Robert D. Hendrix
Petroleum Geologist

GEOLOGIST'S REPORT
DRILLING TIME AND SAMPLE LOG

OPERATOR	Murfin Drilling Company, Inc.
COMPANY	Horse Farms
FIELD	Wildcat
COUNTY	Sherman
STATE	Kansas
SEC.	22
TWSP	8 S
RGE	39W
CONTRACTOR	Murfin Drilling Co. Rig 22
SPUD	2/5/2013
COMP.	2/14/2013
TYPE AND DIMENSIONS	Measurements As All Through Drilling
MUD UP	3000'
CHEMICAL	Chemical
DRILLING TIME KEPT FROM	3150 TO 8100
SAMPLES SAVED FROM	3150 TO 8100
DRILLING TIME AND SAMPLES EXAMINED FROM	3150 TO 8100
GAS TESTS TAKEN FROM	3150 TO 8100
GEOLOGIST ON WELL	Robert D. Hendrix
	Mike Jackson
	Mike Wilson

ELEVATIONS
DF 2232
GL 2227

CASING
CONDUCTOR: None
PRODUCTION: 4½"

ELECTRICAL SURVEYS
Pioneer

FORMATION TOPS: ELECTRIC LOG: SAMPLE:
Anhydrite 1530 (+703)
Base Anhydrite 1564 (+669)
Topeka 3252 (-1019)
Heebner 3494 (-1261)
Toronto 3518 (-1285)
Lansing 3540 (-1307)
Stark Shale 3741 (-1508)
Arbuckle 3871 (-1638)
LTD 3905 (-1673)

REMARKS:

Due to the negative results on all tests and lack of structure it is recommended that this test be plugged and abandoned.

LEGEND

Cuttings | Sandstone | Cuttings Dry | Chert | Dolomite

DRILLING TIME IN MINUTES PER FOOT
Rate of Penetration Decreases

DEPTH	LITHOLOGY	Oil Bottom Tests	Oil Bottom	SAMPLE DESCRIPTION	REMARKS
1500					
					Anhydrite 1530 (+703)
50					
					Base Anhydrite 1564 (+669)
1600					Geologist on location @ 3107' 4:45 am, 2/9/2013
3150				Shale: gray, muddy	
				Limestone: tan, fsm, cr granular, cr fossiliferous, no vis por	8:00 am, 2/9/2013
				Limestone: tan, fsm, cr granular, cr fossiliferous, no vis por	
				Shale: gray, red, silty	
				Shale: gray, black	
				Limestone: tan, fsm, cr granular, cr fossiliferous, no vis por	
				Shale: gray, dark gray, black, red, soft, silty	
3200				Limestone: tan, fsm, chalky, no vis por	
				Shale: gray, dark gray, black, red, soft, silty	
				Shale: gray, muddy, silty	
				Shale: gray, red, silty	
				Limestone (siltstone): tan to gray, fsm, cr chalky, silty, no vis por	
				Limestone: tan, fsm, cr chalky, granular, no vis por	
				Shale: gray, soft, silty	
50					**Topeka 3252 (-1019)**
				Limestone: tan, f-msm, cr chalky, fossiliferous, no vis por	
				Limestone: tan to gray, fsm, cr chalky, soft, no vis por	
				Limestone: tan to brown, fsm, cr chalky, fossiliferous, no vis por	
				Shale: gray, silty	
				Limestone: tan to brown, fsm, cr chalky, granular, cr fossiliferous, no vis por	
				Shale: gray, dark gray	
3300				Limestone: tan, f-msm, chalky, granular, cr fossiliferous, no vis por	wt. 8.7, vis 62, tim 2 *Morgan Mud; Dave Lines*
				Limestone: tan to brown/gray, fsm, chalky, dense in part, no vis por	
				Limestone: tan to brown, f-msm, cr chalky, fossiliferous, no vis por	
				Limestone: tan to gray, fsm, dense, cr fossiliferous, no vis por	
50					
				Shale: black, gray	
				Limestone: tan to white, f-msm, chalky, fossiliferous, no vis por	
				Limestone: tan, fsm, cr chalky, dense in part, fossiliferous, no vis por	
				Limestone: tan to white, fsm, cr chalky, granular, cr chalky, fossiliferous, no vis por	
				Limestone: tan to white, fsm, cr chalky, granular, cr chalky, fossiliferous, no vis por	
3400				Shale: gray, brown, silty	
				Limestone: white to tan, fsm, cr chalky, dense, cr fossiliferous, no vis por	
				Shale: black, carbonaceous	
				Limestone: tan to gray, fsm, cr chalky, dense, cr fossiliferous, no vis por	
				Shale: gray, dark gray, chalky, soft, fossiliferous, no vis por	
				Limestone: tan to white, f-msm, chalky, granular, fossiliferous, cr vuggy, no vis por	
50					
				Limestone: tan to white, fsm, chalky, soft, fossiliferous, no vis por	
				Shale: black, gray	
				Limestone: tan to white, fsm, chalky, fossiliferous, no vis por	
				Limestone: tan to white, fsm, chalky, cr chalky, fossiliferous, no vis por	
3500				Shale: black carbonaceous, gray	
				Limestone: tan, fsm, chalky, dense, fossiliferous, no vis por	**Heebner 3494 (-1261)**
				Shale: black, gray, green, red	
					Toronto 3518 (-1285)
	GF3			Shale: gray, black, red	
				Limestone: tan, f-msm, cr chalky, dense cr chalky, fossiliferous, no vis por	**Lansing 3540 (-1307)**
50				Shale: gray, green, red, soft	**DST #1** 3500-3545 30-60-30-60 *1st open: wk blow built to 2 1/2" 2nd open: wk blow no returns Rec: 10' mud rec on 30'70 hydro: 1828-1786 psi IF: 24-24 psi IS: 928-922 psi ISI: 1047 psi ISI: 928-922 psi hp/ hr: 1/1 B 55.1°F*
	GF5			Limestone: tan to white, fsm, chalky, dense, fossiliferous, no vis por	
				Shale: gray, black, red	
				Limestone: tan to brown, fsm, cr chalky, dense, fossiliferous, no vis por	
				Shale: gray, red	
	GF6			Limestone: tan to brown, fsm, cr chalky, dense, fossiliferous, no vis por	
				Shale: gray, red	
	GF7			Limestone: tan to brown, fsm, cr chalky, dense, fossiliferous, no vis por	8:00 am, 2/10/2013
	GF8			Shale: gray, black, red	
				Limestone: tan to brown, fsm, cr chalky, no vis por, light spotty to wet stain, silty, faint odor	
				Shale: gray, green	
				Limestone: tan, fsm, chalky, mostly dense cr fossiliferous, sl pp por, 4 pieces, fast slow stain, silty, faint odor	
				Shale: gray, green, red	
	GF9			Limestone: tan, fsm, cr chalky, mostly dense cr fossiliferous, sl pp por, 4 pieces, fast slow stain, silty, faint odor	wt. 8.9, vis 48, tim 2.0 *Morgan Mud; Dave Lines*
50				Shale: gray, dark gray	8:00 am, 2/11/2013
3700				Limestone: tan to white, fsm, chalky, 1% sample of interpin por, fr dark sat stain, slow cut, fair odor, 2 pieces, fast slow stain, silty, faint odor, fair fluo, cr chalky, fossiliferous, 2 pieces pp por, fr spotty, fast slow stain, silty, no odor	
	GF10			Shale: gray, red, black	
				Limestone: tan, fsm, chalky, dense, no vis por	
				Shale: gray, red	
	GF11			Limestone: tan, f-msm, cr chalky, cr fossiliferous, oolitic in part, fr oolicastic por (some barren), 1% sample, dark sat stain, slow cut, fair odor, oil break, fair odor	wt. 8.9, vis 64, tim 2.0 *Morgan Mud; Dave Lines*
				Shale: gray, red	**Stark Shale 3741 (-1508)**
50				Limestone: white to tan, fsm, chalky, fossiliferous, cr interpin por, 2 pieces dark stain, silty, no odor	**DST #3** 3727-3770 30-60-30-60 *1st open: wk blow built to 1 1/8" 2nd open: wk blow built to 2" no return's Rec: 1' mud 2'70 oil 12' fo 100% 1966-1919 psi IF 43-37 psi IS 65-57 psi ISI: 1090-1001 psi ISI: 1077-1000 psi hp/ hr: 1/1 B 97.9°*
	GF12			Shale: gray, dark gray	
				Limestone: tan, fsm, chalky, dense, no vis por	
				Shale: gray, red	
				Limestone: white to tan, fsm, chalky, fossiliferous, cr interpin por, few pieces dark stain, silty, no odor	
				Shale: gray, red	
	GF13			Limestone/dolomite: white to tan, m-bm, cr chalky, fossiliferous, 5 pieces, 5% sample dark sat stain, gdsh, fair odor	8:00 am, 2/12/2013
				Limestone: white to tan, msm, cr chalky, 50 % (orange), fossiliferous, 5% sample dark sat stain, poor cut, no odor, faint fluo	wt. 8.2, vis 65, tim 5.0 *Morgan Mud; Dave Lines*
	GF14			Shale: gray, red	
	GF15			Limestone: white, tan, sl. red grained, sub rnd, mod sorted, semi-friable, cpt intergranular por, gd dark spotty stain, slow cut, no odor	
				Shale: gray	
				Dolomite: tan, fsm, dense,hard	**Arbuckle 3871 (-1638)**
				Dolomite: tan, fsm, dense,hard no vis por,several pieces scattered 5 sat stain on break, slotty, faint odor	
				Dolomite: tan, f-msm, granular, cr intersrtvng por, 5% sample, 5 sat stain, slow cut, faint odor	8:00 am, 2/13/2013 wt. 8.4, vis 72, tim 7.0 *Morgan Mud; Dave Lines*
3900				Dolomite: tan, fsm, granular, cr intercrtn por, 10% sample, 8 sat stain, slow cut, faint odor	
				Dolomite: tan, f-msm, granular, fr intercrtnsvg por (some barren), 10% sample, 8 sat stain, slow cut, faint odor	8:00 am, 2/14/2013 wt. 8.1, vis 55, tim 6.0 *Morgan Mud; Dave Lines*
	GF16			Dolomite: tan, m-bm, granular, gd vug por (mostly barren), 1% sample, 8 spotty to sat stain, slow cut	**DST #4** 3871-3882 30-60-30-60 *1st open: wk blow built to 1/2" 2nd open: wk blow surface blow back Rec: 1' mud with oil spots hydro: 1966-1919 psi IF 72-37 psi IS 76-30 psi ISI: 1090-1001 psi ISI: 1087-1000 psi hp/ hr: 4/2 B 52.2°F*
50				Dolomite: tan, m-bm, granular, pitting vug por (barren), no	
4000					**DST #5** 3882-3892 30-60-30-60 *1st open: wk blow built 6"2" 2nd open: wk blow built to 1 1/4" no returns Rec: 20' wm 5/95 hydro: 1966-1901 psi IF 44-51 psi IS 84-81 psi ISI: 1371-1231 psi ISI: 1371-1231 psi chlorides: 22,000 ppm hp/ hr: 4/2 B 52.2°F*
					Geologist off site at 6:00 pm, 2/14/2013
50					
4100					
50					

Murfin Drilling Co Inc
Horse Farms #1-1
7070'N & 990'W
NE NE NW Sec 22 T8S R39W, Sherman County, Kansas
KB=2232, GL=2227
API: 15-051-26461