

Robert D. Hendrix

Petroleum Geologist

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY: **Murfin Drilling Co, Inc.**

LEASE: **Patricia #3-16**

FIELD: **Jones Canyon Southeast**

LOCATION: **700'Int & 1840'Int**

SEC: **16** TWP: **1S** RGE: **37W**

COUNTY: **Cheyenne** STATE: **Kansas**

CONTRACTOR: **Murfin Drilling Co, Inc. Rig #2**

SPUD: **6/20/2015** COMP: **6/30/2015**

RTD: **4/800'** LTD: **4/804'**

MUD UP: **3/420'** TYPE: **LTD** MTD: **Chemical**

SAMPLES SAIVED FROM: **3570'** TO: **TD**

DRILLING TIME KEPT FROM: **3570'** TO: **TD**

SAMPLES EXAMINED FROM: **3570'** TO: **TD**

GEOLOGICAL SUPERVISION FROM: **3570'**

GEOLOGIST ON WELL: **Robert D. Hendrix**

GEOPHYSICIAN: **Denroy Madson/Markus Spahr**

FORMER WELLSERVICES

FORMATION TOPS

ELECTRIC LOG

SAMPLE

ANhydrite

Neva

Topeka

Oread

Lansing

Stark Shale

BKC

Pawnee

Cherokee Shale

ELEVATIONS

KB 3271'

DF

GL 3260'

Measurements Are All From **Kelly Bishing**

CASING

CONDUCTOR

SURFACE: **8.5/8"** at **220'**

PRODUCTION

8.5/8"

220'

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8.5/8"

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8.5/8"

220'

DEPTH	LITHOLOGY	SAMPLE DESCRIPTION	REMARKS
3200	Anhydrite		Anhydrite 3220 (+51)
3250	Base Anhydrite		Base Anhydrite 3255 (+16)
3300	Shale: red, v-sandy		Geologist on location 3515' at 4:20 am 6/24/2015 bit trip at 3515' strap 1.10' long to board
3600	Shale: red, gray, silty, v-sandy		8:00am, 6/24/2015
3650	Sandstone: white, vfn-fn gr, well sorted, rnd, semi-frable, calcareous, no vis por		
3700	Shale: red, gray, green, brown, silty, sandy		
3750	Shale: red, gray, silty, sandy		wt 8.8, vis. 56, lcm 6# Morgan Mud, Dave Lines
3800	Limestone: white, f,fn, sl chalky, oolitic, fossiliferous, no vis por		Neva 3670 (-399)
3850	Shale: red, gray, silty		
3900	Shale: red, brown, silty, sandy		
3950	Sandstone: gray to green, hard, biotitic, fngm, submd, mod sorted, calcareous, no vis por		
4000	Shale: red, brown, silty, sandy		
4050	Limestone: white to tan, f,fn, cherty (orange), fossiliferous, no vis por		Red Eagle 3735 (-464)
4100	Shale: red, brown, gray, silty		
4150	Shale: red, gray		
4200	Limestone: tan to white, f,fn, sl chalky, oolitic, fossiliferous, no vis por, dark spotty to sat stain, silfo (heavy), no odor		Foraker 3780 (-509)
4250	Shale: gray, green, silty		
4300	Limestone: brown to gray, f,fn, sl fossiliferous, granular, pr vug por		
4350	Shale: gray, green, silty		
4400	Limestone: tan, f,fn, sl fossiliferous, sl granular, no vis por		
4450	Shale: gray, red, black		
4500	Dolomite: tan, f,fn, sl chalky, granular, sl fossiliferous, fr interxn por		
4550	Shale: red, gray		
4600	Limestone: white to lt gray, f,fn, sl chalky, sl granular, v-fossiliferous, no vis por		
4650	Shale: red, gray, silty		
4700	Limestone: white to tan, f,fn, sl chalky, fossiliferous, no vis por, few pieces with gilsonite stain, nfo, no odor		
4750	Shale: red, gray, silty		
4800	Limestone: white to tan, f,fn, sl chalky, fossiliferous, no vis por		Stotler 3926 (-655)
4850	Shale: gray, red, black		
4900	Limestone: white, f,fn, oolitic, fossiliferous, no vis por, dark spotty to sat stain, nfo, no odor		
4950	Shale: gray, red		
5000	Limestone: white, m-f,fn, v-fossiliferous, sl interxn por, pr spotty stain, sl amt v-heavy oil, no odor		
5050	Limestone: tan to white, f,fn, fossiliferous, pr pp por, black spotty stain, pr show heavy black asphaltic oil, no odor		
5100	Shale: gray, red		
5150	Shale: red, some gray		
5200	Limestone: tan to brown, mxn, v-fossiliferous, no vis por, ns		
5250	Shale: red, gray		
5300	Shale: red, gray, silty		
5350	Limestone: tan, f,fn, fossiliferous, no vis por, a few pieces dark spotty stain, nfo, no odor		Topeka 4007 (-736)
5400	Limestone: white to tan, f,fn, chalky, oolitic in part, fossiliferous, no vis por		8:00am, 6/25/2015
5450	Shale: gray, red, silty		
5500	Limestone: white, m-f,fn, chalky, fossiliferous, no vis por		
5550	Limestone: white to tan, f,fn, chalky, dense, sl fossiliferous, no vis por		
5600	Shale: gray, red, black, silty		
5650	Shale: red, gray, silty, sandy		
5700	Limestone: white, mxn, sl chalky, oolitic in part, gd oolitic por, ns		
5750	Limestone: white to lt gray, f,fn, chalky, dense, sl fossiliferous, no vis por		wt 9.1, vis. 59, lcm 8# Morgan Mud, Dave Lines
5800	Shale: red, silty		
5850	Shale: red, gray, brown black		
5900	Limestone: white, f,fn, chalky, oolitic, pyritic, fossiliferous, pr interxn por, gd dark spotty to sat stain, sl amount of gilsonite, nfo, no odor		Oread 4141 (-870)
5950	Limestone: tan, f,fn, chalky, dense, sl fossiliferous, no vis por, pr		
6000	Shale: gray, dark gray		
6050	Limestone: white to tan, f,fn, chalky, fossiliferous, no vis por, 7 pieces fr dark sat stain, silfo, no odor		
6100	Shale: red, silty		
6150	Sandstone: lt gray, opaque, fngm, well sorted, submd, calcareous, friable, sl intergranular por, dark sat stain, nfo, no odor		
6200	Shale: red, gray, dark gray		
6250	Shale: red, gray, dark gray		
6300	Limestone: tan, f,fn, dense, fossiliferous, sl pyritic, no vis por		Lansing 4220 (-949)
6350	Limestone: tan, f,fn, sl chalky, dense, no vis por		
6400	Shale: gray, red		
6450	Limestone: lt green to white, f,fn, vfn, mod sorted, sub rmd, sl calcareous, no vis por, dark spotty stain, gilsonite, nfo, no odor		
6500	Shale: gray, red, black		
6550	Shale: red, sandy, silty		
6600	Limestone: white, f,fn, sl chalky, fossiliferous, fr vug (foss) por, black sat stain, frso, gd odor		
6650	Shale: gray, red, brown		
6700	Limestone: tan, f,fn, fossiliferous, no vis por		8:00am, 6/26/2015 wt 9.4, vis. 55, lcm 6# Morgan Mud, Dave Lines
6750	Shale: gray, dark gray, some red		
6800	Shale: red, gray, silty		
6850	Limestone: tan to white, f,fn, sl chalky, oolitic in part, dense, no vis por		
6900	Shale: gray, red, brown		
6950	Limestone: white to gray, f,fn, sl chalky, dense, fossiliferous, no vis por		DST #1 4178-4296 30-60-60-90 1st open: blow built to 2 3/4" 2nd open: surface blow at 47 min no returns no build Rec: 30' mud with oil spots 60' mud 60' w/cm 40/60 hydro: 2172-2173 psi lf: 20-55 psi lf: 61-97 psi sfp: 1103-939 psi sfp: 497-294 psi chl: 136°F chl: 10,500ppm
7000	Shale: gray, red		
7050	Limestone: white, f,fn, sl chalky, dense, fossiliferous, no vis por		
7100	Shale: gray, red		
7150	Limestone: white, f,fn, sl chalky, dense, fossiliferous, no vis por		8:00am, 6/27/2015
7200	Shale: red, gray		
7250	Limestone: white, f,fn, oolitic, fossiliferous, 1% sample pr interxn por, lt sat stain, silfo, no odor		
7300	Limestone: white, f,fn, sl chalky, fossiliferous, no vis por		Stark 4439 (-1168)
7350	Shale: gray light to dark, red		wt 9.2, vis. 69, lcm 8# Morgan Mud, Dave Lines
7400	Shale: red, gray, silty		
7450	Limestone: tan to gray, f,fn, sl chalky, oolitic in part, dense, no vis por		
7500	Shale: gray, green, red, silty		
7550	Limestone: tan, mxn, sl chalky, fossiliferous, no vis por		
7600	Shale: red, gray		
7650	Limestone: white to tan, f,fn, sl chalky, dense, no vis por		BKC 4497 (-1227)
7700	Shale: red, gray		
7750	Limestone: white to lt gray, f,fn, sl chalky, fossiliferous, no vis por		
7800	Shale: red, gray, green, silty		
7850	Shale: red, brown, gray, silty		8:00am, 6/28/2015
7900	Shale: red, brown, silty		
7950	Limestone: white to tan, f,fn, sl chalky, dense, fossiliferous, no vis por		wt 9.2, vis. 64, lcm 7# Morgan Mud, Dave Lines
8000	Limestone: white to tan, f,fn, chalky, oolitic, fossiliferous, no vis por		
8050	Siltstone: lt gray, f,fn, dense, no vis por		
8100	Shale: gray, red, brown, silty		
8150	Limestone: white, mxn, oolitic, fossiliferous, fr colimoidic to interxn por, lt sat stain, gdsfo, fr odor		Pawnee 4621 (-1350)
8200	Limestone: gray, f,fn, sl chalky, sl chert, fossiliferous, no vis por		
8250	Shale: dark gray, red, black		
8300	Limestone: white to tan, mxn, oolitic in part, cherty, fossiliferous, no vis por,ns		
8350	Limestone: tan to gray, f,fn, dense, no vis por		
8400	Limestone: white to gray, f,fn, sl chalky, dense, sl fossiliferous, no vis por		8:00am, 6/29/2015
8450	Shale: black, carbonaceous		
8500	Shale: gray, blocky, silty, hard		wt 9.0, vis. 75, lcm 6# Morgan Mud, Dave Lines
8550	Limestone: tan to brown, f,fn, oolitic in part, dense, sl fossiliferous, no vis por		
8600	Limestone: white to tan, f,fn, sl chalky, dense, sl fossiliferous, no vis por		
8650	Shale: gray, dark gray, red		Cherokee Shale 4709 (-1438)
8700	Sandstone: white with orange tint, lt, sl biotitic, md gm, sub rmd, mod sorted, calcareous, hard, no vis por		
8750	Limestone: tan, v,fn, dense, sl fossiliferous, no vis por		
8800	Shale: gray, red		
8850	Limestone: white to tan, f,fn, dense, fossiliferous, no vis por		
8900	Shale: gray, red		
8950	Limestone: white to tan, f,fn, dense, fossiliferous, no vis por		
9000	Shale: red, brown, gray, sandy		
9050	Sandstone: white, lt, micaceous, md gm, sub ang, moderately sorted, calcareous, hard, no vis por, ns		
9100	Shale: red, gray, brown, sandy, silty		
9150	Sandstone: white, lt, sl biotitic, md-crse gm, sub rmd, mod sorted, calcareous, hard, no vis por, ns		RTD 4800 (-1529)
9200			Geologist off location at 5:00am, 6/30/2015