

Jones, William V., EMNRD

From: Cindy Cottrell [ccottrell@jdmii.com]
Sent: Thursday, July 19, 2012 12:55 PM
To: Jones, William V., EMNRD
Cc: Steve Morris; Joel Stockford; Mike Daugherty
Subject: Ringer Fed Com #6 (30-015-33187)
Attachments: H201467 MURCHISON.pdf

Mr. Jones,

The fresh water analysis requested in your 6/12/12 email is attached. Please let us know if you need any additional information.

Best regards,

Cindy Cottrell

From: Greg Boans
Sent: Thursday, July 19, 2012 1:43 PM
To: Cindy Cottrell
Subject: FW: WATER SAMPLES

Attached is your fresh water sample from Fred Beards water well and a produced water sample on the Ogden 5 A well for you file

Thanks Greg Boans

From: Celey Keene [<mailto:celey.keene@cardinallabsnm.com>]
Sent: Thursday, July 19, 2012 11:08 AM
To: Greg Boans
Subject: WATER SAMPLES

THANK YOU,

Celey Keene
Lab Director
Cardinal Laboratories
101 East Marland
Hobbs, NM 88240
T: (575) 393-2326
F: (575) 393-2476



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

July 19, 2012

GREG BOANS

MURCHISON OIL & GAS, INC.

110 W. SHAW

CARLSBAD, NM 88220

RE: WATER SAMPLES

Enclosed are the results of analyses for samples received by the laboratory on 06/29/12 12:15.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list on accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is written in a cursive style with a large, stylized 'C' and 'K'.

Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

MURCHISON OIL & GAS, INC. 110 W. SHAW CARLSBAD NM, 88220	Project: WATER SAMPLES Project Number: NONE GIVEN Project Manager: GREG BOANS Fax To: (575) 887-7793	Reported: 19-Jul-12 10:54
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Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FRED BEARD FRESH WATEIH	201467-01	Water	28-Jun-12 09:00	29-Jun-12 12:15
OGDEN 5-A WELL	H201467-02	Water	28-Jun-12 09:00	29-Jun-12 12:15

Cardinal Laboratories

* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 MURCHISON OIL & GAS, INC.
 110 W. SHAW
 CARLSBAD NM, 88220

 Project: WATER SAMPLES
 Project Number: NONE GIVEN
 Project Manager: GREG BOANS
 Fax To: (575) 887-7793

 Reported:
 19-Jul-12 10:54

FRED BEARD FRESH WATER
H201467-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories
Dissolved Metals

Calcium	512	10.0	mg/L	10	2071814	JM	11-Jul-12	200.7	GAL
Magnesium	88.0	10.0	mg/L	10	2071814	JM	11-Jul-12	200.7	GAL
Potassium	15.1	10.0	mg/L	10	2071814	JM	11-Jul-12	200.7	GAL
Sodium	22.0	10.0	mg/L	10	2071814	JM	11-Jul-12	200.7	GAL

Inorganic Compounds

Alkalinity, Bicarbonate	161	5.00	mg/L	1	2061106	HM	06-Jul-12	310.1M	
Alkalinity, Carbonate	ND	0.00	mg/L	1	2061106	HM	06-Jul-12	310.1M	
Chloride*	12.0	4.00	mg/L	1	2070514	HM	05-Jul-12	4500-Cl-B	
Conductivity*	2150	1.00	uS/cm	1	2071704	HM	06-Jul-12	120.1	
pH*	7.25	0.100	pH Units	1	2071702	HM	03-Jul-12	150.1	
Sulfate*	1370	10.0	mg/L	1	2071209	HM	12-Jul-12	375.4	
TDS*	2080	5.00	mg/L	1	2062814	AP	05-Jul-12	160.1	
Alkalinity, Total*	132	4.00	mg/L	1	2061106	HM	06-Jul-12	310.1M	

Cardinal Laboratories

*=Accredited Analyte

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 110 W. SHAW
 CARLSBAD NM, 88220

 Project: WATER SAMPLES
 Project Number: NONE GIVEN
 Project Manager: GREG BOANS
 Fax To: (575) 887-7793

 Reported:
 19-Jul-12 10:54

OGDEN 5-A WELL
H201467-02 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories
Dissolved Metals

Barium	ND	0.500	mg/L	50	2071814	JM	11-Jul-12	200.7	GAL
Calcium	4550	50.0	mg/L	50	2071814	JM	11-Jul-12	200.7	GAL
Iron	ND	2.50	mg/L	50	2071814	JM	11-Jul-12	200.7	GAL
Magnesium	1670	50.0	mg/L	50	2071814	JM	11-Jul-12	200.7	GAL
Potassium	442	50.0	mg/L	50	2071814	JM	11-Jul-12	200.7	GAL
Sodium	36900	50.0	mg/L	50	2071814	JM	11-Jul-12	200.7	GAL

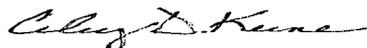
Inorganic Compounds

Alkalinity, Bicarbonate	360	5.00	mg/L	1	2061106	HM	06-Jul-12	310.1M	
Alkalinity, Carbonate	320	0.00	mg/L	1	2061106	HM	06-Jul-12	310.1M	
Chloride*	71000	4.00	mg/L	1	2070514	HM	05-Jul-12	4500-Cl-B	
Conductivity*	231000	1.00	uS/cm	1	2071704	HM	06-Jul-12	120.1	
pH*	7.76	0.100	pH Units	1	2071702	HM	03-Jul-12	150.1	
Resistivity	0.0433		Ohms/m	1	2071704	HM	06-Jul-12	120.1	
Specific Gravity @ 60° F	1.075	0.000	[blank]	1	2071304	HM	11-Jul-12	SM 2710F	
Sulfate*	2820	10.0	mg/L	1	2071209	HM	12-Jul-12	375.4	
TDS*	119000	5.00	mg/L	1	2062814	AP	05-Jul-12	160.1	
Alkalinity, Total*	680	4.00	mg/L	1	2061106	HM	06-Jul-12	310.1M	
Sulfide, total	652	0.0100	mg/L	1	2070312	HM	03-Jul-12	376.2	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 MURCHISON OIL & GAS, INC.
 110 W. SHAW
 CARLSBAD NM, 88220

 Project: WATER SAMPLES
 Project Number: NONE GIVEN
 Project Manager: GREG BOANS
 Fax To: (575) 887-7793

 Reported:
 19-Jul-12 10:54

Dissolved Metals - Quality Control
Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 2071814 - Dissolved/Potentially Dissolved Metals
Blank (2071814-BLK1)

Prepared & Analyzed: 11-Jul-12

Magnesium	ND	1.00	mg/L							
Sodium	ND	1.00	mg/L							
Barium	ND	0.010	mg/L							
Potassium	ND	1.00	mg/L							
Iron	ND	0.050	mg/L							
Calcium	ND	1.00	mg/L							

LCS (2071814-BS1)

Prepared & Analyzed: 11-Jul-12

Calcium	5.68		mg/L	5.00		114	85-115			
Magnesium	28.5		mg/L	25.0		114	85-115			
Potassium	11.3		mg/L	10.0		113	85-115			
Barium	2.71		mg/L	2.50		108	85-115			
Sodium	9.17		mg/L	8.10		113	85-115			
Iron	5.51		mg/L	5.00		110	85-115			

LCS Dup (2071814-BSD1)

Prepared & Analyzed: 11-Jul-12

Calcium	5.73		mg/L	5.00		115	85-115	0.876	20	
Potassium	11.5		mg/L	10.0		115	85-115	1.75	20	
Sodium	9.20		mg/L	8.10		114	85-115	0.327	20	
Barium	2.74		mg/L	2.50		110	85-115	1.10	20	
Magnesium	28.8		mg/L	25.0		115	85-115	1.05	20	
Iron	5.56		mg/L	5.00		111	85-115	0.903	20	

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 MURCHISON OIL & GAS, INC.
 110 W. SHAW
 CARLSBAD NM, 88220

 Project: WATER SAMPLES
 Project Number: NONE GIVEN
 Project Manager: GREG BOANS
 Fax To: (575) 887-7793

 Reported:
 19-Jul-12 10:54

Inorganic Compounds - Quality Control
Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2061106 - General Prep - Wet Chem										
Blank (2061106-BLK1) Prepared & Analyzed: 11-Jun-12										
Alkalinity, Carbonate	ND	0.00	mg/L							
Alkalinity, Bicarbonate	ND	5.00	mg/L							
Alkalinity, Total	ND	4.00	mg/L							
LCS (2061106-BS1) Prepared & Analyzed: 11-Jun-12										
Alkalinity, Carbonate	ND	0.00	mg/L				80-120			
Alkalinity, Bicarbonate	137	5.00	mg/L				80-120			
Alkalinity, Total	112	4.00	mg/L	100		112	80-120			
LCS Dup (2061106-BSD1) Prepared & Analyzed: 11-Jun-12										
Alkalinity, Carbonate	ND	0.00	mg/L				80-120		20	
Alkalinity, Bicarbonate	132	5.00	mg/L				80-120	3.72	20	
Alkalinity, Total	108	4.00	mg/L	100		108	80-120	3.64	20	
Duplicate (2061106-DUP1) Source: H201253-01 Prepared & Analyzed: 11-Jun-12										
Alkalinity, Carbonate	ND	0.00	mg/L		0.00				20	
Alkalinity, Bicarbonate	229	5.00	mg/L		239			4.27	20	
Alkalinity, Total	188	4.00	mg/L		196			4.17	20	
Batch 2062814 - Filtration										
Blank (2062814-BLK1) Prepared & Analyzed: 28-Jun-12										
TDS	ND	5.00	mg/L							
LCS (2062814-BS1) Prepared & Analyzed: 28-Jun-12										
TDS	235	5.00	mg/L	240		97.9	80-120			

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Analytical Results For:

 MURCHISON OIL & GAS, INC.
 110 W. SHAW
 CARLSBAD NM, 88220

 Project: WATER SAMPLES
 Project Number: NONE GIVEN
 Project Manager: GREG BOANS
 Fax To: (575) 887-7793

 Reported:
 19-Jul-12 10:54

Inorganic Compounds - Quality Control
Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2062814 - Filtration										
Duplicate (2062814-DUP1)		Source: H201441-03			Prepared & Analyzed: 28-Jun-12					
TDS	358	5.00	mg/L		365			1.94	20	
Batch 2070312 - General Prep - Wet Chem										
Blank (2070312-BLK1)		Prepared & Analyzed: 03-Jul-12								
Sulfide, total	ND	0.0100	mg/L							
Duplicate (2070312-DUP1)		Source: H201467-02			Prepared & Analyzed: 03-Jul-12					
Sulfide, total	628	0.0100	mg/L		652			3.75	20	
Batch 2070514 - General Prep - Wet Chem										
Blank (2070514-BLK1)		Prepared & Analyzed: 05-Jul-12								
Chloride	ND	4.00	mg/L							
LCS (2070514-BS1)		Prepared & Analyzed: 05-Jul-12								
Chloride	104	4.00	mg/L	100		104	80-120			
LCS Dup (2070514-BSD1)		Prepared & Analyzed: 05-Jul-12								
Chloride	100	4.00	mg/L	100		100	80-120	3.92	20	
Duplicate (2070514-DUP1)		Source: H201491-01			Prepared & Analyzed: 05-Jul-12					
Chloride	1830	4.00	mg/L		1930			5.32	20	
Batch 2071209 - General Prep - Wet Chem										
Blank (2071209-BLK1)		Prepared & Analyzed: 12-Jul-12								
Sulfate	ND	10.0	mg/L							

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 110 W. SHAW
 CARLSBAD NM, 88220

 Project: WATER SAMPLES
 Project Number: NONE GIVEN
 Project Manager: GREG BOANS
 Fax To: (575) 887-7793

 Reported:
 19-Jul-12 10:54

Inorganic Compounds - Quality Control
Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2071209 - General Prep - Wet Chem										
LCS (2071209-BS1)					Prepared & Analyzed: 12-Jul-12					
Sulfate	19.1	10.0	mg/L	20.0		95.5	80-120			
LCS Dup (2071209-BSD1)					Prepared & Analyzed: 12-Jul-12					
Sulfate	18.9	10.0	mg/L	20.0		94.5	80-120	1.05	20	
Duplicate (2071209-DUP1)					Source: H201554-01		Prepared & Analyzed: 12-Jul-12			
Sulfate	146	10.0	mg/L		144			1.38	20	
Batch 2071304 - General Prep - Wet Chem										
Duplicate (2071304-DUP1)					Source: H201467-02		Prepared & Analyzed: 11-Jul-12			
Specific Gravity @ 60° F	1.076	0.000	[blank]		1.075			0.0437	200	
Batch 2071702 - General Prep - Wet Chem										
LCS (2071702-BS1)					Prepared & Analyzed: 06-Jul-12					
pH	7.06		pH Units	7.00		101	90-110			
Duplicate (2071702-DUP1)					Source: H201467-01		Prepared: 03-Jul-12 Analyzed: 06-Jul-12			
pH	7.26	0.100	pH Units		7.25			0.138	20	
Batch 2071704 - General Prep - Wet Chem										
LCS (2071704-BS1)					Prepared & Analyzed: 06-Jul-12					
Conductivity	1410		uS/cm	1410		100	80-120			

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 110 W. SHAW
 CARLSBAD NM, 88220

 Project: WATER SAMPLES
 Project Number: NONE GIVEN
 Project Manager: GREG BOANS
 Fax To: (575) 887-7793

 Reported:
 19-Jul-12 10:54

Inorganic Compounds - Quality Control
Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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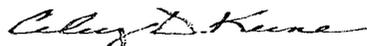
Batch 2071704 - General Prep - Wet Chem
Duplicate (2071704-DUP1)
Source: H201467-01
Prepared & Analyzed: 06-Jul-12

Conductivity	2160	1.00	uS/cm		2150			0.464	20	
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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

- GAL Analysis subcontracted to Green Analytical Laboratories, a subsidiary of Cardinal Laboratories.
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- ** Samples not received at proper temperature of 6°C or below.
- *** Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C
Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Keene, Lab Director/Quality Manager



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
 (575) 393-2326 FAX (575) 393-2476

Company Name: <u>Murchison Oil & Gas, Inc.</u>		BILL TO		ANALYSIS REQUEST																			
Project Manager: <u>Greg Beans</u>		P.O. #:		Cation/ Anion Seales Sulfide																			
Address: <u>110 W. Shaw</u>		Company:																					
City: <u>Carlsbad</u> State: <u>NM</u> Zip: <u>88220</u>		Attn:																					
Phone #: <u>628-3932</u> Fax #: <u>897-7793</u>		Address:																					
Project #: _____ Project Owner: _____		City:																					
Project Name: _____		State: _____ Zip: _____																					
Project Location: _____		Phone #: _____																					
Sampler Name: <u>Greg Beans</u>		Fax #: _____																					
FOR LAB USE ONLY	Lab I.D.	Sample I.D.	(GIRAB OR (COMP. # CONTAINERS	MATRIX				PRESERV		SAMPLING													
				GROUNDWATER WASTEWATER SOIL OIL SLUDGE OTHER:				ACID/BASE: ICE / COOL OTHER:		DATE TIME													
	<u>H201467</u>	<u>1 Fresh water Fred Beard</u>								<u>6/28/12</u>	<u>9:00</u>	✓											
		<u>2 Ogden 5-A well</u>								<u>6/28/12</u>	<u>9:00</u>	✓											

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Relinquished By: _____		Date: <u>6/29/12</u>	Received By: <u>Jodi Benson</u>		Phone Result: <input type="checkbox"/> Yes <input type="checkbox"/> No	Add'l Phone #:
Time: <u>12:15</u>		Date: _____		Fax Result: <input type="checkbox"/> Yes <input type="checkbox"/> No		Add'l Fax #:
Relinquished By: _____		Time: _____		REMARKS: <u>gb beans @ jdmii.com</u>		
Delivered By: (Circle One)		Sample Condition		CHECKED BY: _____		
Sampler - UPS - Bus - Other:		Cool Intact <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No		(Initials)		

† Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

#26

MURCHINSON OIL & GAS, INC.
SCALE INDEX WATER ANALYSIS REPORT

Company : MURCHINSON OIL & GAS, INC.	Date Sampled : 6/28/2012
Lease Name : NOT GIVEN	Company Rep. : GREG BOANS
Well Number : OGDEN 5-A WELL	
Location : NOT GIVEN	

ANALYSIS

1. pH	7.76	
2. Specific Gravity @ 60/60 F.	1.0750	
3. CaCO3 Saturation Index @ 80 F.	+0.867	'Calcium Carbonate Scale Possible'
@ 140 F.	+1.777	'Calcium Carbonate Scale Possible'

Dissolved Gasses

4. Hydrogen Sulfide	652	PPM
5. Carbon Dioxide	Not Determined	PPM
6. Dissolved Oxygen	Not Determined	

Cations

	mg/L	/	Eq. Wt.	=	MEQ/L
7. Calcium (Ca++)	4,550.00	/	20.1	=	226.37
8. Magnesium (Mg++)	1,670.00	/	12.2	=	136.89
9. Sodium (Na+)	36,900	/	23.0	=	1,711.09
10. Barium (Ba++)	0.000	/	68.7	=	0.00

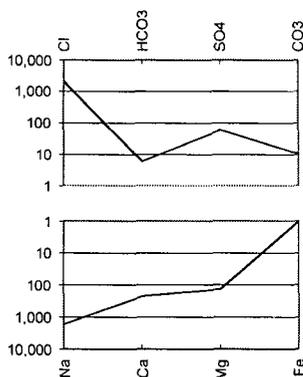
Anions

11. Hydroxyl (OH-)	0	/	17.0	=	0.00
12. Carbonate (CO3=)	320	/	30.0	=	10.67
13. Bicarbonate (HCO3-)	360	/	61.1	=	5.89
14. Sulfate (SO4=)	2,820	/	48.8	=	57.79
15. Chloride (Cl-)	71,000	/	35.5	=	2,000.00

Other

16. Soluble Iron (Fe)	0.000	/	18.2	=	0.00
17. Total Dissolved Solids	119,000				
18. Total Hardness As CaCO3	18,238.0				
19. Calcium Sulfate Solubility @ 90 F.	3,562				'Calcium Sulfate Scale Possible'
20. Resistivity (Measured)	0.043				Ohm/Meters @ 77 Degrees (F)

Logarithmic Water Pattern



PROBABLE MINERAL COMPOSITION

COMPOUND	Eq. Wt.	X	MEQ/L	=	mg/L
Ca(HCO3)2	81.04	X	5.89	=	477
CaSO4	68.07	X	57.79	=	3,934
CaCl2	55.50	X	162.69	=	9,029
Mg(HCO3)2	73.17	X	0.00	=	0
MgSO4	60.19	X	0.00	=	0
MgCl2	47.62	X	136.89	=	6,518
NaHCO3	84.00	X	0.00	=	0
NaSO4	71.03	X	0.00	=	0
NaCl	58.46	X	1,711.09	=	100,030