

Robert L. Milford

PETROLEUM GEOLOGIST
Wichita, Kansas

GEOLOGISTS REPORT

DRILLING TIME AND SAMPLE LOG

OPERATOR **Murfin Drilling Company, Inc.**

LEASE **Jacque #1-2**

LOC. SPOT **C SE SE**

LOC. FOOTAGE **660' FEL 660' FEL**

SEC. **2** TWPSP **4S** RANG **33W**

COUNTY **Rawlins** STATE **KANSAS**

API **15-153-21076-00-00**

CONTRACTOR **Murfin Drilling Co., Inc.** RIG NO. **7**

DRILLING STARTED **11-3-2014** COMPLETED **11-11-2014**

MUD REPLACED **3:05** MUD TYPE **Chemical**

DRILLING TIME KEPT FROM **3:17** TO **RTD**

SAMPLES SAVED FROM **3:10** TO **RTD**

SAMPLES EXAMINED FROM **3:10** TO **RTD**

GEOLOGICAL SUPERVISION FROM **3:10** TO **RTD**

FORMATION NAME	TOP LOG DATUM	TOP SAMPLE DATUM	SAMPLE
Stone Corral	2,778' -299'	not available	
Topoka	3,800' -723'	3,801' -724'	
Heebner	3,970' -893'	3,970' -893'	
Lansing	4,010' -933'	4,010' -933'	
B/KC	4,242' -1165'	4,242' -1165'	
Pawnee	4,368' -1291'	4,368' -1291'	
Cherokee	4,440' -1363'	4,440' -1363'	
Mississippian	4,597' -1520'	4,597' -1520'	
Total Depth	4,685' -1609'	4,685' -1608'	

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DATE	7:00 AM DEPTH	REMARKS
11-3-14	0'	Spud @ 1:45 pm. Plug down @ 10:30 pm. Drilled out plug @ 6:30 am on 11-4-14 w/ PDC bit
11-4-14	290'	Cut 290' in last 24 hrs.
11-5-14	2,010'	Cut 1,720' in last 24 hrs; 19 hrs drlg. Bit trip @ 3707' (ran button bit)
11-6-14	3,707'	Cut 1,697' in last 24 hrs; 17.5 hrs drlg. DST #1 @ 3975'
11-7-14	3,975'	Cut 268' in last 24 hrs; 8.5 hrs drlg. DST #2 @ 4073'
11-8-14	4,073'	Cut 98' in last 24 hrs; 4.25 hrs drlg. DST #3 @ 4120'
11-9-14	4,140'	Cut 67' in last 24 hrs; 3.5 hrs drlg. DST #4 @ 4195'
11-10-14	4,285'	Cut 145' in last 24 hrs; 7 hrs drlg. RTD 4685' @ 4:40 am on 11-11-14
11-11-14	4,685'	Cut 400' in last 24 hrs; 19 hrs drlg. P&A

Remarks

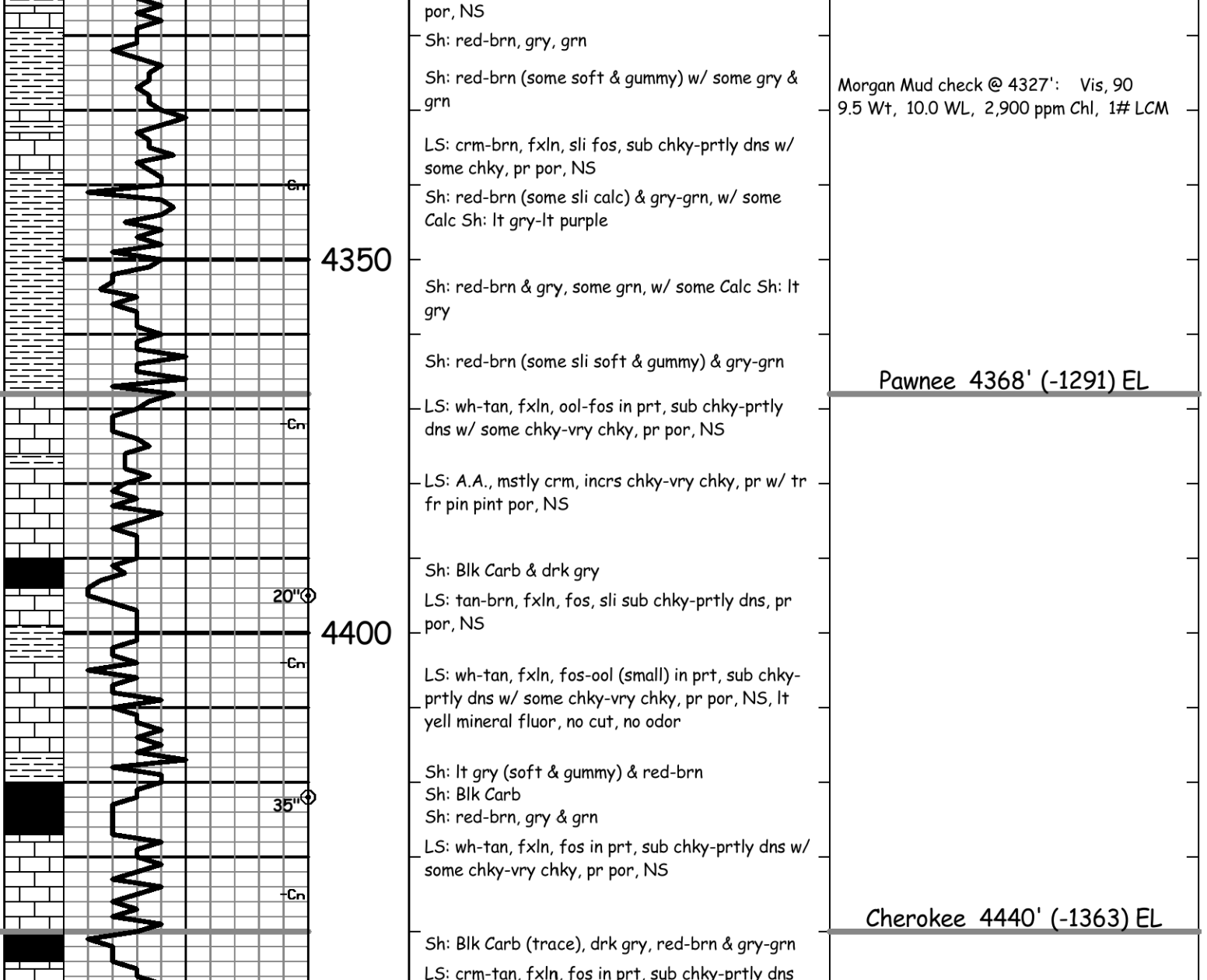
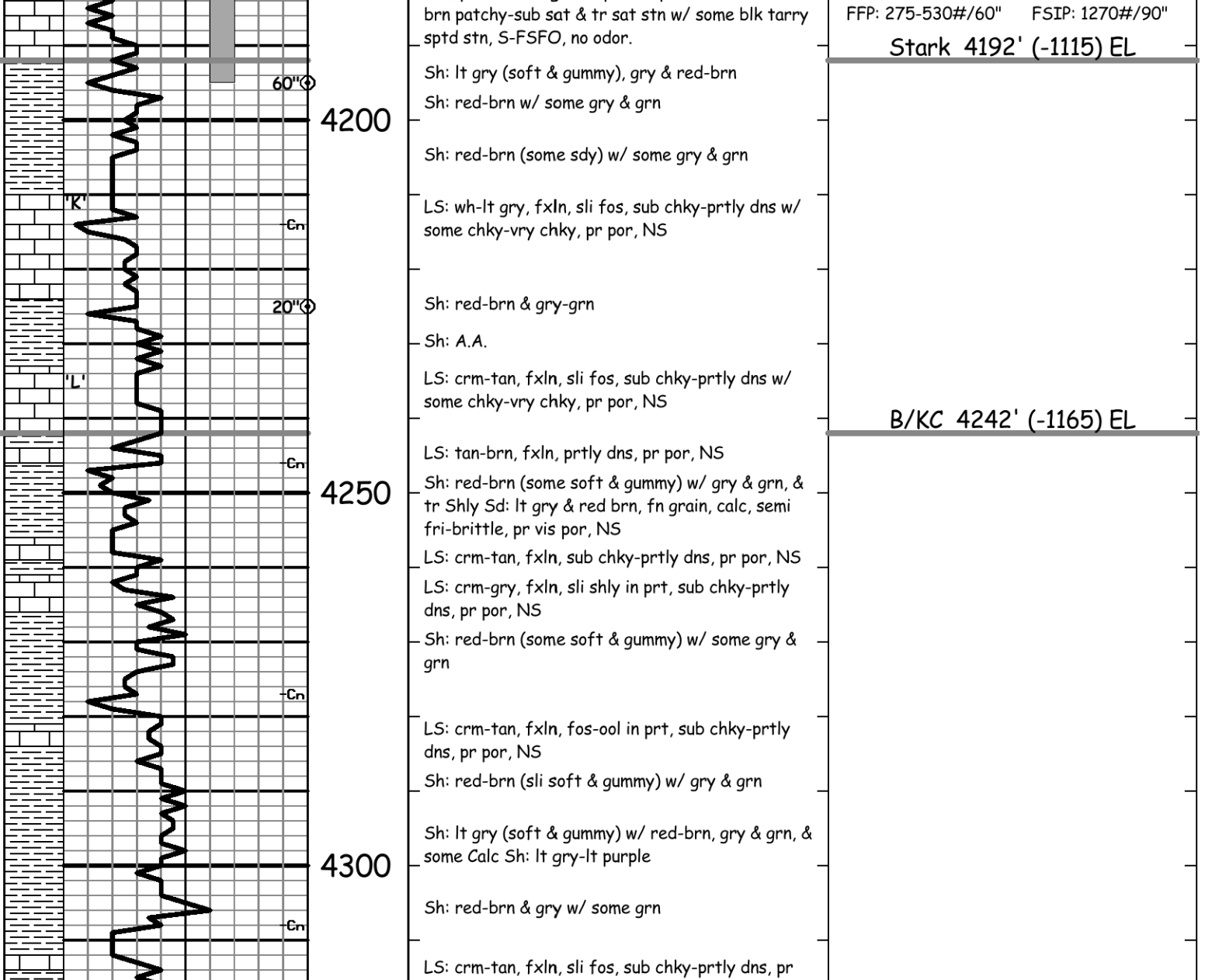
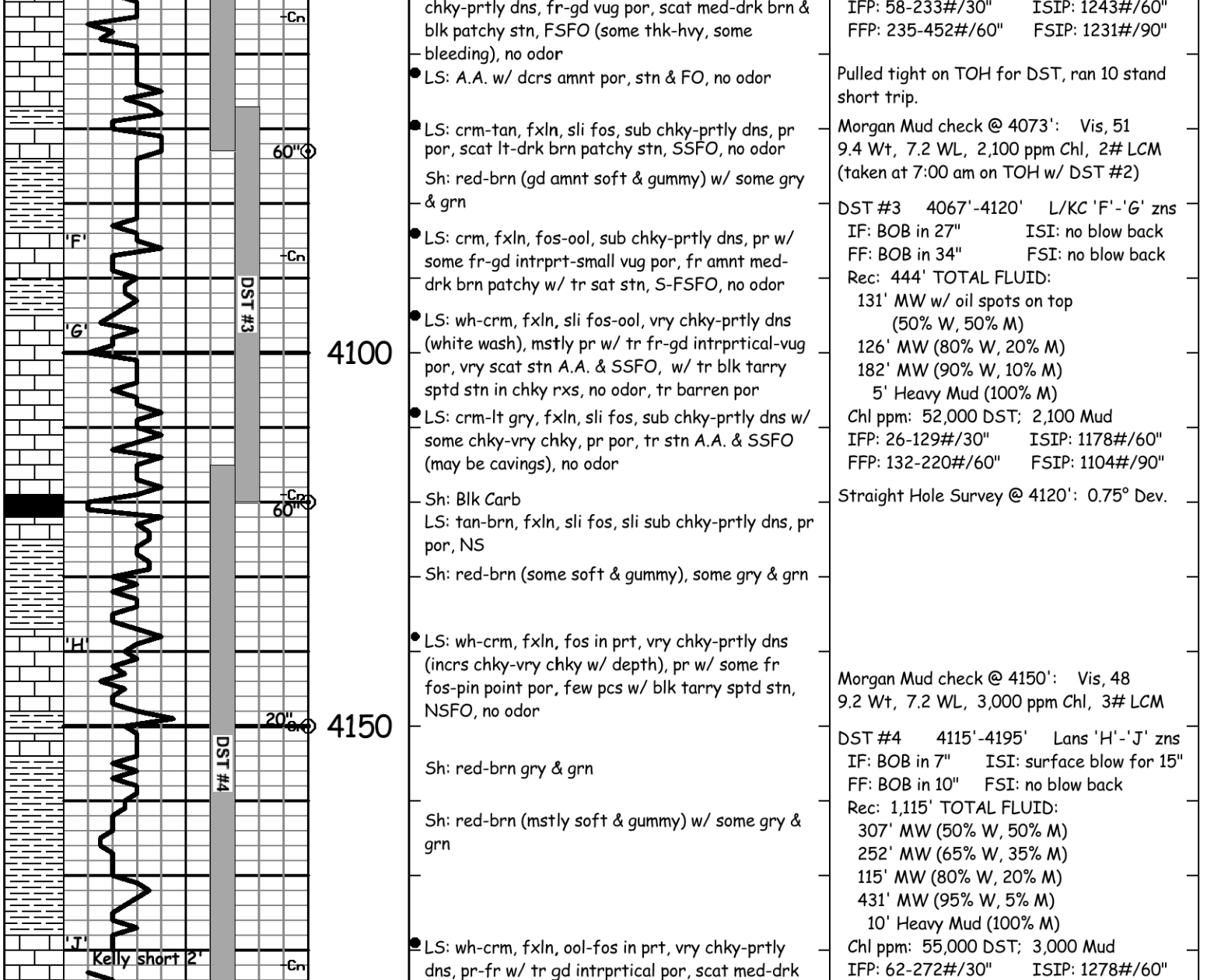
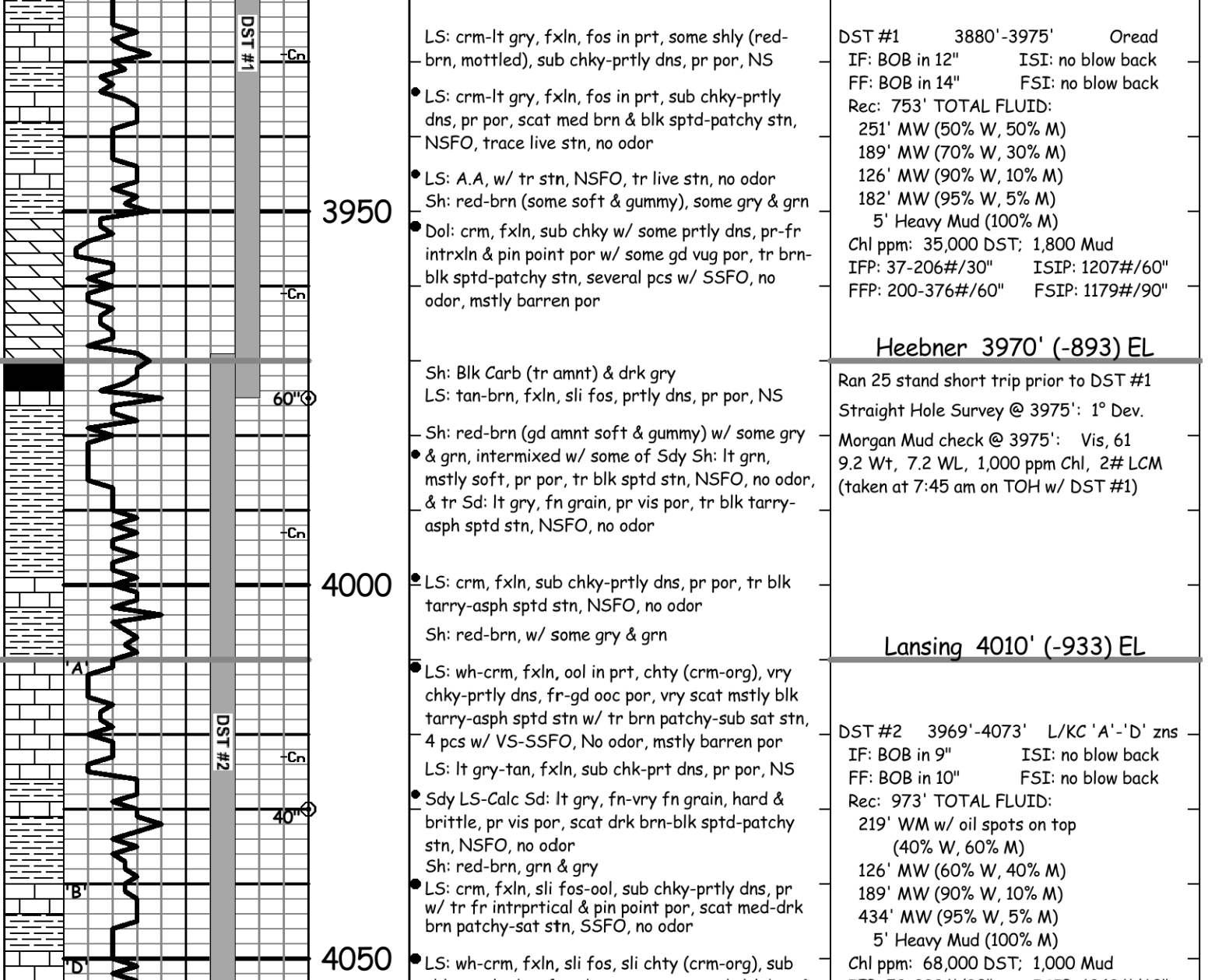
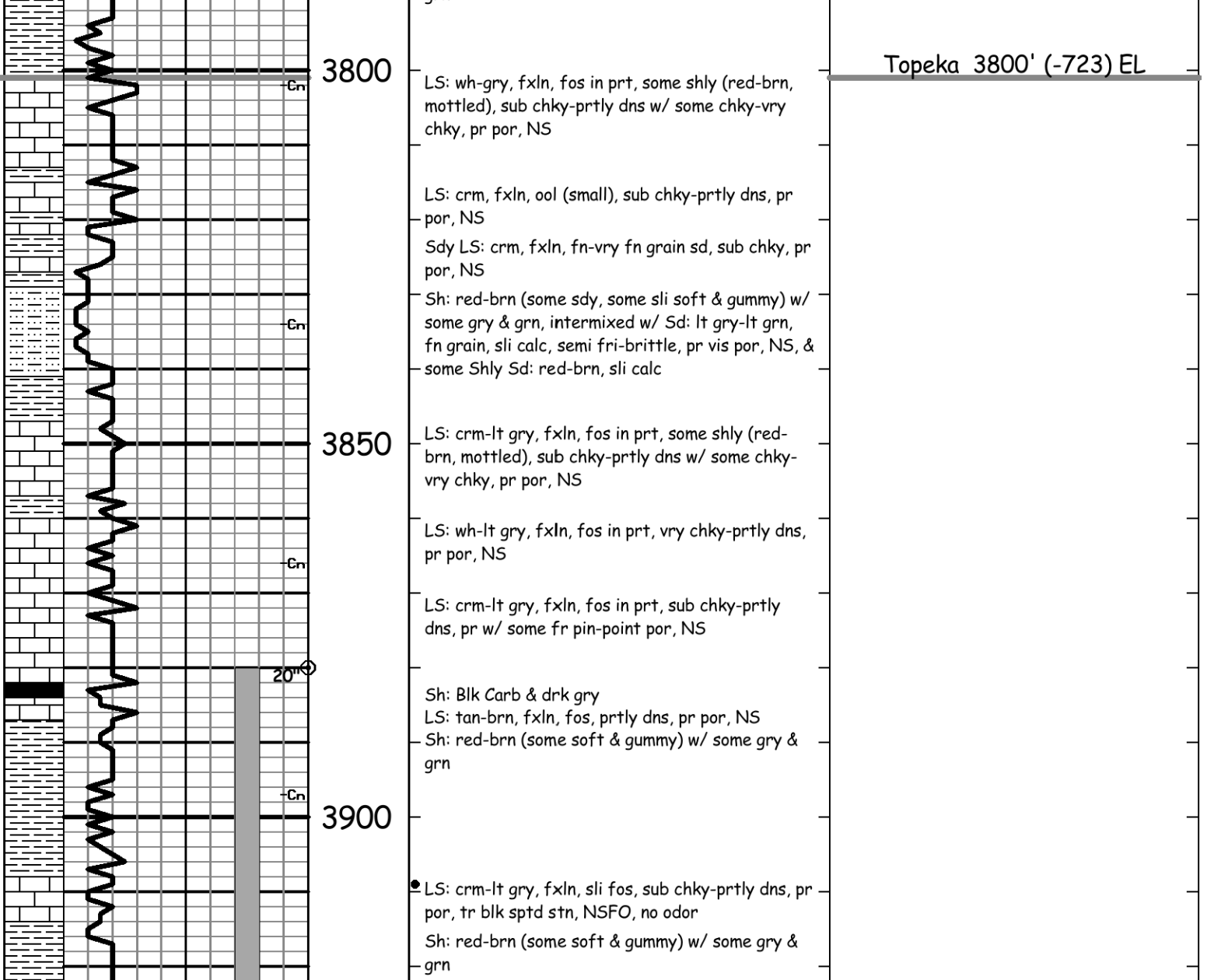
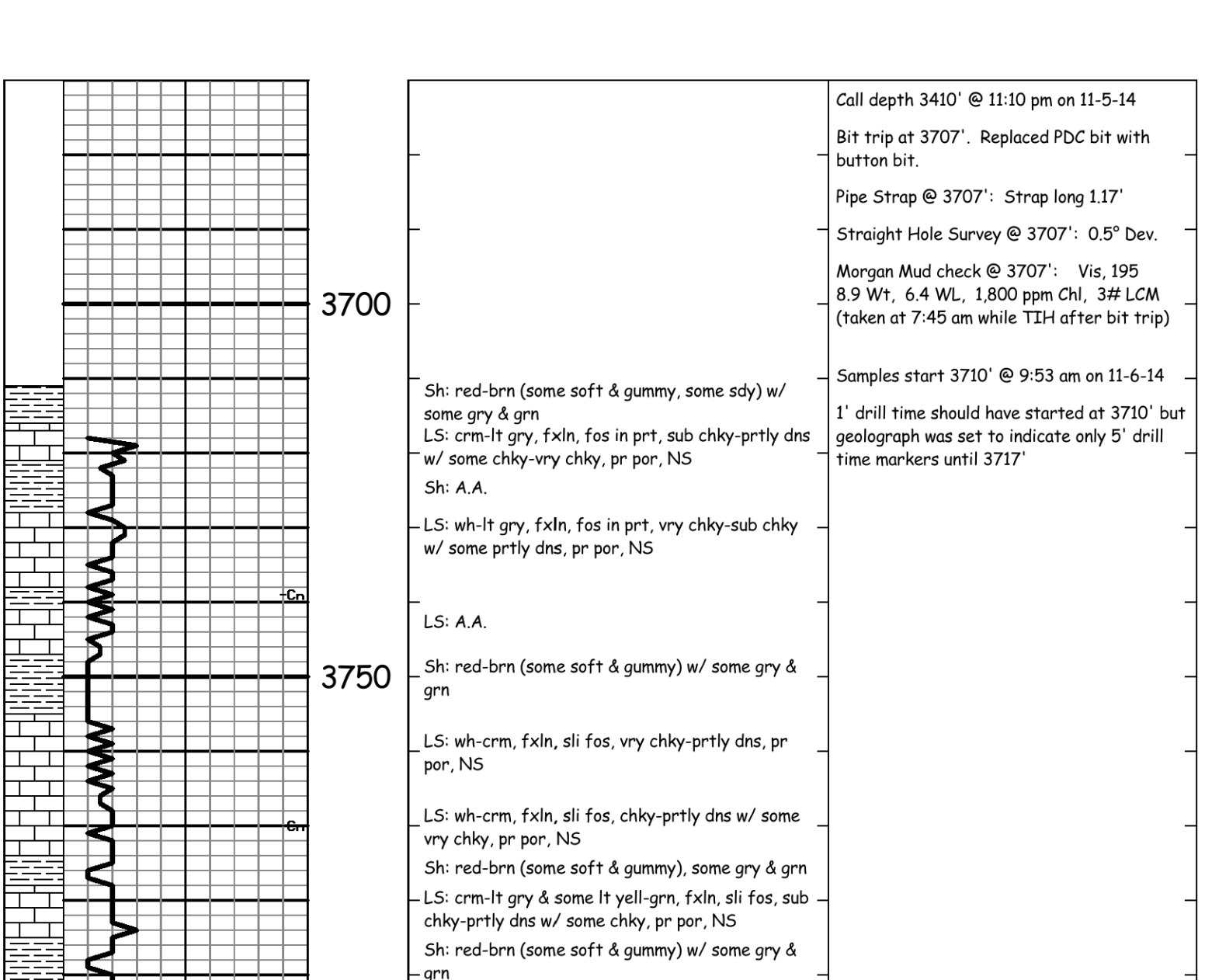
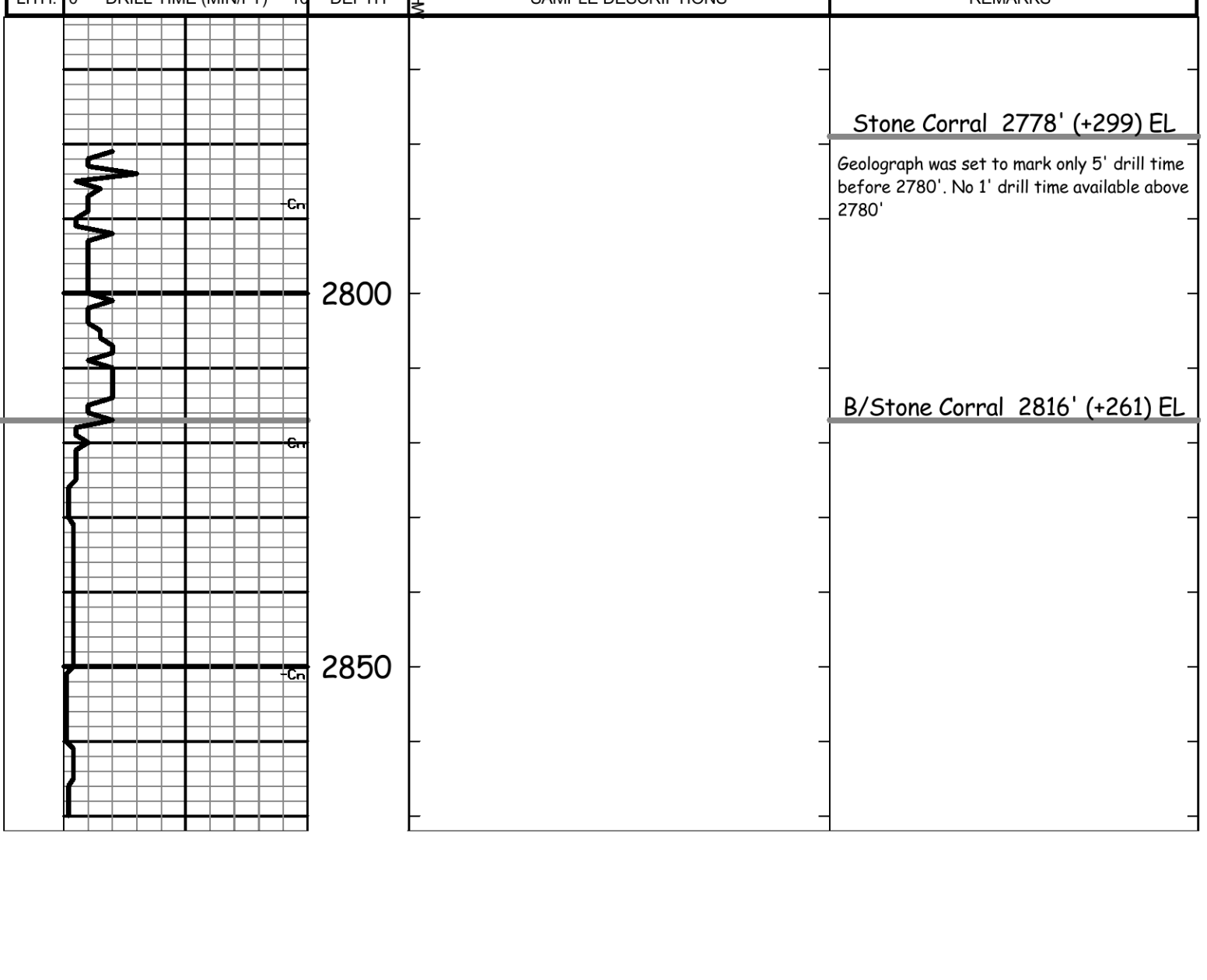
The electric log measurements correlate from even to 1' higher to the drilling measurements.

Formation tops and lithology on this report have been corrected to the electric log.

The drilling samples were deposited at the Kansas Geological Survey office in Wichita.

Respectfully submitted,

Robert L. Milford



LITH.	DRILL TIME (MIN/FT)	DEPTH	SAMPLE DESCRIPTIONS	REMARKS
		3700'		Call depth 3410' @ 11:10 pm on 11-5-14 Bit trip at 3707'. Replaced PDC bit with button bit. Pipe Strap @ 3707': Strap long 1.17' Straight Hole Survey @ 3707': 0.5° Dev. Morgan Mud check @ 3707': Vis, 195 8.9 Wt, 6.4 WL, 1,800 ppm Chl, 3# LCM (taken at 7:45 am while TTH after bit trip)
		3710'		Samples start 3710' @ 9:53 am on 11-6-14 1' drill time should have started at 3710' but geolograph was set to indicate only 5' drill time markers until 3717'
		3750'		
		3800'		Topoka 3800' (-723) EL
		3850'		
		3900'		
		3950'		DST #1 in 3280' ISI: no blow back FF: 808 in 14" FSI: no blow back Rec: 753' TOTAL FLUID: 251' MW (50% W, 50% M) 189' MW (70% W, 30% M) 126' MW (90% W, 10% M) 182' MW (95% W, 5% M) 5' Heavy Mud (100% M) Chl ppm: 35,000 DST: 1,800 Mud IFP: 37-206#/30' ISIP: 1207#/60' FFP: 200-376#/60" F5IP: 1179#/90"
		4000'		Heebner 3970' (-893) EL Ran 25 stand short trip prior to DST #1 Straight Hole Survey @ 3975': 1° Dev. Morgan Mud check @ 3975': Vis, 61 9.2 Wt, 7.2 WL, 1,000 ppm Chl, 2# LCM (taken at 7:45 am on TOH w/ DST #1)
		4050'		Lansing 4010' (-933) EL DST #2 3969'-4073' L/KC 'A'-D' zns IF: 808 in 9" ISI: no blow back FF: 808 in 14" FSI: no blow back Rec: 973' TOTAL FLUID: 219' MW w/ oil spots on top (50% W, 50% M) 126' MW (60% W, 40% M) 189' MW (90% W, 10% M) 434' MW (95% W, 5% M) 5' Heavy Mud (100% M) Chl ppm: 68,000 DST: 1,000 Mud IFP: 28-233#/30' ISIP: 1243#/60' FFP: 235-452#/60" F5IP: 1231#/90"
		4100'		Pulled tight on TOH for DST, ran 10 stand short trip. Morgan Mud check @ 4073': Vis, 51 9.4 Wt, 7.2 WL, 2,100 ppm Chl, 2# LCM (taken at 7:00 am on TOH w/ DST #2)
		4150'		DST #3 4067'-4120' L/KC 'F'-G' zns IF: 808 in 27" ISI: no blow back FF: 808 in 34" FSI: no blow back Rec: 444' TOTAL FLUID: 131' MW w/ oil spots on top (50% W, 50% M) 126' MW (60% W, 40% M) 189' MW (90% W, 10% M) 434' MW (95% W, 5% M) 5' Heavy Mud (100% M) Chl ppm: 52,000 DST: 2,100 Mud IFP: 26-129#/30' ISIP: 1178#/60' FFP: 132-220#/60" F5IP: 1104#/90"
		4200'		Straight Hole Survey @ 4120': 0.75° Dev.
		4250'		Morgan Mud check @ 4150': Vis, 48 9.5 Wt, 7.2 WL, 3,000 ppm Chl, 3# LCM
		4300'		DST #4 4115'-4195' Lans 'H'-J' zns IF: 808 in 7" ISI: surface blow for 15" FF: 808 in 10" FSI: no blow back Rec: 1115' TOTAL FLUID: 307' MW (50% W, 50% M) 252' MW (65% W, 35% M) 115' MW (80% W, 20% M) 431' MW (95% W, 5% M) 10' Heavy Mud (100% M) Chl ppm: 55,000 DST: 2,100 Mud IFP: 62-272#/30' ISIP: 1278#/60' FFP: 275-530#/60" F5IP: 1270#/90"
		4350'		Stark 4192' (-1115) EL
		4400'		
		4450'		B/KC 4242' (-1165) EL
		4500'		
		4550'		
		4600'		Morgan Mud check @ 4327': Vis, 90 9.5 Wt, 10.0 WL, 2,900 ppm Chl, 1# LCM
		4650'		Pawnee 4368' (-1291) EL
		4700'		
		4750'		Cherokee 4440' (-1363) EL
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