

**JAMES C. MUSGROVE**

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P.O. Box 215  
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Mai Oil Operations  
Barngrover #1  
SE-NE-NW-SW (2200' FNL & 725' FWL)  
Section 14-17s-13w  
Barton County, Kansas

Page 1

**5 1/2" Production Casing Set**

**Contractor:** Southwind Drilling Co. (rig #3)  
**Commenced:** April 30, 2014  
**Completed:** May 6, 2014  
**Elevation:** 1901' K.B., 1893' G.L.  
**Casing program:** Surface; 8 5/8" @ 516'  
Production, 5 1/2" @ 3422'  
**Sample:** Samples saved and examined 2900' to the Rotary Total Depth.  
**Drilling time:** One (1) foot drilling time recorded and kept 2900 ft. to the Rotary Total Depth.  
**Measurements:** All depths measured from the Kelly Bushing.  
**Drill Stem Tests:** There were three (3) Drill Stem Tests ran by Trilobite Testing Co.  
**Electric Log:** By Nabors, Dual Induction, Compensated Density/Neutron and Micro Log.

<u>Formation</u>	<u>Log Depth</u>	<u>Sub-Sea Datum</u>
Anhydrite	830	+1071
Base Anhydrite	858	+1043
Heebner	3036	-1135
Toronto	3048	-1147
Lansing	3131	-1230
Base Kansas City	3334	-1433
Arbuckle	3347	-1446
Rotary Total Depth	3423	-1522
Log Total Depth	3425	-1524

(All top and zone determination were made from a correlation of Electric Log measurements).

**SAMPLE ANALYSIS, SHOWS OF OIL, TESTING DATA, ETC.**

**TOPEKA SECTION**

2920-2950' Limestone, cream, tan, brown, fine crystalline, fossiliferous, poor cherty, poor porosity, no shows.

**TORONTO SECTION**

- 2950-2970' Limestone, tan, brown, fine crystalline, fossiliferous, trace of pyrite, poor porosity, no shows.
- 2970-3020' Limestone, tan, brown, fine crystalline, cherty in part, dense, poor visible porosity, no shows.
- 3048-3064' Limestone, tan, fine crystalline, pinpoint scattered porosity, fossiliferous, no shows.

**DOUGLAS SECTION**

- 3064-3085' Silty, shell black, gray, maroon.
- 3085-3114' Sand finely grained, well sorted shell, gray, maroon, no shows.

**BROWN LIME**

- 3115-3129' Limestone, tan, brown, fine crystalline, cherty, poor visible porosity, no shows.

**LANSING SECTION**

- 3130-3170' Limestone, cream, tan, fine crystalline, fossiliferous, poor visible porosity, no shows.
- 3170-3190' Limestone, cream, tan, oolitic, poor scatter porosity, no shows.
- 3190-3200' Limestone, tan, brown, fine crystalline, poor scattered porosity, light brown stain, faint show of free oil and very faint odor in fresh sample.

**Drill Stem Test #1 3134-3200**

**Times: 30-30-30-30**

**Blow: Weak surface**

**Recovery: 15' mud**

**Pressures: ISIP 601 psi**  
**FSIP 542 psi**  
**IFP 24-27 psi**  
**FFP 25-29 psi**  
**HSH 1518-1485 psi**

- 3200-3225' Limestone, cream fine crystalline, oolitic, poor visible porosity, no shows.

- 3225-3250' Limestone, cream, highly oomoldic, good vuggy porosity, no shows.
- 3250-3270' Limestone, tan, brown, fine crystalline, cherty in part, poor visible porosity, (dense), no shows.
- 3270-3290' Limestone, cream, tan, fine crystalline, poor scattered vuggy porosity, light brown stain, no shows and no odor.
- 3290-3310' Limestone, cream, tan, fine crystalline, chalky in part, (dense) poor visible porosity, no shows.
- 3310-3334' Limestone, cream white, fine crystalline, chalky, oolitic poorly developed and developed porosity light brown stain, no shows and no odor.

**BASE KANSAS CITY**

- 3335-3347' Shell, gray, maroon, green, few samples of sucrosic, dolomitic, light show free oil in fresh samples.

**ARBUCKLE SECTION**

- 3348-3360' Dolomite white, sucrosic, fair inter-crystalline porosity, fair vuggy porosity, show of free oil, strong odor in fresh samples.

**Drill Stem Test #2 3338-3360**

**Times:** 30-30-45-45

**Blow:** Initial: Weak built to 6"  
 2<sup>nd</sup> Opening: Weak built to 2 ½ "

**Recovery:** 90' gas in pipe  
 120' clean oil  
 30' HO&GCM (10% gas, 30% oil, 60% mud)

**Pressures:** ISIP 820 psi  
 FSIP 755 psi  
 IFP 23-45 psi  
 FFP 48-66 psi  
 HSH 1635-3368 psi

- 3360-3368' Dolomitic white, cream, fair inter-crystalline porosity, good vuggy porosity, show of free oil in fresh samples.

**Drill Stem Test #3** **3338-3368**

**Times:** 30-30-45-45

**Blow:** Initial: Strong bottom of the bucket 5 min  
2<sup>nd</sup> Opening: Strong bottom of the bucket 12 min

**Recovery:** 125' gas in pipe  
645' clean oil  
90' HO&GCM (10% gas, 40% oil, 50% mud)

**Pressures:** ISIP 936 psi  
FSIP 958 psi  
IFP 45-152 psi  
FFP 159-286 psi  
HSH: Initial not recorded  
HSH: Final 1592 psi

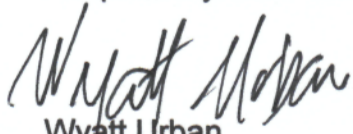
- 3368-3380' Dolomitic white, cream, sucrosic, fair and scattered porosity, show of free oil and faint odor in fresh samples.
- 3380-3400' Dolomitic white, sucrosic good inter-crystalline show of free oil and faint odor in fresh samples.
- 3400-3423' Dolomitic white, fine crystalline, poor visible porosity, no show, no odor.

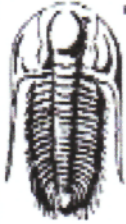
**Rotary Total Depth** 3423  
**Log Total Depth** 3425

**Recommendations:**

The 5 ½ Production Casing Set and cemented on the Barngrover #1

Respectfully submitted;

  
Wyatt Urban  
Petroleum Geologist



**TRILOBITE  
TESTING, INC**

## DRILL STEM TEST REPORT

Mai Oil Operations Inc

**4-17s-13w Barton,KS**

8411 Preston Rd STE 800  
Dallas TX 75225-5520

**Barngrover #1**

Job Ticket: 55336

**DST#: 1**

ATTN: Kurt Mai, Wyatt Urb

Test Start: 2014.05.04 @ 12:55:30

### GENERAL INFORMATION:

Formation: **LKC A-C**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 14:27:55

Time Test Ended: 17:38:09

Test Type: Conventional Bottom Hole (Initial)

Tester: Ray Schwager

Unit No: 70

Interval: **3134.00 ft (KB) To 3200.00 ft (KB) (TVD)**

Reference Elevations: 1901.00 ft (KB)

Total Depth: 3200.00 ft (KB) (TVD)

1893.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 8.00 ft

**Serial #: 8369**

**Inside**

Press@RunDepth: 28.97 psig @ 3139.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.05.04

End Date:

2014.05.04

Last Calib.: 2014.05.04

Start Time: 12:55:30

End Time:

17:38:09

Time On Btm: 2014.05.04 @ 14:26:10

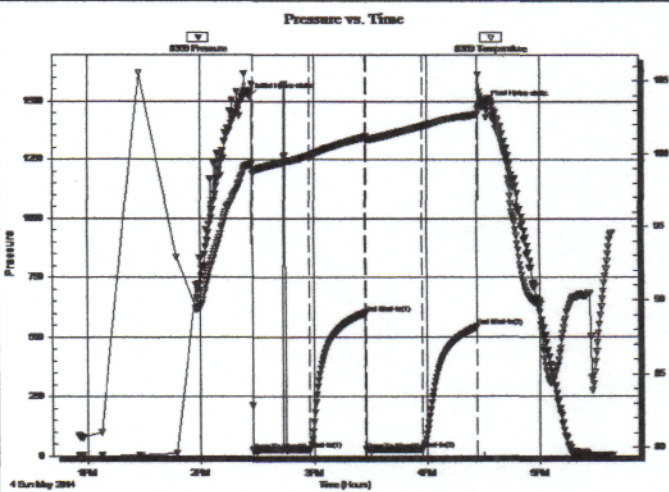
Time Off Btm: 2014.05.04 @ 16:30:55

TEST COMMENT: 30-IFP-surface bl ,died in 15 min, flushed tool

30-ISIP-no bl

30-FFP-no bl

30-FSIP-no bl



### PRESSURE SUMMARY

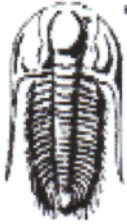
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1517.91	99.21	Initial Hydro-static
2	23.74	98.89	Open To Flow (1)
32	27.48	99.86	Shut-In(1)
62	601.04	101.11	End Shut-In(1)
62	24.59	100.89	Open To Flow (2)
92	28.97	101.86	Shut-In(2)
121	541.94	102.73	End Shut-In(2)
125	1485.00	103.33	Final Hydro-static

### Recovery

Length (ft)	Description	Volume (bbl)
15.00	Mud	0.21

### Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



**TRILOBITE TESTING, INC**

**DRILL STEM TEST REPORT**

Mai Oil Operations Inc

**4-17s-13w Barton,KS**

8411 Preston Rd STE 800  
Dallas TX 75225-5520

**Barngrover #1**

Job Ticket: 55337

**DST#: 2**

ATTN: Kurt Mai, Wyatt Urb

Test Start: 2014.05.05 @ 04:55:52

**GENERAL INFORMATION:**

Formation: **Arbuckle**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 06:26:17

Time Test Ended: 10:20:46

Test Type: Conventional Bottom Hole (Reset)

Tester: Ray Schwager

Unit No: 70

Interval: **3338.00 ft (KB) To 3360.00 ft (KB) (TVD)**

Reference Elevations: 1901.00 ft (KB)

Total Depth: 3360.00 ft (KB) (TVD)

1893.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 8.00 ft

**Serial #: 8369**

**Inside**

Press@RunDepth: 65.83 psig @ 3339.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.05.05 End Date: 2014.05.05

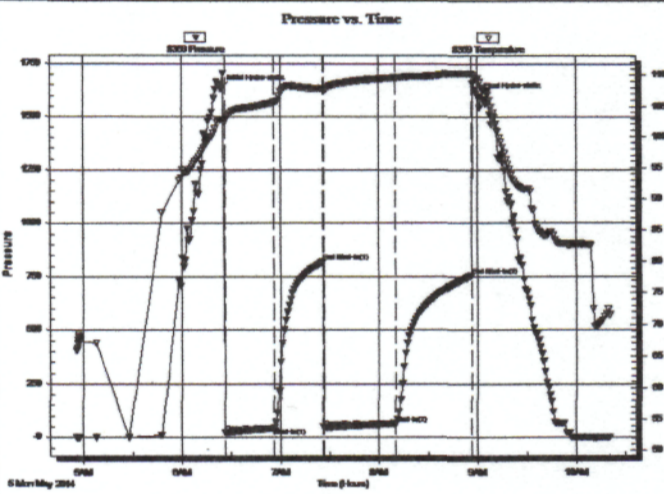
Last Calib.: 2014.05.05

Start Time: 04:55:52 End Time: 10:20:46

Time On Btrr: 2014.05.05 @ 06:24:17

Time Off Btrr: 2014.05.05 @ 09:00:17

TEST COMMENT: 30-IFP-w k to a gd bl 1/2" to 6" bl  
30-ISIP-no bl  
45-FFP-w k bl thru-out, surface to 2 1/2" bl  
45-FSIP-no bl



**PRESSURE SUMMARY**

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1634.74	102.69	Initial Hydro-static
2	23.07	102.20	Open To Flow (1)
32	45.24	105.61	Shut-In(1)
62	819.82	107.77	End Shut-In(1)
62	47.79	107.39	Open To Flow (2)
106	65.83	109.54	Shut-In(2)
152	754.54	110.18	End Shut-In(2)
156	1597.16	109.44	Final Hydro-static

**Recovery**

Length (ft)	Description	Volume (bbl)
0.00	90'GIP	0.00
120.00	CO	1.68
30.00	HO&GCM 10%G30%O60%M	0.42

\* Recovery from multiple tests

**Gas Rates**

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



**TRILOBITE TESTING, INC**

**DRILL STEM TEST REPORT**

Mai Oil Operations Inc

**4-17s-13w Barton,KS**

8411 Preston Rd STE 800  
Dallas TX 75225-5520

**Barngrover #1**

Job Ticket: 55338

**DST#: 3**

ATTN: Kurt Mai, Wyatt Urb

Test Start: 2014.05.05 @ 14:50:25

**GENERAL INFORMATION:**

Formation: **Arbuckle**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 15:52:50

Time Test Ended: 20:17:49

Test Type: Conventional Bottom Hole (Reset)

Tester: Ray Schwager

Unit No: 70

Interval: **3338.00 ft (KB) To 3368.00 ft (KB) (TVD)**

Reference Elevations: 1901.00 ft (KB)

Total Depth: 3368.00 ft (KB) (TVD)

1893.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 8.00 ft

**Serial #: 8369**

**Inside**

Press@RunDepth: 285.95 psig @ 3340.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.05.05 End Date: 2014.05.05

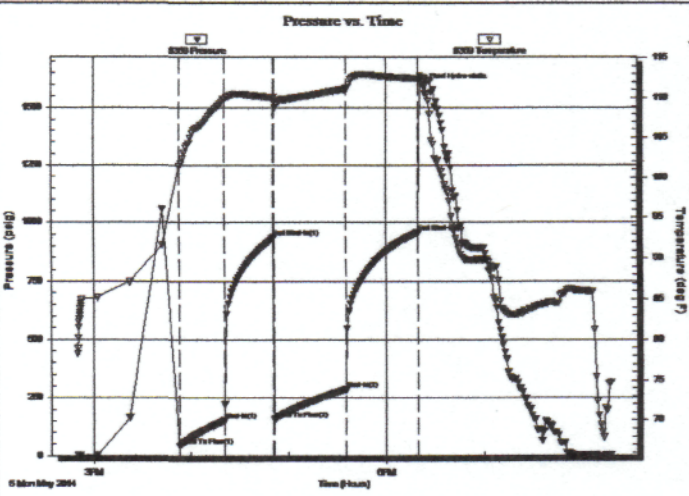
Last Calib.: 2014.05.05

Start Time: 14:50:25 End Time: 20:17:49

Time On Btm:

Time Off Btm: 2014.05.05 @ 18:23:20

TEST COMMENT: 30-IFP-w k to strg in 5 min  
30-ISIP-no bl  
45-FFP-w k to strg in 12 min  
45-FSIP-no bl



**PRESSURE SUMMARY**

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	44.91	101.42	Open To Flow (1)
28	151.82	109.88	Shut-in(1)
58	935.54	110.05	End Shut-in(1)
59	158.54	109.48	Open To Flow (2)
103	285.95	111.13	Shut-in(2)
147	958.29	112.40	End Shut-in(2)
151	1592.11	112.55	Final Hydro-static

**Recovery**

Length (ft)	Description	Volume (bbl)
0.00	125' GIP	0.00
645.00	CO	9.05
90.00	HO&GCM 10%G40%O50%M	1.26

\* Recovery from multiple tests

**Gas Rates**

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

# QUALITY OILWELL CEMENTING, INC.

Federal Tax I.D.# 20-2886107

Phone 785-483-2025  
Cell 785-324-1041

Home Office P.O. Box 32 Russell, KS 67665

No. 423

Date	5-1-14	Sec.	4	Twp.	17	Range	13	County	Barton	State	KS	On Location	5,000ph	Finish	G. 30ph
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Location *Sur Smith 2nd S E 1/4*

Lease	<i>Barhgrover</i>	Well No.	<i>7</i>	Owner	To Quality Oilwell Cementing, Inc. You are hereby requested to rent cementing equipment and furnish cementer and helper to assist owner or contractor to do work as listed.
Contractor	<i>Southwind</i>		<i>3</i>		
Type Job	<i>Surface</i>				
Hole Size	<i>12 1/4</i>	T.D.	<i>516</i>	Charge To	<i>Mai oil</i>
Csg.	<i>8 7/8</i>	Depth	<i>516</i>	Street	
Tbg. Size		Depth		City	
Tool		Depth		State	
Cement Left in Csg.	<i>20 ft</i>	Shoe Joint	<i>20 ft</i>	The above was done to satisfaction and supervision of owner agent or contractor.	
Meas Line		Displace	<i>31.5 BBL</i>	Cement Amount Ordered	<i>60/40 3% CC 1% gel</i>

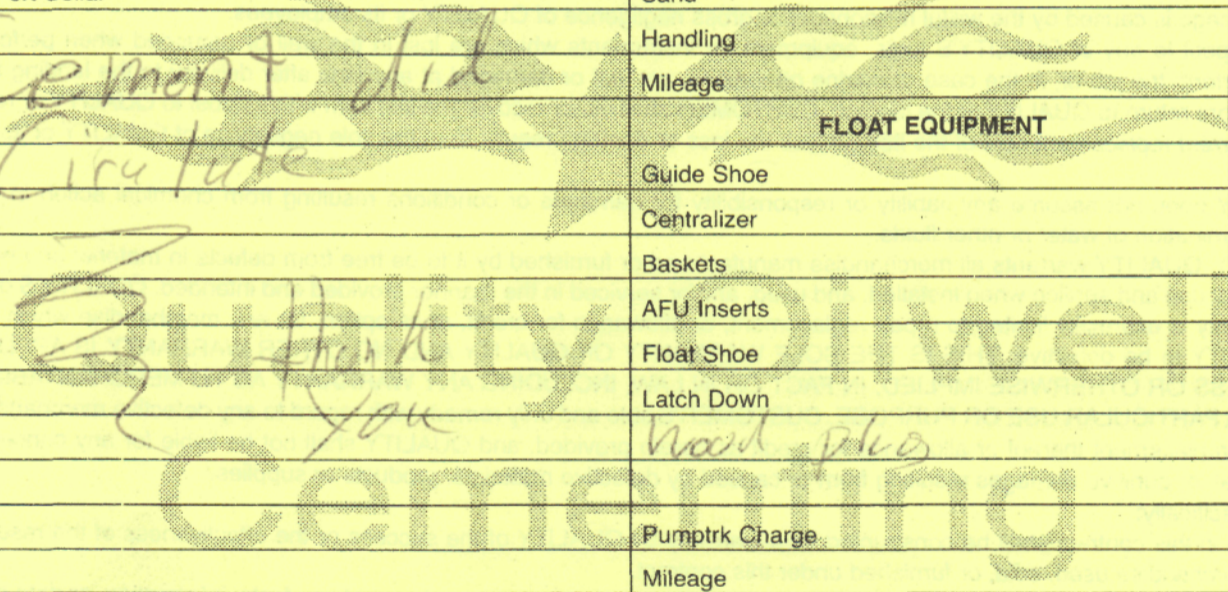
**EQUIPMENT**

Pumptrk	<i>20</i>	No.	Cementer	<i>Tom</i>	Common
			Helper		
Bulktrk	<i>3</i>	No.	Driver	<i>Vick</i>	Poz. Mix
			Driver		
Bulktrk	<i>04</i>	No.	Driver	<i>Ryan</i>	Gel.
			Driver		

**JOB SERVICES & REMARKS**

Remarks:		Hulls
Rat Hole		Salt
Mouse Hole		Flowseal
Centralizers		Kol-Seal
Baskets		Mud CLR 48
D/V or Port Collar		CFL-117 or CD110 CAF 38
		Sand
		Handling
		Mileage
		<b>FLOAT EQUIPMENT</b>
		Guide Shoe
		Centralizer
		Baskets
		AFU Inserts
		Float Shoe
		Latch Down
		<i>Wood plug</i>
		Pumptrk Charge
		Mileage

<input checked="" type="checkbox"/> Signature <i>Tom</i>	Tax
	Discount
	Total Charge





# QUALITY OILWELL CEMENTING, INC.

Federal Tax I.D.# 20-2886107

Phone 785-483-2025  
Cell 785-324-1041

Home Office P.O. Box 32 Russell, KS 67665

No. 219

Date 5-6-14	Sec. 4	Twp. 17	Range 13	County Barton	State KS	On Location	Finish 5:30 PM
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Location *Susank, 2 1/2 S, E n 2*

Lease <i>Barrgrover</i>	Well No. 1	Owner To Quality Oilwell Cementing, Inc. You are hereby requested to rent cementing equipment and furnish cementer and helper to assist owner or contractor to do work as listed.
Contractor <i>Southwind #3</i>		Charge To <i>Maj Oil</i>
Type Job <i>long string</i>	T.D. 3423	
Hole Size <i>7 7/8</i>	Depth 3421	
Csg. <i>5 1/2 14 #</i>	Depth	
Tbg. Size	Depth	
Tool	Depth	The above was done to satisfaction and supervision of owner agent or contractor.
Cement Left in Csg.	Shoe Joint 21.62	Cement Amount Ordered <i>150 sx 6 3/4, 10% salt, 2% gel,</i>
Meas Line	Displace <i>82.9661</i>	<i>1/4 # Flow</i>

**EQUIPMENT**

Pumptrk 17	No.	Cementer Helper <i>Lonniew</i>	Common
Bulktrk 4	No.	Driver <i>chad</i>	Poz. Mix
Bulktrk <i>Ph</i>	No.	Driver <i>Travis</i>	Gel.
			Calcium

**JOB SERVICES & REMARKS**

Remarks:	Hulls
Rat Hole <i>30 sx</i>	Salt
Mouse Hole	Flowseal
Centralizers <i>1-7, 9, 10</i>	Kol-Seal
Baskets	Mud CLR 48 <i>1,000 gal</i>
D/V or Port Collar	CFL-117 or CD110 CAF 38
<i>Pipe on bottom broke circulation Pumped 1,000 gal mud CLR 48 with 10 lb for behind it Plug Rat hole with 30 sx Hooked to 5 1/2 Mixed 120 sx shut down washed pump and lines Released Plug and displaced with 82.9661 Pw. Plug landed and held.</i>	Sand
<i>Lift Pressure 700 psi</i>	Handling
<i>Plug landed at 1400 psi</i>	Mileage

**FLOAT EQUIPMENT**

	Guide Shoe
	Centralizer <i>9 turbos</i>
	Baskets
	AFU Inserts
	Float Shoe
	Latch Down 1
	Pumptrk Charge
	Mileage

X Signature *B. H. Hines*

	Tax
	Discount
	Total Charge