



GRIFFIN MANAGEMENT, LLC

PO Box 347 Pratt, Kansas 67124
620.672.9700

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

Well Name: Cambrie #3
API: 15-151-22500
Location: W2-NW-SE-NW of Sec 28 29s 15w
License Number: 5142
Spud Date: 9/04/2019
Surface Coordinates: Long: -98.9705174
Lat: 37.4948431
Bottom Hole NA
Coordinates: Sterling Drilling (Rig #4). Drilled out from Surface w/ PDC bit.
Ground Elevation (ft): 2000' K.B. Elevation (ft): 2011'
Logged Interval (ft): 3600' To: 4880' Total Depth (ft): 4880'
Formation: Ordovician (Simpson) @ RTD
Type of Drilling Fluid: Mud Co. Chemical Drispac

Region: Pratt Co.
Drilling Completed: 9/09/2019

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

OPERATOR

Company: Griffin Management, LLC
Address: P.O. Box 347
Pratt, KS 67124-0347

GEOLOGIST

Name: Eli J. Felts
Company: Griffin Management, LLC
Address: ejfelts47@gmail.com
316.204.5059

Formation Tops

SAMPLE TOPS	LOG TOPS
TOPEKA	TOPEKA
KING HILL	KING HILL
HEEBNER	HEEBNER
BROWN LIME	BROWN LIME
LANSING	LANSING
STARK	STARK
PAWNEE	PAWNEE
CHK SHALE	CHK SHALE
VIOLA	VIOLA
SIMP SHALE	SIMP SHALE
SIMP SAND	SIMP SAND
RTD	LTD

3659 (-1648)	3658 (-1647)
3697 (-1686)	3694 (-1683)
3916 (-1906)	3916 (-1906)
4077 (-2066)	4077 (-2066)
4094 (-2083)	4096 (-2085)
4351 (-2340)	4352 (-2341)
4562 (-2541)	4564 (-2543)
4588 (-2577)	4588 (-2577)
4662 (-2651)	4662 (-2651)
4778 (-2767)	4778 (-2767)
4811 (-2800)	4812 (-2801)
4880 (-2869)	4881 (-2870)

Drilling Report

- 9/04/19 Spud @ 7:15 PM. Drilled 12.25" to 272.
- 9/05/19 WOC. 272'
- 9/06/19 Drilling @ 1960'. Displaced mud system @ 2787' Lost Returns @ 2840' w/ 10# LCM and 60 spm. Lost ~100bbl. Cut pump strokes from 60 to 55spm & raise LCM to 14#. No losses.
- 9/07/19 Drilling @ 3350'. Geo called @ 8:15 AM. On location @ 12:00 PM. 3550' on arrival. Start 20' wet & dry samples @ 3600'.
- 9/08/19 Drilling @ 4370' (CFS Swope, 20-40-06)
- 9/09/19 RTD @ 3:00 AM. CFS 60" prior to Short trip. Short trip (73) stands to surface pipe. TIH, CTCH 1.5 hours prior to logging well. Eli Wireline run full suite.>CNL/CDL w/ PE, DI, Micro, Sonic< No tight spots while logging.
- 9/10/19 Cementing 5.5" Casing
Plug Down @ 7:30 AM. Release Rig @ 9:30 AM

Problems

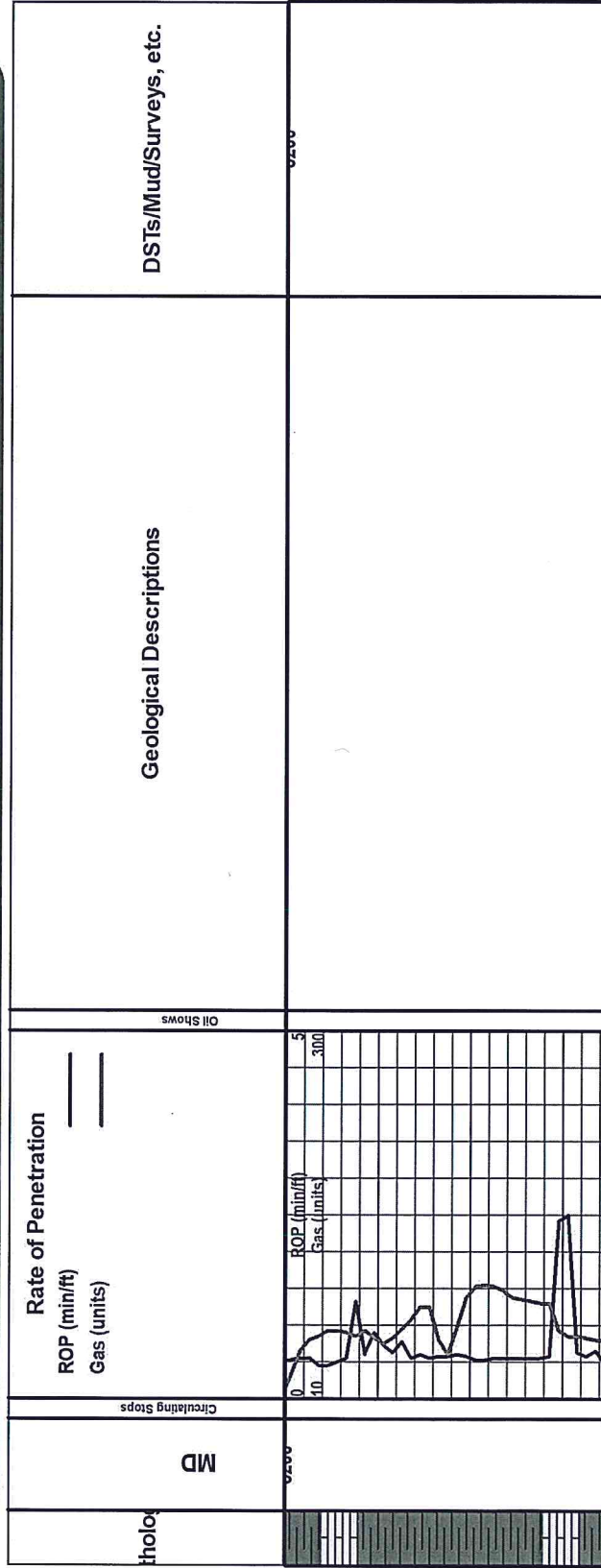
Lost returns @2840'. Lost 100 bbls. Cut pump strokes from 60 down to 55 spm. Raise LCM from 10# to 14#. Maintained circulation from this point forward. No other issues reported.

Pipe Setting

12.25" (23#) Surface Casing @ 268' KB
 5.5" (15.5#) Production Casing @ 4874' KB

ROCK TYPES

Anhy	Coal	Igne	Mrlst	Shcol
Bent	Congl	Granite 2	Quartz	Shgy
Brec	Shale red	Granite	Salt	Slst
Dol-white	Dol-cream	Lmst tan	Shale green	Ss-white
Cht	Dol	Lmst	Shale gry	Ss
Clyst	Gyp	Meta	Shale 1	Till



Formation Tops

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BROWN LIME	4077 (-2066)	BROWN LIME	4077 (-2066)
LANSING	4094 (-2083)	LANSING	4096 (-2086)
STARK	4361 (-2340)	STARK	4362 (-2341)
PAWNEE	4552 (-2541)	PAWNEE	4554 (-2543)
CHK SHALE	4588 (-2577)	CHK SHALE	4588 (-2577)
VIOLA	4662 (-2651)	VIOLA	4662 (-2651)
SIMP SHALE	4778 (-2767)	SIMP SHALE	4778 (-2767)
SIMP SAND	4811 (-2800)	SIMP SAND	4812 (-2801)
RTD	4880 (-2869)	LTD	4881 (-2870)

Drilling Report

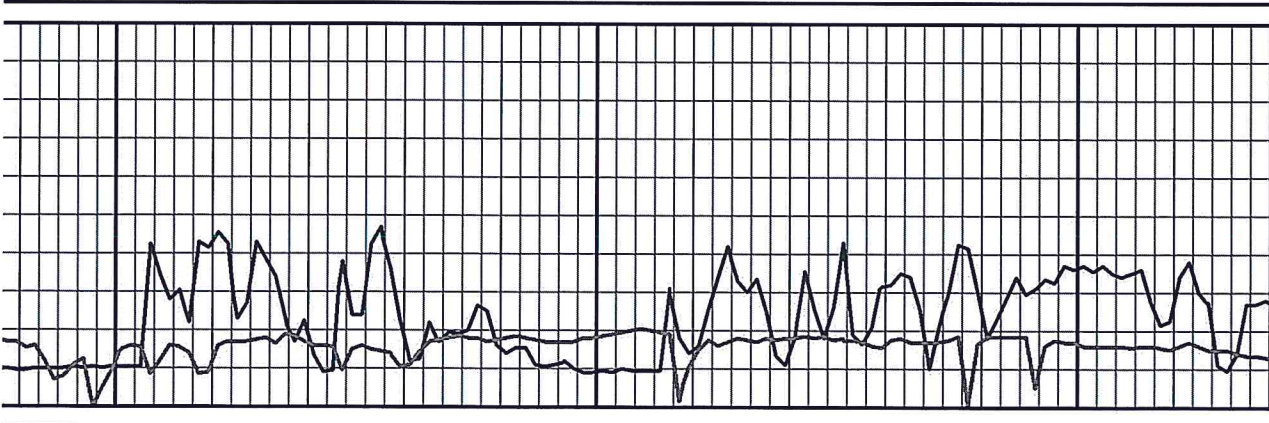
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Plug Down @ 7:30 AM. Release Rig @ 9:30 AM

3250

3300

3350

Mud-Co
Report #4
9/7/2019
Time: 7 AM
Depth: 3348
Wt: 8.9#
Vis: 60
WL: 9.6
Chi: 6,000
LCM: 12#
9/7/2019
3350' @ 7 AM.
Rig call ~8:15 AM



3250

3300

3350





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3400

3450

3500

ROP (min/ft)
Gas (units)

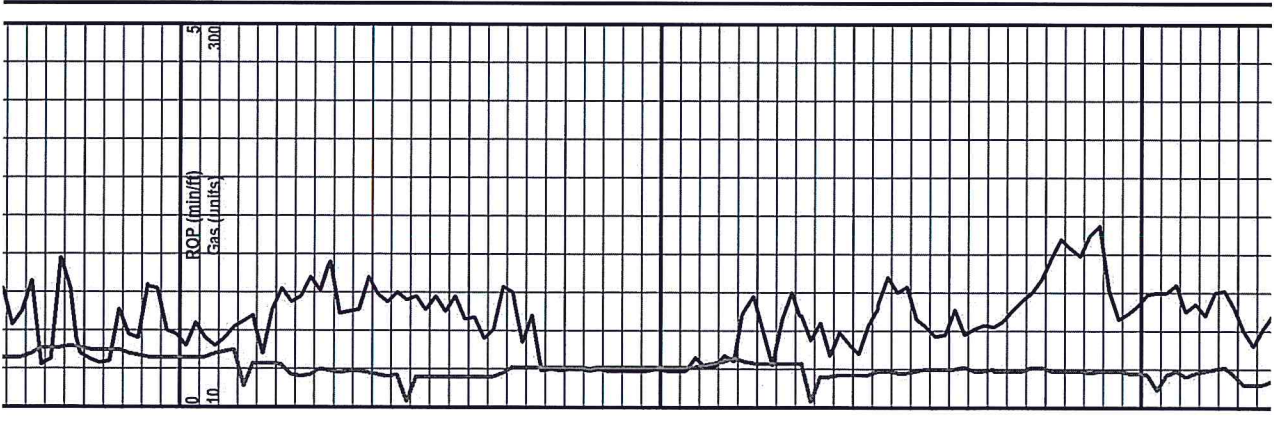
0
10

3400

3450

3500

5
1000



Samples have been lagged. Sample tops have not been corrected to Logs. See header for Log tops.

9/7/19

3550

12 PM:

Geo on Location

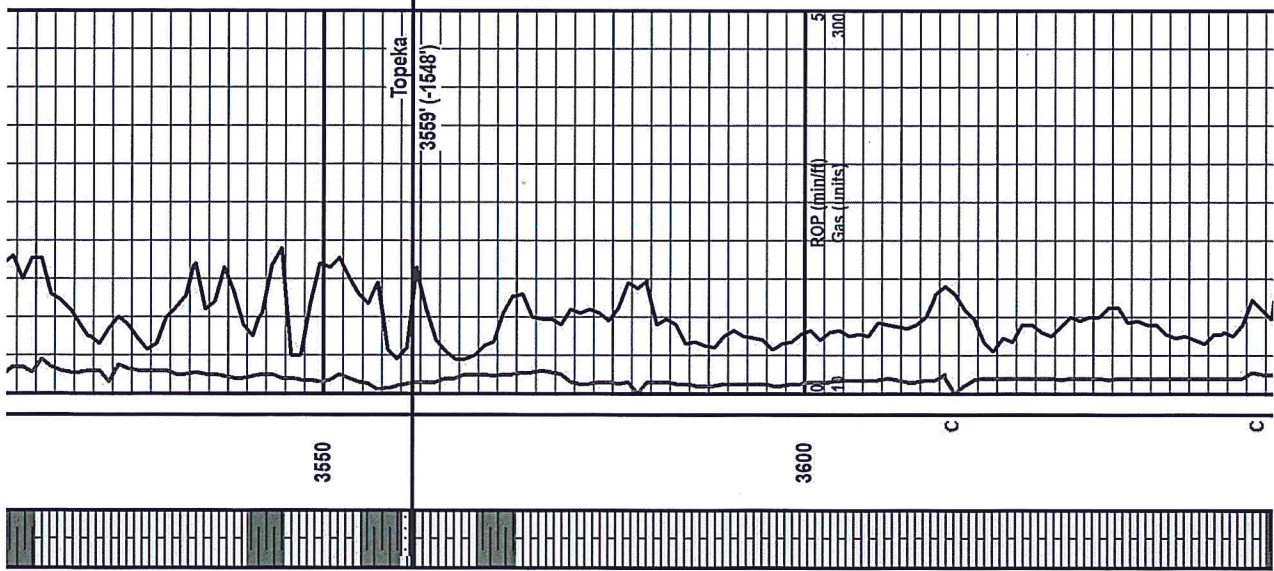
3600

VIS: 52
WT: 9.0
LCM: 12#
WOB: 14K
RPM: 95+
SPM: 65
PP: 760#

LS - cream, grey, med xin; foss in most w/ poor intra foss porosity, some secondary re-xin porosity, chalky in most, increase on break, fr trail; barren, no odor, ns; few trace pcs CH - grey & wht, vitreous, foss

LS - cream to lt tan, grey, highly foss, some 2ndary re-xin; remains chalky, increase CH - vitreous to weathered ip; foss texture, dns; few LS transitional SH - grey, dark, silty & soft; pyrite xin dev in shale

LS - cream, sm grey, highly chalky & foss, soft crush, lt brown to grey mineral staining; sm re-xin ip w/ granular to dolomitic app; no odor, ns



3550

Topoka

3559' (-1548')

3600

ROP (min/ft)

Gas (units)

5

3000

C

C

brown staining in some; oa soft & chalky lime; no odor, ns

WOB: 14K
RPM: 95+
SPM: 65
PP: 750#

VIS: 55
WT: 9.0
LCM: 12#

LS - cream to grey, mst med xin; abdt foss w/ chalky matrix, some trans argillaceous to interbedded shales ip; mst pcs soft, crush easily under light pressure; poor visible porosity; some chalk w/ small pyrite xin dev; no odor, ns; cup washes white

WOB: 14K
RPM: 95+
SPM: 65
PP: 750#

VIS: 55
WT: 9.1
LCM: 10#

LS - cream to it tan, sm grey, mst med xin, foss & chalky aa, few fn to microxin (sub cherty) w/ wht foss; dense w/ sharp edges, contact w/ dark shale & few trace pcs dark, earthy shale; no vis gas, no odor, ns

LS - cream, it tan & grey, mst med xin, aa, some pcs fine to microxin, dense, foss, abdt gills & mineral stning throughout; abundant chalk dominates sample

LS - mostly aa; few pcs SS - app white, blocky clusters, med friab; well sorted, sb rd clear to sl frosted grains; poor vis intergranlir pors; no odor, ns

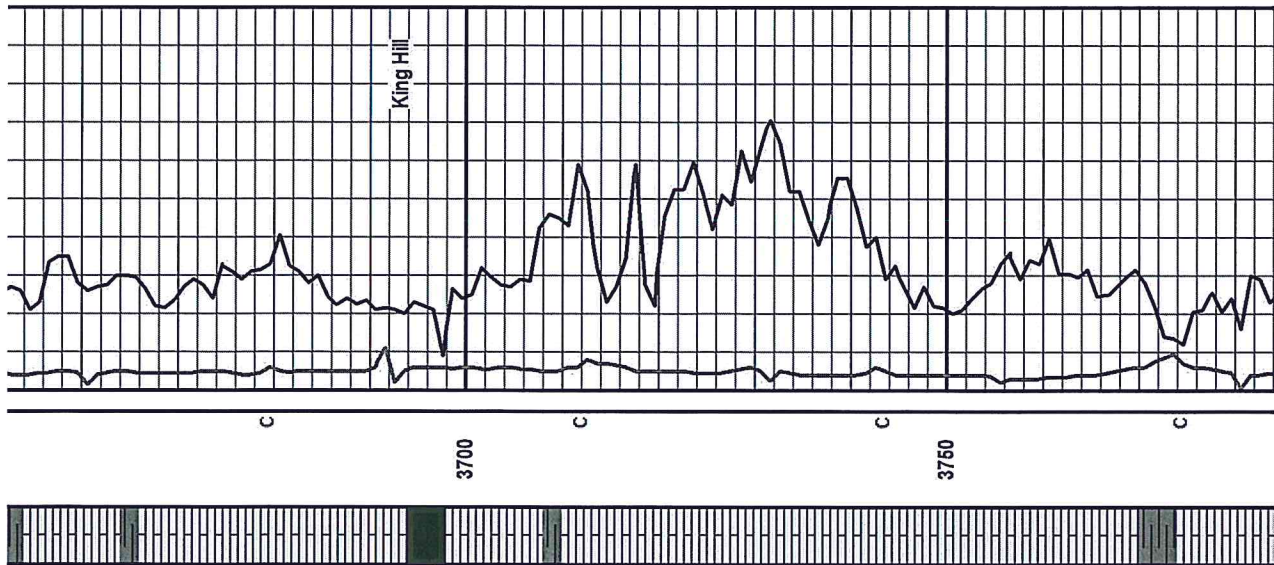
WOB: 15K
RPM: 95+
SPM: 65
PP: 750#

VIS: 53
WT: 9.2
LCM: 9#

LS - crm - it tan, grey, mst med xin, sl foss & highly chalky, few pcs fn xin, foss w/ chert in matrix (white, vit streaks) pos dense & sharp; few shaley stringers

LS - cream, fine to med xin, few pcs w/ ooc porosity, barren, fair to gd vis por, soft crush w/ no show, flood dark grey fine xin LS & grey silty shales

LS - cream, mst fine xin, sl re-xin ip w/ vis dissolution vuggs, barren pors, some cherty ip;



3800	<p>WOB: 16K RPM: 96+ SPM: 66 PP: 750#</p>
3850	<p>Rig Check @ 3870' (~15") WOB: 16K RPM: 96+ SPM: 66 PP: 750#</p>
3900	<p>WOB: 15K RPM: 96 SPM: 66 PP: 750# VIS: 52</p>

LS - cm to gry, fine to med xln, sm granular txt, foss ip, sm lt brown mineral stn, abundant white chalk, few dk grey shales

LS - cm to grey, fn to med xln, few micrite (lt grey w/ wht foss), sl granular txt ip, few foss, mst soft w/ few pcs firm, fissile break, ~20% grey shales remain

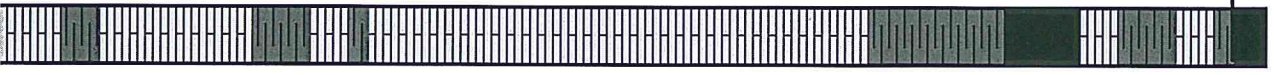
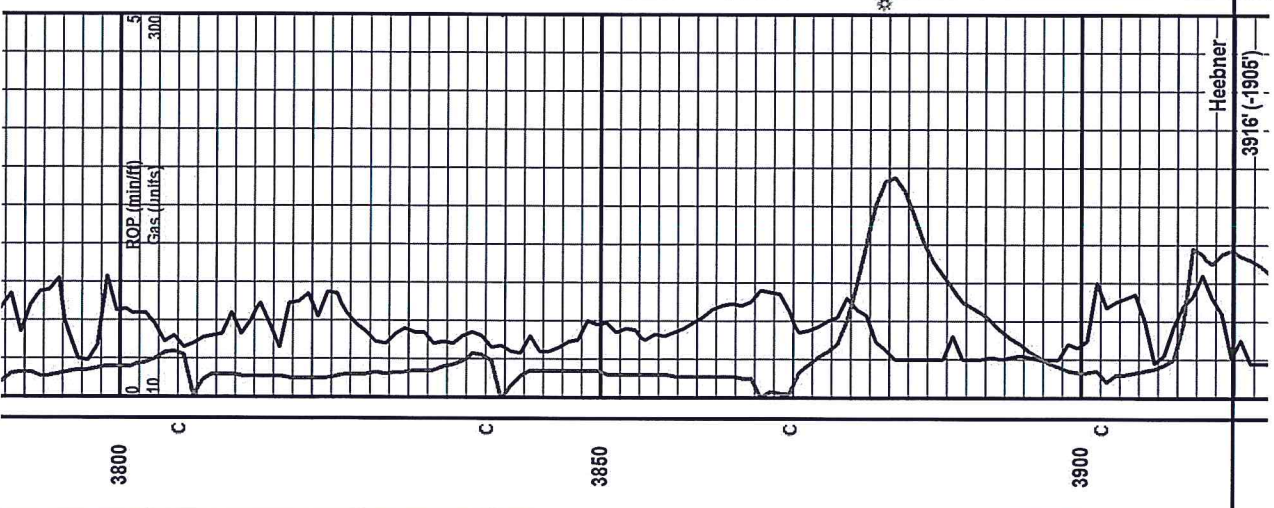
LS - mst cream, sm white & lt grey, mst fine xln, fair porosity w/ intrafoss & sm re-xln sparite, lots of chalk in matrix, fair friab; no odor, ns; w/ trc mineral fluor

LS - cream to grey, fn to med xln; fair re-xln porosity w/ sm lt brown staining in some, w/ chalky transitional pcs, oa soft; no vis fluor; no odor, ns

SH - flood grey to dark brown, soft to firm, some fissile, vis laminations in some w/ poss mic particles (glitter-like); edges bleed gas

SH - some aa, trans lighter grey; abundant LS - cm to tan, fine xln to micritic ip; few dark sm; blocky & dense

SH - dark brown, earthy, laminated & med soft; bleeds gas; SH - green w/ tan to brown



	3960		
		VIS: 67 WT: 9.0+ LCM: 10# WOB: 15-16K RPM: 95 SPM: 65 PP: 750#	4000
			4060

SH - dark brown to black, earthy, bleeds gas, trans micrite; appears cherty, shiny black, heavy HCL reaction; dense & blocky, few cream to tan LS, med xin w/ granular texture; chalky

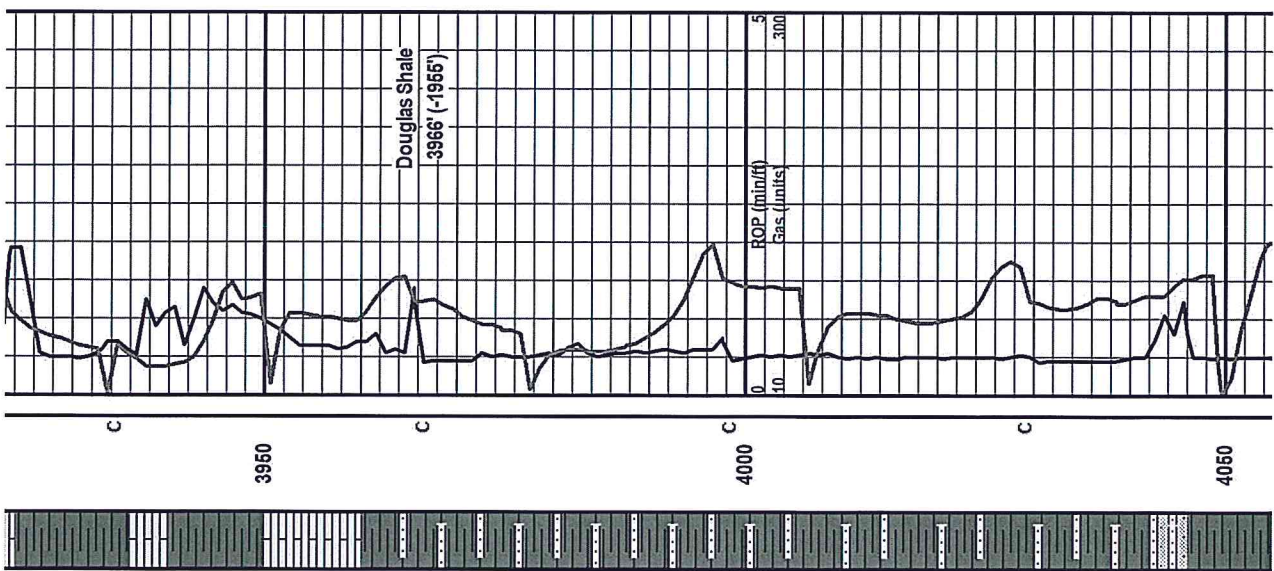
LS - tan, fine to microxin, dense blocky, few foss, abdt wht chalky soft ls, few sandy shales; poorly sorted, sub rd, med-large grains, v shaley

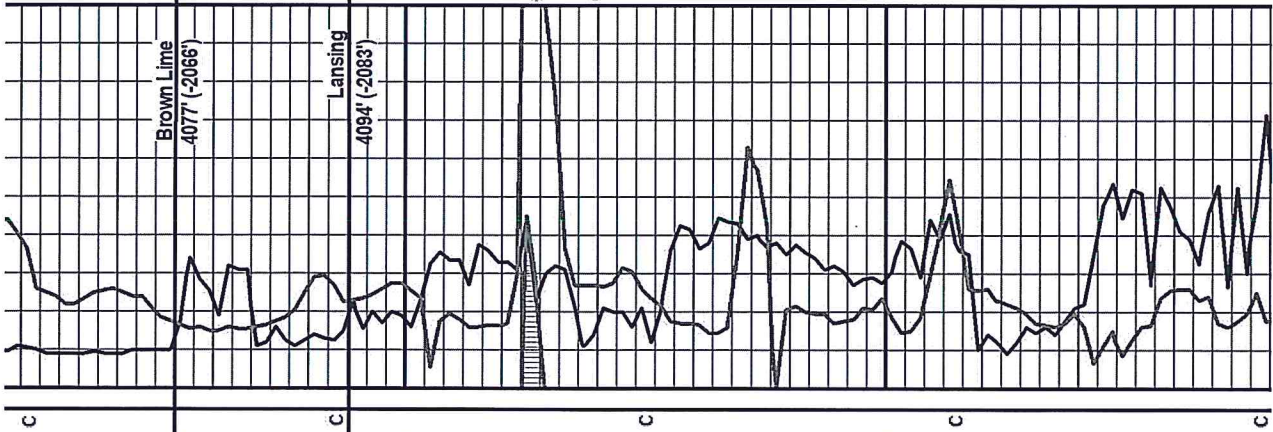
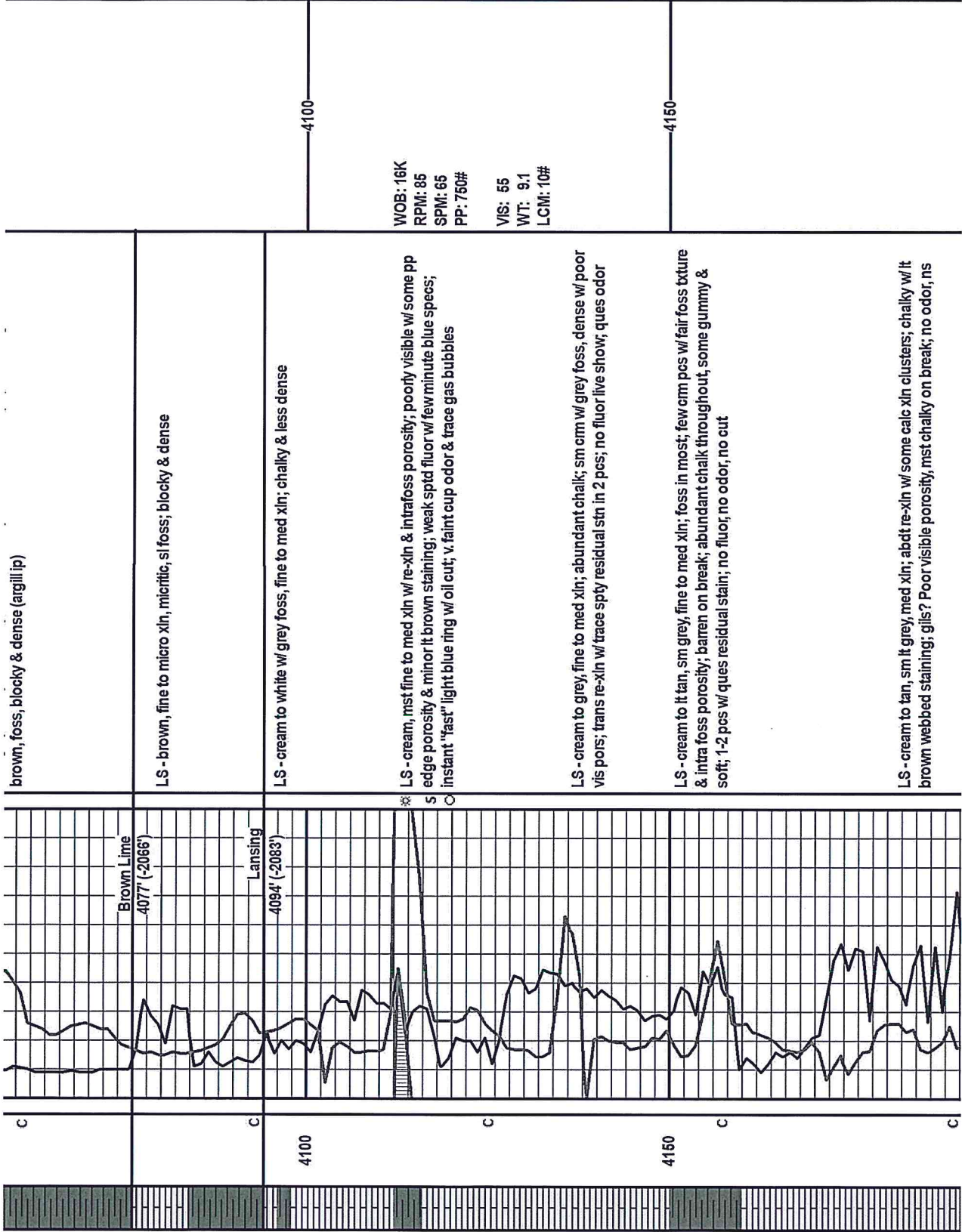
Sandy SH / Shaley SS; lt grey w/ cir grains, fine grains, well rd & std, dark specks/streaks throughout, soft crush w/ v, poor intragranular pores; v. shaley matrix

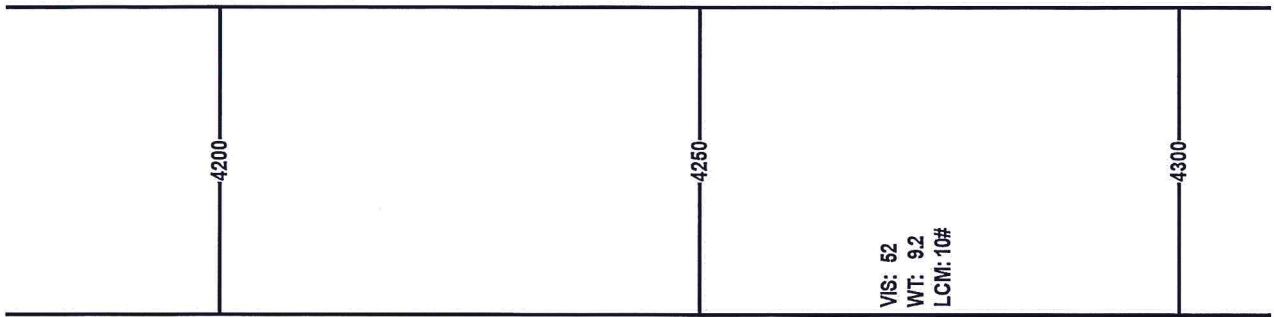
Sandy SH, lt to med grey, aa, sl dec sand content; highly shaley w/ dark streaks/ specks, soft

SH - grey, lt to med w/ some vis layering; abdt sand content, fine grained, appear cir, well rd/std; dark streaks throughout; some dark interbedded silty shale

SH - lt to med grey, decrease sand, some green shale, silty, blocky; all soft, few w/ cream limey foss inclusions, oa more silty w/ scattered sand stringers







LS - cream to tan, sm lt grey, med xin; abdt re-xin w/ some calc xin clusters; chalky w/ it brown webbed staining; gils? Poor visible porosity, mst chalky on break; no odor, ns

LS - cream to tan, grey ip, fine xin, foss ip w/ poor intrafoss pores, well cemented, soft to med firm; chalky on break, abdt gils stn; ~20% shales

LS - cream to grey, med xin w/ granular txt, abdt lt grey foss w/ highly chalky matrix, some re-xin spar w/ residual stn, no odor, lt flakey dead oil on break

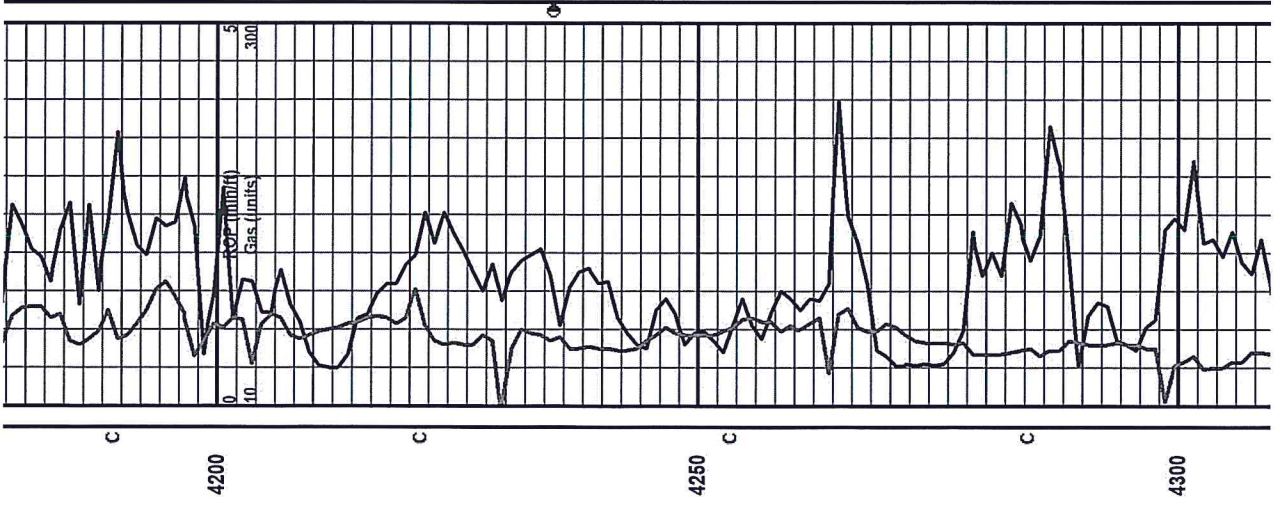
LS - cream lt grey, med xin in most w/ granular to sl foss txture, poor intrafoss porosity, few re-xin w/ sm vis cal xin; few pos w/ ss lt brwn free oil, increase to fair show on break, fair cup odor w/ rare sptd fluor, oa wk show

LS - cream, med xin, granular & foss txture, poor vis porosity; chalky ip, few pcs micritic to cherty, vitreous, foss (grey w/ wht)

LS - cream, fine to med xin, granular & foss txture w/ sm dissolution porosity; sm vggly ip w/ poor interconnected pores; fairly friable; chalky; trace chert; no odor, ns

LS - cream, mst fine xin, blocky & dense; few foss & re-xin; oa poor vis pores, trace pos chert, vitreous, sharp & fresh; no odor, ns

VIS: 52
WT: 9.2
LCM: 10#



4200

4250

4300

VIS: 52
 WT: 9.2
 LCM: 10#

 WOB: 16K
 RPM: 88
 SPM: 66

 9/8/2019
 4370' @ 7 AM.
 Mud-Co
 Report#5
 9/8/2019
 Time: 8:15AM
 Depth: 4375
 Wt: 9.6+
 Vis: 50
 WL: 11.2
 Cht: 5,000
 LCM: 10#

 WOB: 16K
 RPM: 95+

LS - cream to tan, fine to med xin, foss, sl granular to foss txt w/ poor vis prs, some re-xin sparr veins w/ med xin growth; chalky to shaley ip

 LS - cream to lt grey, fine to sm med xin, v. sl foss w/ to re-xin; chalky ip, platy & lithographic w/ poor vis porosity; no odor, ns; few dark silty shales

 LS - cream, fine xin, highly foss w/ poor intrafoss por, some secondary intrafoss xin porosity; trace sfo in 2 pcs, increase on break; good odor on break; good ylw fluor w/ pinhead drops floating in tray, oa weak show

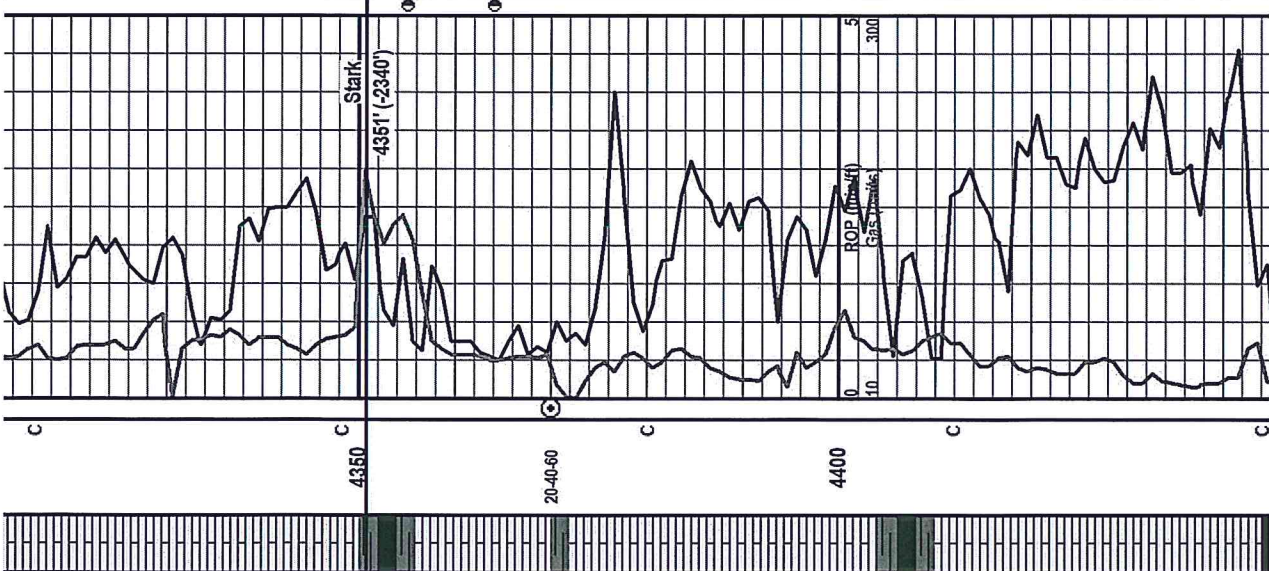
 LS - cream, fn xin, foss aa, mst tight, few w/ vis intrafoss poros & sl re-xin ip; oily odor w/ rare sfo in tray; hvy increase show & odor on break

 LS - cream fossiliferous clusters w/ fair intrafoss porosity; sfo w/ increase show & odor on break & faint cup odor; trans cream lt tan, fine to microxin; foss w/ smooth txture; blocky & dense; stringers dark earthy shale

 LS - cream to lt grey, mst fine xin, blocky & dense, few transitional med xin w/ interbedded brwn shale streaks, chalky break; ns

 LS - crm, med xin w/ sl granular txture, chalky break, mst lithographic; trans fine to micro-xin, gry-brwn, blocky & dense, to foss

 LS - lt tan - brown, micro xin to sub-cherty; trans black chert; trans SH - jet black, earthy, no vis gas



4450	4500	4550
<p>V/S: 59 WT: 93 LCM: 10#</p>		<p>V/S: 57 WT: 9.3+ LCM: 10# WOB: 16K RPM: 95+ SPM: 65 PP: 820#</p>

Flood SH - jet black to shades of grey; few pcs bleeding gas; mst sub-carb; some LS - cream w/ brown mineral str; chalky break, poor vis pots; ns

SH - shades of grey to lt green, silty & soft; LS - crm to brown, many transitional microxin w/ chalky edges; few trc fossiliferous, blocky & dense, sub shaley ip

Flood SH - lt grey to pale green, mst soft & silty; few interbedded LS stringers, caramel, microxin; few foss ip

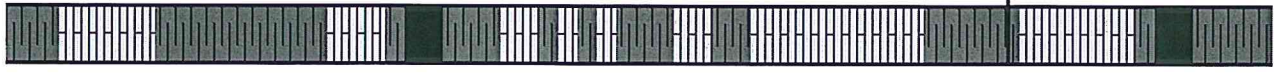
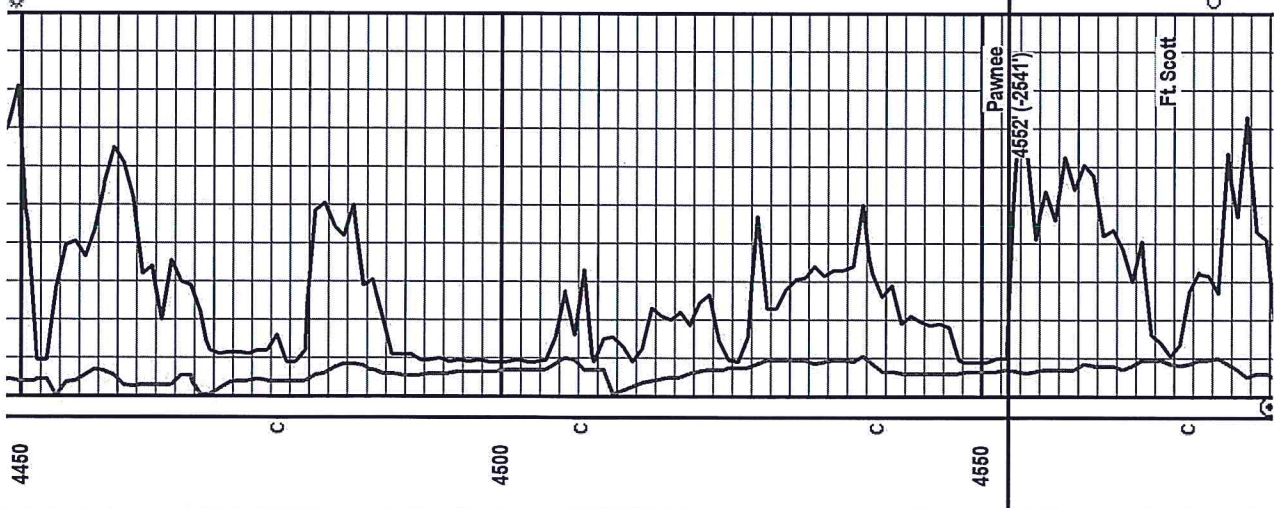
SH - grey to green sm mottled w/ blk specks, soft & silty; interbedded LS in some, brown, fine to microxin w/ few foss

LS & SH - varicolored, cream to tan, brown & pink LS - interbedded shales; grey to green, pink, mottled

LS - cream to brown, mst fine xin; some crm med xin edges w/ chalky appearance; oa blocky & dense

SH - grey green w/ dark specks, soft & silty; trace pcs jet black, carb shale

LS - cream to brown, mst fine xin; few foss w/ poor intrafoss porosity; trc re-xin w/ residual oil staining & vss "clingly" residual oil; no odor, no fluor



Out Pump Strokes back to 55 SPM @ 4650' after CFS. Catching samples with cloth to catch any loose sand grains.

CFS 4600' 4605' 4610' 4615'

4600

WOB: 16K
RPM: 95
SPM: 55
PP: 600#

Increase Pump Strokes back to 65 SMP @ 4615' & resume drilling ahead.

*First sand (KD) in 4680' cup. Increase in 4700' cup

4650

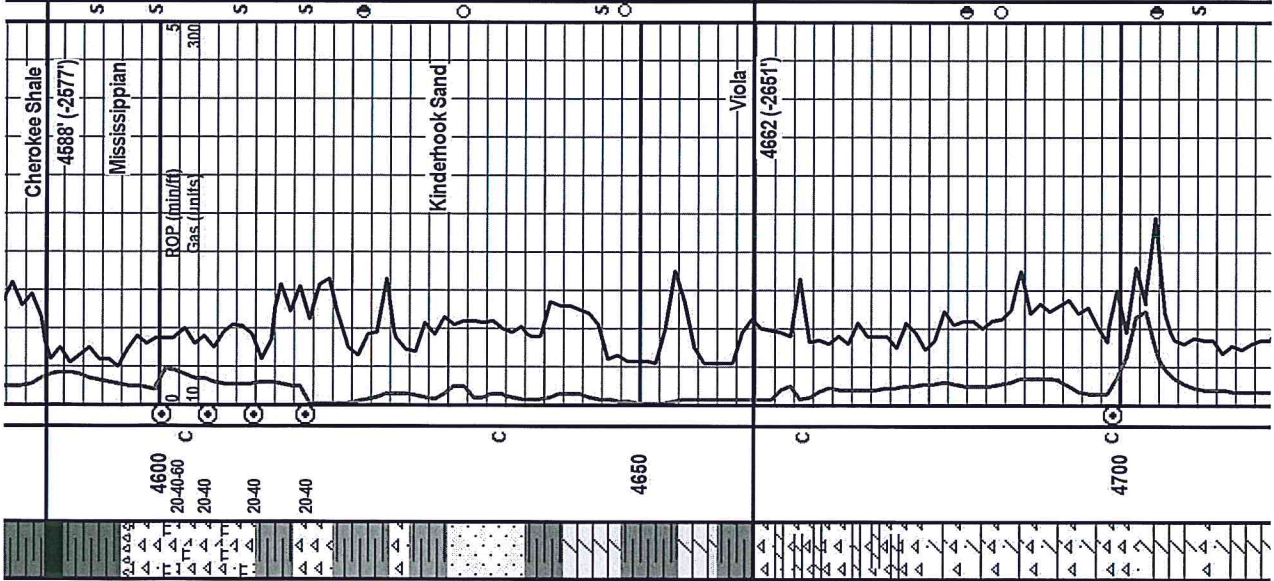
V/S: 58
WT: 9.2
LCM: 8#

V/S: 60
WT: 9.2+
LCM: 8#

WOB: 16K
RPM: 95+
SPM: 65
PP: 800#

4700

shale
Chert - dolomitic, cream to white w/ abt dark staining; vitreous ip mst highly tripolitic weathering; trace pp bright yw-grn flur; quest odor; soft crush
>4605 DS - CH - trans vitreous, varicolored, semi translucent, sharp & blocky; trace weathered CH, aa->20" LS - cream to tan, fine xln; blocky & dense; ~20 shales, varicolored w/ sm interbedded chert; vitreous & varicolored to white, dolomitized & weathered >40" LS aa w/ grn sh contact; iner CH-dolomitic & weath w/ blk str; (f) pc w/ vssio (lt brwn drop)
LS - tan to brown, fine to microxln; bicky & litrographic; 20% CH - dolomitic, sm w/ green hue, weathered w/ blk str, dolomitic texture & abundant sh, varicolored, grey/green 4615 stop->Mst dol im & ch; lt grn hue, trans varic vit ch, ~15% weath CH pcs; trace SS - rare clust; app whitrans, fn-med grn, pr std, sub rd to sb ang; dk str; md friab; no odor; ns 4615 20" food sh, varic, brk red, sm mott w/ grn, whit to pink, mst med firm to chalky; 40" flood sh, aa; scat CH - mst vit w/ few dolo & weath w/ blk str (cavings?) 1-2 pc SS - clr wht, fn grn, friab w/ blk str, no show
4660 > LS & CH - varicolored; LS - crm to tan, fine to med xln; foss ip; poor vis pors; CH - varicolored; translucent white to opaque, cream, sl foss CH - fract'd ip, some weathered & dolomitized; slight show med brown free oil, increase on break; no odor, rare sptd yellow flur; cup washes red
CH white to cream, opaque to semi translucent; mostly vitreous, sharp & fresh. Fract'd in some w/ dark staining in fracs; few clusters SS - appear grey, clear to sl frosted grains, well rd & std, dark material between grains; no odor, ns; fr-gd friab; trace pinhead flur w/ v. slight milky weeping cut
*few wht clusters SS, friab, fn med grains, well rd & std; no show
LS - cream to lt grey, fine to med xln w/ sl granular texture; poss sl dolomitic; abundant CH - wht to cream, foss ip, most vitreous w/ some edge staining & vis fracs; overall dense & blocky
CH & SH - varicolored shales, CH - cream to white, mostly vitreous. v. few pcs w/ edge weathering & visible fracs; sm pcs w/ slight show oil, it brown free drops to some darker, clingy oil; no odor, rare sptd yellow flur in show pcs that were crushed; few wht clusters SS, friab, fn med grains, well rd & std; no show
~50% SH & CH - mst red-green shales; CH - cream to white, mst vitreous, blocky, sharp & fresh; some dolomitic & weathered; dark stain w/ sso in few; dark tarry, heavy oil w/ few lt drops
CH & Dol - mst cream to white; Dol - wht, cottony, soft & chalky break; CH - white to crm, opaque to semi translucent; vitreous in mst w/ some dolomitized & weathered edges; edges are lighter brown w/ sl oil scum in fracs; dense, 1-2 pcs w/ lt brown pinhead drops on break & trc gas bubbles; no odor, wk show



Cherokee Shale
-4588' (-2577')
Mississippian
ROP (min/ft)
Gas (units)
300
10
Kinderhook Sand
Viola
-4662' (-2651')
4700

4760	4800	4850
<p>Rig Check * Clean Suction</p> <p>VIS: 60 WT: 9.3 LCM: 8#</p> <p>WOB: 16K RPM: 95+ SPM: 65 PP: 830#</p>	<p>Mud-Co Report #6 9/9/2019 Time: 9:30AM Depth: 4880 Wt: 9.0 Vis: 66 WL: 8.8 Chl: 5,000 LCM: 9#</p> <p>WOB: 16K RPM: 95+ SPM: 65</p>	<p>RTD @ 3:00 AM CFS 20-40-60</p>

milky white, semi-translucent in some; abdt vitreous, partial dolomitization & weathering w/lt brown to black stain, sit scum lt brown oil residue in frags; no odor, nsfo

Dol & CH, aa, increase dolomite, lt tan to brown, med xln, sucrosic in some w/ good friability & fair show free oil; crushes softly to sandy like grains; some weathered dolomitized CH w/lt tan edges & pp & edge porosity; oa wk to fair show

Flood white chalky dolomite; powder soft, washes tray white; some scattered cream to white vitreous chert; vis frags w/lt brown staining; some tan to grey LS - fine to med xln; blocky & firm; rare silver green shale

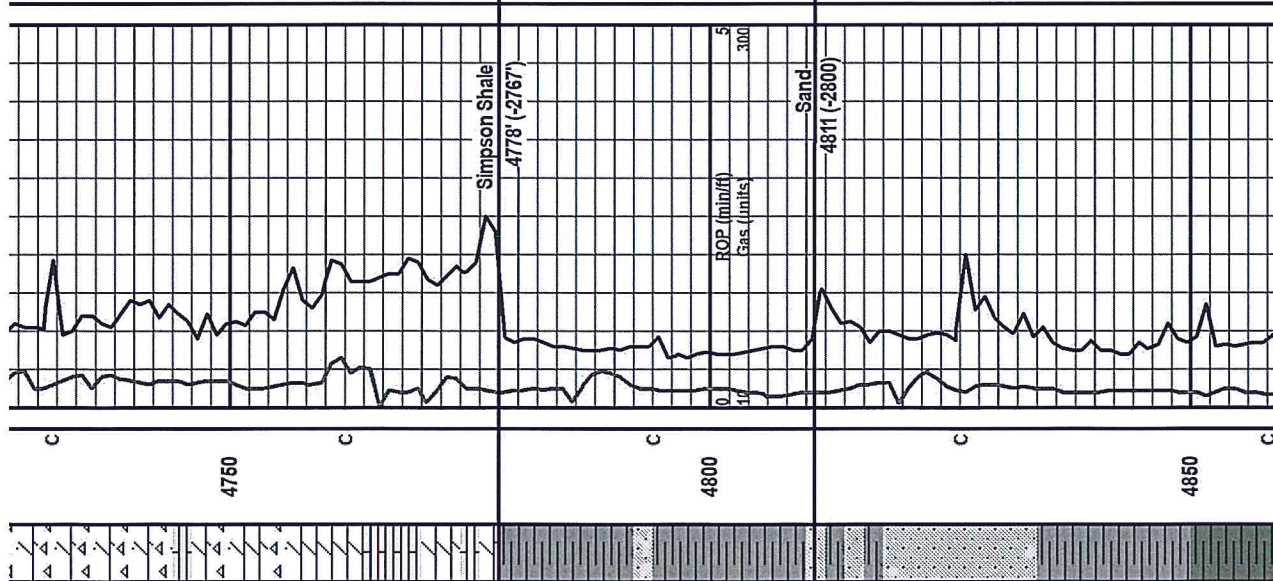
SH - turq green, brittle to sl waxy ip; some lt green chalky LS; few sandy stringers in green shale

SH - turq green, brittle to sl waxy, trans lighter green in some; few larger stringers SS - appear green to grey clusters; fn-med grain, sb angl, clear to frosted grains; mod friab w/ poor visible pois; no odor, ns

SS - variety of clusters; white to lt grey, green, most fn-med xln, mod sorted, well rounded, clear qtz grains, dark material in matrix & abundant green shales; few pcs pyritic; oa mod-gd friability w/ nsfo

SS - as above; increase intergranular black material & some w/ glauconitic inc; trans SH-turq green, aa, brittle to waxy; flood grey silty to waxy w/ green specks

SH - grey & green, brittle to waxy, silty in some; most w/ interbedded SS - clusters aa, increase vis white clust, fn-med grains, well rnd, mod strd; partly friab w/ poor intragran porosity; increase intergranular shale & clay particles (black to green, some pyrite)



VIS: 60
 WT: 9.3
 LCM: 8#
 WOB: 16K
 RPM: 95+
 SPM: 65
 PP: 330#

Mud-Co
 Report #6
 9/9/2019
 Time: 9:30AM
 Depth: 4880
 Wt: 9.0
 Vis: 66
 WL: 8.8
 Chi: 5,000
 LCM: 9#
 WOB: 16K
 RPM: 95+
 SPM: 65

RTD @ 3:00 AM
 CFS 20-40-60
 Short Trip 73 stands up to surface
 pipe. CTCH 1.5 hours.
 TOOH for Logs.

ELI Wireline Ran the
 following:
 >CNL/CDL w/PE
 >Dual Induction
 >Mico
 >Sonic

Geologist left location
 after logs. Leaving
 location @ 5:30 PM

white vitreous chert; vis frags w/ lt brown staining; some tan to grey LS - fine to med xln; blocky & firm; rare siliver green shale

SH - turq green, brittle to sil waxy ip; some lt green chalky LS; few sandy stringers in green shale

SH - turq green, brittle to sil waxy, trans lighter green in some; few larger stringers SS - appear green to grey clusters; fn-med grain, sb angl, clear to frosted grains; mod friab w/ poor visible pois; no odor, ns

SS - variety of clusters; white to lt grey, green, most fn-med xln, mod sorted, well rounded, clear qtz grains, dark material in matrix & abundant green shales; few pcs pyritic; oa mod-gd friability w/ nsfo

SS - as above; increase intergranular black material & some w/ glauconitic inci; trans SH-turq green, aa, brittle to waxy; flood grey silty to waxy w/ green specks

SH - grey & green, brittle to waxy, silty in some; most w/ interbedded SS - clusters aa, increase vis white clust, fn-med grains, well md, mod srtid; partly friab w/ poor intragran porosity; increase intergranular shale & clay particles (black to green, some pyrite)

SH - grey to green, aa, combination of interbedded w/ SS, as described above; increase SH & oa pyritic content of SS

