

# LITHOLOGY STRIP LOG

## WellSight Systems

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

Well Name: Lange #1  
Location: 2305' FNL & 2260' FWL, Sec. 2-T31S-R3W, Sumner Co., KS.  
Licence Number: 15-191-22778 Region: Moyer Northwest  
Spud Date: 8/11/2016 Drilling Completed: 8/18/16  
Surface Coordinates: 2305' FNL & 2260' FWL, Sec. 2-T31S-R3W

Bottom Hole Same as Above  
Coordinates:  
Ground Elevation (ft): 1294' K.B. Elevation (ft): 1305'  
Logged Interval (ft): 2100' To: 3900' Total Depth (ft): 3900'  
Formation: Mississippi at Total Depth  
Type of Drilling Fluid: Freshwater/Gel to 2480'; Chemical Gel 2480' to 3900'

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### OPERATOR

Company: Herman L. Loeb, LLC.  
Address: P.O. Box 838  
Lawrenceville, IL. 62439-0838

### GEOLOGIST

Name: Jon D. Christensen  
Company: Consulting Petroleum Geologist  
Address: 277 S. Maple Dunes Court  
Wichita, KS. 67235-7500

### Cores

None Taken

### DSTs

DST #1(Upper Kansas City) 3182' - 3198'(Corrected Depths to Log) Test Times 15"-45"-30"-60" IFP Strong Blow BOB/3 Min., FFP Strong Blow BOB/1 Min., No GTS, no Blowback on SI's; REC: 185' MCO(Avg. 88%O, 12%M - API 33.1 Deg. Oil), no water, no GIP; IFP 42-43#, ISIP 1053#, FFP 37-81#, FSIP 1023#, IHP 1625#, FHP 1565#, BHT 115 Deg. F.

DST #2(Kansas City 'J' zone) 3250' - 3286'(Corrected Depths to Log) Test Times 15"-45"-45"-90" IFP Fair building to Good 10" Blow, FFP Fair Blow built to BOB/16 Min., 0.5" Blowback on FSI; REC: 310' Gas in Pipe, 82' GOCWM(20%G, 20%O, 30%W, 30%M), 62' MW(15%M, 85%W), 122' SW(CI 50,000 from MudCo., Mud 2500); IFP 34-81#, ISIP 1074#, FFP 89-156#, FSIP 1073#, IHP 1638#, FHP 1574#, BHT 117 Deg. F.

DST #3(Kansas City Swope) 3293' - 3327'(Corrected Depths to Log) Test Times 15"-45"-45"-90" IFP Strong Blow BOB/9 Min, FFP Strong Blow BOB/7 Min, no Gas to Surface, no Blowback on SI's; REC: 558' Gas in Pipe, 10' GCM(30%G, 70%M), 120' GO&MCW(14%G, 32%O, 42%W, 12%M), not enough water for CI measurement; IFP 25-39#, ISIP 853#, FFP 45-81#, FSIP 947# and building , IHP 1659#, FHP 1597#, BHT 114 Deg. F.

## Comments

8/11/16 MIRU Sterling Drilling Co. Rig #4, Spud at 6:00 PM.; 8/12/16 TD. 290' - WOC; 8/13/16 Drilling at 1050'; 8/14/16 Drilling at 2865'; 8/15/16 Drilling at 3250'; 8/16/16 TD. 3328' - TOH with DST #3; 8/17/16 Drilling at 3575'; 8/18/16 RTD. 3900' - Reached TD. at 3:00 AM., TOH for Logs; 8/19/16 RTD. 3900', LTD. 3900' - Production Casing Set - Rig released at 4:00 AM.

Set new 8 5/8"(23#) Surface Casing at 285' KB. with 250 sacks cement(Basic Energy Services). Cement did Circulate. PD. at 6:30 AM. 8/12/16.

Set new 5 1/2"(15.5#) Production Casing at 3406' KB. with 250 sacks of "Loeb Blend" Cement(Basic Energy Services). PD. at 2:00 AM. on 8/19/16.

Surveys: 1.50 Deg. at 290'(Surface Casing); 0.75 Deg. at 3200'(DST #1); 1.0 Deg. at 3328'(DST #3); 0.75 Deg. at 3900'(RTD).


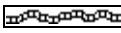
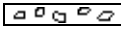
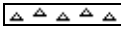
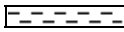







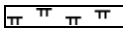
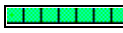
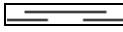
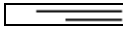
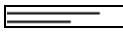



Pipe Strap at 3200'(DST #1): Strap 0.16' Long to the Board, no correction made to the Board.

After review of the ELI Wireline Logs, DST data, structural position and positive indications of commercially recoverable hydrocarbons, the operator elected to set new 5 1/2" Production Casing for completion in the Kansas City Swope and Drum zones.








































































LOG TOPS: Topeka 2151(-846), Heebner Shale 2552(-1247), Toronto 2568(-1263), Iatan Lmst. 2862(-1557), Stalnaker Sand 2909(-1604), Kansas City 3167(-1862), Drum 3176(-1871), Stark Shale 3296(-1991), Swope 3314(-2009), Hertha 3346(-2041), Base Kansas City 3399(-2094), Marmaton 3480(-2175), Cherokee Shale 3613(-2308), Miss. Chert 3808(-2503), Miss. Chert 3808(-2503), Miss. Lmst. 3818(-2513).

NOTE: This log was shifted upward by 1' to 3' for correlation purposes with the ELI Wireline Logs.

### ROCK TYPES

 Anhy  Bent  Brec  Cht	 Clyst  Coal  Congl  Dol	 Gyp  Igne  Lmst  Meta	 Mrlst  Salt  Shale  Shcol	 Shgy  Sltst  Ss  Till
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### ACCESSORIES

<b>MINERAL</b>  Anhy  Arggrn  Arg  Bent  Bit  Brecfrag  Calc  Carb  Chtdk  Chtlt  Dol  Feldspar  Ferrpel  Ferr  Glau	 Gyp  Hvymin  Kaol  Marl  Minxl  Nodule  Phos  Pyr  Salt  Sandy  Silt  Sil  Sulphur  Tuff	<b>FOSSIL</b>  Algae  Amph  Belm  Bioclst  Brach  Bryozoa  Cephal  Coral  Crin  Echin  Fish  Foram  Fossil  Gastro  Oolite	 Ostra  Pelec  Pellet  Pisolite  Plant  Strom  <b>STRINGER</b>  Anhy  Arg  Bent  Coal  Dol  Gyp  Ls  Mrst	 Sltstrg  Ssstrg  <b>TEXTURE</b>  Boundst  Chalky  Cryxln  Earthy  Finexln  Grainst  Lithogr  Microxln  Mudst  Packst  Wackest
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OTHER SYMBOLS

- POROSITY**  
 [E] Earthy  
 [F] Fenest  
 [X] Fracture  
 [M] Inter  
 [O] Moldic  
 [P] Organic  
 [P] Pinpoint

- Vuggy  
**SORTING**  
 [W] Well  
 [M] Moderate  
 [P] Poor

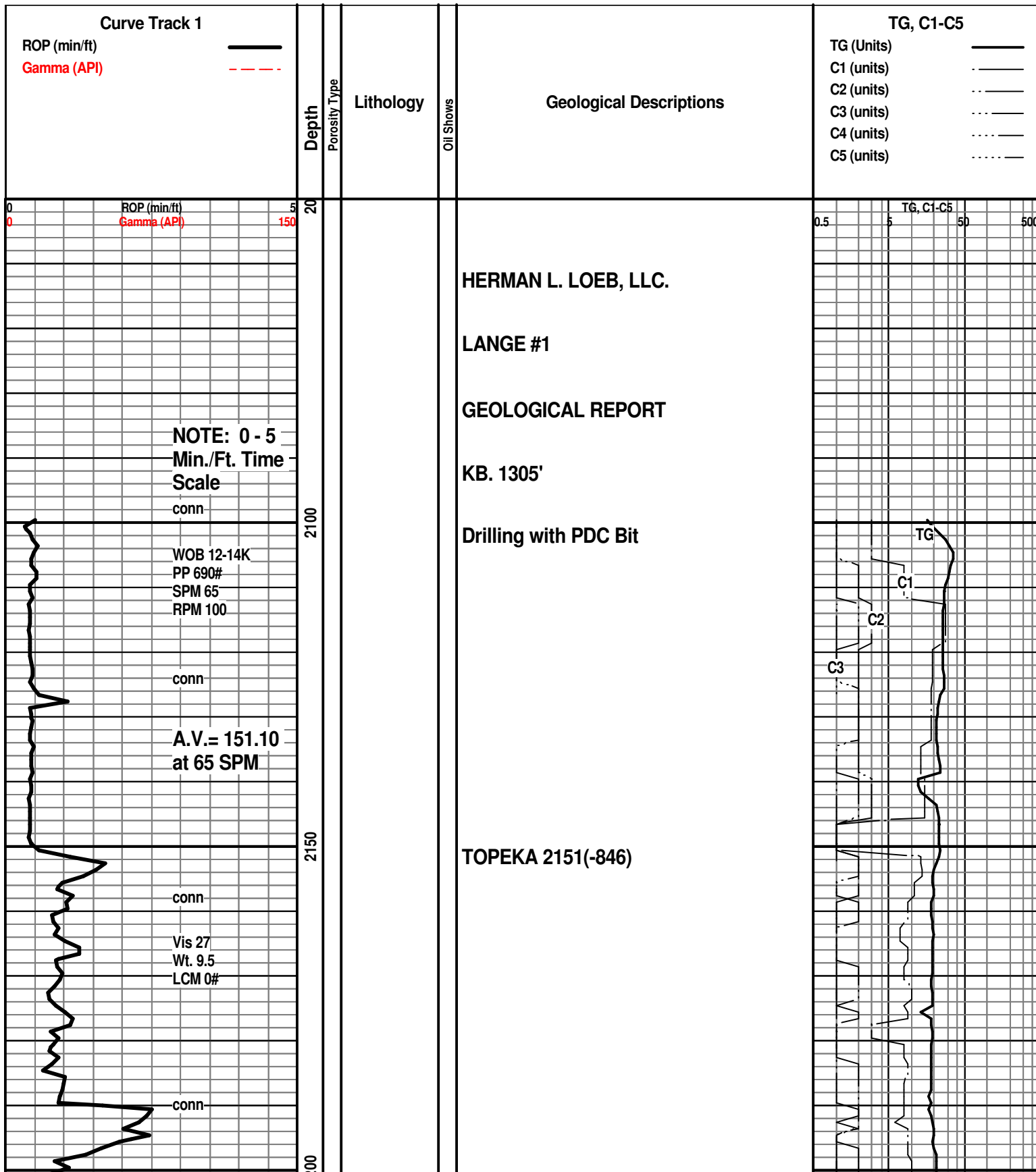
- ROUNDING**  
 [R] Rounded  
 [r] Subrnd  
 [a] Subang  
 [A] Angular

- Spotted  
 [O] Ques  
 [D] Dead

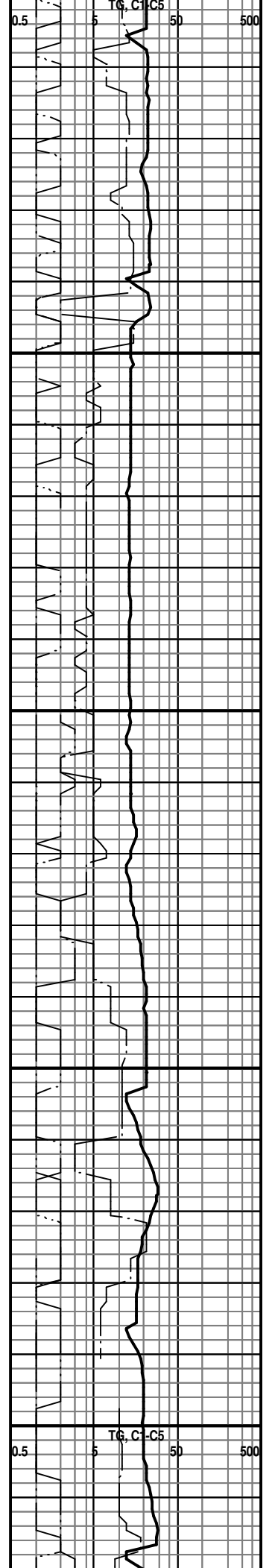
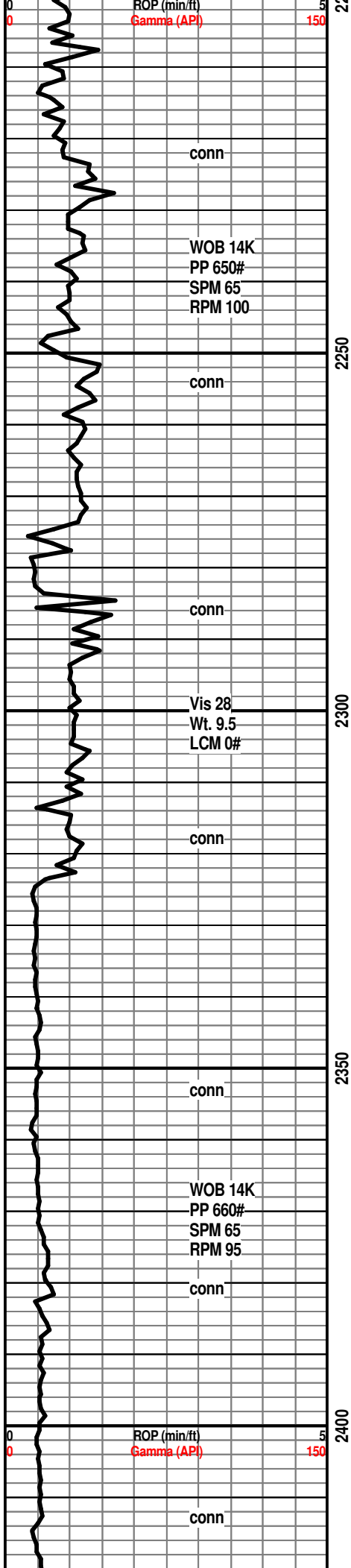
- EVENT**  
 [▽] Rft  
 [▲] Sidewall

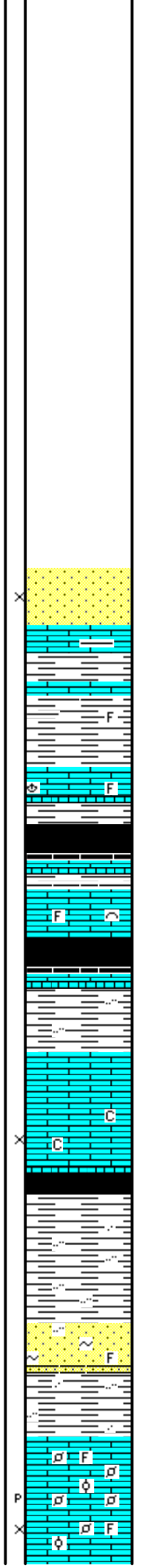
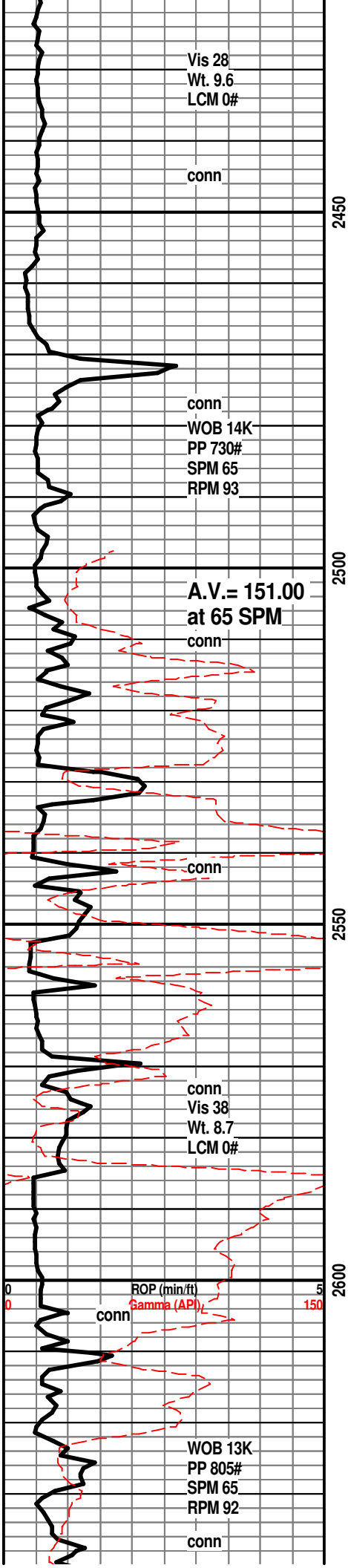
- INTERVAL**  
 [■] Core  
 [□] Dst

- OIL SHOW**  
 Even



TOPEKA 2151(-846)





**DISPLACE MUD SYSTEM AT 2480'**

**Start 20' Wet and Dry Samples at 2500'**

SS; lt gy, f to occ med gr qtz, clusters, fair to gd intergran por, occ mica, no fluor/stn or odor, ns.

LM; tan to lt brn, rare foss, argil ip.

LM; med gy, gy brn, foss ip, hd, blocky

SH; blk, carb ip, platy, trc gas bubbles

LM; med to dk brn, blocky, foss ip, tite

**HEEBNER SHALE 2552(-1247)**  
SH; blk, platy, carb ip.

SH; med gy, gy grn, silty ip.

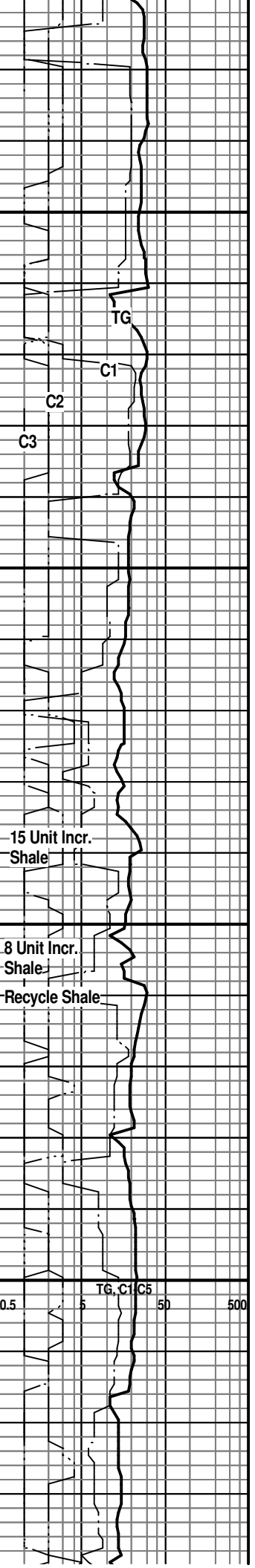
**TORONTO 2568(-1263)**  
LM; lt to med brn, blocky, hd, some cse xln lmst, no vis por, dull yel min fluor, ns.  
LM; tan to lt brn, f to med xln, poor to fair interxln por, rarely chalky, lt yel min fluor, no stn or odor, ns.

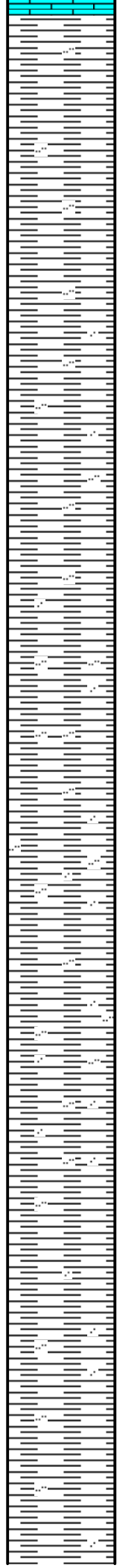
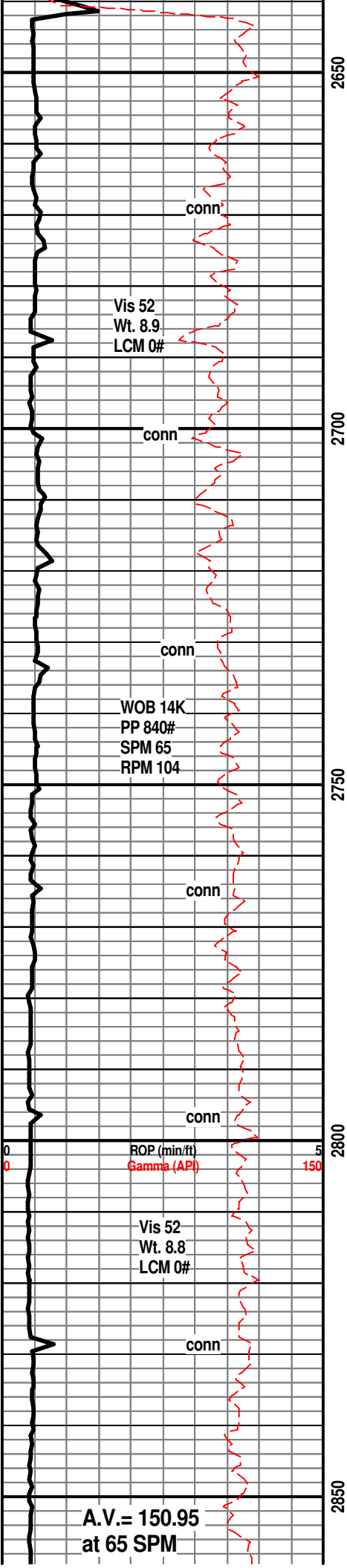
SH; blk, carb, blocky

SH; lt gy, silty to sandy, platy

SS; lt gy, hd tite ss, trc glau

LM; tan to lt brn, v. foss, scat pellets and ooids, some fair p-p and interpart por, lt yel fluor, no stn or odor, no gas kick





SH; It to med gy, platy, occ silty

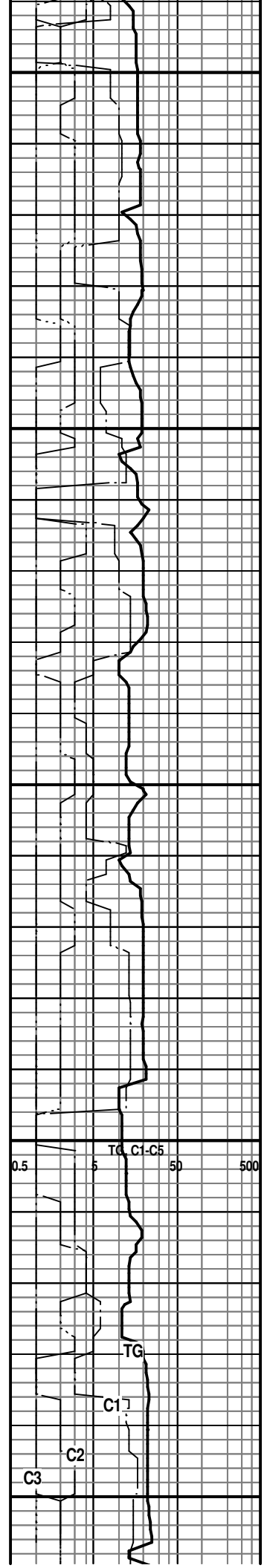
SH; It to med gy, platy, silty to sandy

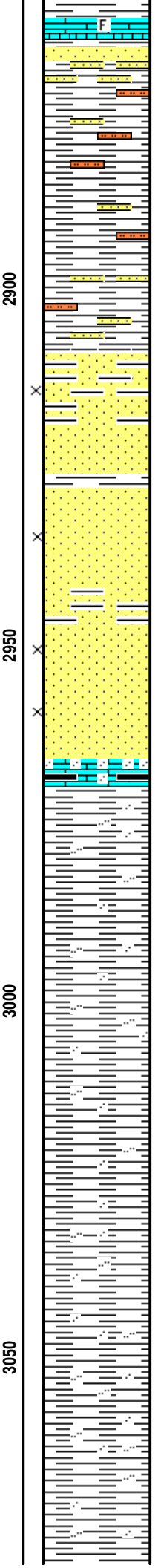
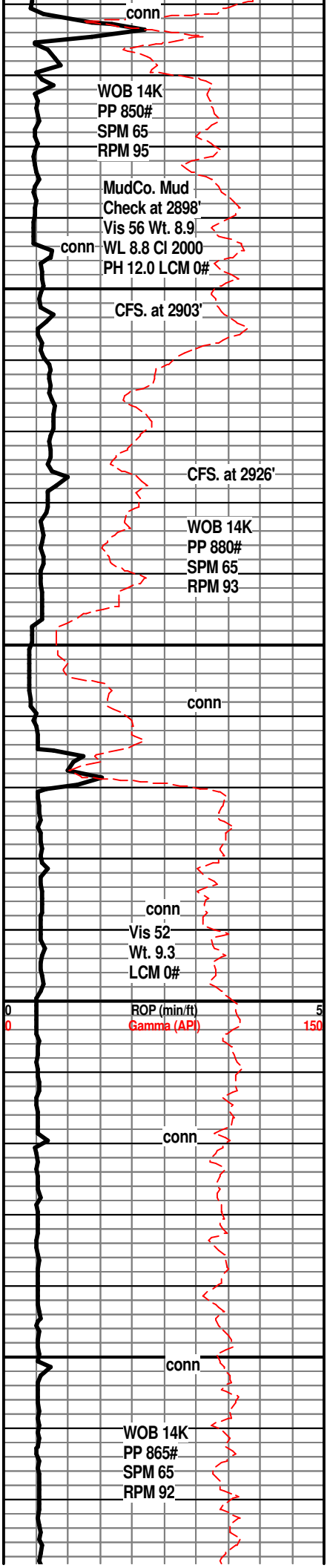
SH; It to med gy, platy, rarely sandy

SH; It to med gy, platy, smooth, occ silty

SH; It to med gy, platy, silty to sandy

SH; It to med gy, silty to sandy





**IATAN 2862(-1557)**  
LM; med to dk brn, foss ip, dense

SS; lt gy, off wh, vf to occ f gr qtz, most v. tite - well cem, few clusters w/fair intergran por, no fluor, quest gas bubbles, no stn or odor, some tite ss strngs

SH; lt to med gy, sandy w/interbdd vf gr ss and sltst strngs

SH; lt gy, silty to sandy w/interbdd tite ss strngs

**STALNAKER SS 2909(-1604)**  
SS; lt gy, rare tan, some argil at top, most f gr qtz, clusters, fair to occ gd intergran por, subang/subrmd gr, no fluor, no stn or odor, no gas kick

SS; lt gy, wh, most f gr qtz, clusters, occ mica, fairly clean, fri, fair to occ gd intergran por, subrng/subang gr, interbdd agril ss and sandy sh, no fluor, no stn or odor, ns.

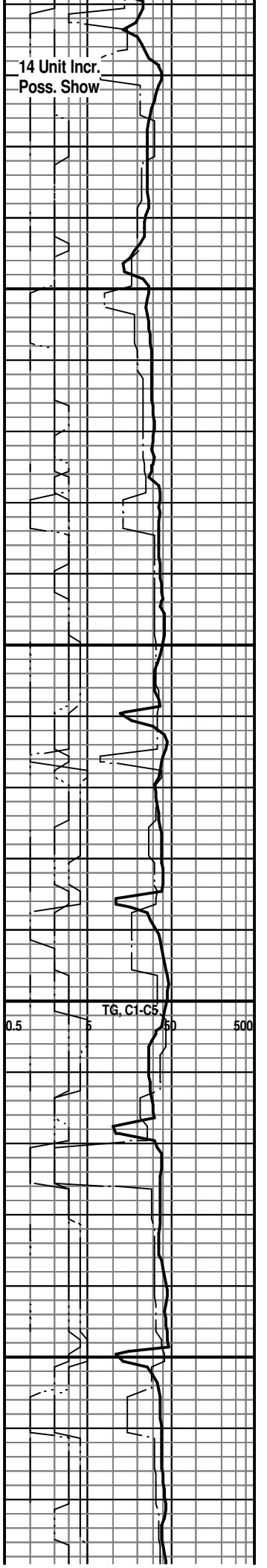
SS; lt gy, off wh, most med gr, qtz, clusters, fairly clean w/fair to gd intergran por, subrng to subang gr, fri ip, no fluor, no stn or odor, ns.

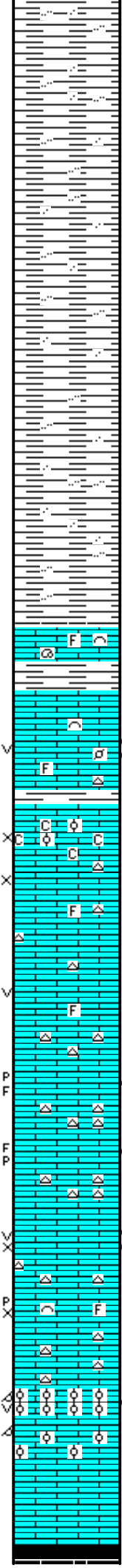
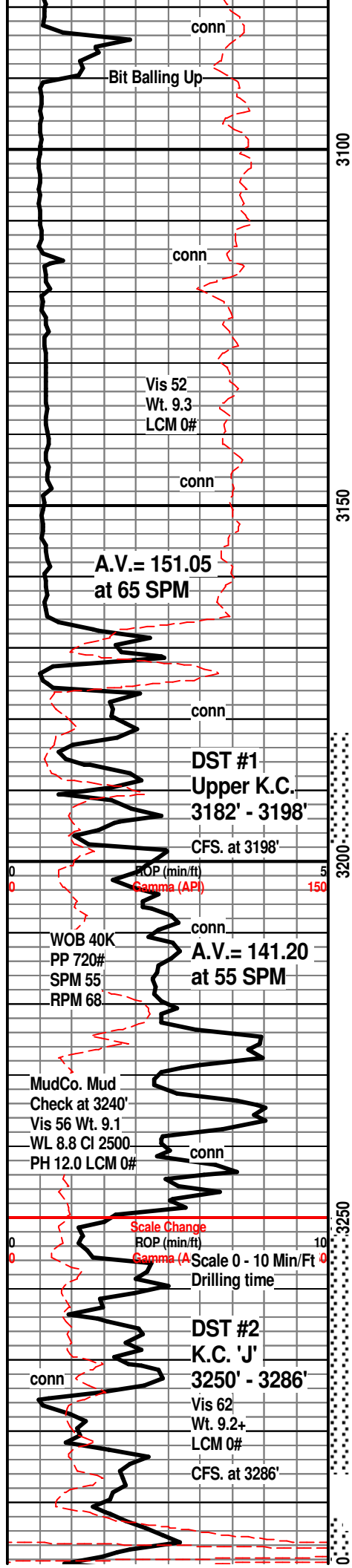
LM; med brn, gy brn, sandy, highly mica ip, scat coaly frags

SH; lt to med gy, platy, silty to sandy

SH; lt to med gy, silty to sandy, rarely mica

SH; lt to med gy, silty to sandy, platy





SH; lt to med gy, silty to sandy, firm, some smooth

SH; lt to med gy, silty to occ sandy, platy

**KANSAS CITY 3167(-1862)**

LM; med to dk brn, foss ip, dense, tite

**K.C. DRUM 3176(-1871)**

LM; tan to cream, off wh, f to med xln, occ foss scat fairly well dev. vug por, some calc overgrowths in porosity, sev. pcs w/spotted to even lt brn stn, brite yel fluor, trc gassy FO., fair odor, fair to occ gd cut

LM; off wh, tan, cream, foss w/few oolites, much soft chalk, no stn or odor, scat fair interxln/interpart por, ns.

**DST #1: Upper K.C. 3182' - 3198'**  
**Corrected Depths to Log**

Drilling with Button Bit

LM; tan to cream, buff, f to med xln, poor to fair interxln por, scat tan to wh fresh cht, no fluor, no stn or odor, ns.

LM; tan to cream, buff, foss ip, scat poor to fair vug and foss-cast por, most tite, occ wh to tan cht, no fluor, no stn or odor, ns.

LM; tan to cream, lt brn, f to med xln, scat poor to fair p-p por, rare spotted lt brn oil stn, fair oil odor, scat med/brite yel fluor, possible frags, could be slough from upper KC zone??, very cherty ip.

LM; lt brn, f to med xln, some gran text, scat fair interxln w/small vug por, spotted to occ even lt brn oil stn, gd odor, SFO, some looks fairly tite, fair to gd cut

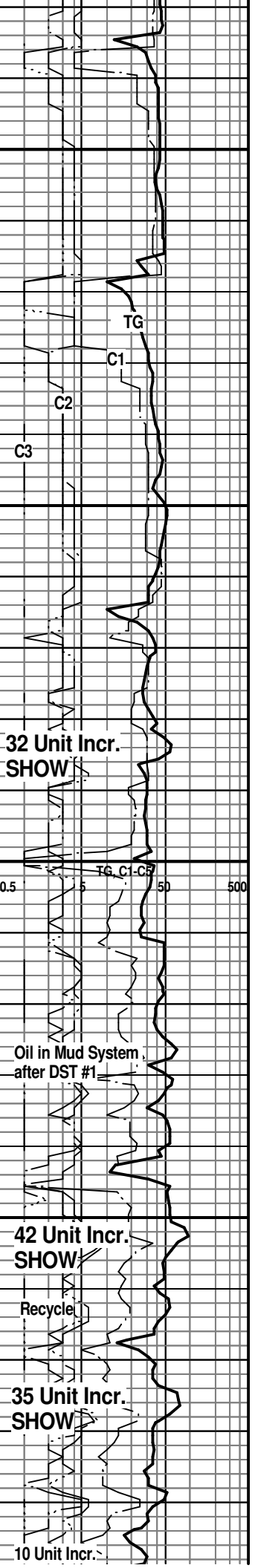
LM; tan to cream, buff, foss ip, trc p-p and interpart por, quest. spotted lt brn stn, most tite, spotty med yel fluor, faint odor, cherty

LM; lt brn, oolitic, well dev. oomoldic por, scat small vug por also, med brn to golden brn mostly even oil stn, gd odor, med yel fluor, SFO, gd cut, some barren por - bcm tighter at base

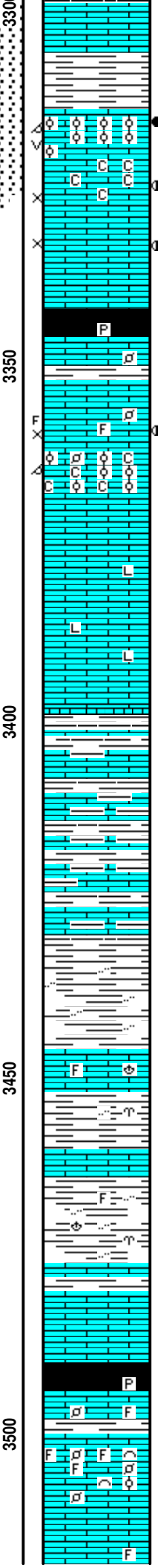
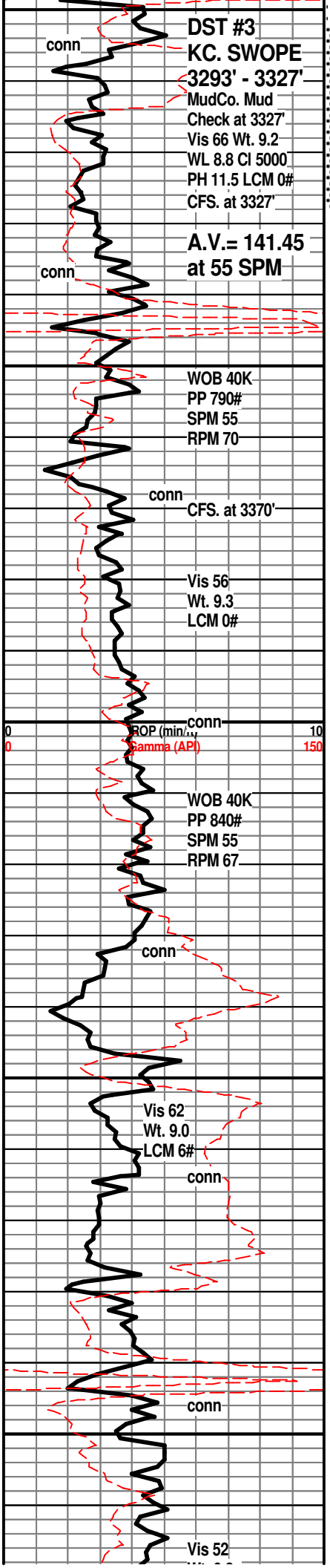
**DST #2: K.C. 'J' zone 3250' - 3286'**  
**Corrected Depths to Log**

**STARK SHALE 3296(-1991)**

SH; blk carb. soft to occ blocky







SH; brn, carb, soft to occ blocky  
LM; med to dk brn, dense, scat spar calc xtals, tite

**SWOPE 3314(-2009)**  
LM; lt to med brn, finely oolitic, most small to occ med size molds, well dev. oomoldic por, occ vug por, med golden brn spotty to even oil stn, gd odor, SSFO, fair to gd cut, med to occ brite yel fluor, sev. pcs bleeding oil, bcm chalky

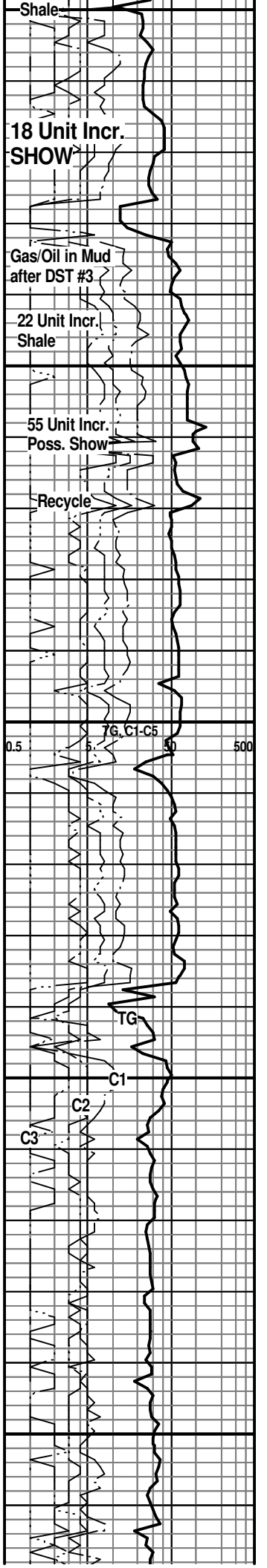
**DST #3: K.C. Swope 3293' - 3327'**  
**Corrected Depths to Log**  
LM; tan to med brn, fxln ip, poor to fair interxln por, some hd micrite, scat lt to med yel fluor, trc spotted med brn stn, looks tite  
SH; blk, carb, blocky ip, trc pyr

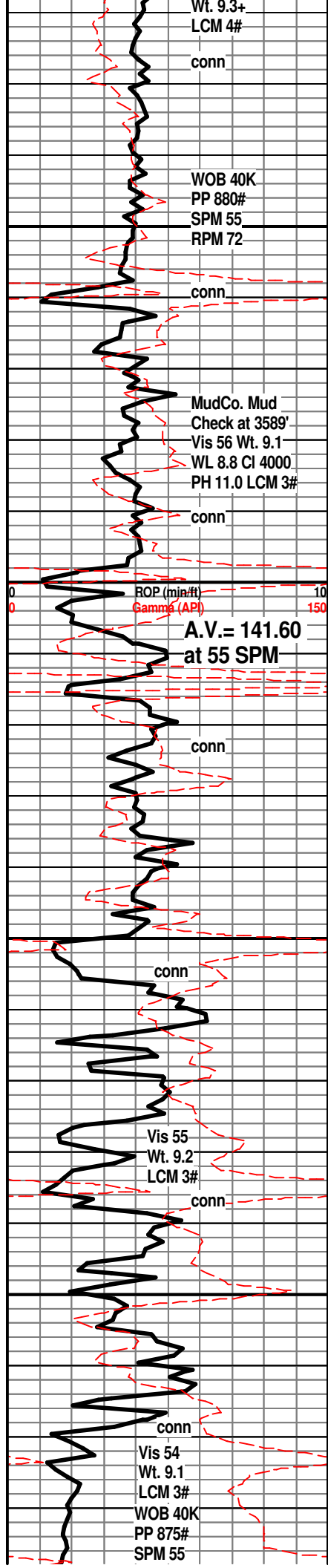
**HERTHA 3346(-2041)**  
LM; tan to cream, foss ip, most fxln w/poor to fair vis interxln por, scat lt to med brn stn, fair odor, trc F.O., lt to occ med yel fluor, fair cut, poss frags, most looks tite  
LM; lt brn, gy brn, foss - oolitic, poor to fair oomoldic por, chalky mtx ip, v. dull yel to no fluor, no vis stn, no odor, barren  
LM; med to occ dk brn, dense, some litho, blocky, tite

**BASE KANSAS CITY 3399(-2094)**  
SH; grn, gy grn, platy to flakey  
LM; med gy brn, argil w/interbdd lmy sh, hd, most blocky  
LM; dk brn, dk gy brn, dk gy, hd, blocky, argil  
SH; varic, maroon, sea grn, gy, platy, some silty

**LOST PARTIAL RETURNS AT 3449' - Pull 5 Stands, mix LCM, regain full returns**  
LM; lt brn, gy brn, scat well cem foss mat, occ tan fresh cht, no vis por, ns  
SH; med gy, gy grn, some varic w/maroon and rust red, foss ip, silty ip.

**MARMATON 3480(-2175)**  
LM; tan, lt gy, most dense - micritic, hd, no vis por, no fluor, ns.  
SH; blk, blocky, trc pyr, no gas kick  
LM; lt to med brn, highly foss w/scat hash and well cem oolites/pellets, lt yel min fluor, no stn or odor, ns.



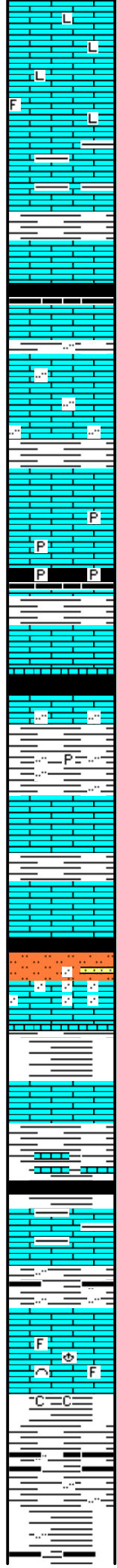


3550

3600

3650

3700



LM; tan to lt brn, most dense, rare foss mat, some litho, no vis por, no fluor, ns.

LM; med to dk brn, occ gy brn, argil ip, tite

LM; tan to med brn, dense, micritic, ns.  
SH; blk, carb, trc gas

LM; lt to med gy, gy brn, hd, blocky, tite

LM; lt to med gy, rare gy brn, fxln to micritic, scat gritty text - partly silty, no vis por, v. dull yel fluor, no stn, ns.

LM; med brn, gy brn, hd, scat pyr, no vis por, no fluor, ns.  
SH; blk, carb, pyr ip, trc gas

LM; tan to lt brn, foss ip, well cem, dull yel min fluor, no vis por, ns.  
**CHEROKEE SHALE 3613(-2308)**  
SH; blk, carb, blocky, brittle ip.  
LM; lt to med brn, dense, micritic, dull yel min fluor, some gritty text - silty ip, ns.  
SH; med gy, gy grn, silty ip, occ pyr

LM; med brn, blocky, micritic, tite

LM; med gy brn, hd, micritic, dull yel min fluor, ns.

SLTST; grn, gy grn, platy, some sandy ip.  
LM; med gy, sandy ip, well cem, no vis por, ns.

LM; lt to med brn, blocky, micritic, tite

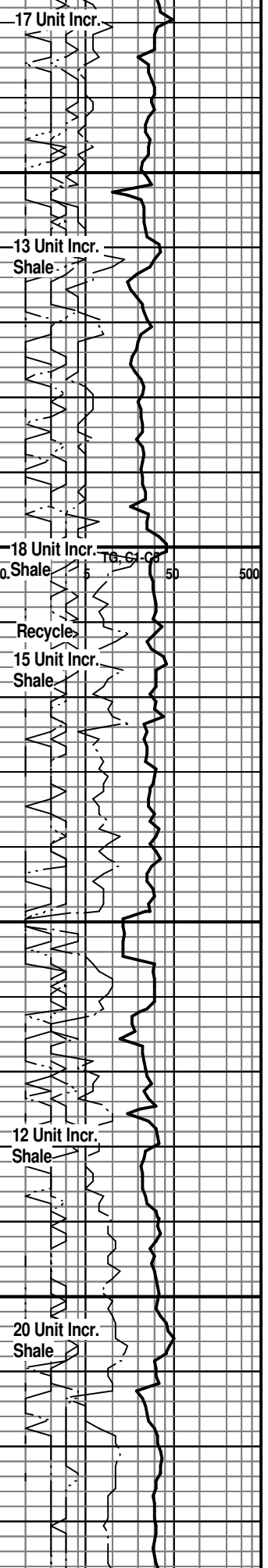
SH; dk gy, trc blk, some varic w/interbdd shaly lmst.

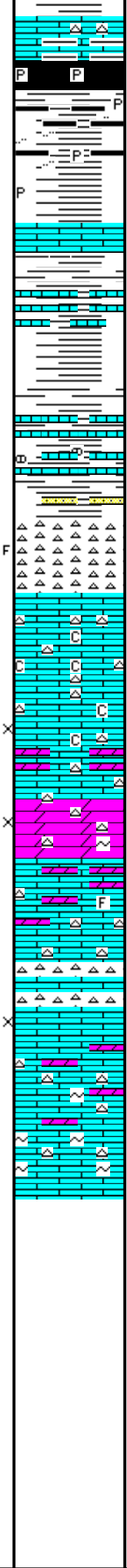
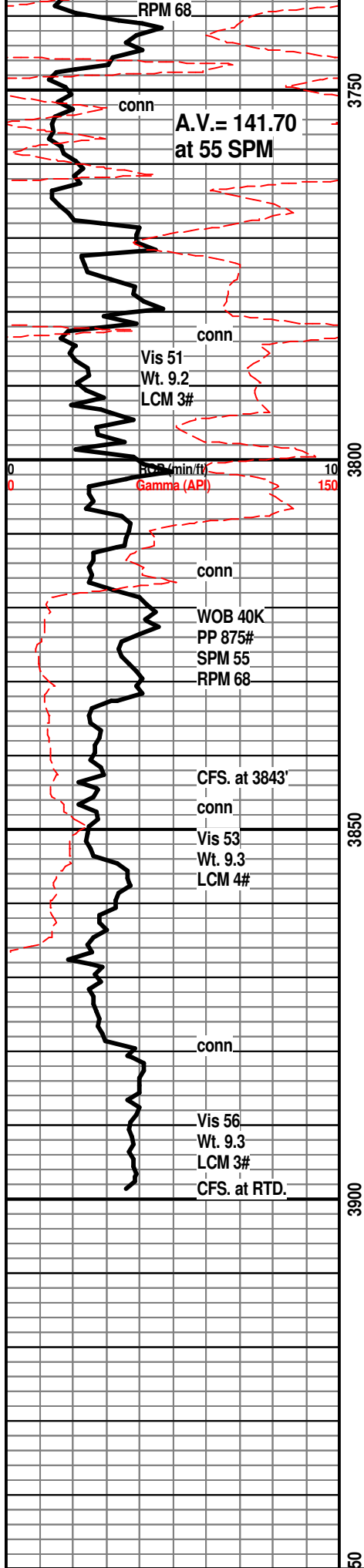
LM; dk brn, gy brn, argil  
SH; lt gy, pale gy grn, soft ip, some silty, some interbdd blk sh

LM; tan to lt brn, off wh, foss ip, most well cem micrite, interbdd soft chalky lmst, lt yel min fluor, no stn or odor, ns.

SH; lt to med gy, gy grn, grn, some blk, platy, occ silty

SH; varic, maroon, gy, silty ip





LM; med gy, gy brn, interbdd cht, hd, some argil lmst, tite

SH; blk, pyr ip, carb w/trc coaly frags, gassy

SH; varic, some dk gy - blk, platy, silty ip.

LM; med brn, hd, argil, blocky, interbdd med to dk gy sh, some brn and varic sh.

SH; varic, platy, interbdd dk grn partly weathered lmst and shaly lmst

SH; varic, grn, gy, brn, interbdd weathered grn to brn occ nodular lmst

SH; med gy, grn, platy, few clusters of med gr qtz ss, no stn or odor, ns.

**MISSISSIPPI CHERT 3808(-2503)**  
 CHT; wh, brn, tan, most fresh, trc weathered wh cht, trc frags, looks tite, no stn/fluor, no odor

**MISSISSIPPI LMST. 3818(-2513)**  
 LM; tan to cream, off wh, med to cse xln, poor to no vis interxln por, cherty ip, scat soft chalky mtx, dull yel min fluor, no stn or odor, ns.

LM; tan to cream, off wh, cse xln, partly dolomitic, poor interxln por, cherty ip, no fluor, no stn or odor, no gas kick

DOL; lt to med brn, sucrosic, interbdd gy fresh to partly weathered foss cht, trc. dull yel fluor, poor interxln por, no odor, no vis oil stn, no sample shows

LM; tan to cream, off wh, cherty mostly fresh, blocky, foss ip, hd, partly dolomitic, no fluor, ns.

CHT; wh, off wh, lt gy, foss, most fresh, rarely dolomitic, interbdd tan cse xln cherty lmst w/poor interxln por, no fluor, ns.

LM; lt to med brn, med xln, partly dolomitic, dense, no vis por, cherty, trc glau, no stn or odor, ns.

LM; lt to med brn, dolomitic ip, scat pyr, some glau, no vis por, ns.

**RTD. 3900' at 3:00 AM. 8/18/16**

**LTD. 3900'**  
 ELI Wireline Co. DIL, NEU/DEN + PE, Microlog

**NOTE: This log was shifted upward by 1' to 3' for Correlation purposes with the ELI Wireline Logs.**

