

Remarks

5 1/2" production casing set to further test Lansing / Kansas City formation.

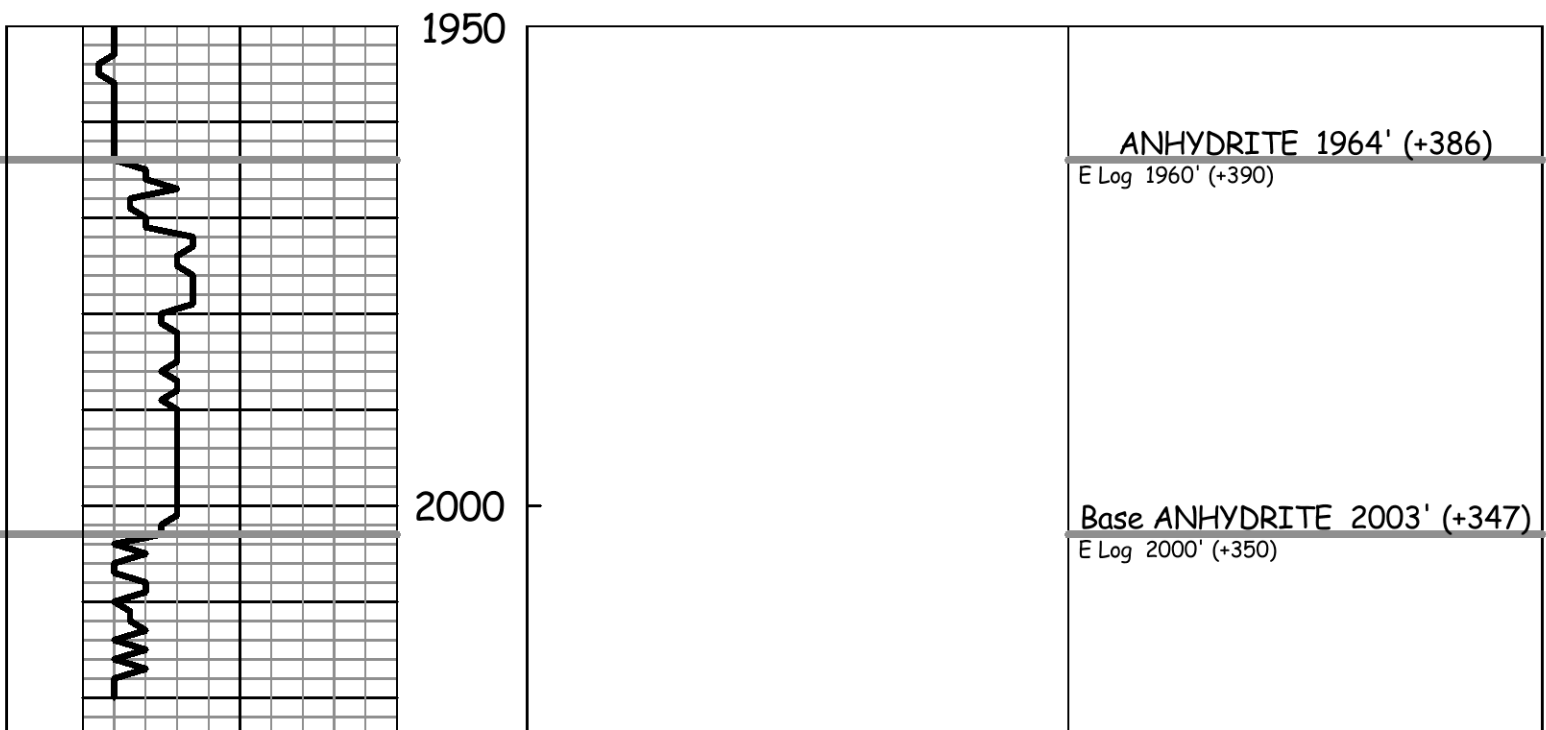
Electric log measurements correlate 3' to 4' high compared to rotary measurements.

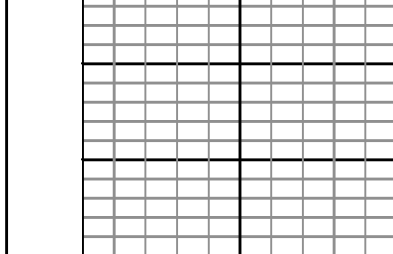
Samples deposited at the Kansas Geological Survey.

Respectfully Submitted,

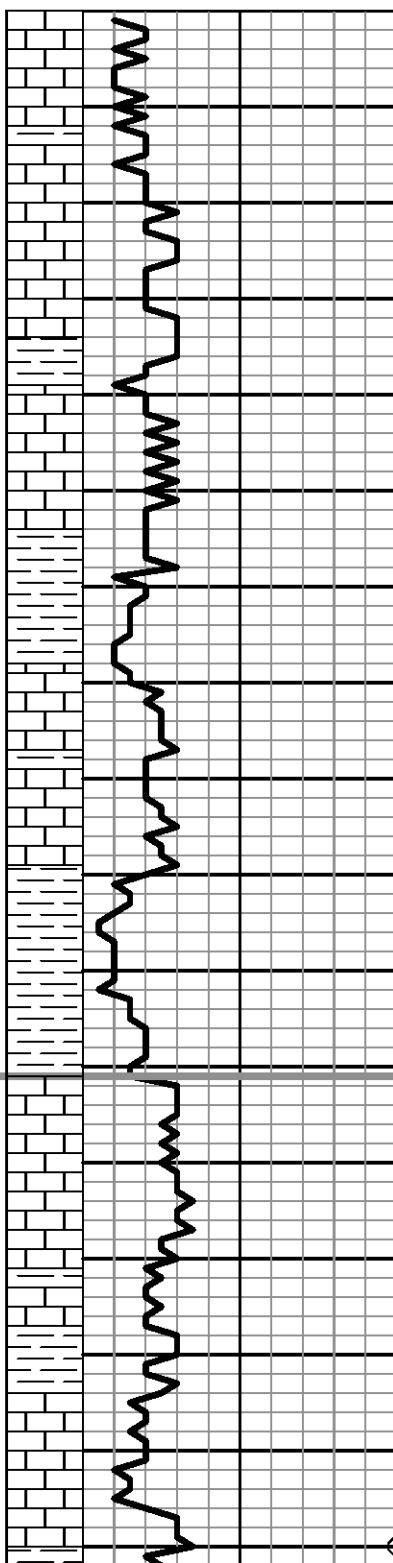
Jeff Christian
Jeff Christian

LITH.	DRILL TIME (MIN/FT)	DEPTH	WHS	SAMPLE DESCRIPTIONS	REMARKS
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2050



3350

3400

3450

3500

Ls: crm-lt brn, fn xln, grnlr, chlky in part, vy foss, fr por, ns

Ls: wt-crm, fn xln, grnlr, chlky, foss, pr-fr por, ns

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

Ls: as above w/ Sh: gry

Ls: lt brn, fn xln, grnlr, part dns, foss in part, pr - some fr intrxln por, ns

Ls: as above w/ Ls: gry, fn xln, dns

Sh: gry-some grn

Ls: lt brn-lt gry, fn xln, dns, foss-sli mott, pr vis por, ns

Same

Sh: gry

Same w/ Ls: gry, argil

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

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

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

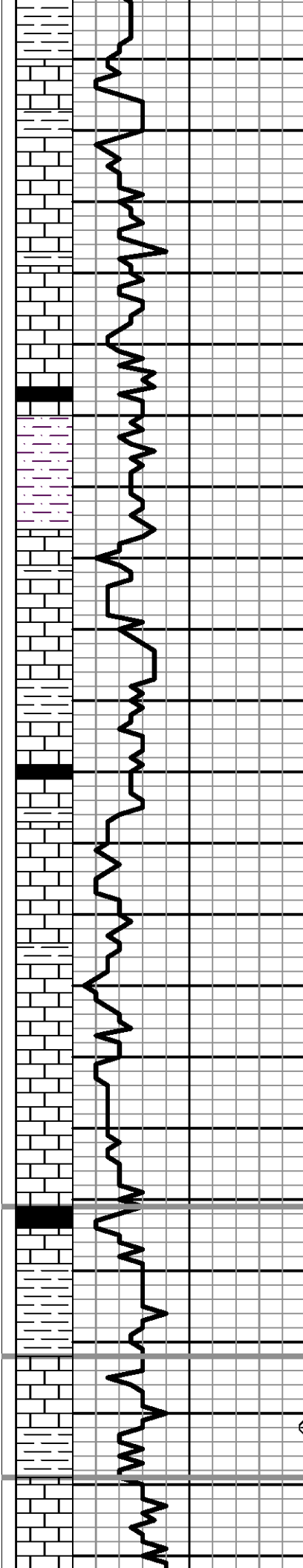
Sh: gry-some red/brn

Ls: crm-lt brn, fn xln, sli grnlr, part chlky, ool in part, pr-fr intrxln por, ns

Morgan Mud @ 3203'; 12/27/13
Wt. 8.7, Vis. 78, WL. 6.0, Chl. 1,900, LCM 0

TOPEKA 3451' (-1101)

E Log 3448' (-1098)



Sh: gry

Ls: crm-lt brn-lt gry, fn xln, sli grnlr, part dns, sli foss, sct intrxln por, ns

Same

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

Ls: lt brn-lt gry, fn xln, part dns, foss-mott, sct wt chlk, some intrxln-foss por, ns

3550

Sh: blk, carb

Sh: gry-grn w/ Sst: lt gry-gry, vy fn-fn grn, calc, subfri, ns

Ls: crm-lt brn, fn xln, foss-trc mott, rare vug por, ns

Ls: as above, part dns

3600

Ls: crm-lt brn, fn xln, subchlky, foss, rare vug por, ns w/ sct gry, dns, ls

Ls: crm-lt brn, fn xln, foss-sli ool, vy sct intrpart-vug por, ns

Ls: crm-lt brn, fn xln, sli grnlr, sli foss, pr-fr intrxln por, ns

Ls: as above, sli chrty

Ls: crm-lt brn, fn xln, sli grnlr, sli dolo, chrty, sli foss, pr-fr intrxln por, ns

3650

Ls: crm-lt brn, fn xln, sli grnlr, chlky in part, chrty, foss, sct fr foss-vug por, ns

Ls: crm-lt brn, fn xln, chrty, foss w/ much wt chlk, pr vis por, ns

Sh: blk, carb

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

Sh: gry-grn

3700

Ls: crm-lt brn, fn xln, part chlky, chrty, foss-sli ool, trc intrpart-vug por, few pcs blk sptd stn, nsfo, no odor

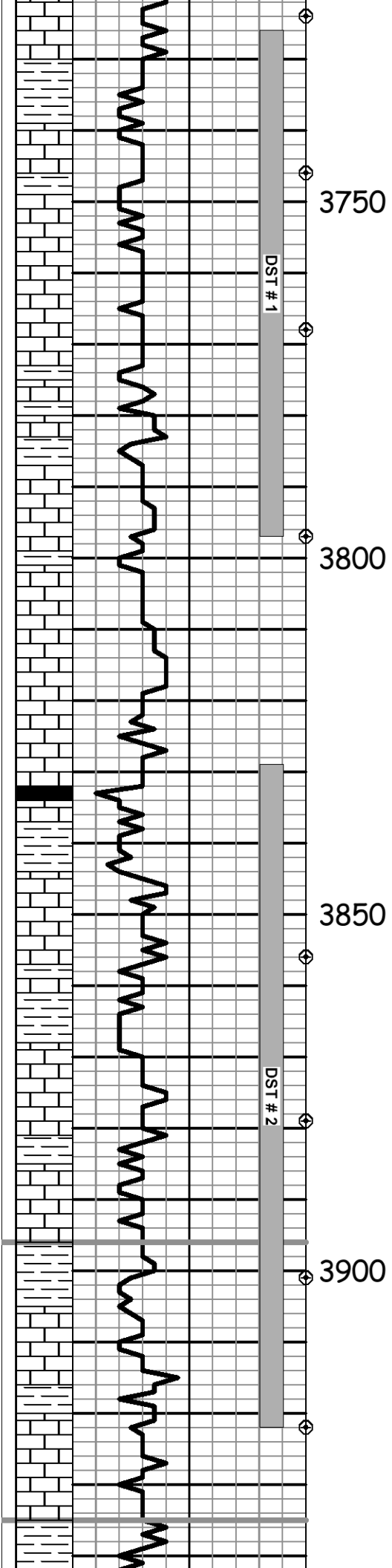
Ls: crm-lt brn, fn xln, part dns, chrty, sli foss, pr vis por, few pcs blk sptd stn, nsfo, no odor

Ls: crm-lt brn, fn xln, dns, few pcs sli dolo, chrty

HEEBNER 3671' (-1321)
 E Log 3668' (-1318)

TORONTO 3692' (-1342)
 E Log 3689' (-1339)

LANSING 3709' (-1359)
 E Log 3706' (-1356)



Ls: crm-lt gry, fn xln, dns, few pcs sh ool, chrty, sli foss, pr vis por, ns

Sh: gry-grn, some red/brn

Ls: crm-lt gry, fn xln, subchlky, part dns, sli chrty, pr vis por, trc brn sptd stn, cpl pcs blk sptd stn, nsfo, 1 pc w/ sli odor on brk

3750

Ls: crm-lt gry, fn xln, subchlky, part dns, chrty, sli foss in part, trc pr vug por, cpl pcs vssfo, vy sct brn sptd stn, no odor

Ls: crm-lt gry, fn xln, dns, 1 pc ool w/ fr introol por, vssfo, no odor

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

Ls: crm-lt gry, fn xln, part dns, sli foss, vy sct pr-trc fr vug por, vssfo, fnt odor, drk brn sptd stn

Ls: wt-crm, fn xln, subchlky, part dns, foss-ool in part, pr-trc fr intrpart por, vssfo, no odor, lt brn sptd stn

3800

Ls: crm-lt gry, fn xln, dns, ool in part w/ sct wt chlk, pr vis por, ns

Ls: crm-lt gry, fn xln, dns, fr amnt wt chlk, pr vis por, ns

Ls: as above, less chlk

Sh: blk, carb

Sh: gry, some gry & red/brn

Ls: crm-lt gry, fn xln, subchlky, part dns, rare foss, trc pr vug por, vssfo, no odor, trc sptd stn

3850

Ls: as above, sli chrty

Sh: gry, some grn & mar w/ Ls: lt brn, fn xln, dns, foss

Ls: crm, fn xln, chlky in part, dns in part, ool, pr-trc fr introol por, vssfo, ? fnt odor, lt brn dull sptd stn

DST # 2

Sh: gry-grn-red, gummy in part

Ls: crm-lt gry, fn xln, dns, ool, pr-trc fr vug por, trc fo, no odor, lt-drk brn sptd-sat stn

Ls: as above, trc fr vug por, vssfo, no odor

3900

Sh: gry-grn-red/brn

Ls: off wt-lt gry, fn xln, part dns, ool-sli foss, pr trc fr intrpart por, vssfo, no odor, lt-med brn sptd-subsat stn

Sh: gry-grn-red/brn

Ls: crm-lt gry, fn xln, part dns, sli chlky, sli foss in part, pr vis por, cpl pcs drk brn-blk sptd stn, nsfo, no odor

Ls: as above, incrs wt chlk, ns

Morgan Mud @ 3734'; 12/28/13
Wt. 9.1, Vis. 55, WL. 7.2, Chl. 4,000, LCM 0

DST # 1 3726' to 3797' (LKC 'B-F' zns)
30"-60"-60"-90"
IF: BOB/20" ISI: No Return
FF: BOB/22" FSI: Surface Blow/Died/14"
RECOVERY: 186' total fluid
30' CO (gravity: 37 deg.)
156' MCW w/ oil spts (80%W,20%M)
IFP: 17-51# ISIP: 1041#
FFP: 54-99# FSIP: 1014#
IHP: 1846# FHP: 1803#
BHT: 113 deg. F
CHL: 140,000 ppm

DST # 2 3829' to 3922' (LKC 'H-K' zns)
30"-60"-60"-90"
IF: BOB/2" ISI: BOB/22"
FF: BOB/.75" FSI: BOB/11"
RECOVERY: 1408' total fluid
1260' GIP
1283' CO (gravity: 30 deg.)
125' HOCM (40%O,60%M)
IFP: 72-287# ISIP: 1197#
FFP: 313-555# FSIP: 1159#
IHP: 1915# FHP: 1942#
BHT: 116 deg. F

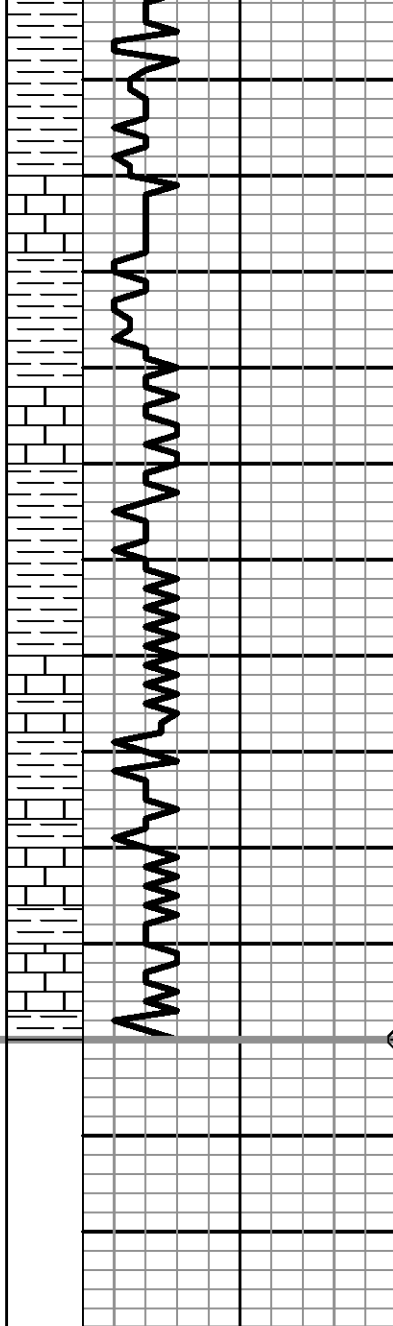
STARK 3896' (-1546)

E Log 3892' (-1542)

Morgan Mud @ 3901'; 12/29/13
Wt. 9.1, Vis. 53, WL. 8.0, Chl. 5,000, LCM 0

BKC 3935' (-1585)

E Log 3931' (-1581)



3950

Sh: gry, lt gry gummy, some grn & red/brn

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

Sh: gry-red/brn, some grn

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

Sh: gry-red/brn, some grn

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

Sh: gry-red/brn, some grn

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

Ls: lt gry, fn xln, dns, sli chlky, argil in part, pr vis por, ns

Morgan Mud @ 4050'; 12/30/13
 Wt. 9.1, Vis. 55, WL. 7.6, Chl. 5,000, LCM 2

RTD 4050' (-1700)

E Log 4048' (-1698)

Drill Stem Test Charts

