

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY Murfin Drilling Co., Inc

LEASE Carolyn #1-3

FIELD Jones Canyon SE

LOCATION 660' FSL + 640' FNL

SEC 3 TWP 1 RGE 37 W

COUNTY Cheyenne STATE K5

CONTRACTOR Murfin Drilling Rig #20

SPUD 01/29/14 COMP 02/18/14

RTD 4615' LTD 4614'

MUD UP 3300' TYPE MUD chem

SAMPLES SAVED FROM 3400'

DRILLING TIME KEPT FROM 3400'

SAMPLES EXAMINED FROM 3400'

GEOLOGICAL SUPERVISION FROM 3400'

GEOLOGIST ON WELL Ken Wallace

ELEVATIONS

KB 3097'

DF

GL 3086'

Measurements Are All From KB

CASING SURFACE 8 7/8 @ 225'

PRODUCTION 5 1/2 @ 4612'

ELECTRICAL SURVEYS DI, CN/CDL, MEL, BHCS

FORMATION TOPS

LOG

SAMPLES

| FORMATION TOPS | LOG | SAMPLES |
|----------------|--------------|--------------|
| Anhydrite | 3049 (+46) | 3055 (+42) |
| Neva | 3502 (-405) | 3498 (-401) |
| Forker | 3614 (-517) | 3610 (-513) |
| Tapeka | 3834 (-737) | 3832 (-735) |
| Lansing | 4050 (-953) | 4049 (-952) |
| Stark | 4266 (-1169) | 4265 (-1168) |
| B/KC | 4321 (-1224) | 4323 (-1226) |
| Pawnee | 4441 (-1344) | 4444 (-1347) |
| Cherokee | 4529 (-1432) | 4533 (-1435) |
| RTD | 4614 (-1517) | 4615 (-1518) |

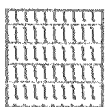
REMARKS Production casing set to further evaluate KC & Pawnee zones,

Ken Wallace

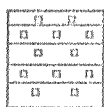
1/29/14: Spud @ 5:30 pm
 1/30/14: Depth 225'
 1/31/14: Depth 1375'
 2/1/14: off-weather
 2/2/14: start up
 2/3/14: Depth 2200'
 2/4/14: Depth 3400'
 2/5/14: Depth 3600'
 2/6 thru 2/8/14: off-weather
 2/9/14: start up
 2/10/14: Depth 3627'
 2/11/14: Depth 3710'
 2/12/14: Depth 4015'
 2/13/14: Depth 4118'

2/14/14: Depth 4235'
 2/15/14: Depth 4464'
 2/16/14: RTD 4615'
 2/17/14: Logging
 2/18/14: complete

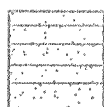
LEGEND



Anhydrite



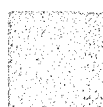
Salt



Sandstone



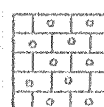
Shale



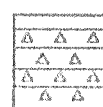
Carb sh



Limestone



Ool. Lima



Chert



Dolomite

SCALE " = 100'

DRILLING TIME - Minutes Per Foot
 Rate of Penetration Decreases

DEPTH

SAMPLE DESCRIPTIONS

REMARKS

3030

50

70

90

3110

3400

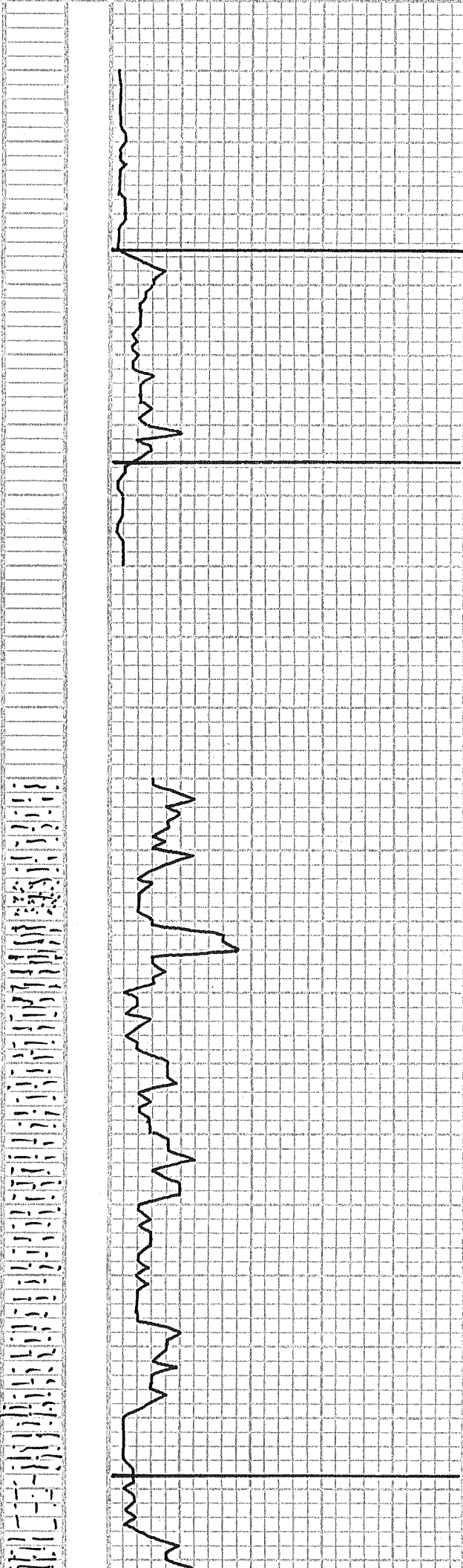
20

40

60

80

3500



Anhydrite 3055 (+42)

B/Anhydrite 3085 (+12)

slst, rd, argl; sm vfg ss; NS

ss, ltgy, vfg, much slst a.a.

sh, gy, sm ltgy (waxy), sm dkgy

sh, rd, sm slst, soft

sh, rd, fissl, hard w/ slst a.a.

sh, rd w/ tan lamina, slty

sh, rd, sm brick rd, slty

Ls, ltgy-tan, sl dolomitic, v fass, sm sd grns, NS, NO, NF

sh, gy, calc impart, s vfg ss

Morgan Mud: 3499'
2/4/14
Wt. 8.8, vis 62, LCM 5

Neva 3498 (-40)

20

sh, rd, v sandy, fg sd

40

sh, dkgy, calc, much rd sh/slst

60

Dol, buff, t snccr, foss, pp, tr org
Δ, NS

Red Eagle 3563 (-466)

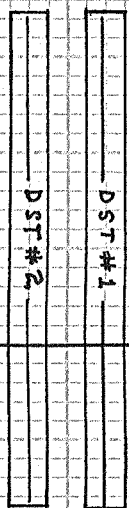
80

sh, lt grn, sdy, sm lt grn fg ss

sh, red, sm lt grn, gy, slst

Morgan Mud: 3600'
2/9/14
wt. 8.8, vis 54, LCM 4

3600



Foraker 3610 (-513)

20

Ls, lt gy-wh, ool, foss, sl salt t
pepr ten, g I G & ug φ, g sfb,
g sptd - sat stn, sm dk stn,
tr FL, NO

Morgan Mud: 3627'
2/10/14
wt. 9, vis 65, LCM 5

40

Ls, m-lt gy-tan, sl foss, xln,
slcky, NS

Pipe Strap @ 3627'
Strap 0.45' short

60

Ls, tan, ool, poolmd φ, sm xln,
dse, slcky, NS

80

sh, gg, calc

Ls, lt gy, fxln-dse, slcky,
NS vis φ, NS

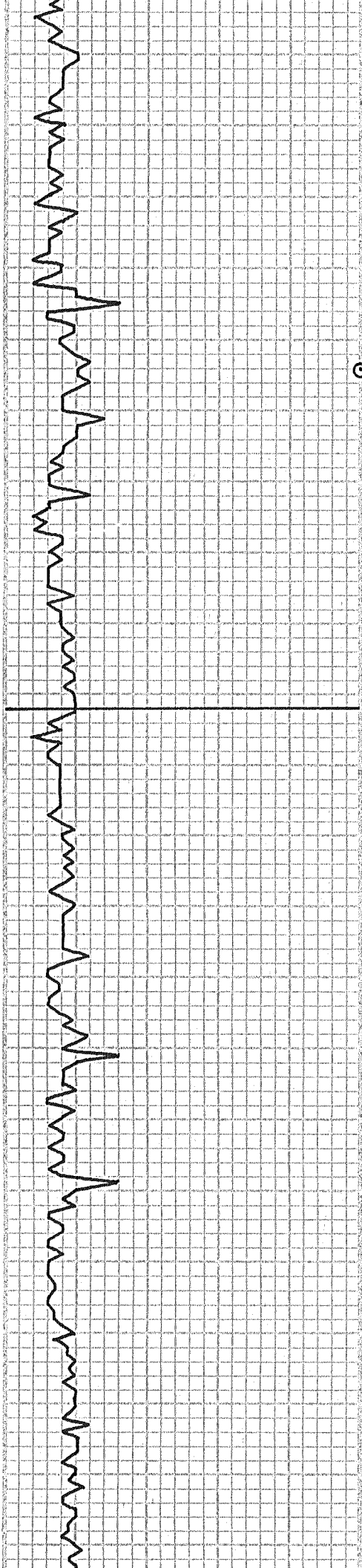
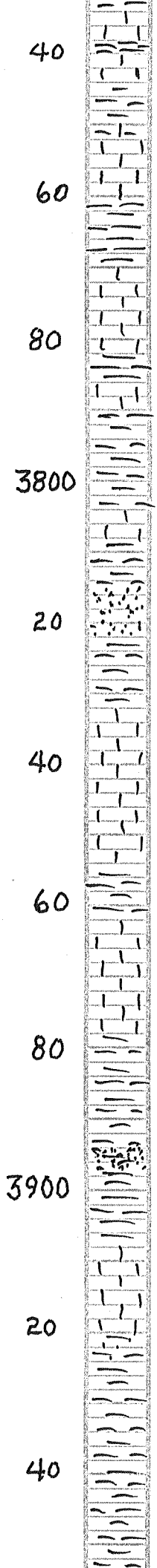
3700

sh, red, gummy

Ls, offwh, granl, foss, ool, NS

20

sh, lt red, calc



Ls, buff, fxl - dse, NS
 sh, red, slty
 Ls, tan, fxl - dse sl cky,
 sl foss, ppt/vg ϕ , fspdt str, SSFO
 asph + globs, NO
 sh, red, slty
 Ls, lt gy, ool (crse oolts), p ϕ ,
 NS, NO
 Ls, off wh, ool, foss, pv ϕ , asph
 str, tr to, NO
 sh, red, slty
 Ls, off wh, ool, foss, NS
 sh, red, slty / sdy
 ss, red, fgd, orgl
 sh, red, sm brn, slty, sdy
 Ls, tan, fxl, dse, sl foss,
 cky, NS
 Ls, lt gy - tan, ool in pt, mstly
 fxl - dse, cky, NS, sl Δ
 Ls, tan, dse, v Δ ty, interbd
 w/ red sh, NS
 Ls, tan, ool in pt, less Δ ,
 foss, cky, NS
 sh, red, slty, sm grn sh
 ss, lt grn, v fg, arg, fsortd,
 sh, red, gy, grn
 Ls, wh - lt gy, sl ool, mstly
 xln - dse, NS
 sh, red, slty, sdy, sm purple,
 calc
 sh, red brown, calc

Morgan Mud: 3772'
 2/11/14
 wt. 9.3, vis 50, LCM 8

Topeka 3832 (-735)

a.a., sm lt grn, calc, sst

Oread 3968(-871)

60

80

4000

20

40

60

80

4100

20

40

60

Ls, wh-ltgy, ool in pt, xln, sm dse, pug φ, sptd bl stn, fplc pigg, psto, NO, NF

Ls, tan, ool, pigg, ssfo, sl foss, psptd bl stn, NO, NF

Ls, tan, dse, cky, sl foss, tr bl stn, NFO, NO

ss, ltgy, vfg, w/rd & sortd, friable, sat gilsonite stn, NFO, NO

sh, red, gy, brn

Lansing 4049(-952)

DST # 3

Ls, off wh-ltgy, mxln-dse, ool in pt, sl foss, p-f vg φ, psto on bk, sptd blk stn, sm frac φ, NO, NF

Ls, ltgy-tan, fxln-dse, tr asph stn, Nfo, NO, Nvix φ, NF

sh, red-brn w/gy ss, ltgy, vfg, friable, calc, NS

ss, brn, vfg, argl, calc, hard, NS
sh, red, slty

Ls, wh-ltgy, ool, sm xln-dse, sl cky, pug φ, scat sptd stn, mstly barren, NFO, NO

15"- Ls, ltgy, fxln, foss, p-f vg φ, foss φ, GSFO & GB, sptd stn, NO, NF

sh, red, gy, grn

Morgan Mud: 4079'
2/12/14
wt. 9.3, vis 90, LCM 6

Morgan Mud: 4118'
2/3/14
wt. 9.4, vis 60, LCM 7

DST # 4

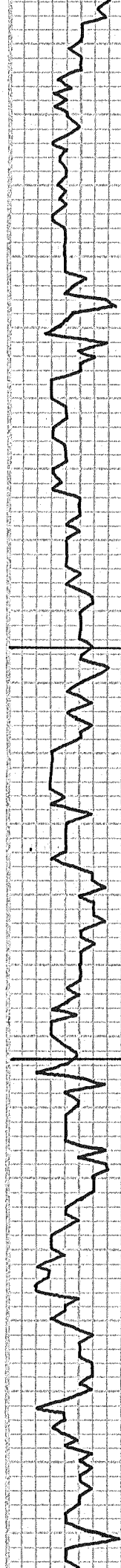
Ls, ltgy, f-mxln, dse, tr vg φ, tr asph stn, ool in pt, NFO, NO

sh, red, brn, sm grn, hard & slty

Ls, ltgy-wh, ool, sm fxln-dse, foss, f-g IG & vg φ, GSFO & GB, f sptd stn, NO, NF

Ls, ltgy-tan, mstly dse-fxln,

80
4200
20
40
60
80
4300
20
40
60
80



ckly, NS
 sh, red, sm grn, calc
 a.a. sdy w/ lt grn, argl, Ls
 Ls, off wh - mgy, fass, fxln, cky in pt, tr ugφ, scat dō stn, NFO, NO, NF
 sh, red, brn
 Ls, gy - tan, ool in pt, fxln - dse, tr dō stn, Nvisφ, NFO, NO
 sh, brn, red, slty
 Ls, off wh - lt gy, sl ool, mstly xln, fass, frhd φ w/ red clay fill, 1pc USSPO, Nstn, NO
 Ls, lt gy, fxln - dse, sl fass, Nvisφ, NS, NO, cky
 sh, gy, red, sm grn
 ss, red-tan, vfg, friable, calc, NS
 Ls, lt gy - tan, ool, xln - cky in pt, fass, NS
 sh, red, grn, gy; sm lt grn argl, Ls
 Ls, lt tan, ool, fass, sm fxln, NS
 sh, red, gy
 Ls, lt gy, sm tan, ool in pt, fxln, sm dse, fass, Nvisφ, NS
 sh, red, grn, sm lt yello.
 Ls, gy, sl ool, fxln - dse, sm clay, NS
 sh, brn, red, sm grn
 ss, red/brn, vfg, argl; sh,

Morgan Mud: 4243'
2/14/14
wt. 9.4, vis 75, LCM B

Stark 4265(-1168)

BKC 4323(-1226)

4400

20

40

60

80

4500

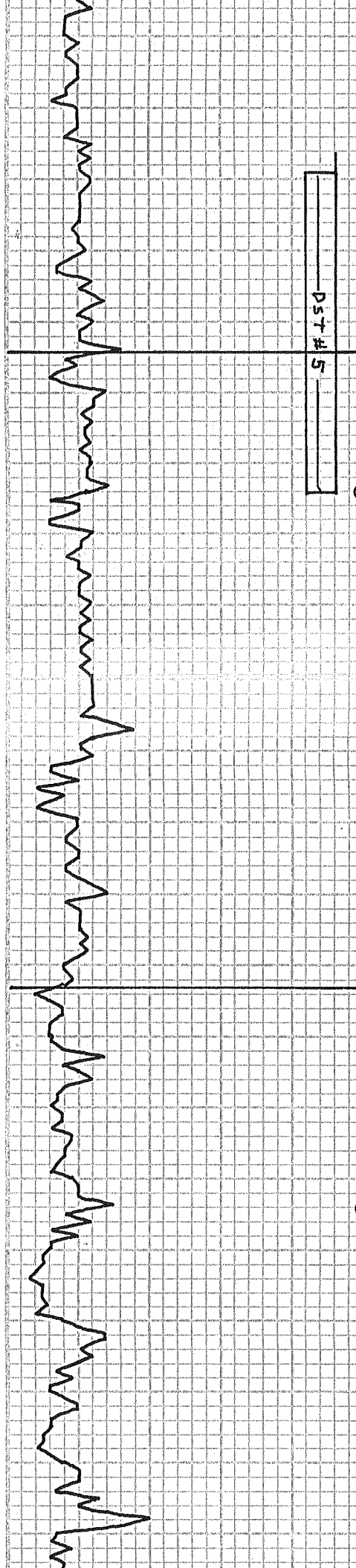
20

40

60

80

4600



DST # 5

red/brn

Ls, tan-1+gy, sl ool, foss, mstly dse, NS

sh, gy, sm red, cak

sh, brn, red

Ls, wh-1+gy, ool, foss, sl cky, f I G/Vg φ, SSFO, scat 1+ d m stn, NO, NF

Ls, m gy, fxln, cky, NS

sh, gy - dk gy

Ls, gy, fxln, dse in pt. & cky, sl granlr, NS

Ls, gy fxln, sm granlr, cky, NS

sh, dk gy - b)

Ls, tan, ool, foss, dse, NS

Ls, tan-gy, stool, fxln, cky, NS

sh, bl

Ls, tan-1+gy, ool, dse, cky, sl foss, NS

Ls, aa. w/ red, gy sh

Ls, tan, ool, cky, tr sd grns in bedded in Ls

sh, red, gy, grn

Ls, off wh, dse, cky, NWIS φ, NS

sh, red, gy w/ tr sd grns

vc sh; ss, cl, fg, psortd, sm large indiv sd grains; sm off wh, dse, Ls

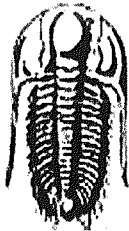
SS, red, v-fg, argl, cak; sm SS, sl pink cl, fg w/ vc sh

Pawnee 4444(-1347)

Morgan Mud: 4464'
2/15/14
wt. 9.4, vis 90, LCM 9

Cherokee 4533(-1435)

Morgan Mud: 4615'
2/16/14



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.
250 N Water STE #300
Wichita, KS 67202
ATTN: Ken Wallace

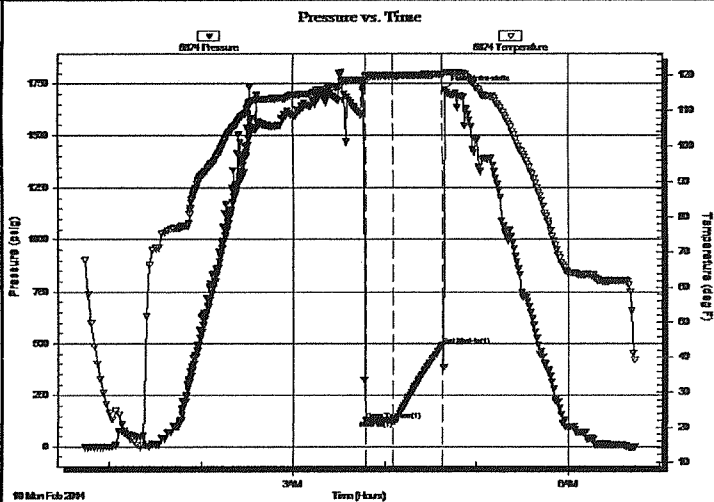
3-1S-37W Cheyenne, KS
Carolyn #1-3
Job Ticket: 53388 **DST#: 1**
Test Start: 2014.02.10 @ 00:43:00

GENERAL INFORMATION:

Formation: **Foraker**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 03:47:30
Time Test Ended: 06:43:30
Test Type: Conventional Bottom Hole (Initial)
Tester: Kevin Mack
Unit No: 66
Interval: **3575.00 ft (KB) To 3627.00 ft (KB) (TVD)**
Reference Elevations: 3087.00 ft (KB)
Total Depth: 3627.00 ft (KB) (TVD) 3077.00 ft (CF)
Hole Diameter: 7.88 inches Hole Condition: KB to GR/CF: 10.00 ft

Serial #: 8874 Inside
Press@RunDepth: 129.66 psig @ 3576.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2014.02.10 End Date: 2014.02.10 Last Calib.: 2014.02.10
Start Time: 00:44:00 End Time: 06:43:30 Time On Btrn: 2014.02.10 @ 03:46:00
Time Off Btrn: 2014.02.10 @ 04:39:30

TEST COMMENT: 30 - IF- Bed off initial surge - Weak surface Blow did not build or die
30 - IS- Weak Surface Return did not build or die
Hit bridge - tool opened - misran



PRESSURE SUMMARY

| Time (Min.) | Pressure (psig) | Temp (deg F) | Annotation |
|-------------|-----------------|--------------|----------------------|
| 0 | 1739.41 | 118.79 | Initial Hydro-static |
| 2 | 129.67 | 119.85 | Open To Flow (1) |
| 19 | 129.66 | 120.02 | Shut-in(1) |
| 52 | 491.05 | 120.35 | End Shut-in(1) |
| 54 | 1718.08 | 120.88 | Final Hydro-static |

Recovery

| Length (ft) | Description | Volume (bbl) |
|-------------|-------------|--------------|
| 315.00 | Mud 100M | 2.72 |
| | | |
| | | |
| | | |
| | | |

Gas Rates

| Choke (inches) | Pressure (psig) | Gas Rate (Mcf/d) |
|----------------|-----------------|------------------|
| | | |

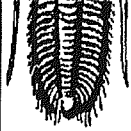


**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.

3-1S-37W Cheyenne, KS



TESTING, INC.

250 N Water STE #300
Wichita, KS 67202

ATTN: Ken Wallace

Carolyn #1-3

Job Ticket: 53389

DST#: 2

Test Start: 2014.02.10 @ 14:01:01

GENERAL INFORMATION:

Formation: Foraker

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 16:15:01

Time Test Ended: 21:16:31

Test Type: Conventional Bottom Hole (Reset)

Tester: Kevin Mack

Unit No: 66

Interval: 3575.00 ft (KB) To 3627.00 ft (KB) (TVD)

Total Depth: 3627.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 3087.00 ft (KB)

3077.00 ft (CF)

KB to GR/CF: 10.00 ft

Serial #: 8653

Outside

Press@RunDepth: 19.07 psig @ 3576.00 ft (KB)

Start Date: 2014.02.10

End Date: 2014.02.10

Start Time: 14:02:01

End Time: 21:16:31

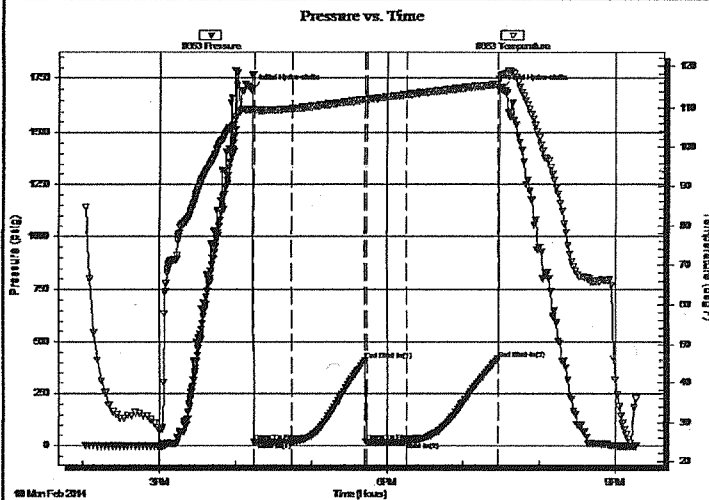
Capacity: 8000.00 psig

Last Calib.: 2014.02.10

Time On Btm: 2014.02.10 @ 16:13:01

Time Off Btm: 2014.02.10 @ 19:30:31

TEST COMMENT: 30 - IF - 1/2" Blow built to 3/4" then died back to 1/2"
60 - ISI - No Return
30 - FF - No Blow
60 - FSI - No Return



PRESSURE SUMMARY

| Time (Min.) | Pressure (psig) | Temp (deg F) | Annotation |
|-------------|-----------------|--------------|----------------------|
| 0 | 1701.22 | 109.59 | Initial Hydro-static |
| 2 | 17.93 | 109.47 | Open To Flow (1) |
| 32 | 18.17 | 109.83 | Shut-In(1) |
| 89 | 410.98 | 111.97 | End Shut-In(1) |
| 91 | 18.80 | 112.00 | Open To Flow (2) |
| 122 | 19.07 | 113.14 | Shut-In(2) |
| 194 | 419.26 | 115.61 | End Shut-In(2) |
| 198 | 1701.92 | 117.78 | Final Hydro-static |

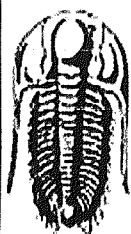
Recovery

| Length (ft) | Description | Volume (bbl) |
|-------------|-------------|--------------|
| 5.00 | Mud 100M | 0.02 |
| | | |
| | | |
| | | |
| | | |

* Recovery from multiple tests

Gas Rates

| | Choke (inches) | Pressure (psig) | Gas Rate (Mcf/d) |
|--|----------------|-----------------|------------------|
| | | | |



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.

3-1S-37W Cheyenne, KS

250 N Water STE #300
Wichita, KS 67202

Carolyn #1-3

Job Ticket: 53390

DST#: 3

ATTN: Ken Wallace

Test Start: 2014.02.12 @ 20:39:00

GENERAL INFORMATION:

Formation: LKC "A-D"

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 22:22:50

Test Type: Conventional Bottom Hole (Initial)

Tester: Kevin Mack

Time Test Ended: 04:59:00

Unit No: 66

Interval: 3996.00 ft (KB) To 4118.00 ft (KB) (TVD)

Reference Elevations: 3087.00 ft (KB)

Total Depth: 4118.00 ft (KB) (TVD)

3077.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 10.00 ft

Serial #: 8874 Inside

Press@RunDepth: 153.43 psig @ 3997.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.02.12

End Date: 2014.02.13

Last Calib.: 2014.02.13

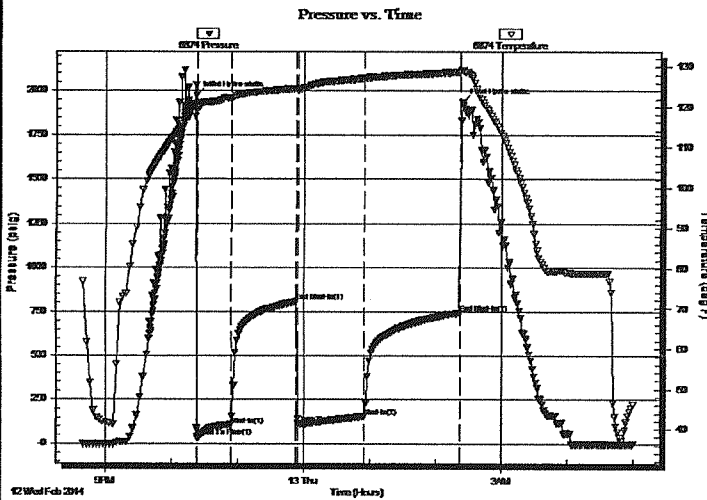
Start Time: 20:40:00

End Time: 04:59:00

Time On Btm: 2014.02.12 @ 22:22:20

Time Off Btm: 2014.02.13 @ 02:24:00

TEST COMMENT: 30 - IF- 1/2" Blow built to BoB in 17 min.
60 - IS- Surface Return started at min. Built to 1 1/2"
60 - FF- Surface Blow built to BoB in 12 min.
90 - FS- Surface Return built to 7"



PRESSURE SUMMARY

| Time (Min.) | Pressure (psig) | Temp (deg F) | Annotation |
|-------------|-----------------|--------------|----------------------|
| 0 | 1976.67 | 120.25 | Initial Hydro-static |
| 1 | 35.99 | 119.80 | Open To Flow (1) |
| 32 | 106.06 | 122.25 | Shut-In (1) |
| 91 | 806.49 | 124.51 | End Shut-In (1) |
| 93 | 113.42 | 124.35 | Open To Flow (2) |
| 153 | 153.43 | 127.09 | Shut-In (2) |
| 240 | 744.12 | 128.63 | End Shut-In (2) |
| 242 | 1936.16 | 129.05 | Final Hydro-static |

Recovery

| Length (ft) | Description | Volume (bbl) |
|-------------|-------------------------|--------------|
| 120.00 | MCO 10o 90M | 0.59 |
| 91.00 | GMCO 5G 25o 70M | 0.68 |
| 123.00 | Clean Gassy Oil 10G 90o | 1.73 |
| 0.00 | 400' GIP | 0.00 |

Gas Rates

| | Choke (inches) | Pressure (psig) | Gas Rate (Mcf/d) |
|--|----------------|-----------------|------------------|
| | | | |



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.

3-1S-37W Cheyenne, KS

250 N Water STE#300
Wichita, KS 67202

Carolyn #1-3

ATTN: Ken Wallace

Job Ticket: 53391

DST#: 4

Test Start: 2014.02.13 @ 15:50:00

GENERAL INFORMATION:

Formation: LKC "G"

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 17:28:40

Time Test Ended: 22:21:00

Test Type: Conventional Bottom Hole (Initial)

Tester: Kevin Mack

Unit No: 66

Interval: 4130.00 ft (KB) To 4175.00 ft (KB) (TVD)

Reference Elevations: 3087.00 ft (KB)

Total Depth: 4175.00 ft (KB) (TVD)

3077.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 10.00 ft

Serial #: 8874 Inside

Press@RunDepth: 17.19 psig @ 4131.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.02.13

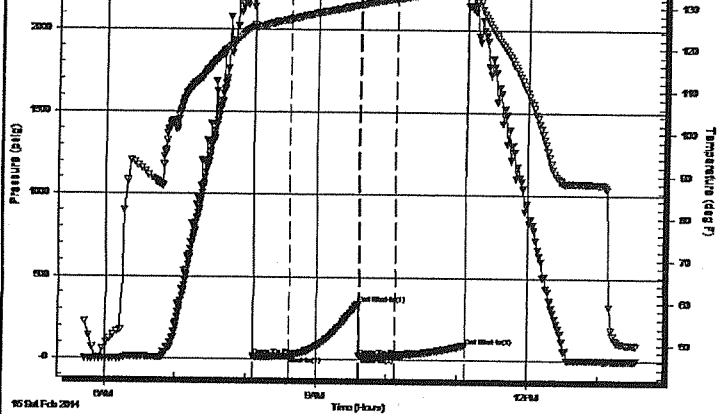
End Date: 2014.02.13

Last Calib.: 2014.02.13

Start Time: 15:51:00

End Time: 22:21:00

Time On Btm: 2014.02.13 @ 17:28:30



| | | | |
|-----|---------|--------|----------------------|
| 0 | 2239.46 | 125.50 | Initial Hydro-static |
| 1 | 15.39 | 124.97 | Open To Flow (1) |
| 31 | 16.62 | 127.05 | Shut-In(1) |
| 90 | 335.10 | 130.48 | End Shut-In(1) |
| 91 | 19.63 | 130.51 | Open To Flow (2) |
| 121 | 19.51 | 132.05 | Shut-In(2) |
| 181 | 89.96 | 134.31 | End Shut-In(2) |
| 183 | 2152.23 | 135.48 | Final Hydro-static |

Recovery

| Length (ft) | Description | Volume (bbl) |
|-------------|-------------------|--------------|
| 18.00 | MCO 54%o 45%m 1%g | 0.09 |
| 2.00 | oil 99%o 1%g | 0.01 |
| | | |
| | | |
| | | |
| | | |

* Recovery from multiple tests

Gas Rates

| | Choke (inches) | Pressure (psig) | Gas Rate (Mcf/d) |
|--|----------------|-----------------|------------------|
| | | | |