

# Robert L. Milford

PETROLEUM GEOLOGIST  
Wichita, Kansas

## GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

<p>OPERATOR: <b>Murfin Drilling Company, Inc.</b></p> <p>LEASE: <b>Ridd, B' #1-22</b></p> <p>LOC. SPOT: <b>301N &amp; 100E of W2 E2 NW</b></p> <p>LOC. FOOTAGE: <b>1,290' FNL 1,750' FWL</b></p> <p>SEC: <b>22</b> TWP: <b>4S</b> R1G: <b>33W</b></p> <p>COUNTY: <b>Rawlins</b> STATE: <b>Kansas</b></p> <p>API: <b>15-153-20895-00-00</b></p> <p>CONTRACTOR: <b>Murfin Drilling Co., Inc.</b> REG. NO. <b>8</b></p> <p>DRILLING STARTED: <b>2-18-2012</b> COMPLETED: <b>2-26-2012</b></p> <p>WELL DISPLACED: <b>3,277'</b> MUD TYPE: <b>Chemical</b></p> <p>DRILLING TIME KEPT FROM: <b>3,000'</b> TO RTD</p> <p>SAMPLES TAKEN FROM: <b>3,000'</b> TO RTD</p> <p>SAMPLES EXAMINED FROM: <b>3,000'</b> TO RTD</p> <p>GEOLOGICAL SUPERVISION FROM: <b>3,561'</b> TO RTD</p>	<p>MSR/FERRELL/STEWART</p> <p><b>CASINO RECORD</b></p> <p>Conductor:</p> <p>Surface: <b>8.5' @ 215'</b> w/ 190 sacks cement</p> <p>Production: <b>5.1/21' @ 4593'</b> w/ 175 sacks cement</p> <p><b>ELECTRICAL SURVEYS:</b> Log-Tech, Inc.</p> <p>Dadl Induction Log</p> <p>Dadl Compersted -</p>
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FORMATION NAME	LOG TOP DATUM	SAMPLE TOP DATUM
Stone Corral	2,679' +309	2,675' +313
Base Stone Corral	2,715' +273	2,711' +277
Topbed	3,700' -712	3,694' -706
Heebner	3,866' -878	3,860' -872
Lansing	3,908' -920	3,902' -914
B/C	4,143' -1155	4,137' -1149
Pawnee	4,269' -1281	4,263' -1275
Cherokee	4,348' -1360	4,342' -1354
Mississippi	4,514' -1526	4,508' -1520
Total Depth	4,606' -1618	4,603' -1615

Porosity Log

Microresistivity Log

DATE	7:00 AM DEPTH	REMARKS
2-15-12	0'	Spud @ 1:30 pm. Plug down @ 6:15 pm. Started drilling out plug @ 2:15 am on 2-16-12
2-16-12	500'	Cut 500' in last 24 hrs. Dev. 0.75" @ 1003'
2-17-12	1,980'	Cut 1,480' in last 24 hrs; 22.25 hrs drlg. Dev. 0.75" @ 2044'
2-18-12	2,770'	Cut 790' in last 24 hrs; 20 hrs drlg.
2-19-12	3,470'	Cut 700' in last 24 hrs; 20.75 hrs drlg.
2-20-12	3,937'	Cut 467' in last 24 hrs; 21 hrs drlg. DST #1 @ 3958'
2-21-12	3,990'	Cut 53' in last 24 hrs; 4.25 hrs drlg. DST #2 @ 4015'. DST #3 @ 4088'
2-22-12	4,088'	Cut 98' in last 24 hrs; 6.5 hrs drlg.
2-23-12	4,220'	Cut 132' in last 24 hrs; 11.5 hrs drlg. DST #4 @ 4321'
2-24-12	4,321'	Cut 101' in last 24 hrs; 7.5 hrs drlg. DST #5 @ 4370'
2-25-12	4,440'	Cut 119' in last 24 hrs; 6 hrs drlg. DST #6 @ 4552'
2-26-12	4,570'	Cut 130' in last 24 hrs; 6.5 hrs drlg. RTD 4603' @ 9:56 am
2-27-12	4,603'	Cut 33' in last 24 hrs; 2.75 hrs drlg. Ran production casing

**Remarks**

The electric log measurements correlate from 4' to 6' lower to the drilling measurements.

Formation tops and lithology on this report have been corrected to the electric log.

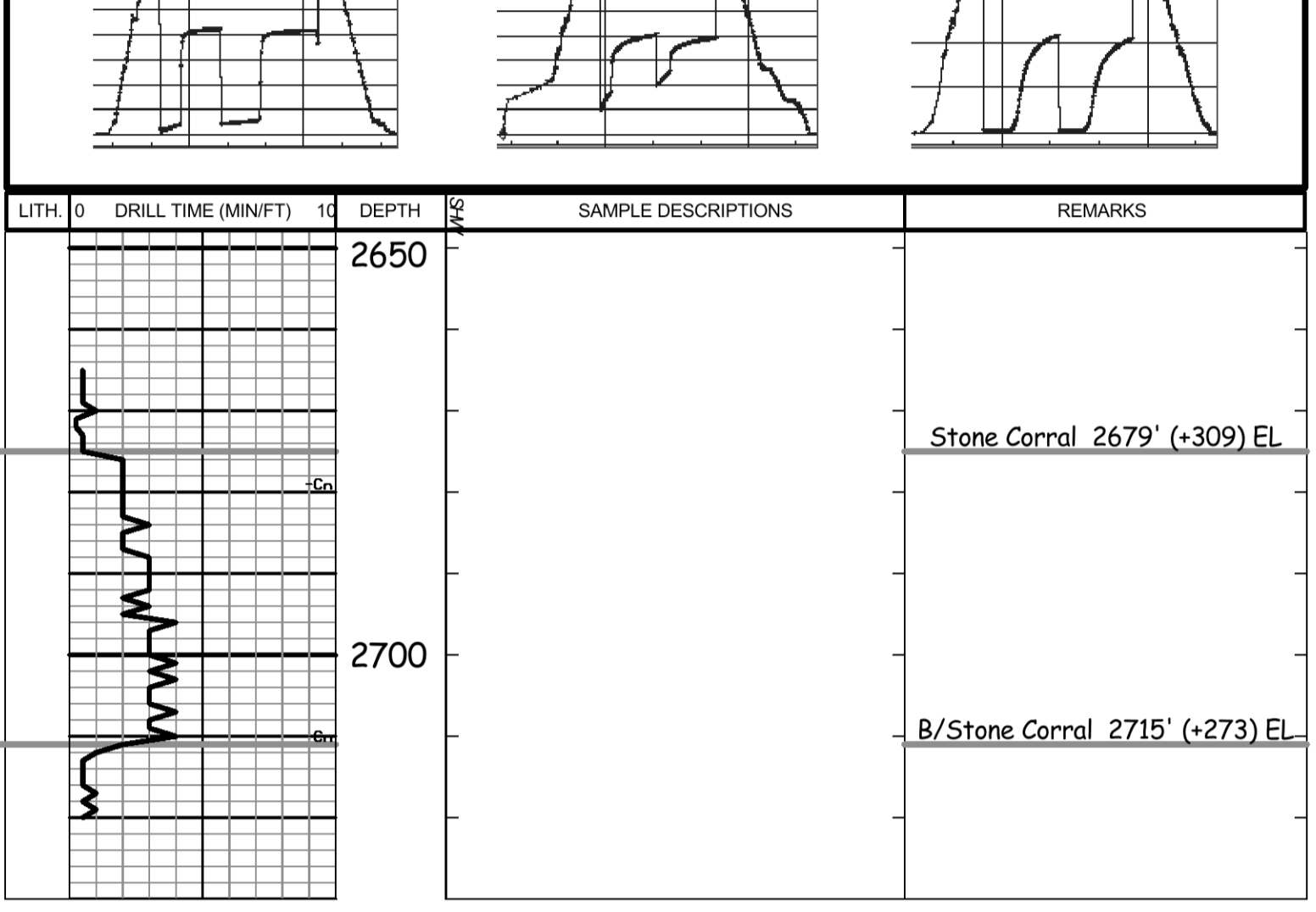
The drilling samples were deposited at the Kansas Geological Survey office in Wichita.

Respectfully submitted,

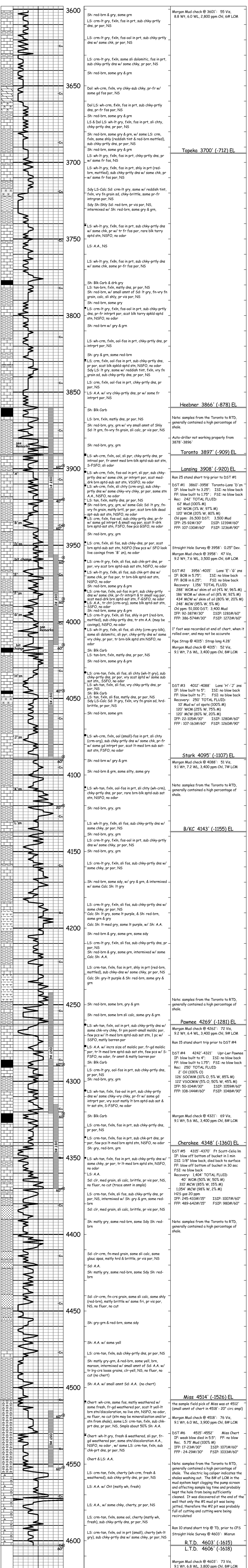
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### Drill Stem Test Charts

Drill Stem Test by Trilobite Testing, Inc.



LITH.	DRILL TIME (MIN/FT)	DEPTH	SAMPLE DESCRIPTIONS	REMARKS
		2650		Stone Corral 2679' (+309) EL
		2700		B/Stone Corral 2715' (+273) EL



<p>Morgan Mud check @ 3601': 55 Vis, 8.8 Wt, 6.0 WL, 2,800 ppm Chl, 6# LCM</p> <p>Morgan Mud check @ 3958': 47 Vis, 9.2 Wt, 6.4 WL, 3,400 ppm Chl, 6# LCM</p> <p>Morgan Mud check @ 4088': 47 Vis, 9.1 Wt, 6.0 WL, 3,900 ppm Chl, 8# LCM</p> <p>Morgan Mud check @ 4321': 69 Vis, 9.1 Wt, 5.6 WL, 3,400 ppm Chl, 8# LCM</p> <p>Morgan Mud check @ 4603': 73 Vis, 9.1 Wt, 6.8 WL, 3,800 ppm Chl, 8# LCM</p>	<p><b>Topex 3700' (-712) EL</b></p> <p><b>Heebner 3866' (-878) EL</b></p> <p><b>Toronto 3897' (-909) EL</b></p> <p><b>Lansing 3908' (-920) EL</b></p> <p>Ran 25 stand short trip prior to DST #1</p> <p>DST #1 3860'-3958' Toronto-Lans 'D' zn IF: blow built to 3.25"; ISI: no blow back FF: blow built to 1.75"; FSI: no blow back Recovery: 1.15% TOTAL FLUID 288' WCM w/ skim of oil (4% W, 96% M) 186' WCM w/ skim of oil (8% W, 92% M) 434' MCW w/ skim of oil (80% W, 20% M) 248' MCW (95% W, 5% M) Chl ppm: 51,000 DST: 3,400 Mud IFF: 92-387#/30' TSP: 1281#/60' FFP: 386-574#/30' FSIP: 1272#/60'</p> <p>1st foot was recorded at end of interval when it rolled over, and may not be accurate</p> <p>Pipe Strap @ 4015': Strap long 4.28'</p> <p>Morgan Mud check @ 4015': 52 Vis, 9.1 Wt, 7.6 WL, 3,400 ppm Chl, 8# LCM</p> <p>DST #2 3956'-4015' Lans 'E'-G' zns IF: BOB in 5.75"; ISI: no blow back FF: BOB in 6.25"; FSI: no blow back Recovery: 1.15% TOTAL FLUID 288' WCM w/ skim of oil (4% W, 96% M) 186' WCM w/ skim of oil (8% W, 92% M) 434' MCW w/ skim of oil (80% W, 20% M) 248' MCW (95% W, 5% M) Chl ppm: 51,000 DST: 3,400 Mud IFF: 92-387#/30' TSP: 1281#/60' FFP: 386-574#/30' FSIP: 1272#/60'</p> <p>1st foot was recorded at end of interval when it rolled over, and may not be accurate</p> <p>Pipe Strap @ 4015': Strap long 4.28'</p> <p>Morgan Mud check @ 4015': 52 Vis, 9.1 Wt, 7.6 WL, 3,400 ppm Chl, 8# LCM</p> <p>DST #3 4012'-4088' Lans 'H'-J' zns IF: blow built to 5"; ISI: no blow back FF: blow built to 1.75"; FSI: no blow back Recovery: 25% TOTAL FLUID 120' Mud w/ oil spots (100% M) 120' MCW (80% W, 20% M) IFF: 22-105#/30' TSP: 1280#/60' FFP: 107-163#/60' FSIP: 1260#/90'</p> <p><b>Stark 4095' (-1107) EL</b></p> <p>Morgan Mud check @ 4088': 51 Vis, 9.1 Wt, 7.2 WL, 3,400 ppm Chl, 7# LCM</p> <p>Note: samples from the Toronto to RTD, generally contained a high percentage of shale.</p> <p><b>B/KC 4143' (-1155) EL</b></p> <p>Note: samples from the Toronto to RTD, generally contained a high percentage of shale.</p> <p><b>Pawnee 4269' (-1281) EL</b></p> <p>Morgan Mud check @ 4262': 72 Vis, 9.2 Wt, 6.4 WL, 3,400 ppm Chl, 9# LCM</p> <p>Ran 15 stand short trip prior to DST #4</p> <p>DST #4 4242'-4321' Upr-Lwr Pawnee IF: blow built to 4"; ISI: no blow back FF: blow built to 1.75"; FSI: no blow back Recovery: 1.404% TOTAL FLUID 40' WCM (50% W, 50% M) 310' MCW (85% W, 15% M) 1,054' MCW (98% W, 2% M) H2S gas 20 ppm IFF: 245-433#/15' TSP: 1007#/60' FFP: 489-642#/15' FSIP: 980#/60'</p> <p>Note: samples from the Toronto to RTD, generally contained a high percentage of shale. The electric log caliper indicates the shales washing out. The #8 of LCM in the mud system kept clogging the pump screen and affecting sample log time and probably kept the hole from being sufficiently cleaned. It was discovered at the end of the well that only the #2 mud pit was being jetted, therefore the #2 pit was probably full of cutting and cutting were being recirculated.</p> <p>Ran 10 stand short trip @ TD, prior to CFS Straight Hole Survey @ 4603': Misrun</p> <p><b>R.T.D. 4603' (-1615)</b> <b>L.T.D. 4606' (-1618)</b></p>
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