



WESLEY D. HANSEN Consulting Petroleum Geologist

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Office: 316-267-7313 Cellular ; 316-772-6188

**KGS
AAPG
Kansas License #418**



**Scale 1:240 (5"=100') Imperial
Measured Depth Log**

Well Name: Murfin Drilling Co., Inc. #1-10 Theron
Location: 1900' FSL, 2200' FEL of Section 10-1S-37W
License Number: API: 15-023-21385
Spud Date: 3-12-2014
Surface Coordinates: 1900' FSL, 2200' FEL of Section 10-1S-37W
Region: Cheyenne County, KS
Drilling Completed: 3-23-2014

Bottom Hole Vertical hole
Coordinates:
Ground Elevation (ft): 3098' **K.B. Elevation (ft):** 3111'
Logged Interval (ft): 3410' **To:** RTD **Total Depth (ft):** 4620'
Formation: Cherokee at RTD
Type of Drilling Fluid: Chemical - Displaced at 3286'-3305'

Printed by MUD.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: Murfin Drilling Co., Inc.
Address: 250 N. Water
Suite 300
Wichita, KS 67202

GEOLOGIST

Name: Wesley D. Hansen
Company: Wesley D. Hansen - Consulting Petroleum Geologist
Address: 212 N. Market, Suite 257
Wichita, KS 67202
Office: 316-263-7313 **Cellular:** 316-772-6188

COMMENTS

Contractor: Murfin Drilling Co., Inc. Rig #25
Pusher: Ray Bland

Surface Casing: 8 5/8" set at 229' w/200sx
Production Casing: 5 1/2" set at 4614' w/500sx

Mud by: Morgan Mud - Dave Korte and Dave Lines were the engineers

DST's by: Trilobite - Ryan Nichols and Robert Zodrow were the testers.

Logs by: Pioneer Wireline (DIL, CN-CD, MEL, BHCS)

Deviation Surveys: 0.6 deg. @ 230'; 0.8 deg. @ 747'; 0.5 deg. @ 1255'; 0.3 deg. @ 1763'; 0.4 deg. @ 2207'; 0.3 deg. @ 2716'; 0.1 deg. @ 3129'; 0.9 deg. @ 3506'; 1.8 deg. @ 3757'; 2.2 deg. @ 3914'; 2.1 deg. @ 3990'; 2.6 deg. @ 4130'; 2.4 deg. @ 4180'; 2.9 deg. @ 4280'; 2.7 deg. @ 4470'; 2.9 deg. @ 4620'

BIT RECORD

Bit #	Size	MFG	Type	Depth Out	Footage Cut	Hours on bit
1	12 1/4"		GMS	230'	230'	4 1/4
2	7 7/8"	HTC	DP506F	3506'	3276'	34 3/4
3	7 7/8"	HTC	GX22	4620'	1114'	100

FORMATION TOPS AND STRUCTURAL COMPARISON

FORMATION	SAMPLE TOPS		LOG TOPS		COMPARISON WELLS MDCI Culwell C 1-10 10-1S-37W 3150' KB
	Depth	Datum	Depth	Datum	
Anhydrite	3058'	+53	3052'	+59	+3
B/Anhydrite	3094'	+17	3085'	+26	-1
Neva	3512'	-401	3505'	-394	+1
Red Eagle	3576'	-465	3569'	-458	flat
Foraker	3625'	-514	3614'	-503	+4
Topeka	3842'	-731	3834'	-723	+3
Oread	3975'	-864	3970'	-859	+1
Lansing	4052'	-941	4050'	-939	+3
Stark Shale	4272'	-1161	4266'	-1155	+3
BKC	4327'	-1216	4321'	-1210	+5
Pawnee	4448'	-1337	4442'	-1331	-3
Cherokee Shale	4538'	-1427	4529'	-1418	+4
RTD	4620'	-1509			
LTD			4616'	-1505	

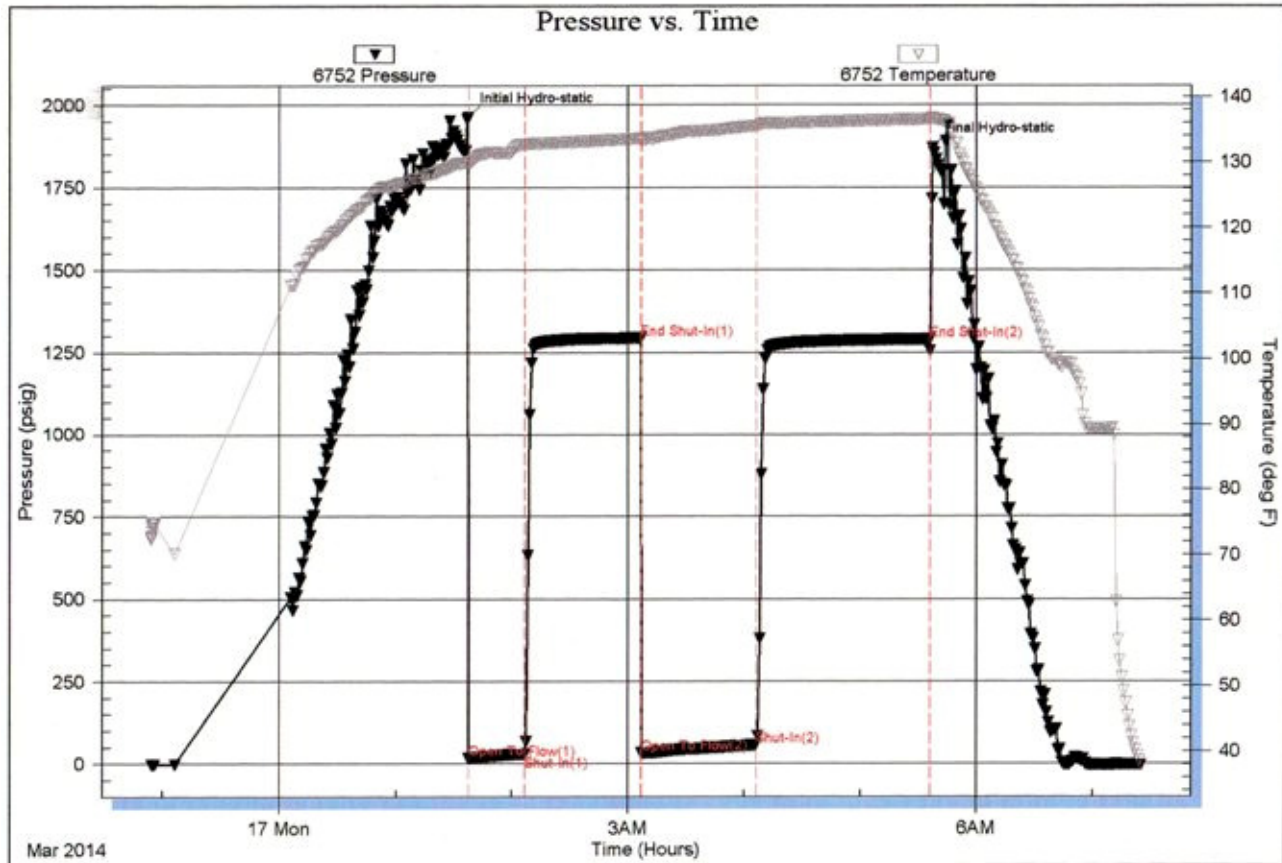
Sample tops 6' to 8' lower than Log tops

DRILL STEM TESTS

DST No. 1 Oread
Interval: 3932'-3990'
Times: 30-60-60-90
Recovery: 95' mud
FP: 17-29/32-57 SIP: 1292-1289
HP: 1960-1868 BHT: 136 deg. F

IFP: surface blow built to 2 1/2 inches
ISIP: no return blow
FFP: surface blow built to 2 inches
FSIP: no return blow

Serial #: 6752 Inside Murfin Drilling Company Inc. Theron #1-10 DST Test Number: 1



DRILL STEM TESTS

DST No. 2 Lansing "A" and "D" Zones
Interval: 4026'-4130'
Times: 30-60-60-90
Recovery: 51' GCO (45g, 55o); 74' OCM (50o,
50m); gravity 24 degrees
FP: 20-35/51-66 SIP: 707-709
HP: 1994-1951 BHT: 136 deg. F

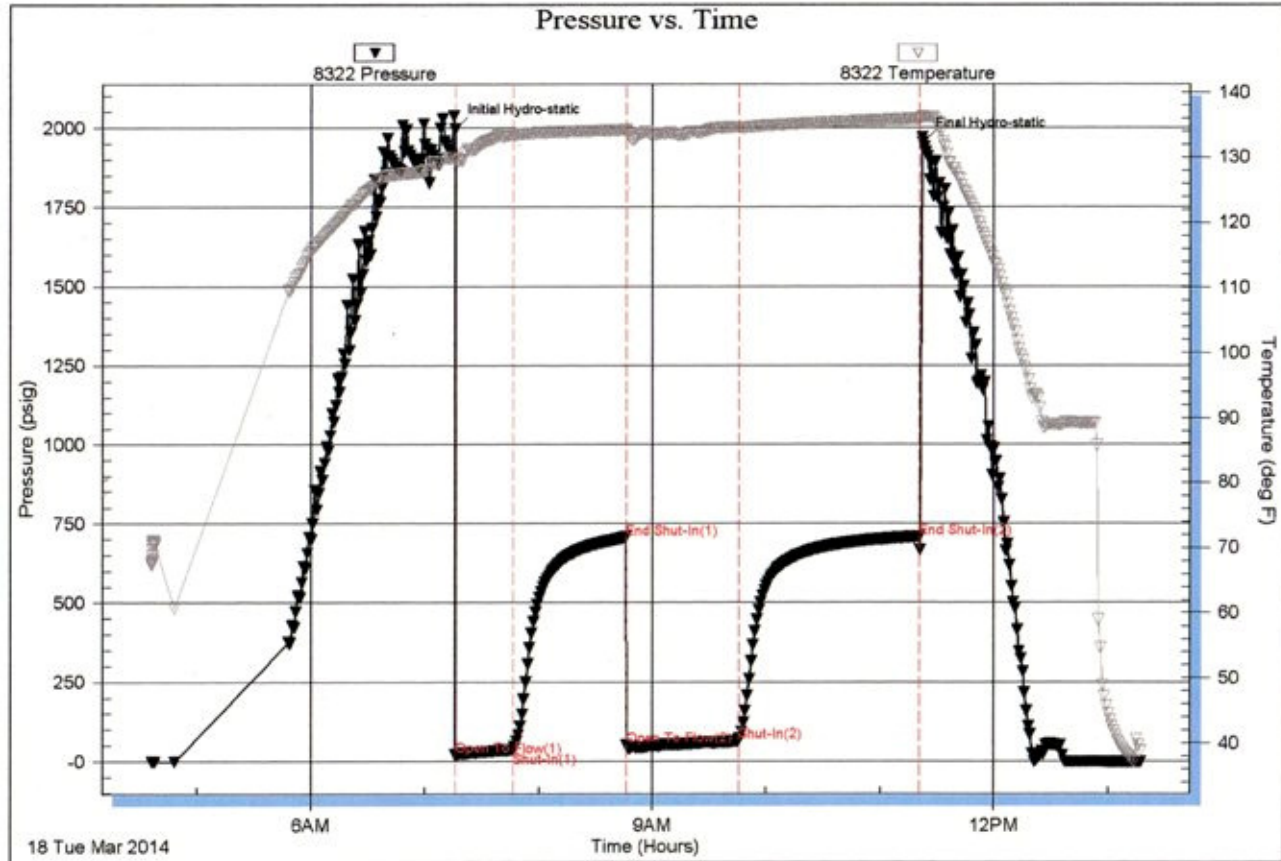
IFP: fair blow built to 6 inches
ISIP: no return blow
FFP: fair blow built to 5 1/2 inches
FSIP: no return blow

Serial #: 8322

Outside Murfin Drilling Company Inc.

Theron #1-10

DST Test Number: 2



Trilobite Testing, Inc

Ref. No: 56770

Printed: 2014.03.18 @ 13:36:56

DRILL STEM TESTS

DST No. 3 Lansing "G" Zone
Interval: 4130'-4180'
Times: 30-60-60-90
Recovery: 752' GIP; 564' CGO (40g, 60o); 188'
O&WCM (25o, 27w, 48m); oil gravity 28 deg.
FP: 41-133/141-291 SIP: 1362-1291
HP: 2026-1939 BHT: 145 deg. F

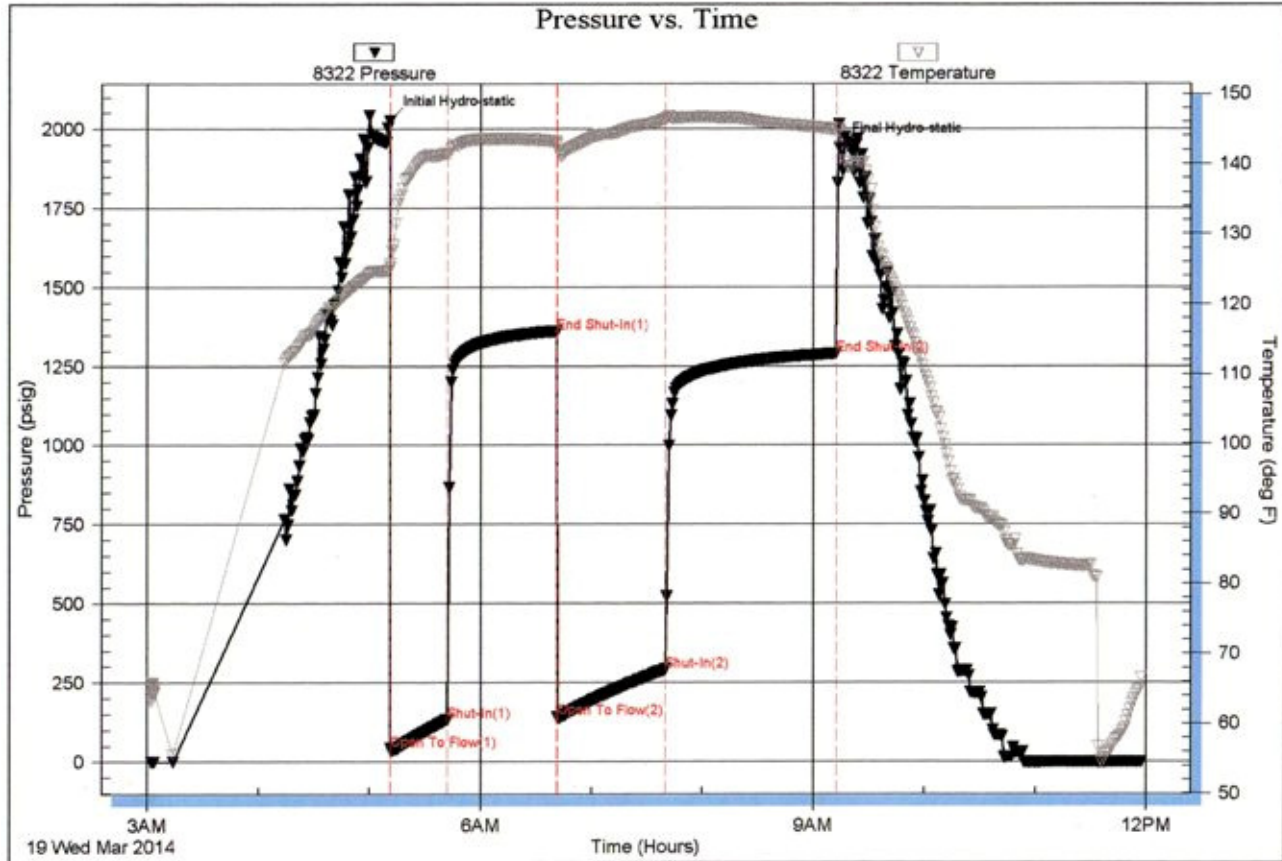
IFP: good blow, B.O.B. in 8 minutes
ISIP: return blow, B.O.B. in 47 minutes
FFP: good blow, B.O.B. in 11 minutes
FSIP: return blow, B.O.B. in 55 minutes

Serial #: 8322

Outside Murfin Drilling Company Inc.

Theron #1-10

DST Test Number: 3



Triobite Testing, Inc

Ref. No: 56771

Printed: 2014.03.19 @ 12:23:23

DRILL STEM TESTS

DST No. 4 Base Lansing "G" through "J"
Interval: 4180'-4280'
Times: 30-60-60-90
Recovery: 10' GCO (5g, 95o); 30' OCM (30o, 70m)
FP: 16-17/24-26 SIP: 1812-1774
HP: 2055-2045 BHT: 135 deg. F

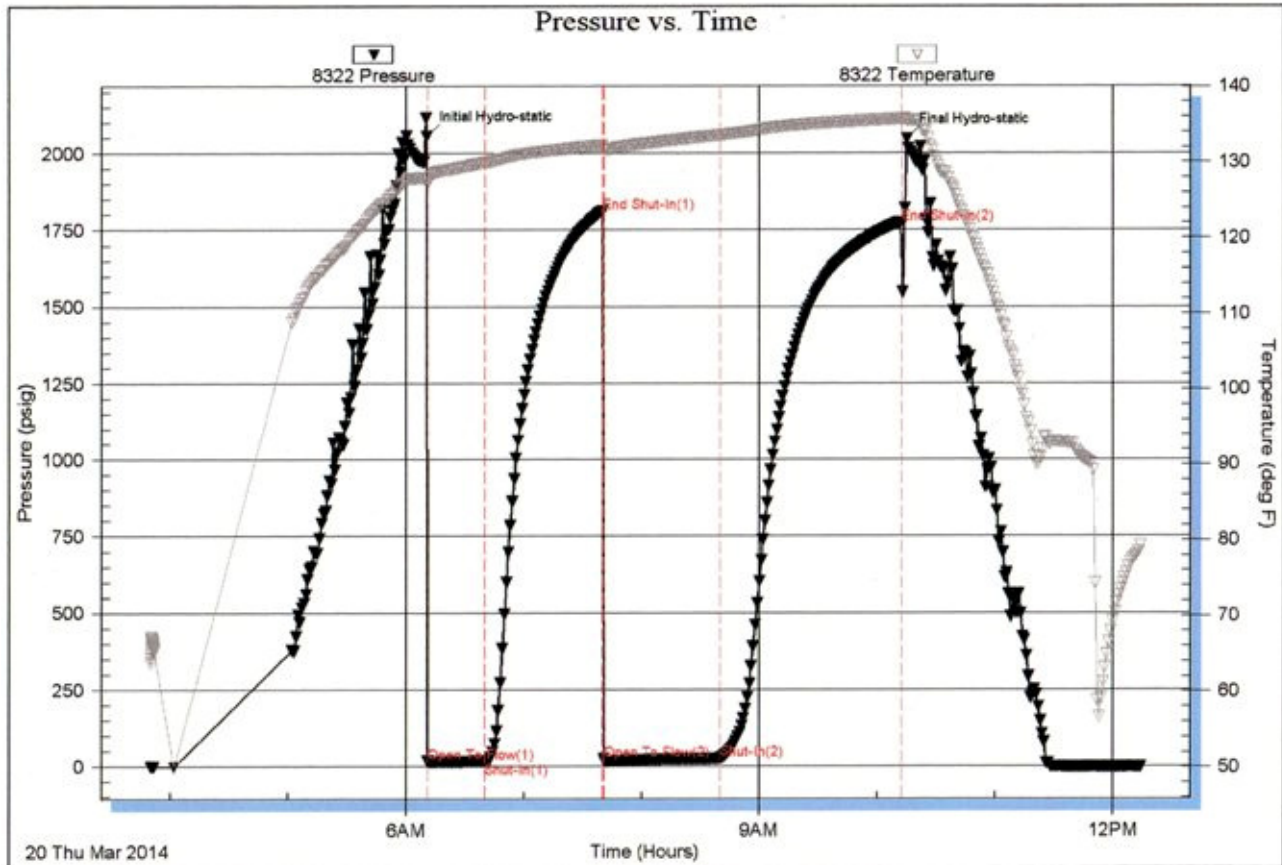
IFP: weak blow built to 3" inches
ISIP: no return blow
FFP: weak blow built to 2 inches
FSIP: no return blow

Serial #: 8322

Outside Murfin Drilling Company Inc.

Theron #1-10

DST Test Number: 4



Tribble Testing, Inc

Ref. No: 56772

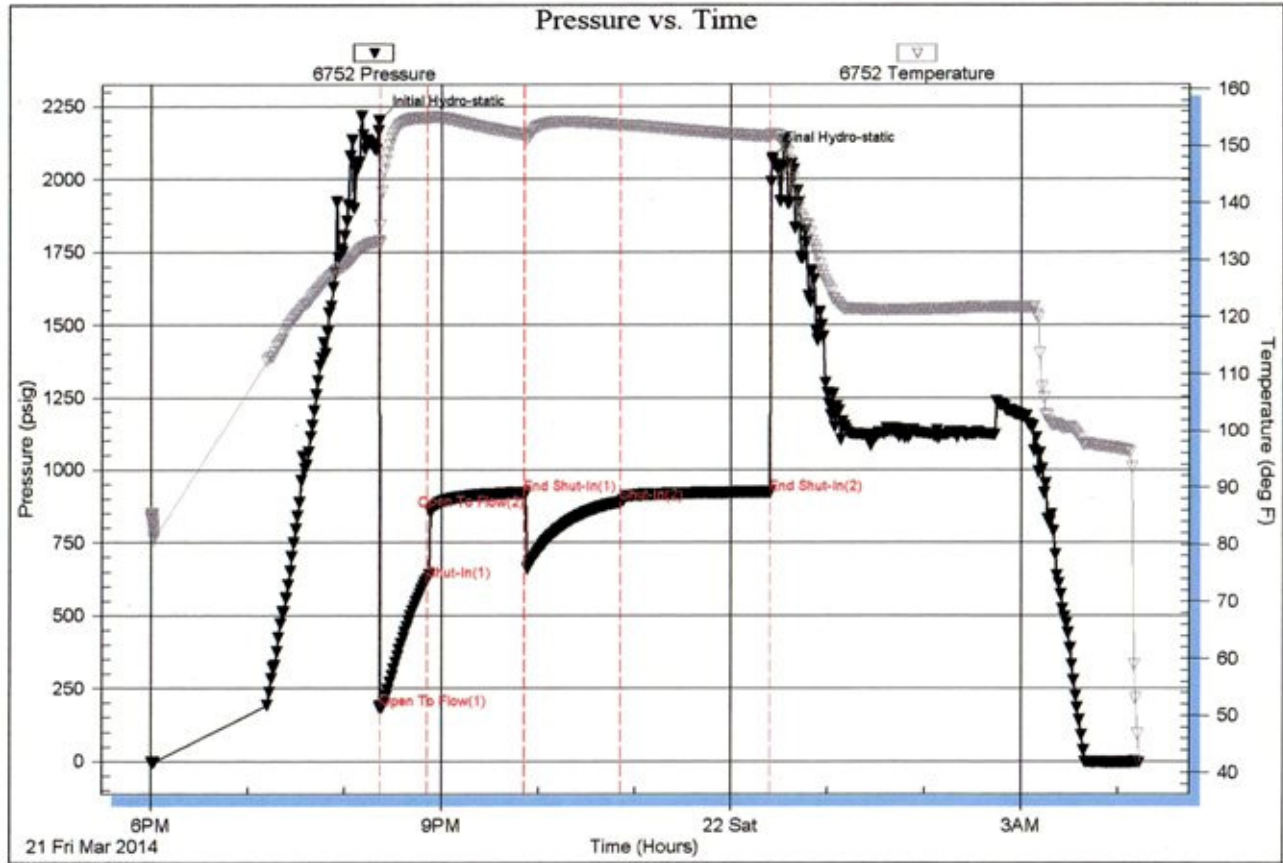
Printed: 2014.03.20 @ 12:39:02

DRILL STEM TESTS

DST No. 5 Pawnee
 Interval: 4426'-4470'
 Times: 30-60-60-90
 Recovery: GTS no measure; 2350' CGO (25g, 75o); 94' G&OCM (3g, 27o, 70m)
 FP: 184-625/921-888 SIP: 921-921
 HP: 2200-2071 BHT: 155 deg. F

IFP: strong blow, B.O.B. in 1 minute
 ISIP: return blow built to B.O.B. in 15 minutes
 FFP: strong blow, B.O.B. in 2 minutes
 FSIP: return blow built to B.O.B. in 16 minutes; GTS 30" into FSIP

Serial #: 6752 Inside Murfin Drilling Company Inc. Theron #1-10 DST Test Number: 5



Triobite Testing, Inc

Ref. No: 56773

Printed: 2014.03.22 @ 05:25:07

ROCK TYPES

- Anhy
- Cht
- Coal
- Congl
- Dol
- Gyp
- Lmst

- Salt
- Shale
- Shcol
- Shgy
- Siltst
- Ss
- Carb sh

- Dol
- Dtd
- Gry sh
- Sandylms
- redshale
- Shale
- Siltstn

- Shlyslts
- Sltys
- Sdy dolo
- Silty dolo
- Shy dolo
- Shaly ls
- Light dolomite

ACCESSORIES

FOSSIL

- Algae
- Amph
- Belm
- Bioclst
- Brach
- Bryozoa
- Cephal
- Coral
- Crin
- Echin
- Fish
- Foram
- Fossil
- Gastro
- Oolite
- Ostra
- Pelec
- Pellet
- Pisolite

- Plant
- Strom
- Fuss
- Oomold

MINERAL

- Anhy
- Arggrn
- Arg
- Bent
- Bit
- Breclrag
- Calc
- Carb
- Chtdk
- Chtlt
- Dol
- Feldspar
- Ferrpel
- Ferr

- Glau
- Gyp
- Hvymin
- Kaol
- Marl
- Minxl
- Nodule
- Phos
- Pyr
- Salt
- Sandy
- Silt
- Sil
- Sulphur
- Tuff
- Chlorite
- Dol
- Sand
- Sltly

STRINGER

- Anhy
- Arg
- Bent
- Coal
- Dol
- Gyp
- Ls
- Mrst
- Sltstrg
- Ssstrg
- Carbsh
- Clystn
- Dol
- Grysh
- Gryslt
- Lms
- Sandylms
- Sh
- Sltstn

OTHER SYMBOLS

INTERVALS

- Core
- Dst
- Dst

EVENTS

- Rft
- Dst top/base

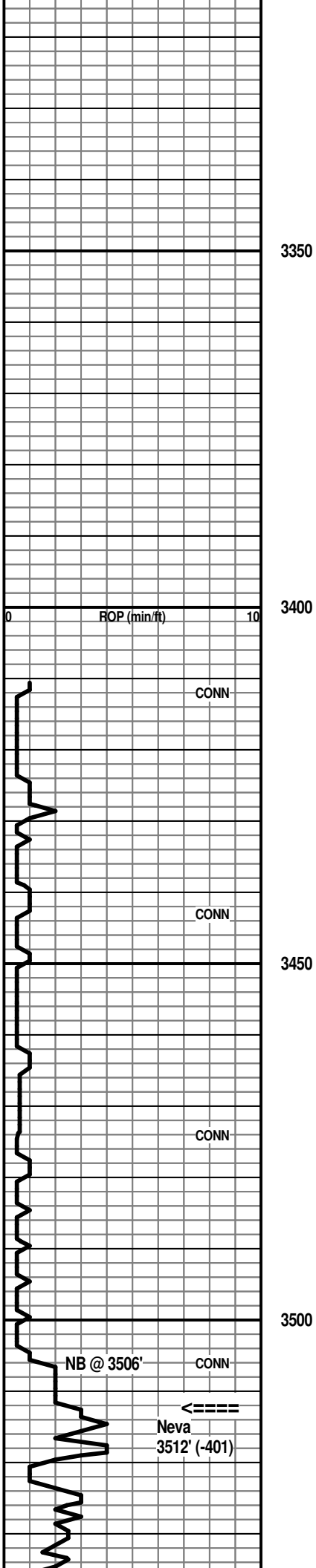
OIL SHOWS

- Even
- Spotted
- Quest.

- Trace
- Dead
- Gas show

Curve Track 1 ROP (min/ft)	Depth	Lithology	Geological Descriptions	Remarks
	3050			Anhydrite 3058' (+53)
	3100			Base/Anhydrite 3094' (+17)
Report Depth & Activity 3-12-2014 MIRT, Spud @ 6:45 PM 3-13 WOC @ 230', drilled out				

- @ 11:45 AM
- 3-14 Drlg. @ 2110'
- 3-15 Drlg. @ 3530'
- 3-16 Drlg. @ 3884'
- 3-17 TIH post DST No. 1 @ 3990'
- 3-18 DST No. 2 @ 4130'
- 3-19 DST No. 3 @ 4180'
- 3-20 DST No. 4 @ 4280'
- 3-21 Drlg. @ 4412'
- 3-22 TIH @ 4470' post DST No. 5
- 3-23 RTD @ 4620' - Logging
- 3-24 5 1/2" casing set at 4614'



3350

3400

3450

3500

PDC samples of no value

Call point at 3110' received at 5:30 PM
3-14-2014 -- Load and departed for well site

Sh: red-brn and gray, silty IP; some red Siltst

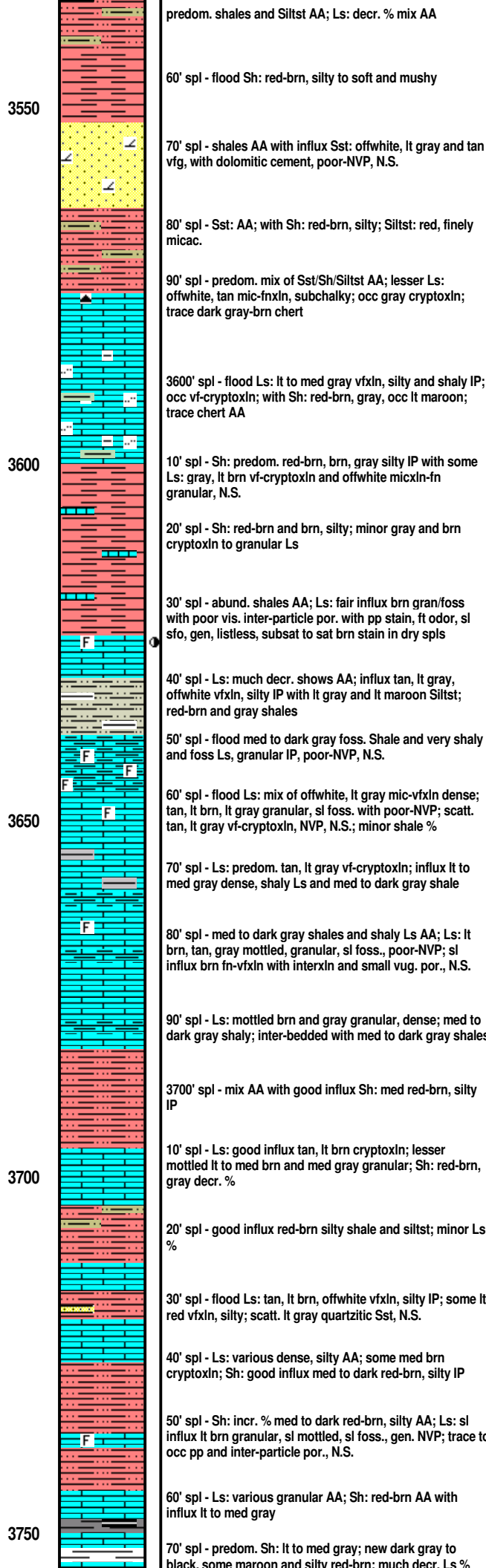
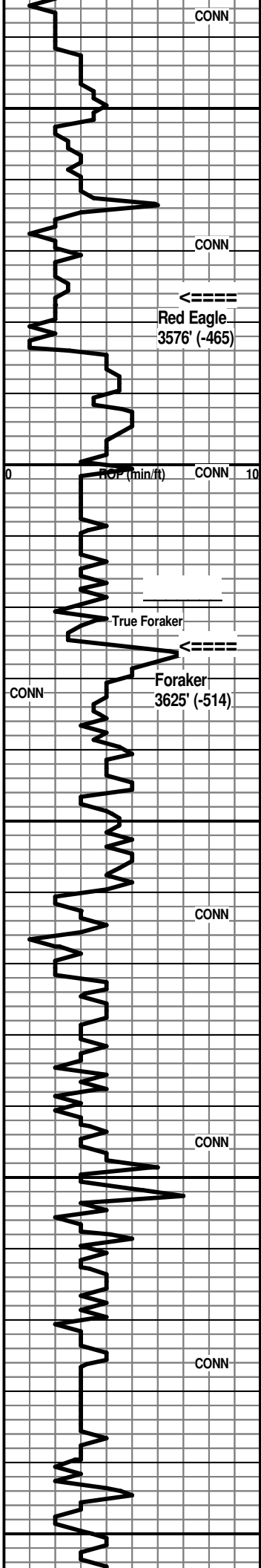
Start 10' samples
PDC bit was tripped at 3506'

Ls: offwhite, some tan mic-fnxln with some pp por.,
subchalky IP; other lt brn and gray fn granular, poor-NVP,
N.S.

Neva 3512' (-401)

Ls: mix AA with influx Siltst: red-brn; silty red-brn shale

7:00 AM at 3530' on 3-15-2014



predom. shales and Siltst AA; Ls: decr. % mix AA

60' spl - flood Sh: red-brn, silty to soft and mushy

70' spl - shales AA with influx Sst: offwhite, lt gray and tan vfg, with dolomitic cement, poor-NVP, N.S.

80' spl - Sst: AA; with Sh: red-brn, silty; Siltst: red, finely micac.

90' spl - predom. mix of Sst/Sh/Siltst AA; lesser Ls: offwhite, tan mic-fnxln, subchalky; occ gray cryptoxln; trace dark gray-brn chert

3600' spl - flood Ls: lt to med gray vfxln, silty and shaly IP; occ vf-cryptoxln; with Sh: red-brn, gray, occ lt maroon; trace chert AA

10' spl - Sh: predom. red-brn, brn, gray silty IP with some Ls: gray, lt brn vf-cryptoxln and offwhite micxn-fn granular, N.S.

20' spl - Sh: red-brn and brn, silty; minor gray and brn cryptoxln to granular Ls

30' spl - abund. shales AA; Ls: fair influx brn gran/foss with poor vis. inter-particle por. with pp stain, ft odor, sl sfo, gen, listless, substat to sat brn stain in dry spls

40' spl - Ls: much decr. shows AA; influx tan, lt gray, offwhite vfxln, silty IP with lt gray and lt maroon Siltst; red-brn and gray shales

50' spl - flood med to dark gray foss. Shale and very shaly and foss Ls, granular IP, poor-NVP, N.S.

60' spl - flood Ls: mix of offwhite, lt gray mic-vfxln dense; tan, lt brn, lt gray granular, sl foss. with poor-NVP; scatt. tan, lt gray vf-cryptoxln, NVP, N.S.; minor shale %

70' spl - Ls: predom. tan, lt gray vf-cryptoxln; influx lt to med gray dense, shaly Ls and med to dark gray shale

80' spl - med to dark gray shales and shaly Ls AA; Ls: lt brn, tan, gray mottled, granular, sl foss., poor-NVP; sl influx brn fn-vfxln with interxln and small vug. por., N.S.

90' spl - Ls: mottled brn and gray granular, dense; med to dark gray shaly; inter-bedded with med to dark gray shales

3700' spl - mix AA with good influx Sh: med red-brn, silty IP

10' spl - Ls: good influx tan, lt brn cryptoxln; lesser mottled lt to med brn and med gray granular; Sh: red-brn, gray decr. %

20' spl - good influx red-brn silty shale and siltst; minor Ls %

30' spl - flood Ls: tan, lt brn, offwhite vfxln, silty IP; some lt red vfxln, silty; scatt. lt gray quartzitic Sst, N.S.

40' spl - Ls: various dense, silty AA; some med brn cryptoxln; Sh: good influx med to dark red-brn, silty IP

50' spl - Sh: incr. % med to dark red-brn, silty AA; Ls: sl influx lt brn granular, sl mottled, sl foss., gen. NVP; trace to occ pp and inter-particle por., N.S.

60' spl - Ls: various granular AA; Sh: red-brn AA with influx lt to med gray

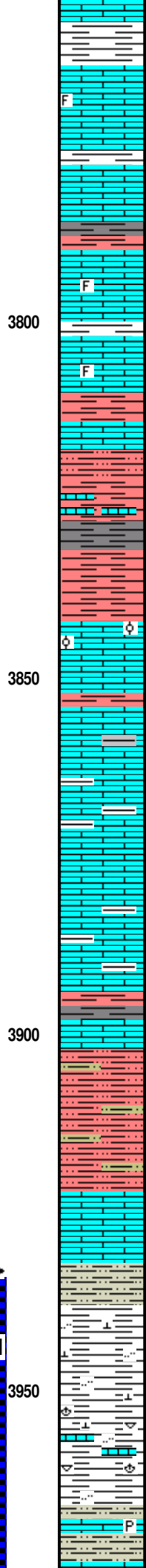
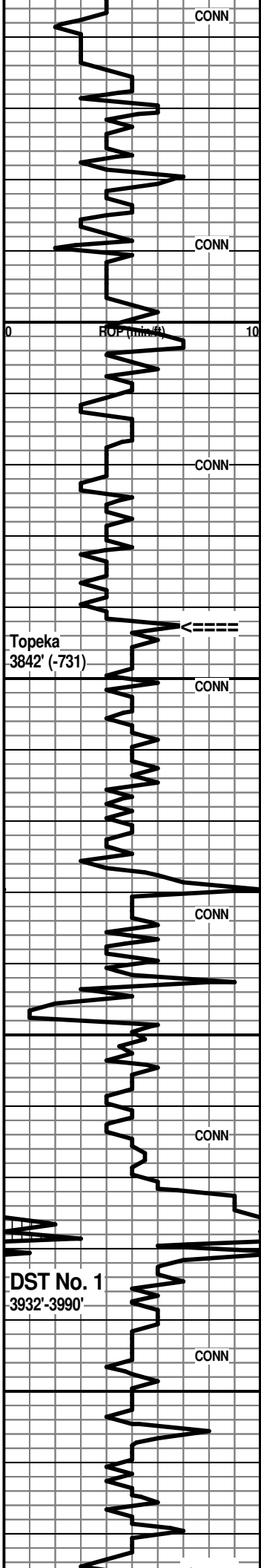
70' spl - predom. Sh: lt to med gray; new dark gray to black. some maroon and silty red-brn: much decr. Ls %

Red Eagle 3576' (-465)

Morgan Mud Check at 3601'
 10:50 AM on 3-15-2014
 wt vis wl pH chl
 9.0 53 7.2 9.5 600
 PV YP GelS lcm solids
 22 16 22/32 4# 5.1%

Geologist on location at 3611'
 11:45 AM on 3-15-2014

Foraker 3625' (-514)



80' spl - Sh: mix AA; Ls: lt gray, tan, lt brn granular, some cryptoxln, NVP; sl influx lt to med brn granular, foss. IP with inter-particle por. with pp black dead and tarry stain, no odor, one minute oil droplet, gas bubbles on brkn surface

90' spl - flood Ls: common lt brn, tan, gray granular with black tarry stain; influx lt brn, gray-brn cryptoxln, NVP and offwhite mic-fnxln, subchalky, N.S.

3800' spl - Ls: mix AA decr. %; Sh: incr. % of red-maroon, med to dark gray, red-brn

10' spl - Ls: mix tan, lt brn granular to cryptoxln, foss. IP, NVP, N.S.; other offwhite, tan mic-vfxln dense; scatt. tan, lt brn fn-vfxln with pp dark stain, vs-l sfo on break, no odor; Sh: red-brn, med gray, occ maroon

20' spl - Ls: various lt to med brn, gray, tan granular, foss. IP; tan mic-vfxln dense; scatt. shows AA, some black tarry stain; Sh: incr. % of med to dark red-brn

30' spl - becoming shale dominated - various red-brn silty IP; Ls various granular AA with sl influx lt gray, tan cryptoxln and offwhite, tan mic-vfxln dense

40' spl - Sh: strong influx med to dark red-brn, silty IP, some soft mushy; lesser med to dark gray

50' spl - Ls: influx lt to med brn, some lt gray and red-brn smooth cryptoxln; occ tan, offwhite oolitic to granular with poor to fair inter-particle por. with lt brn stain, sl sfo, sl sg on break, no odor; Sh: decr. % AA

60' spl - Ls: various cryptoxln AA with influx lt gray granular, NVP, N.S.; streaks of dark red-brn shale

70' spl - Ls: mix lt gray cryptoxln to granular, NVP, N.S.; and Sh: dark red-brn, med to dark gray, some brick red and maroon

80' spl - Ls: various lt gray, lt brn, tan cryptoxln with shales AA

90' spl - incr. % Ls: various cryptoxln AA, some pink to maroon tinted vf-cryptoxln, shaly IP; Sh: streaks AA

3900' spl - interbedded various cryptoxln Ls's and red-brn, gray and maroon shales

10' spl - Ls: tan, lt gray, offwhite cryptoxln and offwhite mic-vfxln dense; Sh: med to dark red-brn, med to dark gray; Siltst: lt to med red

20' spl - predom. Siltst: predom. red-brn with other lt gray finely micac.; much decr. Ls %

30' spl - flood Ls: lt to med brn, yellow-brn, some lt gray smooth cryptoxln; some mottled red-brn vf-cryptoxln; much decr. shale and siltst

40' spl - decr. Ls AA; Siltst: good influx grayish purple, calcar. and grayish-purple silty shale

50' spl - flood Sh: grayish-purple, lt maroon, some gray-green, silty and calcar.

60' spl - Sh: very predom. maroon and grayish-purple, calcar. AA; Ls: scatt. lt gray and brn cryptoxln

70' spl - Sh: various maroon and grayish-purple AA with other yellow-green, gray-green, calcar. with scatt. shells (pelecipods, brachiopods)

80' spl - influx Ls: lt gray, tan, lt brn cryptoxln, foss. and pyritic, hard, NVP; Siltst: good influx offwhite, lt gray

Hole deviation was 1.8 degrees at 3757'
Reduced WOB

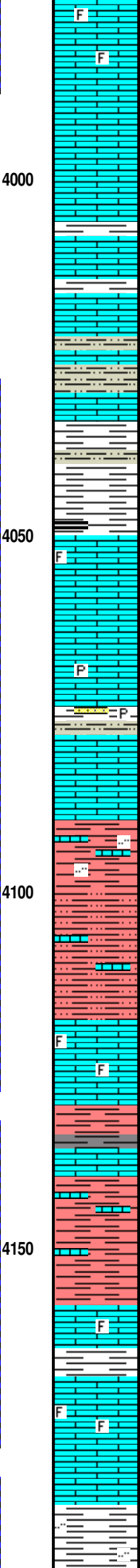
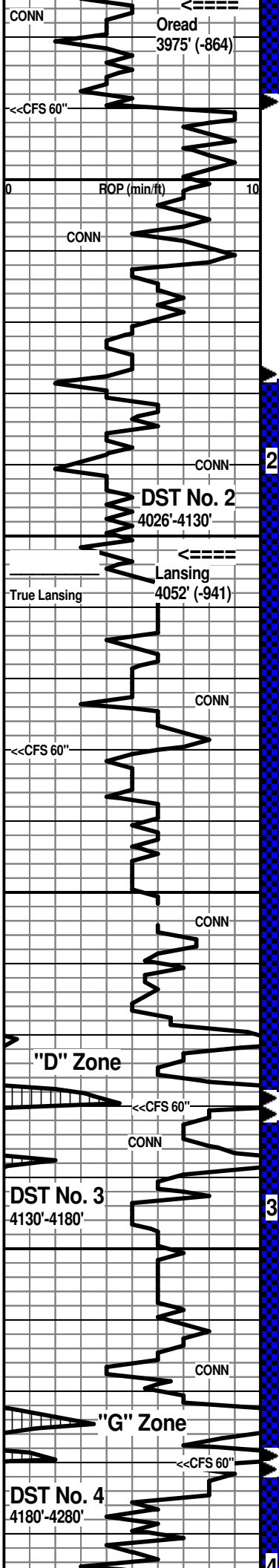
Topeka 3842' (-731)

7:00 AM at 3884' on 3-16-2014

SHS 2.2 degrees at 3914'

Morgan Mud Check at 3929'
12:00 PM on 3-16-2014
wt vis wl pH chl
9.2 74 7.2 10.0 600
PV YP GelS lcm solids
38 20 26/40 6# 6.5%

DST No. 1 Oread
Interval: 3932'-3990'
Times: 30-60-60-90
IFP: surface blow built to 2 1/2 inches
ISIP: no return blow
FFP: surface blow built to 2 inches
FSIP: no return blow
Recovery: 95' mud
FP: 17-29/32-57 SIP: 1292-1289
HP: 1960-1868 BHT: 136 deg. F



90' spl - Ls: tan, lt gray cryptoxln, NVP and offwhite mic-vfxln dense, N.S.; several chips tan, lt gray sl foss. and granular with some vug. por., inter-particle and fossil moldic por. with pp to subsat brn stain, sl-fair sfo, ft odor; several chips offwhite vfxln with pp dark stain, poor vis. por., nfo; 3990' CFS spls >>>

4000' spl - flood Ls: tan, some offwhite vfxln dense, NVP; lesser tan, lt brn cryptoxln, NVP, N.S.; some Sh: med to dark gray

10' spl - Ls: flood tan, lt brn cryptoxln, NVP; decr. shale %

20' spl - Ls: various lt brn, lt gray, tan cryptoxln; offwhite, lt gray mic-vfxln dense; Sh: good influx lt to med gray, some gray-green and red-brn

30' spl - decr. Shale %; Ls: strong influx lt to med brn, gray-brn cryptoxln; very scatt. chips with spotty brn stain, nfo, no odor, ?new?

40' spl - Ls: lt to med brn, med to dark gray-brn, gray cryptoxln; Siltst: good influx offwhite, lt gray calcar.; Sh: some red-brn, gray

50' spl - Ls: various cryptoxln AA; lesser offwhite, tan mic-vfxln dense; Sh: good incr. % dark red-brn, med to dark gray, some gray-green; much decr. Siltst AA

60' spl - Sh: mix AA, occ black carbon.; Ls: tan, lt to med brn cryptoxln NVP and offwhite, tan mic-vfxln dense; scatt. tan, offwhite foss. tight vf-cryptoxln with spotty black stain, nfo, no odor

70' spl - flood Ls: predom. lt to med brn, lt gray smooth cryptoxln, NVP, N.S.; scatt. offwhite, lt gray vfxln with pp dark stain; scatt. tan, offwhite vf-cryptoxln with spotty pp and edge por. with brown to black stain, sl sfo, no odor

80' spl - Ls: very predom. lt to med brn smooth cryptoxln, trace pyritic, NVP, N.S.; lesser offwhite, tan mic-vfxln dense; scatt. tan cryptoxln with spotty vug. por., sl gran. IP with poor inter-particle por. with lt brn stain, vsl sfo, no odor; CFS 4080' spls - >>>

90' spl - Ls: smooth med brn, lt gray cryptoxln; lesser offwhite mic-vfxln dense; Sh: fairly minor red-brn, gray

4100' spl - Ls: various cryptoxln and dense AA; Sh: sl incr. red-brn

10' spl - Ls: predom. lt to med brn smooth cryptoxln; Sh: med to dark red-brn, red-maroon, silty IP

20' spl - Sh: strong influx med to dark red-brn, silty IP; Ls: cryptoxln AA

30' spl - flood Ls: tan, offwhite, lt brn foss. with inter-particle and fossil moldic por. with pp dark stain to subsat. lt brn stain, fair-good sfo, poss. ft odor; lesser offwhite, lt gray, tan vf-cryptoxln, poor-NVP, N.S.

CFS 4130' spls >>>

40' spl - trashy; Sh: med to dark red-brn, maroon, vc gray; some Ls: various cryptoxln AA, some maroon tinted cryptoxln

50' spl - Sh: med to dark red-brn, med gray, some dark maroon; some Ls: new mottled med to dark brn granular, poor-NVP, N.S.

60' spl - predom. Sh: dark red-brn, lesser med to dark gray and red-maroon; Ls: predom. lt to med brn cryptoxln

70' spl - predom. shales AA; Ls: sl influx offwhite, lt brn granular, sl foss. with some vug. por. with spotty brn stain, nfo, no odor; other cryptoxln AA

80' spl - flood Ls: offwhite vfxln dense, gen. NVP, most N.S., some with patchy stain; fair influx tan fn granular, foss. with inter-particle and vug. por. with pp brn stain, fair-good sfo, subsat. to sat. stain in dry spls, no odor

CFS 4180' spls >>>

90' spl - Ls: predom. lt to med gray cryptoxln; lesser offwhite micln, subchalky; Sh: incr. % med to dark red-brn, red-maroon, some brick red; influx med gray

4200' spl - >>>

Oread 3975' (-864)
 CFS 3990' spls - Ls: mix AA with common shows AA; other tan, lt gray cryptoxln NVP with some spotty stain

7:00 AM at 3990' on 3-17-2014
 SHS was 2.1 degrees at 3990'

Morgan Mud Check at 4002'
 11:40 AM on 3-17-2014
 wt vis wl pH chl
 9.4 72 7.6 9.5 700
 PV YP GeIS lcm solids
 22 26 20/34 4# 7.9%

DST No. 2 Lansing "A" and "D" Zones
 Interval: 4026'-4130'
 Times: 30-60-60-90
 IFP: fair blow built to 6 inches
 ISIP: no return blow
 FFP: fair blow built to 5 1/2 inches
 FSIP: no return blow
 Recovery: 51' GCO (45g, 55o); 74' OCM (50o, 50m);
 gravity 24 degrees
 FP: 20-35/51-66 SIP: 707-709
 HP: 1994-1951 BHT: 136 deg. F

Lansing 4052' (-941)
 CFS 4080' 30' spl - Ls: various cryptoxln and tan, offwhite dense; trace shows AA; 60' spl - Ls: mix AA, trace shows; Sh: influx med to dark red-brn, brick red, pyritic gray; Sst: scatt. lt gray fg to some med grnd, calcar., pyritic IP, N.S.; occ gray shaly Siltst

DST No. 3 Lansing "G" Zone
 Interval: 4130'-4180'
 Times: 30-60-60-90
 IFP: good blow, B.O.B. in 8 minutes
 ISIP: return blow, B.O.B. in 47 minutes
 FFP: good blow, B.O.B. in 11 minutes
 FSIP: return blow, B.O.B. in 55 minutes
 Recovery: 752' GIP; 564' CGO (40g, 60o); 188' O&WCM (25o, 27w, 48m); oil gravity 28 deg.
 FP: 41-133/141-291 SIP: 1362-1291
 HP: 2026-1939 BHT: 145 deg. F

CFS 4130' 30' spl - much decr. shows AA; Ls: flood lt gray vf-cryptoxln, sl shaly IP and offwhite, tan vf-cryptoxln, NVP; 60' spl - Ls: mix lt gray, lt to med brn cryptoxln; lesser lt brn, lt gray granular, NVP, N.S.; scatt. shows AA

7:00 AM at 4130' on 3-18-2014
 SHS was 2.6 degrees at 4130'

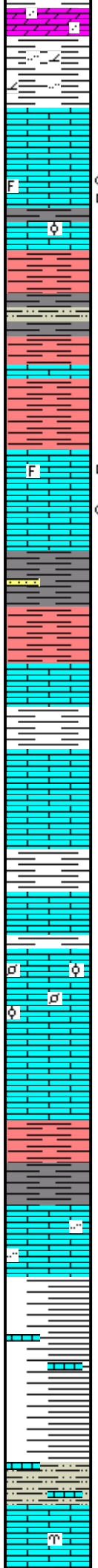
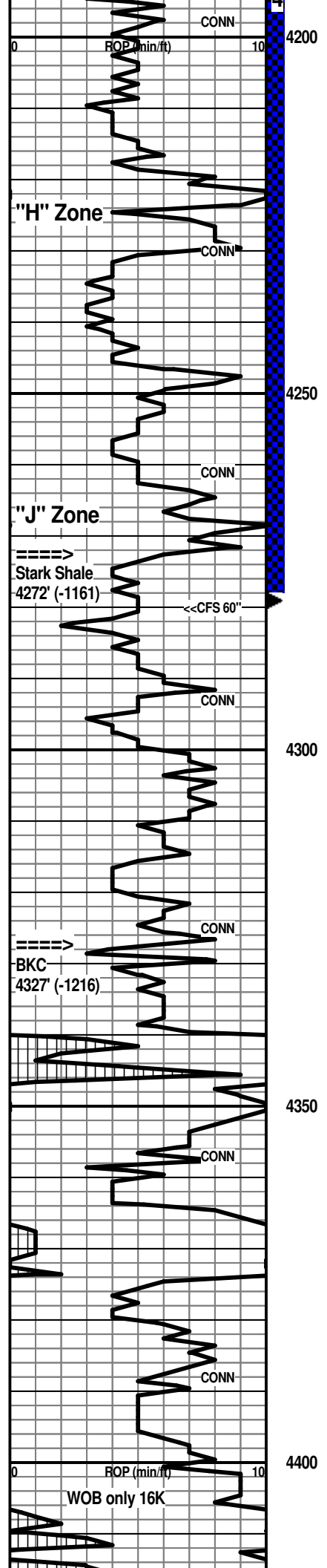
Morgan Mud Check at 4130'
 7:30 AM on 3-18-2014
 wt vis wl pH chl
 9.3 63 6.0 9.5 600
 PV YP GeIS lcm solids
 28 22 22/40 4# 7.2%

CFS 4180' 30' spl -Ls: much decr. shows AA; flood tan, lt gray cryptoxln NVP, N.S.; lesser offwhite, lt gray mic-vfxln dense, subchalky IP; 60' spl - Ls: mix AA, scatt. shows; Sh: some dark red-brn, red-maroon, dark gray

7:00 AM at 4180' on 3-19-2014
 SHS was 2.4 degrees at 4180'

4200' spl - Sh: mix AA with abund. lt to med gray, some purplish-gray; Ls: mix AA with influx med brn, lt to med gray cryptoxln with fnxn edge por. and scatt. vug. por. with siltst to sat. stain, trace fg, no odor

with sat. stain, trace fo, no odor



10' spl - Sh: strong influx dark red-brn, silty IP and it to med gray; Dolo: some lt maroon vfxln, silty; minor Ls % lt gray, offwhite, lt brn vf-cryptoxln

20' spl -Sh: mottled maroon/gray silty to dolomitic; flood Ls: predom. lt gray vf-cryptoxln, NVP, N.S.;

30' spl - Ls: abund. lt gray AA with good influx offwhite mic-vfxln dense, subchaly IP, N.S.; Sh: sl influx med gray

40' spl - Ls: fair influx offwhite foss/granular, gen. tight with subsat. to sat dark pp stain, nfo, no odor, dead; other offwhite, tan granular to sl oolitic, poor-NVP, N.S. and lt gray, lt brn cryptoxln

50' spl - flood Sh: dark red-brn, some silty; lesser lt to med gray; some lt gray and offwhite Siltst

60' spl - Sh: dark red-brn; Ls: some lt gray, lt brn predom. cryptoxln

70' spl - flood Ls: mix tan, offwhite mic-vfxln dense; tan sl granular/foss with gen. poor por.; scatt. brn cryptoxln with gilsonite filled microfractures; some offwhite micxln with black gilsonitic stain, pale ring cut

80' spl - flood Ls: lt to med brn, lt gray, gray-brn cryptoxln, NVP, N.S.; several chips tan cryptoxln with scatt. vug. por. and edge por. with lt brn stain, trace fo, no odor

CFS 4280' 30' spl - Sh: flood lt to med gray and mushy lt gray; some Sst: gray vfg, quartzitic; 60' spl - Sh: AA, some dark red-brn, silty IP; Ls: tan, lt gray vf-cryptoxln, some sl granular, N.S.

90' spl - trashy, various shales; 4300' spl - very predom. Sh: dark red-brn, silty IP with abund. med to dark gray; scatt. Ls: tan, lt gray cryptoxln

10' spl - much decr. shale %; Ls: good influx predom. lt gray granular; other tan, lt gray cryptoxln and offwhite mic-vfxln dense, N.S.

20' spl - Ls: various AA; Sh: dark red-brn and med to dark gray (40% of spl)

30' spl - decr. shale %; Ls: predom. lt to med brn and gray granular, NVP, N.S.; some med brn and gray cryptoxln

40' spl - flood Ls: lt to med brn and gray cryptoxln to granular IP, NVP; some tan pelletal to sl oolitic with spar matrix, N.S.

50' spl - Ls: mix AA; fairly minor Sh: red-brn, dark maroon, trace mottled yellow/gray, med gray

60' spl - Ls: predom. lt gray cryptoxln; lesser gray, lt brn granular, poor-NVP; Sh: influx dark red-brn, med to dark gray, fissile IP

70' spl - Sh: dark red-brn, lesser med gray; Ls: predom. lt to med gray cryptoxln to some granular, NVP; mottled gray, brn and red-brn granular, NVP, N.S.

80' spl - flood Ls: lt to med gray, lt brn cryptoxln and lt gray vfxln, silty to shaly

90' spl - Ls: very predom. lt to med gray, silty and shaly IP; Sh: streaks of med to dark red-brn, lesser maroon, purple; trace dark yellow

4400' spl - predom. Sh: med to dark red-brn, red-maroon, silty IP; lesser vc gray, mottled red/gray, yellow/maroon, purple

10' spl - Sh: med to dark red-brn silty, to finely micac. Siltst; Ls: lt gray, tan cryptoxln to granular, NVP, N.S.

20' spl - Ls: gray, lt brn, offwhite granular, occ mottled pink granular, NVP, N.S.; trace offwhite with fenestral bryozoan por., N.S.; other tan, lt gray, offwhite mic-vfxln dense

Morgan Mud Check at 4180'
7:45 AM on 3-19-2014
wt vis wl pH chl
9.1 50 6.8 9.5 600
PV YP GelS lcm solids
22 12 16/26 6# 5.7%

DST No. 4 Base Lansing "G" through "J"
Interval: 4180'-4280'
Times: 30-60-60-90
IFP: weak blow built to 3" inches
ISIP: no return blow
FFP: weak blow built to 2 inches
FSIP: no return blow
Recovery: 10' GCO (5g, 95o); 30' OCM (30o, 70m)
FP: 16-17/24-26 SIP: 1812-1774
HP: 2055-2045 BHT: 135 deg. F

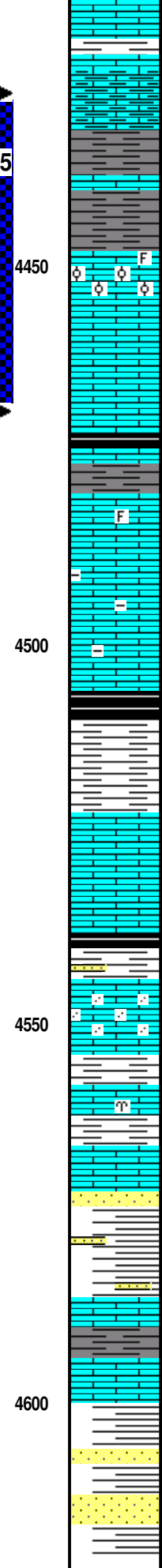
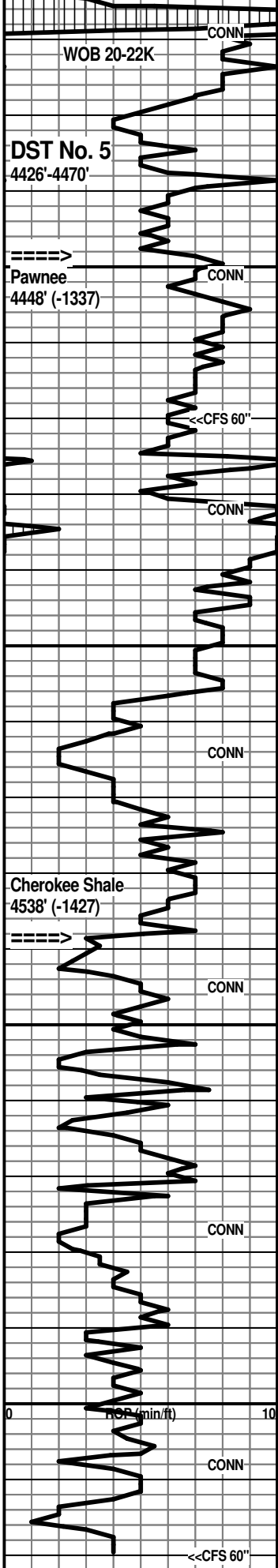
Stark Shale 4272' (-1161)

7:00 AM at 4280' on 3-20-2014
SHS was 2.9 degrees at 4280'

Morgan Mud Check at 4280'
7:45 AM on 3-20-2014
wt vis wl pH chl
9.1 51 6.8 9.5 600
PV YP GelS lcm solids
21 13 14/20 4# 5.7%

BKC 4327' (-1216)

7:00 AM at 4412' on 3-21-2014



30' spl - Ls: mix AA with influx tan, lt gray, some lt brn cryptoxln and offwhite, lt gray mic-vfxln dense; Sh: streaks of med to dark red-brn, lesser lt to med gray, trace-occ purple

40' spl - Ls: flood lt to med gray mic-vfxln dense, shaly and lt to med gray calcar. shale

50' spl - Ls/Sh AA, some lt gray soft, mushy shale

60' spl - predom. AA; Ls: sl influx med brn, med gray, gray-brn cryptoxln, foss. IP, NVP; other gray, brn, offwhite mottled granular, poor-NVP, N.S.

70' spl - Ls: 3-4 chips tan finely oolitic/granular with pp stain in inter-particle/inter-oolitic por., trace fo, no odor; flood lt to med brn, gray-brn cryptoxln, NVP, N.S.

CFS 4470' 30" spl - Ls: 5-6 chips tan oolitic, fair to good por. AA with shows AA, trace fo floating in spl tray; predom. various cryptoxln AA; abund. lt to med gray mic-fxln dense, shaly; 60" spl - Ls: var. lt to med gray vf-cryptoxln, shaly IP

80' spl - Sh: med to dark gray, some black carbon.

90' spl - Sh: abund. mix AA; Ls: med gray, med brn cryptoxln. foss. IP; other lt gray mic-vfxln dense, NVP, N.S.

4500' spl - flood Ls: lt to med gray vf-cryptoxln, shaly IP, NVP, N.S.

10' spl - Ls: various gray AA, more cryptoxln

20' spl - Ls: various gray, gray-brn vf-cryptoxln, NVP, N.S.; Sh: influx dark gray to black carbon. and fissile

30' spl - Sh: med to dark gray, red-brn; Ls: lt to med brn, lt gray cryptoxln, some granular and offwhite, lt gray mic-vfxln; lt gray dense, shaly

40' spl - flood Ls: tan, lt to med brn predom. cryptoxln; lesser offwhite, tan mic-vfxln dense, subchalky IP; Sh: thin gray beds

50' spl - Ls: various dense AA with influx tan, lt brn, lt gray granular, NVP, N.S.; trace tan, lt gray friable Sst, N.S.; Sh: sl influx lt to med gray, dark gray to black, red-brn, trace maroon

60' spl - Ls: influx med to dark brn cryptoxln and offwhite, tan granular and sandy, N.S.; Sh: vc gray, lesser red-brn and gray-green

70' spl - Ls: predom. lt to med brn cryptoxln; lesser tan, brn granular with poor-NVP, N.S.; trace offwhite fenestral bryozoan Ls, N.S.; minor shale %

80' spl - Ls: tan, lt brn, lt gray cryptoxln, NVP; and offwhite mic-vfxln dense, subchalky; Sh: streaks med to dark gray, black

90' spl - Sh: sl influx vc gray, red-brn, maroon, purple; Sst: fair influx red-brn fn-med grnd, ang-subrnd, some coarse grnd, shaly IP, N.S.; Ls: mix AA

4600' spl - Sh: predom. lt to med gray with Sst AA; Ls: various lt to med brn, gray cryptoxln to sl granular, NVP, N.S.

10' spl - predom. Ls: various cryptoxln AA with Sh: lt to med gray; some Sst AA

20' spl - predom. Sh: vc gray, red-brn, maroon, mottled red/brn sandy; Sst: some offwhite fn-med grnd calcar. with abund. fn-very coarse loose grains, N.S.

CFS 4620' 30" spl - Sh: flood red-brn, red-maroon, lt green sandy, other mc AA; Sst: loose grains AA; 60" spl - Sh: mc AA with more purple, mottled maroon/yellow; mottled sandy mc; Sst: loose grains AA; some dirty gray clusters

DST No. 5 Pawnee
Interval: 4426'-4470'
Times: 30-60-60-90
IFP: strong blow, B.O.B. in 1 minute
ISIP: return blow built to B.O.B. in 15 minutes
FFP: strong blow, B.O.B. in 2 minutes
FSIP: return blow built to B.O.B. in 16 minutes; GTS 30" into FSIP
Recovery: GTS no measure; 2350' CGO (25g, 75o); 94' G&OCM (3g, 27o, 70m)
FP: 184-625/921-888 SIP: 921-921
HP: 2200-2071 BHT: 155 deg. F

Pawnee 4448' (-1337)

Morgan Mud Check at 4458'
1:30 PM on 3-21-2014
wt vis wl pH chl
9.3 69 6.4 10.5 600
PV YP GelS lcm solids
23 21 16/37 5# 7.1%
7:00 AM at 4470' on 3-22-2014
SHS was 2.7 degrees at 4470'

Morgan Mud Check at 4482'

9:25 AM on 3-22-2014
wt vis wl pH chl
9.3 62 6.4 9.5 700
PV YP GelS lcm solids
19 21 13/30 4# 7.1%

Cherokee Shale 4538' (-1427)

7:00 AM at 4620' on 3-23-2014
RTD reached at 9:30 PM on 3-22-2014
CFS 60" - 5 stand short trip - CTCH 1 1/4 hours - drop survey - TOFL

Because of the positive results of DST's No. 2, No. 3 and No. 5: 5 1/2" casing was set for

			<p>No. 5 and No. 5, 1/2 casing was set for completion in the Pawnee, Lansing "D" and "G" zones.</p>	SHS was 2.9 degrees at 4620'
	4650		<p>Respectfully submitted,</p> <p>Wesley D. Hansen Petroleum Geologist Kansas License No. 418</p>	