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PETROLEUM GEOLOGIST
Wichita, Kansas

GEOLOGISTS REPORT

DRILLING TIME AND SAMPLE LOG

OPERATOR **Murfin Drilling Company, Inc.**

LEASE **Shuler 'A' #2-20**

LOC. SPOT **110'S of C S2 SW**

LOC. FOOTAGE **550' FSL 1320' FWL**

SEC. **20** TWPSP **5S** RANG **29W**

COUNTY **Decatur** STATE **Kansas**

API **15-039-21216-00-00**

CONTRACTOR **Murfin Drilling Co., Inc.** RIG NO. **7**

DRILLING STARTED **1-2-2015** COMPLETED **1-9-2015**

MUD DISPLACED **2,977** MUD TYPE **Chemical**

DRILLING TIME KEPT FROM **3,580'** TO **RTD**

SAMPLES SAVED FROM **3,580'** TO **RTD**

SAMPLES EXAMINED FROM **3,580'** TO **RTD**

GEOLOGICAL SUPERVISION FROM **3,580'** TO **RTD**

FORMATION NAME

LOG TOP DATUM

SAMPLE TOP DATUM

STONE CORRAL

BASE STONE CORRAL

HEEBNER

TORONTO

LANSING

STARK

B/KC

Total Depth

ELEVATIONS

KB **2,825'**

GL **2,820'**

MEASUREMENTS FROM KB

CASINO RECORD

Conductor

Surface **8.5/8' @ 219'**

w/ 200 sacks cement

Production none

ELECTRICAL SURVEYS:

Pioneer Wireline:

Dual Induction Log

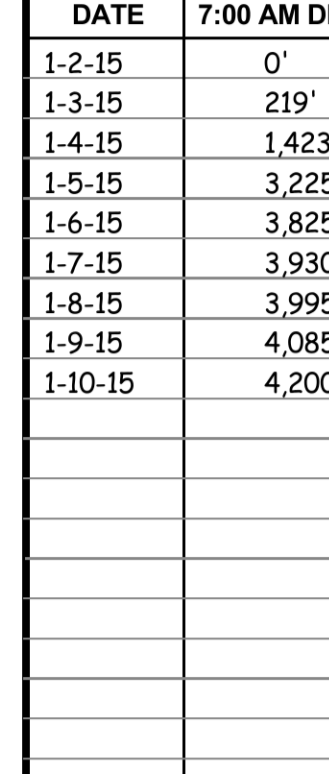
Dual Compensated -

Porosity Log

Microresistivity Log

Borehole Compensated -

Sonic Log



DATE	7:00 AM DEPTH	REMARKS
1-2-15	0'	Spud @ 6:00 pm. Plug down @ 11:00 pm. Dev.: 0.75° @ 219'
1-3-15	219'	Cut 219' in last 24 hrs. Drilled out plug @ 7:00 am. Shut down 10 hrs for weather @ 1297'
1-4-15	1,423'	Cut 1,204' in last 24 hrs; 13.5 hrs drlg.
1-5-15	3,225'	Cut 1,802' in last 24 hrs; 21.5 hrs drlg. Bit trip @ 3547' (replaced PDC with button bit)
1-6-15	3,825'	Cut 600' in last 24 hrs; 17 hrs drlg. DST #1 @ 3930'
1-7-15	3,930'	Cut 105' in last 24 hrs; 3 hrs drlg. DST #2 @ 3947', DST #3 @ 3995'
1-8-15	3,995'	Cut 65' in last 24 hrs; 2.25 hrs drlg. DST #4 @ 4085'
1-9-15	4,085'	Cut 90' in last 24 hrs; 5.25 hrs drlg. RTD 4200' @ 9:12 pm
1-10-15	4,200'	Cut 115' in last 24 hrs; 5.75 hrs drlg. P&A

Remarks

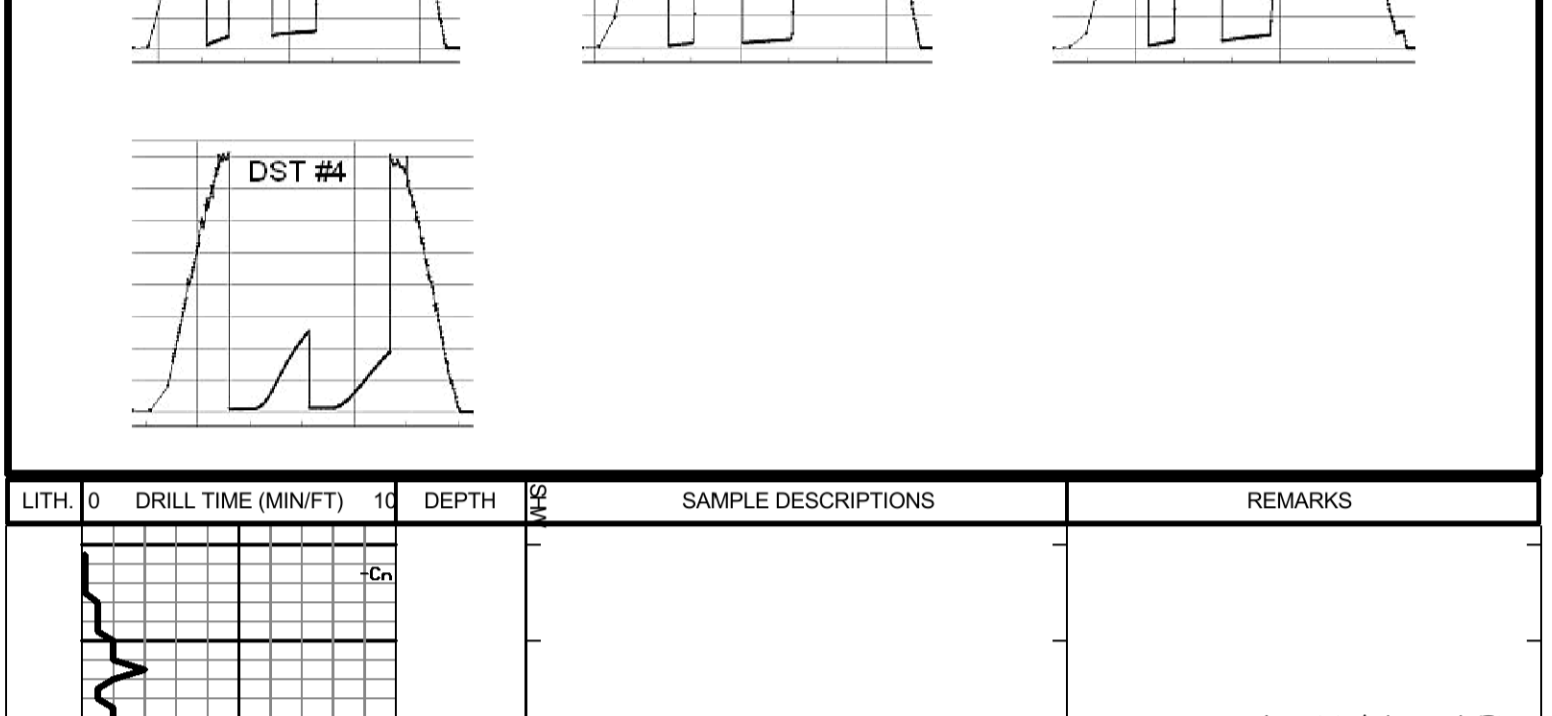
The electric log measurements correlate from 2' lower over the Stone Corral and 2' higher in sample portion to the drilling measurements.

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



LITH.	DRILL TIME (MIN/FT)	DEPTH	SAMPLE DESCRIPTIONS	REMARKS
		2550		Stone Corral 2553' (+272) EL
		2586		B/Stone Corral 2586' (+239) EL
		2600		

		3550		Mud displaced from 2977' to 3009' Call depth 3280' @ 7:10 am on 1-5-15 Morgan Mud check @ 3547': 64 Vis, 9.3 Wt, 6.4 WL, 1,000 ppm Chl, 2# LCM (taken @ 11:00 am, while TOH) Bit trip at 3547'. Replaced PDC bit with button bit. Pipe Strap @ 3547': Strap long 2.53' Straight Hole Survey @ 3547': 1° Dev. Samples start 3580' @ 6:56 pm on 1-5-15
		3600	LS: crm-med gry, fxln, fos in prt, some sli shly, sub chky-prtly dns, pr por, NS Sh: red-brn, gry, grn LS: crm-lt gry, fxln, fos in prt, sub chky-prtly dns, pr por, NS	
		3650	LS: crm, fxln, fos-ool in prt, sub chky-prtly dns, pr-fr intrprtcl por, NS Sh: red-brn, gry & grn LS: crm-tan, fxln, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS Sh: red-brn, gry, grn LS: crm-gry, fxln, fos in prt, some shly, sub chky-prtly dns, pr por, NS LS: wh-gry, fxln, fos in prt, some shly, sub chky-prtly dns w/ some chky-vry chky, pr por, NS Sh: red-brn (some soft & gummy) w/ some gry & grn LS: wh-lt gry, fxln, fos in prt, sub chky-prtly dns w/ some chky-vry chky, pr por, NS	Topeka 3676' (-851) EL
		3700	LS: wh-tan, fxln, fos in prt, sub chky-prtly dns w/ some chky-vry chky, pr por, NS LS: wh-tan, fxln, fos in prt, vry chky-prtly dns, pr w/ tr fr fos por, NS Sdy LS: crm-lt gry, fxln, vry fr grain sd, sub chky, pr vis por, NS Sh: red-brn (some soft & gummy), w/ gry & grn & Sdy Sh: lt gry & red-brn LS: wh-crm, fxln, fos in prt, sub chky-prtly dns w/ some chky-vry chky, pr w/ tr fr fos por, NS	
		3750	Sh: red-brn, gry, grn LS: wh-crm, fxln, fos in prt, chky-prtly dns w/ some vry chky, pr por, NS LS: wh-tan, fxln, fos in prt, vry chky-prtly dns, pr w/ tr fr fos por, NS LS: wh-tan, fxln, fos in prt, sub chky-prtly dns w/ some chky-vry chky, pr por, NS Sh: drk gry w/ tr Blk Carb Sh: red-brn (some soft & gummy) & grn, some gry	
		3800	LS: wh-crm, fxln, fos in prt, vry chky-prtly dns, pr por, NS Sh: red-brn (some soft & gummy) w/ some grn & gry LS: A.A., pr por, NS LS: wh-crm, fxln, fos in prt, chky-prtly dns w/ some vry chky, pr por, NS LS: A.A., pr por, NS LS: wh-tan, fxln, fos in prt, vry chky-prtly dns, pr w/ tr fr fos por, NS LS: A.A., sli chty (crm), tr fr fos por, NS	
		3850	Sh: Blk Carb & drk gry LS: tan, fxln, fos in prt, prtly dns, pr por, NS Sh: mstly lt gry-lt grn (mstly soft & gummy, some sdy) Sh: red-brn (soft & gummy in prt) w/ some gry-gry (soft & gummy in prt)	Heebner 3849' (-1024) EL
		3900	LS: wh-crm, fxln, ool, sli pyr, sub chky-prtly dns, pr-fr intrprtcl por, scat med-drk brn & blk patchy-sub sat stn, FSFO (some thk-hvy, some bleeding), fr odor Sh: red-brn, gry, grn LS: wh-tan, fxln, sli fos-ool, sli pyr, chky-prtly dns, pr w/ some fr intrprtcl por, vry scat drk brn-blk sptd-patchy stn, S-FSFO, sli odor Sh: red-brn (mstly soft & gummy), some gry & grn	Morgan Mud check @ 3947': 50 Vis, 9.3 Wt, 6.4 WL, 1,000 ppm Chl, 1.5# LCM Toronto 3880' (-1055) EL
		3950	LS: crm, fxln, ool-fos in prt, sub chky-prtly dns, pr-fr intrprtcl por, scat med-drk brn & blk sptd-sat stn, F-GSFO, fnt odor Sh: mstly red-brn (mstly soft & gummy) LS: crm-tan, fxln, fos-ool in prt, sli chty, sli pyr, vry chky-prtly dns, pr-fr intrprtcl w/ some fr-gd vug por, scat med-drk brn w/ some blk sptd-sat stn, F-GSFO (some thk-hvy), gd odor LS: crm-tan, sli fos, sub chky-prtly dns, pr w/ some fr fos-vug por, vry scat brn-blk mstly sptd-sat stn, SSFO, no odor (may be from DST #2) Sh: red-brn (soft & gummy in prt), gry & grn LS: wh-tan, fxln, sli fos-ool, some shly (red-brn, mottled), sub chky-prtly dns w/ some chky-vry chky, pr por, tr brn sptd-patchy stn, SSFO, no odor LS: wh-tan, fxln, sli fos, some shly (red-brn, mottled), sub chky-prtly dns, pr w/ tr fr intrprtcl & small vug por, scat lt-med brn patchy w/ tr sat stn, SSFO, no odor LS: A.A. w/ some shly (lt gry) & chty (gry), tr brn sptd stn, NSFO, no odor LS: A.A. w/ some Sh: grn LS: crm-tan, fxln, sli fos, sub chky-prtly dns, pr por, NS Sh: red-brn, gry, grn LS: crm-tan, fxln, sli fos, sli pyr, sub chky-prtly dns w/ some chky, pr por, tr brn-blk mstly sptd stn, 1 pc w/ live stn, NSFO, no odor	DST #1 3850'-3930' L/KC 'E'-'K' B' zn IF: blow built to 5.5" ISI: no blow back FF: blow built to 3" FSIP: no blow back Rec: 254' TOTAL FLUID: 68' WCM w/ oil spots (4% W, 96% M) 124' WCM w/ skim oil (3% W, 97% M) 62' WCM w/ oil spots (3% W, 97% M) IFF: 20-93#/30" ISIP: 1092#/60" FFP: 99-139#/60" FSIP: 1023#/90" Ran 23 stand short trip prior to DST #1 Straight Hole Survey @ 3930': 1° Dev. DST #2 3926'-3947' L/KC 'E'-'K' zn IF: blow built to 1" ISI: very weak surface blow in 20" FF: blow built to 1.25" FSIP: blow back built to 0.25" Rec: 94' Weak 6IP & 92' TOTAL FLUID: 30' GOWCM (4%G, 7%O, 26%W, 63%M) 62' GOWCM w/ skim oil (5%G, 77%W, 18%M) IFF: 18-36#/30" ISIP: 1145#/60" FFP: 37-67#/60" FSIP: 1142#/90"
		4000	LS: wh-tan, fxln, sli fos, some shly (red-brn, mottled), sub chky-prtly dns w/ some chky-vry chky, pr por, NS LS: A.A. w/ some shly (lt gry) & chty (gry), tr brn sptd stn, NSFO, no odor LS: A.A. w/ some Sh: grn LS: crm-tan, fxln, sli fos, sub chky-prtly dns, pr por, NS Sh: red-brn, gry, grn LS: crm-tan, fxln, sli fos, sli pyr, sub chky-prtly dns w/ some chky, pr por, tr brn-blk mstly sptd stn, 1 pc w/ live stn, NSFO, no odor LS: crm-tan, fxln, sli fos (fusi), sub chky-prtly dns, pr por, NS Sh: red-brn, gry, grn	DST #3 3945'-3995' L/KC 'E'-'K' zns IF: blow built to 1.5" ISI: no blow back FF: blow built to 0.75" FSIP: no blow back Rec: 188' TOTAL FLUID: 64' WCM w/ oil spots (2% W, 98% M) 124' WCM w/ skim oil (4% W, 96% M) IFF: 20-54#/30" ISIP: 716#/60" FFP: 59-108#/60" FSIP: 698#/90"
		4050	Sh: red-brn, gry, grn LS: crm-tan, fxln, ool-fos in prt, sub chky-prtly dns w/ some chky, pr por, fr amnt lt-med brn patchy-sat stn, F-GSFO, sli odor Sh: red-brn (some soft & gummy), gry, grn Sh: red-brn (soft & gummy in prt) w/ small amnt grn & gry LS: crm-lt gry, fxln, sli fos-ool, some shly (lt gry-grn), sub chky-prtly dns, pr w/ tr fr intrprtcl & small vug por, scat lt-med brn patchy w/ tr sat stn, SSFO, no odor Sh: red-brn w/ some gry & grn LS: crm-gry, fxln, sli fos, shly (red-brn, mottled) in prt, sub chky-prtly dns, pr por, NS	DST #4 3990'-4085' Lans 'H'-'K' zns IF: blow built to 0.5" FF: no blow Rec: 10' Mud w/ oil spots in tool (100% M) IFF: 22-27#/30" ISIP: 628#/60" FFP: 31-33#/30" FSIP: 467#/60"
		4100	Sh: red-brn w/ some gry & grn Sh: red-brn (sdy in prt) w/ some gry & grn LS: crm-gry, fxln, fos in prt, sub chky-prtly dns, pr por, NS Sh: red-brn, gry, grn	Morgan Mud check @ 4085': 54 Vis, 9.4 Wt, 6.4 WL, 1,600 ppm Chl, 1# LCM (taken @ 7:15 am while taking DST #4)
		4150	LS: crm-lt gry, fxln, fos-ool in prt, sub chky-prtly dns, pr por, NS Sh: red-brn, gry, grn, w/ some Calc Sh: gry	B/KC 4101' (-1276) EL
		4200	LS: crm-gry, fxln, fos in prt, some shly, sub chky-prtly dns, pr por, NS Calc Sh: lt-med gry w/ Sh: red-brn, gry, grn Sh: red-brn, gry, grn w/ some Calc Sh: A.A. Sh: A.A. w/ some Calc Sh: gry & brn A.A. Ran 10 stand short trip @ TD, then CFS L.T.D. 4198' (-1373) R.T.D. 4200' (-1375) Straight Hole Survey @ 4200': 0.5° Dev.	