

JAMES C. MUSGROVE

Petroleum Geologist, LLC
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Office (620) 588-4250

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Mai Oil Operations
Morgenstern Family Corp #1
NW-SE-SW-NW (2184'FNL & 802'FWL)
Section 35-17s-13w
Barton County, Kansas

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5 1/2" Production Casing Set

Contractor: Southwind Drilling Co. (rig #3)
Commenced: August 24, 2017
Completed: August 30, 2017
Elevation: 1886' K.B., 1884' D.F., 1878' G.L.
Casing program: Surface; 8 5/8" @ 454'
Production, 5 1/2" @ 3453'
Sample: Samples saved and examined 2800' to the Rotary Total Depth.
Drilling time: One (1) foot drilling time recorded and kept 2800' to the Rotary Total Depth.
Measurements: All depths measured from the Kelly Bushing.
Drill Stem Tests: There were four (4) Drill Stem Tests ran by Trilobite Testing Co.
Electric Log: By Eli Wireline Services, Dual Induction, Compensated Density/Neutron and Micro Log.

<u>Formation</u>	<u>Log Depth</u>	<u>Sub-Sea Datum</u>
Anhydrite	775	+1111
Base Anhydrite	797	+1089
Heebner	3048	-1162
Toronto	3063	-1177
Douglas	3076	-1190
Brown Lime	3138	-1252
Lansing	3152	--1266
Base Kansas City	3377	-1491
Arbuckle	3377	-1501
Rotary Total Depth	3455	-1569
Log Total Depth	3456	-1570

(All tops and zones corrected to Electric Log Measurement)

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

TOPEKA SECTION

2968-2980' Limestone, white, gray, slightly fossiliferous, trace black tarry stain, no show of free oil and questionable odor in fresh samples.
2994-3004' Limestone, gray, white, finely crystalline, few medium crystalline, chalky, trace black stain, no show of free oil and no odor in fresh samples.

3008-3020' Limestone, gray, slightly fossiliferous, poor visible porosity, trace black to dark brown stain, no show of free oil and no odor in fresh samples.

TORONTO SECTION

3063-3076' Limestone, tan, oolitic; slightly cherty; poor visible porosity, no shows; trace limestone, tan, medium crystalline, poor porosity, trace brown spotty stain, no free oil and no odor in fresh samples.

LANSING SECTION

3152-3160' Limestone, tan, fossiliferous, scattered porosity, brown stain, and black stain, no show of free oil and faint odor in fresh samples.

3160-3170' Limestone, as above.

3183-3191' Limestone, gray, tan, fossiliferous in part; poorly developed, trace brown, black and gray stain, no free oil and faint odor in fresh samples.

3196-3200' Limestone, as above; poor visible porosity, no shows.

3200-3210' Limestone, white, oolitic, chalky in part; fair inter-crystalline and pinpoint porosity, brown stain, show of free oil and fair odor in fresh samples.

Drill Stem Test #1 **3168-3220**
(Log Depth 3170-3222)

Times: 30-30-45-60

Blow: Strong

Recovery: 90' muddy water, slightly show of oil
1180' water

Pressures:

ISIP	777	psi
FSIP	719	psi
IFP	59-382	psi
FFP	375-593	psi
HSH	1519-1475	psi

3220-3232' Limestone, tan, finely crystalline, few fossiliferous, slightly cherty, plus gray oolitic chert.

3238-3252' Limestone, as above

3283-3292' Limestone, cream, tan, fine and medium crystalline, few oolitic, poorly developed porosity, trace brown stain, no show of free oil and no odor in fresh samples.

3298-3320' Limestone, tan, oolitic, sub-oomoldic, poorly developed porosity, trace brown stain, weak show of free oil and no odor.

3323-333' Limestone, as above, plus limestone, tan, fossiliferous, chalky in part, brown spotty stain, no show of free oil and no odor in fresh samples.

Drill Stem Test #2 **3271-3338**
(Log Depth **3273-3340**)

Times: 30-30-45-60

Blow: Strong

Recovery: 640' gas in pipe
402' very heavily oil and gas cut watery mud
(40% gas; 40% oil; 10% water; 10% mud)
186' oil and gas cut muddy water
(25% gas; 10% oil; 55% water; 10% mud)
248' Slightly oil cut muddy water
(1% oil; 99% water)

Pressures: ISIP 961 psi
FSIP 943 psi
IFP 35-176 psi
FFP 182-335 psi
HSH 1584-1554 psi

3350-3358' Limestone, tan, oolitic, fossiliferous, chalky, poor spotty light brown stain, no show of free oil and no odor in fresh samples.

ARBUCKLE SECTION

3387-3396' Dolomite, cream, white, finely crystalline, sucrosic, scattered pinpoint type porosity, brown spotty stain, show of free oil and faint odor in fresh samples.

Drill Stem Test #3 **3350-3394**
(Log Depth **3352-3396**)

Times: 30-30-45-45

Blow: Strong

Recovery: 120' gas in pipe
680' clean oil
372' gassy muddy oil
(25% gas; 60% oil; 15% mud)

Pressures: ISIP 1013 psi
FSIP 970 psi
IFP 43-201 psi
FFP 208-357 psi
HSH 1623-1609 psi

3396-3400' Dolomite, as above, plus white chert.

3400-3407' Dolomite, tan, white, fine and medium crystalline, fair inter-crystalline porosity, brown stain, show of free oil and odor in fresh samples plus white sucrosic dolomite; as above.

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Morgenstern Family Corp #1
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Drill Stem Test #4 **3398-3405**
(Log Depth 3400-3407)

Times: 45-30-30-45

Blow: Weak to Good

Recovery: 10' clean oil
360' water

Pressures: ISIP 1048 psi
FSIP 1047 psi
IFP 18-115 psi
FFP 119-174 psi
HSH 1630-1599 psi

3407-3420' Dolomite, white and cream, finely crystalline, sucrosic, fair pinpoint porosity, trace poor stain, no show of free oil and faint odor in fresh samples; plus white, oolitic chert.

3420-3440' Dolomite, tan, medium crystalline, slightly cherty, poor visible porosity, black tarry stain, no show of free oil and no odor in fresh samples.

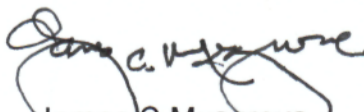
3440-3455' Dolomite, white, fine and medium crystalline, fair inter-crystalline to vuggy type porosity, no shows, plus chert, white, tan oolitic.

Rotary Total Depth 3455
Log Total Depth 3456

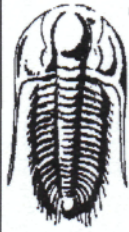
Recommendations:

5 1/2' production casing was set and cemented on the Mai Oil Operations, Morgenstern Family Corp #1.

Respectfully yours,


James C Musgrove
Petroleum Geologist





TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Mai Oil Operations Inc
 8411 Preston Rd STE 800
 Dallas TX 75225-5520
 ATTN: Jim Musgrove

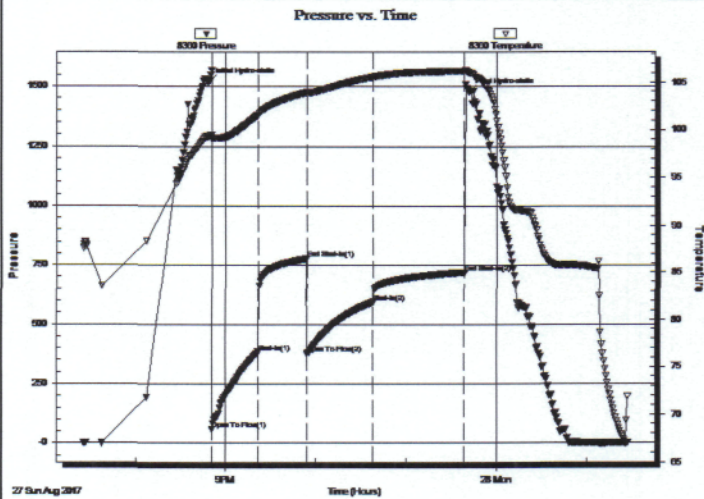
Morgenstern Family Corp #1
35-17s-13w Barton,KS
 Job Ticket: 63018 **DST#: 1**
 Test Start: 2017.08.27 @ 19:25:10

GENERAL INFORMATION:

Formation: **LKC C-D**
 Deviated: No Whipstock: ft (KB)
 Test Type: Conventional Bottom Hole (Initial)
 Time Tool Opened: 20:50:50 Tester: Ray Schwager
 Time Test Ended: 01:27:34 Unit No: 77
 Interval: **3168.00 ft (KB) To 3220.00 ft (KB) (TVD)** Reference Elevations: 1886.00 ft (KB)
 Total Depth: 3220.00 ft (KB) (TVD) 1878.00 ft (CF)
 Hole Diameter: 7.88 inches Hole Condition: Fair KB to GR/CF: 8.00 ft

Serial #: 8360 Inside
 Press@RunDepth: 593.84 psig @ 3170.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2017.08.27 End Date: 2017.08.28 Last Calib.: 2017.08.28
 Start Time: 19:25:10 End Time: 01:27:34 Time On Btm: 2017.08.27 @ 20:48:35
 Time Off Btm: 2017.08.27 @ 23:41:49

TEST COMMENT: 30-IFP-BOB in 2 min
 30-ISIP-no bl bk
 45-FFP-BOB in 10 min
 60-FSIP-no bl bk



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1519.30	99.31	Initial Hydro-static
3	59.58	99.05	Open To Flow (1)
33	382.08	101.51	Shut-In(1)
66	777.76	103.89	End Shut-In(1)
66	375.38	103.74	Open To Flow (2)
110	593.84	105.55	Shut-In(2)
170	719.61	106.15	End Shut-In(2)
174	1475.98	105.99	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
90.00	MW 30%M70%W w/show of oil	1.26
1180.00	Water	16.55

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Mai Oil Operations Inc
8411 Preston Rd STE 800
Dallas TX 75225-5520
ATTN: Jim Musgrove

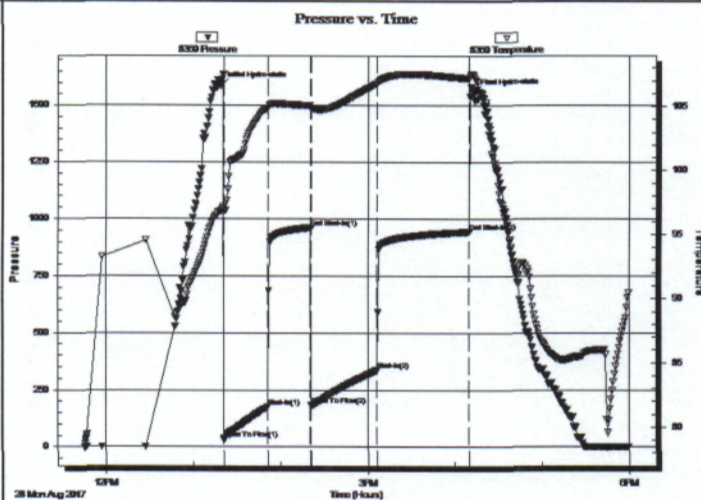
Morgenstern Family Corp #1
35-17s-13w Barton,KS
Job Ticket: 63019 DST#: 2
Test Start: 2017.08.28 @ 11:45:50

GENERAL INFORMATION:

Formation: **LKC**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 13:21:30
Time Test Ended: 17:59:29
Interval: **3271.00 ft (KB) To 3338.00 ft (KB) (TVD)**
Total Depth: 3338.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Fair
Reference Elevations: 1886.00 ft (KB)
1878.00 ft (CF)
KB to GR/CF: 8.00 ft

Serial #: 8360 **Inside**
Press@RunDepth: 335.64 psig @ 3277.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2017.08.28 End Date: 2017.08.28 Last Calib.: 2017.08.28
Start Time: 11:45:50 End Time: 17:59:29 Time On Btm: 2017.08.28 @ 13:19:30
Time Off Btm: 2017.08.28 @ 16:12:44

TEST COMMENT: 30-IFP-BOB in 3 min
30-ISIP-no bl bk
45-FFP-BOB in 7 min
60-FSIP-4"bl bk



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1584.60	96.83	Initial Hydro-static
2	35.76	96.79	Open To Flow (1)
33	176.40	104.85	Shut-In(1)
62	961.38	105.07	End Shut-In(1)
62	182.63	104.80	Open To Flow (2)
107	335.64	106.76	Shut-In(2)
171	943.00	107.17	End Shut-In(2)
174	1554.93	107.38	Final Hydro-static

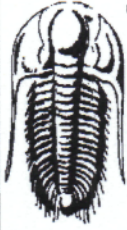
Recovery

Length (ft)	Description	Volume (bbl)
0.00	640'GIP	0.00
402.00	GM&WCO 40%G40%O10%W10%M	5.64
186.00	GO&MCW 25%G10%O10%M55%W	2.61
248.00	SOCW 1%O99%W	3.48

* 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
 8411 Preston Rd STE 800
 Dallas TX 75225-5520
 ATTN: Jim Musgrove

Morgenstern Family Corp #1
35-17s-13w Barton,KS
 Job Ticket: 63020 DST#: 3
 Test Start: 2017.08.29 @ 02:05:40

GENERAL INFORMATION:

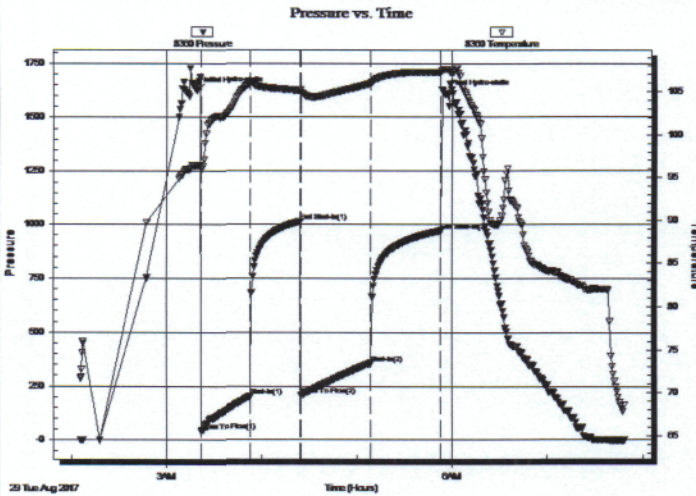
Formation: **Arbuckle**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 03:22:05
 Time Test Ended: 07:48:34
 Interval: **3350.00 ft (KB) To 3394.00 ft (KB) (TVD)**
 Total Depth: 3394.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Ray Schwager
 Unit No: 77
 Reference Elevations: 1886.00 ft (KB)
 1878.00 ft (CF)
 KB to GR/CF: 8.00 ft

Serial #: 8360

Inside

Press@RunDepth: 357.84 psig @ 3358.00 ft (KB)
 Start Date: 2017.08.29 End Date: 2017.08.29 Capacity: 8000.00 psig
 Start Time: 02:05:40 End Time: 07:48:34 Last Calib.: 2017.08.29
 Time On Btm: 2017.08.29 @ 03:19:20
 Time Off Btm: 2017.08.29 @ 05:55:05

TEST COMMENT: 30-IFP-BOB in 4 min
 30-ISIP-no bl bk
 45-FFP-BOB in 7 min
 45-FSIP-no bl bk



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1623.68	96.45	Initial Hydro-static
3	43.27	95.98	Open To Flow (1)
34	201.64	106.05	Shut-In(1)
65	1013.70	105.17	End Shut-In(1)
66	208.66	104.91	Open To Flow (2)
110	357.84	105.98	Shut-In(2)
154	970.80	107.27	End Shut-In(2)
156	1609.47	107.60	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
0.00	120'GIP	0.00
680.00	CO	9.54
372.00	GMO 25%G15%M60%O	5.22

* 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
 8411 Preston Rd STE 800
 Dallas TX 75225-5520
 ATTN: Jim Musgrove

Morgenstern Family Corp #1
35-17s-13w Barton,KS
 Job Ticket: 63021 **DST#: 4**
 Test Start: 2017.08.29 @ 14:05:08

GENERAL INFORMATION:

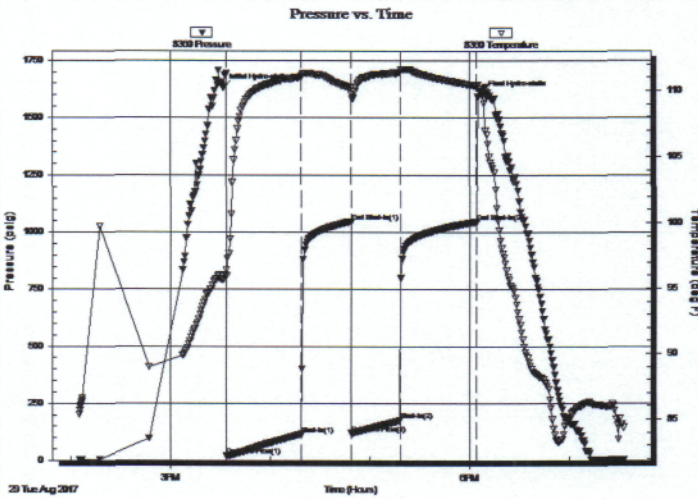
Formation: **Arbucke**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 15:33:48
 Time Test Ended: 19:32:47
 Interval: **3398.00 ft (KB) To 3405.00 ft (KB) (TVD)**
 Total Depth: 3405.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Ray Schwager
 Unit No: 77
 Reference Elevations: 1886.00 ft (KB)
 1878.00 ft (CF)
 KB to GR/CF: 8.00 ft

Serial #: 8360

Inside

Press@RunDepth: 174.91 psig @ 3399.00 ft (KB)
 Start Date: 2017.08.29 End Date: 2017.08.29
 Start Time: 14:05:08 End Time: 19:32:47
 Capacity: 8000.00 psig
 Last Calib.: 2017.08.29
 Time On Btm: 2017.08.29 @ 15:32:03
 Time Off Btm: 2017.08.29 @ 18:07:33

TEST COMMENT: 45--IFP-w k to BOB in 25 min
 30-ISIP-no bl bk
 30-FFP- w k to BOB in 27 min
 45-FSIP-no bl bk



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1630.78	95.66	Initial Hydro-static
2	18.90	95.96	Open To Flow (1)
47	115.34	111.05	Shut-In(1)
77	1048.82	110.23	End Shut-In(1)
77	119.85	109.79	Open To Flow (2)
106	174.91	111.38	Shut-In(2)
153	1047.55	110.34	End Shut-In(2)
156	1599.42	109.78	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
10.00	CO	0.14
360.00	Water	5.05

* Recovery from multiple tests

Gas Rates

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

QUALITY OILWELL CEMENTING, INC.

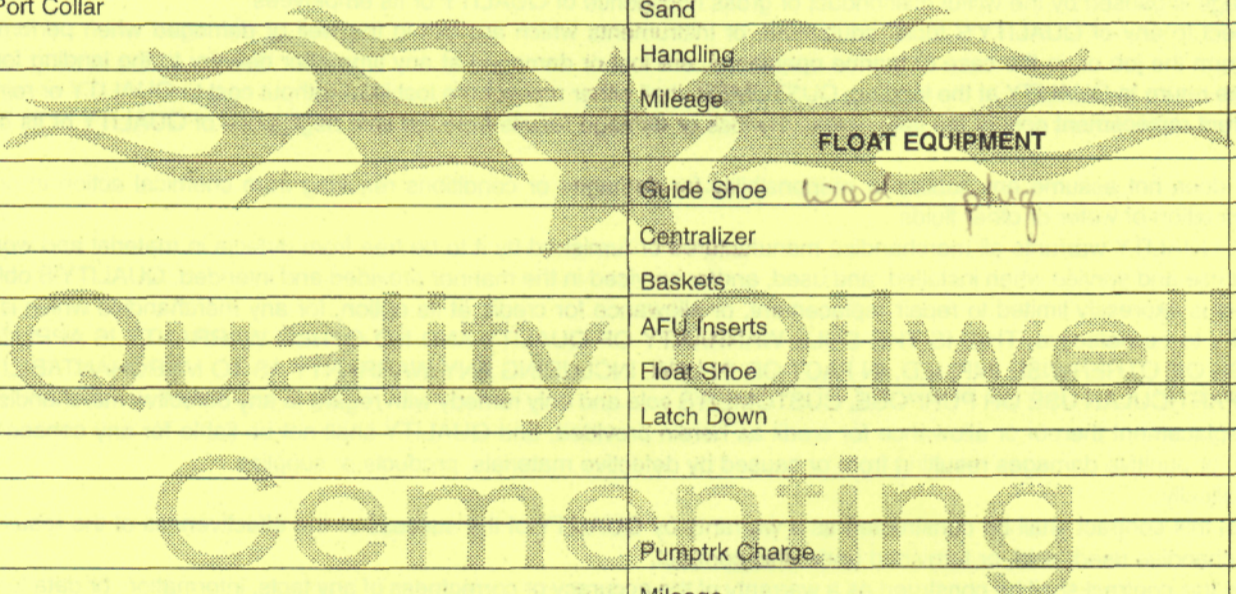
Federal Tax I.D.# 20-2886107

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

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

No. 291

Date	8-24-17	Sec.	35	Twp.	17	Range	13	County	Barton	State	KS	On Location	Finish	10:00PM	
Lease	Morgenstern Family Corp							Well No.	1						
Contractor	Southwind #3							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.						
Type Job	Surface							Charge To	Mai oil operations						
Hole Size	12 1/4"			T.D.	454'			Street							
Csg.	8 3/8"			Depth	454'			City	State						
Tbg. Size								Depth							
Tool								Depth							
Cement Left in Csg.	15'			Shoe Joint	15'			The above was done to satisfaction and supervision of owner agent or contractor.							
Meas Line								Displace	28 Bcs						
EQUIPMENT								Common							
Pumptrk	18	No.	Cementer					Poz. Mix							
			Helper		Craig										
Bulktrk	9	No.	Driver					Gel.							
			Driver		Tony										
Bulktrk	pu.	No.	Driver					Calcium							
			Driver		Rick										
JOB SERVICES & REMARKS								Hulls							
Remarks:	Cement did Circulate							Salt							
Rat Hole								Flowseal							
Mouse Hole								Kol-Seal							
Centralizers								Mud CLR 48							
Baskets								CFL-117 or CD110 CAF 38							
D/V or Port Collar								Sand							
								Handling							
								Mileage							
FLOAT EQUIPMENT								Guide Shoe	Wood plug						
								Centralizer							
								Baskets							
								AFU Inserts							
								Float Shoe							
								Latch Down							
								Pumptrk Charge							
								Mileage							
								Tax							
								Discount							
								Total Charge							
X Signature	Joy Driver														



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. 295

Date	8-30-17	Sec.	35	Twp.	17	Range	13	County	Barton	State	Ks	On Location	NOON	Finish	6:00
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Lease	Morgenstern Family Corp	Well No.	1	Location	Hoisington - 2E 1/2N, E15	Owner	To Quality Oilwell Cementing, Inc.
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Contractor	Southwind #3	Type Job	Longstring	Charge To	Main oil operations	Owner	You are hereby requested to rent cementing equipment and furnish cementer and helper to assist owner or contractor to do work as listed.
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Hole Size	7 7/8"	T.D.	3455'	Csg.	5 1/2" 14# used	Depth	3453'	Street	City	State
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Tbg. Size	Depth	City	State	Tool	Depth	The above was done to satisfaction and supervision of owner agent or contractor.
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Cement Left in Csg.	33.05'	Shoe Joint	33.05'	Cement Amount Ordered	160 60/40 10% Salt 2% Gel 1/4# Flucel
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Meas Line	Displace	83 1/2 Bcs	1000 gal mud Clear 48	EQUIPMENT	Common
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Pumptrk	16	No.	Cementer	Helper	Poz. Mix
Bulktrk	No.	Driver	Driver	Gel.	Gel.
Bulktrk	No.	Driver	Driver	Calcium	Calcium

JOB SERVICES & REMARKS	Hulls
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Remarks:	Salt
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Rat Hole	Flowseal
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Mouse Hole	Kol-Seal
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Centralizers	1-9, 13
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Baskets	pipe on bottom break Circulation
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D/V or Port Collar	pump 1000 gal mud Clear 48
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plug Rathole	w/ 305x Cement 3/2"
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w/ 1305x Cement	shut down wash
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pump + lines	Displaced plug w/ 83 1/2 Bcs
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of New	Released + held
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Lift pressure	650 #
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Land plug	to 1500 #
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Pumptrk Charge	Mileage
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Mileage	Tax
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Tax	Discount
-----	----------

Discount	Total Charge
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X Signature	B. K. Jones
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