

Robert D. Hendrix

Petroleum Geologist

GEOLGISTS REPORT

DRILLING TIME AND SAMPLE LOG

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

LEASE: **Burk Trust #2-22**

FIELD: **NA**

LOCATION: **2190' fsl & 1750' fcl**

SEC: **22** TWP: **1** RGE: **36**

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

CONTRACTOR: **Murfin Drilling Co Inc Rig #8**

SPUD: **10/7/2013** COMP: **10/16/2013**

RTD: **4:51:00** LPE: **4:51:00**

MUD UP: **3:56:97** TYPE MUD: **Chemical**

SAMPLES SAVED FROM: **3490'** TO: **TD**

DRILLING TIME KEPT FROM: **3500'** TO: **TD**

SAMPLES EXAMINED FROM: **3490'** TO: **TD**

GEOLOGICAL SUPERVISION FROM: **3552'**

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

NEUTRON/DENSITOMETER/LOGGERS: **Neutron/Densitometer/Loggers**

PRIMAR ENERGY SERVICES: **Primar Energy Services**

ELECTRICAL SURVEYS: **ELECTRICAL SURVEYS**

PRODUCTION: **5 1/2" @ 4508'**

CONDUCTOR: **KB-3213'**

MEASUREMENTS BY: **All From Kelly Bunting**

GL: **3208'**

DF: **3208'**

KB: **3213'**

ELEVATIONS: **ELEVATIONS**

FORMATION TOPS: **FORMATION TOPS**

ELECTRIC LOG: **ELECTRIC LOG**

SAMPLE: **SAMPLE**

Anyhydrite: **Anyhydrite**

Sandstone: **Sandstone**

Limestone: **Limestone**

Shale: **Shale**

Carb Sh: **Carb Sh**

Cherty LS: **Cherty LS**

Chert: **Chert**

Dolomite: **Dolomite**

DRILLING TIME IN MINUTES PER FOOT: **DRILLING TIME IN MINUTES PER FOOT**

Rate of Penetration Decreases: **Rate of Penetration Decreases**

DEPTH: **DEPTH**

LITHOLOGY: **LITHOLOGY**

SAMPLE DESCRIPTION: **SAMPLE DESCRIPTION**

REMARKS: **REMARKS**

3100: **Anhydrite 3112 (+101)**

50: **Base Anhydrite 3147 (+66)**

3200: **Shale: red, brown, silty, sandy**

50: **Sandstone: white to gray, vf gr, rnd, well srt'd, calcareous cmt, semi friable, no vis por**

50: **Shale: red, brown, gray, silty, sl sandy**

50: **Shale: red, sl amt gray, muddy, clumpy**

50: **Shale: red, silty, sl sandy**

3600: **Neva 3597 (-384)**

50: **Limestone: white to lt gray, f-mxn, sl chalky, oolitic, fossiliferous, dark flaky stain, no vis por, ns**

50: **Shale: red, brown, silty, clumpy**

50: **Sandstone: white to gray, vf gr, rnd, well srt'd, calcareous cmt, friable, pr intergranular por, abundant dark flaky stain, nfo, no odor**

50: **Shale: red, brown, gray, silty**

3700: **Red Eagle 3659 (-446)**

50: **Limestone: white to tan, f-mxn, sl chalky, fossiliferous, no vis por**

50: **Limestone: tan to gray, f-xln, chalky, fossiliferous, no vis por**

50: **Limestone: lt gray, f-xln, fossiliferous, no vis por**

50: **Shale: red, brown, gray, silty**

3700: **Foraker 3707 (-494)**

50: **Limestone: gray to white, f-mxn, chalky, sl fossiliferous, no vis por**

50: **Limestone: gray to brown, f-xln, chalky, sl fossiliferous, no vis por**

50: **Limestone: gray, f-xln, chalky, silty, dense, no vis por**

50: **Shale: gray, brown, silty**

50: **Limestone: tan to gray, f-mxn, chalky, silty, sl fossiliferous, no vis por**

50: **Limestone: tan to gray, f-mxn, chalky, silty, sl fossiliferous, no vis por**

50: **Shale: red, gray, silty**

3800: **Dolomite: tan, f-xln, sl granular, sl fossiliferous, pr interxln por, ns**

3800: **Limestone/Dolomite: tan, f-xln, chxln, sl granular, fossiliferous, pr interxln por**

3800: **Shale: gray, brown, red, silty, blocky in part**

50: **Limestone: white, f-mxn, sl chalky, oolitic, no vis por, ns**

50: **Shale: red, gray, silty**

50: **Limestone: white to gray, f-mxn, sl chalky, oolitic, fr oolitic por, ns**

50: **Shale: gray, sl red, silty**

50: **Shale: red, gray, green, silty**

50: **Limestone: gray to white, f-xln, sl chalky, argillaceous, sl fossiliferous, no vis por, ns**

50: **Shale: red, silty**

50: **Limestone: white, f-xln, fossiliferous, sl interxln por, few pieces with black flaky stain, nfo, no odor**

50: **Shale: red, gray, green, waxy in part**

50: **Limestone: tan to white, f-mxn, chalky, granular, fossiliferous, no vis por**

50: **Shale: gray, red**

50: **Limestone: tan to white, f-mxn, chalky, argillaceous, fossiliferous, pelletaloid, no vis por**

50: **Shale: red, gray, silty**

3900: **Topeka 3925 (-712)**

50: **Limestone: white, f-mxn, sl chalky, fossiliferous, no vis por, ns**

50: **Shale: red, gray, silty**

50: **Limestone: white to lt gray, f-xln, chalky, dense, no vis por, ns**

50: **Limestone: white to lt gray, f-mxn, sl chalky, fossiliferous, no vis por, ns**

50: **Shale: gray, brown, red, silty**

50: **Limestone: white to tan, f-mxn, chalky, sl fossiliferous, no vis por, ns**

50: **Shale: red, brown, gray, silty, sandy**

50: **Shale: red, gray, silty**

50: **Limestone: tan to white, f-xln, granular sl pyritic, no vis por**

50: **Shale: red, brown, gray, silty, sandy**

50: **Shale: red, gray, silty**

50: **Limestone: tan to white, f-xln, sl chalky, sl fossiliferous, fr interxln to pr vug por, 10% sample dark sat stain, frsto, faint odor**

50: **Limestone: white, f-xln, chalky, sl fossiliferous, no vis por**

50: **Shale: red, gray, purple, brown, silty**

4000: **Oread 4033 (-820)**

50: **Limestone: white, mxln, oolitic, fossiliferous, fr oolitic por, gd dark sat stain, fr sfo, gd odor**

50: **Limestone: white, f-mxn, sl chalky, oolitic, fossiliferous, no vis por**

50: **Limestone: white to tan, f-xln, sl chalky, sl fossiliferous, no vis por**

50: **Limestone: lt gray, f-xln, dense, silty in part, no vis por**

50: **Siltstone: lt gray, hard, hard, blocky, silty**

50: **Shale: gray, red, silty**

50: **Limestone: gray to white, f-xln, silty, chalky, soft, no vis por**

50: **Shale: gray, red, silty**

50: **Shale: red, gray to dark gray, green, silty, waxy in part**

4100: **Lansing 4141 (-928)**

50: **Limestone: tan to white, f-xln, chalky, fossiliferous, no vis por, 3% sample spotty black tarry flecky stain, nfo, no odor**

50: **Limestone: white to tan, f-xln, chalky, sl fossiliferous, no vis por**

50: **Shale: gray, red, silty**

50: **Sandstone: gray, vf gr, rnd, well srt'd, poorly cemented calcareous, argillaceous, no vis por**

50: **Shale: red, gray, muddy, silty**

50: **Limestone: tan to white, f-xln, granular sl pyritic, no vis por**

50: **Shale: red, brown, gray, silty, sandy**

50: **Shale: red, gray, silty**

50: **Limestone: tan to white, f-xln, sl chalky, sl fossiliferous, fr interxln to pr vug por, 10% sample dark sat stain, frsto, faint odor**

50: **Limestone: white, f-xln, chalky, sl fossiliferous, no vis por**

50: **Shale: red, gray, silty**

50: **Shale: red, gray, silty**

50: **Shale: red, gray, silty**

50: **Limestone: white to tan, f-xln, sl chalky, sl fossiliferous, pr vug por, 25% sample lt to dark sat stain, frsto, fair odor**

50: **Limestone: tan to white, f-xln, sl chalky, no vis por, 7 pieces dark spotty tarry stain, slsfo, faint odor**

50: **Shale: gray, red, green, silty**

50: **Limestone: tan to white, f-xln, sl chalky, pyritic, pr pp to vug por, 3% sample dark spotty tarry stain, slsfo, faint odor**

50: **Shale: gray, red, pyritic**

50: **Shale: gray, red**

50: **Limestone: white, f-xln, chalky, fossiliferous, sl pyritic, no vis por**

50: **Shale: gray, green, red**

50: **Limestone: tan, f-xln, granular, fossiliferous, pr interxln por, 2 pieces lt spotty stain, nfo, faint odor**

50: **Shale: red, gray, silty**

50: **Shale: red, gray, silty**

50: **Limestone: white to lt gray, f-xln, sl chalky, sl fossiliferous, dense, no vis por, ns**

50: **Shale: red, gray, black silty**

50: **Shale: red, gray, brown silty**

50: **Limestone: white to lt gray, f-xln, chalky, fossiliferous, no vis por**

50: **Shale: red, sl gray, silty**

50: **Limestone: white to lt gray, f-xln, dense, fossiliferous, no vis por**

50: **Shale: red, sl gray, silty**

50: **Limestone: tan to gray, f-xln, fossiliferous, no vis por**

50: **Shale: red, gray, green, silty**

50: **Limestone: white to tan, f-mxn, sl chalky, fossiliferous, pr interxln por, ns**

50: **Shale: gray, red silty**

50: **Shale: gray, red silty**

50: **Limestone: white to lt gray, f-xln, chalky, sl fossiliferous, soft, no vis por, ns**

50: **Limestone: white to lt gray, f-xln, chalky, sl fossiliferous, soft, no vis por, ns**

50: **Shale: gray, red silty**

50: **Shale: gray, red brown, v-sandy, silty**

50: **Shale: gray, red brown, yellow, sandy, silty**

50: **Limestone: tan to gray, f-xln, sl chalky, fossiliferous, dense, no vis por, ns**

50: **Shale: red, gray, silty**

50: **RTD 4510 (-1297)**

50: **Shale: red, gray, black silty**

50: **Shale: red, gray, brown silty**

50: **Limestone: white to lt gray, f-xln, chalky, fossiliferous, no vis por**

50: **Shale: red, sl gray, silty**

50: **Limestone: white to lt gray, f-xln, dense, fossiliferous, no vis por**

50: **Shale: red, sl gray, silty**

50: **Limestone: tan to gray, f-xln, fossiliferous, no vis por**

50: **Shale: red, gray, green, silty**

50: **Limestone: white to tan, f-mxn, sl chalky, fossiliferous, pr interxln por, ns**

50: **Shale: gray, red silty**

50: **Shale: gray, red silty**

50: **Limestone: white to lt gray, f-xln, chalky, sl fossiliferous, soft, no vis por, ns**

50: **Limestone: white to lt gray, f-xln, chalky, sl fossiliferous, soft, no vis por, ns**

50: **Shale: gray, red silty**

50: **Shale: gray, red brown, v-sandy, silty**

50: **Shale: gray, red brown, yellow, sandy, silty**

50: **Limestone: tan to gray, f-xln, sl chalky, fossiliferous, dense, no vis por, ns**

50: **Shale: red, gray, silty**

50: **RTD 4510 (-1297)**

50: **Shale: red, gray, black silty**

50: **Shale: red, gray, brown silty**

50: **Limestone: white to lt gray, f-xln, chalky, fossiliferous, no vis por**

50: **Shale: red, sl gray, silty**

50: **Limestone: white to lt gray, f-xln, dense, fossiliferous, no vis por**

50: **Shale: red, sl gray, silty**

50: **Limestone: tan to gray, f-xln, fossiliferous, no vis por**

50: **Shale: red, gray, green, silty**

50: **Limestone: white to tan, f-mxn, sl chalky, fossiliferous, pr interxln por, ns**

50: **Shale: gray, red silty**

50: **Shale: gray, red silty**

50: **Limestone: white to lt gray, f-xln, chalky, sl fossiliferous, soft, no vis por, ns**

50: **Limestone: white to lt gray, f-xln, chalky, sl fossiliferous, soft, no vis por, ns**

50: **Shale: gray, red silty**

50: **Shale: gray, red brown, v-sandy, silty**

50: **Shale: gray, red brown, yellow, sandy, silty**

50: **Limestone: tan to gray, f-xln, sl chalky, fossiliferous, dense, no vis por, ns**

50: **Shale: red, gray, silty**

50: **RTD 4510 (-1297)**

50: **Shale: red, gray, black silty**

50: **Shale: red, gray, brown silty**

50: **Limestone: white to lt gray, f-xln, chalky, fossiliferous, no vis por**

50: **Shale: red, sl gray, silty**

50: **Limestone: white to lt gray, f-xln, dense, fossiliferous, no vis por**

50: **Shale: red, sl gray, silty**

50: **Limestone: tan to gray, f-xln, fossiliferous, no vis por**

50: **Shale: red, gray, green, silty**

50: **Limestone: white to tan, f-mxn, sl chalky, fossiliferous, pr interxln por, ns**