

LITHOLOGY STRIP LOG

WellSight Systems

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

Well Name: D. Unruh #1-21
Location: 1100' FSL & 2290' FWL, Sec. 21-T27S-R18W, Kiowa Co., KS.
Licence Number: 15-097-21750-0000 Region: Unnamed
Spud Date: 2/18/2013 Drilling Completed: 2/28/2013
Surface Coordinates: 1100' FSL & 2290' FWL, Sec. 21-T27S-R18W

Bottom Hole Same as above
Coordinates:
Ground Elevation (ft): 2191' K.B. Elevation (ft): 2202'
Logged Interval (ft): 3350' To: 4875' Total Depth (ft): 4875'
Formation: Kinderhook at Total Depth
Type of Drilling Fluid: Freshwater/Gel to 3177'; Chemical Gel 3177' to 4875'.

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OPERATOR

Company: Herman L. Loeb, LLC.
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GEOLOGIST

Name: Jon D. Christensen
Company: Consulting Petroleum Geologist
Address: 9002 W. Silver Hollow St.
Wichita, KS. 67205-8856

Cores

None Taken

DSTs

DST #1(Lansing 'A') 4201' - 4218'(Corrected Depths to LOG) Test Times 15"-45"-30"-60" IFP Weak Blow built to 1", FFP Weak 0.5" Blow, no Blowback on SI's; REC: 70' MSW(16%M, 84%W) CI 81,000, Mud 10,000, no shows; IFP 18-30#, ISIP 1464#, FFP 33-54#, FSIP 1451#, IHP 2115#, FHP 2065#, BHT 111 Deg. F.

DST #2(Upper bench of Kansas City 'I') 4394' - 4414'(Corrected Depths to LOG) Test Times 15"-45"-30"-75" IFP Weak Blow built to 3", FFP Fair 4" Blow, no Blowback on SI's; REC: 110' Gas in Pipe, 55' Drlg. Mud w/oil Specks and thin layer of Free Oil on top of Fluid, no water; IFP 29-31#, ISIP 1088#, FFP 36-49#, FSIP 1185# and Building, IHP 2246#, FHP 2100#, BHT 116 Deg. F.

DST #3(Miss. Chert) 4739' - 4788' Test Times 15"-45"-60"-120" IFP Fair to Strong 10" Blow, FFP Fair to Strong 11" Blow, no Blowback on SI's; REC: 340' Gas in Pipe, 35' Drlg. Mud, no oil or water; IFP 20-26#, ISIP 166#, FFP 23-31#, FSIP 219#, IHP 2522#, FHP 2471#, BHT 120 Deg. F.

Comments

2/18/13 MIRU Sterling Drilling Rig #2, Spud at 6:00 PM; 2/19/13 TD. 566' - WOC; 2/20/13 Drilling at 1933'; 2/21/13 Drilling at 2953'; 2/22/13 Drilling at 3680'; 2/23/13 TD. 4222' - CCH for DST #1; 2/24/13 Drilling at 4415'; 2/25 TD. 4418' - SHUT DOWN OP's - SNOW STORM, 2/26/13 Resumed Drilling operations at 1:50 PM.; 2/27/13 Drilling at 4705'; 2/28/13 TIH after DST #3, Reached TD. 4875' at 12:45 PM., Logged well LTD. 4872'; 3/1/13 RTD. 4875' - LDDP to run 5 1/2" Production Casing.

Set new 8 5/8"(24#) Surface Casing at 561' with 350 sacks cement(Basic Energy Services). Cement did Circulate. PD. at 5:00 AM. 2/19/13.

Set new 5 1/2"(15.5#) Production Casing at 4862' with 200 sx. of "Loeb Blend" cement(Basic Energy Services). PD. 5:00 PM. on 3/1/13.

Surveys: 1.25 Deg. at 566'(Surface Casing); 1 Deg. at 4222'(DST #1); 1 Deg. at 4788'(DST #3).


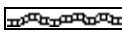
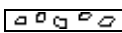
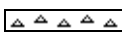
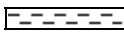







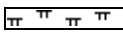
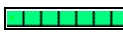
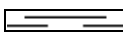
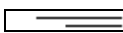
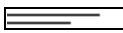



Pipe Strap at 4222'(DST #1): Strap 3.05' Short to the Board, no correction made to the Board.

After review of the Halliburton Logs, DST data, and favorable indication of commercial quantities of hydrocarbons, the operator elected to set new 5 1/2" Production Casing for Completion in the Mississippi Chert and Kansas City 'I' zone.








































































LOG TOPS: Chase 2430(-228), Stotler Lmst. 3389(-1187), Howard 3596(-1394), Heebner Shale 4036(-1834), Toronto 4054(-1852), Brown Lmst. 4189(-1987), Lansing 'A' 4198(-1996), Lansing/KC. 'H' 4358(-2156), K.C. 'I' 4405(-2203), Stark Shale 4491(-2289), Hertha 4550(-2348), Base Kansas City 4581(-2379), Marmaton 4626(-2424), Pawnee 4674(-2472), Cherokee Shale 4710(-2508), Miss. Chert 4754(-2552), Kinderhook Shale 4782(-2580), Kinderhook Sand 4822(-2620).

NOTE: This log was shifted upward by 3' to 4' for correlation purposes with the Halliburton 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

MINERAL  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	FOSSIL  Algae  Amph  Belm  Bioclst  Brach  Bryozoa  Cephal  Coral  Crin  Echin  Fish  Foram  Fossil  Gastro  Oolite	 Ostra  Pelec  Pellet  Pisolite  Plant  Strom STRINGER  Anhy  Arg  Bent  Coal  Dol  Gyp  Ls  Mrst	 Sltstrg  Ssstrg TEXTURE  Boundst  Chalky  Cryxln  Earthy  Finexln  Grainst  Lithogr  Microxln  Mudst  Packst  Wackest
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OTHER SYMBOLS

- POROSITY**
- E Earthy
 - F Fenest
 - X Fracture
 - Inter
 - Moldic
 - Organic
 - Pinpoint

- V Vuggy
- SORTING**
- W Well
 - M Moderate
 - P Poor

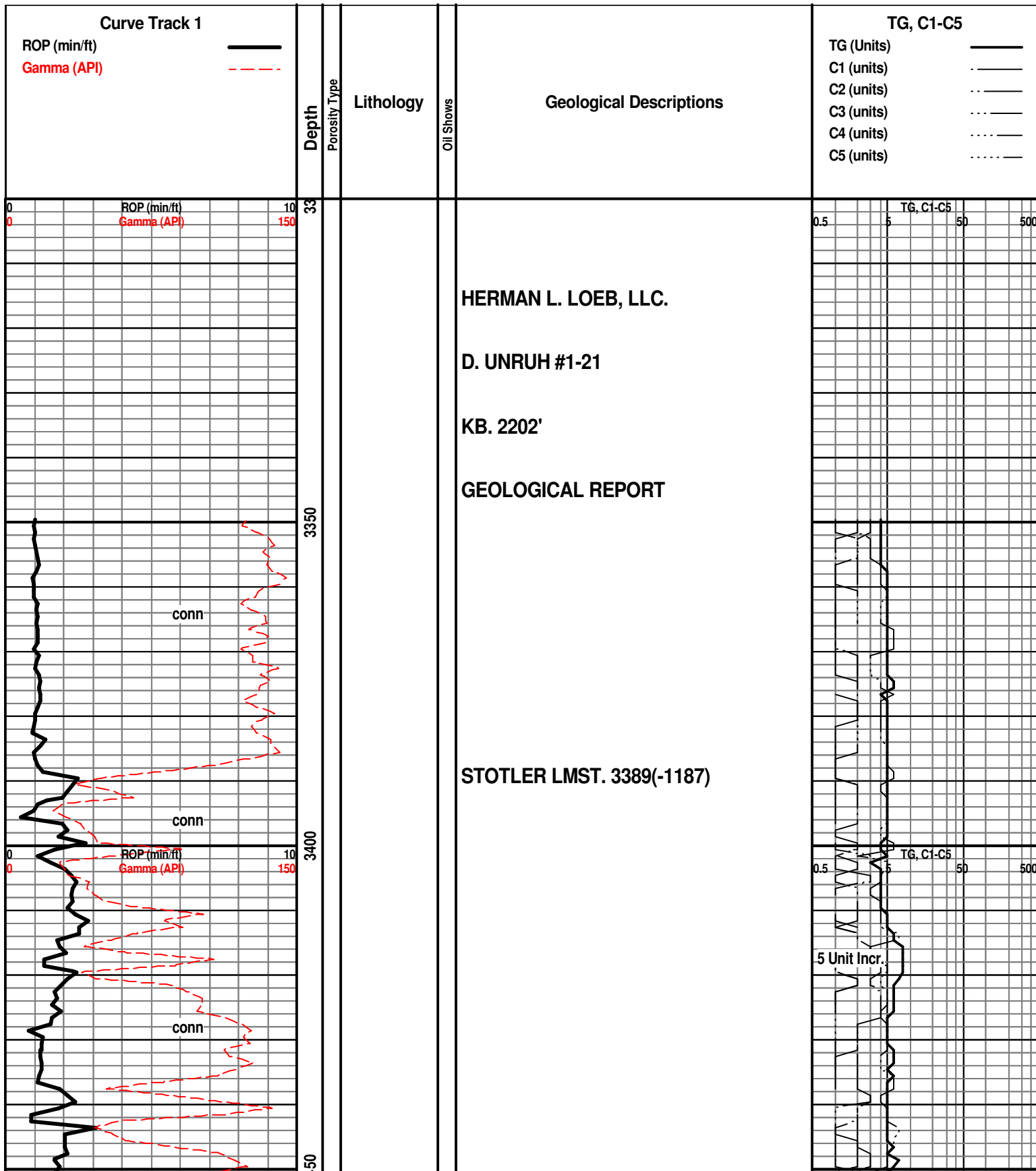
- ROUNDING**
- R Rounded
 - Subr Subrond
 - a Subang
 - A Angular

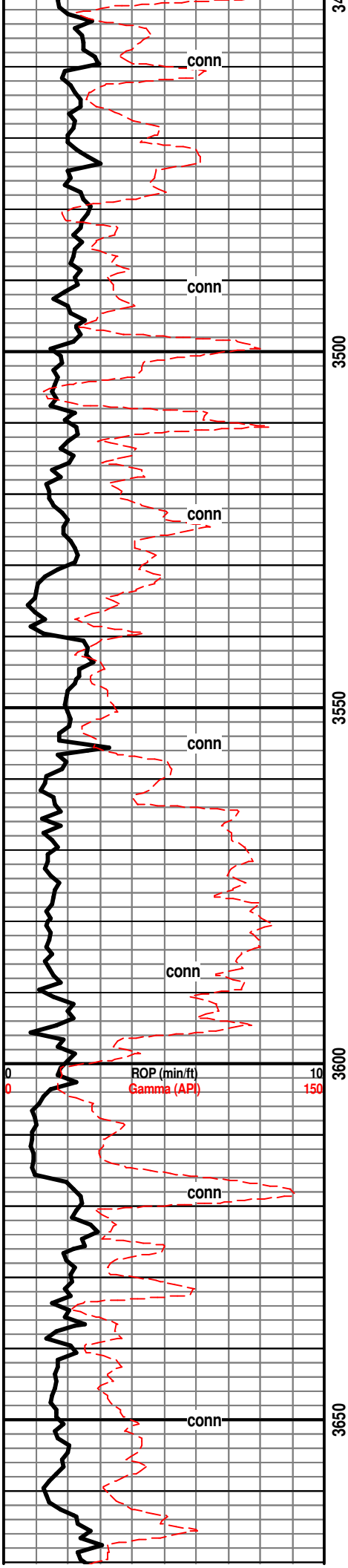
- Spotted
- Qes
- Dead

- EVENT**
- Rft
 - Sidewall

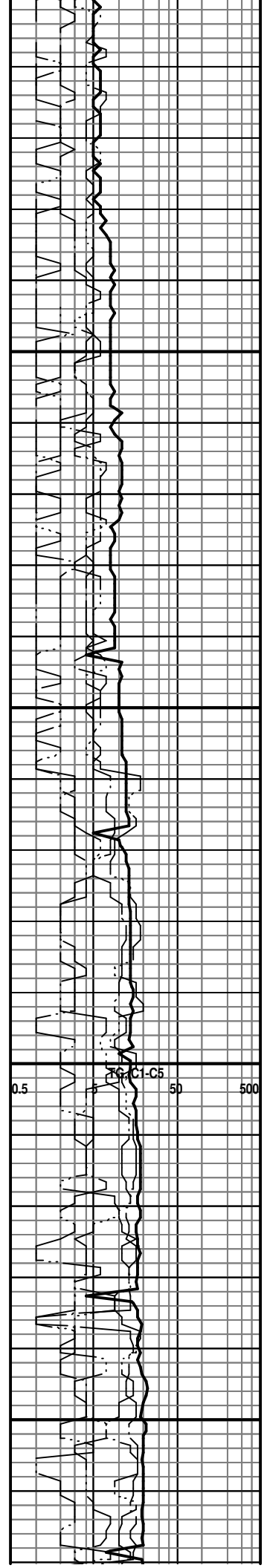
- INTERVAL**
- Core
 - Dst

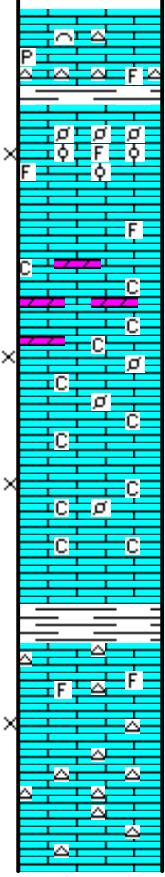
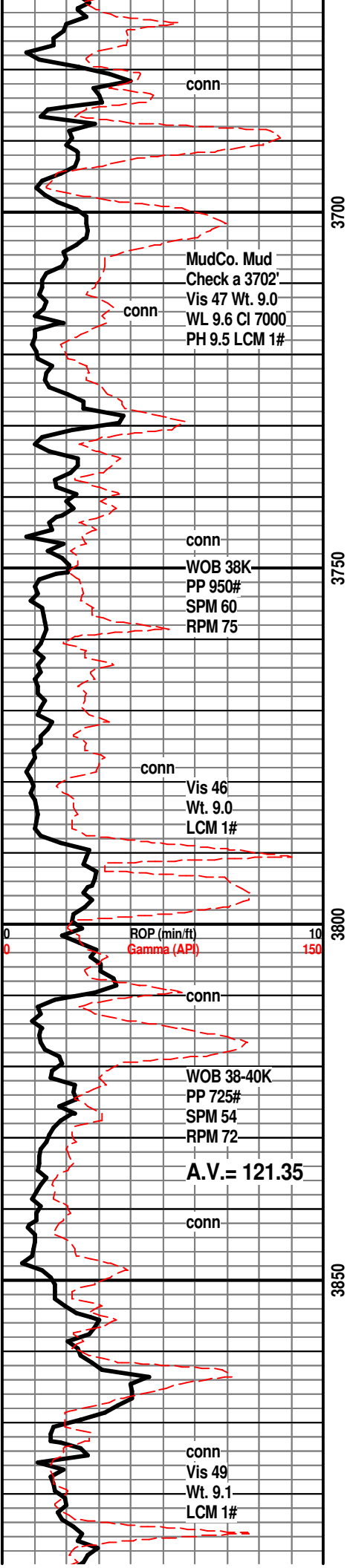
- OIL SHOW**
- Even





HOWARD 3596(-1394)





Start 10' Wet and Dry Samples

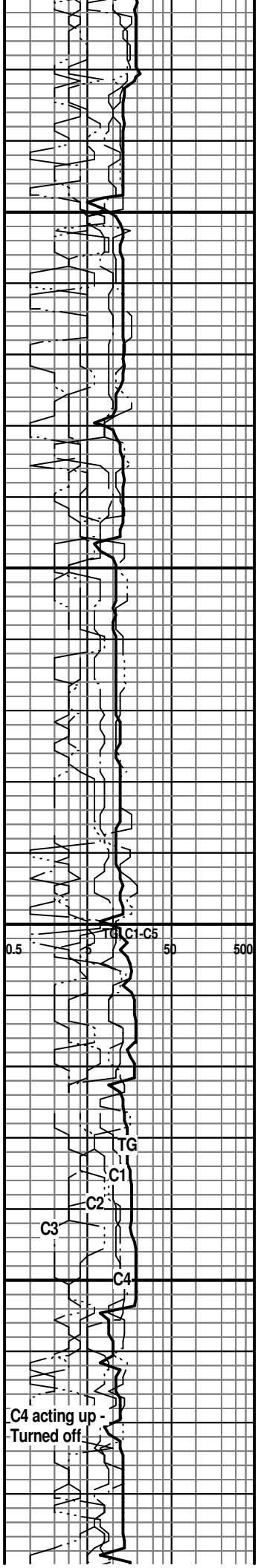
LM; med to dk gy, gy brn, foss, dense, scat gy and tan occ foss cht, no vis por, ns.

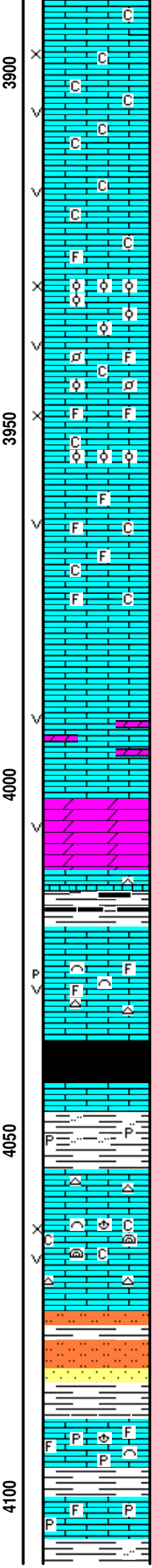
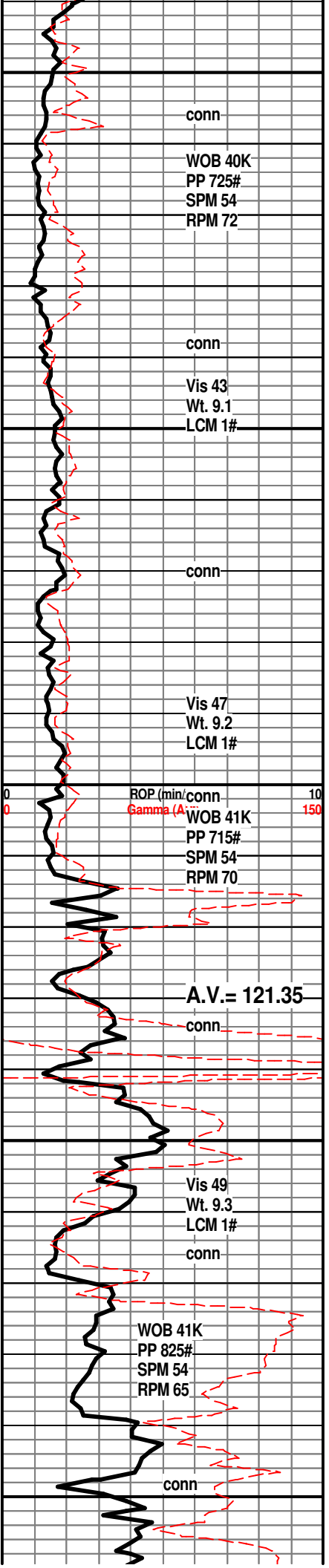
LM; off wh, tan, buff, highly foss - partly oolitic/pelletal, fair interpart por, lt yel min flur, no stn or odor, ns.

LM; off wh, tan, lt brn, gran to cse xln, trc sucrosic text, interbdd dolo and dolomitic lmst, abnt rnd gr and occ foss pellets, chalky soft mtx ip, scat lt to med yel min flur, no stn odor, ns.

LM; tan to lt brn, micritic, blocky, scat gy to off wh/wh cht, interbdd dense foss lmst, no flur, ns.

LM; tan to cream, buff, f to med xln, v. cherty w/scat foss mat, occ lt yel min flur, no stn or odor, ns.





LM; tan to off wh, buff, f to med xln, scat gd interxln w/occ vug por, interbdd soft chalky lmst, scat lt yel min fluor, occ cse opaque spar calc xtals, no stn or odor, ns.

LM; tan to lt brn, off wh, foss ip w/scat pellets and occ hash, chalky mtx, fair interpart w/scat vug por, spotty lt yel min fluor, no stn or odor, ns.

LM; tan to lt brn, buff, off wh, foss w/scat hash, interbdd chalk and chalky lmst, occ vug por, lt yel min fluor, ns.

LM; off wh, tan, buff, med to occ cse xln, abnt opaque spar calc xtals, interbdd sucrosic dolo. lmst w/vug por, lt yel min fluor, no stn or odor, ns.

DOL; lt to med brn, sucrosic, scat vug por, lt to med yel min fluor, no stn or odor, no gas kick, ns.

SH; dk gy, some blk, platy, firm

LM; lt brn, tan, fxln to micritic, scat well cem foss mat, interbdd fxln lmst w/p-p and occ vug por, lt yel fluor, no stn or odor, no gas kick, ns.

HEEBNER SHALE 4036(-1834)

SH; blk, carb ip, platy

LM; med to dk brn, hd, blocky

SH; grn, gy grn, silty ip, occ pyr

TORONTO 4054(-1852)

LM; wh, off wh, fxln to dense, micritic ip, occ wh cht, tite

LM; wh, off wh, tan, foss w/scat algal mat, fair interpart w/occ vug por, interbdd chalk and chalky mtx, dull yel fluor, no stn or odor, no gas kick, rare off wh cht, ns.

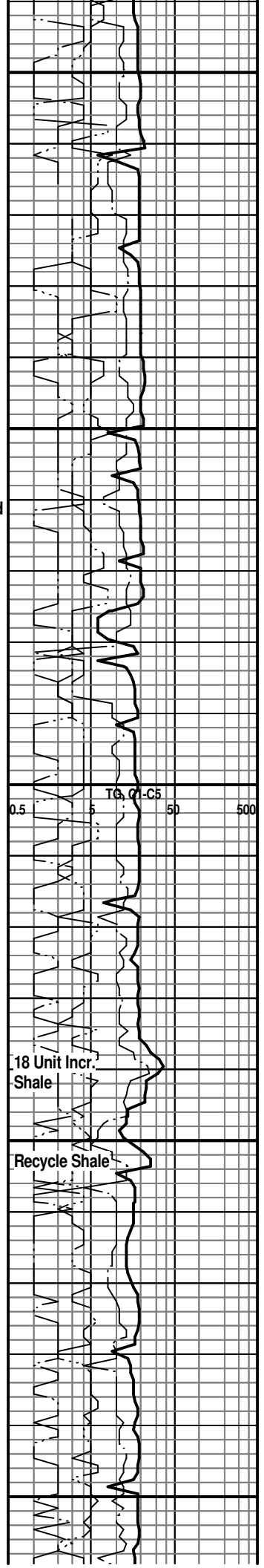
DOUGLAS SHALE 4074(-1872)

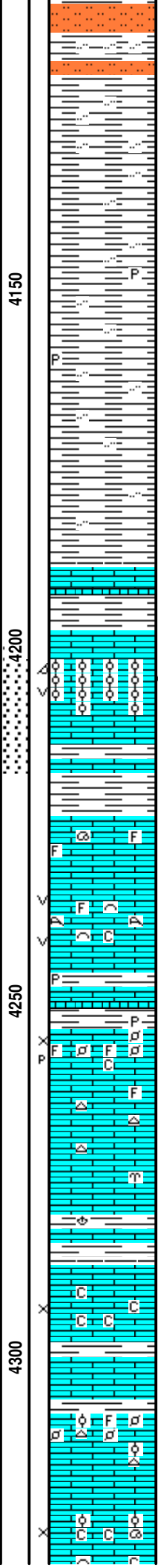
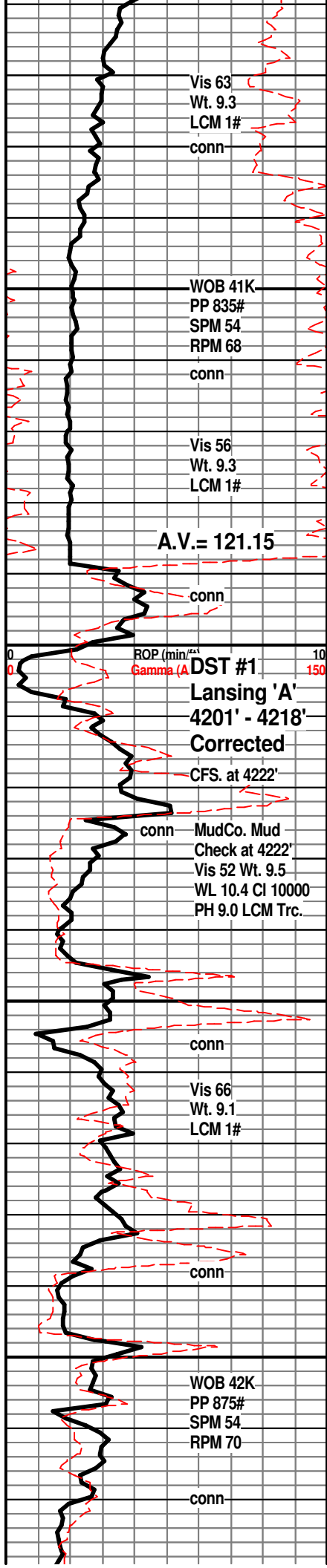
SH & SLTST; red, grn, med gy, firm

SLTST; lt gy, sandy w/interbdd vf to f gr qtz ss, mica ip, platy

LM; lt to med brn, v. foss, hd, well cem, scat pyr, lt yel min fluor, no stn, ns.

LM; med brn, hd, pyr ip, rare foss, tite





SH; lt to med gy, silty w/interbdd sltst, v. firm platy

SH; lt to med gy, platy, occ silty

SH; med gy, silty, platy, occ free pyr

SH; lt to med gy, occ silty, rarely mica, most smooth, flakey ip.

BROWN LMST. 4189(-1987)

LM; med brn, dense, micritic, hd

LANSING 'A' 4198(-1996)

LM; tan to med brn, oolitic, most med to lrg moldic por, gd oomoldic w/occ vug por, med to brite yel fluor, few gas bubbles, rare pcs w/dk brn v. spotted oil stn, v. faint odor, some rextalized, pred. gas show

DST #1: Lansing 'A' 4201' - 4218' Corrected Depths to Log

LANSING 'B' 4224(-2022)

LM; off wh, tan, foss ip, most dense, well cem, scat off wh cht, no vis por, no fluor, ns.

LM; lt gy, tan, foss, scat fusulinids and coral frags, some cse xln w/spar calc xtals, fair vug por ip, occ lt yel fluor, no stn or odor, no gas kick, minor chalky mtx, barren, ns.

SH; grn, gy grn, platy, occ pyr

LM; off wh, buff, foss w/finely pelletal lmst, fair interpart w/scat p-p por, minor chalky mtx, lt yel fluor, no vis stn, no odor, no sample shows

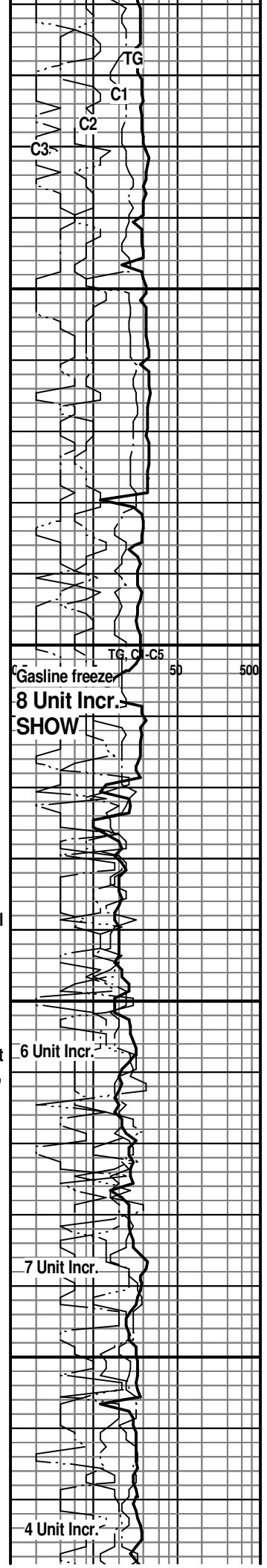
LM; lt brn, tan, micritic, scat off wh/gy cht, tite

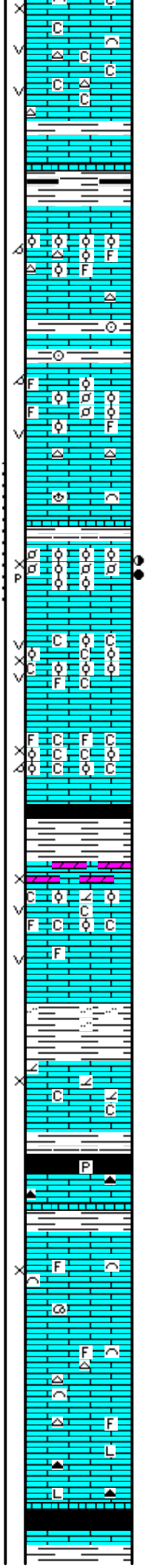
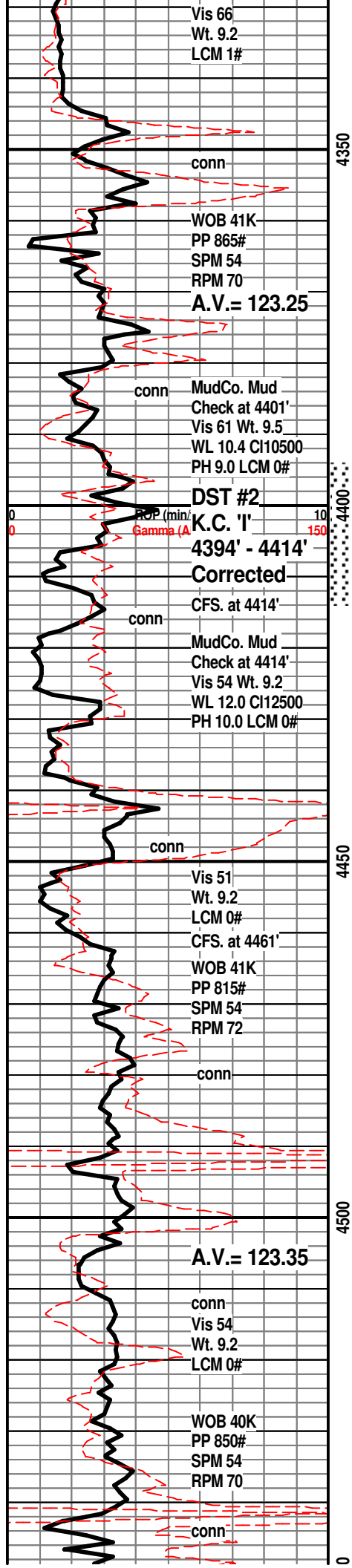
SH; med to dk gy, platy, foss ip.

LM; tan to cream, buff, med xln w/scat cse spar calc xtals, fair interxln por, occ chalky mtx, no fluor, no stn or odor, ns.

LM; lt to med brn, scat small pellets and foss mat, most well cem, interbdd gy/brn cht, no fluor, ns.

LM; off wh, wh, tan, med to occ cse xln, trc off wh oolitic lmst, fair intexln por, much soft chalky mtx, scat foss mat, dull yel min fluor, no stn odor, no sample





shows

LM; off wh, wh, buff, med xln w/scat fair to gd vug por, chalky ip, scat off wh cht interbdd, no fluor, ns.

LM; med brn, dense, micritic, hd.

SH; dk gy, trc blk, platy

LANSING/K.C. 'H' 4358(-2156)

LM; tan to lt brn, oolitic, med size oolites, some poorly dev. oomoldic por, most well cem, scat oolitic cht, dull yel min fluor, no stn or odor, no sample shows

SH; med gy, grn, foss ip.

LM; lt brn, foss - partly oolitic, poor to fair oomoldic por, occ small vug por, interbdd foss hash, lt yel min fluor, no stn or odor, ns.

LM; lt to med brn, hd, foss ip, tite

KANSAS CITY 'I' 4405(-2203)

LM; off wh, buff, finely pelletal/oolitic, fair to gd interpart w/p-p por, med/brite yel fluor, SFO, spotted to even light oil stn, few gas bubbles, gd odor, gd streaming cut

DST #2: K.C. 'I' 4394' - 4414' Corrected
Depths to LOG

LM; tan to lt gy, foss/finely oolitic, fair interpart and vug por, minor chalky mtx, dull yel fluor, no stn or odor, no gas kick, barren

LM; off wh, buff, tan, foss w/small oolites and fair oomoldic por, much soft chalky mtx, dull yel min fluor only, no stn or odor, no gas kick, ns.

SH; blk, dk gy, platy, smooth

KANSAS CITY 'J' 4450(-2248)

LM; off wh, wh, buff, foss w/foss hash and oolitic lmst, dolomitic ip w/scat sucrosic text, fair interpart w/scat small vug por, much chalky mtx, dull yel fluor, no stn/odor, ns.

LM; lt brn, fxln w/rare unconnected vug por, lt yel fluor, no stn, ns.

SH; med gy, gy grn, silty ip, platy

LM; off wh, tan, buff, fxln to sucrosic text, partly dolomitic, poor to no vis interxln por, scat soft chalky mtx, no fluor, ns.

STARK SHALE 4491(-2289)

SH; blk, carb, occ pyr

LM; med brn, hd, scat smoky cht, tite

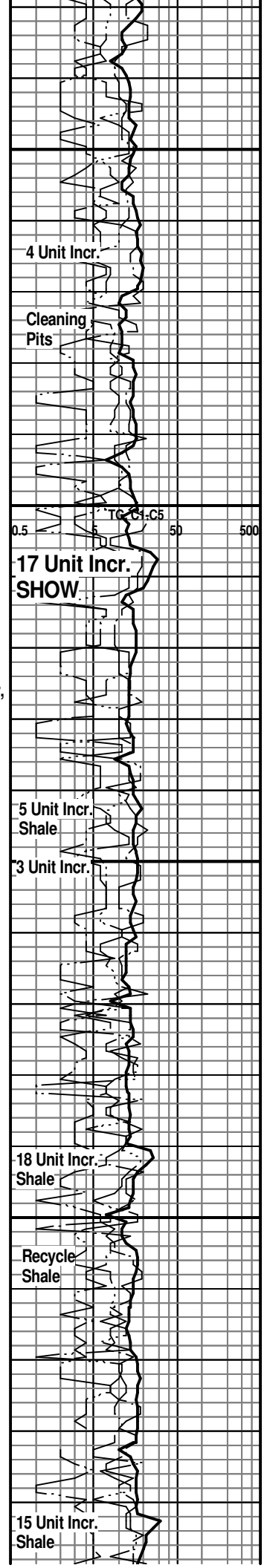
SWOPE 4502(-2300)

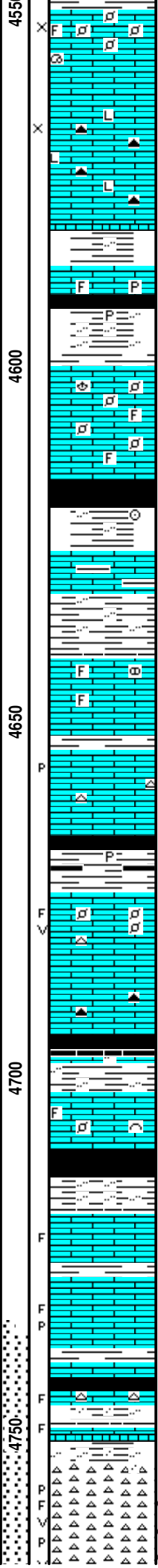
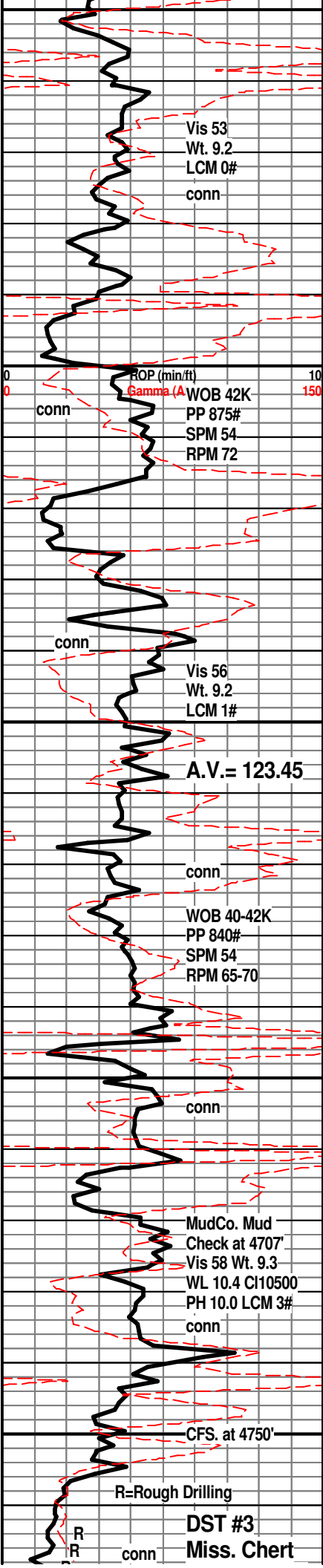
LM; lt to med brn, gy brn, gritty text ip, scat foss mat, poor interpart por, dull yel min fluor only, no stn or odor, ns.

LM; lt to med brn, foss ip, well cem, scat cse opaque spar calc xtals, rare gy cht, no vis por, no fluor, ns.

LM; lt to med brn, dense, litho ip, tite, scat smoky cht

SH; blk, carb ip, platy to blocky





HERTHA 4550(-2348)
LM; lt to med brn, med xln w/scat foss mat, occ pellets, poor interpart por, lt yel min fluor, no stn or odor, ns.

LM; med to dk brn, dense, litho ip, hd, scat dk gy to occ smoky cht, no vis por, no stn, ns.

BASE KANSAS CITY 4581(-2379)
SH; grn, gy grn, some varic, platy

LM; med gy brn, dense, foss ip, scat pyr, tite

SH; varic, blk, grn, silty w/interbdd sltst.

PLEASANTON 4600(-2398)
LM; tan to buff, lt brn, med to occ cse xln, scat well cem foss hash and occ pellets, dense, no vis por, lt yel min fluor, no stn or odor, ns.

SH; blk, grn, red, brn, silty ip, occ foss

MARMATON 4626(-2424)
LM; lt brn, occ pale grn tint, argil ip, micritic, tite

SH; grn, soft, silty ip.

LM; tan to lt brn, foss ip, rare brn nodular lmst interbdd, no vis por, no stn or odor, ns.

LM; off wh, buff, tan, fxln, scat blk dead oil/gils. on few pcs, v. poor p-p por, trc cht w/med brn stn on frac face, lt yel fluor, no odor, no live shows, no gas kick

SH; blk, v. dk gy, platy, occ pyr

PAWNEE 4674(-2472)
LM; lt brn, hd, scat well cem foss pellets and hash, minor cht w/blk tar/gilsonite - trc fracs, minor vug por w/scat blk residual oil, occ lt to med yel min fluor, no odor, no gas kick

LM; lt to med brn, most dense - micritic, blocky, rare brn cht, no fluor, no stn, ns.

SH; blk, carb ip, trc gas

LM; lt to med brn, scat foss mat, no vis por, trc blk tar/dead oil, dull golden yel fluor, no odor, no gas kick,

CHEROKEE SHALE 4710(-2508)
SH; blk, dk gy, grn, silty ip.

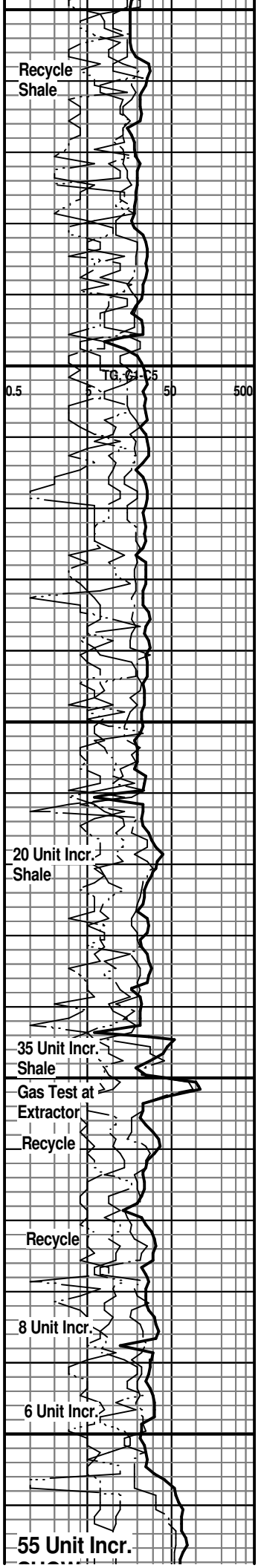
LM; tan to lt brn, fxln, most dense, occ blk tar/gils on edges, poss fracs, dull yel fluor, no live shows, no odor, no new gas kick

LM; tan to lt brn, fxln, trc fracs w/poor p-p por, most dense, trc dk brn/blk spotted stn, most tite, dull yel fluor, no odor

LM; lt brn, dense, scat frac faces w/blk tar/gils, some tan cht w/tar/gils, no odor, no live shows

MISSISSIPPI CHERT 4754(-2552)
CHT; varic, org, gy, wh, fresh and trip, fracs in fresh cht, tripolite has fair p-p and vug por, fair spotted/even med brn oil stn, SSFO, few gas bubbles, med to occ brite yel fluor, faint odor

CHT; wh, off wh, fresh and trip, fracs w/live brn edge



4735' - 4784'
Corrected

CFS. at 4784'

conn

Gamma (API)

MudCo. Mud
Check at 4821'
Vis 64 Wt. 9.3
WL 9.6 Cl 11000 PH
10.0 LCM 2#

conn

CFS. at 4836'

Vis 62
Wt. 9.3
LCM 2#

conn

CFS. at RTD.

4800

4850

4900

50



CHT; wh, off wh, fresh and tip, faces w/lve brn edge stn, rare blk tar/dead oil stn, weathered edges in cht w/lve brn stn, few gas bubbles, SSFO, med/occ brite yel fluor, less show in bottom of zone w/pred fresh chert

DST #3: Miss. Chert 4735' - 4784'

Corrected Depths to LOG

KINDERHOOK SHALE 4782(-2580)

SH; grn, gy grn, rust red, some varic, platy, interbdd f gr qtz ss w/abnt blk tar/dead oil, also weath. cht and sandy cht w/vug por, dead oil

SS; pale grn, off wh, vf to f gr qtz, shaly, soft, fair intergran por, no fluor, no stn, ns.

SH; grn, gy gn, sandy ip, platy

KINDERHOOK SAND 4822(-2620)

SS; wh, lt gy, grn, rare clr, all f gr qtz, clusters, subrnd gr, most fri, glau ip w/chlorite clays, fair to gd intergran por, rare lt yel fluor, trc gas bubbles, rare blk/dead oil, no odor, interbdd argil ss, 99% barren of shows

SS; clr, lt gy, wh, occ pale grn, all f gr qtz, clusters, most w/gd intergran por, subrnd gr, most clean, rare glau/chlorite, no fluor, no stn or odor, no gas kick

SS and CHT; wh, transl, siliceous ss, dense, no fluor, ns.

SH; huge incr. in varic shales, possible sloughing shale, scat wh/transl. chts

RTD. 4875' at 1:45 PM. 2/28/13

LTD. 4872'

Halliburton DIL, NEU/DEN, Microlog, Sonic

NOTE: This log was shifted upward by 3' to 4' for correlation purposes with the Halliburton LOGS.

SHOW

Recycle of the Gas Kick

T.G. C5

10 Unit Incr. POSS. SHOW

