

Robert D. Hendrix

Petroleum Geologist

GEOLOGIST'S REPORT DRILLING TIME AND SAMPLE LOG

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

LEASE **Rathbun #19-2**

FIELD **Wildcat**

LOCATION **1850'nl & 1100'fwl**

SEC **19** TWP **11S** RGE **19W**

COUNTY **Ellis** STATE **Kansas**

CONTRACTOR **Murfin Drilling Co. Inc. Rig #16**

SPUD **10/25/2019** COMP **11/2/2019**

RTD **3660'** LTD **3559'**

MUD UP **2670'** TYPE MUD **Chemical**

SAMPLES SAVED FROM **2890'** TO **3660'**

DRILLING TIME KEPT FROM **2890'** TO **3660'**

SAMPLES EXAMINED FROM **2890'** TO **3660'**

GEOLOGICAL SUPERVISION FROM **2900'**

GEOLOGIST ON WELL **Robert D. Hendrix**

FORMATION TOPS

ANHYDRITE **1339 (+636)**

TOPEKA **2990 (-1015)**

HEEBNER SHALE **3210 (-1237)**

LANSING **3250 (-1275)**

STARK SHALE **3433 (-1458)**

MOUND CITY **3477 (-1502)**

ARBUCKLE **3555 (-1580)**

AP# **15-051-26976**

ELEVATIONS

KB **1975'**

DF _____

GL **1970'**

Measurements Are All From **Kelly Bushing**

CASING

CONDUCTOR

SURFACE **8-5/8" at 265'**

PRODUCTION **5-1/2" @ 3655'**

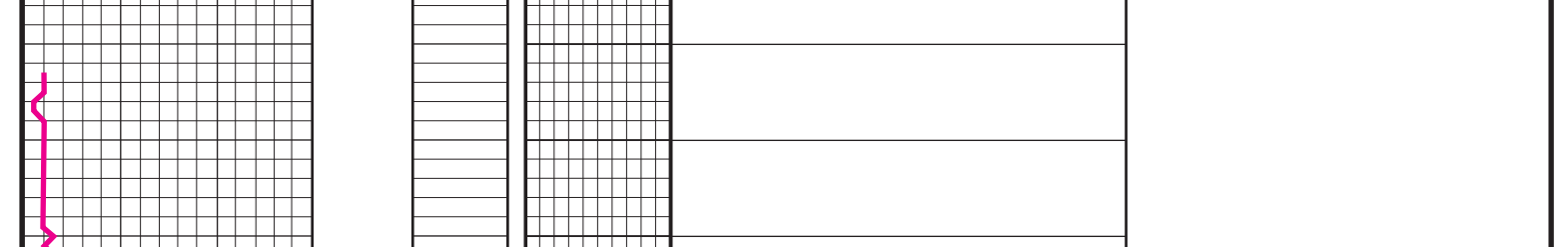
ELECTRICAL SURVEYS

Company: Priority Dual Induction

Microlog: Snelter / Pioneer Wellbore Services

REMARKS:

LEGEND



DEPTH	LITHOLOGY	SAMPLE DESCRIPTION	REMARKS
1300	Anhydrite		Anhydrite 1335 (+640)
50	Anhydrite		Base Anhydrite 1384 (+591)
1400	Limestone	Shale: gray, green, black, blocky	
2900	Limestone	Shale: gray, green, blocky	Geologist on location 2900' at 5:53 am 10/28/2019
50	Limestone	Limestone: tan, m-ixn, pyritic, v-fossiliferous, pr interxn por	
50	Limestone	Shale: gray, silty	
50	Limestone	Limestone: tan to gray, m-ixn, fossiliferous, argillaceous, no vis por	
50	Limestone	Shale: gray, silty	
50	Limestone	Limestone: tan, f-mxn, fossiliferous, no vis por	wt 8.8, vis. 60, lcm 1# Mud-Co., Gary Schmidtberger
50	Limestone	Shale: gray soft, muddy	8:00am, 10/28/2019
3000	Limestone	Limestone: tan, f-mxn, granular, fossiliferous, no vis por	Topeka 2991 (-1016)
50	Limestone	Limestone: tan, f-mxn, oolitic, fossiliferous, no vis por	
50	Dolomite	Dolomite: tan, fxn, sl chalky, granular, sl fossiliferous, no vis por	
50	Limestone	Limestone: tan to lt brown, v-ixn, dense, sl fossiliferous, no vis por	
50	Shale	Shale: gray, brown, blocky, silty	
50	Limestone	Limestone: gray to tan, mxln, sl chalky, v-fossiliferous, no vis por	
50	Limestone	Limestone: tan, mxln, sl chalky, oolitic in part, v-fossiliferous, no vis por	
50	Limestone / Dolomitic	Limestone / Dolomitic: tan, fxn, sl chalky, fossiliferous, granular, fr interxn por, ns	
50	Shale	Shale: black carbonaceous, gray, blocky	
50	Shale	Shale: gray, green, silty	
50	Limestone	Limestone: tan, fxn, mostly dense, fossiliferous, no vis por	
50	Limestone	Limestone: tan to white, f-mxn, sl cherty, fossiliferous, pr vug por	
50	Shale	Shale: gray, green, silty	
50	Limestone	Limestone: tan to brown, fxn, sl chalky, cherty, fossiliferous, 5 pieces sl vug por, dark surface stain, nfo, no odor	
50	Shale	Shale: black, gray, green	
50	Limestone	Limestone: tan to white, f-mxn, chalky, oolitic in part, fossiliferous, pr interxn por, lt sat stain, slsfo on break only, no odor	
50	Shale	Shale: gray, black	
50	Limestone	Limestone: tan to white, f-mxn, oolitic in part, sl chalky, fossiliferous, clear calcite replacement, no vis por	
50	Limestone	Limestone: tan to white, f-mxn, oolitic in part, chalky, fossiliferous, pr interxn por, spotty streaky stain, nfo, no odor	
50	Shale	Shale: black, gray light & dark, pyritic	
50	Shale	Shale: gray, black, green, pyritic	
50	Limestone	Limestone: tan to gray, f-mxn, sl chalky, dense, v-fossiliferous, clear calcite replacement, no vis por	
50	Shale	Shale: gray, black, green	
50	Limestone	Limestone: white, f-mxn, oolitic in part, fossiliferous, 1% sample pr oolitic por, lt brown sat stain, slsfo on break only, no odor	
50	Limestone	Limestone: white, fxn, mostly dense, cherty, sl fossiliferous, no vis por, ns	
50	Shale	Shale: gray, red, silty	DST #1 3280-3320 30-60-30-60 1st open: built to 3/4" (diesel) 2nd open: blow started 10 min, wk blow throughout No Returns Rec: 10' ocm 20/80 hydro: 1596-1576 psi lf: 15-21 psi ff: 21-26 psi sip: 811-775 psi bht: 100° F
50	Shale	Shale: black, gray, blocky	
50	Limestone	Limestone: tan to white, f-mxn, sl chalky, oolitic, fossiliferous, 5% sample fr vug por, brown sat stain, slsfo, fair odor	
50	Limestone	Limestone: tan to white, fxn, chalky, cherty, fossiliferous, sl vug por, lt brown sat stain, slsfo, faint odor	
50	Shale	Shale: gray, green, silty	
50	Limestone	Limestone: tan, f-mxn, sl chalky, oolitic, fossiliferous, 5% sample fr oolitic por, brown sat stain, prsfo, fair odor	
50	Shale	Shale: gray, red, green, silty	8:00am, 10/29/2019 wt 9.1, vis. 57, lcm 1# Mud-Co., Gary Schmidtberger Strap out: 0.96 short to board deviation: 1 degree
50	Limestone	Limestone: tan to white, fxn, chalky, oolitic, fossiliferous, 5 pieces scattered pr interxn por, spotted dark stain, slsfo on break only, no odor	
50	Limestone	Limestone: tan to white, fxn, chalky, oolitic, fossiliferous, no vis por, ns	
50	Shale	Shale: gray, green, red, blocky, silty	DST #2 3315-3339 30-60-60-90 1st open: wk blow built to 1 1/4" 2nd open: wk blow built to 1/2" Rec: 32' ocmw 30/30/40 hydro: 1598-1555 psi lf: 14-27 psi ff: 31-35 psi sip: 337-327 psi bht: 99° F
50	Shale	Shale: gray, green, red, blocky	
50	Limestone	Limestone: white, fxn, sl chalky, cherty, mostly dense, oolitic, no vis por, ns	
50	Shale	Shale: dark to lt gray, red, green, silty	wt 9.1, vis. 50, lcm 2# Mud-Co., Gary Schmidtberger
50	Limestone	Limestone: tan to white, f-mxn, sl chalky, cherty, fossiliferous, 1% sample, pr foss por, brown sat stain, slsfo, no odor	8:00am, 10/30/2019
50	Shale	Shale: gray, green, red, blocky	
50	Limestone	Limestone: tan to white, fxn, chalky, sl cherty, mostly dense, oolitic, fossiliferous 4 pieces sl interxn por, lt brown surface stain, nfo, no odor	
50	Shale	Shale: dark to lt gray, green, red, silty	DST #3 3430-3460 30-60-60-90 1st open: blow built to 3 3/4" 2nd open: blow built to 5 3/4" no returns Rec: 17' mco 30/70 15' free oil hydro: 1674-1656 psi lf: 15-25 psi ff: 25-35 psi sip: 1060-1025 psi bht: 101° F gravity: 24° @ 60° F
50	Limestone	Limestone: white to tan, f-mxn, chalky, oolitic, fossiliferous, 5% sample, or oolitic por, dark sat stain, slsfo more on break, no odor	
50	Shale	Shale: black, gray, red	
50	Limestone	Limestone: white to tan, fxn, chalky, oolitic in part, no vis por, ns	
50	Shale	Shale: gray, black, blocky, carbonaceous	Mound City (BKC) 3477 (-1502)
50	Limestone	Limestone: white to tan, fxn, chalky, oolitic in part, no vis por, ns	
50	Shale	Shale: gray, red, green, black	
50	Limestone	Limestone: white, m-ixn, oolitic chalky, pr oolitic por, ns	
50	Shale	Shale: gray, red, green, black	
50	Shale	Shale: dark to lt gray, red, green	
50	Limestone	Limestone: white to tan, fxn, fossiliferous, no vis por	
50	Shale	Shale: dark to lt gray, red, green	
50	Limestone	Limestone: tan to white, f-mxn, oolitic in part, chalky, cherty, granular, no vis por	
50	Shale	Shale: dark to lt gray, red, green	
50	Limestone	Limestone: white, mxln, chalky, oolitic, fossiliferous, no vis por	
50	Shale	Shale: dark gray, red, green, v-sandy	
50	Dolomite	Dolomite: tan, f-mxn, granular/sucrosic, cherty, pr vug to gd interxn por, dark sat stain, gdsfo, good odor	
50	Dolomite	Dolomite: tan to white, fxn, granular/sucrosic, pyritic, gd interxn por, dark sat stain, gdsfo, good odor	
50	Dolomite	Dolomite: tan, f-mxn, granular/sucrosic, cherty, remnant oolite, fr interxn por, dark spotty stain, frsfo, fair odor	
50	Dolomite	Dolomite: tan, f-mxn, granular/sucrosic, gd interxn por, dark spotty stain, prsfo, fair odor	
50	Dolomite	Dolomite: tan, f-mxn, granular/sucrosic, oolitic, gd vug to interxn por, dark spotty stain, slsfo, fair odor	
50	Dolomite	Dolomite: tan, f-mxn, granular/sucrosic, sl oolitic, fr vug to interxn por, 4 pieces dark spotty stain, slsfo, fair odor	
50	Dolomite	Dolomite: tan, fxn, granular/sucrosic, cherty, remnant oolite, gd vug to interxn por, ns	
50	Dolomite	Dolomite: tan, f-mxn, granular/sucrosic, cherty, pr vug to gd interxn por, dark sat stain, gdsfo, good odor	8:00am, 11/2/2019 Geologist off location at 12:10pm, 11/2/2019 wt 9.3, vis. 55, lcm 2# Mud-Co., Gary Schmidtberger
50	Dolomite	Dolomite: tan, f-mxn, granular/sucrosic, cherty, remnant oolite, gd vug to interxn por, ns	RTD 4930 (-2645) 8:00am, 11/2/2019 Geologist off location at 12:10pm, 11/2/2019 wt 9.3, vis. 55, lcm 2# Mud-Co., Gary Schmidtberger
50	Dolomite	Dolomite: tan, f-mxn, granular/sucrosic, cherty, remnant oolite, gd vug to interxn por, ns	DST #4 3550-3567 30-60-60-90 1st open: bob 22 min 2nd close: no return 2nd open: bob 33 min 2nd close: faint return Rec: 82' gwmco 5/10/15/70 228' free oil hydro: 1770-1735 psi lf: 32-66 psi ff: 78-130 psi sip: 1158-1145 psi bht: 107° F gravity: 23° @ 60° F
50	Dolomite	Dolomite: tan, f-mxn, granular/sucrosic, cherty, remnant oolite, gd vug to interxn por, ns	DST #5 3565-3574 30-60-60-90 1st open: built to 9 1/2" 1st close: no return 2nd open: bob 50 min 2nd close: no return Rec: 124' wmc 15/25/60 124' free oil hydro: 1759-1724 psi lf: 37-56 psi ff: 66-107 psi sip: 1166-1157 psi bht: 107° F gravity: 23° @ 60° F
50	Dolomite	Dolomite: tan, f-mxn, granular/sucrosic, cherty, remnant oolite, gd vug to interxn por, ns	DST #6 3572-3581 30-60-60-90 1st open: built to 3" 1st close: no return 2nd open: built to 2 1/2" 2nd close: no return Rec: 112' osmw os/30/70 hydro: 1740-1711 psi lf: 20-38 psi ff: 41-63 psi sip: 1177-1177 psi bht: 109° F chlorides: 22,000 ppm