

Robert L. Milford

PETROLEUM GEOLOGIST
Wichita, Kansas

GEOLOGISTS' REPORT

DRILLING TIME AND SAMPLE LOG
OPERATOR **Murfin Drilling Company, Inc.**
LEASE **Burk Trust 'A' #6-23**
LOC. SPOT **NW NE NW**

ELEVATIONS
KB **3,302'**
GL **3,297'**

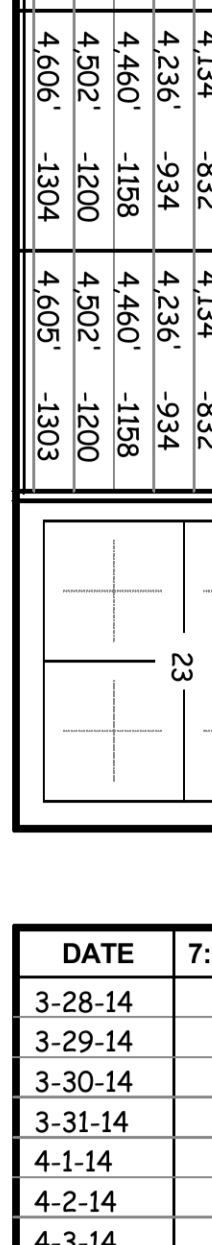
MEASUREMENTS
CASING RECORD
CONDUIT

LOC. FOOTAGE **330 FNL 1,650 FWL**
SEC. **23** TWPSP **1S** RANG **36W**
COUNTY **Rawlins** STATE **Kansas**
API **15-153-21000-00-00**

CONTRACTOR **Murfin Drilling Co., Inc.** REC NO. **8**
DRILLING STARTED **3-28-2014** COMPLETED **4-4-2014**
MUD DISPLACED **3,485** CU YD
DRILLING TIME KEPT FROM **3:59:00** TO **RTD**
SAMPLES SAVED FROM **3:59:00** TO **RTD**
SAMPLES EXAMINED FROM **3:59:00** TO **RTD**
GEOLOGICAL SUPERVISION FROM **3:59:00** TO **RTD**

FORMATION NAME LOG
TOP DATUM TOP SAMPLE DATUM

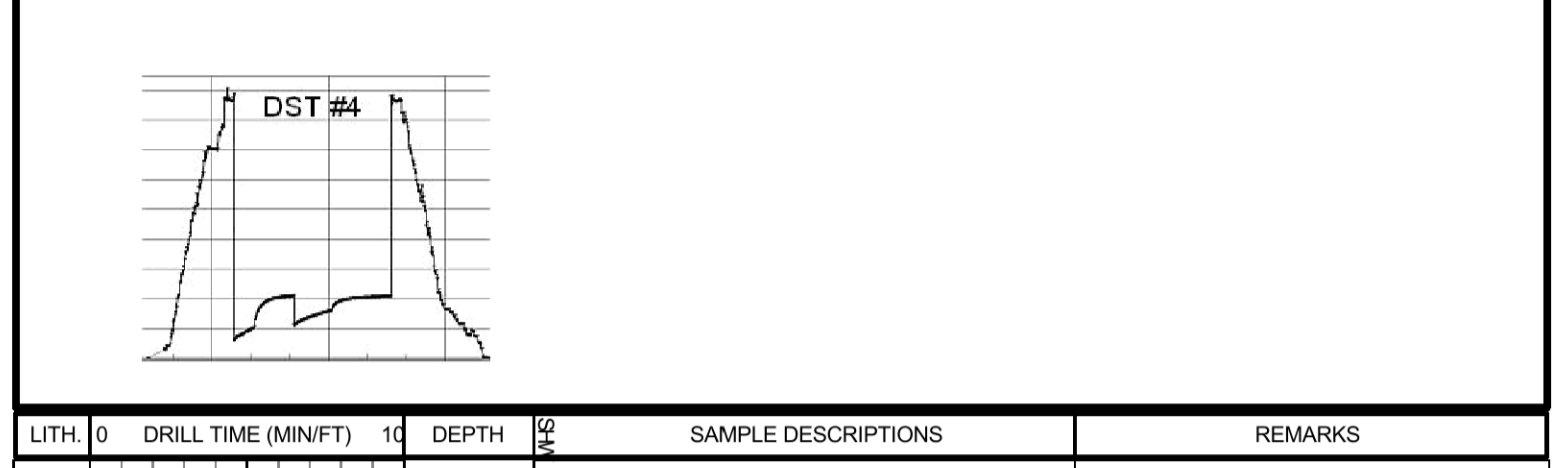
Stone Corral	3,214'	+88	3,214'	+88
Base Stone Corral	3,245'	+57	3,245'	+57
Neva	3,698'	-396	3,699'	-397
Topeka	3,806'	-504	3,808'	-506
Oread	4,023'	-721	4,023'	-721
Lansing	4,134'	-832	4,134'	-832
Stark	4,236'	-934	4,236'	-934
Stark	4,460'	-1158	4,460'	-1158
B/KC	4,502'	-1200	4,502'	-1200
Total Depth	4,605'	-1304	4,605'	-1303



DATE	7:00 AM DEPTH	REMARKS
3-28-14	0'	Spud @ 10:00 am. Plug down @ 3:00 pm. Drilled out plug @ 11:00 pm w/ PDC bit
3-29-14	1,052'	Cut 1,052' in last 24 hrs; 790' in 7.25 hrs w/ PDC bit. Lost circ. @ 2792' (down 4 hrs)
3-30-14	3,170'	Cut 2,118' in last 24 hrs; 18,25 hrs drlg. Bit trip @ 3582' (ran button bit)
3-31-14	3,785'	Cut 615' in last 24 hrs; 15.75 hrs drlg.
4-1-14	4,250'	Cut 465' in last 24 hrs; 21.5 hrs drlg. DST #1 @ 4255'. DST #2 @ 4310'
4-2-14	4,310'	Cut 60' in last 24 hrs; 2.75 hrs drlg. DST #3 @ 4370'
4-3-14	4,370'	Cut 60' in last 24 hrs; 2.5 hrs drlg. DST #4 @ 4460'
4-4-14	4,460'	Cut 90' in last 24 hrs; 3.75 hrs drlg. RTD 4605' @ 7:34 pm
4-5-14	4,605'	Cut 145' in last 24 hrs; 7.75 hrs drlg. Ran production casing.

Remarks
The electric log measurements correlate from even to 2' higher 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,
Robert L. Milford

Drill Stem Test Charts



LITH	DRILL TIME (MIN/FT)	DEPTH	SAMPLE DESCRIPTIONS	REMARKS
		3200		Stone Corral 3214' (+88) EL
		3250		B/Stone Corral 3245' (+57) EL

		3600	Sdy Sh: red-brn, fn-vry fn grain sd, sli calc in prt, w/ some Sd: lt gry, fn-vry fn grain, sli calc in prt, semi fri-brittle, pr vis por, NS Sdy Sh & Sd: A.A.	Call depth 3290' @ 9:20 am on 3-30-14 Mud displaced @ 3455'; down for 1.45 hrs Bit trip at 3582'. Replaced PDC bit with button bit. Pipe Strap @ 3582': Strap long 0.64' Straight Hole Survey @ 3582': 1° Dev. Samples start 3590' @ 6:58 pm on 3-30-14
		3650	Sdy Sh: red-brn, some soft & gummy, w/ small amt of Sh: gry & grn, & some Sd: lt gry, fn-vry fn grain, sli calc, soft-semi fri, pr vis por, NS A.A.	
		3700	Sdy Sh: red-brn, some soft & gummy, w/ some Sdy Sh-Shly Sd: lt grn, fn-vry fn grain, sli calc, soft-semi fri, pr vis por, NS Sdy Sh: red-brn, w/ some Sh: grn, & some Sd: lt gry, fn-vry fn grain, semi fri, pr vis por, NS LS: wh-lt gry, fxln, fos in prt, sub chky-prtly dns w/ some chky-vry chky, pr por, NS Sdy Sh: red-brn, some soft & gummy	Neva 3698' (-396) EL
		3750	Sdy Sh: A.A. w/ small amt Sd: lt-med gry, fn-vry fn grain, sli calc, mstly brittle, pr vis por, NS Sdy Sh: red-brn, soft & gummy in prt Sdy Sh: A.A. w/ small amt of Sh: drk gry Sd: lt gry, fn-vry fn grain, sli calc, semi fri-brittle, pr vis por, NS Sdy Sh: red-brn	Red Eagle 3759' (-457) EL
		3800	LS-Dol: crm-lt gry, fxln, fos in prt, sli chty (tan-org), sub chky-prtly dns w/ some chky-vry chky, pr por, NS LS: lt-med gry, fxln, sli shly in prt, sli sub chky-prtly dns, pr por, NS Sdy Sh: red-brn, soft & gummy in prt, w/ small amt Sd: lt gry, fn-vry fn grain, sli calc, semi fri, pr vis por, NS A.A. w/ small amt Sd: grn & gry Sdy Sh: red-brn, some soft & gummy, w/ small amt Sd: gry	Morgan Mud check @ 3795': 72 Vis, 8.6 Wt, 5.2 WL, 700 ppm Chl, 6# LCM Foraker 3806' (-504) EL
		3850	LS: wh-crm, fxln, fos in prt, sub chky-prtly dns w/ some chky-vry chky, pr w/ some fr fos por, fr amt lt-med brn patchy-sat stn, NSFO, sli odor LS: crm-gry, fxln, sli fos, some sli shly, sli chty, sub chky-prtly dns w/ some chky, pr por, NS LS: tan-gry, fxln, sli fos, sli shly in prt, sli sub chky-prtly dns, pr por, NS LS: wh-tan, fxln, fos in prt, vry chky-prtly dns, pr w/ some fr fos por, NS Dol: tan, fxln, sli sub chky, some pin point-small vug por, NS LS: gry-brn, fxln, prtly dns, pr por, NS Sh: red-brn, soft & gummy in prt Sh: A.A. w/ small amt of drk gry	Note: wind blowing geograph cable was giving erroneous readings. Took drill time by marking footage on Kelly and used stop watch for time from 3820' to 4055' Too windy to trip pipe for a DST. Wind speed about 40 mph, gusting over 60 mph.
		3900	LS: crm-gry, fxln, sli fos, some sli dolomitic, sub chky-prtly dns w/ some chky, pr por, NS Sh: red-brn, mstly soft & gummy, w/ some gry-grn	
		3950	LS: wh-tan, fxln, sli fos, some shly (lt red-brn), sub chky-prtly dns w/ some chky, pr por, NS Sh: red-brn, soft & gummy in prt, w/ some gry & grn LS: tan-gry, fxln, sli fos, sub chky-prtly dns, pr por, NS Sh: A.A. Sh: red-brn, soft & gummy in prt, w/ some gry	Stotler 3957' (-655) EL
		4000	LS: crm-lt gry, fxln, fos (some crs), sub chky-prtly dns, pr por, NS LS: A.A. w/ some chky-vry chky, pr por, NS Sh: red-brn w/ some gry LS: wh-lt gry, fxln, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS LS: A.A. Sh: red-brn w/ some gry LS: wh-tan, fxln, fos in prt, some shly (red-brn, mottled), sli chty (tan), sub chky-prtly dns w/ some chky, pr por, NS LS: crm, fxln, fos (crs) in prt, shly in prt (red-brn, mottled), chky-prtly dns, pr por, NS Sh: red-brn, soft & gummy in prt, sdy in prt, w/ some gry Sh: A.A.	Topoka 4023' (-721) EL
		4050	LS: wh-tan, fxln, sli fos, shly in prt (red-brn, mottled), sub chky-prtly dns w/ some chky-vry chky, pr por, NS LS: wh-lt gry, fxln, fos in prt, chky-prtly dns w/ some vry chky, pr por, NS Shly Sd-Sdy Sh: red-brn w/ tr grn, fn-vry fn grain, sli calc, soft-semi brittle, pr vis por, NS Sh: red-brn, w/ some gry	
		4100	LS: crm-lt gry, fxln, sli fos, some shly (red-brn, mottled), sub chky-prtly dns w/ some chky-vry chky, pr por, NS Calc Sh: lt purple & lt red-brn Calc Sh: red-brn, & small amt Sd: gry LS: crm-tan, fxln, sli fos, sub chky-prtly dns, pr por, tr blk tarry-asp sptd stn, NSFO, no odor Sh: red-brn, soft & gummy in prt, w/ some brn, gry & grn LS: wh-crm, fxln, fos-ool (small) in prt, vry chky-prtly dns, pr-fr intrprtcal & small vug por, tr med-drk brn sptd dead stn, NSFO, no odor	No circ sample caught
		4150	LS: crm, fxln, fos-ool (small) in prt, sub chky-prtly dns w/ some chky, pr por, NS LS: crm-lt gry, fxln, sli fos, sub chky-prtly dns w/ some chky-vry chky, pr por, tr blk tarry-asp sptd stn, NSFO, no odor LS: lt gry, fxln, sli shly in prt, sub chky-prtly dns, pr por, NS LS: A.A., becoming sli darker gry-tan, pr por, NS Shly LS: drk gry, fxln, gritty, pr por, NS Calc Sh: drk gry	Oread 4134' (-832) EL
		4200	LS: lt gry-tan, fxln, sli shly in prt, sub chky-prtly dns, pr por, NS Sh: gry, w/ some red-brn Sd: lt gry, fn-vry fn grain, sli calc, sli shly, semi soft-brittle, pr vis por, NS Sh: gry, w/ some red-brn & tr grn Sh: red-brn, soft & gummy in prt, w/ some gry & grn	DST #1 4180'-4255' L/KC 'A' zn IF: blow built to 6" ISI: 2" blow back FF: blow built to 8" FSI: 0.5" blow back Rec: 80' Mud w/ oil spots (3% G, 3% O, 94% M) IFF: 65-60#/30" ISIP: 1092#/60" FFP: 61-62#/30" FSP: 1026#/60" Note: tool chsd 5' at open, and lost 10' mud. Had 2.5' surge blow at open.
		4250	LS: crm-tan, fxln, sli fos, sub chky-prtly dns w/ some chky, pr por, NS LS: crm-tan, fxln, sli fos, sub chky-prtly dns w/ some chky, pr por, NS Sd: lt gry, fxln, fn-vry fn grain, sli calc, semi fri-brittle, pr vis por, NS, & Sdy Sh-Shly Sd: red-brn Sh: red-brn, soft & gummy in prt, some gry & grn	Ran 21 stand short trip prior to DST #1 Morgan Mud check @ 4255': 65 Vis, 8.7 Wt, 5.2 WL, 700 ppm Chl, 10# LCM
		4300	LS: wh-crm, fxln, fos in prt, sli gry: sub chky-prtly dns w/ some chky, pr-fr fos w/ gd vug por, scat lt-drk brn patchy-sat stn, FSFO, no odor LS: lt gry, fxln, sli shly in prt, sub chky-prtly dns, pr por, NS, intermixed w/ Calc Sh: lt-med gry LS: red-brn, w/ some gry & grn LS: crm-lt gry, fxln, fos in prt, sub chky-prtly dns, pr por, NS Sh: red-brn, soft & gummy in prt, w/ some gry & grn Sh: A.A.	DST #2 4250'-4310' L/KC 'D' zn IF: blow built to 6" ISI: no blow back FF: blow built to 8" FSI: 0.5" blow back Recovery: 270' TOTAL FLUID: 10' MCO (85% G, 15% M) 73' OCM (2% G, 6% O, 92% M) 62' SO&WCM (2%G, 3%O, 32%W, 63%M) 125' MCW w/ oil sps (1%O, 64%W, 35%M) Chl ppm: 23,000 DST: 1,000 Mud IFF: 21-106#/30" ISIP: 1179#/60" FFP: 109-145#/60" FSP: 552#/90"
		4350	LS: wh-lt gry, fxln, fos in prt, sub chky-prtly dns w/ some chky-vry chky, pr-fr fos w/ gd vug por, scat lt-drk brn patchy-sat stn, FSFO, sli odor LS: lt gry, fxln, sli shly in prt, sub chky-prtly dns, pr por, NS LS: crm-lt gry, fxln, sli shly in prt, sub chky-prtly dns, pr por, NS Sh: lt gry, some calc Sh: red-brn & gry, some grn LS: crm-lt brn, fxln, sli fos, sub chky-prtly dns, pr por, tr lt brn sptd-patchy stn, NSFO, no odor Sh: red-brn w/ some gry, intermixed w/ some Sd: lt gry, fn-vry fn grain, sli calc, sli shly, soft-brittle, pr vis por, NS LS: crm-lt gry, fxln, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS Sh: gry, red-brn, gd amt soft & gummy	Morgan Mud check @ 4310': 60 Vis, 9.2 Wt, 5.6 WL, 1,000 ppm Chl, 10# LCM
		4400	LS: wh-lt gry, fxln, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS LS: crm-lt gry, fxln, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS Sh: red-brn, soft & gummy in prt, w/ some gry LS: wh-tan, fxln, sli fos, sub chky-prtly dns w/ some chky-vry chky, pr por, NS Sh: red-brn, w/ some gry-grn	DST #3 4303'-4370' L/KC 'G' zn IF: BOB in 23" ISI: 0.75" blow back FF: BOB in 11.25" FSI: 2" blow back Rec: 380' 6IP & 310' TOTAL FLUID: 110' CGO (17% G, 79% O, 4% M) 75' OCM (7% G, 43% O, 50% M) 125' GOCM (22% G, 29% O, 49% M) Oil Gravity 32° API IFF: 25-100#/30" ISIP: 567#/60" FFP: 107-140#/60" FSP: 552#/90"
		4450	LS: wh-crm, fxln, fos-ool, sub chky-prtly dns w/ some chky, pr-fr intrprt & vug por, fr amt lt brn patchy-sub sat w/ tr sat stn, FSFO, no odor LS: wh-tan, fxln, sli fos, sub chky-prtly dns w/ some chky-vry chky, pr por, NS Sh: red-brn, w/ some gry-grn LS: red-brn, some soft & gummy, w/ some gry & grn, & small amt Sd: lt gry-lt grn, fn-vry fn grain, calc, sli shly, mstly brittle, pr vis por, NS LS: wh-lt gry, fxln, sli fos, sub chky-prtly dns w/ some chky-vry chky, pr por, NS Sh: red-brn & gry-grn, some lt gry (soft & gummy)	Morgan Mud check @ 4460': 58 Vis, 9.3 Wt, 6.0 WL, 1,200 ppm Chl, 6# LCM
		4500	LS: wh-tan, sli fos, shly in prt (mottled), sub chky-prtly dns, pr por, NS LS: A.A. w/ some chky-vry chky, pr por, NS Sh: red-brn, some soft & gummy, w/ some gry-grn LS: crm-tan, fxln, fos in prt, sub chky-prtly dns, pr por, NS Sh: red-brn, soft & gummy in prt, w/ some gry-grn LS: crm-tan, fxln, fos, sub chky-prtly dns, pr por, NS LS: A.A., intermixed w/ Calc Sh: lt gry, grn, red-brn & purple Sh: red-brn, w/ some gry & grn, some calc LS: crm-lt gry, fxln, sli fos, sub chky-prtly dns, pr por, NS Sh: red-brn, w/ some Calc Sh: lt gry	DST #4 4425'-4460' L/KC 'J' zn IF: BOB in 8.25" ISI: 2" blow back FF: BOB in 11.25" FSI: 0.5" blow back Rec: 827' TOTAL FLUID: 20' MCO (2% G, 91% O, 7% M) 180' OCM (3% G, 10% O, 87% M) 190' WM w/ oil spots (3% G, 3% O, 45% W, 49% M) 437' MCW w/ trace oil (trace O, 94% W, 6% M) Oil Gravity 32.6° API Chl ppm: 25,000 DST: 1,100 Mud IFF: 153-261#/30" ISIP: 625#/60" FFP: 278-402#/60" FSP: 521#/90" Note: Tool chsd 13' to bottom at open. Lost 15' of mud.
		4550	LS: crm-lt gry, fxln, sli fos, sub chky-prtly dns, pr por, NS Sh: red-brn, w/ some Calc Sh: lt gry LS: crm-tan, fxln, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS Calc Sh-Shly LS: lt gry & Sh: red-brn & gry	B/KC 4502' (-1200) EL
		4600		Ran 7 stand short trip @ TD, prior to CFS R.T.D. 4605' (-1303) L.T.D. 4606' (-1304) Straight Hole Survey @ 4605': 0.5° Dev.