

Wellsite Services, LLC

John Goldsmith
(316) 640-0236

427 Roosevelt St.
Cheney, KS 67025

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

Well Name: #1 Blau 16C
API: 15-109-21472
Location: 615' FSL & 860' FWL, Sec 16-15S-36W, E/2 SW SW
License Number: REI #4767
Spud Date: 1/23/2017
Surface Coordinates: LAT: 38.7464520
LONG: -101.3322799
Bottom Hole Vertical Hole
Coordinates: 1 Degree Deviation
Ground Elevation (ft): 3346'
Logged Interval (ft): 3750' To: RTD
Formation: Mississippian at RTD
Type of Drilling Fluid: Chemical

Region: Logan County
Drilling Completed: 2/03/2017

K.B. Elevation (ft): 3349'
Total Depth (ft): 5020'

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

OPERATOR

Company: Ritchie Exploration Inc.
Address: 8100 E. 22nd St. N. #700
Wichita, KS 67226
(316) 691-9500

GEOLOGIST

Name: John Goldsmith
Company: Wellsite Services LLC
Address: 427 Roosevelt St.
Cheney, KS 67025
(316) 640-0236

RIG RECORDS

Contractor: WW Drilling Rig #10
Pusher: Ricky Hilgers

Collar Tally: 496'

Pump: Emsco D-300
Liner & Stroke: 6 x 14

BIT RECORDS

Size:	Type:	Footage:	Condition:	Hours:	Serial #:
12 1/4"	Sm-tooth	0-220'	RR	2	RH6605
7 7/8"	Sm-F27	220'-5020'	New	119.25	RJ0642

COMMENTS

Surface Casing: 5 joints of 8 5/8" set @ 220'
Production Casing: 5.5" production casing was set.
Mud by: MudCo
DST's by: Diamond Testing
Logs by: Pioneer Energy Services (DIL, CN-CD, ML)
RTD = 5020' LTD = 5022'

FORMATION TOPS

FORMATION	SAMPLE TOPS		LOG TOPS	
	Depth	Datum	Depth	Datum
Heebner Shale	4050'	-701	4050'	-701
Toronto	4073'	-724	4073'	-724
Lansing	4095'	-746	4097'	-748
Muncie Creek Shale	4277'	-928	4278'	-929
Stark Shale	4369'	-1020	4370'	-1021
Hushpuckney Shale	4412'	-1063	4414'	-1065
Base of KC	4454'	-1105	4456'	-1107
Marmaton	4494'	-1145	4495'	-1146
Altamont	4511'	-1162	4513'	-1164
Pawnee	4602'	-1253	4603'	-1254
Myrick Station	4644'	-1295	4644'	-1295
Ft Scott	4660'	-1311	4660'	-1311
Cherokee Shale	4690'	-1341	4690'	-1341
Johnson Zone	4774'	-1425	4776'	-1427
Morrow	4827'	-1478	4829'	-1480
Mississippian	4949'	-1600	4950'	-1601
RTD	5020'	-1671		
LTD			5022'	-1673

DST's

DST #1 "Toronto" 4018'-4090' 1-27-17 30-45-45-60

1st Blw: 1/4" blw blt to BOB in 29min (No BB)

2nd Blw: Wk surf blw blt to BOB in 38min (No BB)

IFP: 14-106# ISIP: 1101# FFP: 109-187# FSIP: 1086#

Hyd: 1928-1918#

Rec: 145' MCW (55%Wtr), 250' SMCW (88%Wtr).

DST #2 "Lansing A" 4093'-4124' 1-28-17 30-30-30-30

1st Blw: 3.5" blw blt to BOB in 1.5min (No BB)

2nd Blw: 1.5" blw blt to BOB in 2.5min (No BB)

IFP: 195-817# ISIP: 1161# FFP: 832-1062# FSIP: 1165#

Hyd: 1931-1925#

Rec: 330' MCW (69%Wtr), 500' SMCW (98%Wtr), 1515' Wtr.

DST #3 "Lansing C" 4130'-4158' 1-29-17 30-45-45-60

1st Blw: Wk surf blw blt to 10" (No BB)

2nd Blw: Wk surf blw blt to BOB in 43.5min (No BB)

IFP: 13-98# ISIP: 1129# FFP: 99-166# FSIP: 1114#

Hyd: 1937-1935#

Rec: 100' WMw/OS (50%Wtr), 250' SMCW (91%Wtr).

DST #4 "Lansing D/E/F" 4160'-4234' 1-29-17 30-45-45-60

1st Blw: 1" blw blt to BOB in 5.5min (No BB)

2nd Blw: Wk surf blw blt to BOB in 7.5min (No BB)

IFP: 44-279# ISIP: 1154# FFP: 289-504# FSIP: 1127#

Hyd: 1969-1958#

Rec: 95' SWCMw/TrO (4%Wtr), 380' HMCWw/TrO (52%Wtr), 250' MCW (78%Wtr), 315'SMCW (93%Wtr), 60' WCM (24%Wtr).

DST #5 "Lansing I" 4318'-4346' 1-30-17 30-45-45-60

1st Blw: Wk surf blw blt to BOB in 20min (No BB)

2nd Blw: VWk surf blw blt to BOB in 27.5min (No BB)

IFP: 16-137# ISIP: 1225# FFP: 139-252# FSIP: 1206#

Hyd: 2049-2046#

Rec: 1' CO, 35' OHMCW (17%O, 44%Wtr), 190' SOHMCW (2%O, 58%Wtr), 255' SOMCW (3%O, 92%Wtr), 60' SOHWCM (1%O, 44%Wtr).

DST #6 "Altamont A" 4470'-4534' 1-31-17 30-45-45-60

1st Blw: 1" blw blt to BOB in 5.5min (2.5" BB)

2nd Blw: Wk surf blw blt to BOB in 7.5min (1.25" BB)

IFP: 45-251# ISIP: 1251# FFP: 261-463# FSIP: 1239#

Hyd: 2181-2129#

Rec: 485' GIP, 335' GO (89%O), 690' GSMCO (12%G, 83%O), 190' GHOCM (6%G, 45%O).

ROCK TYPES



Anhy



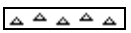
Dol



Sltst



Sandylms



Cht



Lmst



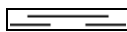
Ss



Shaly ls



Congl



Shale



Carb sh

ACCESSORIES

EVENTS

Circ

Conn

FOSSIL

Brach

Bryozoa

Crin



Foram



Fossil



Gastro



Oolite



Ostra



Fuss



Oolcast

MINERAL

Calc

Chtdk

Chtlt

Glau

Pyr

Sil

TEXTURE

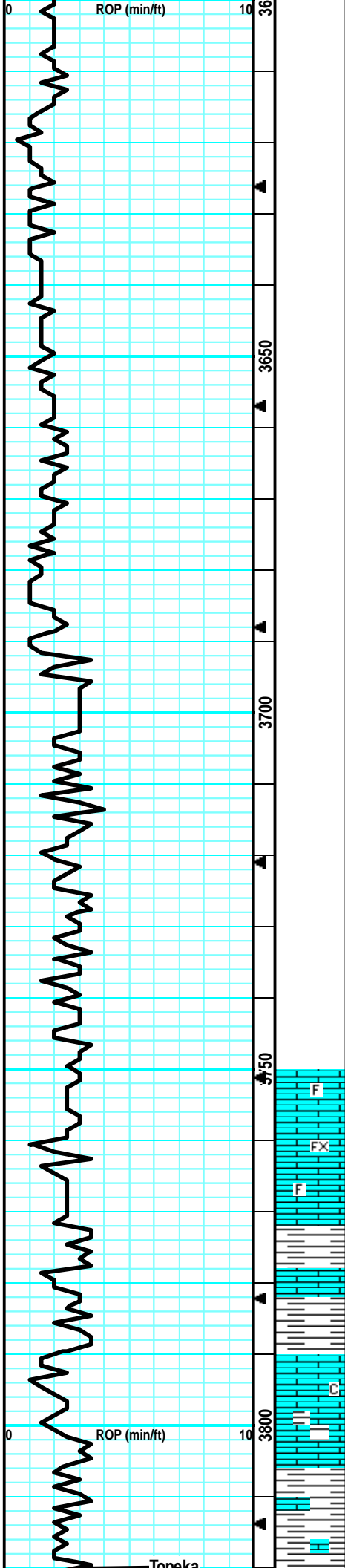
Chalky

Crsxln

Finexln

Microxln

Drilling Time ROP (min/ft)	Depth Lithology	CFS Point Oil Shows	Geological Descriptions	Remarks
			<p>Morning Activity/Depth:</p> <p>Jan 23, 2017: Spud 1/24/17: drlg @ 256' 1/25/17: drlg @ 2590' 1/26/17: drlg @ 3470' (Mud Up) 1/27/17: Shot Trip @ 4003' (DST #1) 1/28/17: Circulating @ 4124' (DST #2 & DST #3) 1/29/17: Tripping Pipe after test (DST #4) 1/30/17: Circulating @ 4316' (DST #5) 1/31/17: drlg @ 4425' (DST #6) 2/1/17: drlg @ 4545' 2/2/17: drlg @ 4840' 2/3/17: TD @ 5020' (Ran Elec-Log)</p>	<p>MudCo Check #1 @ 0' on 01/18/17 Survey @ 220' = 1/4 Degree</p> <p>Anhydrite @ 2626' (+723)</p> <p>MudCo Check #2 @ 643' 01/23/17 @ 10:20am Wt: 8.5 Vis: 27 pH: 8.0 Filt: n/c Chr: 200 LCM: 0#</p> <p>B/Anhydrite @ 2644' (+705)</p>
			<p>Drilling Time @ 3500' on 1/26/2017</p>	<p>MudCo Check #3 @ 2743' 01/25/17 @ 9:40am Wt: 9.5 Vis: 32 pH: 7.0 Filt: n/c Chr: 59.5K LCM: 4#</p> <p>Displaced 680bbls of Mud @ 3451'</p>
				<p>MudCo Check #4 @ 3528' 01/26/17 @ 9:50am Wt: 8.6 Vis: 67 pH: 11.5 Filt: 8.0 Chr: 3K LCM: 1.5#</p>



Samples Begin @ 3750' on 1/26/2017

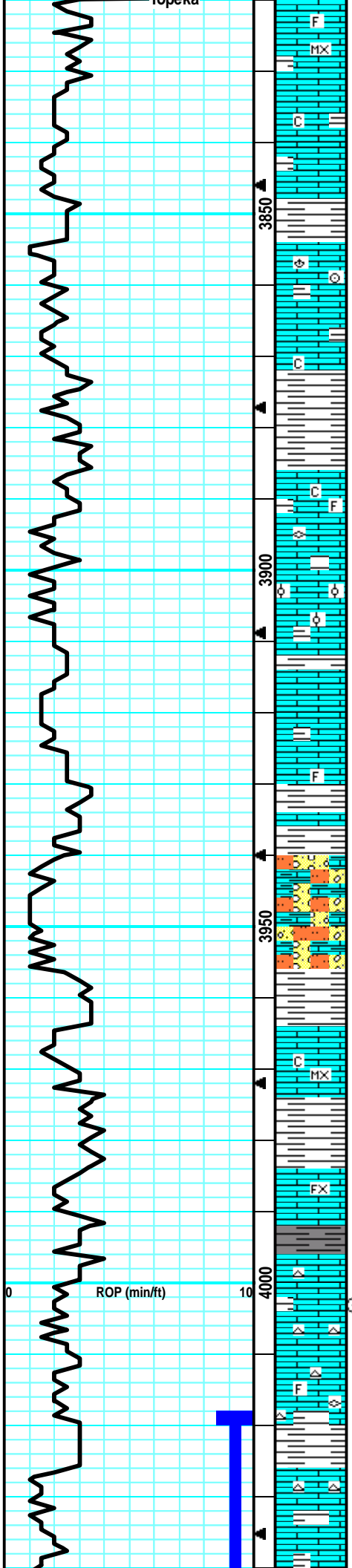
LS: gry/tan, slight mott, fn xln, fw foss, no vis por, no cup odr, ns.

LS: tan/lt gry, mott in prt, fn xln, fw foss frags, no vis por, no cup odr, ns.

LS: lt gry/lt tan, fn xln, fw foss, flaky, chlky, tr no vis por, no cup odr, ns.

LS: lt gry/lt tan, mott, fn xln, dense, tr no vis por, inflix
SH: brn, silty, gritty/sandy, sm firm, no cup odr, ns.

LS: lt tan/ltgry, slight mott, fn xln, dense, firm, fw foss, tr-nvp, sm SH: gry/brn, gritty, silty, sm friable, med crush, no cup odr, ns.



LS: crm/lt tan, sing, micro-fn xln, fw foss frags, dense/firm, tr-nvp, fw SH: gry/brn, silty, soft, no cup odr, ns.

Much of the same: influx SS: silv/gry, fn grn, sub-rnd, arg, firm, tr-? intgrn por, no cup odr, ns.

LS: gry/tan, mott, fn xln, firm, foss w/ brach/crin, sm pr intfoss por, no cup odr, ns.

LS: lt tan, sing, micro-fn xln, deense, sm firm, fw sub chlky, tr-nvp, no cup odr, ns.

Mostly same: Lrg influx pur chlck, svrl SH: drk gry/brn, silty, soft, no cup odr, ns.

SH: gry/lt brn, silty, v soft, muddy, fw blk, friable, carb, no cup odr, ns.

Fw SltStn: brn/lt brn, gritty, silty, soft, fw LS: gry/tan, mott, foss w/ fuss/frags, tr-nvp, no cup odr, ns.

LS: tan, grainy, firm, fw ool, dense, matrck, tr-nvp, fw SH: gry/grn, silty, no cup odr, ns.

Much of the same w/ larg amout of pur chlck.

LS: tan/gry, mott, fn xln, fw foss frags, tr-nvp, fw SH: gry/grn, silty, gritty, no cup odr, ns.

SH: gry/grn, silty, soft, fw blk, carb, friable, no cup odr, ns.

SH: gry/brn, silty, sm SltStn: brn, gritty, v soft, sm muddy, fw LS: gry/tan, mott, dense, foss, tr-nvp, no cup odr, ns.

LS: crm/lt tan, sing, micro-fn xln, dense, firm, tr-nvp, no cup odr, ns.

Fw SH: gry/brn, silty, sm gritty, no cup odr, ns.

LS: lt tan/gry, slght mott, fn xln, dense, fw flakey, tr-nvp, no cup odr, ns.

60" smpl Influx SH: drk gry/brn, silty, gritty, med crush, no cup odr, ns.

LS: gry/brn, slght mott, fn xln, dense, firm, tr-nvp, fw Chert: wht/opaque, svrl SH: gry/brn, silty, no cup odr, ns.

LS: lt tan, sing, fn xln, foss w/ fuss/frags, dense, tr-nvp, fw Chert: wht/opaq, foss, no cup odr, ns.

LS: tan, fn xln, sub-chlky, scat fr vuggy por, sphr of oil cling to rx chp, fr cup odr, frsfo.

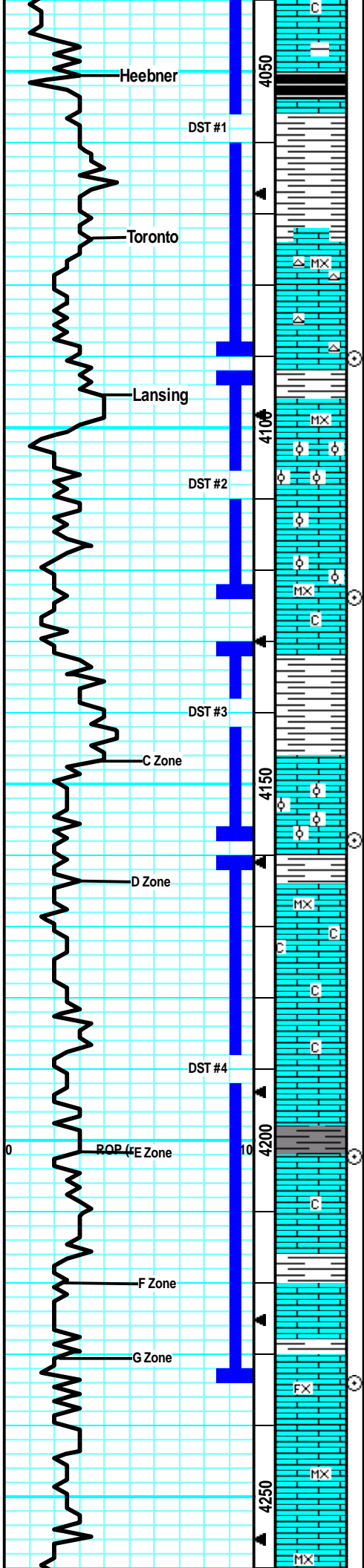
LS: tan/gry, fn xln, scat vuggy por, hvy stns in por, gas bub in vug, sml shpr of oil, gd fluor/cut, fr cup odr, fr sfo in 4-5 pcs/trv

MudCo Check #5 @ 4003'
01/27/17 @ 9:35am
Wt: 8.9 Vis: 54
pH: 11.0 Fil: 7.2
Chlr: 3.4K LCM: 2#

Short Trip 32 Stands @ 4003', Circ for 60"

CFS @ 4003'
30"/60"

DST #1 "Toronto" 4018'-4090' 1-27-17
30-45-45-60
1st Blw: 1/4" blw blt to BOB in 29min (No BB)
2nd Blw: Wk surf blw blt to BOB in 38min (No BB)
IFP: 14-106# ISIP: 1101# FFP: 109-187# FSIP: 1086#
Hyd: 1928-1918#
Rec: 145' MCW (55%Wtr), 250' SMCW (88%Wtr).



SH: blk, silty, carb, friable.
 LS: gry/tan, mott, fn xln, fw foss, tr-nvp, no cup odr, ns.
 SH: gry/brn, silty, sm soft.
 LS: crm/lt tan, sing, micro-fn xln, dense, tr-nvp, fw
 Chert: wht/opaq, sharp, no cup odr, ns.
 LS: lt tan, fn xln, fr intxln por, lght brn stns, gd fluor,
 strm cut, fr-gd cup odr, 2 sml sphr oil cling to rx chp,
 7-8 pcs/try, fr sfo.
 60" Smpl: svrl more pcs w/ sho, more dense rx,
 micro-fn xln, sm gd por, only fr cup odr, fr sfo.
 LS: crm/lt tan, micro-fn xln, dense, brittle, spttd drk brn
 stns, gd fluor/cut, ssfo, svrl SH: gry/brn, silty, sm
 fissile, no cup odr, ns.
 LS: tan, mott, v ool, fr-tight intool por, sm v chlky, drk
 stns in por, fr sho fo on brk, gd fluor/cut, fr cup odr,
 abund pur chl. k.
 LS: tan, fn xln, sm ool, fw ool pcs w/ tight intool por,
 ssfo, faint cup odr, abund pur chl. k.
 LS: lt tan, micro-fn xln, dense, sm brittle, por intxln por
 in sm, vvsfo, faint cup odr.
 60" Smpl: LS: crm/lt tan, micro-fn xln, sm intool por, slght vuggy, svrl
 pcs pur chl. k, ssfo, faint cup odr.
 LS: crm/lt tan, fn xln, mostly dense, brittle, tr-nvp, sm SH: brn/grn,
 silty, sm soft, no cup odr, ns.
 LS: gry/brn, mott, fn xln, flakey/mealy, firm, tr-nvp, fw
 SH: gry/brn, silty, no cup odr, ns.
 SH: gry/brn, silty, soft, no cup odr, ns.
 LS: tan/lt tan, slght mott, fn xln, sm v ool, sm dense, pr
 intool por, fw w/ fr intxln por, hvy stns in por, gd sfo on
 brk, dul yel fluor, strm cut, gd cup odr, svrl pcs/try.
 LS: tan/gry, mott, micro-fn xln, fr intxln por, scat vug, fr
 sfo, sm drk dead oil, gd fluor/cut, faint cup odr, poss
 from base of the "C" zone.
 LS: tan/gry, mott, fn xln, gd vuggy por, hvy stns in por,
 sphr oil cling to rx chp, fr cup odr, svrl pcs/try, gd sho
 fo.
 LS: gry, fn xln, sm dense, many flakey, sub chlky in
 prt, tr-nvp.
 LS: gry/lt tan, fn xln, sm vuggy, ssfo in por, dul yel
 fluor/stream cut, gd cup odr.
 LS: tan/gry, slght mott, fn xln, dense, firm, sm flakey,
 scat vuggy por, stn in por, sphr of oil on rx chp, strg
 cup odr, ssfo.
 LS: gry/lt tan, slght mott, fn xln, dense, firm, fw
 flakey/mealey, tr-nvp, fnt cup odr, fw pcs w/ patchy brn
 stns, vssfo on brk in cpl pcs.
 LS: gry/lt tan, mott in prt, fn xln, dense, firm, many
 flakey, tr-nvp, fw SH: gry, silty, no cup odr, ns.
 LS: tan/lt tan, slght mott, fn xln, fw dense, chlky, tr-nvp,
 svrl SH: grygrn, silty, no cup odr, ns.
 LS: crm/lt tan, sing, micro-fn xln, dense, brittle, chlky,
 tr-nvp.
 LS: crm, sing, micro xln, dense, brittle, tr-nvp, no cup
 odr, ns.

Heebner @ 4050' (-701)

Survey @ 4090' = 1 Degree

Toronto @ 4073' (-724)

CFS @ 4090'
30"/60"

Lansing @ 4095' (-746)

DST #2 "Lansing A" 4093'-4124' 1-28-17
30-30-30-30

1st Blw: 3.5" blw blt to BOB in 1.5min (No BB)
 2nd Blw: 1.5" blw blt to BOB in 2.5min (No BB)
 IFP: 195-817# ISIP: 1161# FFP: 832-1062# FSIP:
 1165#
 Hyd: 1931-1925#
 Rec: 330' MCW (69%Wtr), 500' SMCW (98%Wtr),
 1515' Wtr.

CFS @ 4124' **Strap Pipe: 1.54'**
30"/60" **Long to Board**

MudCo Check #6 @ 4124'
01/28/17 @ 9:20am
Wt: 9.1 Vis: 53
pH: 11.0 Filt: 8.0
Chlr: 4K LCM: 1#

CFS @ 4158'
30"/60"

DST #3 "Lansing C" 4130'-4158' 1-29-17
30-45-45-60

1st Blw: Wk surf blw blt to 10" (No BB)
 2nd Blw: Wk surf blw blt to BOB in 43.5min (No BB)
 IFP: 13-98# ISIP: 1129# FFP: 99-166# FSIP:
 1114#
 Hyd: 1937-1935#
 Rec: 100' WMw/OS (50%Wtr), 250' SMCW
 (91%Wtr).

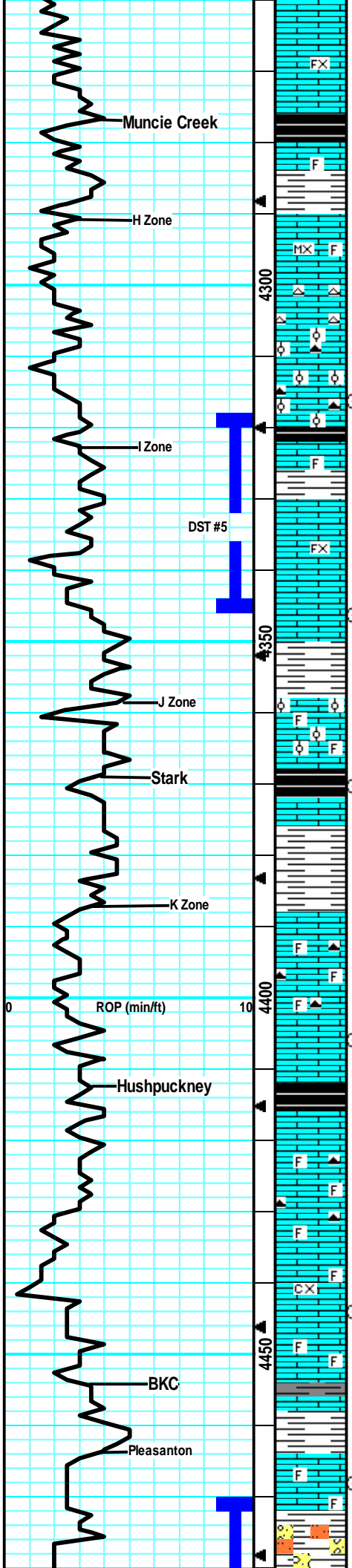
MudCo Check #7 @ 4188'
01/29/17 @ 8:45am
Wt: 9.0 Vis: 59
pH: 10.5 Filt: 8.8
Chlr: 6.1K LCM: 2#

CFS @ 4202'
30"/60"

DST #4 "Lansing D/EF" 4160'-4234' 1-29-17
30-45-45-60

1st Blw: 1" blw blt to BOB in 5.5min (No BB)
 2nd Blw: Wk surf blw blt to BOB in 7.5min (No BB)
 IFP: 44-279# ISIP: 1154# FFP: 289-504# FSIP:
 1127#
 Hyd: 1969-1958#
 Rec: 95' SWCMw/TrO (4%Wtr), 380' HMCWw/TrO
 (52%Wtr), 250' MCW (78%Wtr), 315' SMCW (93%Wtr),
 60' WCM (24%Wtr).

CFS @ 4202'
30"/60"



LS: Lt tan/lt gry, slight mott, fn xln, dense, chlky, fw flakey like, tr-nvp.

LS: gry, slight mott, fn xln, flakey, sub chlky, dense, no cup odr, ns.

SH: blk, silty, carb, sm friable.

LS: gry/tan, mott, fn xln, foss w/ frags, flakey, firm, tr-nvp, no cup odr, ns.

LS: crm/lt tan, micro-fn xln, fw foss frags, mostly dense, abund chlky, tr-nvp, 2 pcs w/ tight scat vugs, lght brn stns, gd fluor/cut, ? sho fo on brk only, fw SH: gry.

LS: Lt gry/lt tan, fn xln, dense, chlky, jtr-nvp, fw Chert: wht/opaque, foss, sharp, no cup odr, ns.

LS: Lt tan, fn xln, sm ool, mostly dense, sm firm, tr-nvp, fw Chert: brn, foss, sharp, no odr, ns.

LS: gry/lt tan, fn xln, sm v ool, fw dense, firm, tr-nvp, svrl Chert: tan, ool/foss, sharp, no odr, ns.

LS: gry/tan, mott, fn xln, foss, dense, flakey, tr-? intxln por, svrl SH: blk, carb, silty, no odr, ns.

LS: tan, mott, fn xln, sm brittle, sub-chlky, sm fr intxln por w/ scat vugs, drk brn stns in por, vssfo on brk, gd fluor/cut, wk cup odr.

LS: Lt gry/lt tan, slight mott, fn xln, sub-chlky, fw flakey, tr-nvp, no cup odr, ns.

LS: gry/tan, mostly sing, fn xln, many dense, sm brittle, sub-chlky, 3 pcs w/ pr intxln por on edges, drk brn stn on edge, wk-? fluor, pos cut, no cup odr, nsfo.

LS: drk gry/lt brn, mott, profus ool/foss, dense, sm firm, tr-pr intfoss por in v fw pcs, sm SH: gry, silty, no odr, ns.

LS: gry/lt tan, sing, fn xln, dense, sm brittle, tr-nvp, no cup odr, ns.

SH: blk, carb, silty, sm friable, no odr, ns.

LS: tan/gry, slight mott, fn xln, dense, firm, tr-nvp, abund SH: gry/blu, silty, gritty, friable, no odr, ns.

LS: tan/gry, mott, fn xln, foss, sm flakey, many firm, tr-nvp, no odr, ns.

LS: gry/tan, mott in prt, fn xln, v foss, many flakey/mealy, sub-chlky, brittle, tr-nvp, fw Chert: gry, foss, sharp, no cup odr, ns.

LS: gry/lt tan, sing, fn xln, dense, firm, sub-chlky in prt, tr-nvp, no odr, ns.

SH: blk, carb, silty, friable.

LS: gry/tan, slight mott, fn xln, dense, flakey, firm, tr-nvp, no odr, ns.

LS: gry, mott, fn xln, v foss, v flakey/mealy, chlky in prt, tr-nvp, sm Chert: gry, foss, sharp, no odr, ns.

LS: tan/gry, slight mott, fn-crs xln, flakey/mealy, brittle, sub-chlky, tr-nvp, no odr, ns.

LS: gry/tan, mott, fn xln, v foss, flakey, tr-nvp, no cup odr, ns.

LS: tan/gry, mott, fn xln, foss, dense, firm, tr-nvp, svrl SH: drk gry, silty, med crush, no odr, ns.

LS: gry, mott, fn xln, v foss, brittle, chlky, tr-nvp, fw SH: gry, silty, no odr, ns.

LS: gry, mott, fn xln, many foss, grain in sm, tr-nvp, no odr, ns.

LS: gry/lt brn, mott, fn xln, many foss, flakey, sm brittle, tr-nvp, sm SH: brn/gry, silty, med crush, fw

Muncie Creek @ 4277' (-928)

CFS @ 4316'
30"/60"

DST #5 "Lansing I" 4318'-4346' 1-30-17
30-45-45-60
1st Blw: Wk surf blw bit to BOB in 20min (No BB)
2nd Blw: VWK surf blw bit to BOB in 27.5min (No BB)
IFP: 16-137# ISIP: 1225# FFP: 139-252# FSIP: 1206#
Hyd: 2049-2046#
Rec: 1' CO, 35' OHMCW (17%O, 44%Wtr), 190'
SOHMCW (2%O, 58%Wtr), 255' SOMCW (3%O, 92%Wtr), 60' SOHWCW (1%O, 44%Wtr).

CFS @ 4346'
30"/60"

MudCo Check #8 @ 4346'
01/30/17 @ 9:20am
Wt: 9.2 Vis: 51
pH: 11.0 Filtr: 7.2
Chir: 5.5K LCM: 1.5#

Stark @ 4369' (-1020)

CFS @ 4370'
30"/60"

CFS @ 4406'
30"/60"

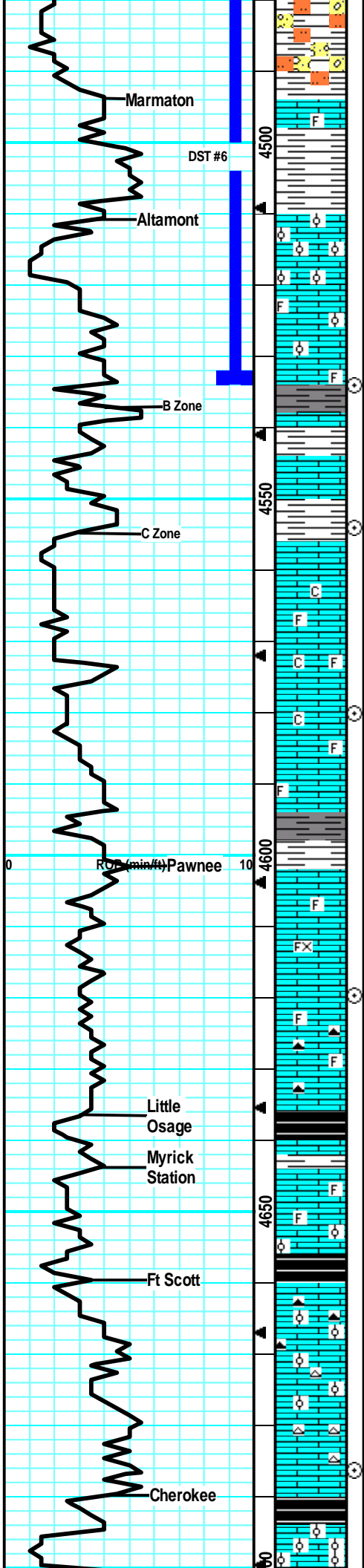
Hushpuckney @ 4412' (-1063)

CFS @ 4444'
30"/60"

BKC @ 4454' (-1105)

CFS @ 4468'
30"/60"

MudCo Check #9 @ 4468'
01/31/17 @ 10:45am
Wt: 9.2 Vis: 61
pH: 10.5 Filtr: 8.8



brittle, tr-nvp, sm SH: drk gry, silty, med crush, fw
StStn: lt gry/lt brn, gritty, friable, soft, no cup odr, ns.

Marmaton @ 4494' (-1145)

LS: gry/tan, slight mott, fn-crs xln, foss, flakey/mealy,
tr-? intxln por, fw SH: gry/brn, silty, no odr, ns.

Altamont @ 4511' (-1162)

SH: gry/brn, silty, soft, sm muddy like, fw LS: gry,
mott, fn-crs xln, mott, tr-nvp, no odr, ns.

LS: gry/tan, mott, fn xln, sm profus ool, gd intool/vuggy
por in svrl, drk hvy saturation in por, free oil in por,
gas bub on brk, gd sfo in 10+ pcs, fr-gd cup odr.

DST #6 "Altamont A" 4470'-4534' 1-31-17
30-45-45-60
1st Blw: 1" blw blt to BOB in 5.5min (2.5" BB)
2nd Blw: Wk surf blw blt to BOB in 7.5min (1.25"
BB)
IFP: 45-251# ISIP: 1251# FFP: 261-463# FSIP:
1239#
Hyd: 2181-2129#
Rec: 485' GIP, 335' GO (89%O), 690' GSMCO
(12%G, 83%O), 190' GHOCM (6%G, 45%O).

LS: gry/tan, mott, fn xln, ool/foss, much tighter por,
scat vugs, fr sfo in svrl pcs, fnt cup odr.

LS: gry/tan, slight mott, fn xln, dense, sm flakey, tr-nvp,
no odr, ns.

LS: tan/lt gry, fn xln, dense, sub-chlky, tr-nvp, svrl SH:
gry/brn, silty, med crush, no odr, ns.

CFS @ 4534'
30"/60"

LS: tan/lt gry, fn xln, sub chlky, sm brittle, pr intxln por
in cpl pcs, lght brn scat stn, nsfo, wk fluor, pos cut, no
cup odr.

LS: crm/lt tan, sing, fn xln, dense, brittle, sub-chlky,
tr-nvp, no odr, ns.

LS: gry/tan, fn xln, sm ool, flakey/mealy, brittle, tr-nvp,
abund pur chl, tr-nvp, sm SH: gry/blu, silty, soft, no
cup odr, ns.

CFS @ 4554'
30"/60"

LS: gry/tan, mott, fn xln, foss, brittle, profus chlky,
tr-nvp, abund pur chl, no odr, ns.

LS: gry/tan, mott, fn xln, grainy, foss, sm brittle, tr-nvp,
fw SH: gry, silty, no odr, ns.

CFS @ 4580'
30"/60"

LS: gry/lt brn, mott, fn xln, fw foss frags, flakey, firm,
tr-nvp, fw pcs pur chl, fw SH: gry, silty, no odr, ns.

MudCo Check #10 @ 4585'
02/01/17 @ 10:50am
Wt: 9.2 Vis: 64
pH: 10.0 Filt: 9.6
Chr: 9.0K LCM: 1#

LS: gry/tan, mott, fn xln, fw foss, mostly dense, firm,
fw flakey, tr-nvp, sm SH: drk gry, silty, no odr, ns.

Pawnee @ 4602' (-1253)

LS: gry/brn, fn xln, dense, firm, tr-nvp, no odr, ns.

CFS @ 4620'
30"/60"

LS: gry/lt brn, mott, fn xln, foss, flakey, sm brittle,
tr-nvp, fw SH: drk gry, silty, no odr, ns.

sm Chert: drk gry, smokey, foss, sharp.

SH: blk, carb, silty, friable.

Myrick Station @ 4644' (-1295)

LS: gry/tan, fn xln, fw foss, flakey/mealy, sm grainy
like, tr-nvp, fw SH: gry/blk, silty, sm carb, no cup odr,
ns.

LS: lt gry/tan, fn xln, sm foss, sm ool, mostly dense,
sm brittle, tr-nvp, fw Chert: gry, ool, sharp, no odr, ns.

Ft Scott @ 4660' (-1311)

SH: blk, silty, carb, friable.

LS: tan, fn xln, v ool, mostly dense, sm firm, tr-nvp, sm
Chert: gry, ool, sharp, no odr, ns.

LS: gry/tan, fn xln, sm ool, many dense, sub-chlky,
tr-nvp, sm Chert: wht/gry, foss, sharp, no odr, ns.

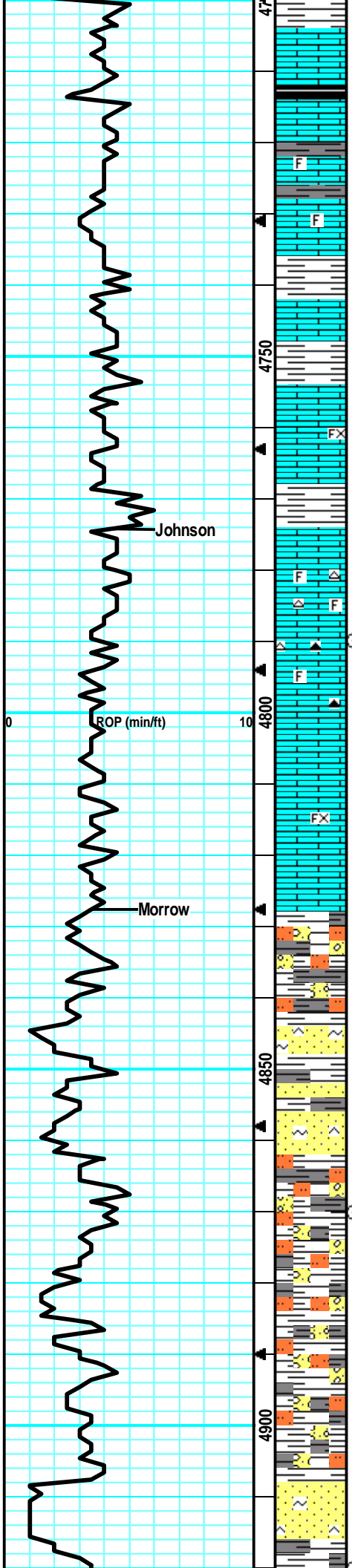
CFS @ 4686'
30"/60"

LS: gry/tan, fn xln, fn xln, dense, sm flakey, sub-chlky,
tr-nvp, fw Chert: wht/gry, foss, sharp, no odr, ns.

SH: blk, silty, carb, friable.

Cherokee @ 4690' (-1341)

LS: gry/tan, mott, fn xln, sm v ool, fw brittle, griany
like, fw dense, tr-nvp, svrl SH: drk gry/blk, silty, sm



LS: tan/gry, slight mott, fn xln, flakey/mealy, sm dense, firm, tr-nvp, sm SH: drk gry/blk, silty, sm carb, no odr, ns.

LS: tan/gry, slight mott, fn xln, flakey/mealy, sm dense, firm, tr-nvp, sm SH: drk gry/blk, silty, carb, no odr, ns.

LS: tan/gry, fn xln, foss in prt, mostly dense, firm, tr-nvp, svrl SH: drk gry/blk, silty, sm carb, no odr, ns.

LS: tan/gry, mott in prt, fn xln, fw foss, sm dense, many flakey, firm, tr-nvp, svrl SH: drk gry/blk, silty, sm carb, no odr, ns.

LS: gry/tan, slight mott, fn xln, dense, sandy in prt, tr-nvp, abund SH: drk gry/blk, silty, soft, sm carb, no odr, ns.

LS: tan/lt gry, slight mott, fn xln, dense, sub-chlky, fw flakey, tr-nvp, fw SH: gry, silty, no odr, ns.

LS: tan/lt gry, slight mott, fn xln, dense, firm, sm flakey, sub-chlky, tr-nvp, fw pcs pur chl, fw SH: gry, silty, no odr, ns.

LS: tan/lt gry, slight mott, fn xln, fw foss, flakey, brittle, sub-chlky, tr-nvp, fw Chert: wht/tan, foss, sharp, no odr, ns.

LS: gry/lt gry, slight mott, fn xln, fw foss frags, many flakey, tr-nvp, fw Chert: gry, smokey, foss, sharp, fw SH: gry, silty, no odr, ns.

LS: tan/gry, slight mott, fn xln, sm dense, many flakey, firm, tr-nvp, sm SH: gry, silty, no odr, ns.

LS: gry, mott, fn xln, flakey, firm, tr-nvp, fw SH: gry, silty, no odr, ns.

SH: gry/brn/grn/yel, sm wthrd, soft, silty, fw LS: gry, mott, fn xln, flakey, tr-nvp, no cup odr, ns.

SH: gry/brn, silty, soft, sm yel wthrd, fw SS: wht/crm, fn grn, sub rnd, friable, firm, sm glauc, tr-? intgrn por, no odr, ns.

SH: gry/brn, silty, sm soft.

SS: gry/why, fn grn, sub-ang, fw brittle, sm firm, sil cem, sm arg/chlky, fw glauc, no sho, no odr.

SH: gry/brn, silty, sm soft, no odr, ns.

SH: gry/brn, silty, soft, sm SltStn: gry, gritty, v soft, friable, no odr, ns.

SH: gry/brn/yel, silty, soft, fw fissile, sm wthrd, fw SltStn: gry/brn, gritty, v soft, friable, no odr, ns.

SH: drk gry/brn/yel, silty, soft, sm wthrd, fw SS: gry/wht, sub rnd, arg, sm glauc, sil cem, tr-? intgrn in fw, no odr, ns.

SS: gry/crm, fn grn, sub ang, silc cem, sm glauc, fw silty/arg, tr-pr intgrn or in sm, no cup odr, ns.

Johnson @ 4774' (-1425)

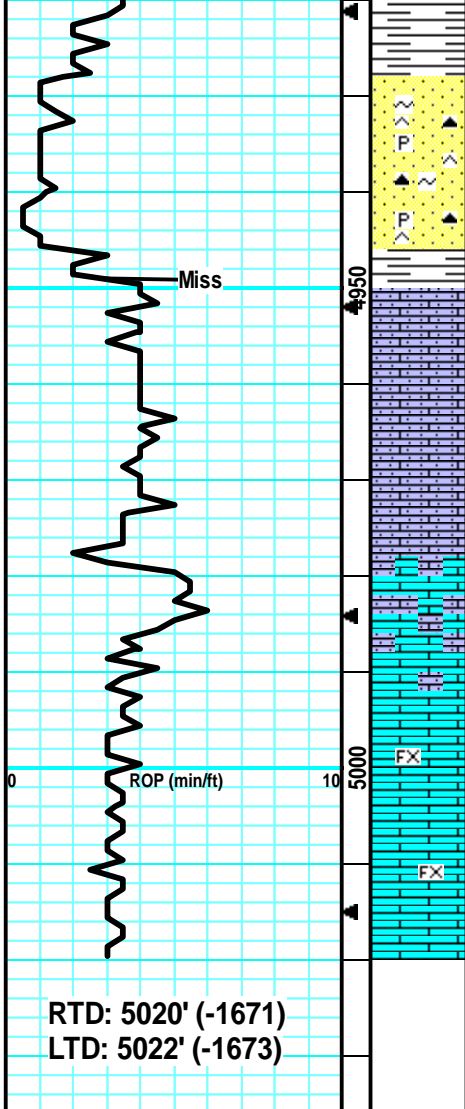
CFS @ 4790'
30"/60"

Morrow @ 4827' (-1478)

CFS @ 4870'
30"/60"

MudCo Check #11 @ 4905'
02/02/17 @ 11:00am
Wt: 9.2 Vis: 63
pH: 10.0 Filt: 8.8
Chlr: 9.3K LCM: 2#

CFS @ 4920'



SH: gry/brn, silty, soft, sm SlStn: gry, gritty, v soft, no odr, ns.
 SH: gry/grn/brn, silty, soft, sm muddy, fw SS: gry/grn, sm firm, fn grn, arg, sm glauc, tr-nvp, no odr, ns.
 SS: pale grn, crs grn, sub-ang, arg, glauc, sm silty, sm frim, tr-nvp, no fluor, no sho, no odr.
 SS: gry/wht/grn, fn-crs grn, sub-ang, arg, sm friable, sm firm, fw glauc, tr-nvp, sm Chert: org/pnk, trip, sharp, svrl pcs pyr, no odr, ns.
 SH: drk gry/gry, silty, soft.
 LS: crm/why, fn xln, sandy/gritty, friable, chlky, brittle, tr-nvp, svrl SH: drk gry, silty, soft, no odr, ns.
 Same sandy/gritty LS. Still bunch of slough SH: most likely Morrow cavings, no odr, ns.
 LS: crm/lt tan, fn xln, sandy/gritty, sm friable, fw firm, sm chlky, tr-nvp, no odr, ns.
 Much of same sandy/gritty LS: sm dense, firm, flakey/mealy, tr-nvp, no odr, ns.
 LS: lt gry/lt tan, slght mott, fn xln, sm flakey/mealy, dense, firm, tr-nvp, no odr, ns.
 LS: gry/lt tan, slght mott, fn xln, many flakey/mealy, sm dense, many firm, tr-nvp, no cup odr, ns.
 LS: gry/lt tan, fn xln, flakey/mealy, dense, firm, tr-nvp, no cup odr, ns.

30"/60"
 CFS @ 4947'
 30"/60"

Miss @ 4949' (-1600)

CFS @ 5020'
 30"/60"
 Survey @ 5020' = 1 Degree

RTD: 5020' (-1671)
 LTD: 5022' (-1673)