



January 7, 2010

Mr. Calvin Dupper
19575 Weld County Road 45
La Salle, Colorado 80645

RE: Water Quality Analytical Results for Domestic Water Well
19575 County Road 45
Section 27, – Township 4 North – Range 65 West
Weld County, Colorado

Dear Mr. Dupper:

On October 26, 2009, the Colorado Oil & Gas Conservation Commission (COGCC) sampled your water well and submitted the water samples to Evergreen Analytical Laboratory (Evergreen) in Wheat Ridge, Colorado for laboratory analysis of organic and inorganic compounds. The COGCC sampled your water well to determine if natural gas (thermogenic gas) from a nearby oil and gas well had impacted your water well. The COGCC has determined that another domestic water well in the area located at 22063 County Road 42 has been impacted by thermogenic gas. As a result, COGCC contacted residents in the area to get permission to collect water samples to determine if any other water wells had been affected. A copy of the Evergreen analytical report is included in Attachment A. Figure 1 illustrates the relative locations of water wells sampled by COGCC and the Dupper #2 gas well.

The Water Quality Control Commission (WQCC) of the Colorado Department of Public Health and Environment (CDPHE) has established drinking water standards for the protection of human health. The analytical results from the water samples from your water well were compared to applicable ground water and/or drinking water standards and are summarized below. These water standards were established for public drinking water supplies. Often people use and consume ground water from private wells that can exceed these standards.

COMPARISON OF INORGANIC ANALYTICAL RESULTS TO STANDARDS

(Please see enclosed Evergreen Laboratory Report, Attachment A)

- **Total Dissolved Solids (TDS):** CDPHE has established a TDS standard for human drinking water of 500 milligrams per liter (mg/l). The standard is referred to as the secondary maximum contaminant level (SMCL) 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. Although CDPHE does not have an agricultural standard for TDS, other agencies recommend concentrations below 2,000 mg/l for irrigation, and below 5,000 mg/l for most livestock watering. TDS concentrations are related to the presence of naturally occurring elements and chemical compounds such as chloride, sodium, potassium, calcium, magnesium,

and sulfate.

- **TDS was detected in the water sample from your water well at a concentration of 756 mg/l, which is greater than the CDPHE SMCL, less than the recommended maximum concentration for irrigation, and less than the recommended maximum concentration for most livestock watering.**
- **Sodium (Na):** Although CDPHE does not have a standard for sodium, people on salt restricted diets should be aware of the Na concentration in the water they drink. Drinking water with a concentration of sodium less than 20 mg/l is recommended by some for people on salt restricted diets or for people suffering from hypertension or heart disease. Sodium occurs naturally in the ground water in many areas at concentrations that exceed the recommended level.

Sodium was detected in the water sample from your water well at a concentration of 99.3 mg/l, which is greater than the recommended level for people on salt restricted diets.

- **Fluoride (F):** CDPHE has established a fluoride (F) standard for human drinking water is 4.0 mg/l. Where fluoride concentrations are in the range of 0.7 mg/l to 1.2 mg/l, health benefits such as reduced dental decay have been observed. Consumption of fluoride at concentrations of greater than 2.0 mg/l can result in mottling of teeth. Consumption of fluoride at concentrations greater than 4.0 mg/l can increase the risk of skeletal fluorosis or other adverse health effects.

Fluoride was detected in the water sample from your water well at a concentration of 1.3 mg/l, which is less than the CDPHE public drinking water standard.

- **Chloride (Cl):** The CDPHE chloride standard (SMCL) for drinking water is 250 mg/l. Chloride concentrations in excess of 250 mg/l usually produce a noticeable taste in drinking water.

Chloride was detected in the water sample from your water well at a concentration of 88.1 mg/l, which is less than the CDPHE SMCL.

- **Sulfate (SO₄):** The CDPHE sulfate standard for drinking water is 250 mg/l (SMCL). 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. Sulfate occurs naturally in the ground water in many areas in Colorado at concentrations that exceed the drinking water standard.

Sulfate was detected in the water sample from your water well at a concentration of 184 mg/l, which is less than the CDPHE SMCL.

- Total Nitrate (NO₃) + Nitrite (NO₂) as Nitrogen (N): The CDPHE total nitrate (NO₃) + nitrite (NO₂) as nitrogen (N) for standard for human drinking water is 10 mg/l. Nitrate and nitrite are common contaminants in ground water from agricultural sources, such as fertilizer and animal, including human, wastes. They are known to cause infant cyanosis or “blue baby disease” in humans and, at concentrations greater than 100 mg/l as nitrogen (N), may be dangerous to livestock. High concentrations of nitrate and nitrite in ground water are known to occur in agricultural areas in Colorado.

Total nitrate/nitrite as N was detected in the water sample from your water well at a concentration of 4.05 mg/l, which is less than the CDPHE public drinking water standard.

- Iron (Fe): The CDPHE standard for human drinking water for iron is 0.3 mg/l (SMCL). Small amounts of iron are common in ground water. Iron may produce a brownish-red color in laundered clothing, can leave reddish stains on fixtures, and impart a metallic taste to beverages and food made with it. After a period of time iron deposits can build up in pressure tanks, water heaters, and pipelines, reducing the effective flow rate and efficiency of the water supply.

Iron was not detected in the water sample from your water well.

- Selenium (Se): The CDPHE selenium standard for human drinking water is 0.05 mg/l and the agricultural standard is 0.02 mg/l. Excessive selenium (Se) (concentrations greater than 0.05 mg/l) can cause loss of hair and/or fingernails as well as adverse effects on the central nervous system. Selenium (Se) occurs naturally in the ground water in many areas of Colorado at concentrations that exceed the drinking water standard.

Selenium was not detected in the water sample from your water well.

- Bromide (Br), Calcium (Ca), Potassium (K), Magnesium (Mg), Manganese (Mn), Bicarbonate (HCO₃) and Carbonate (CO₃) were also tested for in your water. There are no standards from CDPHE for these parameters. In addition, the COGCC also collected samples for metals and Table 1 presents the analytical laboratory results. Please note that Primary standard (P) is the CDPHE Human Health Standard and the Secondary standard (S) is the CDPHE secondary maximum contaminant level (SMCL).

Table 1
DUPPER WATER WELL

METAL/INORGANIC	October 26, 2009 Sample Concentration (in Milligrams per liter [mg/l]) (B – Analyte detected in the Method Blank)	CDPHE Water Quality Standard (P – Primary S-Secondary) (in Milligrams per liter [mg/l])
Arsenic	ND	0.01 (P)
Barium	0.0369	2.0 (P)
Bicarbonate	250	NS
Bromide	0.36	NS
Cadmium	ND	0.005 (P)
Calcium	89.4	NS
Carbonate	ND	NS
Chloride	88.1	250 (S)
Chromium	ND	0.1 (P)
Fluoride	1.3	4.0 (P)
Iron	ND	0.3 (S)
Potassium	3.83	NS
Lead	ND	0.05 (P)
Manganese	ND	0.05 (S)
Magnesium	34.2	NS
Nitrate (NO₃-N)	4.05	10.0 (P)
Nitrite (NO₂-N)	ND	1.0 (P)
pH	7.39	NS
Selenium (Se)	ND	0.05 (P)
Sodium (Na)	99.3	NS
Specific Conductance	936	NS
Sulfate (SO₄)	184	250 (S)
Total Dissolved Solids	756	500 (S)

ND – not detected in the sample

NS – no standard

ORGANIC COMPOUNDS ASSOCIATED WITH PETROLEUM HYDROCARBONS
(see Page 8 of Attachment A)

- Benzene: CDPHE's basic ground water standard for benzene is 5 micrograms per liter (µg/l).
Benzene was not detected in the sample from your water well.
- Toluene: CDPHE's basic ground water standard for toluene is 1,000 µg/l.
Toluene was not detected in the sample from your water well.

- Ethylbenzene: CDPHE's basic ground water standard for ethylbenzene is 700 µg/l. **Ethylbenzene was not detected in the sample from your water well.**
- Total Xylenes (sum of m,p, and o-xylene): CDPHE's basic ground water standard for total xylenes is 10,000 µg/l. **Total xylenes were not detected in the sample from your water well.**

METHANE GAS CONCENTRATION

- **Methane was detected in the sample from your water well at a concentration of 0.00087 mg/l, which is below the COGCC action level of 2 mg/l.**

Methane gas alone is physiologically inert and non-toxic to humans. Normal breath exhalation contains 1 to 99 ppm of methane (parts per million [ppm] is the same units as mg/l). 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 may 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, then pockets of free gas form within the water and cause the well pump to cavitate and no longer bring water to the surface.

Methane gas is common in water wells in Colorado. It occurs naturally and the source of the methane is commonly from one or more of the sources listed below.

1. Methane is commonly found as a gas in coal or black shale seams in the subsurface.
2. Methane is commonly found as a byproduct of the decay of organic matter and the presence of bacteria in water wells can provide the conditions favorable for the production of methane either from the activity or decay of bacteria.

As the result 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 concentration levels in well water at 7 mg/l and higher.

BACTERIA OCCURENCE

Terracon also collected samples of your well water for the determination of the presence of bacteria using the Biological Activity Reaction Test (**BARTTM**) for the following; Iron Related Bacteria (IRB), Sulfate Reducing Bacteria (SRB), and Slime Forming Bacteria (SFB). In addition, an estimation of the size of the population and/or the rate at which they can metabolize and/or

grow to generate an observable change or reaction was made. Your well water showed the presence of the IRB and SFB (see Attachment B).

Iron Related Bacteria: Although not usually harmful, iron related bacteria (IRB) can become a nuisance by plugging the well pump, causing red staining on plumbing fixtures and laundered clothing, building up red, slimy accumulations on any surface the water touches, and causing what may appear to be a oily sheen on standing water. In rare cases, IRB may cause sickness.

- **IRB bacteria were detected in the water sample from your well.**

Sulfate Reducing Bacteria: Sulfate reducing bacteria (SRB) are serious nuisance organisms in water since they can cause severe taste and odor problems. These bacteria reduce sulfate that occurs naturally in the water and generate hydrogen sulfide (H₂S) gas as they grow. In turn, the hydrogen sulfide (H₂S) gas is a nuisance because it smells like rotten eggs, it initiates corrosion on metal surfaces, and it reacts with dissolved metals such as iron to generate black sulfide deposits.

- **SRB bacteria were not detected in the water sample from your well.**

Slime Forming Bacteria: Although not usually harmful, Slime Forming Bacteria (SFB) also can become a nuisance by plugging well pumps and causing slimy accumulations on plumbing fixtures and standing water. Slimes often are gelatinous in nature and may range in color from white, to red, to black. As slime bacteria mats grow they create an environment in which complex associations of other strains of bacteria can develop.

- **SFB bacteria were detected in the water sample from your well.**

WATER WELL DISCUSSION/RECORDS REVIEW

The water well is located in the northcentral part of the Laramie-Fox Hills aquifer. It is our understanding that the well was drilled in 1970, is approximately 85 feet deep, and is completed in the Laramie-Fox Hills aquifer. Water from the well is a sodium bicarbonate type of water typical of the central and northcentral regions of this aquifer (*Chapter 6, Section 6.1- Denver Basin, Ground Water Atlas of Colorado, Colorado Geological Survey Special Publication 53, 2003*).

CONCLUSION

Dissolved methane was not detected in the well water sample above the COGCC action level. There were no indications of any oil & gas related impacts to your water well.

With the exception of TDS, the water sample collected from your water well did not exceed the CDPHE primary or secondary drinking water standards for the constituents analyzed. TDS was

detected in the water sample from your water well at a concentration of 756 mg/l, which is above the CDPHE SMCL.

The positive iron related bacteria and slime forming bacteria result from your water well indicates that treating the well water for bacteria may improve water quality.

Based on the analytical results, the COGCC does not believe your water well has been affected by thermogenic gas that has impacted the other domestic water well in the area. If you have any questions or would like to discuss these results, please contact me at the COGCC via e-mail (john.axelson@state.co.us) or by phone at (303) 637-7178.

Respectfully,

John Axelson, P.G.
Environmental Protection Specialist, Northeast Region
Colorado Oil and Gas Conservation Commission

Enclosure(s) Figure 1 – Well Sampling Locations
Attachment A – Evergreen Laboratory Analytical Report
Attachment B – Residential Water Well Field Data Form and Biological Activity
Reaction Test Results

cc: Dave Neslin - COGCC Director
Debbie Baldwin - COGCC Environmental Manager
Stuart Ellsworth - COGCC Engineering Supervisor



LEGEND

- ★ - GAS WELL
- ▲ - IRRIGATION WELL
- ◆ - DOMESTIC WATER WELL

Project Mgr:	JCD	Project No.	25087038
Drawn By:	DJS	Scale:	1" = 2,000'
Checked By:	JCD	Date:	12/16/09
Approved By:	RP		

Terracon
Consulting Engineers and Scientists
301 N. HOWES FORT COLLINS, CO 80521
PH. (970) 484-0359 FAX. (970) 484-0454

**FIG. 1: ANDERSON COMPLAINT INVESTIGATION #200217527
WATER WELL SAMPLING LOCATIONS
COLORADO OIL and GAS CONSERVATION COMMISSION
1120 LINCOLN STREET, SUITE 801
DENVER, COLORADO**
File No. N:\Projects - Other Offices\Wheatridge - Office No. 25\25087038\25087038-1.dwg

FIG. No.

1

ATTACHMENT A
EVERGREEN LABORATORY ANALYTICAL REPORT

001

WORK ORDER Summary**Evergreen Analytical, Inc.****09-8527****Rpt To:** John Axelson**Email To:** john.axelson@state.co.us

10/28/2009 10:46:43 AM

Colorado Oil & Gas Conservation
Commission9203 E 155th Dr
Brighton, CO 80602
(303) 637-7178**Client Project ID:****QC Level:** LEVEL I+**Comments:** Send PDF and EDD COGCC format.

Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Test Code	Test Name	Hold	MS	Date Due	Hold Time
09-8527-01A	Dupper	Drinking Water	10/26/09 1135	10/26/09	8021_W *	8021: BTEX	<input type="checkbox"/>	<input type="checkbox"/>	11/09/09	11/09/09
09-8527-01B	Dupper	Drinking Water	10/26/09 1135	10/26/09	200.7_T *	200.7: Total Metals	<input type="checkbox"/>	<input type="checkbox"/>	11/09/09	4/24/10
09-8527-01C	Dupper	Drinking Water	10/26/09 1135	10/26/09	200.7_D *	200.7: Dissolved Metals	<input type="checkbox"/>	<input type="checkbox"/>	11/09/09	4/24/10
09-8527-01D	Dupper	Drinking Water	10/26/09 1135	10/26/09	ANIONS_NonDW *	300.0: Anions by IC	<input type="checkbox"/>	<input type="checkbox"/>	11/09/09	10/28/09
09-8527-01D	Dupper	Drinking Water	10/26/09 1135	10/26/09	C/A_BAL	Cation / Anion Balance calculation	<input type="checkbox"/>	<input type="checkbox"/>	11/09/09	
09-8527-01E	Dupper	Drinking Water	10/26/09 1135	10/26/09	ALK_WGRP *	Alkalinity	<input type="checkbox"/>	<input type="checkbox"/>	11/09/09	11/09/09
09-8527-01F	Dupper	Drinking Water	10/26/09 1135	10/26/09	MEEP_W *	RSK175M: Methane	<input type="checkbox"/>	<input type="checkbox"/>	11/09/09	11/09/09
09-8527-01G	Dupper	Drinking Water	10/26/09 1135	10/26/09	COND_W	Specific Conductance @ 25°C	<input type="checkbox"/>	<input type="checkbox"/>	11/09/09	11/23/09
09-8527-01G	Dupper	Drinking Water	10/26/09 1135	10/26/09	F_W	Fluoride	<input type="checkbox"/>	<input type="checkbox"/>	11/09/09	11/23/09
09-8527-01G	Dupper	Drinking Water	10/26/09 1135	10/26/09	PH_DW	E150.1 pH	<input type="checkbox"/>	<input type="checkbox"/>	11/09/09	10/27/09
09-8527-01G	Dupper	Drinking Water	10/26/09 1135	10/26/09	TDS_W	Total Dissolved Solids (TDS)	<input type="checkbox"/>	<input type="checkbox"/>	11/09/09	11/02/09

Definitions: * - Test Code has a Select List

002
CLIENT INFORMATION

CHAIN OF CUSTODY RECORD / ANALYTICAL SERVICES AGREEMENT **

Page 1 of 1

Evergreen Analytical, An Accutest Company

Mail Original Report to: COGCC
Attn: John Axelsson
Address: 9203 East 155th Drive
City: Brighton State: CO Zip: 80602
Tel #: _____ Fax #: _____
E-mail: john.axelsson@state.co.us



4036 Youngfield St.
Wheat Ridge, Colorado 80033
(303) 425-6021
FAX (303) 425-6854
(877) 737-4521
info@evergreenanalytical.com

Report Results by: _____ (Date)*
Standard 2 working weeks ☐
UST Analyses per Fee Schedule ☐
* Rush: ☐ less than 24 hrs, 150% ☐ 1-2 work days, 100%
☐ 3-5 work days, 50% ☐ 6-9 work days, 25%
*Subject to surcharge & exceptions noted in fee schedule.

REPORT ALSO BY ☐ FAX ☐ PDF ☐ EDD

REPORT CHROMATOGRAMS ☐ NO

CONFIRMATION OF SAMPLE RECEIPT REQUIRED? ☐ YES

Mail Invoice to: _____
Attn: _____
Address: _____
City: _____ State: _____ Zip: _____
Tel #: _____ Fax #: _____

Project ID# _____
P.O. _____
Sampler: Chris Roy (Terrace)

NOTE: Identify Known Hazards Below

SAMPLE IDENTIFICATION DATE
DATE SAMPLED TIME

Dupper	10-26-07	11:35a	10	1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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Evergreen Analytical, Inc.

Date: 06-Nov-09

Lab Order: 09-8527

Client Project ID Dupper

CASE NARRATIVE

SAMPLE RECEIVING

Sample(s) were hand delivered to the laboratory by the client.

Custody seals were not present.

The temperature of the sample(s) upon arrival was 3.5°C.

Sample(s) were received in good condition, in the proper container, and within holding times.

Sample(s) were preserved properly.

VOC sample(s) were marked as preserved on the bottle labels.

VOC sample(s) were received with no headspace present. JD

QUALITY ASSURANCE (QA)

Analyses performed on samples in this work order by EAL meet the requirements of the EAL Quality Assurance Program unless otherwise explained. Analyses of RCRA and drinking water samples meet the requirements of NELAC and Utah Rule R444-14 unless otherwise explained. TP

CLIENT SERVICES

There are no anomalies to report. PM

GENERAL CHEMISTRY

Method E300.0: Due to high Chloride levels requiring dilutions to separate the Nitrite peak from the Chloride peak, the detection limit for Nitrite has been raised for the sample. There are no other anomalies to report. BNP/MM

METALS ANALYSIS

There are no anomalies to report. TP

GAS CHROMATOGRAPHY

Method 8021_W: There are no anomalies to report. LC

Method RSK175: There are no anomalies to report. AS

004

Evergreen Analytical, Inc.
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862
(303) 425-6021

Client Sample ID: Dupper	Lab Work Order: 09-8527
Client Project ID: Dupper	Lab Sample ID: 09-8527-01A
Date Collected: 10/26/2009	Sample Matrix: Drinking Water
Date Received: 10/26/2009	

AROMATIC VOLATILE ORGANICS

Method: SW8021B


Prep Method: SW5030B

Date Prepared: 10/27/2009	Lab File ID: TA2943.D\FID1A.CH	Dilution Factor: 1
Date Analyzed: 10/27/2009	Method Blank: MB2102709	

Analytes	CAS Number	Result	LQL	Units
Benzene	71-43-2	U	1.0	µg/L
Toluene	108-88-3	U	2.0	µg/L
Ethylbenzene	100-41-4	U	2.0	µg/L
m,p-Xylene	1330-20-7	U	2.0	µg/L
o-Xylene	95-47-6	U	2.0	µg/L
Surr: 1,2,4-Trichlorobenzene (S)	120-82-1	99	QC Limits: 60-140	%REC



Analyst



Approved

Notes: Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak. Confirmation analysis was not performed.

Qualifiers: B - Analyte detected in the associated Method Blank, value not subtracted from result
E - Extrapolated value. Value exceeds calibration range
H - Sample analysis exceeded analytical holding time
J - Indicates an estimated value when the compound is detected, but is below the LQL
S - Spike Recovery outside accepted limits
U - Compound analyzed for but not detected
X - See case narrative
* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

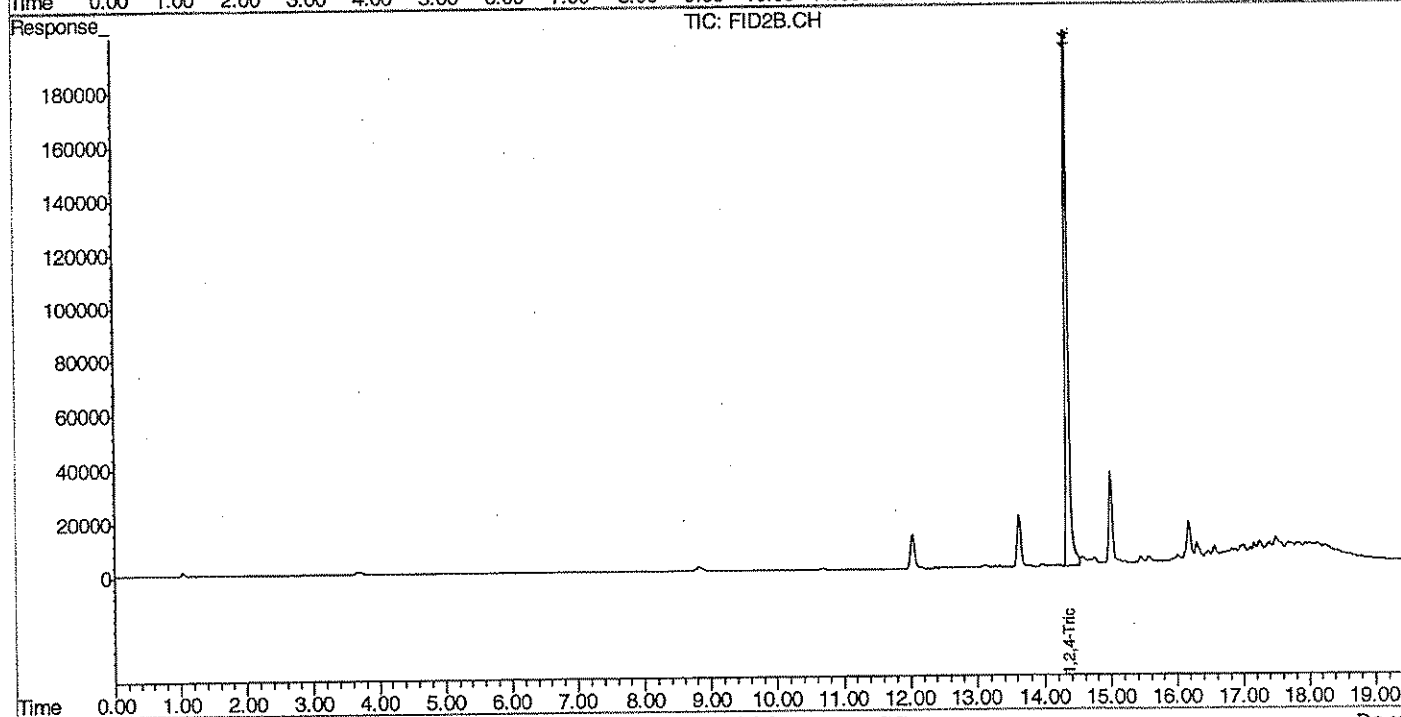
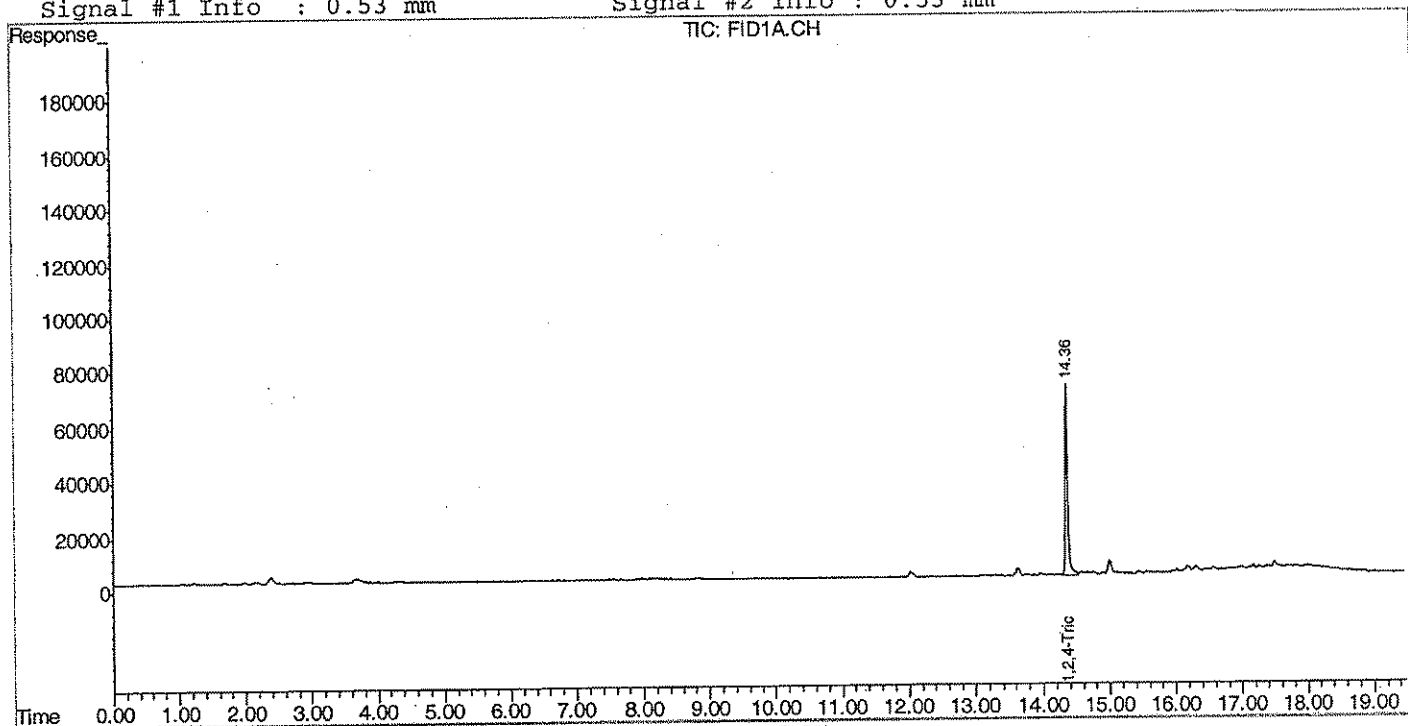
Definitions: LQL - Lower Quantitation Limit
Surr - Surrogate

Print Date: 10/28/2009

Signal #1 : Z:\102709\TA2943.D\FID1A.CH Vial: 12
Signal #2 : Z:\102709\TA2943.D\FID2B.CH
Acq On : 27 Oct 2009 6:30 pm Operator: laurac
Sample : 09-8527-01A Inst : TVHBTEX2
Misc : ,SAMP,8021_W,TVH_W,1,GC324,GTA156,,,,,1 Multiplr: 1.00
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E
Quant Time: Oct 28 11:06 2009 Quant Results File: TW2101709.RES

Quant Method : C:\MSDCHEM\1\METHODS\TW2101709.M (Chemstation Integrator)
Title : 8015B/8021B TVH/BTEX
Last Update : Wed Oct 28 09:14:53 2009
Response via : Multiple Level Calibration
DataAcq Meth : TVB2.M

Volume Inj. :
Signal #1 Phase : DB-624 Signal #2 Phase: DB-624
Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm



906

Evergreen Analytical, Inc.
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862
(303) 425-6021

Client Sample ID: Dupper
Client Project ID: Dupper
Date Collected: 10/26/09
Date Received: 10/26/09

Lab Work Order: 09-8527
Lab Sample ID: 09-8527-01
Sample Matrix: Drinking Water

DISSOLVED METALS

Method: E200.7, Rev. 4.4

Prep Method: E200.7/SW3010A

Date Prepared: 10/28/09
Date Analyzed: 10/28/09

Lab File ID: 102809AM
Method Blank: MB-21335

Dilution Factor: 1
Lab Fraction ID: 09-8527-01C

Analytes	CAS Number	Result	LQL	Units
Calcium	7440-70-2	89.4	0.387	mg/L
Iron	7439-89-6	U	0.0700	mg/L
Magnesium	7439-95-4	34.2	0.150	mg/L
Potassium	7440-09-7	3.83	0.340	mg/L
Sodium	7440-23-5	99.3	0.400	mg/L

TOTAL METALS

Method: E200.7, Rev. 4.4

Prep Method: E200.7, Rev. 4.4


Date Prepared: 11/4/09
Date Analyzed: 11/5/09

Lab File ID: 110509AM
Method Blank: MB-21411

Dilution Factor: 1
Lab Fraction ID: 09-8527-01B

Analytes	CAS Number	Result	LQL	Units
Arsenic	7440-38-2	U	0.0500	mg/L
Barium	7440-39-3	0.0369	0.00200	mg/L
Cadmium	7440-43-9	U	0.0100	mg/L
Chromium	7440-47-3	U	0.0100	mg/L
Lead	7439-92-1	U	0.0730	mg/L
Manganese	7439-96-5	U	0.00500	mg/L
Selenium	7782-49-2	U	0.100	mg/L


Analyst


Approved

Qualifiers: B - Analyte detected in the associated Method Blank, value not subtracted from result
E - Extrapolated value. Value exceeds calibration range
H - Sample analysis exceeded analytical holding time
J - Indicates an estimated value when the compound is detected, but is below the LQL
S - Spike Recovery outside accepted limits
U - Compound analyzed for but not detected
X - See case narrative
* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

Definitions: NA - Not Applicable
LQL - Lower Quantitation Limit
Surr - Surrogate

Print Date: 11/6/2009

007

Evergreen Analytical, Inc.
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862
(303) 425-6021

Client Sample ID: Dupper
Client Project ID: Dupper
Date Collected: 10/26/09 1135
Date Received: 10/26/09

Lab Work Order: 09-8527
Lab Sample ID: 09-8527-01
Sample Matrix: Drinking Water

ANIONS BY IC

Method: E300.0

Prep Method:

Date Prepared: 10/27/09
Date Analyzed: 10/27/09 1302

Lab File ID: 08
Method Blank: MB 10/27/09

Dilution Factor: 1
Lab Fraction ID: 09-8527-01D

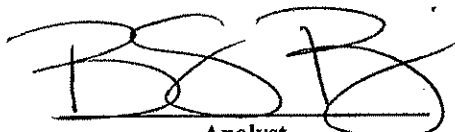
Analytes	CAS Number	Result	LQL	Units
Bromide	7647-15-6	0.36	0.20	mg/L

Date Prepared: 10/27/09
Date Analyzed: 10/27/09 1711

Lab File ID: 16
Method Blank: MB 10/27/09

Dilution Factor: 5
Lab Fraction ID: 09-8527-01D

Analytes	CAS Number	Result	LQL	Units
Chloride	7647-14-5	88.1	2.5	mg/L
Nitrite-N		U	0.31	mg/L
Nitrate-N		4.05	0.23	mg/L
Nitrite+Nitrate-N		4.05	0.31	mg/L
Sulfate	7778-80-2	184	2.5	mg/L


Analyst


Approved

Qualifiers: B - Analyte detected in the associated Method Blank, value not subtracted from result
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H - Sample analysis exceeded analytical holding time
J - Indicates an estimated value when the compound is detected, but is below the LQL
S - Spike Recovery outside accepted limits
U - Compound analyzed for but not detected
X - See case narrative
* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

Definitions: NA - Not Applicable
LQL - Lower Quantitation Limit
Surr - Surrogate

Print Date: 10/28/2009

ACCUTEST MOUNTAIN STATES LABORATORY

4036 Youngfield St., Wheat Ridge, CO 80033
(303)425-6021

Anion-Cation (Ion) Balance - Method 1030, Standard Methods, 20th Ed.

EAL Sample ID	09-8527-01D		09-		09-		09-		09-	
Client Sample ID	Dupper									
Sample Result	mg/L	Meq/L	mg/L	Meq/L	mg/L	Meq/L	mg/L	Meq/L	mg/L	Meq/L
Anions										
Cl	88.1	2.485		0.000		0.000		0.000		0.000
SO ₄	184	3.831		0.000		0.000		0.000		0.000
HCO ₃ as CaCO ₃	250	4.996		0.000		0.000		0.000		0.000
CO ₃ as CaCO ₃		0.000		0.000		0.000		0.000		0.000
NO ₃		0.000		0.000		0.000		0.000		0.000
NO ₃ as N	4.05	0.289		0.000		0.000		0.000		0.000
Other		0.000		0.000		0.000		0.000		0.000
Anions Total		11.601		0.000		0.000		0.000		0.000
Cations										
Ca	89.4	4.461		0.000		0.000		0.000		0.000
Mg	34.20	2.814		0.000		0.000		0.000		0.000
K	3.83	0.098		0.000		0.000		0.000		0.000
Na	99	4.319		0.000		0.000		0.000		0.000
Other		0.000		0.000		0.000		0.000		0.000
Cations Total		11.693		0.000		0.000		0.000		0.000
Ion Balance										
% Difference	0.39									

$$\% \text{ difference} = 100 \times \frac{(\text{sum cations} - \text{sum anions})}{(\text{sum cations} + \text{sum anions})}$$

RAK

Approved

600

Evergreen Analytical, Inc.
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862
(303) 425-6021

Client Sample ID: Dupper
Client Project ID: Dupper
Date Collected: 10/26/09 1135
Date Received: 10/26/09

Lab Work Order 09-8527
Lab Sample ID: 09-8527-01
Sample Matrix: Drinking Water

ALKALINITY

Method: SM2320B

Prep Method:

Date Prepared: 10/27/09
Date Analyzed: 10/27/09

Lab File ID: 64
Method Blank: MBLK 10/27/09

Dilution Factor: 1
Lab Fraction ID: 09-8527-01E

Analytes	CAS Number	Result	LQL	Units
Total Alkalinity		250	5.0	mg/L CaCO ₃
Bicarbonate		250	5.0	mg/L CaCO ₃
Carbonate		U	5.0	mg/L CaCO ₃

SPECIFIC CONDUCTANCE @ 25°C

Method: SM2510 B

Prep Method:

Date Prepared: 10/27/09
Date Analyzed: 10/27/09

Lab File ID: 78

Dilution Factor: 1
Lab Fraction ID: 09-8527-01G

Analytes	CAS Number	Result	LQL	Units
Specific Conductance		936	1.00	µmhos/cm

FLUORIDE

Method: SM 4500-F C

Prep Method:

Date Prepared: 11/4/09
Date Analyzed: 11/4/09

Lab File ID: 138
Method Blank: MBLK 11/4/09

Dilution Factor: 1
Lab Fraction ID: 09-8527-01G

Analytes	CAS Number	Result	LQL	Units
Fluoride	16984-48-8	1.3	0.20	mg/L

E150.1 PH

Method: E150.1


Prep Method:

Date Prepared: 10/26/09
Date Analyzed: 10/26/09 1550

Dilution Factor: 1
Lab Fraction ID: 09-8527-01G

Analytes	CAS Number	Result	LQL	Units
pH		7.39	1.00	pH Units


Analyst


Approved

Qualifiers: B - Analyte detected in the associated Method Blank, value not subtracted from result
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J - Indicates an estimated value when the compound is detected, but is below the LQL
S - Spike Recovery outside accepted limits
U - Compound analyzed for but not detected
X - See case narrative
* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

Definitions: NA - Not Applicable
LQL - Lower Quantitation Limit
Surr - Surrogate

Print Date: 11/6/2009

Evergreen Analytical, Inc.
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862
(303) 425-6021

010

Client Sample ID: Dupper
Client Project ID: Dupper
Date Collected: 10/26/09 1135
Date Received: 10/26/09

Lab Work Order 09-8527
Lab Sample ID: 09-8527-01
Sample Matrix: Drinking Water

TOTAL DISSOLVED SOLIDS (TDS)

Method: SM 2540C

Prep Method:

Date Prepared: 11/2/09
Date Analyzed: 11/2/09

Lab File ID: 4
Method Blank: MBLK 11/2/09

Dilution Factor: 1
Lab Fraction ID: 09-8527-01G

Analytes	CAS Number	Result	LQL	Units
Total Dissolved Solids		756	10.0	mg/L



Analyst



Approved

Qualifiers: B - Analyte detected in the associated Method Blank, value not subtracted from result
E - Extrapolated value. Value exceeds calibration range
H - Sample analysis exceeded analytical holding time
J - Indicates an estimated value when the compound is detected, but is below the LQL
S - Spike Recovery outside accepted limits
U - Compound analyzed for but not detected
X - See case narrative
* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

Definitions: NA - Not Applicable
LQL - Lower Quantitation Limit
Surr - Surrogate

Print Date: 11/6/2009

Evergreen Analytical, Inc.
4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862
(303) 425-6021

Client Project ID Dupper

Lab Order: 09-8527

Units: mg/L

**RSKSOP-175M Headspace
Methane**

Method: RSKSOP175M

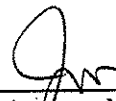
Prep Method: RSKSOP175M

Lab ID	Client ID	Matrix	Date Received	Collection Date	Date Prepared	Date Analyzed	Results	LQL	DF
09-8527-01F	Dupper	Drinking Water	10/26/09	10/26/09	10/28/09	10/28/09	0.00087	0.00080	1

Comments:



Analyst



Approved

Qualifiers: J - Indicates an estimated value when the compound is detected, but is below the LQL
H - Sample analysis exceeded analytical holding time
U - Compound analyzed for but not detected
X - See case narrative
* - Value exceeds Maximum Contamination Level(MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

Definitions: DF - Dilution Factor
LQL - Lower Quantitation Limit

Print Date: 10/28/09

QUALITY ASSURANCE REPORTS

METHOD BLANKS (MB)

LABORATORY CONTROL SPIKES (LCS)

MATRIX SPIKES (MS/MSD)*

DUPLICATES (DUP)*

- **For Metals or Wet Chemistry analyses: only included if requested.**

Evergreen Analytical, Inc.

Date: 28-Oct-09

Work Order: 09-8527

Client Project ID: Dupper

ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_W

Sample ID: MB2102709		SampType: MBLK	TestCode: 8021_W		Run ID: TVHBTEX2_091027A		Prep Date: 10/27/2009		Units: µg/L		
		Batch ID: R50945	TestNo: SW8021B		FileID: TA2934.D\FID1A.CH		Analysis Date: 10/27/2009		SeqNo: 930000		
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	U	1.0									
Toluene	U	2.0									
Ethylbenzene	U	2.0									
m,p-Xylene	U	2.0									
o-Xylene	U	2.0									
Surr: 1,2,4-Trichlorobenzene (S)	106.6	0	100	0	107	60	140	0	0		

Sample ID: LCS2102709		SampType: LCS	TestCode: 8021_W		Run ID: TVHBTEX2_091027A		Prep Date: 10/27/2009		Units: µg/L		
		Batch ID: R50945	TestNo: SW8021B		FileID: TA2935.D\FID1A.CH		Analysis Date: 10/27/2009		SeqNo: 930001		
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	27.51	1.0	27.2	0	101	70	130	0	0		
Toluene	195.6	2.0	211.6	0	92.4	70	130	0	0		
Ethylbenzene	45.97	2.0	45.6	0	101	70	130	0	0		
m,p-Xylene	148.6	2.0	150	0	99	70	130	0	0		
o-Xylene	67.09	2.0	65.9	0	102	70	130	0	0		
Surr: 1,2,4-Trichlorobenzene (S)	114.9	0	100	0	115	60	140	0	0		

Sample ID: 09-8526-01AMS		SampType: MS	TestCode: 8021_W		Run ID: TVHBTEX2_091027A		Prep Date: 10/27/2009		Units: µg/L		
		Batch ID: R50945	TestNo: SW8021B		FileID: TA2937.D\FID1A.CH		Analysis Date: 10/27/2009		SeqNo: 930003		
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	27.95	1.0	27.2	0	103	70	130	0	0		
Toluene	197.2	2.0	211.6	0	93.2	70	130	0	0		
Ethylbenzene	46.41	2.0	45.6	0	102	62	130	0	0		
m,p-Xylene	149.5	2.0	150	0	99.7	70	134	0	0		
o-Xylene	67.44	2.0	65.9	0	102	63	130	0	0		
Surr: 1,2,4-Trichlorobenzene (S)	119.6	0	100	0	120	60	140	0	0		

Qualifiers:

U - Not detected at or above the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside acceptance limits
 E - Extrapolated value, value exceeds calibration range.

R - RPD outside acceptance limits
 B - Analyte detected in the associated Method Blank
 H - Prep or analytical holding time exceeded
 X - See case narrative

Work Order: 09-8527

Client Project ID: Dupper

ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_W

Sample ID: 09-8526-01AMSD		SampType: MSD		TestCode: 8021_W		Run ID: TVHBTEX2_091027A		Prep Date: 10/27/2009		Units: µg/L	
		Batch ID: R50945		TestNo: SW8021B		FileID: TA2938.D\FID1A.CH		Analysis Date: 10/27/2009		SeqNo: 930004	
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	28.51	1.0	27.2	0	105	70	130	27.95	1.96	30	
Toluene	199.6	2.0	211.6	0	94.3	70	130	197.2	1.22	30	
Ethylbenzene	46.98	2.0	45.6	0	103	62	130	46.41	1.21	30	
m,p-Xylene	151.6	2.0	150	0	101	70	134	149.5	1.39	30	
o-Xylene	68.1	2.0	65.9	0	103	63	130	67.44	0.968	30	
Surr: 1,2,4-Trichlorobenzene (S)	118.7	0	100	0	119	60	140	0	0	0	

Qualifiers:

U - Not detected at or above the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery outside acceptance limits

E - Extrapolated value, value exceeds calibration range.

R - RPD outside acceptance limits

B - Analyte detected in the associated Method Blank

H - Prep or analytical holding time exceeded

X - See case narrative

015

Evergreen Analytical, Inc.

Date: 06-Nov-09

Work Order: 09-8527

Client Project ID: Dupper

ANALYTICAL QC SUMMARY REPORT

BatchID: 21335

Sample ID: 09-8527-01CMS	SampType: MS	TestCode: 200.7_D	Run ID: ICP-OPTIMA 5300 DV_091028A	Prep Date: 10/28/2009	Units: mg/L						
Client ID: Dupper	Batch ID: 21335	TestNo: E200.7, Rev.	FileID: 102809AM	Analysis Date: 10/28/2009	SeqNo: 932662						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	100	0.48	12.5	89.41	85	75	125	100	0	0	
Iron	6.494	0.088	6.25	0	104	75	125	6.494	0	0	
Magnesium	47.69	0.19	12.5	34.2	108	75	125	47.69	0	0	
Potassium	17.79	0.43	12.5	3.831	112	75	125	17.79	0	0	
Sodium	114.3	0.50	12.5	99.28	120	75	125	114.3	0	0	

Sample ID: 09-8527-01CMSD	SampType: MSD	TestCode: 200.7_D	Run ID: ICP-OPTIMA 5300 DV_091028A	Prep Date: 10/28/2009	Units: mg/L						
Client ID: Dupper	Batch ID: 21335	TestNo: E200.7, Rev.	FileID: 102809AM	Analysis Date: 10/28/2009	SeqNo: 932663						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	99.61	0.48	12.5	89.41	81.5	75	125	0	0		
Iron	6.375	0.088	6.25	0	102	75	125	0	0		
Magnesium	47.49	0.19	12.5	34.2	106	75	125	0	0		
Potassium	17.62	0.43	12.5	3.831	110	75	125	0	0		
Sodium	113.9	0.50	12.5	99.28	117	75	125	0	0		

Sample ID: MB-21335	SampType: MBLK	TestCode: 200.7_DW	Run ID: ICP-OPTIMA 5300 DV_091028A	Prep Date: 10/28/2009	Units: mg/L						
	Batch ID: 21335	TestNo: E200.7, Rev.	FileID: 102809AM	Analysis Date: 10/28/2009	SeqNo: 930639						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	0	0.39									
Iron	0	0.070									
Magnesium	0	0.15									
Potassium	0	0.34									
Sodium	U	0.40									

Qualifiers:

U - Not detected at or above the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside acceptance limits
 E - Extrapolated value, value exceeds calibration range.

R - RPD outside acceptance limits
 B - Analyte detected in the associated Method Blank
 H - Prep or analytical holding time exceeded
 X - See case narrative

016

Work Order: 09-8527

Client Project ID: Dupper

ANALYTICAL QC SUMMARY REPORT

BatchID: 21335

Sample ID: LCS-21335	SampType: LCS	TestCode: 200.7_DW	Run ID: ICP-OPTIMA 5300 DV_091028A	Prep Date: 10/28/2009	Units: mg/L						
	Batch ID: 21335	TestNo: E200.7, Rev.	FileID: 102809AM	Analysis Date: 10/28/2009	SeqNo: 930640						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	10.16	0.39	10	0	102	85	115	0	0		
Iron	5.03	0.070	5	0	101	85	115	0	0		
Magnesium	9.677	0.15	10	0	96.8	85	115	0	0		
Potassium	9.935	0.34	10	0	99.4	85	115	0	0		
Sodium	9.848	0.40	10	0.2016	98.5	85	115	0	0		

Qualifiers:

U - Not detected at or above the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside acceptance limits
E - Extrapolated value, value exceeds calibration range.

R - RPD outside acceptance limits
B - Analyte detected in the associated Method Blank
H - Prep or analytical holding time exceeded
X - See case narrative

017

Work Order: 09-8527

Client Project ID: Dupper

ANALYTICAL QC SUMMARY REPORT

BatchID: 21411

Sample ID: MB-21411	SampType: MBLK	TestCode: 200.7_T	Run ID: ICP-OPTIMA 5300 DV_091105A	Prep Date: 11/4/2009	Units: mg/L						
	Batch ID: 21411	TestNo: E200.7, Rev.	FileID: 110509AM	Analysis Date: 11/5/2009	SeqNo: 932441						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	U	0.0500									
Barium	U	0.00200									
Cadmium	U	0.0100									
Chromium	U	0.0100									
Lead	U	0.0730									
Manganese	U	0.00500									
Selenium	U	0.100									

Sample ID: LCS-21411	SampType: LCS	TestCode: 200.7_T	Run ID: ICP-OPTIMA 5300 DV_091105A	Prep Date: 11/4/2009	Units: mg/L						
	Batch ID: 21411	TestNo: E200.7, Rev.	FileID: 110509AM	Analysis Date: 11/5/2009	SeqNo: 932442						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	2.109	0.0500	2	0	105	85	115	0	0		
Barium	5.142	0.00200	5	0	103	85	115	0	0		
Cadmium	0.2008	0.0100	0.2	0	100	85	115	0	0		
Chromium	2.014	0.0100	2	0	101	85	115	0	0		
Lead	2.027	0.0730	2	0	101	85	115	0	0		
Manganese	2.002	0.00500	2	0	100	85	115	0	0		
Selenium	2.187	0.100	2	0	109	85	115	0	0		

Sample ID: 09-8527-01BMS	SampType: MS	TestCode: 200.7_T	Run ID: ICP-OPTIMA 5300 DV_091105A	Prep Date: 11/4/2009	Units: mg/L						
Client ID: Dupper	Batch ID: 21411	TestNo: E200.7, Rev.	FileID: 110509AM	Analysis Date: 11/5/2009	SeqNo: 932444						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	2.364	0.0556	2.222	0	106	75	125	0	0		
Barium	5.933	0.00222	5.556	0.03686	106	75	125	0	0		
Cadmium	0.2309	0.0111	0.2222	0	104	75	125	0	0		
Chromium	2.159	0.0111	2.222	0	97.2	75	125	0	0		
Lead	2.324	0.0811	2.222	0	105	75	125	0	0		
Manganese	2.066	0.00556	2.222	0	93	75	125	0	0		

Qualifiers:

U - Not detected at or above the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside acceptance limits
E - Extrapolated value, value exceeds calibration range.

R - RPD outside acceptance limits
B - Analyte detected in the associated Method Blank
H - Prep or analytical holding time exceeded
X - See case narrative

018

Work Order: 09-8527

Client Project ID: Dupper

ANALYTICAL QC SUMMARY REPORT

BatchID: 21411

Sample ID: 09-8527-01BMS	SampType: MS	TestCode: 200.7_T	Run ID: ICP-OPTIMA 5300 DV_091105A	Prep Date: 11/4/2009	Units: mg/L						
Client ID: Dupper	Batch ID: 21411	TestNo: E200.7, Rev.	FileID: 110509AM	Analysis Date: 11/5/2009	SeqNo: 932444						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Selenium	2.36	0.111	2.222	0	106	75	125	0	0		
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Sample ID: 09-8527-01BMSD	SampType: MSD	TestCode: 200.7_T	Run ID: ICP-OPTIMA 5300 DV_091105A	Prep Date: 11/4/2009	Units: mg/L						
Client ID: Dupper	Batch ID: 21411	TestNo: E200.7, Rev.	FileID: 110509AM	Analysis Date: 11/5/2009	SeqNo: 932445						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	2.387	0.0556	2.222	0	107	75	125	2.364	0.954	20	
Barium	5.929	0.00222	5.556	0.03686	106	75	125	5.933	0.0528	20	
Cadmium	0.2327	0.0111	0.2222	0	105	75	125	0.2309	0.754	20	
Chromium	2.17	0.0111	2.222	0	97.6	75	125	2.159	0.472	20	
Lead	2.329	0.0811	2.222	0	105	75	125	2.324	0.202	20	
Manganese	2.076	0.00556	2.222	0	93.4	75	125	2.066	0.482	20	
Selenium	2.386	0.111	2.222	0	107	75	125	2.36	1.06	20	

Qualifiers:

U - Not detected at or above the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside acceptance limits
 E - Extrapolated value, value exceeds calibration range.

R - RPD outside acceptance limits
 B - Analyte detected in the associated Method Blank
 H - Prep or analytical holding time exceeded
 X - See case narrative

019

Work Order: 09-8527

Client Project ID: Dupper

ANALYTICAL QC SUMMARY REPORT

BatchID: R50933

Sample ID: MB 10/27/09	SampType: MBLK	TestCode: anions_w	Run ID: IC-2000_091027A	Prep Date: 10/27/2009	Units: mg/L						
	Batch ID: R50933	TestNo: E300.0	FileID: 06	Analysis Date: 10/27/2009	SeqNo: 929741						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0	0.50									
Nitrite-N	0	0.0040									
Nitrate-N	0	0.010									
Nitrite+Nitrate-N	0	0.010									
Sulfate	0	0.50									

Sample ID: LCS ALLT218099	SampType: LCS	TestCode: anions_w	Run ID: IC-2000_091027A	Prep Date: 10/27/2009	Units: mg/L						
	Batch ID: R50933	TestNo: E300.0	FileID: 05	Analysis Date: 10/27/2009	SeqNo: 929740						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	18.8	2.5	20	0	94	90	110	0	0		
Nitrite-N	6.159	0.020	6.09	0	101	90	110	0	0		
Nitrate-N	4.266	0.050	4.518	0	94.4	90	110	0	0		
Nitrite+Nitrate-N	10.42	0.050	10.61	0	98.3	90	110	0	0		
Sulfate	29.24	2.5	30	0	97.5	90	110	0	0		

Qualifiers:

U - Not detected at or above the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside acceptance limits
 E - Extrapolated value, value exceeds calibration range.

R - RPD outside acceptance limits
 B - Analyte detected in the associated Method Blank
 H - Prep or analytical holding time exceeded
 X - See case narrative

Work Order: 09-8527

Client Project ID: Dupper

ANALYTICAL QC SUMMARY REPORT

TestCode: ALK_WGRP

Sample ID	MBLK 10/27/09	SampType: MBLK	TestCode: ALK_WGRP	Run ID: ALK_091027A	Prep Date: 10/27/2009	Units: mg/L CaCO3						
		Batch ID: R50910	TestNo: SM2320B	FileID: 50	Analysis Date: 10/27/2009	SeqNo: 929303						
Analyte		Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Alkalinity U 5.0

Sample ID	LCS	SampType: LCS	TestCode: ALK_WGRP	Run ID: ALK_091027A	Prep Date: 10/27/2009	Units: mg/L CaCO3						
		Batch ID: R50910	TestNo: SM2320B	FileID: 51	Analysis Date: 10/27/2009	SeqNo: 929304						
Analyte		Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Alkalinity 101.5 5.0 100 0 102 90 110 0 0

Qualifiers:

U - Not detected at or above the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside acceptance limits
E - Extrapolated value, value exceeds calibration range.

R - RPD outside acceptance limits
B - Analyte detected in the associated Method Blank
H - Prep or analytical holding time exceeded
X - See case narrative

021

Work Order: 09-8527

Client Project ID: Dupper

ANALYTICAL QC SUMMARY REPORT

TestCode: COND_W

Sample ID	LCS	SampType: LCS	TestCode: COND_W	Run ID: COND_091027A	Prep Date: 10/27/2009	Units: µmhos/cm						
		Batch ID: R50915	TestNo: SM2510 B	FileID: 73	Analysis Date: 10/27/2009	SeqNo: 929366						
Analyte		Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance		95.7	1.00	101.2	0	94.6	90	110	0	0		

Qualifiers:

U - Not detected at or above the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside acceptance limits
E - Extrapolated value, value exceeds calibration range.

R - RPD outside acceptance limits
B - Analyte detected in the associated Method Blank
H - Prep or analytical holding time exceeded
X - See case narrative

Work Order: 09-8527

Client Project ID: Dupper

ANALYTICAL QC SUMMARY REPORT

TestCode: F_W

Sample ID	MBLK 11/4/09	SampType: MBLK	TestCode: F_W	Run ID: F_091104A	Prep Date: 11/4/2009	Units: mg/L
		Batch ID: R51070	TestNo: SM 4500-F C	FileID: 134	Analysis Date: 11/4/2009	SeqNo: 932081
Analyte		Result	LQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Fluoride		U	0.20			

Sample ID	LCS	SampType: LCS	TestCode: F_W	Run ID: F_091104A	Prep Date: 11/4/2009	Units: mg/L
		Batch ID: R51070	TestNo: SM 4500-F C	FileID: 135	Analysis Date: 11/4/2009	SeqNo: 932082
Analyte		Result	LQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Fluoride		9.827	0.20	10	0	98.3 95 105 0 0

Qualifiers:

U - Not detected at or above the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside acceptance limits
E - Extrapolated value, value exceeds calibration range.

R - RPD outside acceptance limits
B - Analyte detected in the associated Method Blank
H - Prep or analytical holding time exceeded
X - See case narrative

023

Work Order: 09-8527

Client Project ID: Dupper

ANALYTICAL QC SUMMARY REPORT

TestCode: PH_DW

Sample ID	LCS-R50895	SampType: LCS	TestCode: PH_DW	Run ID: PH_091026C	Prep Date: 10/26/2009	Units: pH Units					
		Batch ID: R50895	TestNo: E150.1	FileID:	Analysis Date: 10/26/2009	SeqNo: 929039					
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	7.96	1.00	8	0	99.5	99.3	100.7	0	0		

Qualifiers:

U - Not detected at or above the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside acceptance limits
E - Extrapolated value, value exceeds calibration range.

R - RPD outside acceptance limits
B - Analyte detected in the associated Method Blank
H - Prep or analytical holding time exceeded
X - See case narrative

Work Order: 09-8527

Client Project ID: Dupper

ANALYTICAL QC SUMMARY REPORT

TestCode: TDS_W

Sample ID	MBLK 11/2/09	SampType: MBLK	TestCode: TDS_W	Run ID: ANALYTICAL BALANCE_091102A	Prep Date: 11/2/2009	Units: mg/L						
		Batch ID: R51051	TestNo: SM 2540C	FileID: 47	Analysis Date: 11/2/2009	SeqNo: 931855						
Analyte		Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Dissolved Solids	U	10.0
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Sample ID	LCS	SampType: LCS	TestCode: TDS_W	Run ID: ANALYTICAL BALANCE_091102A	Prep Date: 11/2/2009	Units: mg/L						
		Batch ID: R51051	TestNo: SM 2540C	FileID: 48	Analysis Date: 11/2/2009	SeqNo: 931856						
Analyte		Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Dissolved Solids	419	10.0	400	0	105	90	110	0	0
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Qualifiers:

U - Not detected at or above the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside acceptance limits
E - Extrapolated value, value exceeds calibration range.

R - RPD outside acceptance limits
B - Analyte detected in the associated Method Blank
H - Prep or analytical holding time exceeded
X - See case narrative

Evergreen Analytical, Inc.

Date: 28-Oct-09

Work Order: 09-8527

Client Project ID: Dupper

ANALYTICAL QC SUMMARY REPORT

TestCode: MEEP_W

Sample ID: GB102809	SampType: MBLK	TestCode: MEEP_W	Run ID: FID4_091028A	Prep Date: 10/28/09	Units: mg/L						
	Batch ID: GAS102809	TestNo: RSKSOP175	FileID: FB866	Analysis Date: 10/28/09	SeqNo: 930117						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	U	0.00080									

Sample ID: LCS102809	SampType: LCS	TestCode: MEEP_W	Run ID: FID4_091028A	Prep Date: 10/28/09	Units: mg/L						
	Batch ID: GAS102809	TestNo: RSKSOP175	FileID: FB867	Analysis Date: 10/28/09	SeqNo: 930118						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	0.5744	0.0080	0.5094	0	113	70	130	0	0		

Sample ID: LCSD102809	SampType: LCSD	TestCode: MEEP_W	Run ID: FID4_091028A	Prep Date: 10/28/09	Units: mg/L						
	Batch ID: GAS102809	TestNo: RSKSOP175	FileID: FB868	Analysis Date: 10/28/09	SeqNo: 930119						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	0.5969	0.0080	0.5094	0	117	70	130	0.5744	3.83	30	

Sample ID: 09-8527-01FMS	SampType: MS	TestCode: MEEP_W	Run ID: FID4_091028A	Prep Date: 10/28/09	Units: mg/L						
Client ID: Dupper	Batch ID: GAS102809	TestNo: RSKSOP175	FileID: FB879	Analysis Date: 10/28/09	SeqNo: 930111						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	0.5547	0.0080	0.5094	0.0008654	109	70	130	0	0		

Sample ID: 09-8527-01FMSD	SampType: MSD	TestCode: MEEP_W	Run ID: FID4_091028A	Prep Date: 10/28/09	Units: mg/L						
Client ID: Dupper	Batch ID: GAS102809	TestNo: RSKSOP175	FileID: FB880	Analysis Date: 10/28/09	SeqNo: 930112						
Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	0.557	0.0080	0.5094	0.0008654	109	70	130	0.5547	0.426	30	

Qualifiers:

U - Not detected at or above the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside acceptance limits
 E - Extrapolated value, value exceeds calibration range.

R - RPD outside acceptance limits
 B - Analyte detected in the associated Method Blank
 H - Prep or analytical holding time exceeded
 X - See case narrative

November 06, 2009

John Axelson
Colorado Oil & Gas Conservation Commission
9203 E 155th Dr
Brighton, CO 80602

Lab Work Order: 09-8527
Client Project ID: Dupper

Dear John Axelson:

Enclosed are the analytical results for the samples shown in the Laboratory Work Order Summary.

THE INVOICE WILL BE MAILED FROM OUR NEW JERSEY OFFICE UNDER SEPARATE COVER.


The enclosed data for testing performed at Accutest Laboratory (formerly Evergreen Analytical) have been reviewed for quality assurance. A case narrative is included to describe any anomalies associated with the samples or data.

Accutest will dispose of all samples 44 days from the sample receipt date. If you want samples returned, please advise us by mail or fax as soon as possible.

A copy of this project report and supporting data will be retained for a period of five years unless we are otherwise advised by you. A document retrieval charge will apply.

Thank you for using the services of Accutest Laboratories. If you have any questions concerning the analytical data, please contact me. Please direct other questions to Client Services.

Sincerely,



Joseph J Egry IV/ Tiffany Pham
Quality Assurance

ATTACHMENT B

RESIDENTIAL WATER WELL FIELD DATA FORM
AND
BIOLOGICAL ACTIVITY REACTION TEST RESULTS

**Terracon****Residential Water Well Field Data Form**

Project Name: COGCC - Environmental Support
Project Number: 25087038 Task 26

Permit No: 0040837

Owner: Norm Anderson

Address: 19575 Weld County Road 45
La Salle, Colorado

Location: SE 1/4, NE 1/4, Section 27, T4N, R65W

Date: 10/26/2009

Weather: Sunny, 50 degrees F

Well Owner Survey

Is there a holding tank for the well? Yes X No
Do you have a water softener/treatment system? Yes No X
Do you have an in-line filter? Yes No X
Sampling point upstream of pressure tank and treatment system? Yes No X

Location of well: Approximately 75 feet south of residence

Type of pump (jet, submersible, suction): Jet

Casing material and diameter: 5-inch PVC

Depth to Static Water Table (fluctuations): Approximately 15 - 20 feet

Description of area around well: Dirt driveway/grass agricultural residential property

Location and description of sample point: Dirt driveway/grass agricultural residential property

Pump start time: 11:15 AM

Time	Volume Purged (gal.)	PH (SI Units)	Spec Cond (ms/cm)	DO (mg/L)	Turbidity (NTU)	Temperature (°C)	Clarity	Other *
11:15 AM	0				None		V. clear	None
11:20 AM	5	7.81	0.824	3.57	None	11.74	V. clear	None
11:23 AM	8	7.72	0.825	3.03	None	11.77	V. clear	None
11:26 AM	11	7.63	0.826	2.70	None	11.84	V. clear	None

* odors (if any); effervescence (if any); produced sediment (if any); evidence of bacterial fouling (bioslimes or biofilms).

Field Sample ID: Dupper Collection Time: 11:35 AM Number of Containers: 11

Analyte	# of Containers	Container Size	Type	Analytical Method	Preservative
Dissolved Methane	3	40 ml	vial	RSKSOP-175M	4°C
Aromatic Volatile Organics	2	40 ml	vial	8021	HCl, 4°C
Dissolved Metals	1	250 ml	poly	200.7	4° C
Total Metals	1	250 ml	poly	200.7	HNO ₃ , 4° C
Spec. Cond., TDS, pH, Fluoride	1	1 L	poly	E150.1	4° C
Anions by IC	1	125 ml	poly	300	4° C
Alkalinity (Carbonate/bicarbonate)	1	250 ml	poly	CARB/BICAR	4°C
Isotopic Analysis	1	1 L	Plastic	NG-2	biocide, 4°C
Duplicate Sample Collected?	Yes:		No:	X	

Sampler: Chris Roy

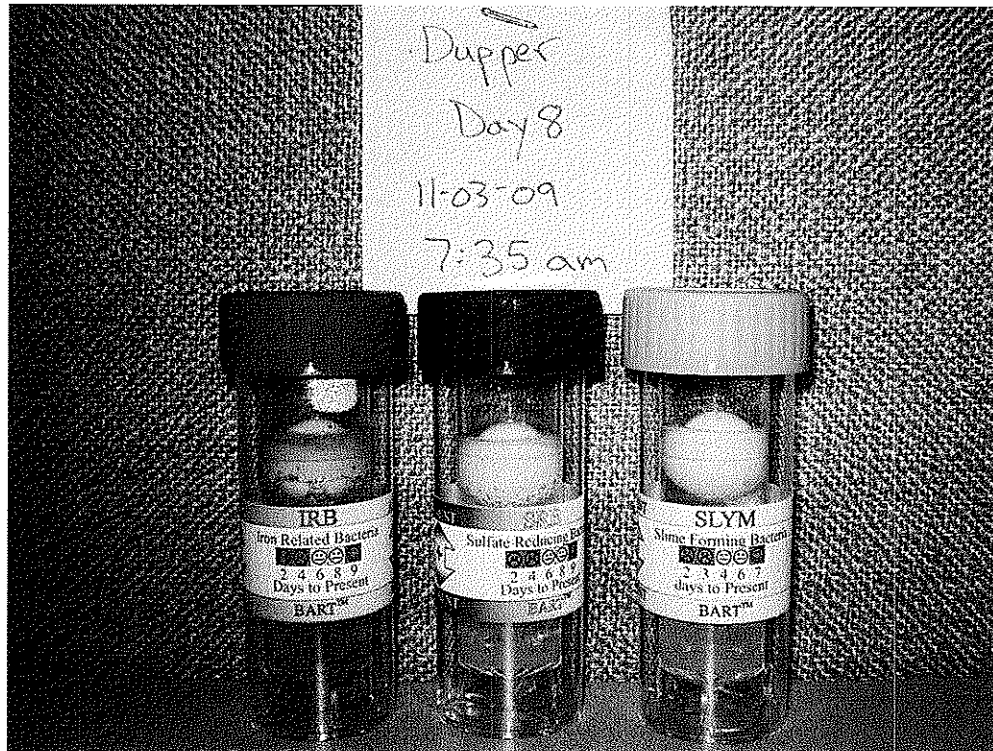
Duplicate ID: Not applicable

GPS Coordinates

Latitude: 40° 17' 30.0" Longitude: 104° 38' 26.1"

Comments: Well drilled in 1970, 85 feet deep. Bottom 20 feet is screened with 5-inch PVC. Typical daily water use includes domestic (excluding drinking) and summer irrigation. Isotopic analysis put on hold until further direction from COGCC, pending results from dissolved methane analysis.

**BIOLOGICAL ACTIVITY REACTION TEST RESULTS
DUPPER WATER WELL**



Results after 8 Days:

Red Capped Vial – Test for Iron Related Bacteria – Present

Black Capped Vial – Test for Sulfate Reducing Bacteria – Absent

Green Capped Vial – Test for Slime Forming Bacteria – Present