

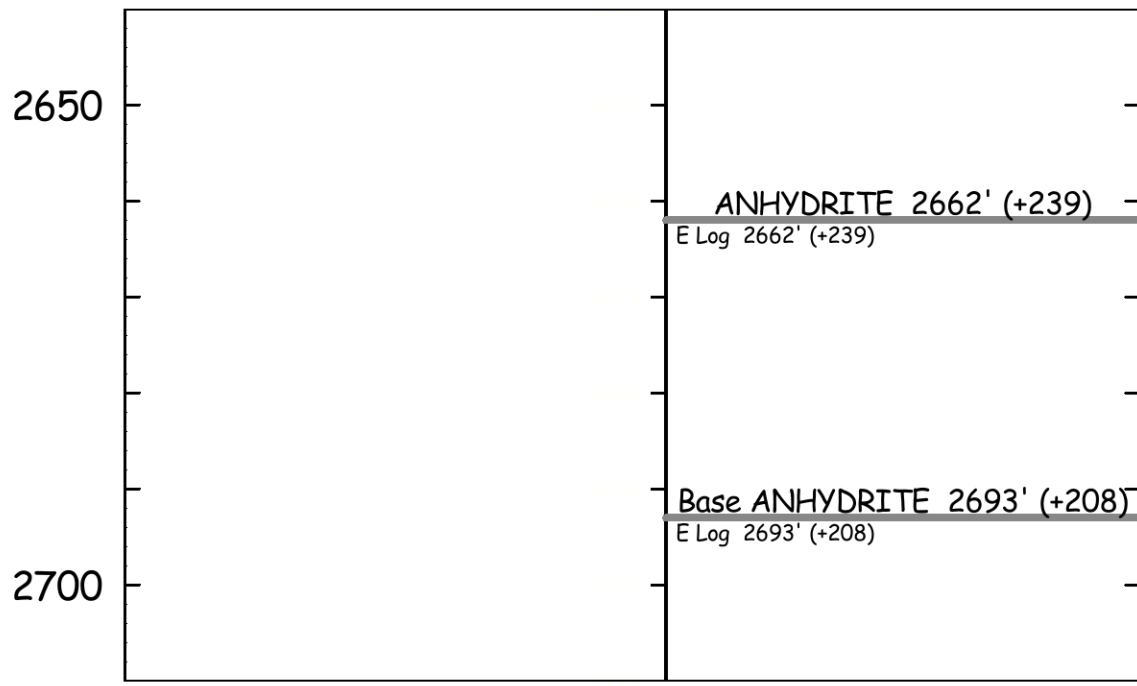
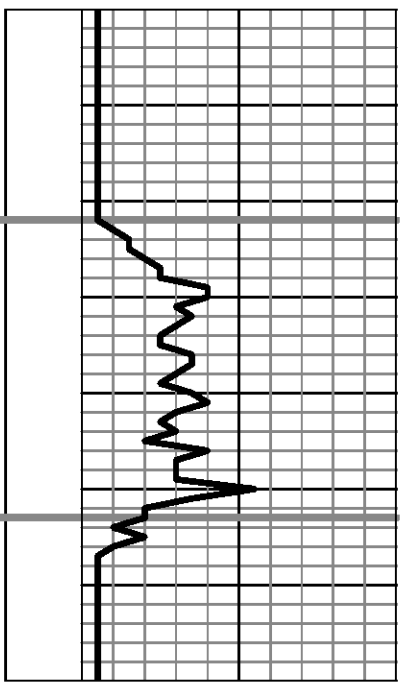


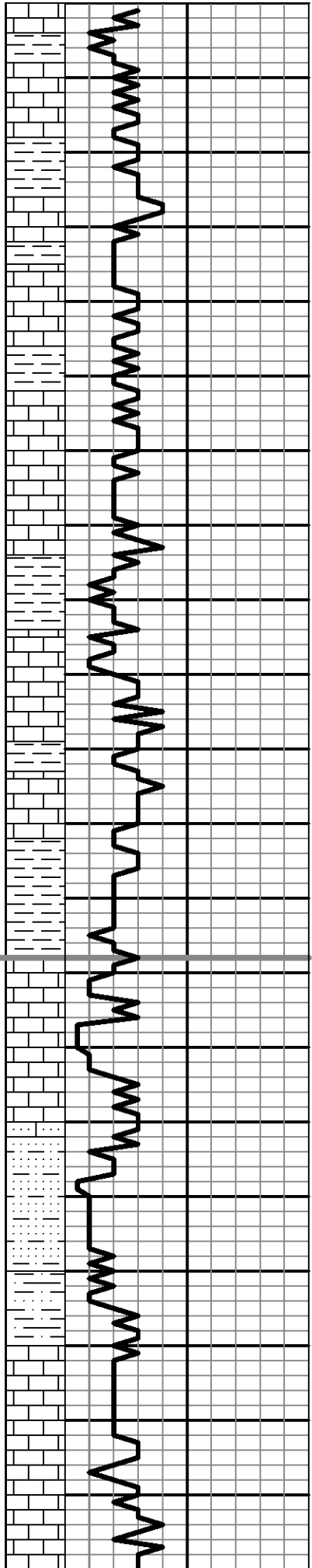

**Remarks**

5 1/2" production casing run to further test the Lansing/Kansas City formaton.  
 Electric log measurements correlate about even to 2' high compared to rotary measuremnts.  
 Samples deposited at the Kansas Geological Survey.

Respectfullu Submitted,  
*Jeff Christian*  
 Jeff Christian

LITH.	0	DRILL TIME (MIN/FT)	10	DEPTH	MHS	SAMPLE DESCRIPTIONS	REMARKS
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3600

3650

3700

3750

3800

Sh: gry-some red

Ls: lt gry, fn xln, foss-mott in part, pr vis por, ns

Ls: crm-lt gry, fn xln, foss in part w/ Sh: gry-grn-red

Same

Ls: crm-lt gry, fn xln, chlky in part, sli foss, sli glauc, pr vis por, ns

Ls: crm-lt brn-lt gry, fn xln, sli chlky, foss, pr vis por, ns

Sh: red-brn-some grn

Dolo: crm-lt brn, fn xln, sli suc, pr-fr intrxln por, ns

Ls: lt gry, fn xln, part dns, foss, pr vis por, ns

Shly Ls: lt gry, grn/gry, red, prpl

Sh: red-brn, gummy, some gry & grn sh

Ls: crm-lt brn-lt gry, fn xln, sli grnlr, foss in part, pr vis por, ns w/ wt chlk

Ls: crm-lt gry, fn xln, sli grnlr, chlky in part, sli foss, pr-trc fr pp-intrxln por, ns

Sst: lt gry, vy fn-fn grn, calc, subfri, pr vis por, ns

Sh: red-brn, sndy, gummy in part

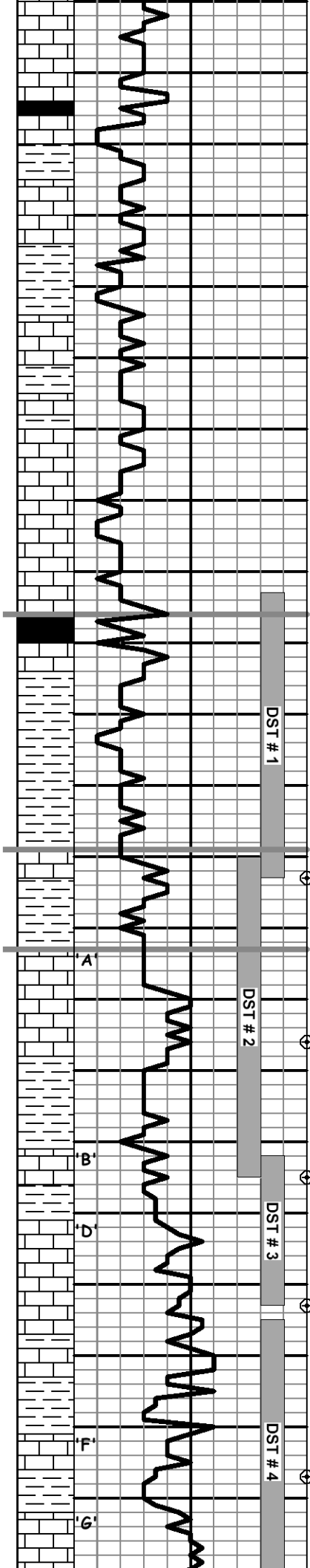
Ls: crm-lt brn, fn xln, chlky in part, sli foss, pr vis por, ns

Ls: as above, part dns

Same

Morgan Mud @ 3625': 7/27/13  
 Wt. 8.6, Vis. 52, WL. 6.0, Chl. 600, LCM. 4

**TOPEKA 3728' (-827)**  
 E Log 3727' (-826)



3850

3900

3950

4000

same

Sh: blk, carb  
Ls: brn, fn xln, argil, foss, ns

Sh: gry-grn

Ls: crm-lt brn, fn xln, part dns, foss, pr vis por, ns

Sh: red-brn w/ sst: gry/grn, vy fn grn, calc, pr vis por, ns

Ls: wt-crm-lt gry, fn xln, part dns, chlky, glauc, pr vis por, trc blk sptd stn

Sh: red-brn, some gry & grn

Ls: wt-crm-lt gry, fn xln, chlky, sli foss, pr vis por, sct blk sptd stn

Ls: crm-lt brn, fn xln, subchlky, sli foss, pr vis por, trc dead stn

Ls: wt-crm-lt gry, fn xln, chlky, sli foss, pr vis por, trc dead stn

Sh: blk, carb  
Ls: lt brn, fn xln, dns, foss

Sh: lt gry-lt grn, gummy w/ sst: gry/grn, vy fn grn, calc, ns

Sh: red-brn, gummy

Ls: crm-lt gry, fn xln, sli foss-ool, pr-trc fr intrpart-vug por, sli-fr sfo, no odor, drk brn sptd-subsat stn

Sh: red-brn, gummy-some gry & grn sh

Ls: crm-lt gry, fn xln, subchlky, part dns, sli foss-ool, pr-trc fr intrpart-vug por, ssfo, no odor, drk brn sptd stn

Ls: crm-lt gry, fn xln, dns, chlky in part, pr vis por, ns w/ sct Sh: grn, pyritic

Ls: lt brn-lt gry, fn xln, dns, foss-ool, rare vug por, ssfo, no odor, drk brn subsat stn

Sh: red-brn, gummy in part, sndy in part

Ls: crm-lt gry, fn xln, ool, pr-sct fr introol-vug por, fr-gd sgfo, fnt odor, drk brn subsat-sat stn

Sh: red-brn, some grn, gummy in part

Ls: crm-lt gry, fn xln, chlky, vy chrty, foss, pr-some fr vug-foss por, sli-fr sfo, fnt odor, drk brn subsat stn

Ls: crm-lt gry, fn xln, part dns, part chlky, pr vis por, ns

Ls: lt brn-lt gry, fn xln, dns, part chlky, pr vis por, sct blk dead sptd stn, nsfo

Ls: wt-lt gry, fn xln, dns, chlky w/ Sh: gry-grn, some red & brn

Ls: crm-lt gry, fn xln, part chlky, ool, pr-some fr introol-vug por, sli some fr sfo, no odor, brn sptd-subsat stn

Ls: crm-lt gry, fn xln, dns, chlky in part, sli foss in part, pyritic in part, pr vis por, vssfo, no odor, vy sct sptd brn stn

DST # 1 3893' to 3933'  
30"-60"-30"-60"  
IF: Blow Built to 1/4"  
FF: No Blow  
RECOVERY: 5' Mud w/ trace of oil  
IFP: 17-22# ISIP: 1193#  
FFP: 20-22# FSIP: 1163#  
IHP: 1895# FHP: 1876#  
BHT: 113 deg. F

Pipe Strap @ 3933': 2.38' short to board Dev. 3/4 deg.

**HEEBNER 3896' (-995)**  
E Log 3893' (-992)

Morgan Mud @ 3933': 7/28/13  
Wt. 9.0, Vis. 67, WL. 6.0, Chl. 1,200, LCM. 5

**TORONTO 3929' (-1028)**  
E Log 3926' (-1025)

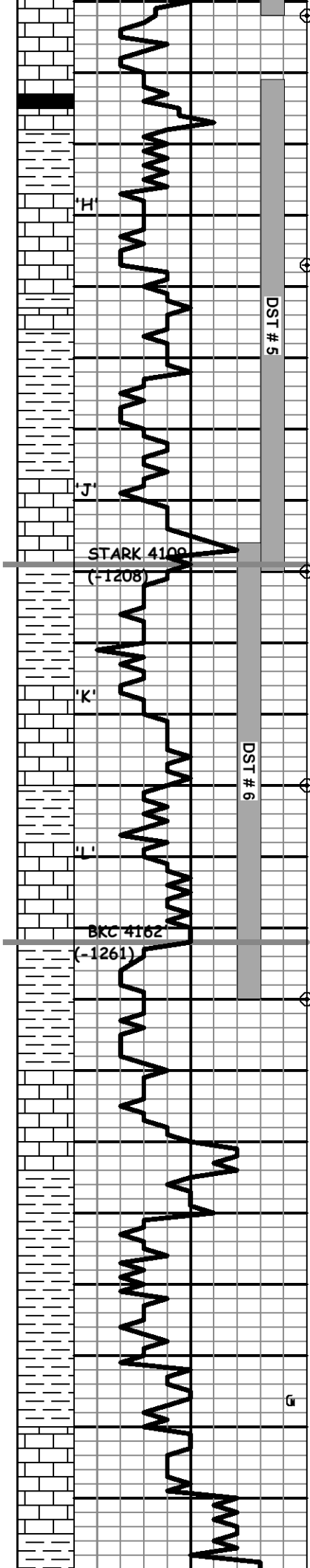
**LANSING 3943' (-1042)**  
E Log 3941' (-1040)

DST # 2 3930' to 3975'  
30"-60"-30"-60"  
IF: Blow Built to 1/8"; dead/15"  
FF: No Blow  
RECOVERY: 5' SOCM (8%O, 92%M)  
IFP: 20-22# ISIP: 203#  
FFP: 23-25# FSIP: 65#  
IHP: 1933# FHP: 1884#  
BHT: 113 deg. F

Morgan Mud @ 3975': 7/29/13  
Wt. 9.1, Vis. 76, WL. 6.0, Chl. 1,200, LCM. 5

DST # 3 3972' to 3993'  
30"-60"-60"-90"  
IF: Blow Built to 2 1/4" ISI: No Return  
FF: Blow Built to 2" FSI: No Return  
RECOVERY: 120' total fluid  
60' MCW w/ trc oil (1%O, 59%W, 40%M)  
40' MCW w/ trc oil (76%w, 24%M)  
20' WCM w/ trc oil (1%O, 25%W, 74%M)  
IFP: 19-41# ISIP: 1270#  
FFP: 44-73# FSIP: 1254#  
IHP: 1960# FHP: 1901#  
BHT: 116 deg. F  
Chl: 17,500 ppm

Morgan Mud @ 4032': 7/30/13  
Wt. 9.2, Vis. 52, WL. 6.4, Chl. 1,600, LCM. 4



4050

4100

4150

4200

4250

Ls: wt-lt gry, fn xln, dns, chlky, pr vis por, ns

Sh: blk, carb

Ls: gry, fn xln, dns, foss

Sh: red-brn, some gry & grn, gummy

Ls: wt-lt gry, fn xln, chlky, part dns, pr vis por, drk brn-blk sptd stntrc fo no odor

Ls: as above, less chlky, more dns, pr vis por, trc stn & fo w/ sh: red-brn, gummy

Ls: crm-lt gry, fn xln, dns, foss

Sh: gry-grn- red-brn, gummy

Sh: red-brn, gummy

Ls: lt gry, fn xln, ool, pr-trc fr introol por, vssfo, fnt odor, lt brn sat stn

Ls: lt gry, fn xln, dns, sct wt chlky, pr vis por, ns

Sh: gry-grn, some red & brn

Sh: red-brn, gummy, some gry & grn sh

Ls: crm-lt gry, fn xln, few pcs ool, pr vis introol por, trc fo, no odor, drk brn subsat stn

Ls: lt gry, fn xln, dns, some crm subchlky, pr vis por, ns

Sh: red-brn, gummy in part, some gry sh

Ls: lt gry, fn xln, dns, sli foss inpart, pr vis por, ns

Ls: gry-prpl/gry, fn xln, dns, argil in partsli foss, pr vis por, ns

Sh: red-brn-gry, some grn

Sh: red-brn, gummy, some gry & grn sh

Ls: wt-lt gry, fn xln, part dns, part chlky, sli foss, pr vis por, ns

Sh: lt gry, gummy, some gry sh

Same

Sh: red-brn, gummy w/ Ls: lt gry, fn xln, dns, chlky

Same

Sh: as above w/ Ls: lt gry-grn/gry, fn xln, part dns, foss, pr vis por, ns

Sh: red-brn-purpl, gummy

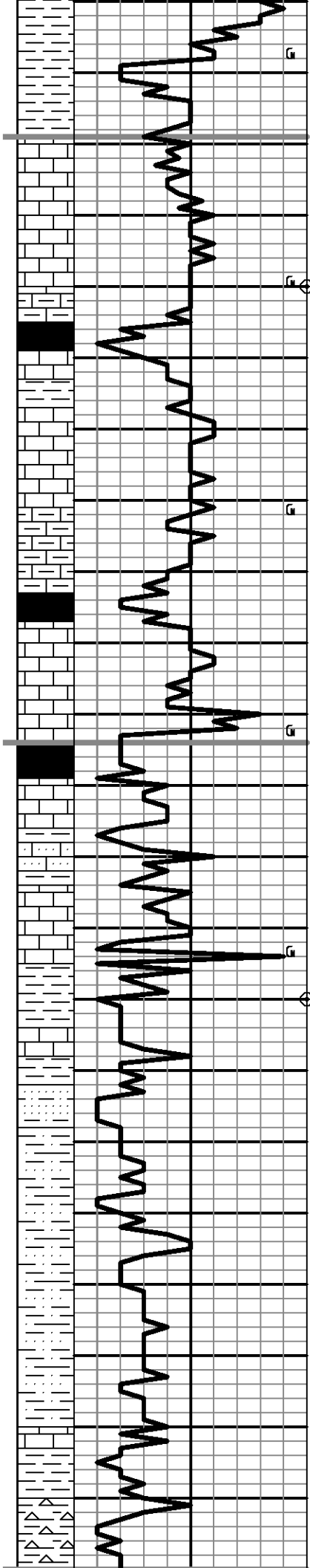
DST # 4 3995' to 4032'  
 30"-60"-60"-90"  
 IF: Blow Built to 9 1/2" ISI: No Return  
 FF: BOB/23.5" FSI: Blow Built to 1"  
 RECOVERY: 335' total fluid  
 30' CO (5%G,92%O, 3%M)  
 55' OCM (5%G, 24%O, 71%M)  
 75' SOCWM (5%G, 3%O, 30%W, 62%M)  
 175' MCW w/ trc oil (82%w, 18%M)  
 IFP: 21-102# ISIP: 1283#  
 FFP: 106-171# FSIP: 1254#  
 IHP: 1996# FHP: 1953#  
 BHT: 120 deg. F  
 Chl: 22,000 ppm  
 Gravity: 34.6 deg.

DST # 5 4041' to 4110'  
 30"-60"-60"-90"  
 IF: BOB/ 3 1/2" ISI: BOB/ 8 1/2"  
 FF: BOB/3 3/4" FSI: BOB/ 8 3/4"  
 RECOVERY: 1590' total fluid  
 1550' GIP  
 Dumped: 30' CO (10%G,90%O)  
 Reversed Out 1440' GO (3%G, 96%O,1%M)  
 Dumped 120' fluid below circ sub:  
 60' VSOCMW (2%O, 71%W, 27%M)  
 60' SO&GCMW (5%G,5%O,65%W, 25%M)  
 IFP: 55-305# ISIP: 1326#  
 FFP: 320-620# FSIP: 1319#  
 IHP: 1978# FHP: 1866#  
 BHT: 123 deg. F  
 Chl: 22,000 ppm  
 Gravity: 39.8 deg.

Morgan Mud @ 4132': 7/31/13  
 Wt. 9.0, Vis. 62, WL. 5.6, Chl. 1,400, LCM. 5

DST # 6 4106' to 4170'  
 30"-60"-60"-90"  
 IF: Blow Built to 8 1/2" ISI: No Return  
 FF: BOB/33 1/2" FSI: Blow Built to 1 1/4"  
 RECOVERY: 335' total fluid  
 15' CO (4%G,94%O, 2%M)  
 120' CGO (18%G, 78%O,4%M)  
 55' GOCM (10%G, 33%O, 57%M)  
 IFP: 22-46# ISIP: 1327#  
 FFP: 51-92# FSIP: 1301#  
 IHP: 2041# FHP: 1925#  
 BHT: 120 deg. F  
 Gravity: 31 deg

Morgan Mud @ 4172': 8/1/13  
 Wt. 9.1, Vis. 88, WL. 5.6, Chl. 1,400, LCM. 4



4250  
 4300  
 4350  
 4400  
 4450

Calc Sh: gry-grn-lt purpl w/ sct Ls: lt gry, fn-med xln, argil in part, foss, pr vis por, ns

Sh: red-brn, gummy in part, some gry & grn

Ls: crm-lt gry, fn xln, dns, subchlky, sli foss-ool, pr vis por, ns

Ls: crm-lt brn-lt gry, fn xln, part dns, part chlky, rare foss-ool, pr vis por, ns

Sh: gry-grn, calc w/ Ls: lt gry, subchlky, dns

Sh: drk gry-blk

Sh: gry

Ls: lt brn, fn xln, dns, ool, pr vis por, ns

Ls: lt gry, fn xln, dns, subchlky

Ls: lt-drk gry, fn xln, dns, argil w/ Sh: gry

Sh: blk, carb

Ls: crm-lt brn, fn xln, dns, subchlkt, foss in part, pr vis por, ns

Sh: blk, carb

Ls: crm-lt brn-lt gry, fn xln, chlky in part, dns in part, pr vis por, ns

Same w/ Sh: gry-grn, trc Sst: lt gry, vy fn grn, calc, fri, pr vis por, ns

Ls: crm-lt brn-lt gry, fn xln, dns, chlky in part, rare sndy, pr vis por, ns

Sh: red-brn, gummy, some gry-grn-olive

Ls: wt-lt gry, fn xln, part dns, part chlky

Sh & Ls: as above w/ sct Sst: clr, fn-med grn, subfri, ns

Sh: red-brn, gummy, sndy, some gry & grn sh w/ Ls: as above & loose sd grns

Sh: red-brn, gummy, sndy, some gry-grn-olive, abndnt loose sd grns

same w/ sct Sst clusters: wt-clr, fn-crs, pr srt, fri, qtz cmnt, fr por, ns

Same

Sh: red-brn-prpl, gummy in part, sndy in part, ns

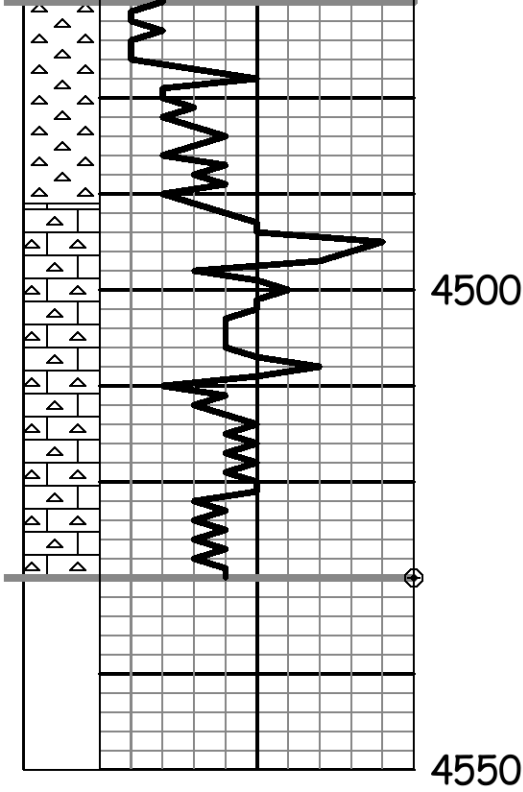
Varicolor Sh, Chrt, Sd

**PAWNEE 4269' (-1368)**  
 E Log 4268' (-1367)

**CHEROKEE 4354' (-1453)**  
 E Log 4354' (-1453)

**Mississippian 4470' (-1569)**





Chrt: wt-crm, fresh, sli weath, foss in part, ns

Chrt: wt-crm-lt gry-tan, fresh, sharp, weath in part, ns

Ls: crm-tan-lt gry, fn-some med xln, chlky, chrty, ns

Ls: as above, incrs Chrt: lt gry-yell/gry, fresh, sharp, frac por, ns

Same

60% Chrt: lt-gry-yel/gry, fresh, sharp, 40% Ls: crm-tan, fn-med xln, chlky, silicifd in part, ns

E Log 4470' (-1569)

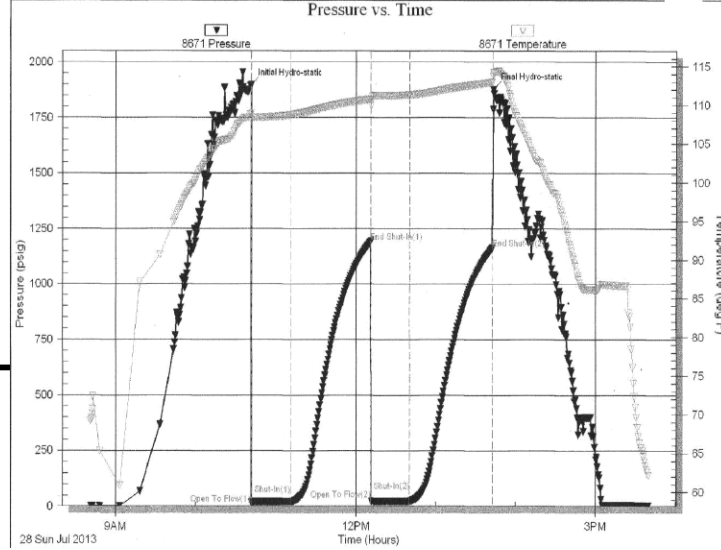
Morgan Mud @ 4503': 8/2/13  
Wt. 9.3, Vis. 59, WL. 6.4, Chl. 1,400, LCM. 4

**RTD 4530' (-1629)**

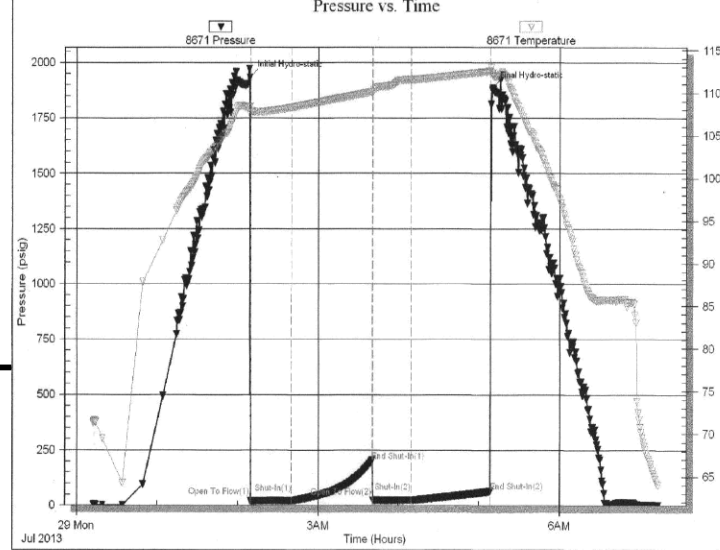
E Log 4529' (-1628)

### Drill Stem Test Charts

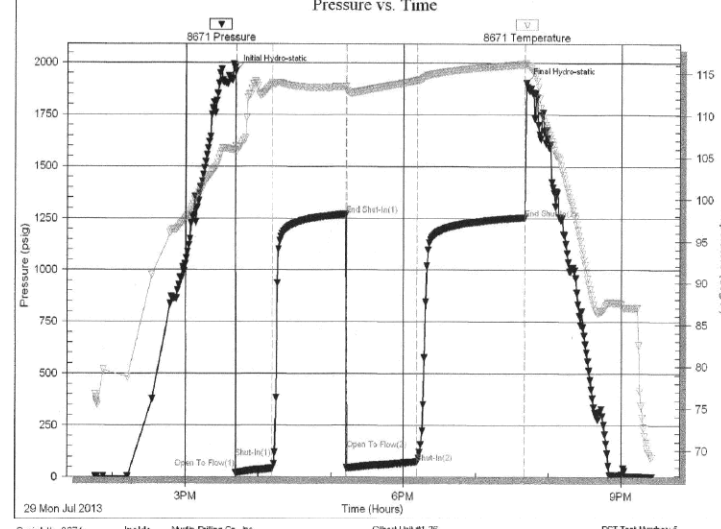
Serial #: 8671 Inside Murfin Drilling Co., Inc. Gilbert Unit #1-26 DST Test Number: #1



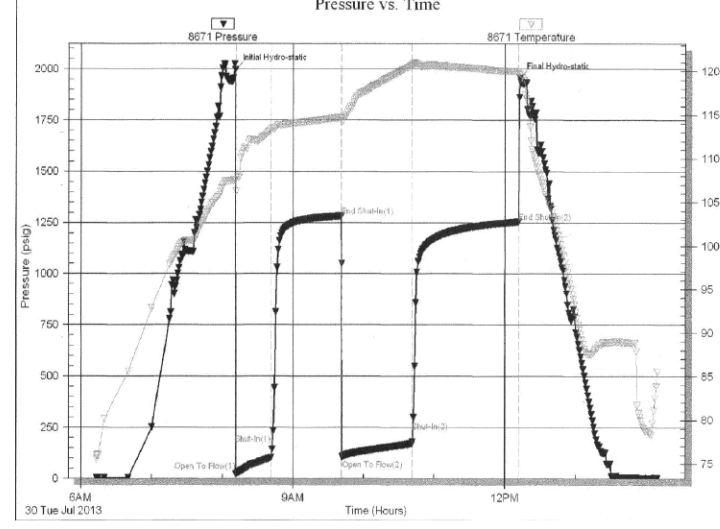
Serial #: 8671 Inside Murfin Drilling Co., Inc. Gilbert Unit #1-26 DST Test Number: #2



Serial #: 8671 Inside Murfin Drilling Co., Inc. Gilbert Unit #1-26 DST Test Number: #3



Serial #: 8671 Inside Murfin Drilling Co., Inc. Gilbert Unit #1-26 DST Test Number: #4



Serial #: 8671 Inside Murfin Drilling Co., Inc. Gilbert Unit #1-26 DST Test Number: #5



Serial #: 8671 Inside Murfin Drilling Co., Inc. Gilbert Unit #1-26 DST Test Number: #6



