Robert L. Milford
PETROLEUM GEOLOGIST
Wichita, Kansas

GEOLOGIST'S REPORT
DRILLING TIME AND SAMPLE LOG

OPERATOR Eagle Creek Corporation
LEASE Decker #1-6
LOC. SPOT 39'S & 121'E of C W2 SE
LOC. FOOTAGE 1,281' FSL & 1,859' FEL
SEC. 6 TWSP 17S RNG 34W
COUNTY Scott STATE Kansas
API 15-171-21217-00-00

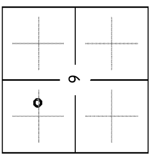
CONTRACTOR WW Drilling, LLC RIG NO. 2
DRILLING STARTED 3-2-2018 COMPLETED 3-13-2018
MUD DISPLACED 3,390' MUD TYPE Chemical
DRILLING TIME KEPT FROM 3,500' TO RTD
SAMPLES SAVED FROM 3,600' TO RTD
SAMPLES EXAMINED FROM 3,600' TO RTD
GEOLOGICAL SUPERVISION FROM 3,600' TO RTD

ELEVATIONS
KB 3,164'
GL 3,159'
MEASUREMENTS FROM K.B.

CASING RECORD
Conductor
Surface 8-5/8" @ 261'
w/ 180 sacks cement
Production 5-1/2" @ 4959'
w/ 165 sacks cement

ELECTRICAL SURVEYS:
ELI Wireline:
Dual Induction Log
Compensated Density-
Neutron PE Log
Micro Log

FORMATION NAME	LOG TOP	LOG DATUM	SAMPLE TOP	SAMPLE DATUM
Base Stone Corral	2,460'	+704	2,463'	+701
Heebner Shale	4,010'	-846	4,013'	-849
Lansing	4,059'	-895	4,062'	-898
Stark Shale	4,344'	-1180	4,346'	-1182
B/KC	4,463'	-1299	4,463'	-1299
Marmaton	4,497'	-1333	4,497'	-1333
Cherokee Shale	4,618'	-1454	4,618'	-1454
Morrow Shale	4,789'	-1625	4,789'	-1625
Mississippian	4,867'	-1703	4,866'	-1702
Total Depth	4,972'	-1808	4,970'	-1806



DATE	7:00 AM DEPTH	REMARKS
3-2-19	0'	Spud @ 11:00 pm. Dev.: 0.75° @ 261'
3-3-18	261'	Cut 261' in last 24 hrs; 4 hrs drlg. Plug down @ 7:30 am. Drilled out plug @ 3:30 pm
3-4-18	1,220'	Cut 959' in last 24 hrs; 15 hrs drlg.
3-5-18	2,463'	Cut 1,243' in last 24 hrs; 18.75 hrs drlg.
3-6-18	3,385'	Cut 922' in last 24 hrs; 20 hrs drlg.
3-7-18	3,785'	Cut 400' in last 24 hrs; 15.75 hrs drlg. TOH for wiper trip @ 3958'
3-8-18	4,148'	Cut 363' in last 24 hrs; 14 hrs drlg. DST #1 @ 4320'
3-9-18	4,320'	Cut 172' in last 24 hrs; 8.25 hrs drlg. DST #2 @ 4512'
3-10-18	4,512'	Cut 192' in last 24 hrs; 10.75 hrs drlg. DST #3 @ 4527'
3-11-18	4,527'	Cut 15' in last 24 hrs; 1 hr drlg.
3-12-18	4,741'	Cut 214' in last 24 hrs; 16.25 hrs drlg. RTD 4970' @ 12:08 am on 3-13-18
3-13-18	4,970'	Cut 229' in last 24 hrs; 14.75 hrs drlg. 5.5" casing set at 4959' with 165 sacks on bottom.
		DV tool set at 2445' and 425 sacks of cement were used to circulate cement to surface

Remarks

The electric log measurements correlate from 4' higher to 1' lower to the drilling measurements.

Formation tops and lithology on this report have been corrected to the electric log.

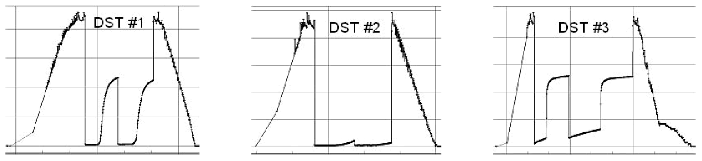
The drilling samples were deposited at the Kansas Geological Survey office in Wichita.

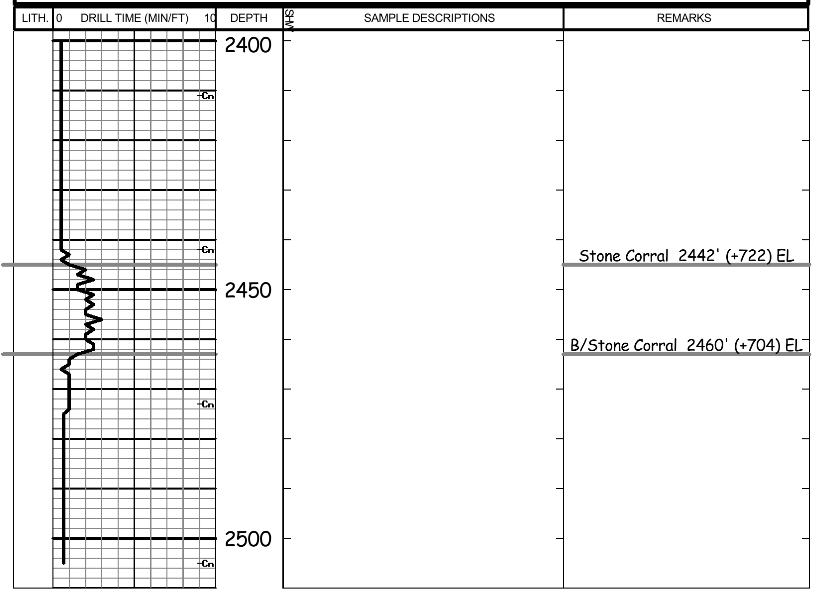
Respectfully submitted,

Robert L. Milford

Drill Stem Test Charts

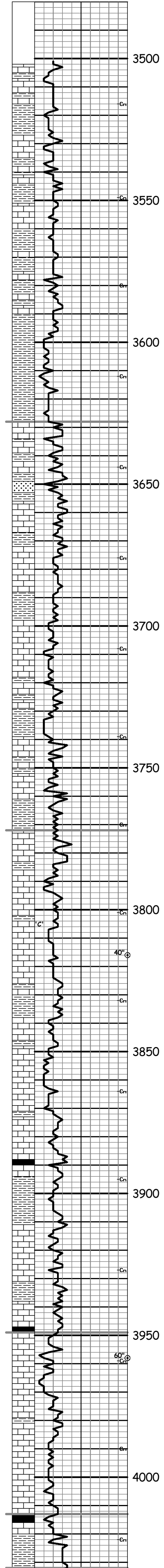
Drill Stem Test by Trilobite Testing, Inc.





Stone Corral 2442' (+722) EL

B/Stone Corral 2460' (+704) EL



Sh: gry, red-brn & grn

Sh: mstly gry w/ some red-brn & grn

Sh: mstly gry w/ some red-brn & grn, & some Siltstone-Sd: lt gry, fn-vry fn grain, pr vis por, NS

LS: crm-tan, w/ some gry-brn, fos in prt, sub chky-prtly dns, pr por, NS

LS: crm-tan w/ some gry-brn, fos in prt, some shly, sub chky-prtly dns, pr por, NS

Siltstone-Sd: lt gry, fn-vry fn grain, pr vis por, NS

LS: crm-lt tan, fos in prt, sub chky-prtly dns, pr por, NS

Sh: gry (some calc), some grn

LS: crm-lt tan w/ some gry-brn, fos in prt, some shly, sub chky-prtly dns, pr por, NS

LS: A.A., pr por, NS

Sh: gry (some calc) w/ some red-brn & grn

LS: crm-tan w/ some gry-brn, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS

LS: A.A., pr por, NS

Sh: gry (some calc) w/ some grn & red-brn

LS: A.A., pr por, NS

Sh: gry (some calc) w/ some lt gry-lt grn

LS: crm-tan w/ some gry-brn, fos in prt, sub chky-prtly dns w/ some chky, pr w/ tr fr fos por, NS

LS: crm-gry, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS

Sh: gry (some calc), some red-brn & grn

Sh: lt-med gry (some calc) w/ some red-brn & grn

LS: crm-tan w/ some gry-brn, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS

Sh: gry (some calc), some red-brn & grn

● LS: crm-tan w/ some gry-brn, fos in prt, sub chky-prtly dns w/ some chky, pr por, tr med-drk brn sptd dead stn, NSFO, no odor

● LS: crm-gry, fos-ool in prt, sub chky-prtly dns w/ some chky, pr w/ some fr-gd intrprtical por, tr lt-drk brn patchy-sat stn (0-3 pcs/tray), VSSFO (mstly thk-hvy), no odor

● LS: rare pcs w/ stn & SO AA, w/ mostly LS: crm-tan, fos in prt, sub chky-prtly dns w/ some chky, pr for por, NS

Sh: gry w/ some red-brn & grn

LS: crm-gry, fos in prt, sub chky-prtly dns w/ some chky, pr w/ some fr fos por, NS

Sh: gry (some calc)

LS: crm-tan w/ some wh & gry-brn, fos in prt, sli chty (crm), sub chky-prtly dns w/ some chky-vry chky, pr w/ some fr fos por, NS

LS: crm-tan-gry, fos in prt, sub chky-prtly dns w/ some chky, pr fos por, NS

LS: A.A. w/ some chky, pr fos por, NS

Sh: Blk Carb (tr amnt in 3890'-3900' smpl)

LS: tan-brn, fos, prtly dns, pr por, NS

Sh: gry w/ some red-brn

LS: crm-tan w/ some wh & gry, fos in prt, sub chky-prtly dns w/ some chky-vry chky, pr-fr w/ tr gd fos por, NS

LS: A.A., pr w/ some fr fos por, NS

Sh: gry w/ some red-brn

LS: crm-gry, fos in prt, sub chky-prtly dns w/ some chky, pr w/ some fr fos por, NS

Sh: Blk Carb (tr amnt in 3950-58' smpl)

● LS: crm-tan, fos w/ tr ool, sub chk-prt dns w/ some chky, pr-fr w/ tr gd intrprtical por, 5 pcs w/ drk brn stn, 2 pcs had VSSFO, no odor

LS: crm-tan, fos in prt, sub chky-prtly dns w/ some chky, pr-fr fos por, NS

LS: crm-tan, fos in prt, sli chty (wh-crm), sub chky-prtly dns w/ some chky, pr-fr w/ some gd fos por, NS

LS: A.A. w/ some LS: lt gry, sli fos, sub chky-prtly dns, pr por, NS

LS: crm-tan w/ some gry, fos in prt, sub chky-prtly dns w/ some chky, pr-fr w/ some gd fos por, NS

LS: A.A.

Sh: Blk Carb (tr amnt in 4020'-30' smpl)

LS: crm-tan, fos in prt, sub chky-prtly dns w/ some chky, pr w/ some fr fos por, NS

Sh: gry w/ some red-brn

Call depth 3350' @ 4:27 am on 3-6-18

Mud displaced at 3390'. Down 7.25 hrs.
(had problem with mud trash pump)

Mud Co./Service Mud @ 3390': 67 Vis, 8.5 Wt, 5.6 WL, 2,500 ppm Chl, 1# LCM (10:30 am, during displacement)

Lithology is inferred from only electric logs from 3500' to about 3590'

Samples start 3600' @ 11:12 pm on 3-6-18

Stotler 3624' (-460) EL

Topeka 3769' (-605) EL

Mud Co./Service Mud @ 3842': 53 Vis, 8.8 Wt, 6.4 WL, 3,500 ppm Chl, 2# LCM

Oread 3946' (-782) EL

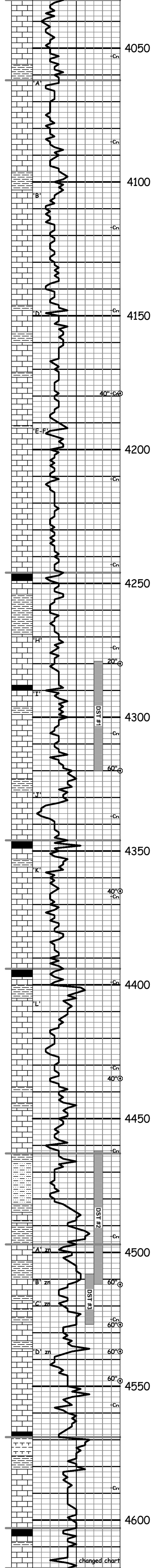
TOH for wiper trip @ 3958'. Conditioned hole for over 30" after trip. Had trouble with mud pump.

Pipe Strap @ 3958': Strap long 2.35'. Windy

Straight Hole Survey @ 3958': 1° Dev.

Heebner 4010' (-846) EL

Toronto 4029' (-865) EL



LS: crm-tan, fos in prt, sub chky-prtly dns w/ some chky-vry chky, pr w/ some fr fos por, 3 pcs w/ blk sptd dead stn, NSFO, no odor

LS: A.A., sli chty (wh-lt gry), NS, no odor

Sh: gry w/ some red-brn

LS: crm-tan, fos in prt, some dolomitic, chty (wh-crm w/ tr orange), sub chky-prtly dns w/ some chky, pr w/ tr fr fos por, few pcs w/ brn-blk sptd dead stn, NSFO, no odor

LS: crm-tan w/ some wh, fos in prt, chty (wh-crm), sub chky-prtly dns w/ some chky-vry chky, pr w/ some fr fos por, NS

LS: A.A., dcrs amnt chky, pr fos por, NS

Sh: mstly gry, some red-brn & grn

LS: crm-tan w/ some wh, fos in prt, sli chty (wh-crm), sub chky-prtly dns w/ some chky-vry chky, pr por, NS

LS; crm-tan, fos in prt, sli chty (crm), sub chky-prtly dns w/ some chky, pr por, NS

LS: A.A., pr por, NS

Sh: mstly gry w/ some red-brn

LS: crm-tan, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS

LS: A.A., pr por, NS w/ some LS: gry-brn, fos, prtly dns, pr por, NS

LS: crm-tan, fos in prt, sub chky-prtly dns w/ some chky & some dns, pr w/ some fr fos & pin-point por, NS

LS: crm-tan, fos in prt, sub chky-prtly dns w/ some chky & dns, pr por, NS

LS: crm-tan, fos-ool (sm-med) in prt, sub chky-prtly dns w/ some chky & dns, mstly pr w/ some prly dvlpd moldic por, NS

LS: crm-tan w/ some wh, fos-ool (sm-med) in prt, sub chky-prtly dns w/ some chky-vry chky, pr w/ tr fr-gd intrprtical & moldic por, NS

LS: A.A. w/ tr cht (crm), some dns pcs, mstly pr por, NS

LS: crm-tan w/ some wh, fos-ool in prt, sub chky-prtly dns w/ some chky-vry chky & some dns, pr w/ tr fr intrprtical por, NS

Sh: Blk Carb (sm amnt 4250'-60' smpl) & drk gry

LS: crm-tan, fos in prt, sli chty (clr-crm), sub chky-prtly dns w/ some chky, pr por, NS

Sh: gry w/ some red-brn

Sh: gry w/ some red-brn (some soft & gummy)

LS: crm-tan, fos in prt, sli chty (clr-crm), sub chky-prtly dns w/ some chky, pr w/ tr fr fos por, 3 pcs w/ brn-blk stn, 1 pc VSSFO (pin point beads), no odor

LS: crm-tan, fos in prt, sub chky-prtly dns, pr fos por, 2 pcs w/ brn-blk sptd-patchy stn, 1 pc w/ 2 pin point beads of FO, no odor

Sh: Blk Carb (small amnt 4290'-4300' smpl)

LS: crm-lt gry, fos in prt, sli chty (clr-wh), sub chky-prtly dns, pr fos por, NS

LS: crm-tan, fos in prt, sub chky-prtly dns, pr-fr fos por, vry scat lt-drk brn sptd-sat stn, SSFO, vry faint odor

LS: A.A. w/ vry scat porosity & staining A.A., SSFO, no odor

Sh: gry & red-brn

LS: crm-tan, ool w/ some fos, sub chky-prtly dns, gd moldic por & pr intrprtical por, tr med-drk brn & blk sptd-patchy stn (few pcs w/ live stn), NSFO, no odor, all moldic por is barren, all oil stn in non-moldic rxs

LS: tan, tr cht (clr-wh), prtly dns, pr por, NS

Sh: Blk Carb (4350'-60' smpl)

LS: brn, prtly dns, pr por, NS

Sh: gry & red-brn

LS: crm-tan w/ some wh, fos-ool in prt, sub chk-prt dns w/ some chky-vry chky, pr intrprt por, tr brn-blk sptd-patchy stn, 1 pc w/ VSSFO, no odor

LS: A.A., NS

LS: wh-crm-tan, fos in prt, chky-prtly dns w/ some chky, pr w/ tr fr fos por, NS

LS: crm-tan, fos in prt, sub chky-prtly dns w/ some chky-vry chky, pr por, NS

Sh: Blk Carb (4410'-10' smpl)

LS: crm-tan w/ some brn, fos in prt, sub chky-prtly dns w/ some chky & some dns, pr por, NS

LS: crm-tan, fos in prt, sli chty (crm-tan), sub chky-prtly dns w/ some chky, pr por, NS

LS: A.A., w/ some dolomitic, fxln, pr vis por, NS & some Dol: tan, fxln, mstly pr vis por w/ some pin point por, NS

LS: crm-tan, fos-ool in prt, sub chky-prtly dns w/ some chky, pr por, NS

LS: crm-tan w/ some brn, fos-ool in prt, sub chky-prtly dns w/ some chky, pr intrprtical por, tr sptd-patchy brn-blk dead stn, NSFO, no odor

LS: crm-tan w/ some gry-brn, fos-ool in prt, sli chty (lt gry), chky-prtly dns w/ some chky, pr intrprtical por w/ tr ooc por, NS

Sh: gry & grn

Siltstone: lt gry-lt grn, calc, some soft & gummy

Sh: gry & grn

LS: crm-tan w/ some brn, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS

Sh: gry & grn

LS: crm-tan, fos-ool in prt, sub chky-prtly dns, pr w/ tr fr intrprtical por, tr lt-drk brn sptd-patchy w/ few pcs sat stn (some live stn) & tr blk sptd stn, 4 pcs w/ S-VSSFO & 1 pc FSFO, no odor

LS: crm-tan, ool-fos in prt, sub chky-prtly dns, pf-fr w/ tr gd intrprtical & some vug por, scat lt-med brn patchy-sat stn, S-FSFO, no odor

LS: crm-lt brn, sli fos, prtly dns, pr por, NS

LS: wh-tan, fos-ool in prt, sub chk-prt dns w/ some chky, pr w/ tr fr intrprt por, tr lt-med brn patchy-sat stn, few pcs w/ S-VSSFO, no odor

LS: wh-crm-lt brn, sli fos-ool, sub chky-prtly dns w/ some chky-vry chky, sli chty (lt gry), pr w/ tr fr-gd intrprtical por (some barren), tr lt-drk brn patchy w/ cpl pcs sat stn, 1 pc w/ SSFO, no odor

LS: crm-tan, fos-ool in prt, sli chty, pr w/ tr fr intrprt por, cpl pcs w/ brn stn, NSFO, no odor

LS: crm-tan, fos-ool in prt, sli chty (wh-tan), sub chky-prtly dns, mstly pr w/ tr fr-gd intrprtical por, NS

Sh: Blk Carb (4570'-80' smpl)

Sh: lt gry (calc, soft & gummy), w/ some med-drk gry, grn & red-brn

LS: crm-tan w/ some brn, fos in prt, chty (wh-tan), sub chky-prtly dns w/ some chky & some dns, pr por, NS

LS: A.A., incrs tan-brn, prtly dns, pr por, NS

Sh: Blk Carb

LS: crm-tan-brn, fos in prt, chty (gry-brn), sub chky-prtly dns w/ some chky, pr por, NS

Lansing 4059' (-895) EL

Mud Co./Service Mud @ 4179': 64 Vis, 9.3 Wt, 8.0 WL, 5,000 ppm Chl, 2# LCM (9:00 am, during circulation)

Muncie Creek 4243' (-1079) EL

DST #1 4279'-4320' LKC 'I' zn
IF: blow built to 0.25" FF: no blow
Rec. 5' Oily Mud (5% O, 95% M)
IFP: 29-28#/30" ISIP: 1162#/45"
FFP: 23-34#/30" FSIP: 1116#/45"

Straight Hole Survey @ 4320': 1.5° Dev.

Mud Co./Service Mud @ 4320': 57 Vis, 9.4 Wt, 8.8 WL, 6,000 ppm Chl, 2# LCM (10:00 am, while circulating after DST #1)

Stark 4344' (-1180) EL

Hushpuckney 4393' (-1229) EL

B/KC 4463' (-1299) EL

DST #2 4462'-4512' Marmaton 'A'
IF: weak surface blow died in 7 min.
FF: no blow
Rec. 3' Oily Mud (5% O, 95% M)
IFP: 21-20#/30" ISIP: 107#/30"
FFP: 21-24#/30" FSIP: 66#/30"

Pulled tight while TOH for DST #2. Ran 21 stand wiper trip, last 5 stands pulled free

Marmaton 4497' (-1333) EL

Mud Co./Service Mud @ 4512': 57 Vis, 9.5 Wt, 7.2 WL, 4,000 ppm Chl, 2# LCM (10:20 am, during FSI on DST #2)

Ran another bit (used) @ 4512'

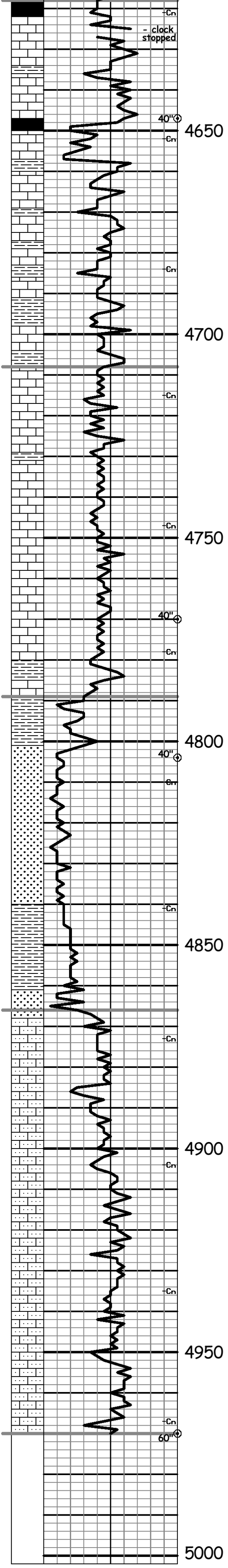
DST #3 4508'-4527' Marm 'B'-'C'
IF: BOB in 9" ISI: blow built to 7.5"
FF: BOB in 6" FSI: blow built to 0.5"
Rec: 496' GIP & 749' TOTAL FLUID:
439' GO (10% G, 90% O)
310' GOW (5% G, 5% O, 90% W)
Oil Gravity 32° API
Chl ppm: 105,000 DST; 4,000 Mud
IFP: 56-151#/30" ISIP: 1291#/60"
FFP: 161-316#/90" FSIP: 1280#/90"
Note: FFP ran 30" longer than instructed.

Mud Co./Service Mud @ 4527': 64 Vis, 9.3 Wt, 8.0 WL, 4,400 ppm Chl, 2# LCM (10:50 am, during circulation after DST #3)

Pawnee 4569' (-1405) EL

Labette 4603' (-1439) EL

Cherokee 4618' (-1454) EL



Sh: Blk Carb

● LS: crm-tan w/ some brn, fos-ool in prt, sli chty (tan-brn), sub chky-prtly dns w/ some chky, pr w/ tr fr intrprtical por, tr lt-med brn patchy-sat stn (few pcs w/ live stn), 1 pc w/ SSFO & 1 pc w/ VSSFO, no odor

LS: crm-tan, fos-ool in prt, sub chky-prtly dns w/ some chky, pr por, NS

Sh: Blk Carb (few pcs in 4647' 40" circ smpl)

LS: crm-tan w/ some brn, fos in prt, sub chky-prtly dns w/ some chky, pr vis por, NS, w/ some Sh: med-drk gry & small amnt Blk Carb

LS: A.A. w/ some chky, pr por, NS, w/ some Sh: A.A.

LS: crm-tan w/ some brn, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS, w/ some Sh: mstly gry, tr grn & small amnt Blk Carb

A.A.

Sh: mstly gry, tr grn & small amnt Blk Carb

LS: crm-tan w/ some brn, sli fos, sli chty (lt gry), sub chky-prtly dns, pr por, NS

Sh: mstly gry, tr Blk Carb

Johnson zone 4708' (-1544) EL

LS: crm-tan w/ some brn, fos in prt, sli chty (lt gry), sub chky-prtly dns w/ some chky, pr por, NS

LS: A.A.

LS: crm-tan w/ some brn, fos in prt, sub chky-prtly dns w/ some chky-vry chky, pr por, NS, w/ some Sh: mstly gry, tr Blk Carb

LS & Sh: A.A.

● LS: crm-tan w/ some brn, fos in prt, sub chky-prtly dns, pr por, tr drk brn-blk dead stn, NSFO, no fluor, no cut, no odor (4750'-60' smpl)

● LS: A.A. w/ incrs tan LS, few pcs dead stn A.A., NSFO, no fluor, no cut, no odor (4760'-70' smpl)

LS: crm-tan w/ some brn, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS, w/ some Sh: gry, grn & red-brn

LS: LS: A.A. pr por, NS

Sh: gry, grn, & red-brn

Mud Co./Service Mud @ 4783': 56 Vis, 9.5 Wt, 7.2 WL, 5,500 ppm Chl, 2# LCM

LS: lt brn, prtly dns, pr por, NS

Morrow 4789' (-1625) EL

Sh: gry, grn, some red-brn, w/ tr Sd: clr-crm, fn grain, sil, semi fri, pr vis por, NS

Sd: clr-crm, fn grain, sil, fri-brtl, pr vis por, NS

Sd: clr-crm, fn-med grain, sil, semi fri-brittle, pr vis por, NS & Sh: gry & grn, some red-brn, brick red, w/ tr yell

Sd: clr-crm, fn-med grain, sil, semi fri w/ some brittle, pr vis por, NS & Sh: gry, grn & brn w/ some red-brn, brick red, & yell

Sd: A.A., pr vis por, NS & Sh: gry-grn, some red-brn & brick red

Sh: gry, grn some red-brn, brn, brick red & yell, intermixed w/ some Sd: A.A., pr vis por, NS

Note: samples throughout the Morrow & upper Miss. section contained about 40% to 50% of recirculated LS cuttings. The rig used steel pits without a shale shaker.

Sh: gry w/ some grn, brick red & brn w/ some Sd: A.A., fn-med grain, pr vis por, NS

Miss. 4867' (-1703) EL

Sdy LS: wh-lt gry, fn grain sd, sub chky, pr por, NS (small amnt in the 4870'-80' smpl)

Sdy LS: A.A. some gritty, pr por, NS

Sdy LS: wh-crm, fn w/ some med grain sd, sub chky w/ some chky, pr por, NS w/ some Calc Sd-Sdy LS: lt gry-lt grn, fn-vry fn grain, soft-friable, pr vis por, NS

Sdy LS: A.A., sli chty (org), pr por, NS w/ small amnt LS: tan, prtly dns, pr por, NS

Sdy LS: wh-crm, fn-med grain sd, sli pyr, sub chky w/ some chky, pr por, NS

Sdy LS: A.A., sli chty (org), pr por, NS w/ small amnt LS: crm-tan, prtly dns, pr por, NS

A.A.

Sdy LS: wh-crm, fn-med grain sd, sub chky w/ some chky-vry chky, pr por, NS w/ small amnt LS: crm, prtly dns, pr por, NS

Sdy LS: A.A. w/ some lt grn, pr por, NS

Sdy LS: wh-crm, fn-med grain sd, sub chky w/ some chky, pr por, NS w/ small amnt LS: crm-tan, prtly dns, pr por, NS

Ran 10 stand short trip @ 4970' after CFS

A.A.

R.T.D. 4970' (-1806)

L.T.D. 4972' (-1808)

Straight Hole Survey @ 4970': 1.25° Dev.