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Mai Oil Operations Inc.  
Christiansen #1  
SW-NW-NW (725' FSL & 503' FEL)  
Section 18-21s-12w  
Stafford County, Kansas

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

**Contractor:** Southwind Drilling Co. (rig #3)

**Commenced:** September 25, 2018

**Completed:** October 2, 2018

**Elevation:** 1867' K.B., 1865' D.F., 1859' G.L.

**Casing program:** Surface; 8 5/8" @ 655'  
Production, 5 1/2" @ 3674'

**Sample:** Samples saved and examined 2900' to the Rotary Total Depth.

**Drilling time:** One (1) foot drilling time recorded and kept 2900' to the Rotary Total Depth.

**Measurements:** All depths measured from the Kelly Bushing.

**Drill Stem Tests:** There were five (5) Drill Stem Tests ran by Trilobite Testing Co.

**Electric Log:** By Eli; Dual Induction; Compensated Density/Neutron Log and Micro Log.

<u>Formation</u>	<u>Log Depth</u>	<u>Sub-Sea Datum</u>
Anhydrite	701	+1166
Base Anhydrite	722	+1145
Heebner	3133	-1266
Toronto	3152	-1285
Douglas	3167	-1300
Brown Lime	3260	-1393
Lansing	3277	-1410
Base Kansas City	3488	-1621
Conglomerate	3496	-1629
Simpson Shale	3570	-1643
Arbuckle	3541	-1674
Rotary Total Depth	3675	-1808
Log Total Depth	3677	-1810

(All tops and zone(s) corrected to Electric Log Measurements)

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

**TOPEKA SECTION**

3038-3066' Limestone, gray, tan, fossiliferous, sub-oomoldic, chalky, few granular, trace tan and gray cherts, no shows.

**TORONTO SECTION**

3152-3160' Limestone, white, cream, finely crystalline, chalky; plus white boney chert.

**LANSING SECTION**

3276-3286' Limestone, tan; finely crystalline, few with fine inter-crystalline and pinpoint type porosity; questionable stain, no show of free oil and no odor in fresh samples.

3295-3305' Limestone, tan, finely crystalline, slightly fossiliferous, cherty, trace brown stain, trace of free oil and faint odor in fresh samples.

3311-3321' Limestone, gray, tan, slightly fossiliferous, poor visible porosity, no shows.

3334-3340' Limestone, gray, oolitic (dense).

3346-3350' Limestone, gray fossiliferous/oolitic, scattered porosity, brown and dark brown stain, show of free oil and faint odor in fresh samples.

**Drill Stem Test #1** **3286-3348**  
**(Log Measurements 3288-3350)**

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

**Blow: Weak**

**Recovery: 10' mud, with oil specks**

**Pressures: ISIP 759 psi**  
**FSIP 613 psi**  
**IFP 12-13 psi**  
**FFP 13-15 psi**  
**HSH 1535-1592 psi**

3356-3366' Limestone, tan, mottled, fossiliferous, poor pinpoint type porosity, dense, no shows.

3370-3390' Limestone, tan, cream, finely crystalline, poor visible porosity, dense, no shows.

3370-3390' Limestone, tan; buff finely crystalline, few fossiliferous, cherty; poor visible porosity, no shows.

3400-3410' Limestone, tan, oomoldic, chalky, poor to fair porosity, trace brown to dark brown stain, show of free oil and fair odor in fresh samples.

3414-3420' Limestone, tan, buff; finely crystalline, fossiliferous, poor pinpoint type porosity; trace black stain, trace of free oil and faint odor in fresh samples.

3430-3440' Limestone, cream, tan, finely crystalline, granular, chalky, fair porosity; trace brown stain; no show of free oil and no odor in fresh samples.

3456-3460' Limestone, white, cream, scattered vuggy type porosity; trace brown stain, show of free oil and no odor in fresh samples.

**Drill Stem Test #2** **3379-3500**  
**Log Measurements 3381-3502)**

**Times:** 30-30-30-30  
**Blow:** Strong  
**Recovery:** 1039' gas in pipe  
17' oil and gas cut mud  
(2% gas; 33% oil; 28% mud)  
63' oil and gas cut mud  
(40% gas; 32% oil; 28% mud)  
**Pressures:** ISIP 559 psi  
FSIP 626 psi  
IFP 19-31 psi  
FFP 34-45 psi  
HSH 1597-1621 psi

**CONGLOMERATE SECTION**

3497-3512' Varied colored shale; banded; trace sand; clear, medium grained; sub-rounded, trace brown stain, trace tan and orange cherts.

**SIMPSON SECTION**

3515-3520' Sand; gray; white, very fined grained, sub-rounded, sub-angular, poorly sorted, no shows.

**ARBUCKLE SECTION**

3540-3550' Dolomite, tan, medium and coarse crystalline, fair vuggy type porosity; brown stain, show of free oil and strong odor in fresh samples.

3550-3560' Dolomite, as above

**Drill Stem Test #3** **3470-3558**  
**(Log Measurement 3472-3560)**

**Times:** 30-30-30-30  
**Blow:** Strong  
**Recovery:** 1827' gas in pipe  
693' clean oil  
10' oil and gas cut mud  
(53% gas; 32% oil; 15% mud)  
63' heavily oil and gas cut mud to muddy oil  
(35% gas; 36% oil; 5% mud)  
63' oil and gas cut mud  
(73% gas; 24% oil; 3% mud)  
**Pressures:** ISIP 831 psi  
FSIP 782 psi  
IFP 47-183 psi  
FFP 190-298 psi  
HSH 1700-1687 psi

- 3560-3570' Dolomite, tan, brown, coarse crystalline, good inter-crystalline, and vuggy type porosity; dark brown stain, show of free oil and strong odor in fresh samples.
- 3570-3585' Dolomite, tan brown, medium crystalline, good inter-crystalline porosity, brown/golden brown stain, show of free oil and strong odor in fresh samples.

**Drill Stem Test #4** **3559-3583**  
**(Log Measurements 3561-3585)**

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

**Blow:** Fair

**Recovery:** 189' gas in pipe  
282' water cut mud with oil specks

**Pressures:**

ISIP	889	psi
FSIP	875	psi
IFP	15-75	psi
FFP	78-133	psi
HSH	1738-1721	psi

- 3586-3603' Shale; green; soft, dolomitic; plus trace sand; clear, medium grained; sub-rounded, trace brown stain, show of free oil.
- 3603-3605' Dolomite, white, medium to coarse crystalline, good inter-crystalline porosity; brown stain, show of free oil and strong odor in fresh samples.

**Drill Stem Test #5** **3586-3603**  
**(Log Measurements 3588-3605)**

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

**Blow:** Weak

**Recovery:** 40' mud cut water, oil specks

**Pressures:**

ISIP	114	psi
FSIP	124	psi
IFP	12-18	psi
FFP	23-25	psi
HSH	1747-1707	psi

- 3605-3620' Dolomite, tan, medium crystalline, good inter-crystalline porosity; dark brown stain, show of free oi and strong odor in fresh samples.
- 3620-3640' Dolomite, tan, fine and medium crystalline, poor porosity to scattered pinpoint porosity, chalky luster; no shows, plus, white and cream cherts.

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3640-3600' Dolomite, tan, buff, finely crystalline, poor scattered pinpoint porosity and poor inter-crystalline porosity; dark black stain, show of free oil (heavy, black, tarry) few black flaky. Dead.

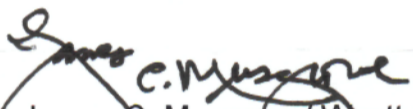
3660-3677' Dolomite, white, cream, finely crystalline, cherty; poor porosity; dense.

Rotary Total Depth            3675 (-1808)  
Log Total Depth             3677 (-1810)

**Recommendations:**

5 ½" production casing was set and cemented on the Mai Oil Operations, Inc., Christiansen #1.

Respectfully yours,

  
James C. Musgrove/ Wyatt Urban  
Petroleum Geologists  
