JERRY A. SMITH

CERTIFIED PETROLEUM GEOLOGIST

GEOLOGIST'S REPORT

DRILLING TIME and SAMPLE LOG

COMPANY: BEREXCO, LLC
LEASE: HEATON #10
FIELD: MUELLER
LOCATION: S/2-SE-NE-SW
SEC. 17 | TWSP. 21 | RNG.12W
COUNTY: STAFFORD | STATE: KANSAS

ELEVATIONS
K.B. 1870
D.F. 1869
G.L. 1863
Measurements Are All From: KB

CONTRACTOR: ROYAL DRLG., RIG #2
SPUD: 1/2/2019 | COMP. 1/10/2019
RTD. 3700 | LTD. 3699
MUD UP: 2606 | TYPE MUD: CHEMICAL

CASING
SURFACE: 8 5/8" @ 682'
PRODUCTION: 5 1/2" @ 3697'

API No. 15-185-24044

ELECTRICAL SURVEYS
PIONEER: CNL/CDL, DIL, MEL, BHCS

SAMPLES SAVED FROM: 2700 TO: RTD
DRILLING TIME KEPT FROM: 2300 TO: RTD
SAMPLES EXAMINED FROM: 2700 TO: RTD
GEOLOGICAL SUPERVISON FROM: 1940 TO: RTD
GEOLOGIST ON WELL: JERRY A. SMITH

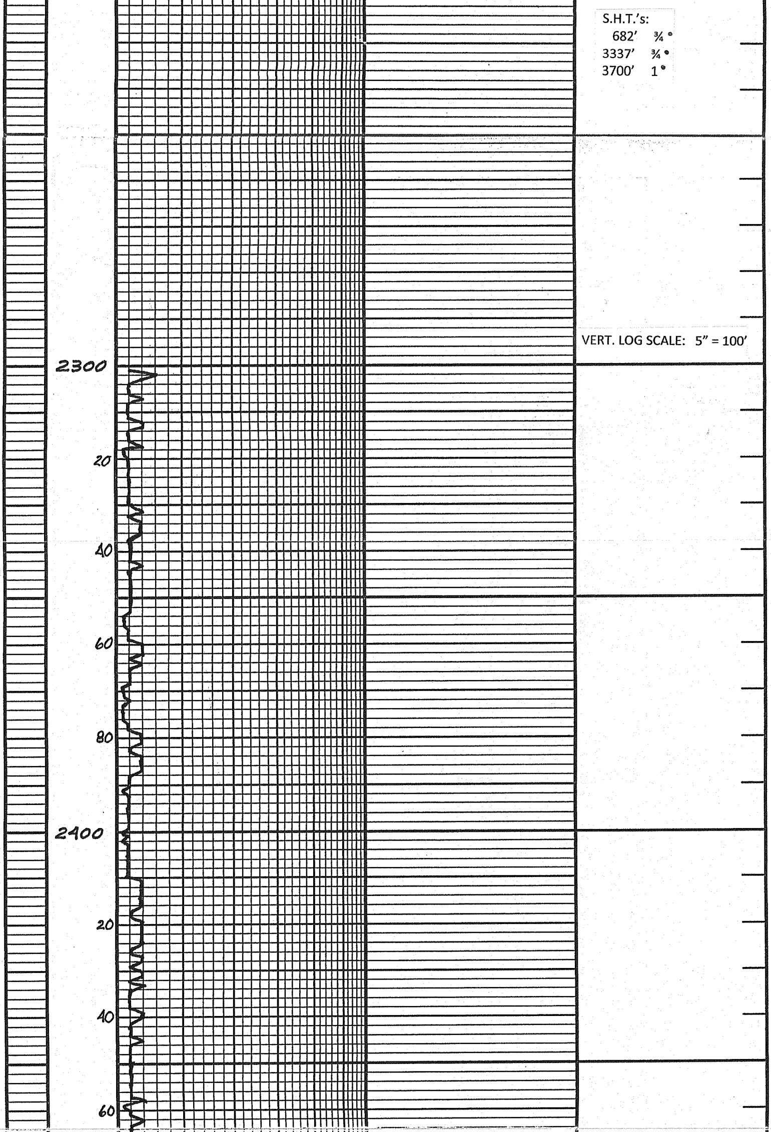
FORMATION TOPS	LOG	SAMPLES
ANHYDRITE	670 (+1200)	
HEEBNER	3112 (-1242)	3113 (-1243)
TORONTO	3130 (-1260)	3134 (-1264)
DOUGLAS SH.	3144 (-1274)	3146 (-1276)
BROWN LIME	3242 (-1372)	3244 (-1374)
LANSING	3258 (-1388)	3260 (-1390)
B/KANSAS CITY	3484 (-1614)	3482 (1612)
ARBUCKLE	3540 (-1670)	3539 (-1669)

LEGEND

Anhydrite	Salt	Sandstone	Shale	Carb sh	Limestone	Ool.Lime	Chert	Dolomite

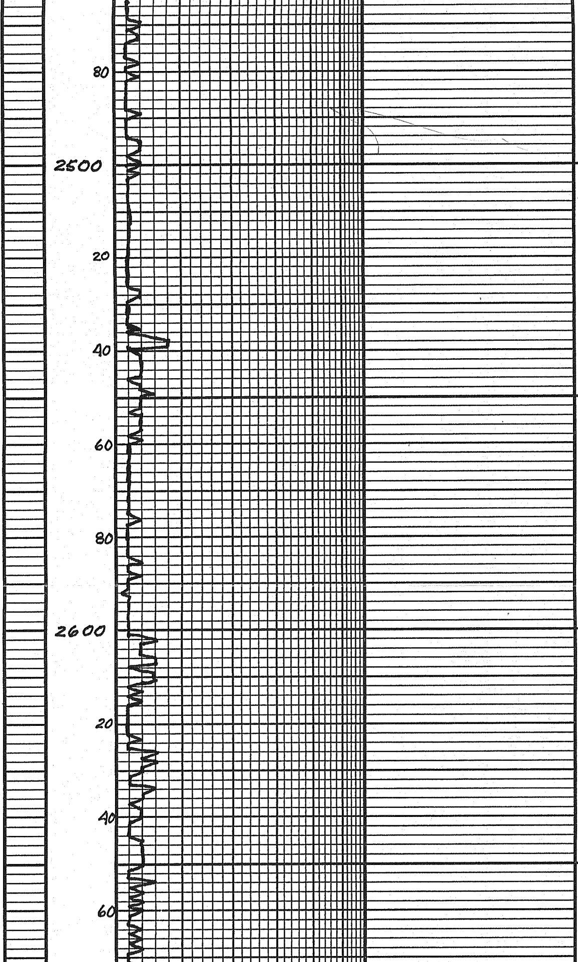
LOG 7704

LITHOLOGY	DEPTH	DRILLING TIME IN MINUTES PER FOOT Rate of Penetration Increases 5" 10" 15" 20" 25"	SAMPLE DESCRIPTIONS	REMARKS
				NO GAS DETECTOR DST's (5): TRILOBITE MUD: ANDY's MUD & CHEMICAL

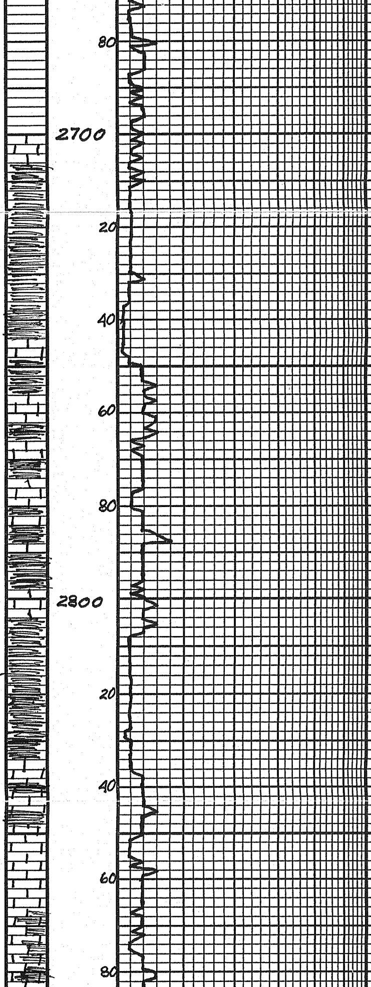


S.H.T.'s:
682' ¾°
3337' ¾°
3700' 1°

VERT. LOG SCALE: 5" = 100'



MUD @ 2602':
8.7 WT, 65 VIS, 7.6 FILT.,
2000 CHLOR, 2# LCM



START SAMPLES @ 2700'

PREDOM GY GRN, RD SH. w/ TR M GY & CRM, FX, DSE LM.

SH w/ TR LM - AA.

SH - GY, GRN, RD.

SH - AA w/ SLI INC IN LM - AA. CHKY IN PT.

SH & LM - AA.

LM & SH - AA. INC IN LM.

LM - CRM, LT → M GY, FX. DSE w/ ABD GY, GRN SH.

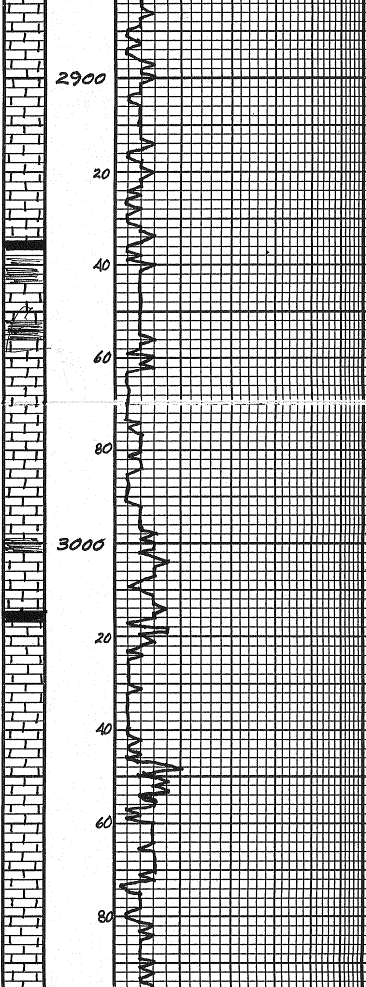
SH - PREDOM LT → M GY, GY-GRN.

SH - AA.

SH - AA w/ INC IN LT → M GY, FX, DSE LM.

SN & LM - AA.

ABD SH, LT → M → DK GY, GY-BRN, GY-BRN. TR LM - AA.



LM- LT → M GY. FX. DSE. w/ SH- LT → M GY, GY-/GRN.

LM & SH- AA. INC IN LM.

LM- AA w/ TR SH- AA. TR BLK/CARB SH.

LM- LT → M GY. GY-TN. FX. DSE → CHKY IN PT.

LM- M GY. GY-TN. FX. FOSS IN PT. FR INT-XLN & FOSS MLD Ø. NO VIS SHO.

LM- LT → M GY. GY-TN. FX. FOSS IN PT. FR → GD INTXLN & FOSS MLD Ø. NS.

LM- AA. B'CMING DSE. ABD M → DK GY. SH.

LM- LT → M GY. FX. DSE → SPSLY CHKY.

LM- CRM, LT → M GY GY-TN. FX. DSE → CHKY. SPSLY FOSS. TR BLK/CARB SH.

LM- LT GY GY-TN. FX. FOSS IN PT. DSE → PR → FR INT-XLN & FOSS MLD Ø. NVS. CHKY.

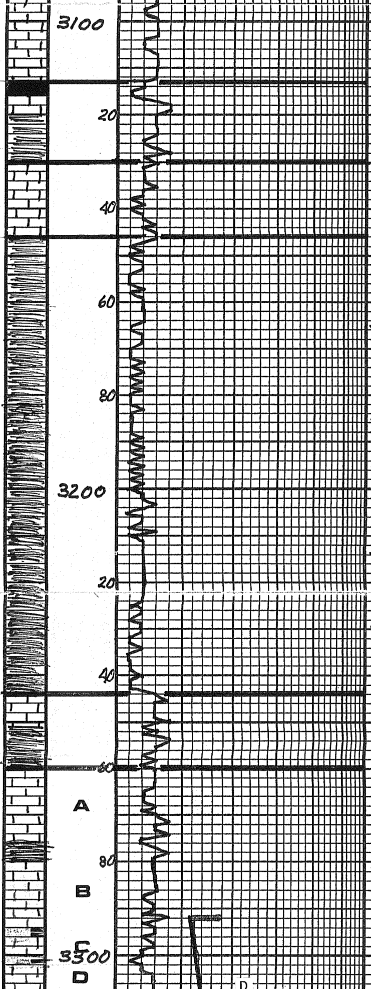
LM- AA. NS.

LM- CRM, LT → M GY. FX. FOSS IN PT. DSE → CHKY.

LM- AA.

LM- LT → M GY. GY-TN. FX. DSE → PR. SCATT INTXLN Ø. SBS VGY Ø. CHKY IN PT. NS.

LM- AA.



LM - AA.

LM-AA.

HEEBNER SH.
3113 (-1243) SMPL
3112 (-1242) LOG

SH-BLK, CARB.

LM-M GY, GY-TN. FX. DSE. HD.

SH-M→DK GY.

TORONTO
3134 (-1264) SMPL
3130 (-1260) LOG

LM-CRM, LT GY. FX. DSE→ PR INTXLN Ø. NS. SCATT WH CHK.

DOUGLAS SH.
3146 (-1276) SMPL
3144 (-1274) LOG

SH- M → DK GY, GY-GRN. SILTY IN PT.

SH- AA.

SH- AA.

SH- AA.

SH- AA.

SH- AA.

SH- LT → M GY, GY-GRN. MIC. SILTY.

MUD @ 3249':
8.7 WT, 80 VIS, 10 FILT,
2000 CHLOR, 1.5# LCM

SH-AA w/ ABD DK GRN SH.

SH-AA.

BROWN LIME
3244 (-1374) SMPL
3242 (-1372) LOG

LM-DK TN, GY-TN. FX. DSE. HD.

SH-M GY, GY-GRN.

LANSING
3260 (-1390) SMPL
3258 (-1388) LOG

LM-M GY, GY-TN. FX. DSE. SCATT WH CHK.

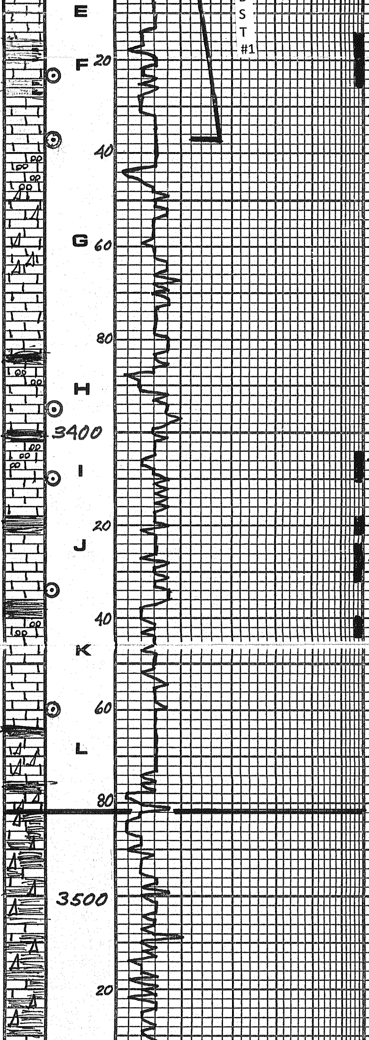
LM-AA.

LM- LT → M → DK GY. FX. DSE → SPS FOSS MLD Ø. NS.

LM-AA.

LM-AA.

LM-CRM, LT GY. FX. DSE→ PR INTXLN Ø. QUES WK ODOR. NO VIS. SHO.



LM-CRM, LT GY. FX. SEVERAL PC'S GD VGY Ø. GD DK STN → SAT. FR → GD SHO FO. FR ODOR.

LM-CRM, LT GY, GY-TN. FX. DSE. NO VIS Ø. NO ODOR.

LM-AA. TR VGY Ø. DK STN IN Ø. NO FO. WK ODOR.

LM-AA.

LM-CRM, LT TN. FX. SCATT OOMLD Ø. CHKY. NS.

PIPE STRAP @ 3337:
3359.87 STRAP
3359.46 BOARD
.41 LONG

LM-CRM, LT GY. FX. DSE. TR LT GY, OPQ, SHP, DSE CHT.

LM-AA.

LM-CRM. FX. OOL IN PT. NO VIS Ø.

LM-LT GY, LT TN. FX. SPSLY OOMLDIC. NS. SCATT WH CHK.

LM-LT → M GY, GY-TN. FX. DSE.

MUD @ 3395':
8.9 WT, 60 VIS, 8.8 FILT,
3000 CHLOR, 1# LCM

LM-CRM, LT → M GY. FX. DSE.

LM-LT → M GY. FX. SPARSE OOMLD Ø. WK ODOR. DK BRN STN IN Ø. 1 PC BROKE 1 DROPLET OF FO. ABD BLK RESID STN ON FEW PC'S.

LM-LT → M GY. FX. DSE → SPARSE SCATT MOLDIC Ø w/ BLK STN. V WK FLEET ODOR.

LM-AA. SCATT MLDIC Ø w/ DK STN. V WK ODOR. NO FO.
40" SMPL: 1 PC w/ FO & FR ODOR.

LM-LT GY, LT TN. FX. SCATT OOMLD, FOSS MLD & VGY Ø. LT BRN STN. WK ODOR.

LM-CRM, LT → M GY. FX. DSE. NO VIS Ø. NO ODOR. NS.

LM-CRM, LT → M GY. FX. DSE. ABD WH CHK.

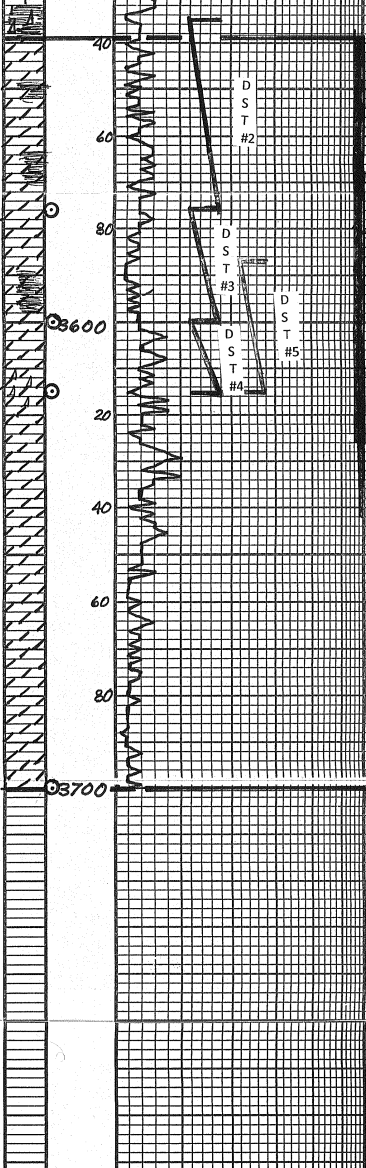
LM-AA w/ CHT-VARICOL OPQ → SEMITRSL, SHP, DSE. INC LNGY SH.

BASE KANSAS CITY/
CONGLOMERATE
3482 (-1612) SMPL
3484 (-1614) LOG

LM-CRM, LT → M GY. FX. DSE. CHKY w/ SH-GRN, M → DK GY, GY-GRN. w/ SCATT CHT-LT GY OPQ → VARICOL SEMITRSL, SHP, DSE.

LM, SH, TR CHT-AA.

LM-M GY. FX. OOLIT IN PT. DSE → PR INTXLN Ø. SCATT DK STN. WK ODOR. w/ SH & TR CHT-AA.



ARBUCKLE
3539 (-1669) SMPL
3540 (-1670) LOG

DOLO- TN GY-TN. F→MX. SUCRO. FR→GD INT-XLN Ø. GD VGY Ø. V STRONG ODOR. GD SHO GAS BUBB. GD SHO LT FO.

DOLO- AA.

DOLO- CRM, LT GY, LT TN. FX. SUCRO. SCATT GD VGY Ø. V STR ODOR. GD SHO LT FO.

DOLO- AA.

MUD @ 3579':
8.9 WT, 65 VIS, 10.4 FILT,
5000 CHLOR, 3# LCM

DOLO- CRM, LT→M GY, GY-TN. F→MX. SUCRO. PR INTXLN Ø. SCATT VGY Ø. V STR ODOR. DK STN IN Ø. OIL FILM ON WTR SURF.

DOLO- AA. V STR ODOR. FR SHO FGO.

DOLO- AA.

DST #4: MISRUN –
PKR. FAILURE

DOLO- CRM, LT→M GY, GY-TN, F→MX. SUCRO. FR→GD INTXLN Ø. SCATT VGY Ø. V STR ODOR. SCATT LT TN STN. SS FO.

20": GD VGY Ø GD SHO FO. V STR ODOR. ABD WH OPQ. SHP DSE CHT.

40": LOSS OF Ø IN DOLO.

MUD @ 3615':
9.2 WT, 53 VIS, 9.6 FILT,
6000 CHLOR, 3# LCM

DOLO- CRM, LT GY, GY-TN, TN. F→MX. GD INTXLN Ø. SCATT PR VGY Ø. STR ODOR. GD SHO TN FO.

DOLO- AA w/ GD SHO'S & ODOR- AA.

O/W EST. @ APPROX.
3613'

DOLO- AA w/ SHO'S- AA. w/ DOLO- CRM, FX, DSE. NO Ø. NS.

DOLO- CRM, LT GY, FX. DSE. WK ODOR. NO VIS SHO.

DOLO- AA.

DOLO- CRM, LT GY, FX. DSE. SUCRO IN PT. NO Ø. NS. w/ DOLO FROM ABV w/ GD Ø, GD SHO, GD ODOR.

DOLO- TN GY-TN. F→MX. GD INTXLN & VGY Ø. FR ODOR. GD SHO FO & BRN STN. w/ ABD DOLO- AA.

DOLO- LT GY. FX. DSE. SPSLY SUCRO. SCATT BLK STN. NO FO. VWK ODOR.

TOTAL DEPTH
3700 (-1830) ROTARY
3699 (-1829) LOG

LITHOLOGY	DEPTH	5" 10" 15" 20" 25" DRILLING TIME MINUTES/FOOT Rate of Penetration Increases	SAMPLE DESCRIPTIONS	REMARKS

COMPANY: BEREXCO, LLC	**ELEVATION: 1870 KB**		
LEASE: HEATON #10			
LOCATION: S/2-SE-NE-SW	**SEC 17**	**TWP 21**	**RGE 12W**
COUNTY: STAFFORD	**STATE: KS**		

TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Berexco LLC

2020 N Bramblewood
Wichita, KS 67206

ATTN: Jerry Smith

17-21S-12W Stafford

Heaton 10

Job Ticket: 64886 **DST#: 1**

Test Start: 2019.01.06 @ 18:56:00

GENERAL INFORMATION:

Formation: **Lansing "E&F"**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 21:02:17
Time Test Ended: 01:04:02

Test Type: Conventional Bottom Hole (Initial)
Tester: Leal Cason
Unit No: 74

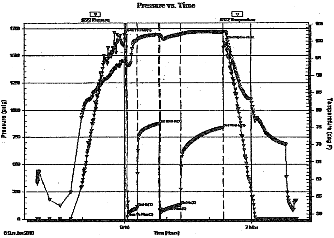
Interval: 3292.00 ft (KB) To 3337.00 ft (KB) (TVD)
Total Depth: 3337.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

Reference Elevations: 1870.00 ft (KB)
1862.00 ft (CF)
KB to GR/CF: 8.00 ft

Serial #: 8672 **Inside**

Press@RunDepth:	112.11 psig @	3293.00 ft (KB)		Capacity:	psig
Start Date:	2019.01.06	End Date:	2019.01.07	Last Calib.:	2019.01.07
Start Time:	18:56:00	End Time:	01:04:02	Time On Btm:	
				Time Off Btm:	2019.01.06 @ 23:21:47

TEST COMMENT: IF: Strong Blow, BOB in 20 Seconds, Built to 760 Inches
ISI: GTS During Bleed Off, No Blow Back
FF: Strong Blow, BOB & GTS Immediate, Gauged & Caught Sample
FSI: 1 inch Blow Back



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1718.51	94.08	Open To Flow (1)
2	23.84	92.85	Open To Flow (2)
16	112.11	100.25	Shut-In(1)
48	879.28	101.93	End Shut-In(1)
49	77.74	101.62	Open To Flow (3)
78	130.48	102.01	Shut-In(2)
139	841.88	102.66	End Shut-In(2)
140	1619.64	102.80	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
0.00	3037 GIP	0.00
63.00	OMCW 4%O 10%M 86%W	0.88
199.00	GOWCM 22%G 6%O 32%W 40%M	2.79

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)
First Gas Rate	0.25	24.00	61.00
Last Gas Rate	0.25	36.00	79.95
Max. Gas Rate	0.25	36.00	79.95

TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

Berexco LLC

2020 N Bramblewood
Wichita, KS 67206

ATTN: Jerry Smith

17-21S-12W Stafford

Heaton 10

Job Ticket: 64887 **DST#: 2**

Test Start: 2019.01.07 @ 23:00:00

GENERAL INFORMATION:

Formation: **Arbuckle**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 01:11:02
Time Test Ended: 06:34:02

Test Type: Conventional Bottom Hole (Reset)
Tester: Leal Cason
Unit No: 74

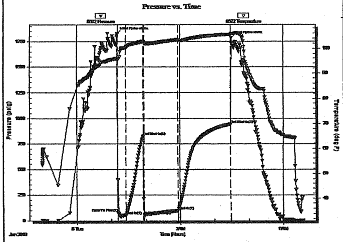
Interval: 3535.00 ft (KB) To 3576.00 ft (KB) (TVD)
Total Depth: 3576.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

Reference Elevations: 1870.00 ft (KB)
1862.00 ft (CF)
KB to GR/CF: 8.00 ft

Serial #: 8672 **Inside**
Press@RunDepth: 97.04 psig @ 3536.00 ft (KB)
Start Date: 2019.01.07 End Date: 2019.01.08
Start Time: 23:00:00 End Time: 06:34:02

Capacity: psig
Last Calib.: 2019.01.08
Time On Btm: 2019.01.08 @ 01:10:47
Time Off Btm: 2019.01.08 @ 04:29:47

TEST COMMENT: IF: Strong Blow , BOB in 3 minutes, Built to 76 inches
ISI: No Blow Back
FF: Strong Blow , BOB Immediate, Built to 134 inches
FSI: No Blow Back



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1825.00	96.08	Initial Hydro-static
1	80.65	95.21	Open To Flow (1)
15	54.10	100.20	Shut-In(1)
46	826.52	102.65	End Shut-In(1)
47	55.64	102.09	Open To Flow (2)
107	97.04	103.46	Shut-In(2)
198	945.01	105.59	End Shut-In(2)
199	1785.42	105.83	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
0.00	1512 GIP	0.00
126.00	GMCO 20%G 30%M 50%O	1.77
93.00	OCM 50%M 50%O	1.30

* Recovery from multiple tests

Gas Rates

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

TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

Berexco LLC

2020 N Bramblewood
Wichita, KS 67206

ATTN: Jerry Smith

17-21S-12W Stafford

Heaton 10

Job Ticket: 64888 **DST#: 3**

Test Start: 2019.01.08 @ 12:39:00

GENERAL INFORMATION:

Formation: **Arbuckle**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 13:45:47
Time Test Ended: 19:01:02

Interval: 3576.00 ft (KB) To 3600.00 ft (KB) (TVD)
Total Depth: 3600.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

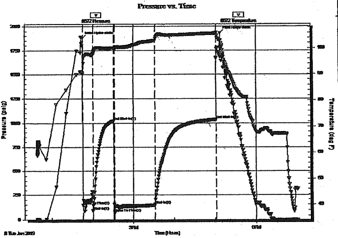
Test Type: Conventional Bottom Hole (Reset)
Tester: Leal Cason
Unit No: 74

Reference Elevations: 1870.00 ft (KB)
1862.00 ft (CF)
KB to GR/CF: 8.00 ft

Serial #: 8672 **Inside**

Press@RunDepth:	153.95 psig @	3577.00 ft (KB)		Capacity:	psig
Start Date:	2019.01.08	End Date:	2019.01.08	Last Calib.:	2019.01.08
Start Time:	12:39:00	End Time:	19:01:02	Time On Btm:	2019.01.08 @ 13:45:02
				Time Off Btm:	2019.01.08 @ 17:07:17

TEST COMMENT: IF: Strong Blow, BOB in 2 minutes, Built to 132 inches
ISI: Weak Surface Blow Back
FF: Strong Blow, BOB immediate, Built to 317 inches, GTS in 42 minutes, TSTM, Caught Sample
FSI: No Blow Back



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1875.84	90.56	Initial Hydro-static
1	145.51	90.03	Open To Flow (1)
16	94.37	97.76	Shut-In(1)
46	1020.72	99.89	End Shut-In(1)
47	73.79	99.43	Open To Flow (2)
107	153.95	102.99	Shut-In(2)
197	1034.62	105.68	End Shut-In(2)
203	1930.33	103.11	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
0.00	3211 GIP	0.00
126.00	GMCO 10%G 30%M 60%O	1.77
219.00	GSY Oil 10%G 90%O	3.07

* Recovery from multiple tests

Gas Rates

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

TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

Berexco LLC

2020 N Bramblewood
Wichita, KS 67206

ATTN: Jerry Smith

17-21S-12W Stafford

Heaton 10

Job Ticket: 65890 **DST#: 5**

Test Start: 2019.01.09 @ 05:52:00

GENERAL INFORMATION:

Formation: **Arbuckle**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 07:37:02
Time Test Ended: 13:16:02

Test Type: Conventional Bottom Hole (Reset)
Tester: Leal Cason
Unit No: 74

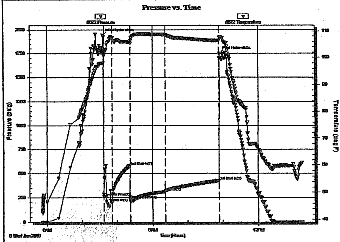
Interval: 3587.00 ft (KB) To 3615.00 ft (KB) (TVD)
Total Depth: 3615.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

Reference Elevations: 1870.00 ft (KB)
1862.00 ft (CF)
KB to GR/CF: 8.00 ft

Serial #: 8672 **Inside**
Press@RunDepth: 312.20 psig @ 3588.00 ft (KB)
Start Date: 2019.01.09 End Date: 2019.01.09
Start Time: 05:52:00 End Time: 13:16:02

Capacity: psig
Last Calib.: 2019.01.09
Time On Btm: 2019.01.09 @ 07:35:02
Time Off Btm: 2019.01.09 @ 10:55:02

TEST COMMENT: IF: Strong Blow , BOB in 1 minute, Built to 276 inches
ISI: No Blow Back
FF: Strong Blow , BOB in 1 minute, Built to 215 inches
FSI: 4 inch Blow Back



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1938.91	97.99	Initial Hydro-static
2	257.86	101.39	Open To Flow (1)
16	202.67	107.48	Shut-In(1)
47	579.81	105.67	End Shut-In(1)
47	229.95	105.26	Open To Flow (2)
107	312.20	108.48	Shut-In(2)
199	430.29	106.38	End Shut-In(2)
200	1750.21	107.60	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
0.00	2739 GIP	0.00
63.00	SMCW 5%M 95%W	0.88
315.00	GMWCO 20%G 5%M 20%W 55%O	4.42
408.00	GMCO 30%G 10%M 60%O	5.72
786'		

* Recovery from multiple tests

Gas Rates

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