



WESLEY D. HANSEN Consulting Petroleum Geologist

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**KGS
AAPG
Kansas License #418**



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

Well Name: Murfin Drilling Co., Inc. #5-1 Walter
Location: 765' FNL, 867' FEL of Section 1-1S-36W
License Number: API: 15-153-20961
Spud Date: 11-15-2013
Surface Coordinates: 765' FNL, 867' FEL of Section 1-1S-36W
Region: Rawlins County, KS
Drilling Completed: 11-19-2013

Bottom Hole Vertical hole
Coordinates:
Ground Elevation (ft): 3131' **K.B. Elevation (ft):** 3142'
Logged Interval (ft): 3450' **To: RTD** **Total Depth (ft):** 4474'
Formation: Marmaton at RTD
Type of Drilling Fluid: Chemical - Displaced at 3248'

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
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Wichita, KS 67202
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COMMENTS

Contractor: Murfin Drilling Co., Inc. Rig #2
 Pusher: Arturo Cabezas

Surface Casing: 8 5/8" set at 265' w/245 sx
 Production Casing: 5 1/2" set at 4465' w/500 sx

Mud by: Morgan Mud - Dave Lines was the engineer

DST's by: No DST's

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


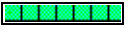



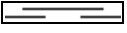







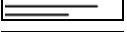






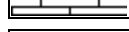
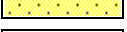





Deviation Surveys: 1/2 deg. @ 265'; 1 deg. @ 1008'; 3/4 deg. @ 1797'; 1 deg. @ 2743'; 3/4 deg. @ 3248'; 1 1/4 deg. @ 3751'; 1 1/4 deg. @ 4474'

Bit #	Size	MFG	Type	Depth Out	Footage Cut	Hours on bit
1	12 1/4"	HTC	rerun	265'	265'	
2	7 7/8"	HTC	DP506F	4474'	4209'	48 1/4

FORMATION TOPS AND STRUCTURAL COMPARISON




















FORMATION	SAMPLE TOPS		LOG TOPS		COMPARISON WELL MDC #2-1 Walter 330'FNL, 1360' FEL Section 1-1S-36W 3117' KB
	Depth	Datum	Depth	Datum	
Anhydrite	3068'	+74	3068'	+74	+4
B/Anhydrite	3105'	+37	3104'	+38	+3
Neva	3552'	-410	3554'	-412	+6
Red Eagle	3617'	-475	3615'	-473	+7
Foraker	3663'	-521	3664'	-522	+5
Topeka	3866'	-724	3871'	-729	+6
Oread	3985'	-843	3986'	-844	+1
Lansing	4082'	-940	4087'	-945	+4
Stark Shale	4298'	-1156	4302'	-1160	flat
BKC	not picked		4354'	-1212	+2
RTD	4474'	-1332			
LTD			4478'	-1336	





ROCK TYPES

 Anhy	 Salt	 Dol	 Shlyslts
 Cht	 Shale	 Dtd	 SltysH
 Coal	 Shcol	 Gry sh	 Sdy dolo
 Congl	 Shgy	 Sandylms	 Silty dolo
 Gyp	 Sltst	 redshale	 Shy dolo
 Ls colorless	 Ss	 Shale	 Shaly ls
 Lmst	 Carb sh	 Sltstn	












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


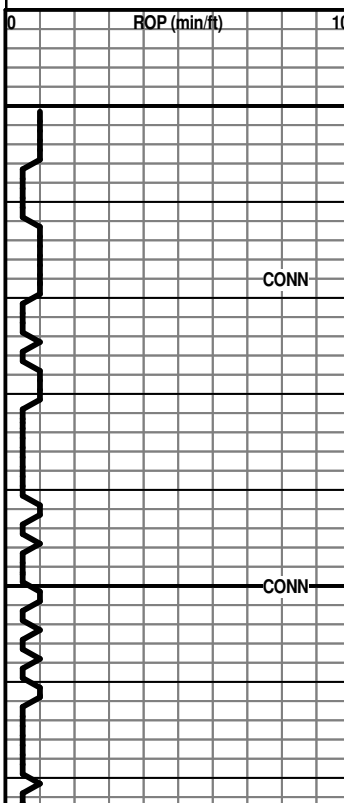
EVENTS

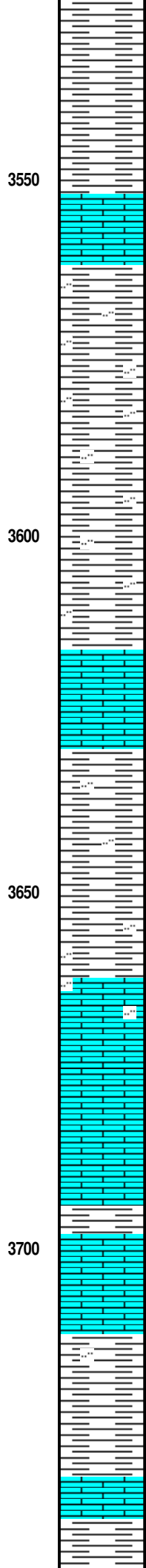
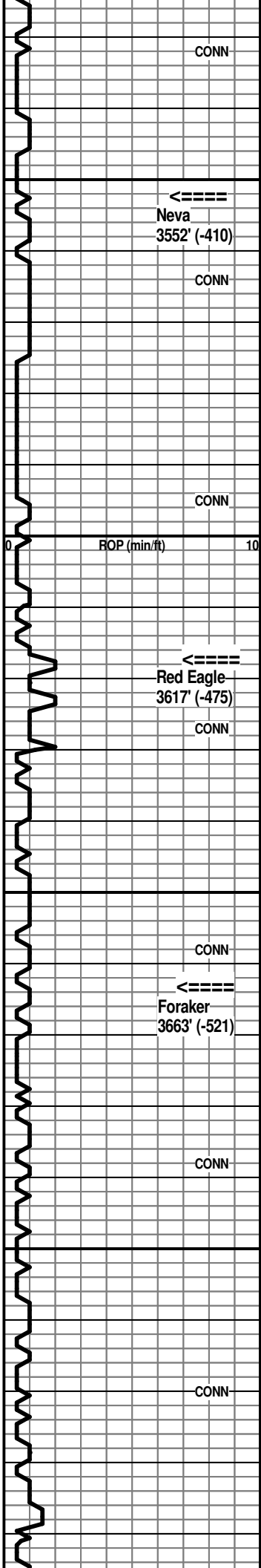
-  Rft
-  Dst top/base

OIL SHOWS

-  Even
-  Spotted
-  Quest.

-  Trace
-  Dead
-  Gas show

<p>Curve Track 1</p> <p>ROP (min/ft) </p>	Depth	Lithology	Oil Shows	Geological Descriptions	Remarks
	<p>3450</p> <p>3500</p>	<p>CONN</p>			<p>Because of the very rapid drilling rate and difficult correlation to offset wells, the lithology column was adjusted to the E-Logs after logging was completed.</p>



Sh: red gummy

Neva 3552' (-410)

Ls: scatt. offwhite, lt gray fn granular to subchalky

Sh: red, silty

Sh: red silty, some lt gray, trace dark red-brn

Red Eagle 3617' (-475)

Ls: offwhite, lt gray vfxln dense; some med gray cryptoxln

60' spl - flood Ls: offwhite, lt gray vfxln dense; lesser offwhite subchalky

80' spl - Sh: red gummy and silty; very minor Ls %

Foraker 3663' (-521)

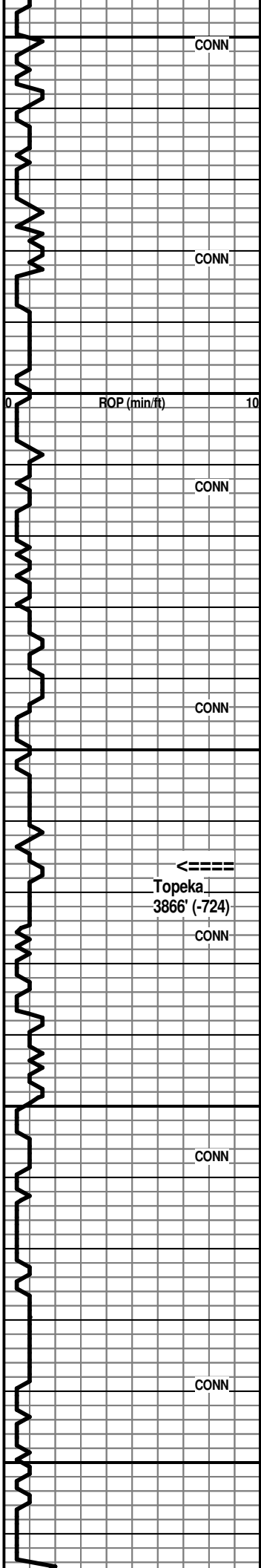
3700' spl - flood Ls: lt to med gray vfxln dense, shaly and silty IP; Sh: med to dark gray, silty IP, calcar.

20' spl - Ls: lt gray, offwhite mic-fnxln, poor-NVP; lesser offwhite suchalky to chalky; fairly minor shale %

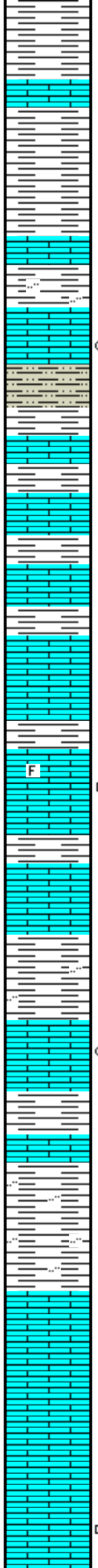
40' spl - Ls: mix AA with some med brn and gray cryptoxln; Sh: lt red mushy to silty IP

60' spl - Ls: lt gray, some tan, offwhite mic-vfxln dense; scatt. chalky; Sh: lt red and some lt gray

80' spl - Ls: predom. lt gray, offwhite vfxln dense; Sh: lt red with sl influx med to dark gray



3750
 3800
 3850
 3900
 3950



3800' spl - Sh: flood red, gummy

20' spl - Sh: med to dark gray and silty red, much decr. %; some lt gray micac. Siltst; Ls: lt gray vfxln and offwhite mic-vfxln dense; trace lt gray with spotty stain, nfo, no odor, weak milky cut

40' spl - very predom. red gummy shale; some offwhite, lt gray dense Ls

60' spl - Sh: red gummy AA; Ls: sl incr. offwhite, lt gray vfxln dense

80' spl - still very shaly, sl influx med gray; Ls: tan, lt gray cryptoxln, sl foss. poor-NVP; scatt. chips lt brn fn granular with sat. black tarry stain, no odor, nfo

3900' spl - Sh: lt to med red, gummy; Ls: tan, lt gray, offwhite vfxln to occ cryptoxln, NVP; scatt. chips with shows AA

20' spl - Sh: lt to med red, gummy to silty; some lt to med gray and gray-green; Ls: scatt. lt brn granular with sat. stain; lt gray vf-cryptoxln and offwhite mic-vfxln, NVP

40' spl - Ls: scatt. sat. stain AA; sl influx tan, lt gray cryptoxln, NVP; Sh: mix AA

60' spl - Sh: lt to med red, red-brn gummy to silty; Ls: influx lt gray, tan cryptoxln; lesser offwhite mic-vfxln dense

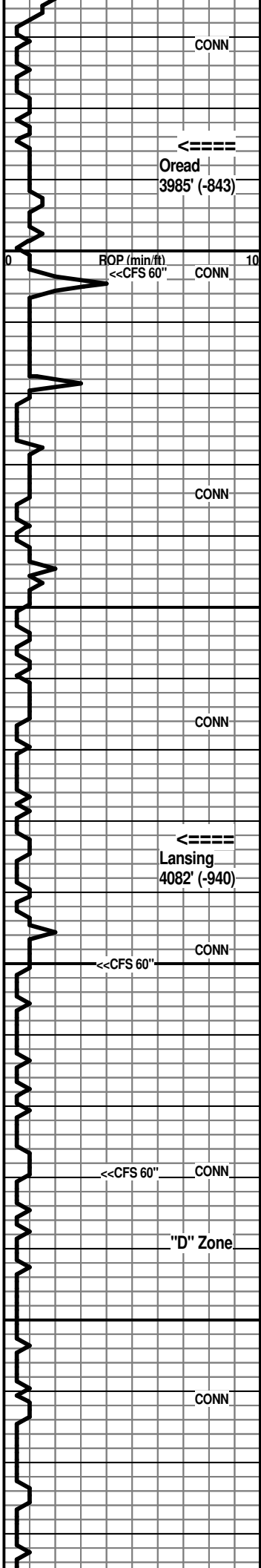
80' spl - Sh: incr. red gummy; Ls: various lt gray, tan, lt brn predom. cryptoxln

4000' spl - Sh: decr. %, but more red-maroon; Ls: incr. offwhite, lt gray mic-vfxln, poor-NVP with patchy dead gilsonite stain, no odor, nfo

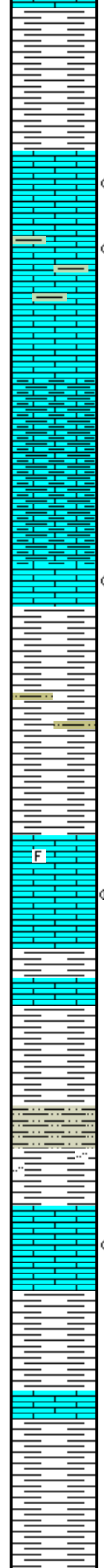
vis 65 wt 8.8 lcm 4#

Topeka 3866' (-724)

with patchy acid gas-sulfide stain, no odor, no



4000
4050
4100
4150



CFS 4003' 30" spl - Ls: lt gray vf-cryptoxln, NVP; offwhite mic-vfxln dense, subchalky IP, N.S.; some lt gray vf-cryptoxln, gran. IP with inter-particle and vug. por. with black spotty stain, trace brn fo, no odor; Sh: lt red and red-maroon; 60" spl - decr. Ls%; incr. Sh: lt red soft, silty with red-maroon

20' spl - very shaly AA with influx lt to med gray, gray-green; Ls: tan, lt gray vf-cryptoxln, N.S.; scatt. offwhite, tan sl granular with spotty dark brn stain, sl sfo, no odor

40' spl - flood Ls: lt to med gray vf-cryptoxln; lesser offwhite vfxln dense, N.S.

60' spl - Ls: flood med to dark gray vfxln, shaly; scatt. lt gray cryptoxln with spotty vug. por. with dark brn to black stain, no odor, nfo; Sh: med to dark gray calcar. shale

80' spl - very predom. gray shaly Ls and gray calcar. shale AA; scatt. lt gray granular with spotty brn stain, sl sfo, sg, ft to no odor

4100' spl - mix AA with influx lt to med gray cryptoxln Ls; some gray micac. Siltst

CFS 4100' 30" spl - Ls: tan, lt brn, lt gray cryptoxln, NVP; lesser offwhite mic-vfxln dense, subchalky, N.S.; scatt. tan cryptoxln, foss. IP. with some good vug. and intra-particle por. with brn stain, sl sfo, no odor; 60" spl - Ls: mix AA, predom. N.S.; trace lt brn granular with sat, stain; Sh: incr. med to dark gray, red-brn

30' spl - Ls and Sh mix AA; incr. med brn cryptoxln with vug. por. with lt brn stain

CFS 4130' 30" spl - Ls: mix tan, lt to med brn, lt gray predom. cryptoxln, scatt. chips with vug. por. and stain; offwhite mic-vfxln subchalky; occ offwhite vfxln with dark spotty stain; Sh: lt to med gray, red-brn, dark red, gray-green, some silty; 60" spl - mix AA incr. shales AA; some lt gray, lt brn Siltst; occ gray med grnd sl pyritic Sst

60' spl - Ls: mix AA with scatt. shows AA; Sh: lt to med red, gummy and silty IP; lt to med gray, gray-green

80' spl - Shales AA; Ls: good influx tan cryptoxln with vug. and sucrosic edge porosity with lt stain, sl sfo, ft to no odor

4200' spl - Ls: common shows AA; other tan, lt brn cryptoxln, NVP and offwhite, lt gray mic-vfxln dense; abund. Sh: med to dark gray, med to dark red-brn, brn

20' spl - very shaly AA; still carrying tan cryptoxln Ls with some vug. por. and shows

Oread 3985' (-843)

7:00 AM at 4003' on 11-18-2013
wiper trip at 4003'

Lansing 4082' (-940)

Oread
3985' (-843)

Lansing
4082' (-940)

"D" Zone

ROP (min/ft)
<<CFS 60" CONN

<<CFS 60" CONN

<<CFS 60" CONN

CONN

CONN

CONN

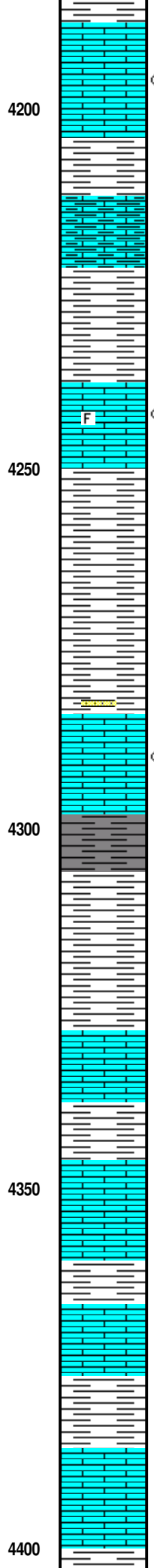
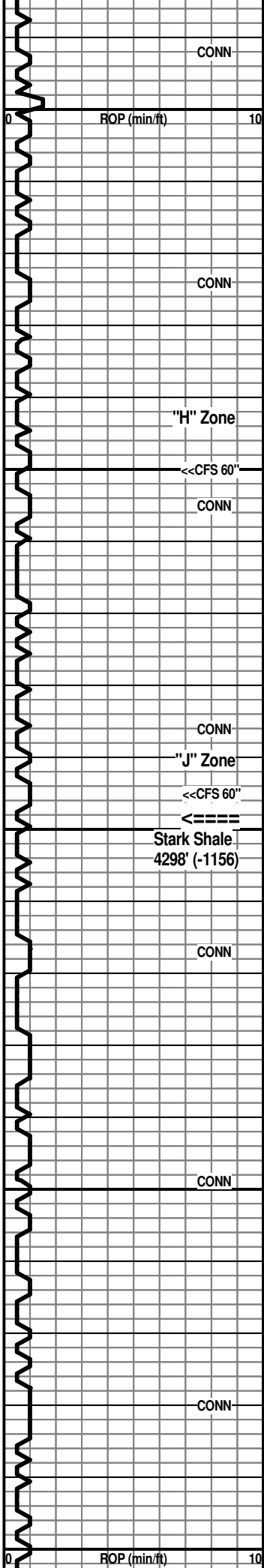
CONN

CONN

CONN

CONN

Morgan Mud Check at 4186
 12:45 PM on 11-18-2013
 wt vis wl pH chl
 9.1 60 7.2 10.0 700
 PV YP GelS lcm solids
 19 19 14/33 4# 5.7%



AA

40' spl - much decr. shale %; Ls: influx lt gray cryptoxln, NVP and offwhite, lt gray mic-vfxln dense, some poor pp por. with patchy lt brn stain and lt brn with small to med vug. por. with sat. stain

50' spl - Ls: predom. lt gray and offwhite vf-cryptoxln and lesser mic-vfxln dense, N.S.; Sh: common red-brn, lesser med to dark gray

CFS 4250' 30" spl - Sh: abund. med to dark red-brn and med to dark gray; Ls: predom. tan, lt gray cryptoxln, NVP, N.S.; scatt. offwhite, tan vf-cryptoxln with patchy stain; trace offwhite cryptoxln with vug. por. with lt stain, vsf sfo on break, no odor; trace fn granular with sat. stain

60" spl - very shaly AA; Ls: predom. tan, lt gray, offwhite vfxln to occ cryptoxln, poor-NVP, N.S.; scatt. offwhite with patchy stain; trace lt brn gran. and foss. with vug. por., sat. lt brn stain, sfo, ft to no odor

very shaly mix AA

CFS 4295' 30" spl - influx Ls: some offwhite, tan cryptoxln with spotty to good vug. por. with lt stain, vsf sfo; other offwhite mic-vfxln with pp por. with patchy stain, nfo, no odor; Sh: decr. %, but mix red-brn, med to dark gray, some brick red; 60" spl - Ls/Sh mix AA 60% shales; scatt. tan cryptoxln with shows AA; occ very coarse loose qtz grains, trace lt gray med gray Sst clusters

20' spl - Sh/Ls mix AA with scatt. shows AA; new offwhite, lt gray mic-vfxln dense, subchalky IP, occ patchy lt brn stain

40' spl - Sh: influx med to dark gray; Ls: offwhite mic-vfxln and tan, lt gray vf-cryptoxln, NVP, N.S.

60' spl - Sh: med to dark gray, dark red-brn; Ls: tan, lt to med gray predom. cryptoxln, NVP and offwhite mic-vfxln dense, subchalky IP, N.S.

80' spl - Ls: sl influx tan granular with micxln matrix and dark brn granular, NVP; other cryptoxln and dense AA; Sh: dark red-brn, med to dark gray, some gray-green

4400' spl - becoming more shale dominated with mix AA; Ls: mix AA

20' spl - Ls: predom. offwhite, tan fn granular, sl mottled; lesser lt gray, tan cryptoxln and offwhite mic-vfxln dense; Sh: med to dark red-brn, lt to med gray, some mottled gray/red

40' spl - very predom. Sh: now lt red, red-brn

jet #1 add premix

Stark Shale 4298' (-1156)

