

Robert D. Hendrix

Petroleum Geologist

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY **Murfin Drilling Co. Inc.**

LEASE **Sutton 'A' #1-18**

FIELD **Wittcat**

LOCATION **19807h1 & 3307e1**

SEC **18** TWPSP **1s** RGE **35w**

COUNTY **Rawlins** STATE **Kansas**

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

SPUD **10/26/2015** COMP **11/4/2015**

RTD **4527'** LTD **4298'**

MUD UP **3386'** TYPE MUD **Chemical**

SAMPLES SAVED FROM **3630'** TO **TD**

DRILLING TIME KEPT FROM **3608'** TO **TD**

SAMPLES EXAMINED FROM **3530'** TO **TD**

GEOLOGICAL SUPERVISION FROM **3607'**

GEOLOGIST ON WELL **Robert D. Hendrix**

FORMATION TOPS

ANHYDRITE **3122' (+113)**

FORAKER **3731 (-496)**

TOPEKA **3940 (-705)**

OREAD **4048 (-813)**

LANSING **4158 (-923)**

STARK **4378 (-1143)**

BKC **4427 (-1192)**

ELEVATIONS

KB **3935'**

DF

GL **3224'**

Measurements Are All From **Kelly Bushing**

CASING

CONDUCTOR SURFACE **8-5/8" at 258'**

PRODUCTION **5-1/2"**

ELECTRICAL SURVEYS

Densily/Induction/Microlog/Seis

Pioneer Wireline Services

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AP# **15-153-21170**

REMARKS:

LEGEND

| | | | | | | | | | | | | | | | |
|--|-----------|--|-----------|--|-----------|--|-------|--|---------|--|-----------|--|-------|--|----------|
| | Anhydrite | | Sandstone | | Limestone | | Shale | | Carb Sh | | Cherty LS | | Chert | | Dolomite |
|--|-----------|--|-----------|--|-----------|--|-------|--|---------|--|-----------|--|-------|--|----------|

| DEPTH | LITHOLOGY | SAMPLE DESCRIPTION | REMARKS |
|-------|-----------|--|--|
| 3100 | | | Anhydrite 3122 (+113) |
| 3150 | | | Base Anhydrite 3151 (+84) |
| 3600 | | Shale: red, gray, silty | bit trip at 3607' strap 0.06' long to board Geologist on location at bit trip at 6:00pm 10/28/2015 |
| 3650 | | Limestone: white, f-xln, sl chalky, oolitic, fossiliferous, no vis por, ns Shale: red, silty | Neva 3618 (-383) |
| 3700 | | Shale: red, gray, brown, silty Sandstone: gray to green, glauconitic, fngm, submd, mod sorted, calcareous, no vis por Shale: red, brown, silty, sandy | Red Eagle 3684 (-449) |
| 3750 | | Limestone: white, f-xln, sl oolitic, mostly dense, cherty (orange), fossiliferous, no vis por, ns Shale: red, brown, gray, silty Shale: red, gray, silty | Foraker 3731 (-496) |
| 3800 | | Limestone: white, f-xln, sl chalky, sl cherty, granular, fossiliferous, pr interxln to sl pp por, lt to dark sat stain, frsfo (light), faint odor, occasional gas bubble Shale: gray, silty Limestone: tan to brown, mxln, granular, no vis por, ns Limestone: tan to brown, mxln, granular, no vis por, ns Shale: gray, black Dolomite: tan to brown, f-xln, sl chalky, granular, sl fossiliferous, fr interxln por, ns Shale: red, gray | 8:00am, 10/29/2015 wt 8.9, vis. 54, lcm 8# Morgan Mud, Dave Lines |
| 3850 | | Limestone: white to lt gray, f-xln, sl chalky, sl granular, v-fossiliferous, no vis por Shale: gray, red, black Shale: red, brown, silty Limestone: white to gray, f-xln, oolitic, fossiliferous, no vis por Limestone: white to lt gray, f-xln, fossiliferous, no vis por Shale: gray, red, green, silty Limestone: gray, f-mxln, granular, fossiliferous, no vis por Shale: red, gray | Stotler 3880 (-645) |
| 3900 | | Limestone: white to tan, f-mxln, sl chalky, oolitic, v-fossiliferous, pr interxln por, gd dark sat stain, prsfo, faint odor Shale: red, gray, silty Limestone: tan to white, m-lxln, oolitic, fossiliferous, no vis por Shale: gray, red Limestone: lt gray, f-mxln, oolitic, fossiliferous, no vis por, few pieces lt sat stain, silsfo, no odor Limestone: white to lt gray, mxln, oolitic, fossiliferous, pellicoidal, no vis por, 2 pieces, dark spotty to sat stain, nfo, no odor Shale: gray, red Shale: red, gray, black | Topeka 3940 (-705) |
| 3950 | | Limestone: tan to white, mxln, oolitic, fossiliferous, no vis por Shale: gray, red Limestone: white, m-lxln, oolitic, fossiliferous, dense, lt calcite replacement, no vis por Shale: gray, red Shale: gray, red, brown | 8:00am, 10/30/2015 wt 9.2, vis. 56, lcm 6# Morgan Mud, Dave Lines |
| 4000 | | Limestone: tan to white, f-xln, chalky, fossiliferous, no vis por, ns Shale: red, brown, silty Shale: red, gray, brown, green, silty Shale: gray, green, red, silty | Oread 4048 (-813) |
| 4050 | | Limestone: white, f-xln, chalky, fossiliferous, no vis por, several pieces dark spotty stain, nfo, no odor Shale: gray, red Limestone: tan to white, f-xln, chalky, dense, no vis por, ns Limestone: white to lt gray, f-xln, chalky, sl fossiliferous, granular, no vis por, ns Shale: gray, brown, red, black Limestone: gray, v-f-xln, sl chalky, dense, no vis por, ns Shale: gray, brown, silty Limestone: brown, v-f-xln, sl fossiliferous, dense, no vis por, ns Sandstone: white, opaque, fngm, well sorted, submd, calcareous, friable, no por, ns Shale: gray, red, silty | 8:00am, 10/31/2015 wt 9.1, vis. 51, lcm 7# Morgan Mud, Dave Lines |
| 4100 | | Limestone: tan to white, f-mxln, fossiliferous, pr interxln por, dark spotty to sat stain, silsfo, no odor Limestone: tan to white, f-xln, fossiliferous, pr vug por, dark spotty to sat stain, silsfo, no odor Shale: red, gray, silty, sandy Sandstone: lt green, opaque, fngm, well sorted, submd, calcareous, friable, pr intergranular por, few pieces lt sat stain, nfo, no odor Shale: red, gray, green | Lansing 4158 (-923) |
| 4150 | | Limestone: white to tan, f-mxln, chalky, pyritic, sl fossiliferous, pr interxln some foss por, dark sat stain, silsfo, no odor Limestone: white, f-xln, chalky, pyritic, pr interxln por, 1% sample lt sat stain, silsfo, no odor Shale: gray, red, silty | 8:00am, 11/1/2015 wt 9.2, vis. 58, lcm 8# Morgan Mud, Dave Lines |
| 4200 | | Limestone: white to tan, f-xln, chalky, dense, fossiliferous, no vis por, ns Shale: red, gray, silty | Stark 4378 (-1143) |
| 4250 | | Limestone: white to tan, f-xln, chalky, fossiliferous, sl pyritic, fr pp to vug por, gd dark sat stain, frsfo some bleeding, good odor Limestone: white, mxln, sl chalky, fossiliferous, sl pyritic, fr pp to vug por, gd lt sat stain, frsfo some bleeding, good odor Shale: red, gray, dark gray Limestone: tan, f-xln, fossiliferous, pyritic, fr pp to pr vug por, gd dark sat stain, prsfo, gd odor Shale: red, gray, green | 8:00am, 11/2/2015 |
| 4300 | | Limestone: white, f-mxln, fossiliferous in part, fr to gd interxln to vug por, gd spotty to sat stain, frsfo some bleeding, gd odor Limestone: white, f-mxln, chalky, fossiliferous, sl interxln por, 1% sample lt spotty to sat stain, nfo, no odor Shale: gray, red Shale: red, gray, silty | Stark 4378 (-1143) |
| 4350 | | Limestone: white, f-xln, chalky, sl fossiliferous, sl interxln por, 1% sample lt spotty to sat stain, nfo, no odor Shale: red, gray, silty | 8:00am, 11/3/2015 |
| 4400 | | Shale: gray, black, red, brown Shale: gray, dark gray, red, silty Limestone: white, f-xln, sl chalky, oolitic in part, fossiliferous, sl interxln por, 2 pieces spotty, stain, nfo, no odor Shale: gray, green, red, brown Limestone: tan to white, f-xln, sl chalky, oolitic, fossiliferous, no vis por, ns Shale: red, gray, silty | BKC 4427 (-1192) |
| 4450 | | Limestone: tan, f-mxln, chalky, oolitic, fossiliferous, no vis por, ns Shale: red, gray, brown, silty Limestone: tan, f-xln, oolitic, sl cherty, fossiliferous, no vis por Shale: red, silty, sandy Shale: red, gray, silty, sandy | 8:00am, 11/3/2015 |
| 4500 | | Limestone: lt gray to white, f-xln, sl chalky, fossiliferous, no vis por | RTD 4527 (-1292) |
| 4550 | | | wt 9.1, vis. 54, lcm 4# Morgan Mud, Dave Lines Geologist off location at 12:21am, 11/4/2015 |