Robert D. Hendrix
Petroleum Geologist

GEOLOGIST'S REPORT
DRILLING TIME AND SAMPLE LOG

COMPANY	Murfin Drilling Company Inc.
FIELD	Jimmy Northwest
LEASE	Jimmy Northwest #1-4
SEC.	4
TWP.	T13 S
RGE.	25 W
COUNTY	Thomas
STATE	Kansas
API #	15-193-20,767
COMP. DATE	8/20/2013
SPUD	8/19/13
CONTRACTOR	Murfin Drilling Co. Inc. Rig 19
MUD UP	3300 ft
TYPE MUD	Chemical
SURFACE CASING	8-5/8" at 300'
PRODUCTION CASING	4-1/2" at 4707'
ELEVATIONS	KB 3277
	DF
	GL 3272
	Here Comes Oil & Gas
	Jim Smith
	Bill Cody

DRILLING TIME IN MINUTES PER FOOT	DEPTH	LITHOLOGY	GAS UNIT	SAMPLE DESCRIPTION	REMARKS
5 10 15	2700				
				Shale black gray	
					8:00am, 8/23/2013
				Limestone: tan, fine, silty, argillaceous, granular, no sh pin	
	2750			Shale black gray	
				Limestone: tan, brown, f-mdm, sl chalky, fossiliferous, no oil, poor	
				Shale: gray, black, green, red	
				Limestone: tan, f-mdm, sl chalky, fossiliferous, no oil, poor	
				Limestone: tan, f-mdm, sl chalky, fossiliferous, no oil, poor	
				Shale: tr dark gray, black	
	2800				
				Limestone: tan, f-vfm, dense, fossiliferous, no sh pin	
				Shale: gray, black, red	
				Limestone: tan, f-mdm, sl fossiliferous, no sh pin	
				Shale: black, gray, red, green, silty	
				Limestone: tan to white, f-m, sl chalky, fossiliferous, no sh pin, poor	
				Shale: gray, red, green	
				Limestone: tan to white, f-m, sl chalky, sl oolitic, sl fossiliferous, no sh pin, poor	
	2850			Shale: black, gray, red, green	
				Limestone: tan, f-m, sl chalky, oolitic in part, fossiliferous, no sh pin, poor	**Topeka**
				Limestone: tan, f-m, sl chalky, oolitic, sl oolitic/sh pint, no	**3906 (-689)**
				Limestone: tan to white, fdm, chalky, oolitic, granular, sl fossiliferous, no sh pin	wt 8.9, vis 48, loss 3k
				Shale: gray, red, w/lt	Morgan Mud: Cade Lines
				Limestone: tan, f-m, chalky, oolitic, granular, fossiliferous, no sh pin, poor	
				Shale: gray, red, w/lt	
	2900				
				Shale: gray, red, brown, silty	
				Limestone: tan, mdm, chalky, fossiliferous, no sh pin	
				Shale: gray, red, brown, silty	
				Shale: black carbonaceous	
				Shale: gray, green, red	
				Shale: gray, green, red	
				Limestone: tan, f-mdm, oolitic, fossiliferous, sl oolitic/sh pin, no	
				Shale: gray, red, silty, sandy	
				Limestone: tan to white, f-vdm, chalky, fossiliferous, no sh pin	
	2950			Shale: tr dark gray, black carbonaceous	
				Limestone: tan to gray/white, f-mdm, argillaceous, oolitic, fossiliferous, granular, no sh pin	
				Limestone: tan to white, f-m, sl chalky, dense, fossiliferous, no sh pin, poor	
				Limestone: tan to white, f-mdm, chalky, fossiliferous, no sh pin	
				Shale: gray, green, red	
				Shale: black carbonaceous	**Heebner**
				Limestone: brown, f-m, dense, fossiliferous, no sh pin	**4121 (-904)**
				Shale: gray, green, brown, red	
				Limestone: tan to white, f-mdm, sl chalky, oolitic in part, sl oolitic/sh pin, 2 pieces f oil stain, solid on broad only, fair odor	
				Limestone: tan to white, f-m, chalky, dense, fossiliferous, no sh pin	**Lansing**
				Limestone: tan, f-mdm, chalky, oolitic, pyritic, fossiliferous, fractured, frag oil, 2 pieces f oil stain, solid on broad, fair odor, fair oil flow, poor porosity	**4161 (-944)**
				Shale: gray, green, red, silty	
				Limestone: tan, f-mdm, chalky, oolitic, pyritic, fossiliferous, fractured, frag oil, 2 pieces f oil stain, solid on broad, fair odor, fair oil flow, poor porosity	
				Shale: gray, green, red, silty	
				Limestone: tan, f-m, sl chalky, oolitic, mostly dense, fossiliferous, no sh pin, 2 pieces f oil stain, solid on broad, no odor	
				Limestone: tan, f-m, sl chalky, sl oolitic, mostly dense, fossiliferous, no sh pin, 2 pieces f oil stain, solid on broad, no odor	
				Zulzmble: tan to brown, f-vfm, granular, sl chalky, sl oolitic, fossiliferous, no sh pin, gd stain/sh pin, 2 pieces dead spotty stain, HC, no odor	
				Limestone: tan, f-m, chalky, mostly dense, fossiliferous, no sh pin, 2 pieces f oil stain, solid on broad, no odor	
				Limestone: tan, f-m, chalky, mostly dense, fossiliferous, no sh pin, 2 pieces f oil stain, solid on broad, no odor	
				Shale: dark, lt d gray, green, soft, silty	8:00am, 8/24/2013
				Limestone: tan to brown, f-mdm, oolitic, fossiliferous, sl oolitic/sh pint, 5% sample dark spotted to set stain, pyritic, no odor	
				Shale: gray, red, green, silty	
				Limestone: tan, f-mdm, oolitic, fossiliferous, sl oolitic/sh pint, 5% sample dark spotted to set stain, pyritic, no odor	
				Limestone: tan to white, f-m, chalky, granular, sl fossiliferous, no sh pin, no	**Muncie Creek**
				Shale: gray, red, green, silty	**4307 (-1090)**
				Shale: black carbonaceous	wt 9.1, vis 51, loss 1.5k
				Limestone: tan to brown, f-m, sl chalky, fossiliferous, no sh pin	Morgan Mud: Cade Lines
				Shale: gray, green, red, brown, silty	
				Shale: gray, red, green, black	**DST #1**
				Limestone: tan to f-gray, sl sdy, dense, sl chalky, fossiliferous, no sh pin	4300-4320
				Shale: gray, green, black carbonaceous	30-60-60-90
				Limestone: tan to white, f-m, sl chalky, oolitic in part, granular, chalky, fossiliferous, no sh pin, 1 piece spotted stain, oil, no odor	1st open: blow built to 2 1/2"
				Shale: gray, black, dark red, silty	on dead in 2nd open
				Limestone: white, f-m, dense, fossiliferous, sl chalky, no sh pin	Rec:
				Limestone: tan, f-m, chalky, mostly dense, fossiliferous, no sh pin	127 oil/mmw 3/2780
				Shale: gray, red, brown, silty	5x900, 2237-2158 psi
				Shale: gray, green, red, brown, silty	IF 29-60 psi
				Shale: black carbonaceous	FF 61-90 psi
				Shale: gray, green, red	ISI 1201-1165 psi
				Shale: gray, green, black	HSI 1221 #
				Shale: gray, green, red, brown, silty	Pr: 40.000 ppm
				Shale: gray, green, black	8:00am, 8/25/2013
				Shale: gray, green, black	wt 8.2, vis 48, loss 1.5k
				Limestone: tan to gray, sl sdy, dense, sl chalky, fossiliferous, no sh pin	Morgan Mud: Cade Lines
				Shale: gray, green, black carbonaceous	**Stark**
				Limestone: tan to white, f-m, sl chalky, oolitic in part, granular, chalky, fossiliferous, no sh pin, 1 piece spotted stain, oil, no odor	**4394 (-1177)**
				Shale: gray, red, green, black	
				Limestone: tan to brown, f-m, dense, fossiliferous, no sh pin	
				Shale: gray, red, green	
				Limestone: white to tan, f-m, chalky, chalky, granular, fossiliferous, no sh pin	**BKC**
				Limestone: tan, f-m, chalky, granular, fossiliferous, no sh pin	**4447 (-1230)**
				Shale: gray, red, green, black	
				Limestone: tan, f-m, chalky, fossiliferous, sl stained, poor	
				Shale: gray, red, green, black	
				Limestone: white, f-m, chalky, granular, fossiliferous, no sh pin	
				Shale: gray, red, green, black	
				Limestone: tan, f-m, chalky, mostly dense, chalky, sl fossiliferous, no sh pin	
				Limestone: tan to white, f-m, sl chalky, dense, fossiliferous, no sh pin	
				Shale: gray, red, green	
				Shale: black, gray, green, red	
				Limestone: tan, f-m, dense, chalky, oolitic in part, no sh pin	
				Shale: gray, red, soft, mushy	
				Limestone: tan, f-m, chalky, chalky, granular, clear calcite replacement, no sh pin	
				Shale: gray, red, green, silty	8:00am, 8/26/2013
				Limestone: tan, f-m, chalky, chalky, granular, clear calcite replacement, no sh pin	
				Shale: gray, black, silty	
				Shale: black carbonaceous	
				Shale: gray, red	
				Limestone: tan, f-m, oolitic in part, chalky (f gray), sl chalky, fossiliferous, pyritic, no sh pin	**Ft Scott**
				Limestone: tan, f-m, oolitic, sl oolitic/sh pint, chalky (f gray), sl chalky, fossiliferous, pyritic, no sh pin	**4588 (-1371)**
				Shale: brown, black, green, gray, red	wt 9.2, vis 49, loss 2k
				Limestone: brown to tan, f-mdm, sl chalky, oolitic, sl oolitic/sh pint, no sh pin	Morgan Mud: Cade Lines
				Limestone: tan, f-m, dense, chalky, chalky (f gray), sl fossiliferous, no sh pin	**DST #2**
				Limestone: tan, f-m, dense, chalky, chalky, fossiliferous, very crystalline in part	4580-4610
				Limestone: tan, f-m, chalky, sl sdy, sl fossiliferous, sl oolitic/sh pint, 8 broken pieces, solid, sl odor	30-60-60-90
				Shale: gray, green, black	1st open: 1/2" blow built to 12"
				Limestone: tan, f-m, dense, chalky, chalky (f gray), sl fossiliferous, no sh pint	2nd open: no blow
				Limestone: tan, f-m, chalky, chalky, fossiliferous, very crystalline in part	Rec:
				Limestone: tan, f-m, chalky, sl sdy, sl fossiliferous, sl oolitic/sh pint, 8 broken pieces, solid, sl odor	1 open 835
				Shale: gray, green, black	5x900, 2475-2389 psi
				Limestone: tan, f-m, chalky, chalky, sl fossiliferous, very crystalline in part	IF 29-29 psi
				Shale: gray, green, black	FF 29-29 psi
				Limestone: tan, f-m, chalky, chalky, dense, fossiliferous, no sh pin	ISI 725-67 psi
				Shale: gray, red, soft, mushy	HSI 124 #
				Shale: black carbonaceous	
				Shale: gray, red	
				Limestone: tan, f-m, chalky, chalky, dense, fossiliferous, no sh pin	**Oakley**
				Shale: black carbonaceous, gray, green, red, brown, silty	**4665 (-1448)**
				Limestone: tan, f-m, chalky, chalky, dense, fossiliferous, no sh pin	
				Shale: black carbonaceous, gray, green, red, brown, silty	
				Limestone: tan to brown, f-m, dense, chalky, fossiliferous, no sh pin	
				Shale: gray, green, black, brown	
				Limestone: tan, f-m, dense, chalky, fossiliferous, no sh pin	
				Shale: black, gray, green, yellow, sandy	
				Limestone: clear, tr, vcrsp, sub-round, medium xln, poor intergranular por	
				Limestone: tan to white, f-m, oolitic in part, chalky, chalky, fossiliferous, no sh pin	**Mississippian**
				Shale: gray, green, red	**4795 (-1578)**
				Limestone: tan to white, f-m, chalky, chalky, mostly dense, oolitic in part, fossiliferous, no sh pin	
				Limestone: tan, f-m, chalky, chalky, sl pyritic, fossiliferous, no sh pin	
				Shale: gray, red	
				Dolsdy: white, f-vfm, chalky, chalky, granular, no sh pin	
				Limestone: tan to white, f-m, sl chalky, fossiliferous, no sh pin	
				Limestone: tan to white, f-m, oolitic in part, chalky, chalky, fossiliferous, no sh pin	
				Limestone/Dolomite: tan, v-fm, dense, chalky, chalky, chalky, sl fossiliferous, no sh pin	
				Limestone: tan, f-m, dense, v-chalky, sl pyritic, pyritic, no sh pin	
					RTD
					4805 (-1578)
					Geologist off location at 5:15pm, 8/28/2013

LEGEND

Drilling Time | Lithology | Gas Units | Cuttings Lithology | Oil | Cuttings Fluorescence | Chert | Cuttings Porosity

Murfin Drilling Co Inc
Jimmy Northwest #1-4
2310 FNL & 2640 FWL
Sec 4-T13S-R25W
Thomas County, Kansas
API#15-193-20767
KB: 3277 GL: 3272