

LITHOLOGY STRIP LOG

WellSight Systems

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

Well Name: Randel #3-20
Location: 2360' FSL & 1930' FEL, Sec. 20-T27S-R18W, Kiowa Co., KS.
Licence Number: 15-097-21807-00-00 Region: Einsel North
Spud Date: 9/3/2014 Drilling Completed: 9/10/2014
Surface Coordinates: 2360' FSL & 1930' FEL, Sec. 20-T27S-R18W

Bottom Hole Same as Above
Coordinates:
Ground Elevation (ft): 2188' K.B. Elevation (ft): 2201'
Logged Interval (ft): 3900' To: 4827' Total Depth (ft): 4827'
Formation: Kinderhook at Total Depth
Type of Drilling Fluid: Freshwater/Gel to 3196'; Chemical Gel 3196' to 4827'

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OPERATOR

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GEOLOGIST

Name: Jon D. Christensen
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Cores

None Taken

DSTs

DST #1(Kansas City 'I' Middle Porosity) 4396' - 4415'(Corrected Depths to Log) Test Times 15"-45"-45"-90" IFP Fair to Good 8.5" Blow, FFP Fair to Strong Blow BOB/44 Min., No Blowback on SI's; REC: 186' Gas in Pipe, 20' O&GCM(2%G, 2%O, 96%M), 120' GWM(2%G, 20%W, 78%M), 120' SW(CL 78,000, Mud 4000), IFP 33-60#, ISIP 1346#, FFP 65-141#, FSIP 1332#, IHP 2231#, FHP 2156#, BHT 122 Deg. F.

DST #2(Kansas City Lower 'I' + 'J' zones) 4420' - 4442'(Corrected Depths to Log) Test Times 15"-45"-45"-90" IFP Strong Blow BOB/45 Sec., 6" Blowback on ISI; FFP Strong Blow BOB/3 Min., Gas to Surface in 40 Min., Volume TSTM, 5" Blowback on FSI; REC: 3685' Gas in Pipe, 155' GWMO(30%G, 31%O, 34%W, 5%M), 124' GOCW(10%G, 10%O, 80%W), 444' SW(CI 70,000, Mud 5000); IFP 46-144#, ISIP 1383#, FFP 177-334#, FSIP 1376#, IHP 2258#, FHP 2159#, BHT 121 Deg. F.

DST #3(Miss. Chert) 4726' - 4790'(Corrected Depths to Log) Test Times 15"-45"-45"-90" IFP Strong Blow BOB/45 Sec., 9" Blowback in ISI, FFP Strong Blow Gas to Surface in 5 Min., Gauged Max. 30.7 MCFG; REC: 4674' Gas in Pipe, 50' SGCM(2%G, 98%M), no oil, no water; IFP 34-43#, ISIP 1436#, FFP 43-47#, FSIP 1491#, IHP 2431#, FHP 2296#, BHT 128 Deg. F.

Comments

9/3/14 MIRU Sterling Drilling Co. Rig #5, Spud at 6:45 PM. ; 9/4/14 TD. 652' - Cementing Surface Casing ; 9/5/14 Drilling at 1820'; 9/6/14 Drilling at 3580'; 9/7/14 Drilling at 4320'; 9/8/14 TD. 4444' - CFS; 9/9/14 Drilling at 4625'; 9/10/14 TD. 4792' - TOH with DST #3, Reached TD. 4827' at 1:00 PM.; 9/11/14 RTD. 4827' - LTD. 4826', CCH to LDDP - Set 5 1/2" Production Casing.

Set new 8 5/8"(23#) Surface Casing at 647' KB. with 400 sacks cement(Basic Energy Services). Cement did Circulate. PD. at PM. at 7:45 AM. on 9/4/14.

Set new 5 1/2"(15.5#) Production Casing at 4824' KB. with 200 sacks of "Loeb Blend" cement(Basic Energy Services). PD. at 5:15 PM. 9/11/14.

Surveys: 0.75 Deg. at 652'(Surface Casing); 0.50 Deg. at 4202'(Bit Trip); 0.75 Deg. at 4417'(DST #1); 1.0 Deg. at 4792'(DST #3).

Pipe Strap at 4202'(Bit Trip): Strap 1.07' Long to the Board, no correction made to the Board.

After review of the Halliburton Logs, DST data and positive indications of commercial amounts of recoverable hydrocarbons, the operator elected to set new 5 1/2" Production Casing for completion in the Miss. Chert and Kansas City zones.

NOTE: This log was shifted upward by 2' - 4' for correlation purposes with the Halliburton Logs.

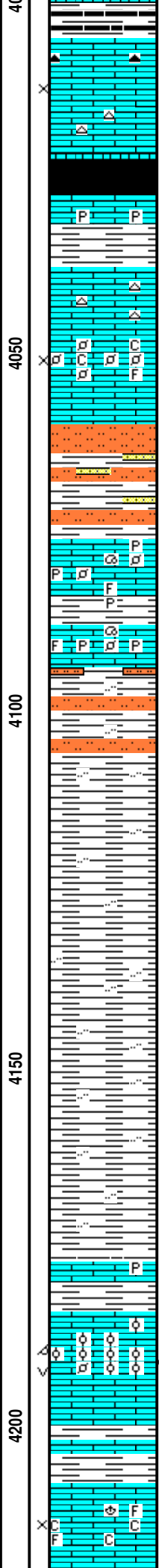
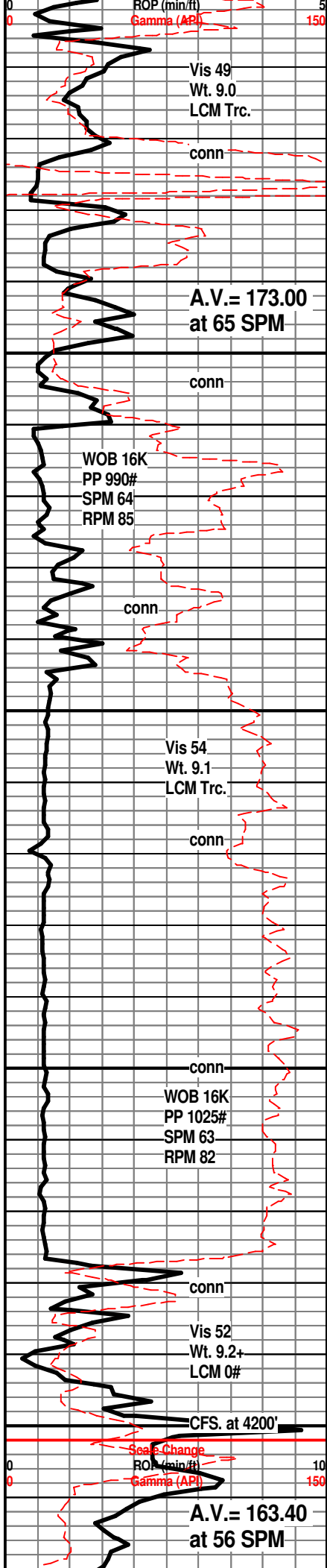
LOG TOPS: Chase 2432(-231), Stotler Lmst. 3382(-1181), Howard 3589(-1388), Heebner Shale 4023(-1822), Toronto 4038(-1837), Brown Lmst. 4177(-1976), Lansing 'A' 4184(-1983), Lansing/KC 'H' 4344(-2143), KC. 'I' 4393(-2192), KC 'J' 4437(-2236), Stark Shale 4481(-2280), Hertha 4538(-2337), BKC 4568(-2367), Marmaton 4616(-2415), Pawnee 4664(-2463), Cherokee Shale 4700(-2499), Miss. Chert 4763(-2562), Kinderhook Shale 4817(-2616).

ROCK TYPES

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

ACCESSORIES

MINERAL			
	Anhy		FOSSIL
	Arggrn		
	Arg		Algae
	Bent		Amph
	Bit		Belm
	Brecfrag		Bioclst
	Calc		Brach
	Carb		Bryozoa
	Chtdk		Cephal
	Chtlt		Coral
	Dol		Crin
	Feldspar		Echin
	Ferrpel		Fish
	Ferr		Foram
	Glau		Fossil
			Gastro
			Oolite
			STRINGER
			Anhy
			Arg
			Bent
			Coal
			Dol
			Gyp
			Ls
			Mrst
			Sltstrg
			Ssstrg
			TEXTURE
			Boundst
			Chalky
			Cryxln
			Earthy
			Finexln
			Grainst
			Lithogr
			Microxln
			Mudst
			Packst
			Wackest



SH; dk gy, blk, platy

LM; tan to lt brn, cream, f to med xln, fair interxln por ip, scat dk gy/off wh cht, lt yel min fluor, no stn or odor, ns.

HEEBNER SHALE 4023(-1822)

SH; blk, carb, gassy ip.

LM; med brn, hd, pyr ip, tite

TORONTO 4038(-1837)

LM; off wh, lt gy, tan, f to med xln, some dense - micritic, blocky ip, interbdd soft foss - partly pelletal lmst w/fair/gd interpart por, lt yel fluor, no stn or odor, minor chalky mtx, ns.

DOUGLAS SHALE 4060(-1859)

SLTST; lt gy, mica, interbdd vf gr qtz ss, trc poor intergran por, no fluor, ns.

LM; med to dk brn, brn, foss ip, hd, scat pyr, tite, dull yel min fluor

LM; med to dk brn, foss, hd, scat pyr

SH; lt to med gy, silty ip w/interbdd sltst.

SH; lt to med gy, silty ip, platy

SH; med gy, silty ip, smooth

BROWN LMST. 4177(-1976)

LM; med to dk brn, hd, blocky, rare pyr, tite

LANSING 'A' 4184(-1983)

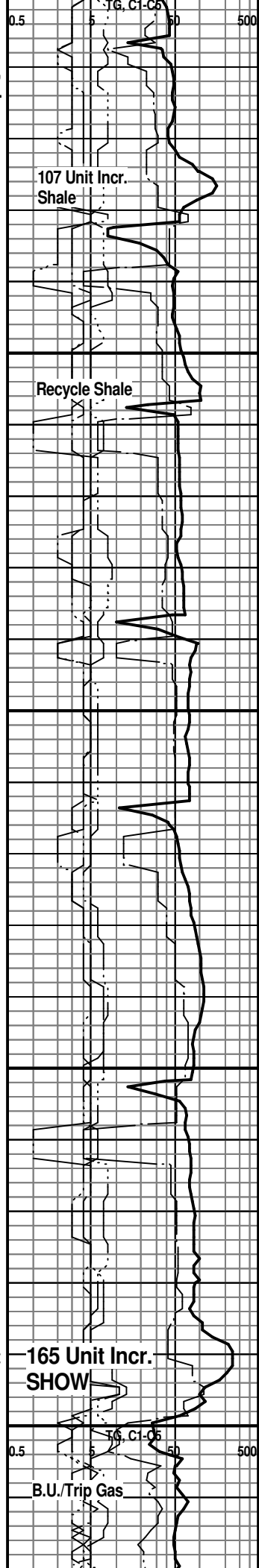
LM; lt to med brn, oolitic, med to rarely lrg molds, gd oomoldic por, trc poor vug por, med/brite yel fluor, faint odor, spotted lt brn stn, VSSFO, trc gas bubbles

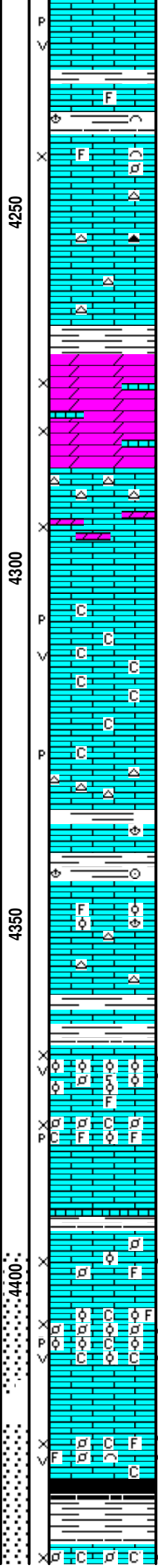
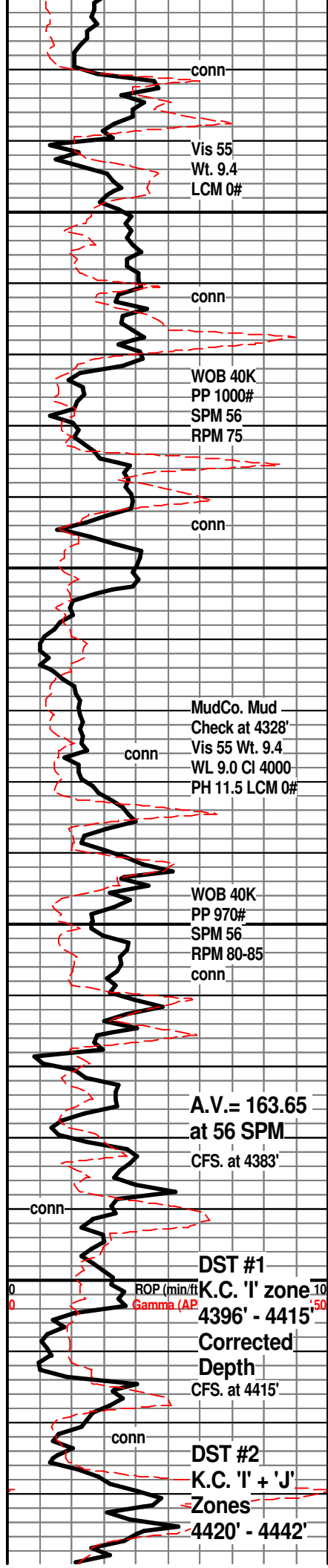
BIT TRIP AT 4200'

Drilling with Button Bit

LANSING 'B' 4208(-2007)

LM; off wh, buff, tan, foss ip, most well cem, scat chalk and chalky mtx, trc poor interxln por, no fluor, no stn or odor, ns.





LM; off wh, lt gy, buff, med xln w/fair vug and p-p por, dull yel fluor, no stn or odor, ns.

SH; med to dk gy, foss ip, platy

LM; tan to lt brn, fxln w/scat foss mat, fair interxln/interpart por, no stn/odor, no fluor, ns.

LM; lt to med brn, blocky, cherty ip, no vis por, no fluor, ns.

SH; med gy, smooth, platy

DOL; tan to cream, lt brn, sucrosic, dolomitic w/interbdd dolo. Imst, poor to fair vis interxln por, dull yel fluor, no stn or odor, no gas kick, ns.

LM; tan to off wh, lt brn, scat sucrosic text, partly dolomitic, fair interxln por, no fluor, ns.

LM; off wh, wh, buff, med to cse xln, abnt spar calc xtals, fair p-p and vug por, occ soft chalk and chalky mtx, lt to occ med yel min fluor, no stn or odor, ns.

LM; tan, off wh, med to cse xln, chalky ip, scat cse spar calc, bcm cherty, lt to med yel min fluor, no stn or odor, ns.

SH; med gy, gy grn, red/brn, foss ip.

LANSING/K.C. 'H' 4344(-2143)

LM; tan to buff, foss ip, rare well cem ooids, scat hash, no vis por, no fluor, occ off wh/gy cht, no gas kick, ns.

LM; tan, off wh, hd, blocky, scat gy cht

SH; med gy, gy grn, some slough sh.

LM; off wh, v. foss w/small ooids/pellets, fair interpart/small vug por, med/brite yel fluor, spotted/even lt brn stn, fair odor, SSFO, gas bubbles, fair/gd cut

LM; tan, off wh, foss - pelletal/oolitic ip, fair interpart w/p-p por, chalky mtx ip, lt yel fluor, no vis stn, no odor, no gas kick, barren por.

K.C. 'I' ZONE 4393(-2192)

LM; tan to lt brn, foss ip - most well cem, poor to no vis interpart por, spotted lt yel fluor, trc lt/med brn oil stn, no F.O, looks tite

LM; tan to buff, foss - partly oolitic, fair interpart, p-p and scat vug por(not oomoldic), strong odor, scat brite yel fluor, SFO, few gas bubbles, some chalk has brite yel fluor, gd cut

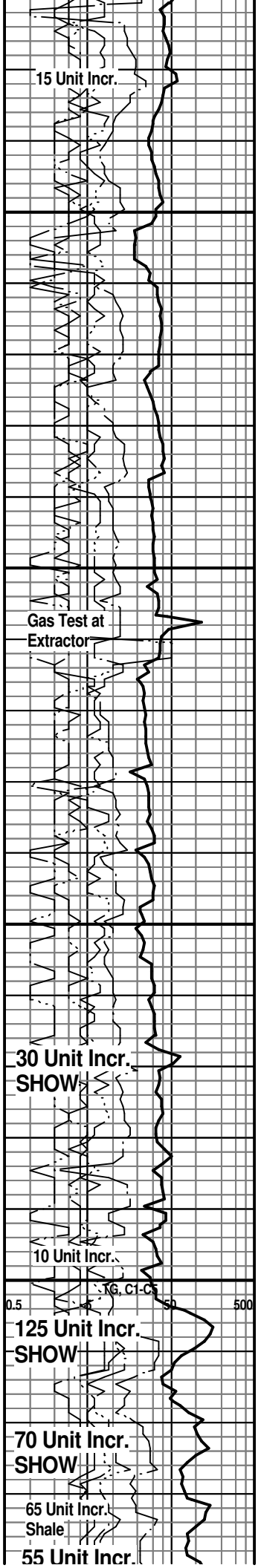
DST #1: Kansas City 'I' 4396' - 4415'

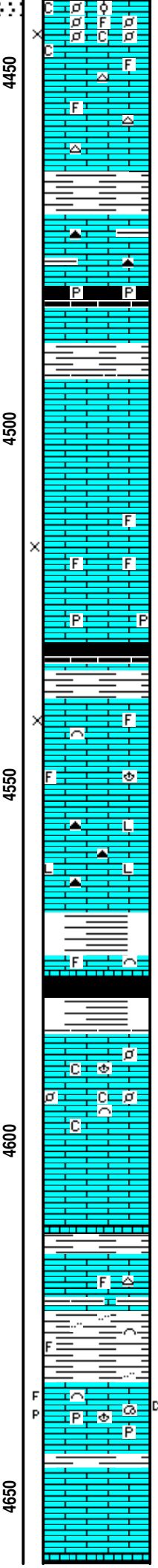
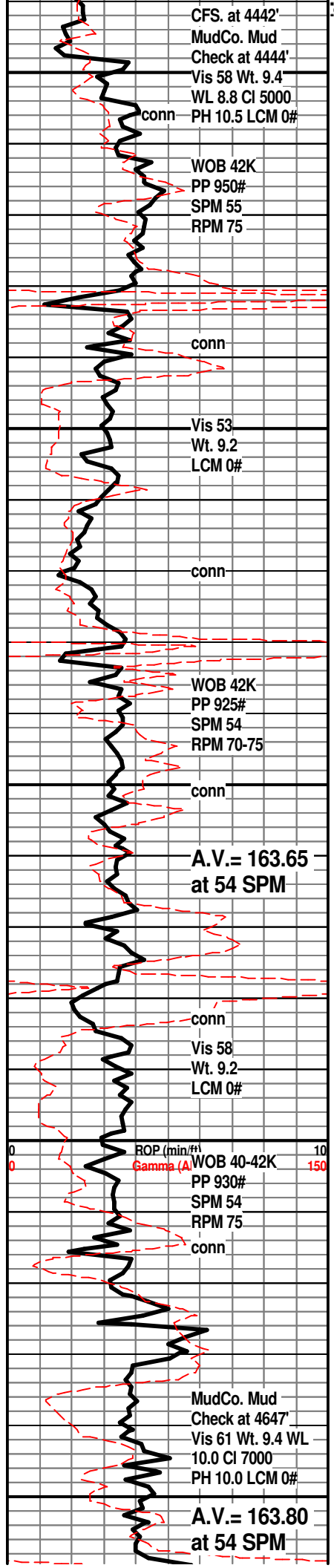
LM; lt brn, foss - med xln, fair interxln w/scat small vug por, strong odor, abnt brite yel fluor, spotted to even lt brn oil stn, SFO, few gas bubbles, gd cut, minor chalky mtx

SH; blk, dk gy, carb ip, platy

KANSAS CITY 'J' 4437(-2236)

LM; tan/ buff, foss - finely pelletal, fair to gd interpart





por, fair sweet odor, SFO, most w/even lt brn stn, med/brite yel fluor, gd cut, chalky ip.

DST #2: K.C. 'I' + 'J' 4420' - 4442'
Corrected Depths to Log
 LM; tan to lt brn, foss to micritic, scat wh to lt gy cht, no vis por, ns.

SH; med gy, gy grn, platy

LM; med to dk brn, gy brn, argil ip, hd, scat dk gy cht, no vis por, ns.

STARK SHALE 4481(-2280)
 SH; blk, carb ip, scat pyr, trc gas

SWOPE 4493(-2292)
 LM; tan to off wh, buff, fxln w/scat foss mat, most well cem, no fluor, no stn or odor, ns.

LM; off wh, buff, rare lt gy, foss to fxln, trc sucrosic text, fair interxln/interpart por, v. dull yel min fluor, no vis stn, no odor, no gas kick

SH; blk, carb ip, trc gas

HERTHA 4538(-2337)
 LM; lt brn, tan, fxln, foss ip w/trc poor interpart por, most dense - blocky, no fluor, no stn or odor, ns.

LM; med to odd dk brn, gy brn, hd, litho ip, interbdd blk/smoky cht, dense, ns.

BASE KANSAS CITY 4568(-2367)
 SH; varic - rust red, grn, brn, platy

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

SH; dk gy, blk, varic, platy

PLEASANTON 4585(-2384)
 LM; off wh, wh, buff, foss to med xln, scat pellets/some foss hash, minor soft chalky mtx, dull yel fluor, trc poor interpart por, no stn, ns.

LM; off wh, tan, foss w/well cem ooids/pellets, no vis por, scat dull yel min fluor, no gas kick, ns.

SH; dk gy, some blk, platy

MARMATON 4616(-2415)
 LM; lt brn, pale grn tint - argil ip, most dense, blocky, trc transl cht, tite

SH; med gy, grn, silty ip, rare foss mat.

LM; lt brn, tan, foss ip, sev. pcs. w/blk hvy oil stn - tar/gilsonite, trc poor p-p por, dull yel fluor, trc calc fld fracs w/gilsonite on edges, no live sample shows, scat pyr, tite

LM; lt to med brn, most dense - micritic, blocky, no vis por, no fluor, ns.

