metals	LEVEL III (Std QC + forms)
COGCC will email Site ID to lab for EDD generation	LEVEL IV (Std QC + forms + raw data)
Email pdf report, EDD, and invoice to rick.allison@state.co.us	
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035	

RELINQUISHED BY	SIGNATURE	PRINTED NAME	DATE	TIME
RECEIVED BY	Rick Allison	Rick Allison	9/6/13	130
RELINQUISHED BY	C. Trumble	C. Trumble	9-6-13	1335
RECEIVED BY				
RELINQUISHED BY				
RECEIVED BY				

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: COGIC

Workorder No: 1309081

Project Manager: ARW

Initials: LAS Date: 9/6/13

1. Does this project require any special handling in addition to standard ALS procedures?		YES	NO
2. Are custody seals on shipping containers intact?	NONE	YES	NO
3. Are Custody seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		YES	NO
5. Are the COC and bottle labels complete and legible?		YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	YES	NO
10. Is there sufficient sample for the requested analyses?		YES	NO
11. Were all samples placed in the proper containers for the requested analyses?		YES	NO
12. Are all samples within holding times for the requested analyses?		YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		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	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	NO
16. Were the samples shipped on ice?		YES	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4 RAD ONLY		YES	NO
Cooler #: 1			
Temperature (°C): 10.0°			
No. of custody seals on cooler: 0			
External µR/hr reading: N/A			
Background µR/hr reading: 11			
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.

#14 1309081-1-3 von } all arrived with headspace \leq pea-size
 ↓ 1-8 RSK
 ↓ 1-9 ↓

*17 samples collected same day as arrival at lab, temp OK

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

Project Manager Signature / Date: [Signature] 9/9/13

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

Form 201r24.xls (06/04/2012)

Page 1 of 1

Dissolved Metals by 200.8

Method EPA200.8 Revision 5.4

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID: Brotemarkle 162136

Lab ID: 1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 17-Sep-13

Date Analyzed: 18-Sep-13

Prep Method: EPA200.2 Rev 2.8

Prep Batch: IP130917-6

QCBatchID: IP130917-6-3

Run ID: IM130918-10A2

Cleanup: NONE

Basis: As Received

File Name: 014SMPL.

Analyst: Ross Miller

Sample Aliquot: 50 G

Final Volume: 50 G

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
7440-38-2	ARSENIC	10	0.002	0.002	U	
7440-39-3	BARIUM	10	0.0095	0.001		
7440-42-8	BORON	10	0.05	0.05	U	
7440-70-2	CALCIUM	10	17	1		
7440-47-3	CHROMIUM	10	0.01	0.01	U	
7439-89-6	IRON	10	0.1	0.1	U	
7439-92-1	LEAD	10	0.0005	0.0005	U	
7439-95-4	MAGNESIUM	10	3.2	0.1		
7439-96-5	MANGANESE	10	0.038	0.002		
7440-09-7	POTASSIUM	10	3	1		
7782-49-2	SELENIUM	10	0.001	0.001	U	
7440-23-5	SODIUM	10	570	1		
	SODIUM ADSORPTION RATIO	10	33	0.26		
7440-24-6	STRONTIUM	10	0.5	0.001		

Data Package ID: im1309081-1

Metals by 200.8

Method EPA200.8 Revision 5.4

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: F130912-1MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 17-Sep-13

Date Analyzed: 18-Sep-13

Prep Method: EPA200.2 Rev 2.8

Prep Batch: IP130917-6

QCBatchID: IP130917-6-3

Run ID: IM130918-10A2

Cleanup: NONE

Basis: N/A

File Name: 002SMPL.

Sample Aliquot: 50 g

Final Volume: 50 g

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
7440-38-2	ARSENIC	10	0.002	0.002	U	
7440-39-3	BARIUM	10	0.001	0.001	U	
7440-42-8	BORON	10	0.05	0.05	U	
7440-70-2	CALCIUM	10	1	1	U	
7440-47-3	CHROMIUM	10	0.01	0.01	U	
7439-89-6	IRON	10	0.1	0.1	U	
7439-92-1	LEAD	10	0.0005	0.0005	U	
7439-95-4	MAGNESIUM	10	0.1	0.1	U	
7439-96-5	MANGANESE	10	0.002	0.002	U	
7440-09-7	POTASSIUM	10	1	1	U	
7782-49-2	SELENIUM	10	0.001	0.001	U	
7440-23-5	SODIUM	10	1	1	U	
7440-24-6	STRONTIUM	10	0.001	0.001	U	

Data Package ID: *im1309081-1*

Date Printed: Thursday, September 26, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.670

Metals by 200.8

Method EPA200.8 Revision 5.4

Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: FM130912-1LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/17/2013

Date Analyzed: 09/18/2013

Prep Method: EPA200.22.8

Prep Batch: IP130917-6

QCBatchID: IP130917-6-3

Run ID: IM130918-10A2

Cleanup: NONE

Basis: N/A

File Name: 003SMPL.

Sample Aliquot: 50 g

Final Volume: 50 g

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7440-38-2	ARSENIC	0.1	0.0924	0.002		92	85 - 115%
7440-39-3	BARIUM	0.1	0.0953	0.001		95	85 - 115%
7440-42-8	BORON	1	0.895	0.05		89	85 - 115%
7440-70-2	CALCIUM	10	9.03	1		90	85 - 115%
7440-47-3	CHROMIUM	0.5	0.459	0.01		92	85 - 115%
7439-89-6	IRON	5	4.87	0.1		97	85 - 115%
7439-92-1	LEAD	0.05	0.0493	0.0005		99	85 - 115%
7439-95-4	MAGNESIUM	10	9.14	0.1		91	85 - 115%
7439-96-5	MANGANESE	0.2	0.185	0.002		92	85 - 115%
7440-09-7	POTASSIUM	5	4.91	1		98	85 - 115%
7782-49-2	SELENIUM	0.1	0.0886	0.001		89	85 - 115%
7440-23-5	SODIUM	10	9.67	1		97	85 - 115%
7440-24-6	STRONTIUM	0.1	0.104	0.001		104	85 - 115%

Data Package ID: *im1309081-1*

Date Printed: Thursday, September 26, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.670



Dissolved Gasses

Case Narrative

COGCC

Water Wells Sec23 3N 66W -- 434043

Work Order Number: 1309081

1. This report consists of 1 water sample. The sample was received intact by ALS on 09/06/2013. The sample was received at 10.0° Celsius.

The sample was free of headspace prior to analysis.

The sample had a pH < 2 at the time of analysis.

2. The sample was prepared and analyzed according to method RSK-175 procedures and the current revision of SOP 449.
3. The preparation batch included a method blank, laboratory control sample, laboratory control sample duplicate, sample duplicate, and matrix spike. Per method requirements, matrix QC was performed for this analysis. Since a sample from this order number was not the selected quality control (QC) sample, matrix specific QC results are not included in this report.

All preparation QC were within the acceptance criteria.

4. The sample was associated with one or more of the following analytical QC: initial calibrations, initial calibration verifications (ICV), and continuing calibration verifications (CCV).
5. All analytical QC were within the acceptance criteria.
6. Sample dilutions were not required for the requested analysis.
7. The sample was prepared and analyzed within the established holding time.
8. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in the current revision of SOP 939.



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.

Mindy Norton

Mindy Norton
Organics Primary Data Reviewer

9/12/13

Date

Joan Norton

Joan Norton
Organics Final Data Reviewer

9.16.13

Date



ALS
Data Qualifier Flags
Chromatography and Mass Spectrometry

- U or ND:** This flag indicates that the compound was analyzed for but not detected.
- J:** This flag indicates an estimated value. This flag is used as follows : (1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the reporting limit (RL) but greater than the method detection limit (MDL); (3) when the data indicate the presence of a compound that meets the identification criteria, and the result is less than the RL but greater than the MDL; and (4) the reported value is estimated.
- B:** This flag is used when the analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user. This flag shall be used for a tentatively identified compound (TIC) as well as for a positively identified target compound.
- E:** This flag identifies compounds whose concentration exceeds the upper level of the calibration range.
- A:** This flag indicates that a tentatively identified compound is a suspected aldol-condensation product.
- X:** This flag indicates that the analyte was diluted below an accurate quantitation level.
- *:** This flag indicates that a spike recovery is outside the control criteria.
- +:** This flag indicates that the relative percent difference (RPD) exceeds the control criteria.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1309081

Client Name: COGCC

Client Project Name: Water Wells Sec23 3N 66W

Client Project Number: 434043

Client PO Number: PHA 14-22

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Brotemarkle 162136	1309081-1		WATER	06-Sep-13	10:10



ALS Environmental

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

Chain-of-Custody

Form 20218

WORKORDER # 1309081									
PAGE 1 of 1									
By Lab or Return to Client									
DISPOSAL									
Nitrate-Nitrite as N									
Cations/ Dissolved Metals - see comments									
Anions - Br Cl F SO4 P									
Volatile Organic Compounds									
TEPH - GRO and DRO									
Sodium Adsorption Ratio									
pH									
Conductivity									
Total Dissolved Solids									
Alkaline Group									
Dissolved Gases - Methane, Ethane, Prop									
TURNAROUND									
DATE									
SAMPLER Rick Allison									
SITE ID									
EDD FORMAT COGCC									
PURCHASE ORDER PHA 14-22									
BILL TO COMPANY COGCC									
INVOICE ATTN TO Rick Allison									
ADDRESS 1120 Lincoln St, Ste 801									
CITY / STATE / ZIP Denver, CO 80203									
PHONE 970-461-2970									
FAX 970-461-4781									
E-MAIL rick.allison@state.co.us									
Matrix									
Sample Date 9/6/13									
Sample Time 1010									
# Bottles									
Pres. QC									
Field ID									
Brotemarkle 162136									
Lab ID									
1									

*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,	x LEVEL II (Standard QC)
Sr Lab Filter Dissolved Metals	LEVEL III (Std QC + forms)
COGCC will email Site ID to lab for EDD generation	LEVEL IV (Std QC + forms + raw data)
Email pdf report, EDD, and invoice to rick.allison@state.co.us	
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035	

RELINQUISHED BY	SIGNATURE	PRINTED NAME	DATE	TIME
RECEIVED BY	Rick Allison	Rick Allison	9/6/13	130
RELINQUISHED BY	C. Trumble	C. Trumble	9-6-13	1335
RECEIVED BY				
RELINQUISHED BY				
RECEIVED BY				



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: COGCC

Workorder No: 1309081

Project Manager: ARW

Initials: LAS

Date: 9/6/13

1. Does this project require any special handling in addition to standard ALS procedures?		YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES	NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible?		<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		<u>YES</u>	NO
7. Were airbills / shipping documents present and/or removable?	<u>DROP OFF</u>	YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	<u>YES</u>	NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	<u>YES</u>	NO
10. Is there sufficient sample for the requested analyses?		<u>YES</u>	NO
11. Were all samples placed in the proper containers for the requested analyses?		<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?		<u>YES</u>	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		<u>YES</u>	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	N/A	YES	<u>NO</u> *
15. Do any water samples contain sediment? Amount of sediment: <u> </u> dusting <u> </u> moderate <u> </u> heavy	Amount N/A	YES	<u>NO</u>
16. Were the samples shipped on ice?		<u>YES</u>	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> #4 RAD ONLY		YES	<u>NO</u> *
Cooler #: <u>1</u>			
Temperature (°C): <u>10.0°</u>			
No. of custody seals on cooler: <u>0</u>			
External µR/hr reading: <u>N/A</u>			
Background µR/hr reading: <u>11</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.

*14 1309081-1-3 VOC }
 1-8 RSK } all arrived with headspace ≤ pea-size
 1-9 }
 ↓
 ↓

*17 samples collected same day as arrival at lab, temp OK

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

Project Manager Signature / Date: Arw 9/9/13

Dissolved Gasses

Method RSK175

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: HC130911-9MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 11-Sep-13

Date Analyzed: 11-Sep-13

Prep Method: METHOD

Prep Batch: HC130911-9

QCBatchID: HC130911-9-1

Run ID: HC130911-9A

Cleanup: NONE

Basis: N/A

File Name: 06096.dat

Sample Aliquot: 38.5 ml

Final Volume: 38.5 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
74-82-8	METHANE	1	1	1	U	
74-84-0	ETHANE	1	2	2	U	
74-98-6	PROPANE	1	1	1	U	

Data Package ID: MEE1309081-1

Date Printed: Thursday, September 12, 2013

ALS Environmental -- FC

LIMS Version: 6.658

Page 1 of 1

Dissolved Gasses

Method RSK175

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID: Brotemarkle 162136

Lab ID: 1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 11-Sep-13

Date Analyzed: 11-Sep-13

Prep Method: METHOD

Prep Batch: HC130911-9

QCBatchID: HC130911-9-1

Run ID: HC130911-9A

Cleanup: NONE

Basis: As Received

File Name: 06113.dat

Analyst: Joel F. Nolte

Sample Aliquot: 38.5 ML

Final Volume: 38.5 ML

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
74-82-8	METHANE	1	190	1		
74-84-0	ETHANE	1	2.7	2		
74-98-6	PROPANE	1	1	1	U	

Data Package ID: MEE1309081-1

Date Printed: Thursday, September 12, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.658

Dissolved Gasses

Method RSK175

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: HC130911-9LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/11/2013

Date Analyzed: 09/11/2013

Prep Method: METHOD

Prep Batch: HC130911-9

QCBatchID: HC130911-9-1

Run ID: HC130911-9A

Cleanup: NONE

Basis: N/A

File Name: 06095.dat

Sample Aliquot: 38.5 ml

Final Volume: 38.5 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
74-82-8	METHANE	142	131	1		92	80 - 120%
74-84-0	ETHANE	267	249	2		93	80 - 120%
74-98-6	PROPANE	391	366	1		94	80 - 120%

Lab ID: HC130911-9LCSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/11/2013

Date Analyzed: 09/11/2013

Prep Method: METHOD

Prep Batch: HC130911-9

QCBatchID: HC130911-9-1

Run ID: HC130911-9A

Cleanup: NONE

Basis: N/A

File Name: 06118.dat

Sample Aliquot: 38.5 ml

Final Volume: 38.5 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
74-82-8	METHANE	142	148	1		104	25	12
74-84-0	ETHANE	267	261	2		98	25	5
74-98-6	PROPANE	391	379	1		97	25	4

Data Package ID: MEE1309081-1

Date Printed: Thursday, September 12, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.658



GC/MS Volatiles

Case Narrative

COGCC

Water Wells Sec23 3N 66W -- 434043

Work Order Number: 1309081

1. This report consists of 1 water sample. The sample was received intact at 10°C by ALS on 09/06/13. The water sample was free of headspace and had a pH < 2 at the time of analysis.
2. The sample was prepared according to SW-846, 3rd Edition procedures. Specifically, the water sample was prepared using purge and trap procedures based on Method 5030C.
3. The sample was analyzed using GC/MS with an RTX-624, RTX-VMS, or equivalent capillary column according to the current revision of SOP 525 based on SW-846 Method 8260. All positive results were quantitated against the initial calibration standards using the internal standard technique. The identification of positive results was achieved by a comparison of the retention time and mass spectrum of the sample versus the daily calibration standard.
4. All initial calibration criteria were met.
5. All initial calibrations are verified by comparing a second source standard calibration verification (ICV) against the calibration curve. All criteria for initial calibration verification were met.
6. All compounds in the continuing calibration verification had a %D of less than 20%.
7. Methylene chloride, acetone and 2-butanone are common laboratory contaminants. In order to minimize the levels of these compounds detected in the gc/ms analysis, ALS has designated its volatile laboratory as a restricted access area. In addition, the laboratory has been equipped with a dedicated, air intake and exhaust system that operates under positive pressure in order to minimize cross contamination of these compounds. Due to fluctuations in ambient laboratory conditions, reported sample values for common laboratory contaminants may be due to lab contamination even if the compound in question is not detected in the associated method blank.

The method blank VL130907-4MB acetone and chloroform detected below the reporting limit. These compounds were not detected in the associated sample.



8. All laboratory control sample and laboratory control sample duplicate recoveries and RPDs were within the acceptance criteria.
9. Since a sample from this order number was not the selected quality control (QC) sample, matrix specific QC results are not included in this report.
10. The sample was analyzed within the established holding time.
11. All surrogate recoveries were within acceptance criteria.
12. All internal standard recoveries were within acceptance criteria.
13. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in the current revision of SOP 939.

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.

Emily Lyons
Emily Lyons
Organics Primary Data Reviewer

9/11/13
Date

Tim Muehl
Organics Final Data Reviewer

9/11/13
Date



ALS
Data Qualifier Flags
Chromatography and Mass Spectrometry

- U or ND:** This flag indicates that the compound was analyzed for but not detected.
- J:** This flag indicates an estimated value. This flag is used as follows : (1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the reporting limit (RL) but greater than the method detection limit (MDL); (3) when the retention time data indicate the presence of a compound that meets the GC identification criteria, and the result is less than the RL but greater than the MDL; and (4) the reported value is estimated.
- B:** This flag is used when the analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user. This flag shall be used for a tentatively identified compound (TIC) as well as for a positively identified target compound.
- E:** This flag identifies compounds whose concentration exceeds the upper level of the calibration range.
- A:** This flag indicates that a tentatively identified compound is a suspected aldol-condensation product.
- X:** This flag indicates that the analyte was diluted below an accurate quantitation level.
- *:** This flag indicates that a spike recovery is equal to or outside the control criteria used.
- +:** This flag indicates that the relative percent difference (RPD) equals or exceeds the control criteria.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1309081

Client Name: COGCC

Client Project Name: Water Wells Sec23 3N 66W

Client Project Number: 434043

Client PO Number: PHA 14-22

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Brotemarkle 162136	1309081-1		WATER	06-Sep-13	10:10



ALS Environmental

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

Chain-of-Custody

Form 20218

WORKORDER # 1309081									
PAGE 1 of 1									
By Lab or Return to Client									
DISPOSAL									
Nitrate-Nitrite as N									
Cations/ Dissolved Metals - see comments									
Anions - Br Cl F SO4 P									
Volatile Organic Compounds									
TEPH - GRO and DRO									
Sodium Adsorption Ratio									
pH									
Conductivity									
Total Dissolved Solids									
Alkaline Group									
Dissolved Gases - Methane, Ethane, Prop									
DATE									
TURNAROUND									
SAMPLER Rick Allison									
SITE ID									
EDD FORMAT COGCC									
PURCHASE ORDER PHA 14-22									
BILL TO COMPANY COGCC									
INVOICE ATTN TO Rick Allison									
ADDRESS 1120 Lincoln St, Ste 801									
CITY / STATE / ZIP Denver, CO 80203									
PHONE 970-461-2970									
FAX 970-461-4781									
E-MAIL rick.allison@state.co.us									
Matrix									
Sample Date 9/6/13									
Sample Time 1010									
# Bottles									
Pres. QC									
Field ID									
Brotemarkle 162136									
Lab ID									
1									
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.									
QC PACKAGE (check below)									
LEVEL II (Standard QC)									
LEVEL III (Std QC + forms)									
LEVEL IV (Std QC + forms + raw data)									
Comments: Cations/ Dissolved Metals - Ca, Fe, Mg, Mn, K, Na, Ba, B, Cr, Se, Sr 20 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									
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035									
RELINQUISHED BY Rick Allison									
RECEIVED BY C Trumble									
RELINQUISHED BY									
RECEIVED BY									
RELINQUISHED BY									
RECEIVED BY									
DATE 9/6/13									
TIME 130									
DATE 9-6-13									
TIME 1335									



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: COGCC

Workorder No: 1309081

Project Manager: ARW

Initials: LAS Date: 9/6/13

1. Does this project require any special handling in addition to standard ALS procedures?		YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES	NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible?		<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		<u>YES</u>	NO
7. Were airbills / shipping documents present and/or removable?	<u>DROP OFF</u>	YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	<u>YES</u>	NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	<u>YES</u>	NO
10. Is there sufficient sample for the requested analyses?		<u>YES</u>	NO
11. Were all samples placed in the proper containers for the requested analyses?		<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?		<u>YES</u>	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		<u>YES</u>	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	N/A	YES	<u>NO</u> *
15. Do any water samples contain sediment? Amount of sediment: <u> </u> dusting <u> </u> moderate <u> </u> heavy	Amount N/A	YES	<u>NO</u>
16. Were the samples shipped on ice?		<u>YES</u>	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> #4	RAD ONLY	YES	<u>NO</u> *
Cooler #: <u>1</u>			
Temperature (°C): <u>10.0°</u>			
No. of custody seals on cooler: <u>0</u>			
External µR/hr reading: <u>N/A</u>			
Background µR/hr reading: <u>11</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.

*14 1309081-1-3 VOC }
 1-8 RSK } all arrived with headspace ≤ pea-size
 1-9 ↓

*17 samples collected same day as arrival at lab, temp OK

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

Project Manager Signature / Date: Arw 9/9/13

GC/MS Volatiles

Method SW8260_25C

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 07-Sep-13

Date Analyzed: 07-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44054

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	1	1	1	U	
74-87-3	CHLOROMETHANE	1	1	1	U	
75-01-4	VINYL CHLORIDE	1	1	1	U	
74-83-9	BROMOMETHANE	1	1	1	U	
75-00-3	CHLOROETHANE	1	1	1	U	
75-69-4	TRICHLOROFLUOROMETHANE	1	1	1	U	
75-35-4	1,1-DICHLOROETHENE	1	1	1	U	
76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROET	1	1	1	U	
67-64-1	ACETONE	1	4.6	10	J	
74-88-4	IODOMETHANE	1	1	1	U	
75-15-0	CARBON DISULFIDE	1	1	1	U	
75-09-2	METHYLENE CHLORIDE	1	1	1	U	
156-60-5	TRANS-1,2-DICHLOROETHENE	1	1	1	U	
1634-04-4	METHYL TERTIARY BUTYL ETHER	1	1	1	U	
75-34-3	1,1-DICHLOROETHANE	1	1	1	U	
108-05-4	VINYL ACETATE	1	2	2	U	
156-59-2	CIS-1,2-DICHLOROETHENE	1	1	1	U	
78-93-3	2-BUTANONE	1	10	10	U	
74-97-5	BROMOCHLOROMETHANE	1	1	1	U	
67-66-3	CHLOROFORM	1	0.51	1	J	
71-55-6	1,1,1-TRICHLOROETHANE	1	1	1	U	
594-20-7	2,2-DICHLOROPROPANE	1	1	1	U	
56-23-5	CARBON TETRACHLORIDE	1	1	1	U	
563-58-6	1,1-DICHLOROPROPENE	1	1	1	U	
107-06-2	1,2-DICHLOROETHANE	1	1	1	U	
71-43-2	BENZENE	1	1	1	U	
79-01-6	TRICHLOROETHENE	1	1	1	U	

Data Package ID: VL1309081-1

Date Printed: Wednesday, September 11, 2013

ALS Environmental -- FC

Page 1 of 3

LIMS Version: 6.658

GC/MS Volatiles

Method SW8260_25C

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 07-Sep-13

Date Analyzed: 07-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44054

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

78-87-5	1,2-DICHLOROPROPANE	1	1	1	U	
74-95-3	DIBROMOMETHANE	1	1	1	U	
75-27-4	BROMODICHLOROMETHANE	1	1	1	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	1	1	1	U	
108-10-1	4-METHYL-2-PENTANONE	1	10	10	U	
108-88-3	TOLUENE	1	1	1	U	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	1	1	1	U	
79-00-5	1,1,2-TRICHLOROETHANE	1	1	1	U	
591-78-6	2-HEXANONE	1	10	10	U	
127-18-4	TETRACHLOROETHENE	1	1	1	U	
142-28-9	1,3-DICHLOROPROPANE	1	1	1	U	
124-48-1	DIBROMOCHLOROMETHANE	1	1	1	U	
106-93-4	1,2-DIBROMOETHANE	1	1	1	U	
544-10-5	1-CHLOROHEXANE	1	1	1	U	
108-90-7	CHLOROBENZENE	1	1	1	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	1	1	1	U	
100-41-4	ETHYLBENZENE	1	1	1	U	
136777-61-2	M+P-XYLENE	1	1	1	U	
95-47-6	O-XYLENE	1	1	1	U	
100-42-5	STYRENE	1	1	1	U	
75-25-2	BROMOFORM	1	1	1	U	
98-82-8	ISOPROPYLBENZENE	1	1	1	U	
96-18-4	1,2,3-TRICHLOROPROPANE	1	1	1	U	
79-34-5	1,1,2,2-TETRACHLOROETHANE	1	1	1	U	
108-86-1	BROMOBENZENE	1	1	1	U	
103-65-1	N-PROPYLBENZENE	1	1	1	U	
95-49-8	2-CHLOROTOLUENE	1	1	1	U	
108-67-8	1,3,5-TRIMETHYLBENZENE	1	1	1	U	
106-43-4	4-CHLOROTOLUENE	1	1	1	U	

Data Package ID: VL1309081-1

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ALS Environmental -- FC

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GC/MS Volatiles

Method SW8260_25C

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 07-Sep-13

Date Analyzed: 07-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44054

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

98-06-6	TERT-BUTYLBENZENE	1	1	1	U	
95-63-6	1,2,4-TRIMETHYLBENZENE	1	1	1	U	
135-98-8	SEC-BUTYLBENZENE	1	1	1	U	
541-73-1	1,3-DICHLOROBENZENE	1	1	1	U	
99-87-6	P-ISOPROPYLTOLUENE	1	1	1	U	
106-46-7	1,4-DICHLOROBENZENE	1	1	1	U	
104-51-8	N-BUTYLBENZENE	1	1	1	U	
95-50-1	1,2-DICHLOROBENZENE	1	1	1	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	1	2	2	U	
120-82-1	1,2,4-TRICHLOROBENZENE	1	1	1	U	
87-68-3	HEXACHLOROBUTADIENE	1	1	1	U	
91-20-3	NAPHTHALENE	1	1	1	U	
87-61-6	1,2,3-TRICHLOROBENZENE	1	1	1	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	26.3		25	105	85 - 115
1868-53-7	DIBROMOFLUOROMETHANE	24.3		25	97	84 - 118
2037-26-5	TOLUENE-D8	24.6		25	98	85 - 115

Data Package ID: VL1309081-1

Date Printed: Wednesday, September 11, 2013

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GC/MS Volatiles

Method SW8260_25

Tentatively Identified Compounds

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	
Lab ID:	VL130907-4MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 07-Sep-13

Date Analyzed: 07-Sep-13

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: As Received

Sample Aliquot: 10 ml

Final Volume: 10 ml

Clean DF: 1

File Name: D44054

CASNO	Retention Time	Target Analyte	Dilution Factor	Result	Units	Qualifier
		NONE DETECTED	1			U

Data Package ID: VL1309081-1

GC/MS Volatiles

Method SW8260_25 Revision C

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID: Brotemarkle 162136

Lab ID: 1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 07-Sep-13

Date Analyzed: 08-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: As Received

File Name: D44070

Analyst: Steven D. White

Sample Aliquot: 10 ML

Final Volume: 10 ML

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	1	1	1	U	
74-87-3	CHLOROMETHANE	1	1	1	U	
75-01-4	VINYL CHLORIDE	1	1	1	U	
74-83-9	BROMOMETHANE	1	1	1	U	
75-00-3	CHLOROETHANE	1	1	1	U	
75-69-4	TRICHLOROFLUOROMETHANE	1	1	1	U	
75-35-4	1,1-DICHLOROETHENE	1	1	1	U	
76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1	1	1	U	
67-64-1	ACETONE	1	10	10	U	
74-88-4	IODOMETHANE	1	1	1	U	
75-15-0	CARBON DISULFIDE	1	1	1	U	
75-09-2	METHYLENE CHLORIDE	1	1	1	U	
156-60-5	TRANS-1,2-DICHLOROETHENE	1	1	1	U	
1634-04-4	METHYL TERTIARY BUTYL ETHER	1	1	1	U	
75-34-3	1,1-DICHLOROETHANE	1	1	1	U	
108-05-4	VINYL ACETATE	1	2	2	U	
156-59-2	CIS-1,2-DICHLOROETHENE	1	1	1	U	
78-93-3	2-BUTANONE	1	10	10	U	
74-97-5	BROMOCHLOROMETHANE	1	1	1	U	
67-66-3	CHLOROFORM	1	1	1	U	
71-55-6	1,1,1-TRICHLOROETHANE	1	1	1	U	
594-20-7	2,2-DICHLOROPROPANE	1	1	1	U	
56-23-5	CARBON TETRACHLORIDE	1	1	1	U	
563-58-6	1,1-DICHLOROPROPENE	1	1	1	U	
107-06-2	1,2-DICHLOROETHANE	1	1	1	U	
71-43-2	BENZENE	1	1	1	U	
79-01-6	TRICHLOROETHENE	1	1	1	U	

Data Package ID: VL1309081-1

GC/MS Volatiles

Method SW8260_25 Revision C

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136
Lab ID:	1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 07-Sep-13

Date Analyzed: 08-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: As Received

File Name: D44070

Analyst: Steven D. White

Sample Aliquot: 10 ML

Final Volume: 10 ML

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
78-87-5	1,2-DICHLOROPROPANE	1	1	1	U	
74-95-3	DIBROMOMETHANE	1	1	1	U	
75-27-4	BROMODICHLOROMETHANE	1	1	1	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	1	1	1	U	
108-10-1	4-METHYL-2-PENTANONE	1	10	10	U	
108-88-3	TOLUENE	1	1	1	U	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	1	1	1	U	
79-00-5	1,1,2-TRICHLOROETHANE	1	1	1	U	
591-78-6	2-HEXANONE	1	10	10	U	
127-18-4	TETRACHLOROETHENE	1	1	1	U	
142-28-9	1,3-DICHLOROPROPANE	1	1	1	U	
124-48-1	DIBROMOCHLOROMETHANE	1	1	1	U	
106-93-4	1,2-DIBROMOETHANE	1	1	1	U	
544-10-5	1-CHLOROHEXANE	1	1	1	U	
108-90-7	CHLOROBENZENE	1	1	1	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	1	1	1	U	
100-41-4	ETHYLBENZENE	1	1	1	U	
136777-61-2	M+P-XYLENE	1	1	1	U	
95-47-6	O-XYLENE	1	1	1	U	
100-42-5	STYRENE	1	1	1	U	
75-25-2	BROMOFORM	1	1	1	U	
98-82-8	ISOPROPYLBENZENE	1	1	1	U	
96-18-4	1,2,3-TRICHLOROPROPANE	1	1	1	U	
79-34-5	1,1,1,2,2-TETRACHLOROETHANE	1	1	1	U	
108-86-1	BROMOBENZENE	1	1	1	U	
103-65-1	N-PROPYLBENZENE	1	1	1	U	
95-49-8	2-CHLOROTOLUENE	1	1	1	U	

Data Package ID: VL1309081-1

GC/MS Volatiles

Method SW8260_25 Revision C

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID: Brotemarkle 162136

Lab ID: 1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 07-Sep-13

Date Analyzed: 08-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: As Received

File Name: D44070

Analyst: Steven D. White

Sample Aliquot: 10 ML

Final Volume: 10 ML

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
108-67-8	1,3,5-TRIMETHYLBENZENE	1	1	1	U	
106-43-4	4-CHLOROTOLUENE	1	1	1	U	
98-06-6	TERT-BUTYLBENZENE	1	1	1	U	
95-63-6	1,2,4-TRIMETHYLBENZENE	1	1	1	U	
135-98-8	SEC-BUTYLBENZENE	1	1	1	U	
541-73-1	1,3-DICHLOROBENZENE	1	1	1	U	
99-87-6	P-ISOPROPYLTOLUENE	1	1	1	U	
106-46-7	1,4-DICHLOROBENZENE	1	1	1	U	
104-51-8	N-BUTYLBENZENE	1	1	1	U	
95-50-1	1,2-DICHLOROBENZENE	1	1	1	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	1	2	2	U	
120-82-1	1,2,4-TRICHLOROBENZENE	1	1	1	U	
87-68-3	HEXACHLOROBUTADIENE	1	1	1	U	
91-20-3	NAPHTHALENE	1	1	1	U	
87-61-6	1,2,3-TRICHLOROBENZENE	1	1	1	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	25.7		25	103	85 - 115
1868-53-7	DIBROMOFLUOROMETHANE	24.4		25	97	84 - 118
2037-26-5	TOLUENE-D8	24.4		25	98	85 - 115

Data Package ID: VL1309081-1

GC/MS Volatiles

Method SW8260_25

Tentatively Identified Compounds

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136
Lab ID:	1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 07-Sep-13

Date Analyzed: 08-Sep-13

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: As Received

Sample Aliquot: 10 ml

Final Volume: 10 ml

Clean DF: 1

File Name: D44070

CASNO	Retention Time	Target Analyte	Dilution Factor	Result	Units	Qualifier
	2.34	Unknown	1	3.6	UG/L	J

Data Package ID: VL1309081-1

GC/MS Volatiles

Method SW8260_25C

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/07/2013

Date Analyzed: 09/07/2013

Prep Method: SW5030C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44052

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
75-71-8	DICHLORODIFLUOROMETHANE	10	8.17	1		82	63 - 125%
74-87-3	CHLOROMETHANE	10	8.78	1		88	73 - 122%
75-01-4	VINYL CHLORIDE	10	8.72	1		87	72 - 123%
74-83-9	BROMOMETHANE	10	8.97	1		90	68 - 123%
75-00-3	CHLOROETHANE	10	10	1		100	74 - 124%
75-69-4	TRICHLOROFLUOROMETHANE	10	9.85	1		99	74 - 124%
75-35-4	1,1-DICHLOROETHENE	10	10.8	1		108	77 - 119%
76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETH	10	10.3	1		103	79 - 122%
67-64-1	ACETONE	40	41.8	10		104	62 - 142%
74-88-4	IODOMETHANE	10	8.98	1		90	72 - 126%
75-15-0	CARBON DISULFIDE	10	10.5	1		105	76 - 121%
75-09-2	METHYLENE CHLORIDE	10	10.6	1		106	71 - 130%
156-60-5	TRANS-1,2-DICHLOROETHENE	10	10.6	1		106	82 - 117%
1634-04-4	METHYL TERTIARY BUTYL ETHER	20	21.2	1		106	77 - 119%
75-34-3	1,1-DICHLOROETHANE	10	10.8	1		108	83 - 119%
108-05-4	VINYL ACETATE	10	10.4	2		104	76 - 121%
156-59-2	CIS-1,2-DICHLOROETHENE	10	10.9	1		109	83 - 117%
78-93-3	2-BUTANONE	40	42.6	10		106	70 - 135%
74-97-5	BROMOCHLOROMETHANE	10	10.8	1		108	83 - 121%
67-66-3	CHLOROFORM	10	11	1		110	82 - 119%
71-55-6	1,1,1-TRICHLOROETHANE	10	10.5	1		105	80 - 120%
594-20-7	2,2-DICHLOROPROPANE	10	11.2	1		112	83 - 125%
56-23-5	CARBON TETRACHLORIDE	10	11	1		110	77 - 122%
563-58-6	1,1-DICHLOROPROPENE	10	11	1		110	84 - 118%
107-06-2	1,2-DICHLOROETHANE	10	10.5	1		105	74 - 128%
71-43-2	BENZENE	10	10.7	1		107	83 - 117%

Data Package ID: VL1309081-1

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GC/MS Volatiles

Method SW8260_25C

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/07/2013

Date Analyzed: 09/07/2013

Prep Method: SW5030C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44052

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
79-01-6	TRICHLOROETHENE	10	10.8	1		108	83 - 117%
78-87-5	1,2-DICHLOROPROPANE	10	11	1		110	84 - 120%
74-95-3	DIBROMOMETHANE	10	10.7	1		107	79 - 122%
75-27-4	BROMODICHLOROMETHANE	10	10.9	1		109	76 - 122%
10061-01-5	CIS-1,3-DICHLOROPROPENE	10	11	1		110	81 - 120%
108-10-1	4-METHYL-2-PENTANONE	40	46.8	10		117	73 - 125%
108-88-3	TOLUENE	10	10.9	1		109	82 - 113%
10061-02-6	TRANS-1,3-DICHLOROPROPENE	10	10.7	1		107	81 - 114%
79-00-5	1,1,2-TRICHLOROETHANE	10	10.9	1		109	78 - 116%
591-78-6	2-HEXANONE	40	43.3	10		108	71 - 124%
127-18-4	TETRACHLOROETHENE	10	10.5	1		105	84 - 117%
142-28-9	1,3-DICHLOROPROPANE	10	10.8	1		108	80 - 115%
124-48-1	DIBROMOCHLOROMETHANE	10	11.3	1		113	82 - 118%
106-93-4	1,2-DIBROMOETHANE	10	10.7	1		107	79 - 114%
544-10-5	1-CHLOROHEXANE	10	9.52	1		95	80 - 117%
108-90-7	CHLOROBENZENE	10	10.9	1		109	81 - 113%
630-20-6	1,1,1,2-TETRACHLOROETHANE	10	11.2	1		112	78 - 113%
100-41-4	ETHYLBENZENE	10	10.6	1		106	81 - 113%
136777-61-	M+P-XYLENE	20	21.7	1		109	82 - 115%
95-47-6	O-XYLENE	10	11.2	1		112	81 - 115%
100-42-5	STYRENE	10	11.1	1		111	78 - 118%
75-25-2	BROMOFORM	10	11.2	1		112	70 - 120%
98-82-8	ISOPROPYLBENZENE	10	10.4	1		104	80 - 113%
96-18-4	1,2,3-TRICHLOROPROPANE	10	11.1	1		111	78 - 117%
79-34-5	1,1,2,2-TETRACHLOROETHANE	10	10.6	1		106	75 - 121%
108-86-1	BROMOBENZENE	10	10.9	1		109	81 - 114%
103-65-1	N-PROPYLBENZENE	10	9.95	1		100	79 - 116%

Data Package ID: VL1309081-1

GC/MS Volatiles

Method SW8260_25C

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/07/2013

Date Analyzed: 09/07/2013

Prep Method: SW5030C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44052

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
95-49-8	2-CHLOROTOLUENE	10	10.5	1		105	79 - 116%
108-67-8	1,3,5-TRIMETHYLBENZENE	10	10.2	1		102	78 - 116%
106-43-4	4-CHLOROTOLUENE	10	10.9	1		109	78 - 115%
98-06-6	TERT-BUTYLBENZENE	10	10.2	1		102	76 - 120%
95-63-6	1,2,4-TRIMETHYLBENZENE	10	10.3	1		103	80 - 117%
135-98-8	SEC-BUTYLBENZENE	10	9.59	1		96	78 - 115%
541-73-1	1,3-DICHLOROBENZENE	10	10.7	1		107	79 - 115%
99-87-6	P-ISOPROPYLTOLUENE	10	9.68	1		97	77 - 116%
106-46-7	1,4-DICHLOROBENZENE	10	10.8	1		108	82 - 114%
104-51-8	N-BUTYLBENZENE	10	9.62	1		96	79 - 117%
95-50-1	1,2-DICHLOROBENZENE	10	10.8	1		108	82 - 114%
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	10	10.3	2		103	73 - 125%
120-82-1	1,2,4-TRICHLOROBENZENE	10	10.3	1		103	75 - 120%
87-68-3	HEXACHLOROBUTADIENE	10	11.1	1		111	71 - 124%
91-20-3	NAPHTHALENE	10	10.5	1		105	71 - 131%
87-61-6	1,2,3-TRICHLOROBENZENE	10	10.4	1		104	70 - 131%

Data Package ID: VL1309081-1

Date Printed: Wednesday, September 11, 2013

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LIMS Version: 6.658

GC/MS Volatiles

Method SW8260_25C

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4LCSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/07/2013

Date Analyzed: 09/07/2013

Prep Method: SW5030C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44053

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
75-71-8	DICHLORODIFLUOROMETHANE	10	7.75	1		78	20	5
74-87-3	CHLOROMETHANE	10	8.22	1		82	20	7
75-01-4	VINYL CHLORIDE	10	8.36	1		84	20	4
74-83-9	BROMOMETHANE	10	8.64	1		86	20	4
75-00-3	CHLOROETHANE	10	9.18	1		92	20	9
75-69-4	TRICHLOROFLUOROMETHANE	10	9.38	1		94	20	5
75-35-4	1,1-DICHLOROETHENE	10	9.63	1		96	20	11
76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETH	10	9.47	1		95	20	8
67-64-1	ACETONE	40	43.5	10		109	30	4
74-88-4	IODOMETHANE	10	8.19	1		82	20	9
75-15-0	CARBON DISULFIDE	10	9.68	1		97	20	8
75-09-2	METHYLENE CHLORIDE	10	10.3	1		103	20	3
156-60-5	TRANS-1,2-DICHLOROETHENE	10	10	1		100	20	6
1634-04-4	METHYL TERTIARY BUTYL ETHER	20	20.2	1		101	20	5
75-34-3	1,1-DICHLOROETHANE	10	10.1	1		101	20	6
108-05-4	VINYL ACETATE	10	10.4	2		104	20	0
156-59-2	CIS-1,2-DICHLOROETHENE	10	10	1		100	20	8
78-93-3	2-BUTANONE	40	42.2	10		106	30	1
74-97-5	BROMOCHLOROMETHANE	10	9.84	1		98	20	10
67-66-3	CHLOROFORM	10	10.6	1		106	20	4
71-55-6	1,1,1-TRICHLOROETHANE	10	10	1		100	20	5
594-20-7	2,2-DICHLOROPROPANE	10	10.6	1		106	20	6
56-23-5	CARBON TETRACHLORIDE	10	10.4	1		104	20	6
563-58-6	1,1-DICHLOROPROPENE	10	10.3	1		103	20	7
107-06-2	1,2-DICHLOROETHANE	10	10.1	1		101	20	4
71-43-2	BENZENE	10	10.1	1		101	20	6
79-01-6	TRICHLOROETHENE	10	10.1	1		101	20	6

Data Package ID: VL1309081-1

GC/MS Volatiles

Method SW8260_25C

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4LCSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/07/2013

Date Analyzed: 09/07/2013

Prep Method: SW5030C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44053

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
78-87-5	1,2-DICHLOROPROPANE	10	10.4	1		104	20	6
74-95-3	DIBROMOMETHANE	10	10.2	1		102	20	5
75-27-4	BROMODICHLOROMETHANE	10	10.4	1		104	20	4
10061-01-5	CIS-1,3-DICHLOROPROPENE	10	10.2	1		102	20	7
108-10-1	4-METHYL-2-PENTANONE	40	45.6	10		114	30	2
108-88-3	TOLUENE	10	10	1		100	20	9
10061-02-6	TRANS-1,3-DICHLOROPROPENE	10	10.3	1		103	20	4
79-00-5	1,1,2-TRICHLOROETHANE	10	9.95	1		100	20	10
591-78-6	2-HEXANONE	40	41.1	10		103	30	5
127-18-4	TETRACHLOROETHENE	10	10.1	1		101	20	4
142-28-9	1,3-DICHLOROPROPANE	10	10.1	1		101	20	7
124-48-1	DIBROMOCHLOROMETHANE	10	10.7	1		107	20	6
106-93-4	1,2-DIBROMOETHANE	10	10.5	1		105	20	2
544-10-5	1-CHLOROHEXANE	10	8.63	1		86	20	10
108-90-7	CHLOROBENZENE	10	10.1	1		101	20	7
630-20-6	1,1,1,2-TETRACHLOROETHANE	10	10.3	1		103	20	8
100-41-4	ETHYLBENZENE	10	9.87	1		99	20	7
136777-61-	M+P-XYLENE	20	20.1	1		101	20	8
95-47-6	O-XYLENE	10	10.1	1		101	20	11
100-42-5	STYRENE	10	10.2	1		102	20	9
75-25-2	BROMOFORM	10	11.1	1		111	20	1
98-82-8	ISOPROPYLBENZENE	10	9.56	1		96	20	8
96-18-4	1,2,3-TRICHLOROPROPANE	10	10.6	1		106	20	5
79-34-5	1,1,2,2-TETRACHLOROETHANE	10	10	1		100	20	5
108-86-1	BROMOBENZENE	10	10.1	1		101	20	8
103-65-1	N-PROPYLBENZENE	10	9.26	1		93	20	7
95-49-8	2-CHLOROTOLUENE	10	9.54	1		95	20	10

Data Package ID: VL1309081-1

GC/MS Volatiles

Method SW8260_25C

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4LCSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/07/2013

Date Analyzed: 09/07/2013

Prep Method: SW5030C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44053

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
108-67-8	1,3,5-TRIMETHYLBENZENE	10	9.43	1		94	20	8
106-43-4	4-CHLOROTOLUENE	10	9.91	1		99	20	10
98-06-6	TERT-BUTYLBENZENE	10	9.16	1		92	20	11
95-63-6	1,2,4-TRIMETHYLBENZENE	10	9.36	1		94	20	10
135-98-8	SEC-BUTYLBENZENE	10	8.71	1		87	20	10
541-73-1	1,3-DICHLOROBENZENE	10	9.8	1		98	20	9
99-87-6	P-ISOPROPYLTOLUENE	10	9.02	1		90	20	7
106-46-7	1,4-DICHLOROBENZENE	10	9.87	1		99	20	9
104-51-8	N-BUTYLBENZENE	10	8.67	1		87	20	10
95-50-1	1,2-DICHLOROBENZENE	10	10.1	1		101	20	6
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	10	9.21	2		92	20	11
120-82-1	1,2,4-TRICHLOROBENZENE	10	9.85	1		98	20	5
87-68-3	HEXACHLOROBUTADIENE	10	9.93	1		99	20	12
91-20-3	NAPHTHALENE	10	9.88	1		99	20	6
87-61-6	1,2,3-TRICHLOROBENZENE	10	9.79	1		98	20	6

Surrogate Recovery LCS/LCSD

CASNO	Target Analyte	Spike Added	LCS % Rec.	LCS Flag	LCSD % Rec.	LCSD Flag	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	25	101		100		85 - 115
1868-53-7	DIBROMOFLUOROMETHANE	25	97		100		84 - 118
2037-26-5	TOLUENE-D8	25	98		97		85 - 115

Data Package ID: VL1309081-1

Date Printed: Wednesday, September 11, 2013

ALS Environmental -- FC

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Dissolved Gasses

Case Narrative

COGCC

Water Wells Sec23 3N 66W -- 434043

Work Order Number: 1309081

1. This report consists of 1 water sample. The sample was received intact by ALS on 09/06/2013. The sample was received at 10.0° Celsius.

The sample was free of headspace prior to analysis.

The sample had a pH < 2 at the time of analysis.

2. The sample was prepared and analyzed according to method RSK-175 procedures and the current revision of SOP 449.
3. The preparation batch included a method blank, laboratory control sample, laboratory control sample duplicate, sample duplicate, and matrix spike. Per method requirements, matrix QC was performed for this analysis. Since a sample from this order number was not the selected quality control (QC) sample, matrix specific QC results are not included in this report.

All preparation QC were within the acceptance criteria.

4. The sample was associated with one or more of the following analytical QC: initial calibrations, initial calibration verifications (ICV), and continuing calibration verifications (CCV).
5. All analytical QC were within the acceptance criteria.
6. Sample dilutions were not required for the requested analysis.
7. The sample was prepared and analyzed within the established holding time.
8. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in the current revision of SOP 939.



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.

Mindy Norton

Mindy Norton
Organics Primary Data Reviewer

9/12/13

Date

Joan Norton

Joan Norton
Organics Final Data Reviewer

9.16.13

Date



ALS
Data Qualifier Flags
Chromatography and Mass Spectrometry

- U or ND:** This flag indicates that the compound was analyzed for but not detected.
- J:** This flag indicates an estimated value. This flag is used as follows : (1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the reporting limit (RL) but greater than the method detection limit (MDL); (3) when the data indicate the presence of a compound that meets the identification criteria, and the result is less than the RL but greater than the MDL; and (4) the reported value is estimated.
- B:** This flag is used when the analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user. This flag shall be used for a tentatively identified compound (TIC) as well as for a positively identified target compound.
- E:** This flag identifies compounds whose concentration exceeds the upper level of the calibration range.
- A:** This flag indicates that a tentatively identified compound is a suspected aldol-condensation product.
- X:** This flag indicates that the analyte was diluted below an accurate quantitation level.
- *:** This flag indicates that a spike recovery is outside the control criteria.
- +:** This flag indicates that the relative percent difference (RPD) exceeds the control criteria.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1309081

Client Name: COGCC

Client Project Name: Water Wells Sec23 3N 66W

Client Project Number: 434043

Client PO Number: PHA 14-22

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Brotemarkle 162136	1309081-1		WATER	06-Sep-13	10:10



Chain-of-Custody

Chain-of-Custody

Form 202r8

1806081

WORKORDER

R ALLISON

[illegible][illegible]

*Time Zone (Circle): EST CST MST PST Matrix: Q = 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 Lab Filter Dissolved Metals COCOC will email Site ID to lab for EDD generation Email pdf report, EDD, and invoice to rick.allison@state.co.us	<input checked="" type="checkbox"/> LEVEL II (Standard QC) <input type="checkbox"/> LEVEL III (Std QC + forms) <input type="checkbox"/> LEVEL IV (Std QC + forms + raw data)
	Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: COGCC

Workorder No: 1309081

Project Manager: ARW

Initials: LAS

Date: 9/6/13

1. Does this project require any special handling in addition to standard ALS procedures?		YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES	NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible?		<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		<u>YES</u>	NO
7. Were airbills / shipping documents present and/or removable?	<u>DROP OFF</u>	YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	<u>YES</u>	NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	<u>YES</u>	NO
10. Is there sufficient sample for the requested analyses?		<u>YES</u>	NO
11. Were all samples placed in the proper containers for the requested analyses?		<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?		<u>YES</u>	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		<u>YES</u>	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	N/A	YES	<u>NO</u>
15. Do any water samples contain sediment? Amount of sediment: <u> </u> dusting <u> </u> moderate <u> </u> heavy	N/A	YES	<u>NO</u>
16. Were the samples shipped on ice?		<u>YES</u>	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> #4 RAD ONLY		YES	<u>NO</u>
Cooler #: <u>1</u>			
Temperature (°C): <u>10.0°</u>			
No. of custody seals on cooler: <u>0</u>			
External µR/hr reading: <u>N/A</u>			
Background µR/hr reading: <u>11</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.

*14 1309081-1-3 VOA }
 1-8 RSK } all arrived with headspace ≤ pea-size
 1-9 }
 ↓
 ↓

*17 samples collected same day as arrival at lab, temp OK

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

Project Manager Signature / Date: Arw 9/9/13

Dissolved Gasses

Method RSK175

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: HC130911-9MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 11-Sep-13

Date Analyzed: 11-Sep-13

Prep Method: METHOD

Prep Batch: HC130911-9

QCBatchID: HC130911-9-1

Run ID: HC130911-9A

Cleanup: NONE

Basis: N/A

File Name: 06096.dat

Sample Aliquot: 38.5 ml

Final Volume: 38.5 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
74-82-8	METHANE	1	1	1	U	
74-84-0	ETHANE	1	2	2	U	
74-98-6	PROPANE	1	1	1	U	

Data Package ID: MEE1309081-1

Dissolved Gasses

Method RSK175

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID: Brotemarkle 162136

Lab ID: 1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 11-Sep-13

Date Analyzed: 11-Sep-13

Prep Method: METHOD

Prep Batch: HC130911-9

QCBatchID: HC130911-9-1

Run ID: HC130911-9A

Cleanup: NONE

Basis: As Received

File Name: 06113.dat

Analyst: Joel F. Nolte

Sample Aliquot: 38.5 ML

Final Volume: 38.5 ML

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
74-82-8	METHANE	1	190	1		
74-84-0	ETHANE	1	2.7	2		
74-98-6	PROPANE	1	1	1	U	

Data Package ID: MEE1309081-1

Date Printed: Thursday, September 12, 2013

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Dissolved Gasses

Method RSK175

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: HC130911-9LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/11/2013

Date Analyzed: 09/11/2013

Prep Method: METHOD

Prep Batch: HC130911-9

QCBatchID: HC130911-9-1

Run ID: HC130911-9A

Cleanup: NONE

Basis: N/A

File Name: 06095.dat

Sample Aliquot: 38.5 ml

Final Volume: 38.5 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
74-82-8	METHANE	142	131	1		92	80 - 120%
74-84-0	ETHANE	267	249	2		93	80 - 120%
74-98-6	PROPANE	391	366	1		94	80 - 120%

Lab ID: HC130911-9LCSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/11/2013

Date Analyzed: 09/11/2013

Prep Method: METHOD

Prep Batch: HC130911-9

QCBatchID: HC130911-9-1

Run ID: HC130911-9A

Cleanup: NONE

Basis: N/A

File Name: 06118.dat

Sample Aliquot: 38.5 ml

Final Volume: 38.5 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
74-82-8	METHANE	142	148	1		104	25	12
74-84-0	ETHANE	267	261	2		98	25	5
74-98-6	PROPANE	391	379	1		97	25	4

Data Package ID: MEE1309081-1

Date Printed: Thursday, September 12, 2013

ALS Environmental -- FC

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Anion / Cation Summary Report

Lab ID: **1309081-1**

QC Type: SMP

Field ID Brotemarkle 162136

Analyte	Final Result	Report Units	mEq
BICARBONATE AS CaCO3	317.0172	MG/L	6.34
CARBONATE AS CaCO3	20	MG/L	0.00
CHLORIDE	77.37832	MG/L	2.18
FLUORIDE	0.3190552	MG/L	0.02
NITRATE/NITRITE AS N	0.01	MG/L	0.00
SULFATE	821.0269	MG/L	17.09
Anion Result Sum	1235.75		

Analyte	Final Result	Report Units	mEq
CALCIUM	17.08964	MG/L	0.85
IRON	0.1	MG/L	0.00
MAGNESIUM	3.19547	MG/L	0.26
MANGANESE	0.03788	MG/L	0.00
POTASSIUM	2.99571	MG/L	0.08
SODIUM	565.5112	MG/L	24.60
Cation Result Sum	588.93		

Total Result: **1824.68** MG/L
TDS Result: **1730.000** MG/L
RPD: 5.33%

Anion mEq Sum: **25.63**
Cation mEq Sum: **25.79**
RPD: 0.64%

Below is a list of Lab IDs for this Order Number that were logged in for metals analyses. Note: if this area is empty then either no metals analyses were requested or the cations of interest were not requested.

1309081-1



Total Extractable Petroleum Hydrocarbons (Diesel)

Case Narrative

COGCC

Water Wells Sec23 3N 66W -- 434043

Work Order Number: 1309081

1. This report consists of 1 water sample. The sample was received intact by ALS on 09/06/2013. The sample was received at 10.0° Celsius.
2. The water sample was extracted by adding hexane to the water sample and shaking the resulting two phase solution according to the current revision of SOP 603, which was developed at ALS. The hydrocarbons partition into the hexane layer, which is then removed for analysis.
3. 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.
4. All initial and continuing calibration criteria were met.
5. The method blank associated with this project was below the reporting limit, but above the MDL for diesel range organics. No diesel or other fuel pattern was present in the method blank. Typically, small fluctuations in the detector baseline are responsible for this type of low level analytical result with no observable fuel pattern.
6. All laboratory control sample and laboratory control sample duplicate recoveries and RPDs were within the acceptance criteria.
7. Per method requirements, matrix QC was performed for this analysis. Since a sample from this order number was not the selected quality control (QC) sample, matrix specific QC results are not included in this report.
8. The sample was extracted and analyzed within the established holding time.



9. All surrogate recoveries were within acceptable limits with the following exceptions:

Surrogate	Sample	Direction
O-terphenyl	MB and LCSD	High

The sample was non-detect for TEPH/DRO. All spike recoveries in the batch were within limits. No further action was taken.

10. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in the current revision of SOP 939.

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.

Mindy Norton

Mindy Norton
Organics Primary Data Reviewer

9/12/13
Date

Joe Nette

Organics Final Data Reviewer

9-12-13
Date



ALS
Data Qualifier Flags
Fuels

- G:** This flag indicates that a pattern resembling gasoline was detected in this sample.
- D:** This flag indicates that a pattern resembling diesel was detected in this sample.
- M:** This flag indicates that a pattern resembling motor oil was detected in this sample.
- C:** This flag indicates that a pattern resembling crude oil was detected in this sample.
- 4:** This flag indicates that a pattern resembling JP-4 was detected in this sample.
- 5:** This flag indicates that a pattern resembling JP-5 was detected in this sample.
- H:** This flag indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.
- L:** This flag 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
- Multiple flags may be used to indicate the presence of more than one product or component.



ALS
Data Qualifier Flags
Chromatography and Mass Spectrometry

- U or ND:** This flag indicates that the compound was analyzed for but not detected.
- J:** This flag indicates an estimated value. This flag is used as follows : (1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the reporting limit (RL) but greater than the method detection limit (MDL); (3) when the data indicate the presence of a compound that meets the identification criteria, and the result is less than the RL but greater than the MDL; and (4) the reported value is estimated.
- B:** This flag is used when the analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user. This flag shall be used for a tentatively identified compound (TIC) as well as for a positively identified target compound.
- E:** This flag identifies compounds whose concentration exceeds the upper level of the calibration range.
- A:** This flag indicates that a tentatively identified compound is a suspected aldol-condensation product.
- X:** This flag indicates that the analyte was diluted below an accurate quantitation level.
- *:** This flag indicates that a spike recovery is outside the control criteria.
- +:** This flag indicates that the relative percent difference (RPD) exceeds the control criteria.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1309081

Client Name: COGCC

Client Project Name: Water Wells Sec23 3N 66W

Client Project Number: 434043

Client PO Number: PHA 14-22

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Brotemarkle 162136	1309081-1		WATER	06-Sep-13	10:10



Chain-of-Custody

Chain-of-Custody

Form 202r8

1809081

WORKORDER

R ALLISON

[illegible]

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	aa	ab	ac	ad	ae	af	ag	ah	ai	aj	ak	al	am	an	ao	ap	aq	ar	as	at	au	av	aw	ax	ay	az	ba	bb	bc	bd	be	bf	bg	bh	bi	bj	bk	bl	bm	bn	bo	bp	bq	br	bs	bt	bu	bv	bw	bx	by	bz	ca	cb	cc	cd	ce	cf	cg	ch	ci	cj	ck	cl	cm	cn	co	cp	cq	cr	cs	ct	cu	cv	cw	cx	cy	cz	da	db	dc	dd	de	df	dg	dh	di	dj	dk	dl	dm	dn	do	dp	dq	dr	ds	dt	du	dv	dw	dx	dy	dz	ea	eb	ec	ed	ee	ef	eg	eh	ei	ej	ek	el	em	en	eo	ep	eq	er	es	et	eu	ev	ew	ex	ey	ez	fa	fb	fc	fd	fe	ff	fg	fh	fi	fj	fk	fl	fm	fn	fo	fp	fq	fr	fs	ft	fu	fv	fw	fx	fy	fz	ga	gb	gc	gd	ge	gf	gg	gh	gi	gj	gk	gl	gm	gn	go	gp	gq	gr	gs	gt	gu	gv	gw	gx	gy	gz	ha	hb	hc	hd	he	hf	hg	hh	hi	hj	hk	hl	hm	hn	ho	hp	hq	hr	hs	ht	hu	hv	hw	hx	hy	hz	ia	ib	ic	id	ie	if	ig	ih	ii	ij	ik	il	im	in	io	ip	iq	ir	is	it	iu	iv	iw	ix	iy	iz	ja	jb	jc	jd	je	jf	jj	jk	jl	jm	jn	jo	jp	jq	jr	js	jt	ju	jv	jw	jx	ky	kz	la	lb	lc	ld	le	lf	lg	lh	li	lj	lk	ll	lm	ln	lo	lp	lq	lr	ls	lt	lu	lv	lw	lx	ly	lz	ma	mb	mc	md	me	mf	mg	mh	mi	mj	mk	ml	mm	mn	mo	mp	mq	mr	ms	mt	mu	mv	mw	mx	my	mz	na	nb	nc	nd	ne	nf	ng	nh	ni	nj	nk	nl	nm	nn	no	np	nq	nr	ns	nt	nu	nv	nw	nx	ny	nz	oa	ob	oc	od	oe	of	og	oh	oi	oj	ok	ol	om	on	oo	op	oq	or	os	ot	ou	ov	ow	ox	oy	oz	pa	pb	pc	pd	pe	pf	pg	ph	pi	pj	pk	pl	pm	pn	po	pp	pq	pr	ps	pt	pu	pv	pw	px	py	pz	qa	qb	qc	qd	qe	qf	qg	qh	qi	qj	qk	ql	qm	qn	qo	qp	qq	qr	qs	qt	qu	qv	qw	qx	qy	qz	ra	rb	rc	rd	re	rf	rg	rh	ri	rj	rk	rl	rm	rn	ro	rp	rq	rr	rs	rt	ru	rv	rw	rx	ry	rz	sa	sb	sc	sd	se	sf	sg	sh	si	sj	sk	sl	sm	sn	so	sp	sq	sr	ss	st	su	sv	sw	sx	sy	sz	ta	tb	tc	td	te	tf	tg	th	ti	tj	tk	tl	tm	tn	to	tp	tq	tr	ts	tt	tu	tv	tw	tx	ty	tz	ua	ub	uc	ud	ue	uf	ug	uh	ui	uj	uk	ul	um	un	uo	up	uq	ur	us	ut	uu	uv	uw	ux	uy	uz	va	vb	vc	vd	ve	vf	vg	vh	vi	vj	vk	vl	vm	vn	vo	vp	vq	vr	vs	vt	vu	vv	vw	vx	vy	vz	wa	wb	wc	wd	we	wf	wg	wh	wi	wj	wk	wl	wm	wn	wo	wp	wq	wr	ws	wt	wu	wv	ww	wx	wy	wz	xa	xb	xc	xd	xe	xf	xg	xh	xi	xj	xk	xl	xm	xn	xo	xp	xq	xr	xs	xt	xu	xv	xw	xx	xy	xz	ya	yb	yc	yd	ye	yf	yg	yh	yi	yj	yk	yl	ym	yn	yo	yp	yq	yr	ys	yt	yu	yv	yw	yx	yy	yz	za	zb	zc	zd	ze	zf	zg	zh	zi	zj	zk	zl	zm	zn	zo	zp	zq	zr	zs	zt	zu	zv	zw	zx	zy	zz	aa	ab	ac	
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*Time Zone (Circle): EST CST MST PST Matrix: Q = 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 Lab Filter Dissolved Metals COC will email Site ID to lab for EDD generation Email pdf report, EDD, and invoice to rick.allison@state.co.us	<input checked="" type="checkbox"/> LEVEL II (Standard QC) <input type="checkbox"/> LEVEL III (Std QC + forms) <input type="checkbox"/> LEVEL IV (Std QC + forms + raw data)
	Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

RELINQUISHED BY	<i>Rick Allison</i>	7/6/13	130
RECEIVED BY	<i>C Trumble</i>	9-6-13	1335
RELINQUISHED BY			
RECEIVED BY			
RELINQUISHED BY			
RECEIVED BY			



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: COGCC

Workorder No: 1309081

Project Manager: ARW

Initials: LAS Date: 9/6/13

1. Does this project require any special handling in addition to standard ALS procedures?		YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES	NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible?		<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		<u>YES</u>	NO
7. Were airbills / shipping documents present and/or removable?	<u>DROP OFF</u>	YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	<u>YES</u>	NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	<u>YES</u>	NO
10. Is there sufficient sample for the requested analyses?		<u>YES</u>	NO
11. Were all samples placed in the proper containers for the requested analyses?		<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?		<u>YES</u>	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		<u>YES</u>	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	N/A	YES	<u>NO</u>
15. Do any water samples contain sediment? Amount of sediment: <u> </u> dusting <u> </u> moderate <u> </u> heavy	Amount N/A	YES	<u>NO</u>
16. Were the samples shipped on ice?		<u>YES</u>	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> #4 RAD ONLY		YES	<u>NO</u>
Cooler #: <u>1</u>			
Temperature (°C): <u>10.0°</u>			
No. of custody seals on cooler: <u>0</u>			
External µR/hr reading: <u>N/A</u>			
Background µR/hr reading: <u>11</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.

*14 1309081-1-3 VOA }
 1-8 RSK } all arrived with headspace ≤ pea-size
 1-9 }
 ↓
*17 samples collected same day as arrival at lab, temp OK

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

Project Manager Signature / Date: Arw 9/9/13

Diesel Range Organics

Method SW8015MD

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: EX130909-1MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09-Sep-13

Date Analyzed: 10-Sep-13

Prep Method: METHOD

Prep Batch: EX130909-1

QCBatchID: EX130909-1-1

Run ID: HC130910-3A

Cleanup: NONE

Basis: N/A

File Name: F3F47274

Sample Aliquot: 160 ml

Final Volume: 4 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
68334-30-5	Diesel Range Organics	1	0.15	0.5	J	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
84-15-1	O-TERPHENYL	1.25	*	1.25	100	51 - 97

Data Package ID: HCD1309081-1

Date Printed: Thursday, September 12, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.658

Diesel Range Organics

Method SW8015M Revision D

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136
Lab ID:	1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 09-Sep-13

Date Analyzed: 11-Sep-13

Prep Method: METHOD

Prep Batch: EX130909-1

QCBatchID: EX130909-1-1

Run ID: HC130910-3A

Cleanup: NONE

Basis: As Received

File Name: F3F47285

Analyst: Joel F. Nolte

Sample Aliquot: 160 ML

Final Volume: 4 ML

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
68334-30-5	Diesel Range Organics	1	0.5	0.5	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
84-15-1	O-TERPHENYL	1.12		1.25	89	51 - 97

Data Package ID: HCD1309081-1

Diesel Range Organics

Method SW8015MD

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: EX130909-1LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/09/2013

Date Analyzed: 09/10/2013

Prep Method: METHOD

Prep Batch: EX130909-1

QCBatchID: EX130909-1-1

Run ID: HC130910-3A

Cleanup: NONE

Basis: N/A

File Name: F3F47275

Sample Aliquot: 160 ml

Final Volume: 4 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
68334-30-5	Diesel Range Organics	10	10.2	0.5		102	36 - 150%

Lab ID: EX130909-1LCSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/09/2013

Date Analyzed: 09/11/2013

Prep Method: METHOD

Prep Batch: EX130909-1

QCBatchID: EX130909-1-1

Run ID: HC130910-3A

Cleanup: NONE

Basis: N/A

File Name: F3F47276

Sample Aliquot: 160 ml

Final Volume: 4 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
68334-30-5	Diesel Range Organics	10	10.4	0.5		104	20	3

Surrogate Recovery LCS/LCSD

CASNO	Target Analyte	Spike Added	LCS % Rec.	LCS Flag	LCSD % Rec.	LCSD Flag	Control Limits
84-15-1	O-TERPHENYL	1.25	97		100	*	51 - 97

Data Package ID: HCD1309081-1

Date Printed: Thursday, September 12, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.658



Total Volatile Petroleum Hydrocarbons (Gasoline) Case Narrative

COGCC

Water Wells Sec23 3N 66W -- 434043

Work Order Number: 1309081

1. This report consists of 1 water sample. The sample was received intact by ALS on 09/06/2013. The sample was received at 10.0° Celsius.

The water sample was free of head space prior to analysis.

The sample had a pH < 2 at the time of analysis.

2. The sample was prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water sample was prepared by heating and purging 5ml using purge and trap procedures based on Method 5030C. The calibration curve was also prepared using the heated purge.
3. 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.
4. All initial and continuing calibration criteria were met.
5. The method blank associated with this project was below the MDL for gasoline range organics.
6. All laboratory control sample and laboratory control sample duplicate recoveries and RPDs were within the acceptance criteria.
7. Per method requirements, matrix QC was performed for this analysis. Since a sample from this order number was not the selected quality control (QC) sample, matrix specific QC results are not included in this report.



8. The sample was extracted and analyzed within the established holding time.
9. All surrogate recoveries were within acceptance criteria.
10. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in the current revision of SOP 939.

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.

Mindy Norton
Mindy Norton
Organics Primary Data Reviewer

9/12/13
Date

Joel Nicks
Organics Final Data Reviewer

9-16-13
Date



ALS
Data Qualifier Flags
Fuels

- G:** This flag indicates that a pattern resembling gasoline was detected in this sample.
- D:** This flag indicates that a pattern resembling diesel was detected in this sample.
- M:** This flag indicates that a pattern resembling motor oil was detected in this sample.
- H:** This flag indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.
- L:** This flag 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-4
JP-8
diesel
mineral spirits
motor oil
Stoddard solvent
bunker C
- Multiple flags may be used to indicate the presence of more than one product or component.



ALS
Data Qualifier Flags
Chromatography and Mass Spectrometry

- U or ND:** This flag indicates that the compound was analyzed for but not detected.
- J:** This flag indicates an estimated value. This flag is used as follows : (1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the reporting limit (RL) but greater than the method detection limit (MDL); (3) when the data indicate the presence of a compound that meets the identification criteria, and the result is less than the RL but greater than the MDL; and (4) the reported value is estimated.
- B:** This flag is used when the analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user. This flag shall be used for a tentatively identified compound (TIC) as well as for a positively identified target compound.
- E:** This flag identifies compounds whose concentration exceeds the upper level of the calibration range.
- A:** This flag indicates that a tentatively identified compound is a suspected aldol-condensation product.
- X:** This flag indicates that the analyte was diluted below an accurate quantitation level.
- *:** This flag indicates that a spike recovery is outside the control criteria.
- +:** This flag indicates that the relative percent difference (RPD) exceeds the control criteria.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1309081

Client Name: COGCC

Client Project Name: Water Wells Sec23 3N 66W

Client Project Number: 434043

Client PO Number: PHA 14-22

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Brotemarkle 162136	1309081-1		WATER	06-Sep-13	10:10



Chain-of-Custody

Chain-of-Custody

Form 202r8

1806081

WORKORDER

R ALLISON

[illegible][illegible]

*Time Zone (Circle): EST CST MST PST Matrix: Q = 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 Lab Filter Dissolved Metals COC will email Site ID to lab for EDD generation Email pdf report, EDD, and invoice to rick.allison@state.co.us	<input checked="" type="checkbox"/> LEVEL II (Standard QC) <input type="checkbox"/> LEVEL III (Std QC + forms) <input type="checkbox"/> LEVEL IV (Std QC + forms + raw data)
	Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: COGIC

Workorder No: 1309081
Initials: LAS Date: 9/6/13

Project Manager: ARW

Initials: LAS

Date: 9/6/13

1. Does this project require any special handling in addition to standard ALS procedures?		YES	NO
2. Are custody seals on shipping containers intact?	NONE	YES	NO
3. Are Custody seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		YES	NO
5. Are the COC and bottle labels complete and legible?		YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	YES	NO
10. Is there sufficient sample for the requested analyses?		YES	NO
11. Were all samples placed in the proper containers for the requested analyses?		YES	NO
12. Are all samples within holding times for the requested analyses?		YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		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	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	NO
16. Were the samples shipped on ice?		YES	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4 RAD ONLY		YES	NO
Cooler #: 1			
Temperature (°C): 10.0°			
No. of custody seals on cooler: 0			
External µR/hr reading: N/A			
Background µR/hr reading: 11			
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.

#14 1309081-1-3 von } all arrived with headspace \leq pea-size
 ↓ 1-8 RSK
 ↓ 1-9 ↓

(*) samples collected same day as arrival at lab, temp OK

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

Project Manager Signature / Date: [Signature] 9/9/13

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

Form 201r24.xls (06/04/2012)

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Gasoline Range Organics

Method SW8015D

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: HC130909-6MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09-Sep-13

Date Analyzed: 09-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: HC130909-6

QCBatchID: HC130909-6-1

Run ID: HC130909-6A

Cleanup: NONE

Basis: N/A

File Name: 09939.dat

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
8006-61-9	GASOLINE RANGE ORGANICS	1	0.1	0.1	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
193533-92-5	2,3,4-TRIFLUOROTOLUENE	0.0808		0.1	81	74 - 129

Data Package ID: HCG1309081-1

Date Printed: Thursday, September 12, 2013

ALS Environmental -- FC

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LIMS Version: 6.658

Gasoline Range Organics

Method SW8015 Revision D

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136
Lab ID:	1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 09-Sep-13

Date Analyzed: 09-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: HC130909-6

QCBatchID: HC130909-6-1

Run ID: HC130909-6A

Cleanup: NONE

Basis: As Received

File Name: 09965.dat

Analyst: Tyler Knaebel

Sample Aliquot: 5 ML

Final Volume: 5 ML

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
8006-61-9	GASOLINE RANGE ORGANICS	1	0.1	0.1	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
193533-92-5	2,3,4-TRIFLUOROTOLUENE	0.0883		0.1	88	74 - 129

Data Package ID: HCG1309081-1

Gasoline Range Organics

Method SW8015D

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: HC130909-6LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/09/2013

Date Analyzed: 09/09/2013

Prep Method: SW5030C

Prep Batch: HC130909-6

QCBatchID: HC130909-6-1

Run ID: HC130909-6A

Cleanup: NONE

Basis: N/A

File Name: 09949.dat

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
8006-61-9	GASOLINE RANGE ORGANICS	1	1.02	0.1		102	79 - 118%

Lab ID: HC130909-6LCSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/09/2013

Date Analyzed: 09/09/2013

Prep Method: SW5030C

Prep Batch: HC130909-6

QCBatchID: HC130909-6-1

Run ID: HC130909-6A

Cleanup: NONE

Basis: N/A

File Name: 09960.dat

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
8006-61-9	GASOLINE RANGE ORGANICS	1	0.973	0.1		97	20	4

Surrogate Recovery LCS/LCSD

CASNO	Target Analyte	Spike Added	LCS % Rec.	LCS Flag	LCSD % Rec.	LCSD Flag	Control Limits
193533-92-	2,3,4-TRIFLUOROTOLUENE	0.1	92		91		74 - 129

Data Package ID: HCG1309081-1

Date Printed: Thursday, September 12, 2013

ALS Environmental -- FC

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Inorganics

Case Narrative

COGCC

Water Wells Sec23 3N 66W -- 434043

Work Order Number: 1309081

1. This report consists of 1 water sample.
2. The sample was received intact at 10.0° Celsius by ALS on 09/06/13.
3. The sample had been correctly preserved for the requested analyses.
4. The sample was prepared for analysis based on Methods for the Chemical Analysis of Waters and Wastes (MCAWW), May 1994 procedures and Environmental Monitoring Systems Laboratory (EMSL) Rev 2.1 procedures.
5. The sample was analyzed following MCAWW and EMSL procedures for the current revisions of the following SOPs and methods:

<u>Analyte</u>	<u>Method</u>	<u>SOP #</u>
Alkalinity	310.1	1106
Bicarbonate	310.1	1106
Carbonate	310.1	1106
Nitrate/nitrite as N	353.2 Revision 2.0	1127
pH	150.1	1126
Total phosphorus	365.2	1119
Specific conductance	120.1	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
Sulfate	300.0 Revision 2.1	1113

6. All standards and solutions were used within their recommended shelf life.
7. The sample was prepared and analyzed within the established hold time for each analysis.



All in house quality control procedures were followed, as described below.

8. General quality control procedures.

- n A preparation (method) blank and laboratory control sample (LCS) were prepared and analyzed with the samples in each applicable preparation batch.
- n The method blank associated with each applicable batch was below the reporting limit for the requested analytes.
- n All laboratory control sample criteria were met.
- n All initial and continuing calibration blanks were below the reporting limit for the requested analytes.
- n All initial and continuing calibration verifications were within the acceptance criteria for the requested analytes.

9. Matrix specific quality control procedures.

Per method requirements, matrix QC was performed for each analysis. Since a sample from this order number was not the selected quality control (QC) sample, matrix specific QC results are not included in this report.

10. Electrical conductivity screening indicated that the concentration of dissolved salts was high in the sample. Therefore, it was necessary to dilute the sample prior to injection into the ion chromatograph in order to minimize the amount of salts loaded into the analytical column.

It was necessary to further dilute the sample in order to bring the chloride and sulfate concentrations into the analytical range of the ion chromatograph (IC).

Reduced aliquots were taken of the sample for the alkalinity, bicarbonate, and carbonate analysis. Reporting limits were elevated accordingly.

A reduced aliquot was taken of the sample for the TDS analysis. Reporting limits were elevated accordingly.

11. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in the current revision of SOP 939.



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.

Megan Johnstone

Megan Johnstone
Inorganics Primary Data Reviewer

9/16/13

Date

Bob A

Inorganics Final Data Reviewer

9/16/13

Date



Inorganic Data Reporting Qualifiers

The following qualifiers are used by the laboratory when reporting results of inorganic analyses.

- Concentration qualifier -- If the analyte was analyzed for but not detected a "U" is entered.
- QC qualifier -- Specified entries and their meanings are as follows:
 - N - Spiked sample recovery not within control limits.
 - * - Duplicate analysis (relative percent difference) not within control limits.
 - Z - Calibration spike recovery not within control limits.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1309081

Client Name: COGCC

Client Project Name: Water Wells Sec23 3N 66W

Client Project Number: 434043

Client PO Number: PHA 14-22

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Brotemarkle 162136	1309081-1		WATER	06-Sep-13	10:10



Chain-of-Custody

Chain-of-Custody

Form 202r8

1806081

WORKORDER

R ALLISON

[illegible]

*Time Zone (Circle): EST CST MST PST Matrix: Q = 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 & Lab Filter Dissolved Metals COCCC will email Site ID to lab for EDD generation Email pdf report, EDD, and invoice to rick.allison@state.co.us	x LEVEL II (Standard QC)
	LEVEL III (Std QC + forms)
	LEVEL IV (Std QC + forms + raw data)
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035	



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: COGCC

Workorder No: 1309081

Project Manager: ARW

Initials: LAS

Date: 9/6/13

1. Does this project require any special handling in addition to standard ALS procedures?		YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES	NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible?		<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		<u>YES</u>	NO
7. Were airbills / shipping documents present and/or removable?	<u>DROP OFF</u>	YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	<u>YES</u>	NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	<u>YES</u>	NO
10. Is there sufficient sample for the requested analyses?		<u>YES</u>	NO
11. Were all samples placed in the proper containers for the requested analyses?		<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?		<u>YES</u>	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		<u>YES</u>	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	N/A	YES	<u>NO</u>
15. Do any water samples contain sediment? Amount of sediment: <u> </u> dusting <u> </u> moderate <u> </u> heavy	N/A	YES	<u>NO</u>
16. Were the samples shipped on ice?		<u>YES</u>	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> #4	RAD ONLY	YES	<u>NO</u>
Cooler #: <u>1</u>			
Temperature (°C): <u>10.0°</u>			
No. of custody seals on cooler: <u>0</u>			
External µR/hr reading: <u>N/A</u>			
Background µR/hr reading: <u>11</u>			
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES / <u>NO</u> / NA (If no, see Form 008.)			

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

*14 1309081-1-3 VOA }
 1-8 RSK } all arrived with headspace ≤ pea-size
 1-9 }
 ↓

*17 samples collected same day as arrival at lab, temp OK

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

Project Manager Signature / Date: Arw 9/9/13

BICARBONATE AS CaCO₃

Method EPA310.1

Sample Results

Lab Name: ALS Environmental -- FC
Client Name: COGCC
Client Project ID: Water Wells Sec23 3N 66W 434043
Work Order Number: 1309081 Final Volume: 100 ml
Reporting Basis: As Received Matrix: WATER
Prep Method: METHOD Result Units: MG/L
Analyst: Kristen A. Middleton

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit LOD/LOQ	Flag	Sample Aliquot
Brotemarkle 162136	1309081-1	09/06/2013	09/11/2013	09/11/2013	N/A	1	320	20		25 ml

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *ak1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

LIMS Version: 6.658

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CARBONATE AS CaCO3

Method EPA310.1

Sample Results

Lab Name: ALS Environmental -- FC
Client Name: COGCC
Client Project ID: Water Wells Sec23 3N 66W 434043
Work Order Number: 1309081 Final Volume: 100 ml
Reporting Basis: As Received Matrix: WATER
Prep Method: METHOD Result Units: MG/L
Analyst: Kristen A. Middleton

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit LOD/LOQ	Flag	Sample Aliquot
Brotemarkle 162136	1309081-1	09/06/2013	09/11/2013	09/11/2013	N/A	1	20	20	U	25 ml

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *ak1309081-1*

TOTAL ALKALINITY AS CaCO3

Method EPA310.1

Sample Results

Lab Name: ALS Environmental -- FC
Client Name: COGCC
Client Project ID: Water Wells Sec23 3N 66W 434043
Work Order Number: 1309081 Final Volume: 100 ml
Reporting Basis: As Received Matrix: WATER
Prep Method: METHOD Result Units: MG/L
Analyst: Kristen A. Middleton

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit LOD/LOQ	Flag	Sample Aliquot
Brotemarkle 162136	1309081-1	09/06/2013	09/11/2013	09/11/2013	N/A	1	320	20		25 ml

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *ak1309081-1*

Nitrate/Nitrite as N

Method EPA353.2 Revision 2.0

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136	Sample Matrix:	WATER	Prep Batch:	NN130909-2	Analyst:	Peter Workman
Lab ID:	1309081-1	% Moisture:	N/A	QCBatchID:	NN130909-2-1	Sample Aliquot:	5 ML
		Date Collected:	06-Sep-13	Run ID:	NN130909-1A1	Final Volume:	5 ML
		Date Extracted:	09-Sep-13	Cleanup:	NONE	Result Units:	MG/L
		Date Analyzed:	09-Sep-13	Basis:	As Received	Clean DF:	1
		Prep Method:	NONE	File Name:	0909NOX.FDT		

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
1-005	NITRATE/NITRITE AS N	1	0.01	0.01	U	

Data Package ID: *nn1309081-1*

pH

Method EPA150.1

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136
Lab ID:	1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 10-Sep-13

Date Analyzed: 10-Sep-13

Prep Method: NONE

Prep Batch: PH130910-2

QCBatchID: PH130910-2-1

Run ID: PH130910-1A

Cleanup: NONE

Basis: As Received

File Name:

Analyst: Kristin L. Ratajczak

Sample Aliquot: 20 ML

Final Volume: 20 ML

Result Units: pH

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
10-29-7	PH AnalysisTime: 13:10	1	8.36	0.1		

Data Package ID: *ph1309081-1*

Total Phosphorus as P

Method EPA365.2

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136
Lab ID:	1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 12-Sep-13

Date Analyzed: 12-Sep-13

Prep Method: METHOD

Prep Batch: TP130912-1

QCBatchID: TP130912-1-1

Run ID: TP130912-1A

Cleanup: NONE

Basis: As Received

File Name: Manual Entry

Analyst: Tyler Knaebel

Sample Aliquot: 50 ML

Final Volume: 50 ML

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
7723-14-0	TOTAL PHOSPHORUS	1	0.05	0.05	U	

Data Package ID: *tp1309081-1*

Specific Conductance in Water

Method EPA120.1

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136	Sample Matrix:	WATER	Prep Batch:	SC130910-1	Analyst:	Kristen A. Middleton
Lab ID:	1309081-1	% Moisture:	N/A	QCBatchID:	SC130910-1-1	Sample Aliquot:	45 ML
		Date Collected:	06-Sep-13	Run ID:	SC130910-1A	Final Volume:	45 ML
		Date Extracted:	10-Sep-13	Cleanup:	NONE	Result Units:	umhos/cm
		Date Analyzed:	10-Sep-13	Basis:	As Received	Clean DF:	1
		Prep Method:	METHOD	File Name:			

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
10-34-4	SPECIFIC CONDUCTIVITY AnalysisTime: 12:15	1	2570	1		

Data Package ID: sc1309081-1

Total Dissolved Solids

Method EPA160.1

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136	Sample Matrix:	WATER	Prep Batch:	TD130910-1	Analyst:	Kristen A. Middleton
Lab ID:	1309081-1	% Moisture:	N/A	QCBatchID:	TD130910-1-2	Sample Aliquot:	50 ML
		Date Collected:	06-Sep-13	Run ID:	TD130911-1A	Final Volume:	50 ML
		Date Extracted:	10-Sep-13	Cleanup:	NONE	Result Units:	MG/L
		Date Analyzed:	11-Sep-13	Basis:	As Received	Clean DF:	1
		Prep Method:	METHOD	File Name:	Manual Entry		

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
10-33-3	TOTAL DISSOLVED SOLIDS	1	1700	40		

Data Package ID: *td1309081-1*

Ion Chromatography

Method EPA300.0 Revision 2.1

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136
Lab ID:	1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 10-Sep-13

Date Analyzed: 10-Sep-13

Prep Method: NONE

Prep Batch: IC130910-1

QCBatchID: IC130910-1-1

Run ID: IC130910-1A1

Cleanup: NONE

Basis: As Received

File Name: 30910_025.dxd

Analyst: Alex J. Devonald

Sample Aliquot: 5 ML

Final Volume: 5 ML

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
16984-48-8	FLUORIDE AnalysisTime: 20:14	2	0.32	0.2		
16887-00-6	CHLORIDE AnalysisTime: 21:38	25	77	5		
24959-67-9	BROMIDE AnalysisTime: 20:14	2	1.1	0.4		
14808-79-8	SULFATE AnalysisTime: 21:38	25	820	25		

Data Package ID: *ic1309081-1*

BICARBONATE AS CaCO₃

Method EPA310.1

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: AK130911-2MB

Sample Matrix: WATER

% Moisture: N/A

Prep Batch: AK130911-2

QCBatchID: AK130911-2-1

Run ID: AK130911-1A

Cleanup: NONE

Basis: N/A

Sample Aliquot: 100 ml

Final Volume: 100 ml

Result Units: MG/L

Lab ID	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit LOD/LOQ	Flag
AK130911-2MB	9/11/2013	09/11/2013	N/A	1	5	5	U

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *ak1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

LIMS Version: 6.658

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CARBONATE AS CaCO3

Method EPA310.1

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: AK130911-2MB

Sample Matrix: WATER

% Moisture: N/A

Prep Batch: AK130911-2

QCBatchID: AK130911-2-1

Run ID: AK130911-1A

Cleanup: NONE

Basis: N/A

Sample Aliquot: 100 ml

Final Volume: 100 ml

Result Units: MG/L

Lab ID	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit LOD/LOQ	Flag
AK130911-2MB	9/11/2013	09/11/2013	N/A	1	5	5	U

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *ak1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

LIMS Version: 6.658

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TOTAL ALKALINITY AS CaCO3

Method EPA310.1

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: AK130911-2MB

Sample Matrix: WATER

% Moisture: N/A

Prep Batch: AK130911-2

QCBatchID: AK130911-2-1

Run ID: AK130911-1A

Cleanup: NONE

Basis: N/A

Sample Aliquot: 100 ml

Final Volume: 100 ml

Result Units: MG/L

Lab ID	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit LOD/LOQ	Flag
AK130911-2MB	9/11/2013	09/11/2013	N/A	1	5	5	U

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *ak1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

LIMS Version: 6.658

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TOTAL ALKALINITY AS CaCO₃

Method EPA310.1

Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: AK130911-2LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/11/2013

Date Analyzed: 09/11/2013

Prep Batch: AK130911-2

QCBatchID: AK130911-2-1

Run ID: AK130911-1A

Cleanup: NONE

Basis: N/A

Sample Aliquot: 100 ml

Final Volume: 100 ml

Result Units: MG/L

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
	TOTAL ALKALINITY AS CaCO ₃	100	97.1	5		97	85 - 115

Data Package ID: *ak1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

LIMS Version: 6.658

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Nitrate/Nitrite as N

Method EPA353.2 Revision 2.0

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: NN130909-2MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09-Sep-13

Date Analyzed: 09-Sep-13

Prep Method: NONE

Prep Batch: NN130909-2

QCBatchID: NN130909-2-1

Run ID: NN130909-1A1

Cleanup: NONE

Basis: N/A

File Name: 0909NOX.FDT

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
1-005	NITRATE/NITRITE AS N	1	0.01	0.01	U	

Data Package ID: *nn1309081-1*

Nitrate/Nitrite as N

Method EPA353.2 Revision 2.0

Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: NN130909-2LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/09/2013

Date Analyzed: 09/09/2013

Prep Method: NONE

Prep Batch: NN130909-2

QCBatchID: NN130909-2-1

Run ID: NN130909-1A1

Cleanup: NONE

Basis: N/A

File Name: 0909NOX.FDT

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
1-005	NITRATE/NITRITE AS N	0.5	0.51	0.01		102	90 - 110%

Data Package ID: *nn1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

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LIMS Version: 6.658

Total Phosphorus as P

Method EPA365.2

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: TP130912-1MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 12-Sep-13

Date Analyzed: 12-Sep-13

Prep Method: METHOD

Prep Batch: TP130912-1

QCBatchID: TP130912-1-1

Run ID: TP130912-1A

Cleanup: NONE

Basis: N/A

File Name: Manual Entry

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
7723-14-0	TOTAL PHOSPHORUS	1	0.05	0.05	U	

Data Package ID: *tp1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

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LIMS Version: 6.658

Total Phosphorus as P

Method EPA365.2

Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: TP130912-1LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/12/2013

Date Analyzed: 09/12/2013

Prep Method: METHOD

Prep Batch: TP130912-1

QCBatchID: TP130912-1-1

Run ID: TP130912-1A

Cleanup: NONE

Basis: N/A

File Name: Manual Entry

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7723-14-0	TOTAL PHOSPHORUS	0.5	0.521	0.05		104	80 - 120%

Data Package ID: *tp1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

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LIMS Version: 6.658

Total Dissolved Solids

Method EPA160.1

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: TD130910-1MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 10-Sep-13

Date Analyzed: 11-Sep-13

Prep Method: METHOD

Prep Batch: TD130910-1

QCBatchID: TD130910-1-2

Run ID: TD130911-1A

Cleanup: NONE

Basis: N/A

File Name: Manual Entry

Sample Aliquot: 100 ml

Final Volume: 100 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
10-33-3	TOTAL DISSOLVED SOLIDS	1	20	20	U	

Data Package ID: *td1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

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LIMS Version: 6.658

Total Dissolved Solids

Method EPA160.1

Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: TD130910-1LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/10/2013

Date Analyzed: 09/11/2013

Prep Method: METHOD

Prep Batch: TD130910-1

QCBatchID: TD130910-1-2

Run ID: TD130911-1A

Cleanup: NONE

Basis: N/A

File Name: Manual Entry

Sample Aliquot: 100 ml

Final Volume: 100 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
10-33-3	TOTAL DISSOLVED SOLIDS	400	400	20		100	85 - 115%

Data Package ID: *td1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.658

Ion Chromatography

Method EPA300.0 Revision 2.1

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: IC130910-1MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 10-Sep-13

Date Analyzed: 10-Sep-13

Prep Method: NONE

Prep Batch: IC130910-1

QCBatchID: IC130910-1-1

Run ID: IC130910-1A1

Cleanup: NONE

Basis: N/A

File Name: 30910_014.dxd

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
16984-48-8	FLUORIDE	1	0.1	0.1	U	
16887-00-6	CHLORIDE	1	0.2	0.2	U	
24959-67-9	BROMIDE	1	0.2	0.2	U	
14808-79-8	SULFATE	1	1	1	U	

Data Package ID: ic1309081-1

Ion Chromatography

Method EPA300.0 Revision 2.1

Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: IC130910-1LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/10/2013

Date Analyzed: 09/10/2013

Prep Method: NONE

Prep Batch: IC130910-1

QCBatchID: IC130910-1-1

Run ID: IC130910-1A1

Cleanup: NONE

Basis: N/A

File Name: 30910_013.dxd

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
16984-48-8	FLUORIDE	2	2.05	0.1		103	90 - 110%
16887-00-6	CHLORIDE	5	5.06	0.2		101	90 - 110%
24959-67-9	BROMIDE	5	5.37	0.2		107	90 - 110%
14808-79-8	SULFATE	20	20	1		100	90 - 110%

Data Package ID: *ic1309081-1*

Date Printed: Monday, September 16, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.658



Metals

Case Narrative

COGCC

Water Wells Sec23 3N 66W -- 434043

Work Order Number: 1309081

1. This report consists of 1 water sample.
2. The sample was received intact at 10°C by ALS on 09/06/13.
3. 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.
4. The sample was prepared and analyzed based on Methods for the Determination of Metals in Environmental Samples – Supplement 1 procedures.

For analysis by ICP-MS, the sample was digested following method 200.2 and the current revision of SOP 806.

5. Analysis by ICP-MS followed method 200.8 and the current revision of SOP 827.
6. All standards and solutions are NIST traceable and were used within their recommended shelf life.
7. The sample was prepared and analyzed within the established hold time.

All in house quality control procedures were followed, as described below.

8. General quality control procedures.
 - A filter (method) blank and laboratory control sample were filtered, preserved, and digested at the same time as the sample.
 - The preparation (method) blank associated with this digestion batch was below the reporting limit for the requested analytes.
 - All laboratory control sample criteria were met.



- All initial and continuing calibration blanks were below the reporting limit for the requested analytes, with the exceptions of CCB2 and CCB3 for strontium. The samples bracketed by these CCBs contained more than ten times the concentrations of strontium that was detected in the CCBs.
- All initial and continuing calibration verifications were within the acceptance criteria for the requested analytes.
- The interference check samples associated with Method 200.8 were analyzed.

9. Matrix specific quality control procedures.

Per method requirements, matrix QC was performed for this analysis. Since a sample from this order number was not the selected quality control (QC) sample, matrix specific QC results are not included in this report.

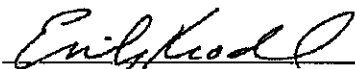
10. It is a standard practice that samples for ICP-MS are analyzed at a dilution.

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

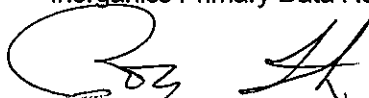
$$SAR = Na / (((Ca + Mg) / 2)^{1/2})$$

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

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.


Emily Knodel
Inorganics Primary Data Reviewer

9/19/13
Date


Inorganics Final Data Reviewer

9/19/13
Date



Inorganic Data Reporting Qualifiers

The following qualifiers are used by the laboratory when reporting results of inorganic analyses.

- Result qualifier -- If the analyte was analyzed for but not detected a "U" is entered.
- QC qualifier -- Specified entries and their meanings are as follows:
 - 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.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1309081

Client Name: COGCC

Client Project Name: Water Wells Sec23 3N 66W

Client Project Number: 434043

Client PO Number: PHA 14-22

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Brotemarkle 162136	1309081-1		WATER	06-Sep-13	10:10



Chain-of-Custody

Chain-of-Custody

Form 202r8

WORKORDER

1309081

R ALLISON

[illegible]

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

For metals or anions, please detail analytes below.

Comments: Cations/ Dissolved Metals - Ca, Fe, Mg, Mn, K, Na, Ba, B, Cr, Se, Sr Lab Filter Dissolved Metals COCCC will email Site ID to lab for EDD generation Email pdf report, EDD, and invoice to rick.allison@state.co.us	QC PACKAGE (check below)	
	x	LEVEL II (Standard QC)
		LEVEL III (Std QC + forms)
		LEVEL IV (Std QC + forms + raw data)
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035		



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: COGCC

Workorder No: 1309081

Project Manager: ARW

Initials: LAS Date: 9/6/13

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	<input checked="" type="radio"/> NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES	<input checked="" type="radio"/> NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
5. Are the COC and bottle labels complete and legible?		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> 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	<input checked="" type="radio"/> NO
7. Were airbills / shipping documents present and/or removable?	<input checked="" type="radio"/> DROP OFF	YES	<input checked="" type="radio"/> NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
10. Is there sufficient sample for the requested analyses?		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
12. Are all samples within holding times for the requested analyses?		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	N/A	YES	<input checked="" type="radio"/> NO *
15. Do any water samples contain sediment? Amount of sediment: <u> </u> dusting <u> </u> moderate <u> </u> heavy	Amount N/A	YES	<input checked="" type="radio"/> NO
16. Were the samples shipped on ice?		<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <input checked="" type="radio"/> #2 <input type="radio"/> #4 <input type="radio"/> RAD ONLY		YES	<input checked="" type="radio"/> NO *
Cooler #: <u>1</u>			
Temperature (°C): <u>10.0°</u>			
No. of custody seals on cooler: <u>0</u>			
External µR/hr reading: <u>N/A</u>			
Background µR/hr reading: <u>11</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.

*14 1309081-1-3 VOC }
 1-8 RSK } all arrived with headspace ≤ pea-size
 1-9 ↓

*17 samples collected same day as arrival at lab, temp OK

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

Project Manager Signature / Date: 9/9/13

Dissolved ICPMS Metals

Method SW6020 Revision A

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID: Brotemarkle 162136

Lab ID: 1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 17-Sep-13

Date Analyzed: 18-Sep-13

Prep Method: EPA200.2 Rev 2.8

Prep Batch: IP130917-6

QCBatchID: IP130917-6-3

Run ID: IM130918-10A2

Cleanup: NONE

Basis: As Received

File Name: 014SMPL.

Analyst: Ross Miller

Sample Aliquot: 50 G

Final Volume: 50 G

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
7440-38-2	ARSENIC	10	0.002	0.002	U	
7440-39-3	BARIUM	10	0.0095	0.001		
7440-42-8	BORON	10	0.05	0.05	U	
7440-70-2	CALCIUM	10	17	1		
7440-47-3	CHROMIUM	10	0.01	0.01	U	
7439-89-6	IRON	10	0.1	0.1	U	
7439-92-1	LEAD	10	0.0005	0.0005	U	
7439-95-4	MAGNESIUM	10	3.2	0.1		
7439-96-5	MANGANESE	10	0.038	0.002		
7440-09-7	POTASSIUM	10	3	1		
7782-49-2	SELENIUM	10	0.001	0.001	U	
7440-23-5	SODIUM	10	570	1		
	SODIUM ADSORPTION RATIO	10	33	0.26		
7440-24-6	STRONTIUM	10	0.5	0.001		

Data Package ID: IM1309081-1

ICPMS Metals

Method SW6020A

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: F130912-1MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 17-Sep-13

Date Analyzed: 18-Sep-13

Prep Method: EPA200.2 Rev 2.8

Prep Batch: IP130917-6

QCBatchID: IP130917-6-3

Run ID: IM130918-10A2

Cleanup: NONE

Basis: N/A

File Name: 002SMPL.

Sample Aliquot: 50 g

Final Volume: 50 g

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
7440-38-2	ARSENIC	10	0.002	0.002	U	
7440-39-3	BARIUM	10	0.001	0.001	U	
7440-42-8	BORON	10	0.05	0.05	U	
7440-70-2	CALCIUM	10	1	1	U	
7440-47-3	CHROMIUM	10	0.01	0.01	U	
7439-89-6	IRON	10	0.1	0.1	U	
7439-92-1	LEAD	10	0.0005	0.0005	U	
7439-95-4	MAGNESIUM	10	0.1	0.1	U	
7439-96-5	MANGANESE	10	0.002	0.002	U	
7440-09-7	POTASSIUM	10	1	1	U	
7782-49-2	SELENIUM	10	0.001	0.001	U	
7440-23-5	SODIUM	10	1	1	U	
7440-24-6	STRONTIUM	10	0.001	0.001	U	

Data Package ID: IM1309081-1

Date Printed: Thursday, September 19, 2013

ALS Environmental -- FC

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LIMS Version: 6.658

ICPMS Metals

Method SW6020A

Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: FM130912-1LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/17/2013

Date Analyzed: 09/18/2013

Prep Method: EPA200.22.8

Prep Batch: IP130917-6

QCBatchID: IP130917-6-3

Run ID: IM130918-10A2

Cleanup: NONE

Basis: N/A

File Name: 003SMPL.

Sample Aliquot: 50 g

Final Volume: 50 g

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7440-38-2	ARSENIC	0.1	0.0924	0.002		92	85 - 115%
7440-39-3	BARIUM	0.1	0.0953	0.001		95	85 - 115%
7440-42-8	BORON	1	0.895	0.05		89	85 - 115%
7440-70-2	CALCIUM	10	9.03	1		90	85 - 115%
7440-47-3	CHROMIUM	0.5	0.459	0.01		92	85 - 115%
7439-89-6	IRON	5	4.87	0.1		97	85 - 115%
7439-92-1	LEAD	0.05	0.0493	0.0005		99	85 - 115%
7439-95-4	MAGNESIUM	10	9.14	0.1		91	85 - 115%
7439-96-5	MANGANESE	0.2	0.185	0.002		92	85 - 115%
7440-09-7	POTASSIUM	5	4.91	1		98	85 - 115%
7782-49-2	SELENIUM	0.1	0.0886	0.001		89	85 - 115%
7440-23-5	SODIUM	10	9.67	1		97	85 - 115%
7440-24-6	STRONTIUM	0.1	0.104	0.001		104	85 - 115%

Data Package ID: IM1309081-1

Date Printed: Thursday, September 19, 2013

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.658



GC/MS Volatiles

Case Narrative

COGCC

Water Wells Sec23 3N 66W -- 434043

Work Order Number: 1309081

1. This report consists of 1 water sample. The sample was received intact at 10°C by ALS on 09/06/13. The water sample was free of headspace and had a pH < 2 at the time of analysis.
2. The sample was prepared according to SW-846, 3rd Edition procedures. Specifically, the water sample was prepared using purge and trap procedures based on Method 5030C.
3. The sample was analyzed using GC/MS with an RTX-624, RTX-VMS, or equivalent capillary column according to the current revision of SOP 525 based on SW-846 Method 8260. All positive results were quantitated against the initial calibration standards using the internal standard technique. The identification of positive results was achieved by a comparison of the retention time and mass spectrum of the sample versus the daily calibration standard.
4. All initial calibration criteria were met.
5. All initial calibrations are verified by comparing a second source standard calibration verification (ICV) against the calibration curve. All criteria for initial calibration verification were met.
6. All compounds in the continuing calibration verification had a %D of less than 20%.
7. Methylene chloride, acetone and 2-butanone are common laboratory contaminants. In order to minimize the levels of these compounds detected in the gc/ms analysis, ALS has designated its volatile laboratory as a restricted access area. In addition, the laboratory has been equipped with a dedicated, air intake and exhaust system that operates under positive pressure in order to minimize cross contamination of these compounds. Due to fluctuations in ambient laboratory conditions, reported sample values for common laboratory contaminants may be due to lab contamination even if the compound in question is not detected in the associated method blank.

The method blank VL130907-4MB acetone and chloroform detected below the reporting limit. These compounds were not detected in the associated sample.



8. All laboratory control sample and laboratory control sample duplicate recoveries and RPDs were within the acceptance criteria.
9. Since a sample from this order number was not the selected quality control (QC) sample, matrix specific QC results are not included in this report.
10. The sample was analyzed within the established holding time.
11. All surrogate recoveries were within acceptance criteria.
12. All internal standard recoveries were within acceptance criteria.
13. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in the current revision of SOP 939.

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.

Emily Lyons
Emily Lyons
Organics Primary Data Reviewer

9/11/13
Date

Tim Muehl
Organics Final Data Reviewer

9/11/13
Date



ALS
Data Qualifier Flags
Chromatography and Mass Spectrometry

- U or ND:** This flag indicates that the compound was analyzed for but not detected.
- J:** This flag indicates an estimated value. This flag is used as follows : (1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the reporting limit (RL) but greater than the method detection limit (MDL); (3) when the retention time data indicate the presence of a compound that meets the GC identification criteria, and the result is less than the RL but greater than the MDL; and (4) the reported value is estimated.
- B:** This flag is used when the analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user. This flag shall be used for a tentatively identified compound (TIC) as well as for a positively identified target compound.
- E:** This flag identifies compounds whose concentration exceeds the upper level of the calibration range.
- A:** This flag indicates that a tentatively identified compound is a suspected aldol-condensation product.
- X:** This flag indicates that the analyte was diluted below an accurate quantitation level.
- *:** This flag indicates that a spike recovery is equal to or outside the control criteria used.
- +:** This flag indicates that the relative percent difference (RPD) equals or exceeds the control criteria.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1309081

Client Name: COGCC

Client Project Name: Water Wells Sec23 3N 66W

Client Project Number: 434043

Client PO Number: PHA 14-22

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Brotemarkle 162136	1309081-1		WATER	06-Sep-13	10:10



Chain-of-Custody

Chain-of-Custody

Form 202r8

WORKORDER

1309081

R ALLISON

[illegible]

*Time Zone (Circle): EST CST MST PST Matrix: Q = 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 ²⁰ 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	<input checked="" type="checkbox"/> LEVEL II (Standard QC)
	<input type="checkbox"/> LEVEL III (Std QC + forms)
	<input type="checkbox"/> LEVEL IV (Std QC + forms + raw data)
	<input type="checkbox"/>
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035	

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: COGIC

Workorder No: 1309081

Project Manager: ARW

Initials: LAS Date: 9/6/13

1. Does this project require any special handling in addition to standard ALS procedures?		YES	NO
2. Are custody seals on shipping containers intact?	NONE	YES	NO
3. Are Custody seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		YES	NO
5. Are the COC and bottle labels complete and legible?		YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	YES	NO
10. Is there sufficient sample for the requested analyses?		YES	NO
11. Were all samples placed in the proper containers for the requested analyses?		YES	NO
12. Are all samples within holding times for the requested analyses?		YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		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	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	NO
16. Were the samples shipped on ice?		YES	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4 RAD ONLY		YES	NO
Cooler #: 1			
Temperature (°C): 10.0°			
No. of custody seals on cooler: 0			
External µR/hr reading: N/A			
Background µR/hr reading: 11			
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.

*14 1309081-1-3 VOA
 1-8 RSK
 1-9 ↓
 ↓
 } all arrived with headspace \leq pea-size

*17 samples collected same day as arrival at lab, temp OK

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

Project Manager Signature / Date: Chris 9/9/13

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

GC/MS Volatiles

Method SW8260_25C

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 07-Sep-13

Date Analyzed: 07-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44054

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit LOD/LOQ	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	1	1	1	U	
74-87-3	CHLOROMETHANE	1	1	1	U	
75-01-4	VINYL CHLORIDE	1	1	1	U	
74-83-9	BROMOMETHANE	1	1	1	U	
75-00-3	CHLOROETHANE	1	1	1	U	
75-69-4	TRICHLOROFLUOROMETHANE	1	1	1	U	
75-35-4	1,1-DICHLOROETHENE	1	1	1	U	
76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROET	1	1	1	U	
67-64-1	ACETONE	1	4.6	10	J	
74-88-4	IODOMETHANE	1	1	1	U	
75-15-0	CARBON DISULFIDE	1	1	1	U	
75-09-2	METHYLENE CHLORIDE	1	1	1	U	
156-60-5	TRANS-1,2-DICHLOROETHENE	1	1	1	U	
1634-04-4	METHYL TERTIARY BUTYL ETHER	1	1	1	U	
75-34-3	1,1-DICHLOROETHANE	1	1	1	U	
108-05-4	VINYL ACETATE	1	2	2	U	
156-59-2	CIS-1,2-DICHLOROETHENE	1	1	1	U	
78-93-3	2-BUTANONE	1	10	10	U	
74-97-5	BROMOCHLOROMETHANE	1	1	1	U	
67-66-3	CHLOROFORM	1	0.51	1	J	
71-55-6	1,1,1-TRICHLOROETHANE	1	1	1	U	
594-20-7	2,2-DICHLOROPROPANE	1	1	1	U	
56-23-5	CARBON TETRACHLORIDE	1	1	1	U	
563-58-6	1,1-DICHLOROPROPENE	1	1	1	U	
107-06-2	1,2-DICHLOROETHANE	1	1	1	U	
71-43-2	BENZENE	1	1	1	U	
79-01-6	TRICHLOROETHENE	1	1	1	U	

Data Package ID: VL1309081-1

Date Printed: Wednesday, September 11, 2013

ALS Environmental -- FC

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LIMS Version: 6.658

GC/MS Volatiles

Method SW8260_25C

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 07-Sep-13

Date Analyzed: 07-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44054

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

78-87-5	1,2-DICHLOROPROPANE	1	1	1	U	
74-95-3	DIBROMOMETHANE	1	1	1	U	
75-27-4	BROMODICHLOROMETHANE	1	1	1	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	1	1	1	U	
108-10-1	4-METHYL-2-PENTANONE	1	10	10	U	
108-88-3	TOLUENE	1	1	1	U	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	1	1	1	U	
79-00-5	1,1,2-TRICHLOROETHANE	1	1	1	U	
591-78-6	2-HEXANONE	1	10	10	U	
127-18-4	TETRACHLOROETHENE	1	1	1	U	
142-28-9	1,3-DICHLOROPROPANE	1	1	1	U	
124-48-1	DIBROMOCHLOROMETHANE	1	1	1	U	
106-93-4	1,2-DIBROMOETHANE	1	1	1	U	
544-10-5	1-CHLOROHEXANE	1	1	1	U	
108-90-7	CHLOROBENZENE	1	1	1	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	1	1	1	U	
100-41-4	ETHYLBENZENE	1	1	1	U	
136777-61-2	M+P-XYLENE	1	1	1	U	
95-47-6	O-XYLENE	1	1	1	U	
100-42-5	STYRENE	1	1	1	U	
75-25-2	BROMOFORM	1	1	1	U	
98-82-8	ISOPROPYLBENZENE	1	1	1	U	
96-18-4	1,2,3-TRICHLOROPROPANE	1	1	1	U	
79-34-5	1,1,2,2-TETRACHLOROETHANE	1	1	1	U	
108-86-1	BROMOBENZENE	1	1	1	U	
103-65-1	N-PROPYLBENZENE	1	1	1	U	
95-49-8	2-CHLOROTOLUENE	1	1	1	U	
108-67-8	1,3,5-TRIMETHYLBENZENE	1	1	1	U	
106-43-4	4-CHLOROTOLUENE	1	1	1	U	

Data Package ID: VL1309081-1

Date Printed: Wednesday, September 11, 2013

ALS Environmental -- FC

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LIMS Version: 6.658

GC/MS Volatiles

Method SW8260_25C

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 07-Sep-13

Date Analyzed: 07-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44054

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

98-06-6	TERT-BUTYLBENZENE	1	1	1	U	
95-63-6	1,2,4-TRIMETHYLBENZENE	1	1	1	U	
135-98-8	SEC-BUTYLBENZENE	1	1	1	U	
541-73-1	1,3-DICHLOROBENZENE	1	1	1	U	
99-87-6	P-ISOPROPYLTOLUENE	1	1	1	U	
106-46-7	1,4-DICHLOROBENZENE	1	1	1	U	
104-51-8	N-BUTYLBENZENE	1	1	1	U	
95-50-1	1,2-DICHLOROBENZENE	1	1	1	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	1	2	2	U	
120-82-1	1,2,4-TRICHLOROBENZENE	1	1	1	U	
87-68-3	HEXACHLOROBUTADIENE	1	1	1	U	
91-20-3	NAPHTHALENE	1	1	1	U	
87-61-6	1,2,3-TRICHLOROBENZENE	1	1	1	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	26.3		25	105	85 - 115
1868-53-7	DIBROMOFLUOROMETHANE	24.3		25	97	84 - 118
2037-26-5	TOLUENE-D8	24.6		25	98	85 - 115

Data Package ID: VL1309081-1

Date Printed: Wednesday, September 11, 2013

ALS Environmental -- FC

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LIMS Version: 6.658

GC/MS Volatiles

Method SW8260_25

Tentatively Identified Compounds

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	
Lab ID:	VL130907-4MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 07-Sep-13

Date Analyzed: 07-Sep-13

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: As Received

Sample Aliquot: 10 ml

Final Volume: 10 ml

Clean DF: 1

File Name: D44054

CASNO	Retention Time	Target Analyte	Dilution Factor	Result	Units	Qualifier
		NONE DETECTED	1			U

Data Package ID: VL1309081-1

GC/MS Volatiles

Method SW8260_25 Revision C

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID: Brotemarkle 162136

Lab ID: 1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 07-Sep-13

Date Analyzed: 08-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: As Received

File Name: D44070

Analyst: Steven D. White

Sample Aliquot: 10 ML

Final Volume: 10 ML

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	1	1	1	U	
74-87-3	CHLOROMETHANE	1	1	1	U	
75-01-4	VINYL CHLORIDE	1	1	1	U	
74-83-9	BROMOMETHANE	1	1	1	U	
75-00-3	CHLOROETHANE	1	1	1	U	
75-69-4	TRICHLOROFLUOROMETHANE	1	1	1	U	
75-35-4	1,1-DICHLOROETHENE	1	1	1	U	
76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1	1	1	U	
67-64-1	ACETONE	1	10	10	U	
74-88-4	IODOMETHANE	1	1	1	U	
75-15-0	CARBON DISULFIDE	1	1	1	U	
75-09-2	METHYLENE CHLORIDE	1	1	1	U	
156-60-5	TRANS-1,2-DICHLOROETHENE	1	1	1	U	
1634-04-4	METHYL TERTIARY BUTYL ETHER	1	1	1	U	
75-34-3	1,1-DICHLOROETHANE	1	1	1	U	
108-05-4	VINYL ACETATE	1	2	2	U	
156-59-2	CIS-1,2-DICHLOROETHENE	1	1	1	U	
78-93-3	2-BUTANONE	1	10	10	U	
74-97-5	BROMOCHLOROMETHANE	1	1	1	U	
67-66-3	CHLOROFORM	1	1	1	U	
71-55-6	1,1,1-TRICHLOROETHANE	1	1	1	U	
594-20-7	2,2-DICHLOROPROPANE	1	1	1	U	
56-23-5	CARBON TETRACHLORIDE	1	1	1	U	
563-58-6	1,1-DICHLOROPROPENE	1	1	1	U	
107-06-2	1,2-DICHLOROETHANE	1	1	1	U	
71-43-2	BENZENE	1	1	1	U	
79-01-6	TRICHLOROETHENE	1	1	1	U	

Data Package ID: VL1309081-1

GC/MS Volatiles

Method SW8260_25 Revision C

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID: Brotemarkle 162136

Lab ID: 1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 07-Sep-13

Date Analyzed: 08-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: As Received

File Name: D44070

Analyst: Steven D. White

Sample Aliquot: 10 ML

Final Volume: 10 ML

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
78-87-5	1,2-DICHLOROPROPANE	1	1	1	U	
74-95-3	DIBROMOMETHANE	1	1	1	U	
75-27-4	BROMODICHLOROMETHANE	1	1	1	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	1	1	1	U	
108-10-1	4-METHYL-2-PENTANONE	1	10	10	U	
108-88-3	TOLUENE	1	1	1	U	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	1	1	1	U	
79-00-5	1,1,2-TRICHLOROETHANE	1	1	1	U	
591-78-6	2-HEXANONE	1	10	10	U	
127-18-4	TETRACHLOROETHENE	1	1	1	U	
142-28-9	1,3-DICHLOROPROPANE	1	1	1	U	
124-48-1	DIBROMOCHLOROMETHANE	1	1	1	U	
106-93-4	1,2-DIBROMOETHANE	1	1	1	U	
544-10-5	1-CHLOROHEXANE	1	1	1	U	
108-90-7	CHLOROBENZENE	1	1	1	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	1	1	1	U	
100-41-4	ETHYLBENZENE	1	1	1	U	
136777-61-2	M+P-XYLENE	1	1	1	U	
95-47-6	O-XYLENE	1	1	1	U	
100-42-5	STYRENE	1	1	1	U	
75-25-2	BROMOFORM	1	1	1	U	
98-82-8	ISOPROPYLBENZENE	1	1	1	U	
96-18-4	1,2,3-TRICHLOROPROPANE	1	1	1	U	
79-34-5	1,1,1,2,2-TETRACHLOROETHANE	1	1	1	U	
108-86-1	BROMOBENZENE	1	1	1	U	
103-65-1	N-PROPYLBENZENE	1	1	1	U	
95-49-8	2-CHLOROTOLUENE	1	1	1	U	

Data Package ID: VL1309081-1

GC/MS Volatiles

Method SW8260_25 Revision C

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID: Brotemarkle 162136

Lab ID: 1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 07-Sep-13

Date Analyzed: 08-Sep-13

Prep Method: SW5030 Rev C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: As Received

File Name: D44070

Analyst: Steven D. White

Sample Aliquot: 10 ML

Final Volume: 10 ML

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit\ LOD\LOQ	Result Qualifier	EPA Qualifier
108-67-8	1,3,5-TRIMETHYLBENZENE	1	1	1	U	
106-43-4	4-CHLOROTOLUENE	1	1	1	U	
98-06-6	TERT-BUTYLBENZENE	1	1	1	U	
95-63-6	1,2,4-TRIMETHYLBENZENE	1	1	1	U	
135-98-8	SEC-BUTYLBENZENE	1	1	1	U	
541-73-1	1,3-DICHLOROBENZENE	1	1	1	U	
99-87-6	P-ISOPROPYLTOLUENE	1	1	1	U	
106-46-7	1,4-DICHLOROBENZENE	1	1	1	U	
104-51-8	N-BUTYLBENZENE	1	1	1	U	
95-50-1	1,2-DICHLOROBENZENE	1	1	1	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	1	2	2	U	
120-82-1	1,2,4-TRICHLOROBENZENE	1	1	1	U	
87-68-3	HEXACHLOROBUTADIENE	1	1	1	U	
91-20-3	NAPHTHALENE	1	1	1	U	
87-61-6	1,2,3-TRICHLOROBENZENE	1	1	1	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	25.7		25	103	85 - 115
1868-53-7	DIBROMOFLUOROMETHANE	24.4		25	97	84 - 118
2037-26-5	TOLUENE-D8	24.4		25	98	85 - 115

Data Package ID: VL1309081-1

GC/MS Volatiles

Method SW8260_25

Tentatively Identified Compounds

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Field ID:	Brotemarkle 162136
Lab ID:	1309081-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 06-Sep-13

Date Extracted: 07-Sep-13

Date Analyzed: 08-Sep-13

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: As Received

Sample Aliquot: 10 ml

Final Volume: 10 ml

Clean DF: 1

File Name: D44070

CASNO	Retention Time	Target Analyte	Dilution Factor	Result	Units	Qualifier
	2.34	Unknown	1	3.6	UG/L	J

Data Package ID: VL1309081-1

GC/MS Volatiles

Method SW8260_25C

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/07/2013

Date Analyzed: 09/07/2013

Prep Method: SW5030C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44052

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
75-71-8	DICHLORODIFLUOROMETHANE	10	8.17	1		82	63 - 125%
74-87-3	CHLOROMETHANE	10	8.78	1		88	73 - 122%
75-01-4	VINYL CHLORIDE	10	8.72	1		87	72 - 123%
74-83-9	BROMOMETHANE	10	8.97	1		90	68 - 123%
75-00-3	CHLOROETHANE	10	10	1		100	74 - 124%
75-69-4	TRICHLOROFLUOROMETHANE	10	9.85	1		99	74 - 124%
75-35-4	1,1-DICHLOROETHENE	10	10.8	1		108	77 - 119%
76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETH	10	10.3	1		103	79 - 122%
67-64-1	ACETONE	40	41.8	10		104	62 - 142%
74-88-4	IODOMETHANE	10	8.98	1		90	72 - 126%
75-15-0	CARBON DISULFIDE	10	10.5	1		105	76 - 121%
75-09-2	METHYLENE CHLORIDE	10	10.6	1		106	71 - 130%
156-60-5	TRANS-1,2-DICHLOROETHENE	10	10.6	1		106	82 - 117%
1634-04-4	METHYL TERTIARY BUTYL ETHER	20	21.2	1		106	77 - 119%
75-34-3	1,1-DICHLOROETHANE	10	10.8	1		108	83 - 119%
108-05-4	VINYL ACETATE	10	10.4	2		104	76 - 121%
156-59-2	CIS-1,2-DICHLOROETHENE	10	10.9	1		109	83 - 117%
78-93-3	2-BUTANONE	40	42.6	10		106	70 - 135%
74-97-5	BROMOCHLOROMETHANE	10	10.8	1		108	83 - 121%
67-66-3	CHLOROFORM	10	11	1		110	82 - 119%
71-55-6	1,1,1-TRICHLOROETHANE	10	10.5	1		105	80 - 120%
594-20-7	2,2-DICHLOROPROPANE	10	11.2	1		112	83 - 125%
56-23-5	CARBON TETRACHLORIDE	10	11	1		110	77 - 122%
563-58-6	1,1-DICHLOROPROPENE	10	11	1		110	84 - 118%
107-06-2	1,2-DICHLOROETHANE	10	10.5	1		105	74 - 128%
71-43-2	BENZENE	10	10.7	1		107	83 - 117%

Data Package ID: VL1309081-1

Date Printed: Wednesday, September 11, 2013

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GC/MS Volatiles

Method SW8260_25C

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/07/2013

Date Analyzed: 09/07/2013

Prep Method: SW5030C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44052

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
79-01-6	TRICHLOROETHENE	10	10.8	1		108	83 - 117%
78-87-5	1,2-DICHLOROPROPANE	10	11	1		110	84 - 120%
74-95-3	DIBROMOMETHANE	10	10.7	1		107	79 - 122%
75-27-4	BROMODICHLOROMETHANE	10	10.9	1		109	76 - 122%
10061-01-5	CIS-1,3-DICHLOROPROPENE	10	11	1		110	81 - 120%
108-10-1	4-METHYL-2-PENTANONE	40	46.8	10		117	73 - 125%
108-88-3	TOLUENE	10	10.9	1		109	82 - 113%
10061-02-6	TRANS-1,3-DICHLOROPROPENE	10	10.7	1		107	81 - 114%
79-00-5	1,1,2-TRICHLOROETHANE	10	10.9	1		109	78 - 116%
591-78-6	2-HEXANONE	40	43.3	10		108	71 - 124%
127-18-4	TETRACHLOROETHENE	10	10.5	1		105	84 - 117%
142-28-9	1,3-DICHLOROPROPANE	10	10.8	1		108	80 - 115%
124-48-1	DIBROMOCHLOROMETHANE	10	11.3	1		113	82 - 118%
106-93-4	1,2-DIBROMOETHANE	10	10.7	1		107	79 - 114%
544-10-5	1-CHLOROHEXANE	10	9.52	1		95	80 - 117%
108-90-7	CHLOROBENZENE	10	10.9	1		109	81 - 113%
630-20-6	1,1,1,2-TETRACHLOROETHANE	10	11.2	1		112	78 - 113%
100-41-4	ETHYLBENZENE	10	10.6	1		106	81 - 113%
136777-61-	M+P-XYLENE	20	21.7	1		109	82 - 115%
95-47-6	O-XYLENE	10	11.2	1		112	81 - 115%
100-42-5	STYRENE	10	11.1	1		111	78 - 118%
75-25-2	BROMOFORM	10	11.2	1		112	70 - 120%
98-82-8	ISOPROPYLBENZENE	10	10.4	1		104	80 - 113%
96-18-4	1,2,3-TRICHLOROPROPANE	10	11.1	1		111	78 - 117%
79-34-5	1,1,2,2-TETRACHLOROETHANE	10	10.6	1		106	75 - 121%
108-86-1	BROMOBENZENE	10	10.9	1		109	81 - 114%
103-65-1	N-PROPYLBENZENE	10	9.95	1		100	79 - 116%

Data Package ID: VL1309081-1

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GC/MS Volatiles

Method SW8260_25C

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/07/2013

Date Analyzed: 09/07/2013

Prep Method: SW5030C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44052

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
95-49-8	2-CHLOROTOLUENE	10	10.5	1		105	79 - 116%
108-67-8	1,3,5-TRIMETHYLBENZENE	10	10.2	1		102	78 - 116%
106-43-4	4-CHLOROTOLUENE	10	10.9	1		109	78 - 115%
98-06-6	TERT-BUTYLBENZENE	10	10.2	1		102	76 - 120%
95-63-6	1,2,4-TRIMETHYLBENZENE	10	10.3	1		103	80 - 117%
135-98-8	SEC-BUTYLBENZENE	10	9.59	1		96	78 - 115%
541-73-1	1,3-DICHLOROBENZENE	10	10.7	1		107	79 - 115%
99-87-6	P-ISOPROPYLTOLUENE	10	9.68	1		97	77 - 116%
106-46-7	1,4-DICHLOROBENZENE	10	10.8	1		108	82 - 114%
104-51-8	N-BUTYLBENZENE	10	9.62	1		96	79 - 117%
95-50-1	1,2-DICHLOROBENZENE	10	10.8	1		108	82 - 114%
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	10	10.3	2		103	73 - 125%
120-82-1	1,2,4-TRICHLOROBENZENE	10	10.3	1		103	75 - 120%
87-68-3	HEXACHLOROBUTADIENE	10	11.1	1		111	71 - 124%
91-20-3	NAPHTHALENE	10	10.5	1		105	71 - 131%
87-61-6	1,2,3-TRICHLOROBENZENE	10	10.4	1		104	70 - 131%

Data Package ID: VL1309081-1

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GC/MS Volatiles

Method SW8260_25C

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4LCSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/07/2013

Date Analyzed: 09/07/2013

Prep Method: SW5030C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44053

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
75-71-8	DICHLORODIFLUOROMETHANE	10	7.75	1		78	20	5
74-87-3	CHLOROMETHANE	10	8.22	1		82	20	7
75-01-4	VINYL CHLORIDE	10	8.36	1		84	20	4
74-83-9	BROMOMETHANE	10	8.64	1		86	20	4
75-00-3	CHLOROETHANE	10	9.18	1		92	20	9
75-69-4	TRICHLOROFLUOROMETHANE	10	9.38	1		94	20	5
75-35-4	1,1-DICHLOROETHENE	10	9.63	1		96	20	11
76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETH	10	9.47	1		95	20	8
67-64-1	ACETONE	40	43.5	10		109	30	4
74-88-4	IODOMETHANE	10	8.19	1		82	20	9
75-15-0	CARBON DISULFIDE	10	9.68	1		97	20	8
75-09-2	METHYLENE CHLORIDE	10	10.3	1		103	20	3
156-60-5	TRANS-1,2-DICHLOROETHENE	10	10	1		100	20	6
1634-04-4	METHYL TERTIARY BUTYL ETHER	20	20.2	1		101	20	5
75-34-3	1,1-DICHLOROETHANE	10	10.1	1		101	20	6
108-05-4	VINYL ACETATE	10	10.4	2		104	20	0
156-59-2	CIS-1,2-DICHLOROETHENE	10	10	1		100	20	8
78-93-3	2-BUTANONE	40	42.2	10		106	30	1
74-97-5	BROMOCHLOROMETHANE	10	9.84	1		98	20	10
67-66-3	CHLOROFORM	10	10.6	1		106	20	4
71-55-6	1,1,1-TRICHLOROETHANE	10	10	1		100	20	5
594-20-7	2,2-DICHLOROPROPANE	10	10.6	1		106	20	6
56-23-5	CARBON TETRACHLORIDE	10	10.4	1		104	20	6
563-58-6	1,1-DICHLOROPROPENE	10	10.3	1		103	20	7
107-06-2	1,2-DICHLOROETHANE	10	10.1	1		101	20	4
71-43-2	BENZENE	10	10.1	1		101	20	6
79-01-6	TRICHLOROETHENE	10	10.1	1		101	20	6

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GC/MS Volatiles

Method SW8260_25C

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4LCSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/07/2013

Date Analyzed: 09/07/2013

Prep Method: SW5030C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44053

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
78-87-5	1,2-DICHLOROPROPANE	10	10.4	1		104	20	6
74-95-3	DIBROMOMETHANE	10	10.2	1		102	20	5
75-27-4	BROMODICHLOROMETHANE	10	10.4	1		104	20	4
10061-01-5	CIS-1,3-DICHLOROPROPENE	10	10.2	1		102	20	7
108-10-1	4-METHYL-2-PENTANONE	40	45.6	10		114	30	2
108-88-3	TOLUENE	10	10	1		100	20	9
10061-02-6	TRANS-1,3-DICHLOROPROPENE	10	10.3	1		103	20	4
79-00-5	1,1,2-TRICHLOROETHANE	10	9.95	1		100	20	10
591-78-6	2-HEXANONE	40	41.1	10		103	30	5
127-18-4	TETRACHLOROETHENE	10	10.1	1		101	20	4
142-28-9	1,3-DICHLOROPROPANE	10	10.1	1		101	20	7
124-48-1	DIBROMOCHLOROMETHANE	10	10.7	1		107	20	6
106-93-4	1,2-DIBROMOETHANE	10	10.5	1		105	20	2
544-10-5	1-CHLOROHEXANE	10	8.63	1		86	20	10
108-90-7	CHLOROBENZENE	10	10.1	1		101	20	7
630-20-6	1,1,1,2-TETRACHLOROETHANE	10	10.3	1		103	20	8
100-41-4	ETHYLBENZENE	10	9.87	1		99	20	7
136777-61-	M+P-XYLENE	20	20.1	1		101	20	8
95-47-6	O-XYLENE	10	10.1	1		101	20	11
100-42-5	STYRENE	10	10.2	1		102	20	9
75-25-2	BROMOFORM	10	11.1	1		111	20	1
98-82-8	ISOPROPYLBENZENE	10	9.56	1		96	20	8
96-18-4	1,2,3-TRICHLOROPROPANE	10	10.6	1		106	20	5
79-34-5	1,1,2,2-TETRACHLOROETHANE	10	10	1		100	20	5
108-86-1	BROMOBENZENE	10	10.1	1		101	20	8
103-65-1	N-PROPYLBENZENE	10	9.26	1		93	20	7
95-49-8	2-CHLOROTOLUENE	10	9.54	1		95	20	10

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GC/MS Volatiles

Method SW8260_25C

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1309081

Client Name: COGCC

ClientProject ID: Water Wells Sec23 3N 66W 434043

Lab ID: VL130907-4LCSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/07/2013

Date Analyzed: 09/07/2013

Prep Method: SW5030C

Prep Batch: VL130907-4

QCBatchID: VL130907-4-3

Run ID: VL130907-4A

Cleanup: NONE

Basis: N/A

File Name: D44053

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
108-67-8	1,3,5-TRIMETHYLBENZENE	10	9.43	1		94	20	8
106-43-4	4-CHLOROTOLUENE	10	9.91	1		99	20	10
98-06-6	TERT-BUTYLBENZENE	10	9.16	1		92	20	11
95-63-6	1,2,4-TRIMETHYLBENZENE	10	9.36	1		94	20	10
135-98-8	SEC-BUTYLBENZENE	10	8.71	1		87	20	10
541-73-1	1,3-DICHLOROBENZENE	10	9.8	1		98	20	9
99-87-6	P-ISOPROPYLTOLUENE	10	9.02	1		90	20	7
106-46-7	1,4-DICHLOROBENZENE	10	9.87	1		99	20	9
104-51-8	N-BUTYLBENZENE	10	8.67	1		87	20	10
95-50-1	1,2-DICHLOROBENZENE	10	10.1	1		101	20	6
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	10	9.21	2		92	20	11
120-82-1	1,2,4-TRICHLOROBENZENE	10	9.85	1		98	20	5
87-68-3	HEXACHLOROBUTADIENE	10	9.93	1		99	20	12
91-20-3	NAPHTHALENE	10	9.88	1		99	20	6
87-61-6	1,2,3-TRICHLOROBENZENE	10	9.79	1		98	20	6

Surrogate Recovery LCS/LCSD

CASNO	Target Analyte	Spike Added	LCS % Rec.	LCS Flag	LCSD % Rec.	LCSD Flag	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	25	101		100		85 - 115
1868-53-7	DIBROMOFLUOROMETHANE	25	97		100		84 - 118
2037-26-5	TOLUENE-D8	25	98		97		85 - 115

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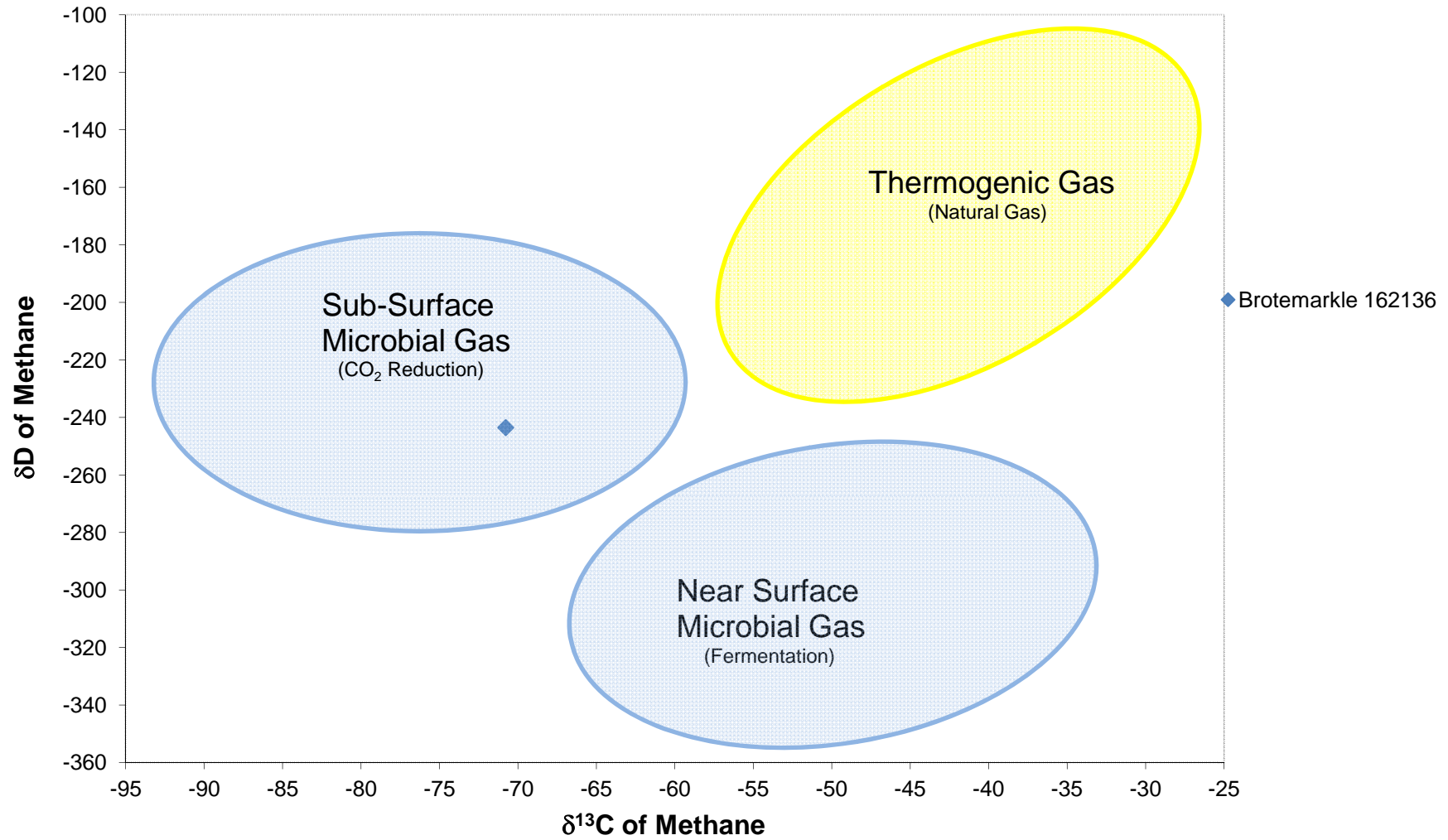
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Brotemarkle 162136



Lab #: 379358 Job #: 22813 IS-64384 Co. Job#:
 Sample Name: Brotemarkle 162136 Co. Lab#:
 Company: Colorado Oil & Gas Conservation
 Date Sampled: 9/06/2013
 Container: Dissolved Gas Bottle
 Field/Site Name: Project 434043
 Location: Sec 23 3N 66W Weld County, CO
 Formation/Depth:
 Sampling Point:
 Date Received: 9/10/2013 Date Reported: 9/18/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.124			
Hydrogen -----	nd			
Argon -----	1.18			
Oxygen -----	0.19			
Nitrogen -----	97.16			
Carbon Dioxide -----	0.19			
Methane -----	1.15	-70.78	-243.5	
Ethane -----	0.0027			
Ethylene -----	nd			
Propane -----	0.0008			
Propylene -----	nd			
Iso-butane -----	0.0002			
N-butane -----	0.0005			
Iso-pentane -----	0.0002			
N-pentane -----	0.0002			
Hexanes + -----	0.0002			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 12

Specific gravity, calculated: 0.968

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.