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17 February 2015

Jim Hughes
Colorado Oil and Gas Conservation Commission
112 Lincoln St.
Denver, CO 80203
RE: Redwine

Enclosed are the results of analyses for samples received by the laboratory on 02/06/15 16:45.
If you need any further assistance, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads 'Debbie Zufelt'.

Debbie Zufelt
Reports Manager

All accredited analytes contained in this report are denoted by an asterisk (*). For a complete list of accredited analytes please do not hesitate to contact us via any of the contact information contained in this report. All of our certifications can be viewed at <http://greenanalytical.com/certifications/>

Green Analytical Laboratories is NELAP accredited through the Texas Commission on Environmental Quality. Accreditation applies to drinking water and non-potable water matrices for trace metals and a variety of inorganic parameters. Green Analytical Laboratories is also accredited through the Colorado Department of Public Health and Environment and EPA region 8 for trace metals, Cyanide, Fluoride, Nitrate, and Nitrite in drinking water.

Our affiliate laboratory, Cardinal Laboratories, is also NELAP accredited through the Texas Commission on Environmental Quality for a variety of organic constituents in drinking water, non-potable water and solid matrices. Cardinal is also accredited for regulated VOCs, TTHM, and HAA-5 in drinking water



Colorado Oil and Gas Conservation Commission
112 Lincoln St.
Denver CO, 80203

Project: Redwine
Project Name / Number: Redwine
Project Manager: Jim Hughes

Reported:
02/17/15 15:42

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
0206151300	1502086-01	Solid	02/06/15 13:00	02/06/15 16:45
0206151315	1502086-02	Solid	02/06/15 13:15	02/06/15 16:45

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A handwritten signature in black ink that reads 'Debbie Zufelt'.

Debbie Zufelt, Reports Manager

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Denver CO, 80203

Project: Redwine
Project Name / Number: Redwine
Project Manager: Jim Hughes

Reported:
02/17/15 15:42

0206151300

1502086-01 (Solid)

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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General Chemistry

% Dry Solids	89.7			%	1	02/11/15	EPA160.3		LLG
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Saturated Paste Extraction

Calcium	41.0	1.00	0.004	mg/L	1	02/13/15	EPA200.7		JGS
Conductivity	270			umhos/cm	1	02/13/15	ASA#9 10-3.3		ACH
Magnesium	8.32	1.00	0.019	mg/L	1	02/13/15	EPA200.7		JGS
pH	7.71			pH Units	1	02/13/15	ASA#9 12-2.6		ACH
SAR	0.14			[blank]	1	02/13/15	Calculation		JGS
Sodium	3.85	2.00	0.004	mg/L	1	02/13/15	EPA200.7		JGS

Total Metals by ICP

Barium	143	1.00	0.368	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Cadmium	<5.00	5.00	0.125	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Chromium	6.19	5.00	0.767	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Copper	7.46	2.00	0.603	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Lead	15.6	10.0	1.95	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Nickel	15.8	5.00	1.27	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Selenium	<20.0	20.0	3.38	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Silver	<5.00	5.00	0.212	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Zinc	55.2	1.00	0.699	mg/kg dry	100	02/13/15	EPA6010 B		JGS

Total Metals by ICPMS

Arsenic	12.8	0.500	0.202	mg/kg dry	1000	02/16/15	6020 A		JGS
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Total Mercury by CVAA

Mercury	<0.108	0.108	0.0203	mg/kg dry	485	02/16/15	EPA7471		JGS
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Project: Redwine
Project Name / Number: Redwine
Project Manager: Jim Hughes

Reported:
02/17/15 15:42

0206151300

1502086-01 (Solid)

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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Hot Water Extractable

Boron	<1.50	1.50	0.163	mg/kg dry	5	02/13/15	EPA200.7		JGS
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Project Name / Number: Redwine
Project Manager: Jim Hughes

Reported:
02/17/15 15:42

0206151315

1502086-02 (Solid)

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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General Chemistry

% Dry Solids	86.0			%	1	02/11/15	EPA160.3		LLG
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Saturated Paste Extraction

Calcium	275	10.0	0.039	mg/L	10	02/13/15	EPA200.7		JGS
Conductivity	1200			umhos/cm	1	02/13/15	ASA#9 10-3.3		ACH
Magnesium	19.4	10.0	0.190	mg/L	10	02/13/15	EPA200.7		JGS
pH	7.81			pH Units	1	02/13/15	ASA#9 12-2.6		ACH
SAR	0.12			[blank]	1	02/13/15	Calculation		JGS
Sodium	<20.0	20.0	0.041	mg/L	10	02/13/15	EPA200.7		JGS

Total Metals by ICP

Barium	244	1.00	0.368	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Cadmium	<5.00	5.00	0.125	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Chromium	9.44	5.00	0.767	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Copper	9.73	2.00	0.603	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Lead	<10.0	10.0	1.95	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Nickel	14.1	5.00	1.27	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Selenium	<20.0	20.0	3.38	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Silver	<5.00	5.00	0.212	mg/kg dry	100	02/13/15	EPA6010 B		JGS
Zinc	43.5	1.00	0.699	mg/kg dry	100	02/13/15	EPA6010 B		JGS

Total Metals by ICPMS

Arsenic	5.45	0.500	0.202	mg/kg dry	1000	02/16/15	6020 A		JGS
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Total Mercury by CVAA

Mercury	<0.120	0.120	0.0225	mg/kg dry	515	02/16/15	EPA7471		JGS
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Project: Redwine
Project Name / Number: Redwine
Project Manager: Jim Hughes

Reported:
02/17/15 15:42

0206151315

1502086-02 (Solid)

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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Hot Water Extractable

Boron	2.97	1.50	0.163	mg/kg dry	5	02/13/15	EPA200.7		JGS
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02/17/15 15:42

Saturated Paste Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B502126 - Dissolved Metals, E200.7/E200.8

Duplicate (B502126-DUP1)	Source: 1502086-02			Prepared & Analyzed: 02/13/15					
Calcium	274	10.0	mg/L		275		0.413	20	
Magnesium	19.0	10.0	mg/L		19.4		2.51	20	
Sodium	5.70	20.0	mg/L		7.59		28.6	20	R2

Batch B502129 - General Prep - Wet Chem

Duplicate (B502129-DUP1)	Source: 1502086-02			Prepared: 02/12/15 Analyzed: 02/13/15					
Conductivity	1200		umhos/cm		1200		0.00	20	
pH	7.82		pH Units		7.81		0.128	20	

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Project: Redwine
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Reported:
02/17/15 15:42

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B502127 - EPA 3050

Blank (B502127-BLK1)

Prepared & Analyzed: 02/13/15

Barium	ND	0.010	mg/kg dry
Cadmium	ND	0.050	mg/kg dry
Chromium	ND	0.050	mg/kg dry
Copper	ND	0.020	mg/kg dry
Lead	ND	0.100	mg/kg dry
Nickel	ND	0.050	mg/kg dry
Selenium	ND	0.200	mg/kg dry
Silver	ND	0.050	mg/kg dry
Zinc	ND	0.010	mg/kg dry

LCS (B502127-BS1)

Prepared & Analyzed: 02/13/15

Barium	1.84	0.010	mg/kg dry	2.00	91.8	85-115
Cadmium	1.87	0.050	mg/kg dry	2.00	93.3	85-115
Chromium	1.92	0.050	mg/kg dry	2.00	96.1	85-115
Copper	3.94	0.020	mg/kg dry	4.00	98.5	85-115
Lead	1.92	0.100	mg/kg dry	2.00	95.8	85-115
Nickel	1.85	0.050	mg/kg dry	2.00	92.3	85-115
Selenium	7.68	0.200	mg/kg dry	8.00	96.0	85-115
Silver	0.094	0.050	mg/kg dry	0.100	93.8	85-115
Zinc	1.86	0.010	mg/kg dry	2.00	92.9	85-115

LCS Dup (B502127-BSD1)

Prepared & Analyzed: 02/13/15

Barium	1.93	0.010	mg/kg dry	2.00	96.3	85-115	4.83	20
Cadmium	1.96	0.050	mg/kg dry	2.00	98.0	85-115	4.98	20
Chromium	2.02	0.050	mg/kg dry	2.00	101	85-115	5.05	20
Copper	4.13	0.020	mg/kg dry	4.00	103	85-115	4.74	20
Lead	2.01	0.100	mg/kg dry	2.00	100	85-115	4.57	20
Nickel	1.93	0.050	mg/kg dry	2.00	96.6	85-115	4.53	20
Selenium	8.06	0.200	mg/kg dry	8.00	101	85-115	4.90	20
Silver	0.098	0.050	mg/kg dry	0.100	97.9	85-115	4.27	20
Zinc	1.94	0.010	mg/kg dry	2.00	97.1	85-115	4.47	20

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Reported:
02/17/15 15:42

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B502131 - EPA 3050M

Blank (B502131-BLK1)

Prepared & Analyzed: 02/16/15

Arsenic	0.0005	0.0005	mg/kg dry							B1
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LCS (B502131-BS1)

Prepared & Analyzed: 02/16/15

Arsenic	0.0539	0.0005	mg/kg dry	0.0500		108	85-115			
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LCS Dup (B502131-BSD1)

Prepared & Analyzed: 02/16/15

Arsenic	0.0558	0.0005	mg/kg dry	0.0500		112	85-115	3.42	20	
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Reported:
02/17/15 15:42

Total Mercury by CVAA - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B502135 - EPA 7471

Blank (B502135-BLK1)

Prepared & Analyzed: 02/16/15

Mercury	ND	0.0002	mg/kg wet
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LCS (B502135-BS1)

Prepared & Analyzed: 02/16/15

Mercury	0.0020	0.0002	mg/kg wet	0.00200	100	85-115
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LCS Dup (B502135-BSD1)

Prepared & Analyzed: 02/16/15

Mercury	0.0020	0.0002	mg/kg wet	0.00200	100	85-115	0.300	20
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Project: Redwine
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Project Manager: Jim Hughes

Reported:
02/17/15 15:42

Hot Water Extractable - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B502125 - Hot Water Soluble Metals Extract

Blank (B502125-BLK1)

Prepared & Analyzed: 02/13/15

Boron	ND	0.300	mg/kg dry
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LCS (B502125-BS1)

Prepared & Analyzed: 02/13/15

Boron	4.94	0.300	mg/kg dry	5.00	98.8	85-115
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LCS Dup (B502125-BSD1)

Prepared & Analyzed: 02/13/15

Boron	5.04	0.300	mg/kg dry	5.00	101	85-115	2.04	20
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Notes and Definitions

R2	Duplicate sample RPD exceeded the method control limit. One or more of the duplicates was less than 5X reporting limit.
B1	Target analyte detected in method blank at or above method reporting limit. Sample concentration found to be 10 times above the concentration found in the method blank or less than the reporting limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis *Results reported on as received basis unless designated as dry.
RPD	Relative Percent Difference
LCS	Laboratory Control Sample (Blank Spike)
RL	Report Limit
MDL	Method Detection Limit

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