



ThruBit
A Schlumberger Company

**ARRAY INDUCTION
DENSITY / NEUTRON
GAMMA RAY
MEMORY LOG**

Company SHELL EXP. & PROD. CO., INC.
Well KOBLITZ 3409 28-1H
Field WILDCAT
County HARPER
State KANSAS

Company SHELL EXP. & PROD. CO., INC.
Well KOBLITZ 3409 28-1H
Field WILDCAT
County HARPER
State KANSAS
Location: API #: 15-007-21855-01-00
331' FNL & 1520' FEL
SEC 28 TWP 34S RGE 9W

Other Services
SONIC
LOG
Elevation
Permanent Datum G.L. Elevation 1269'
Log Measured From D.F. 23' ABOVE PERM DATUM
Drilling Measured From D.F. G.L. 1269'

Date	17 DEC 2012
Run Number	ONE
Depth Driller	9100'
Depth Logger	9022'
Bottom Logged Interval	9012'
Top Log Interval	5244'
Casing Driller	7.0" @ 5239'
Casing Logger	5244'
Bit Size	6.125
Type Fluid in Hole	WBM
Density / Viscosity	8.7 / 33
pH / Fluid Loss	7.5 / NA
Source of Sample	MUD SENSOR
Rim @ Meas. Temp	2.21 OHM @ 65 DEGF
Rinf @ Meas. Temp	1.66 OHM @ 65 DEGF
Rimc @ Meas. Temp	2.76 OHM @ 65 DEGF
Source of Rinf / Rimc	CALCULATED
Rim @ BHT	1.20 OHM @ 126 DEGF
Time Circulation Stopped	23:00 17 DEC 2012
Time Logger on Bottom	03:00 18 DEC 2012
Maximum Recorded Temperature	126 DEGF
Equipment Number	T005
Location	OKC, OK
Recorded By	S.JARSKI
Witnessed By	J.GARRET

<<< Fold Here >>>

The use of and reliance upon this recorded-data by the herein named company (and any of its affiliates, partners, representatives, agents, consultants and employees) is subject to the terms and conditions agreed upon between ThruBit LLC and the company, including: (a) Restrictions on use of the recorded-data; (b) Disclaimers and waivers of warranties and representations regarding company's use of and reliance upon the recorded-data; and (c) Customer's full and sole responsibility for any inference drawn or decision made in connection with the use of this recorded-data.

Comments

SERVICE: LEVEL 4 HORIZONTAL PUMP DOWN MEMORY BIT DEPTH: 8940' LOGGED TO: 5239'
ALL SCALES AND PRESENTATIONS PER CLIENT REQUEST
LIMESTONE MATRIX, 2.71 g/cc. USED FOR POROSITY MEASUREMENTS
TOOLSTING RAN WITH SMALL DE-CENTRALIZER, SWIVEL, KNUCKLES, S. CENTRALIZER AND NO S
TBHV REPRESENTS TOTAL BORHOLE VOLUME, ft3
ABHV REPRESENTS ANNULAR HOLE VOLUME, CALCULATED FOR 4.5" CSG., ft3
RIGMINDER AND CANRIG USED TO ACQUIRE LOG DEPTH
LOG CORRELATED TO MWD
CL=1800Mg/l NaCl=2471.4 mg/l NO BARITE
CASING SIZE 7.00" 23.0 LB FT ID 6.241" CALI DIA 6.37" NO CORRECTION MADE
RIG: NABORS 774
CREW: S.JARSKI I.HERNADEZ R.CRESSWELL J.HIRST

Service Ticket No. 1645 API No. 15-077-21855-01-00 PGM Ver WARRIOR 7.0

The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client

EQUIPMENT DATA

GAMMA RAY	NEUTRON	DENSITY	INDUCTION
-----------	---------	---------	-----------

Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	PS27T	Serial No.	ENP5N	Serial No.	PS44D	Serial No.	PS38R
Model No.	PS	Model No.	PS	Model No.	PS	Model No.	PS
Diameter	2.125"	Diameter	2.125"	Diameter	2.125"	Diameter	2.125"

LOGGING DATA

General Data

Pass	Depths		Well Head	Speed	Logging Run Comments
No.	From	To	Pressure	Ft/Min	
ONE	9022'	5244'	0	30	

Pass	GAMMA RAY		NEUTRON		DENSITY		INDUCTION	
	Scale		Scale		Scale		Scale	
No.	L	R	L	R	L	R	L	L
ONE	0 API	150 API	30%	-10%	30%	-10%	0.2 OHMM	2000 OHMM

DIRECTIONAL INFORMATION

Maximum Deviation	92.2	deg. @	5433'	KOP	200'	
-------------------	------	--------	-------	-----	------	--

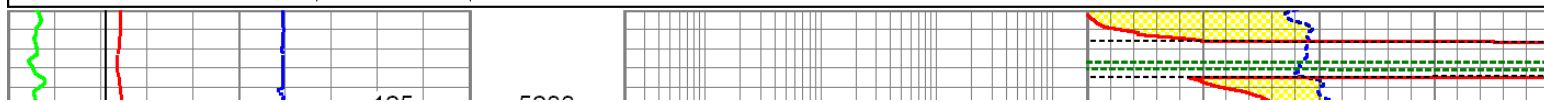
```

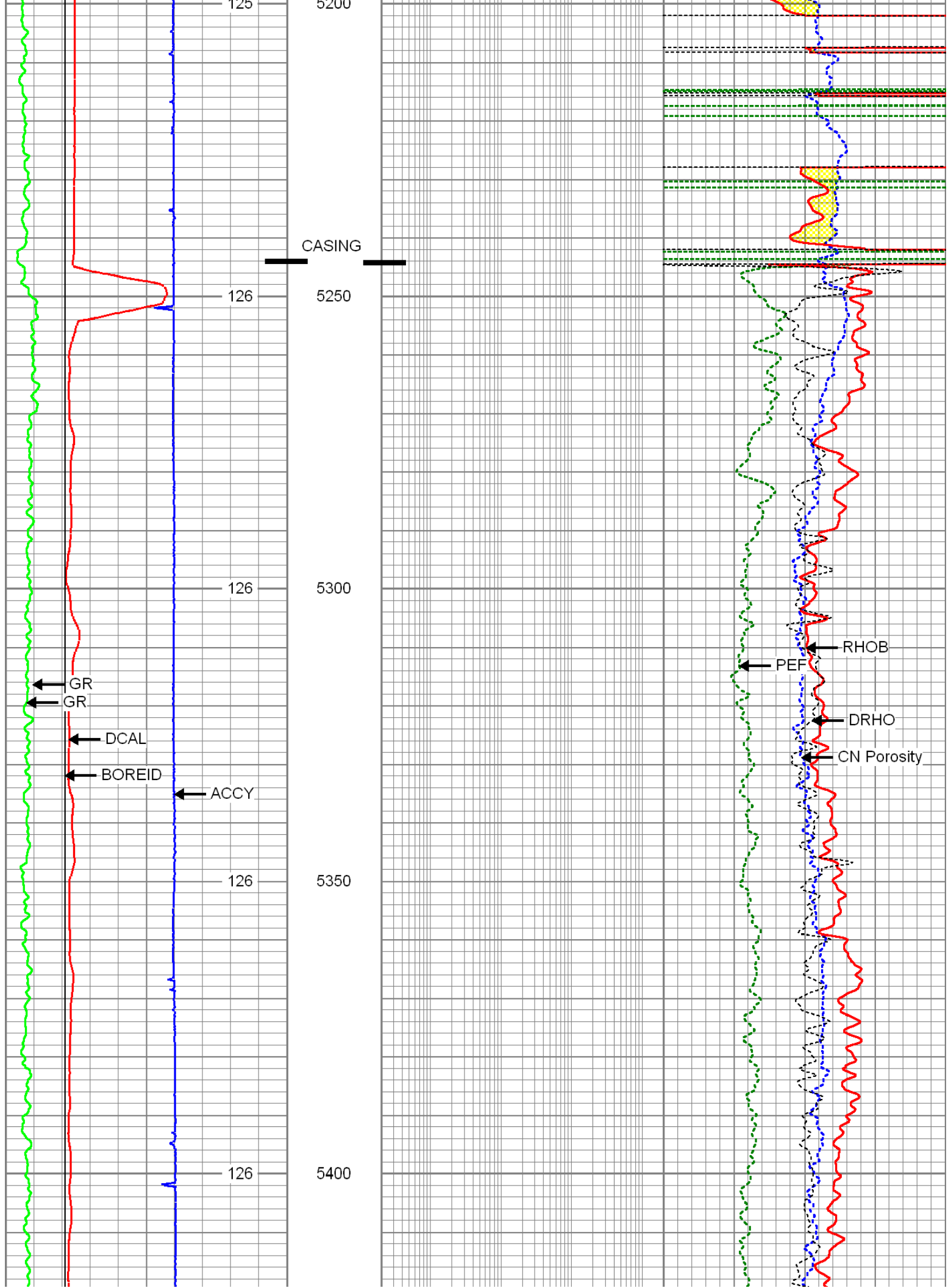
Job Times□□□□
Job # :□1645□□□□
Operator :□Shell Oil□□□□
Well name :□Koblitz 3409 28-1H□□□□
Job level :□Level 4□□□□
□□□□
TimeLine of Bit Times□□□□
Date□Start Time□Elapsed Time (HH:MM)□Time Code□Notes
□□□□
TimeLine of Crew / Logging Equipment Times□□□□
Date□Start Time□Elapsed Time (HH:MM)□Time Code□Notes
17 Dec 2012□16:00□□L00 : Time stamp - activity start□Depart Shop
17 Dec 2012□19:45□03:45□L01 : Logging eqt travel time□Arrive on location
18 Dec 2012□11:30□15:45□L20 : Logging eqt standby time□Waiting for well
19 Dec 2012□04:00□16:30□L31 : Logging rig up / down time□rig up - deploy tools - r
19 Dec 2012□10:00□06:00□L30 : Logging operating time□logging time
19 Dec 2012□12:00□02:00□L31 : Logging rig up / down time□rig up - retrieve - rig d
19 Dec 2012□15:00□03:00□L80 : Data processing time□logs sent to shell

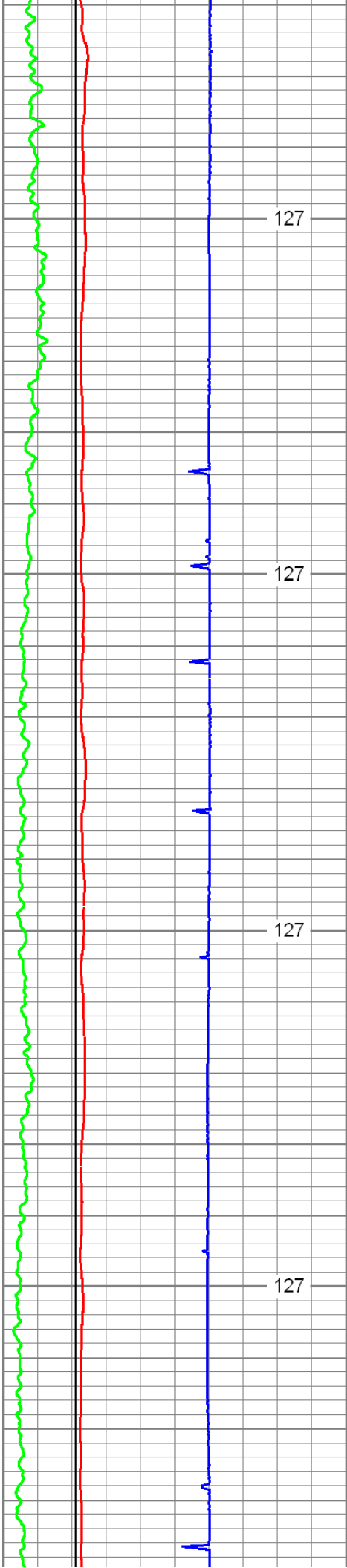
```

Database File: c:\documents and settings\t006\desktop\shell koblitz3409 28-1h\koblitz_3409_28_1h_mem.db
Dataset Pathname: proc1/pass1.6
Presentation Format: 6_SH_T~1
Dataset Creation: Tue Dec 18 13:40:45 2012
Charted by: Depth in Feet scaled 1:240

0	GR (GAPI)	150	0.2	60 IN-2FTRES (Ohm-m)	2000	45	CN Porosity (pu)	-15
-5	ACCY	5	0.2	30 IN-2FTRES (Ohm-m)	2000	0	PEF (barn)	10
4	DCAL (in)	14	0.2	20 IN-2FTRES (Ohm-m)	2000	1.95	RHOB (g/cc)	2.95
4	BOREID (in)	14	0.2	10 IN2FTRES (Ohm-m)	2000	-0.25	DRHO (g/cc)	0.25
	GRTEMP		0.2	90 IN - 2FTRES (Ohm-m)	2000			
	(degF)							





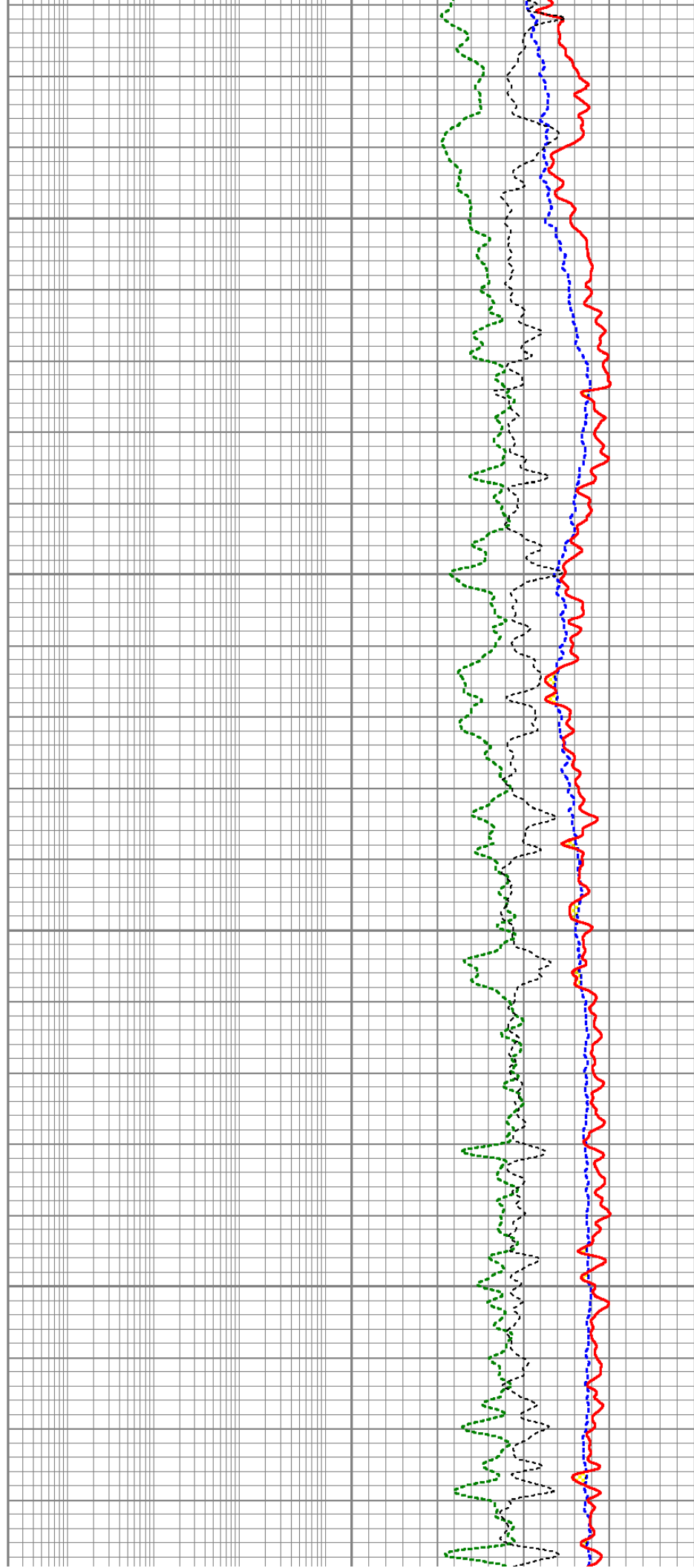


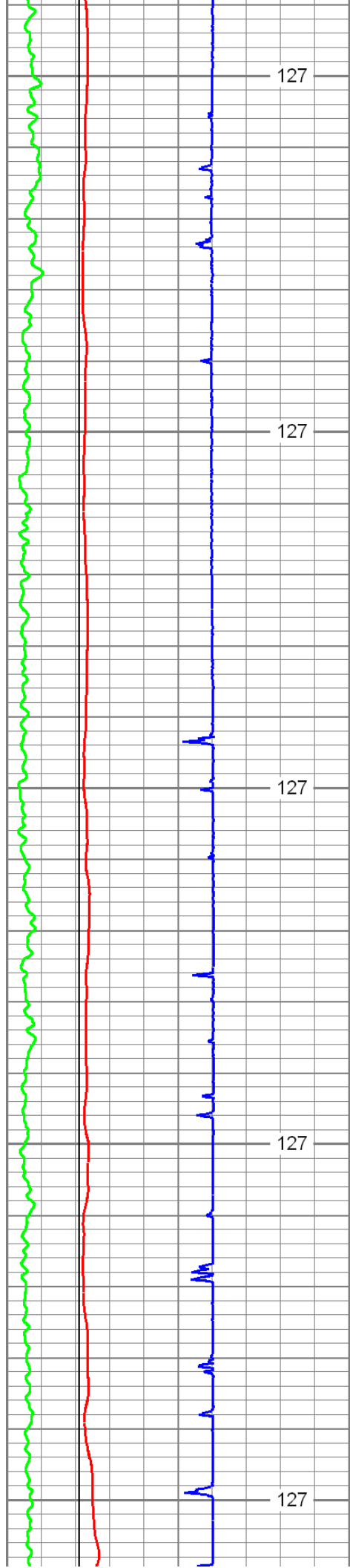
127 5450

127 5500

127 5550

127 5600





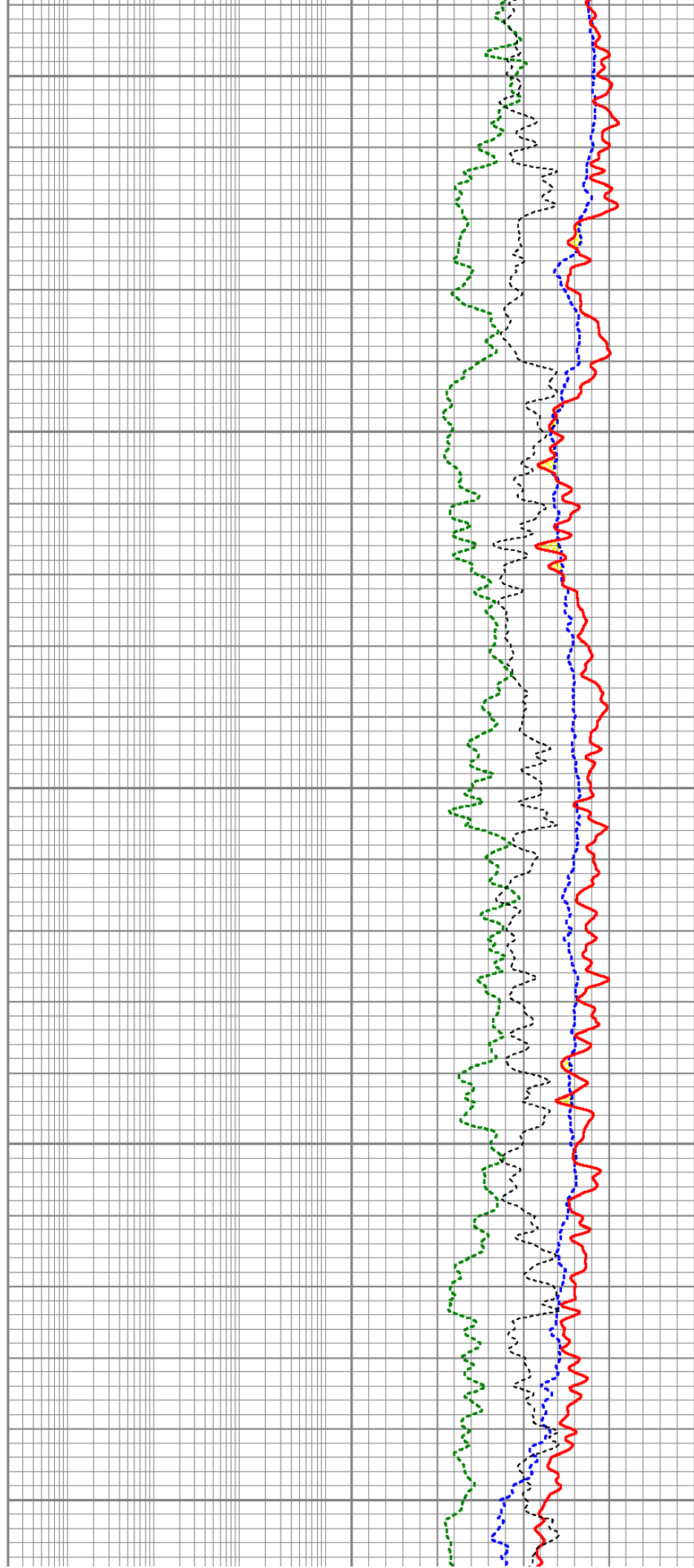
5650

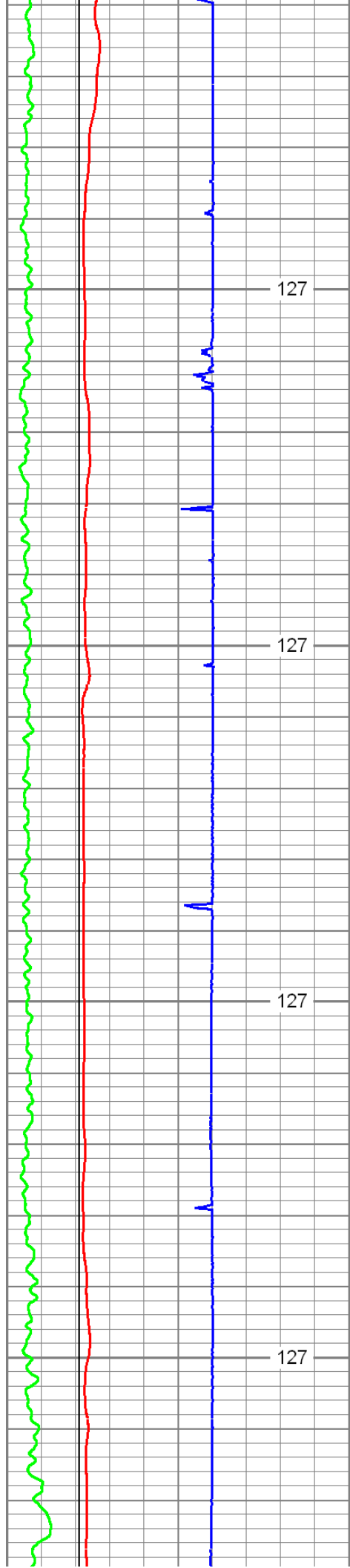
5700

5750

5800

5850



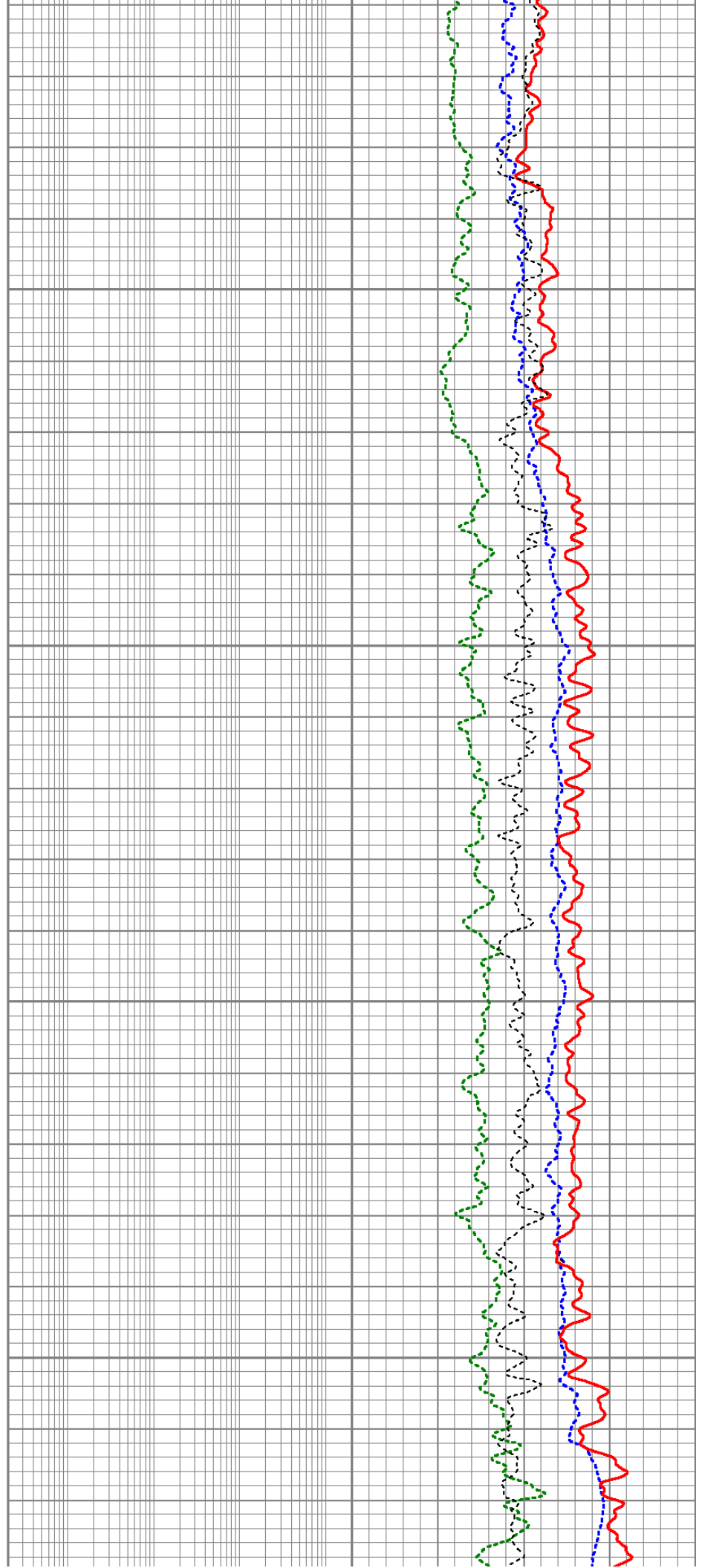


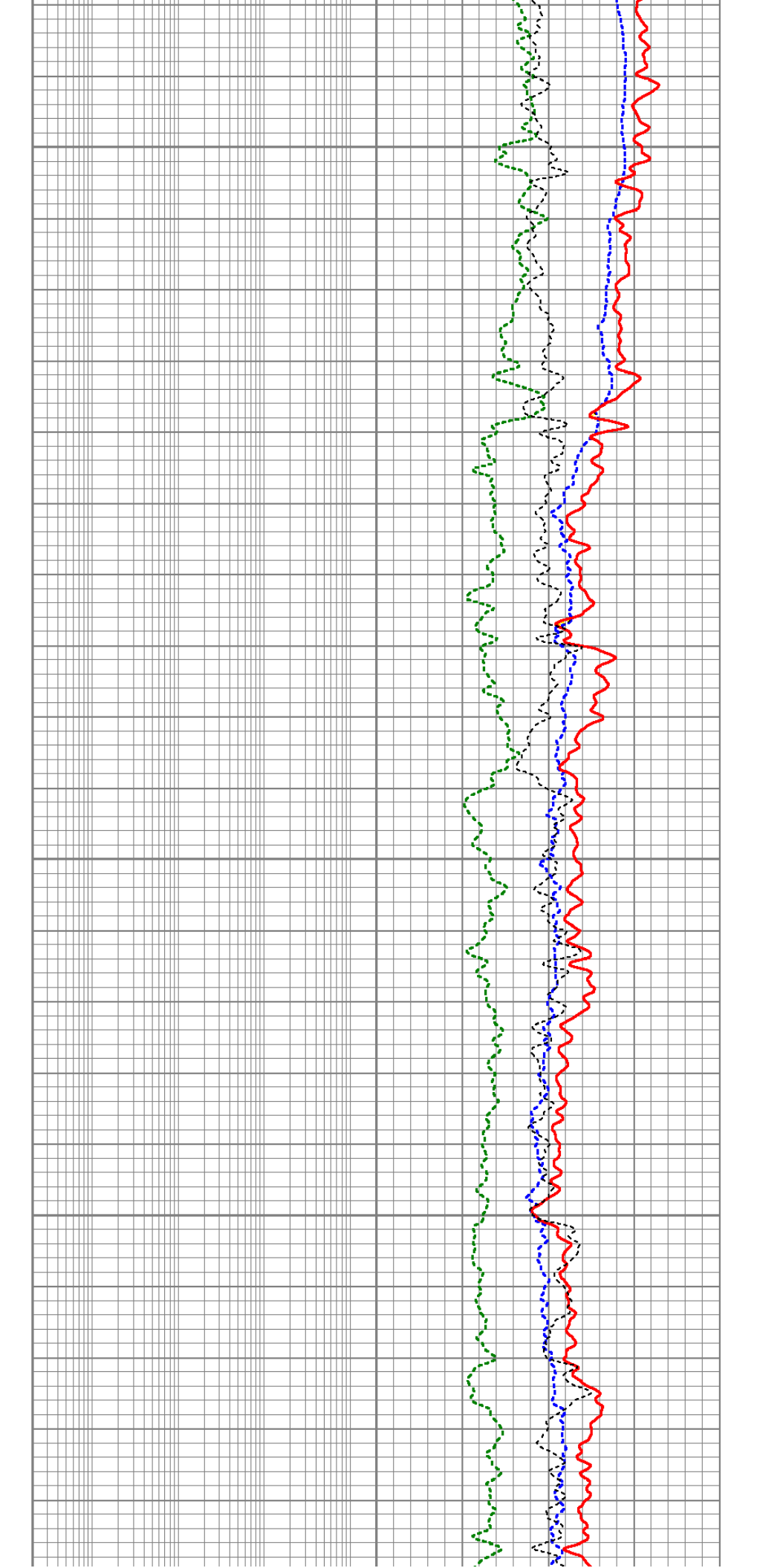
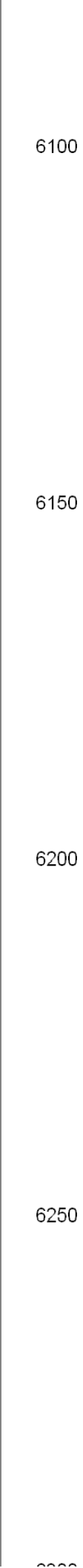
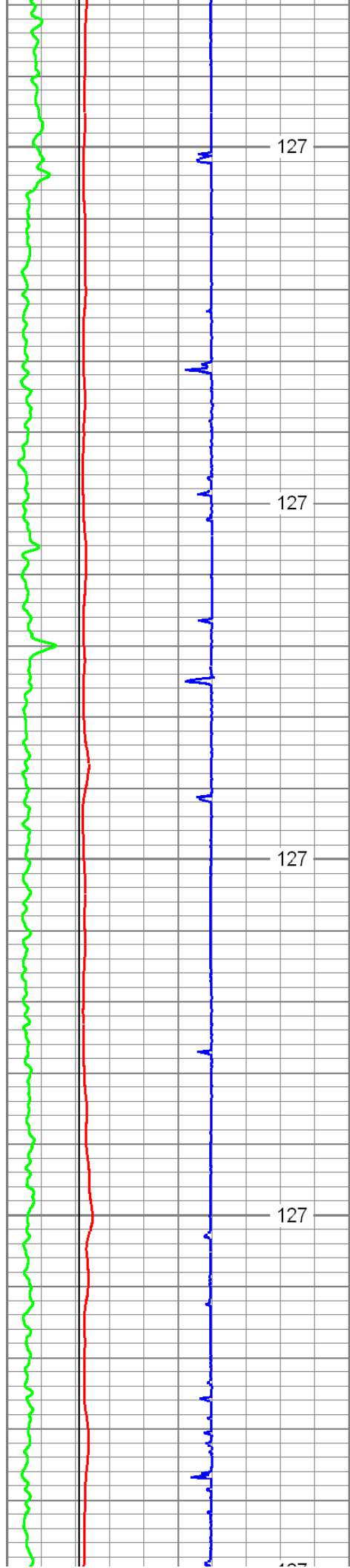
127
5900

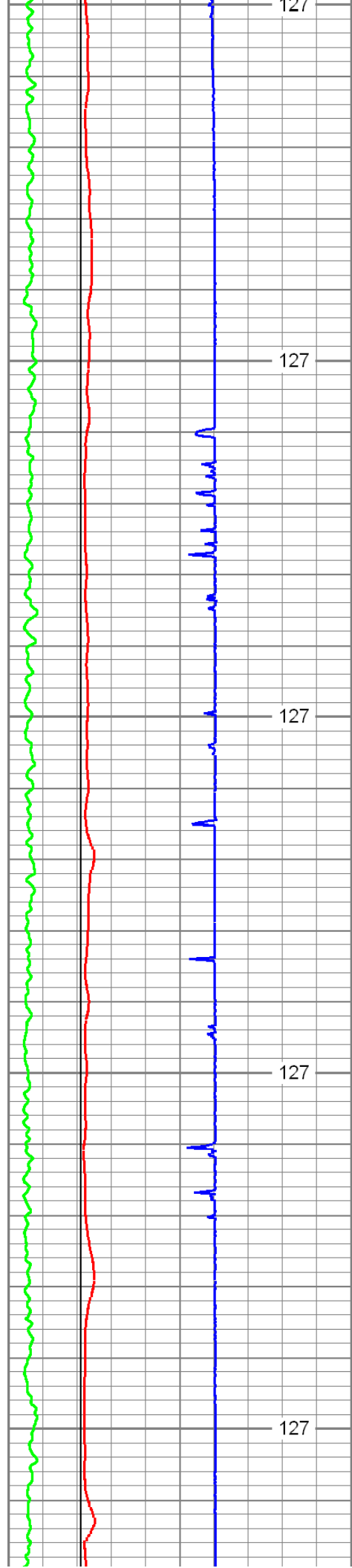
127
5950

127
6000

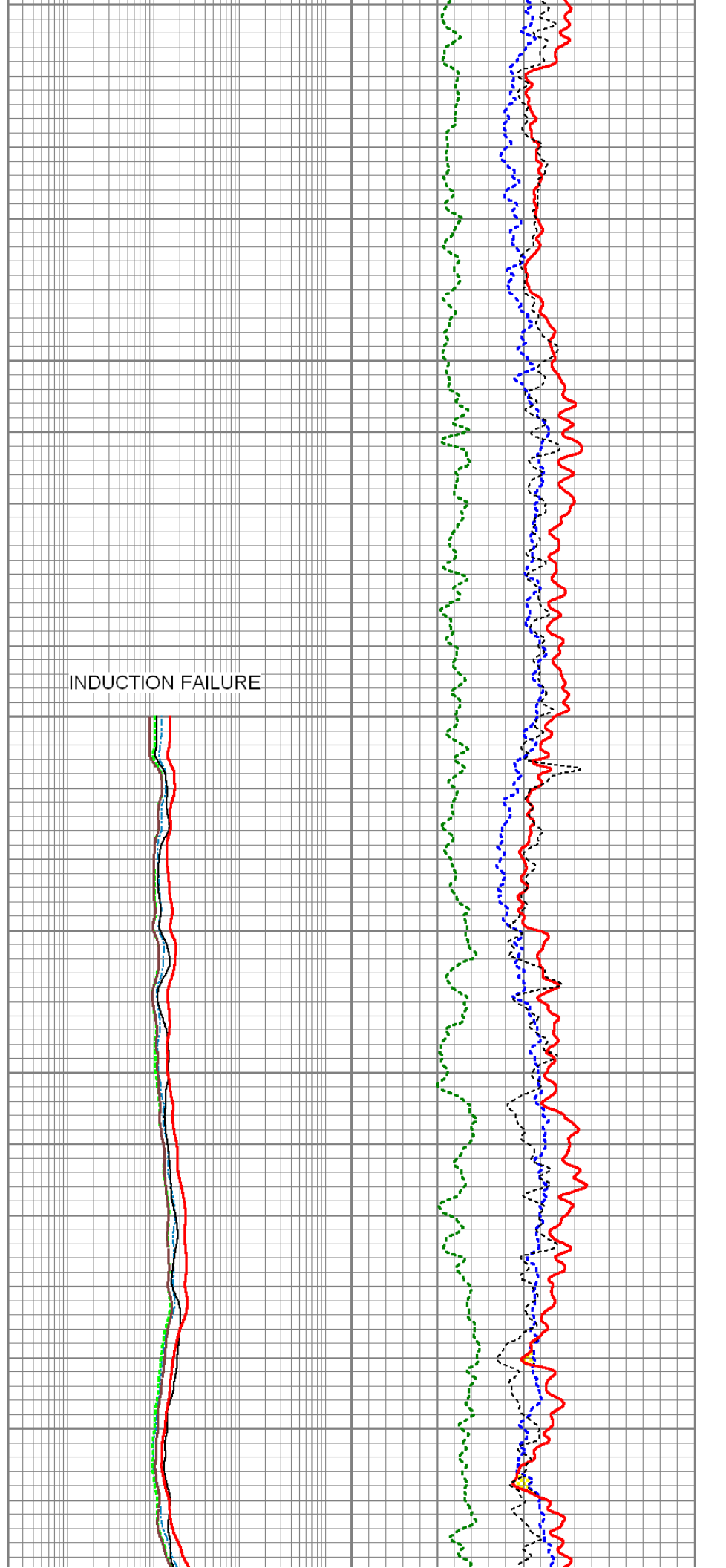
127
6050

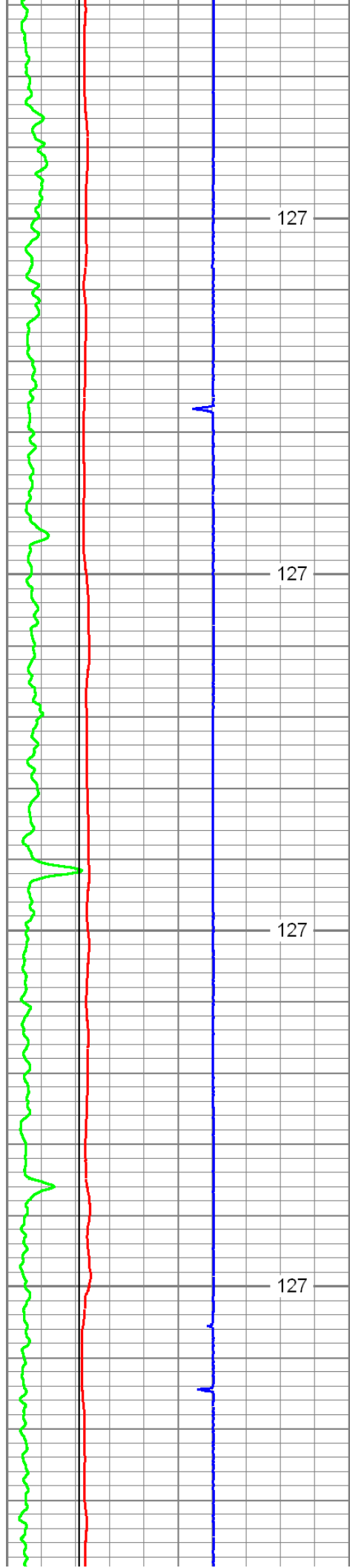






6300
6350
6400
6450
6500



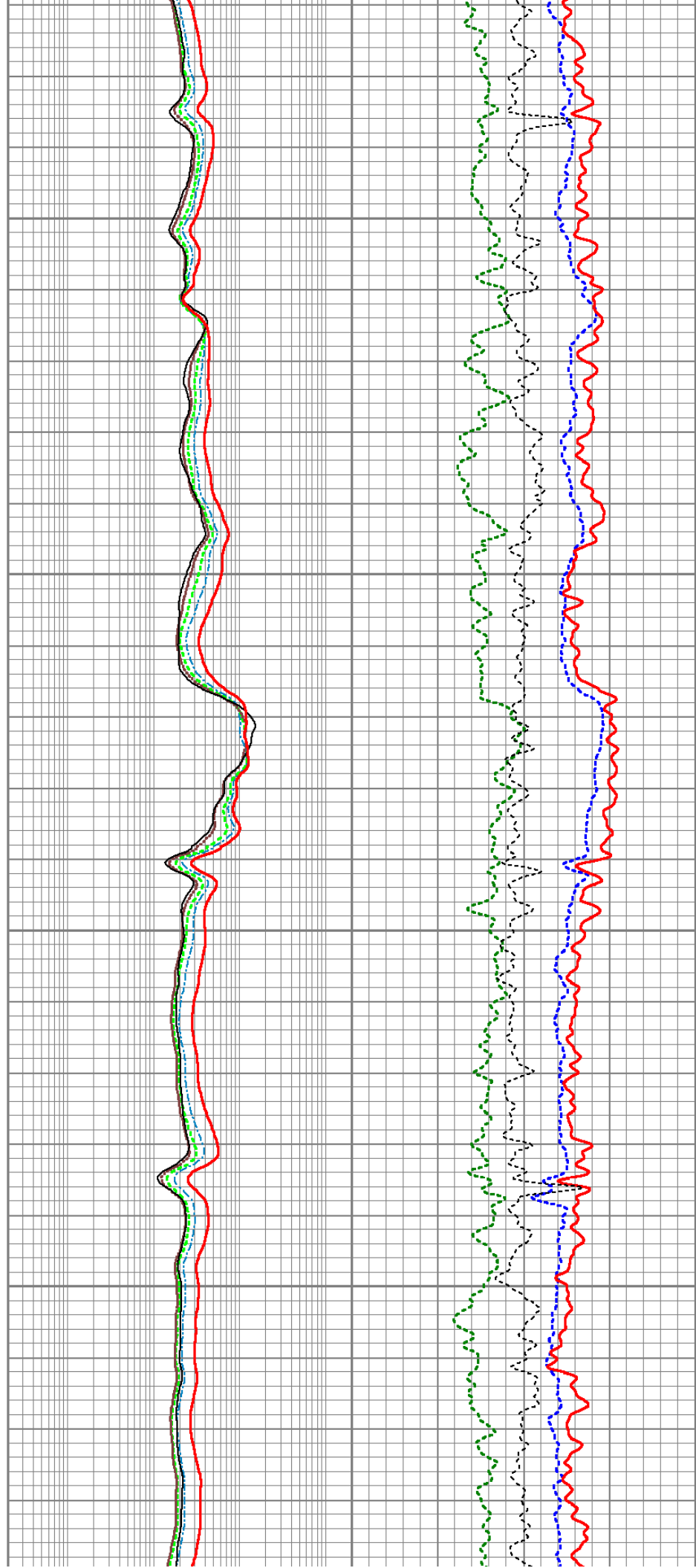


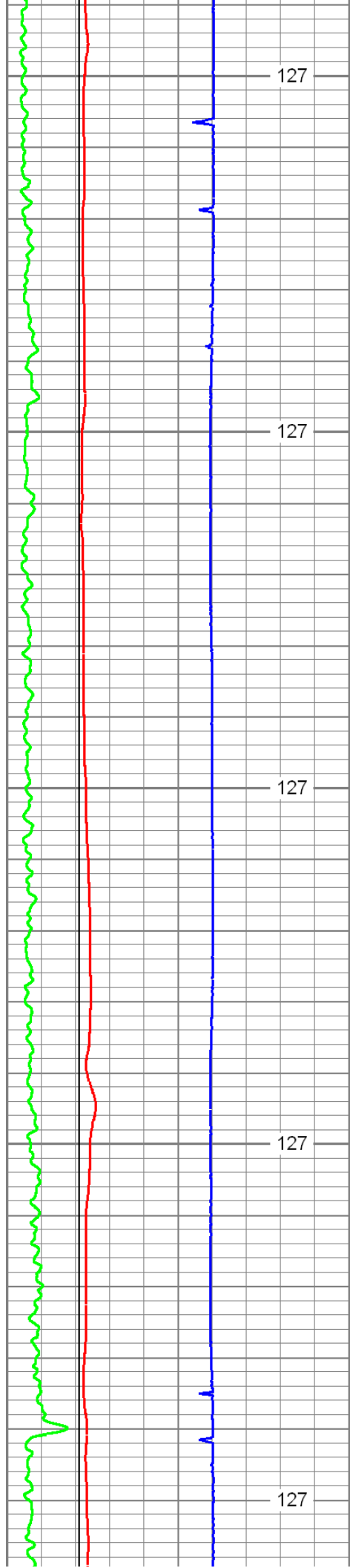
127
6550

127
6600

127
6650

127
6700





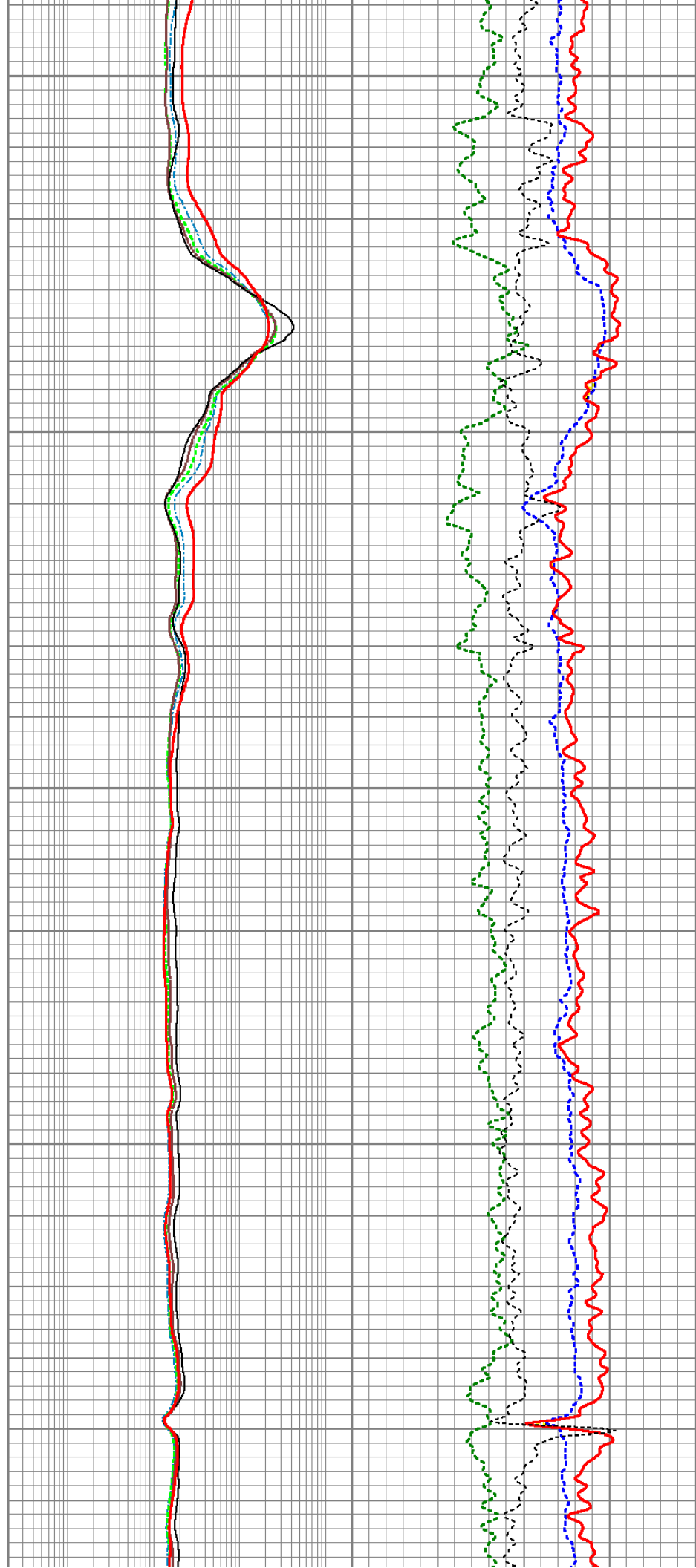
6750

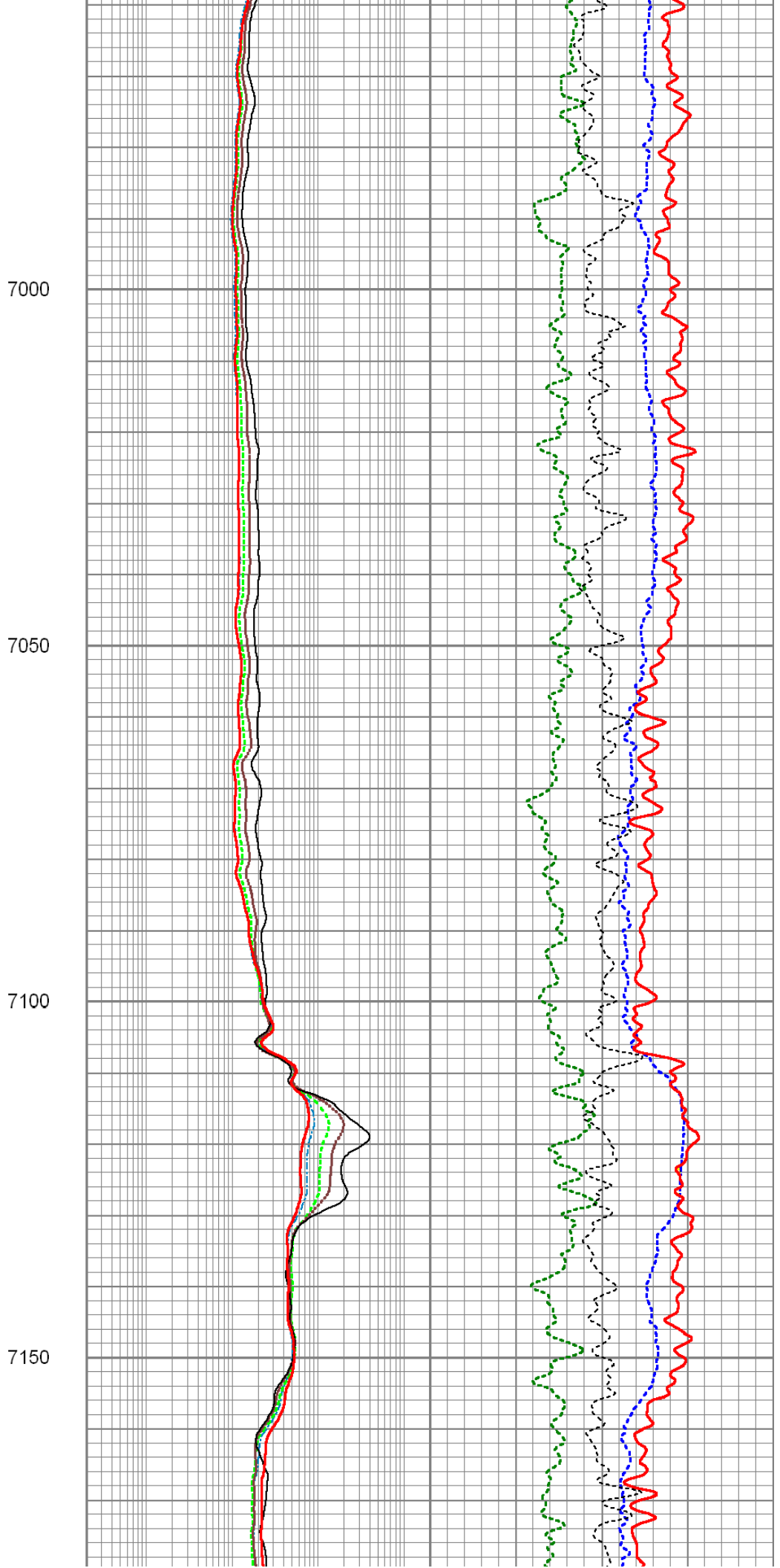
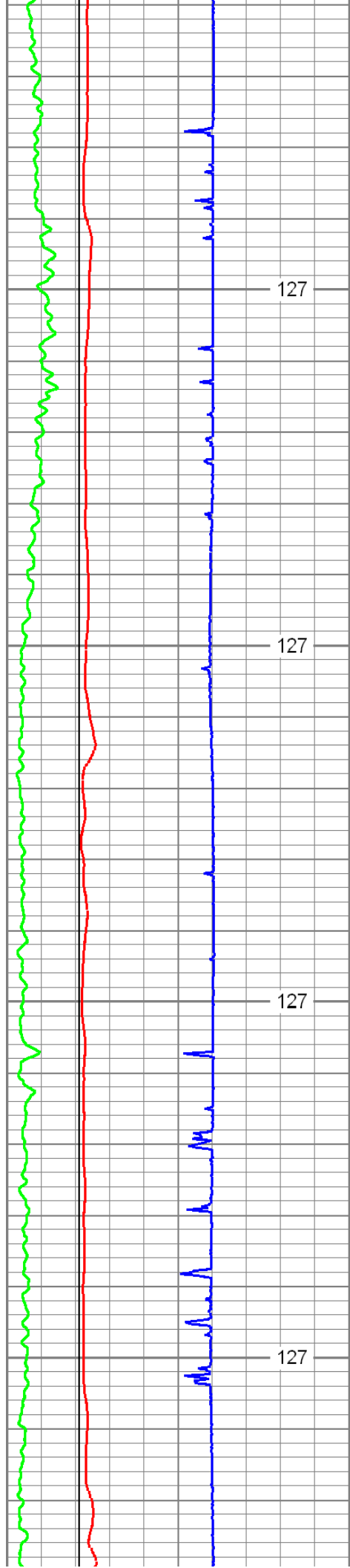
6800

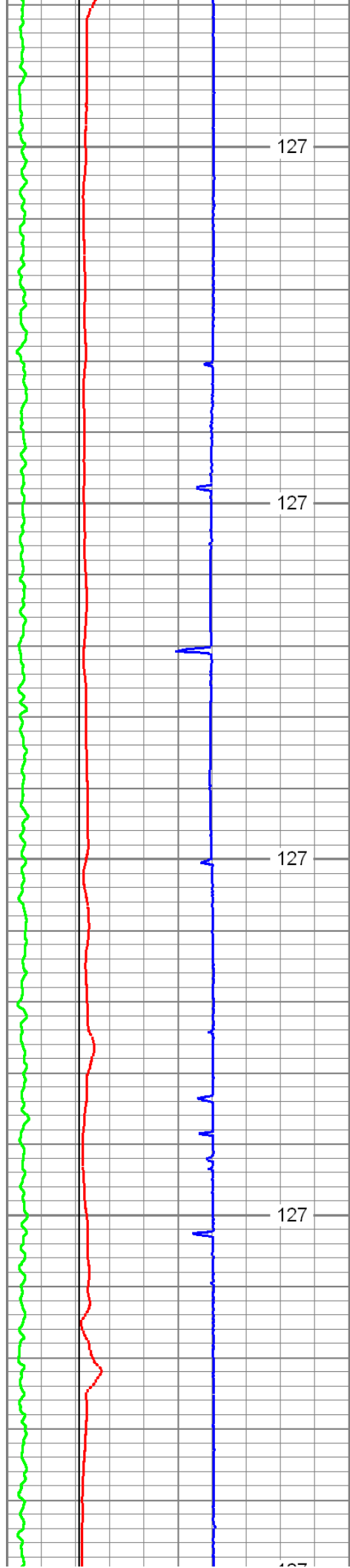
6850

6900

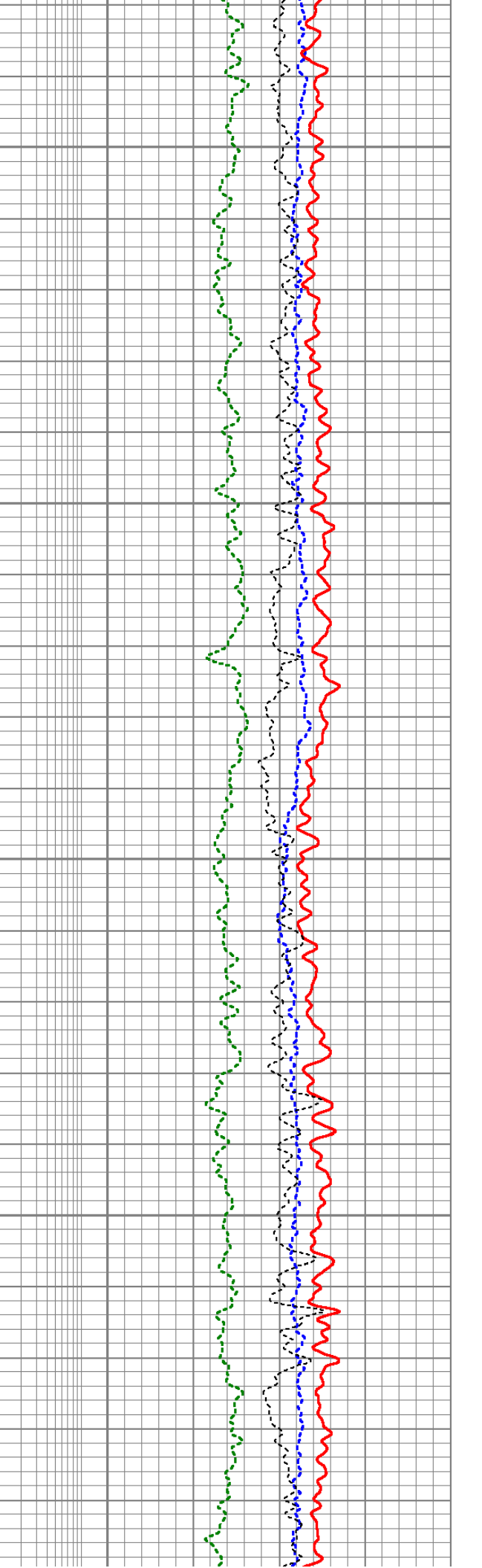
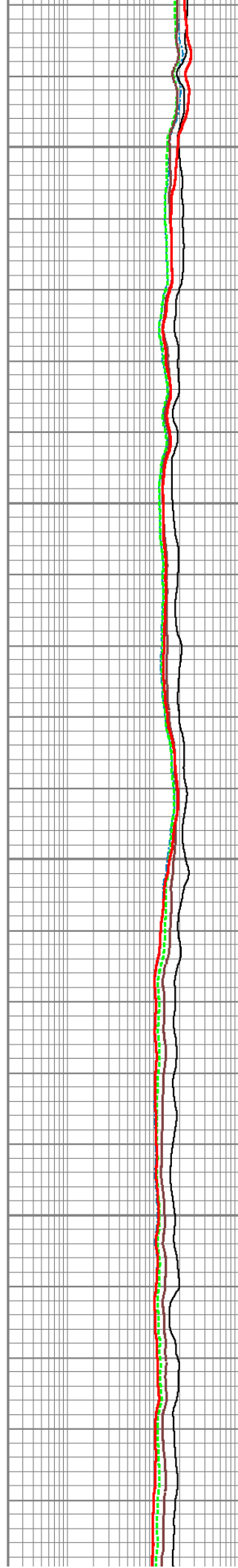
6950

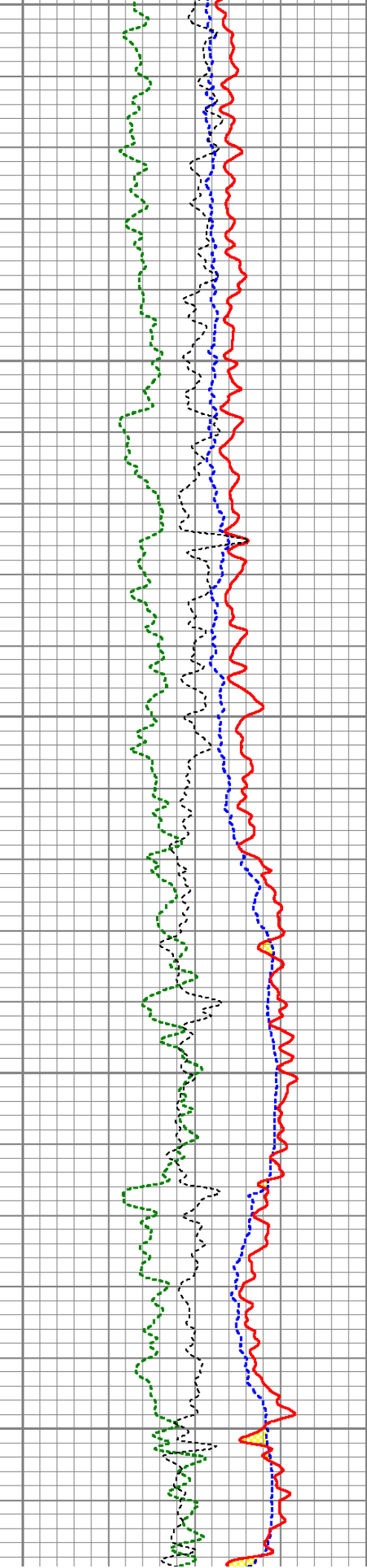
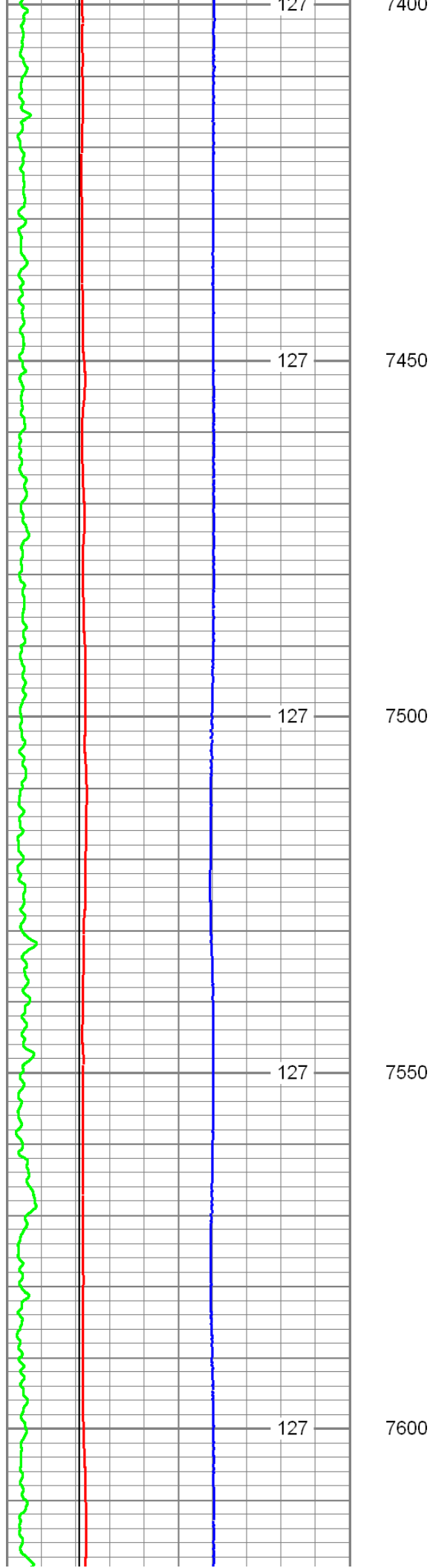


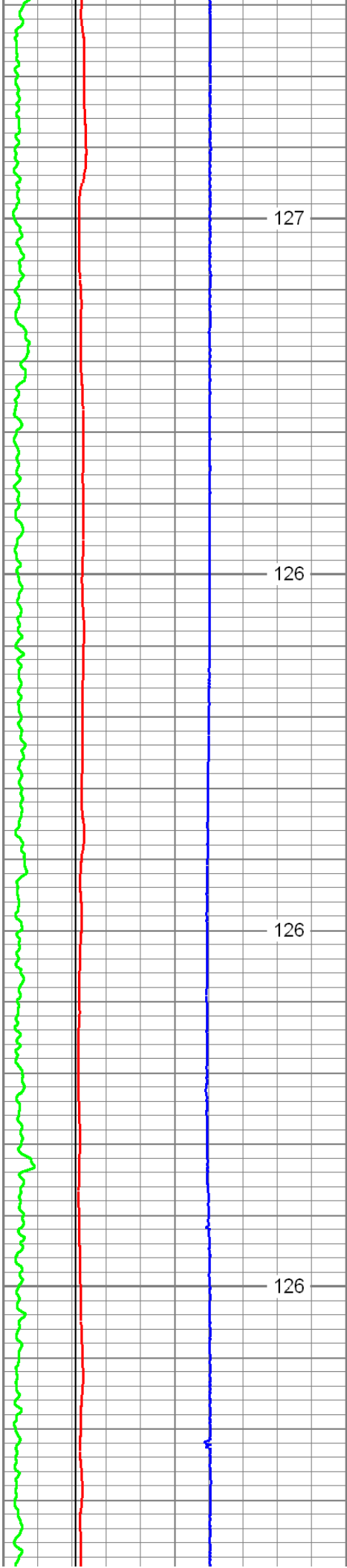




127 7200
127 7250
127 7300
127 7350
127 7400







127

7650

126

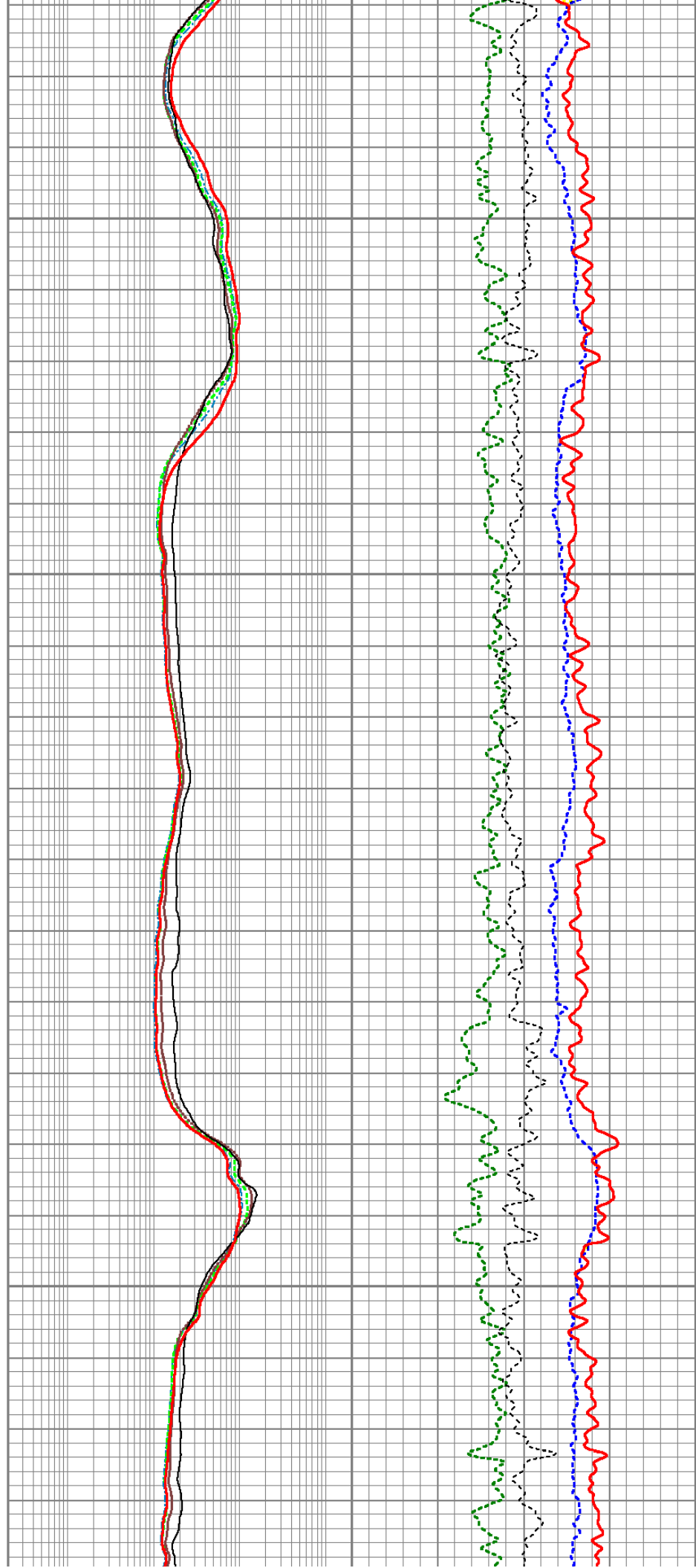
7700

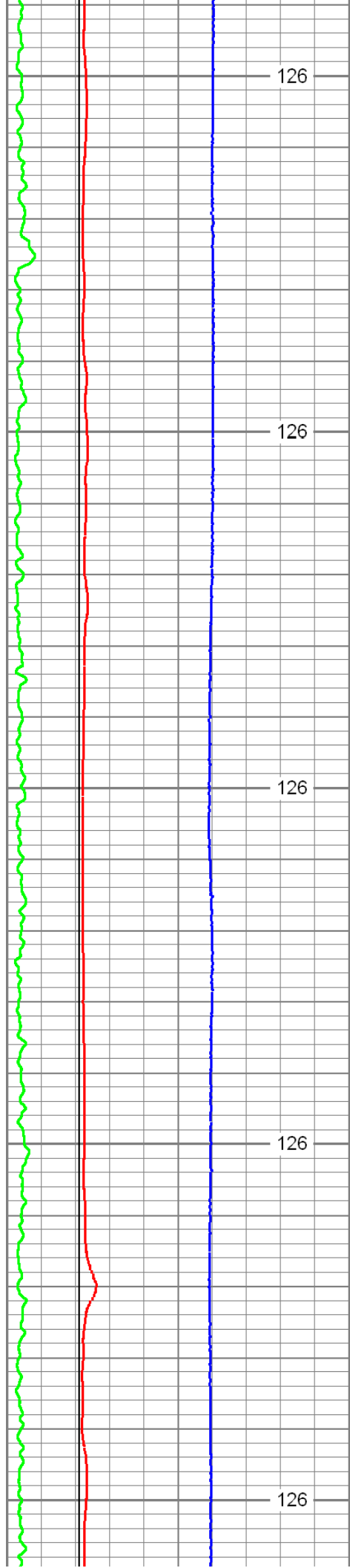
126

7750

126

7800





126

7850

126

126

7900

126

126

7950

126

126

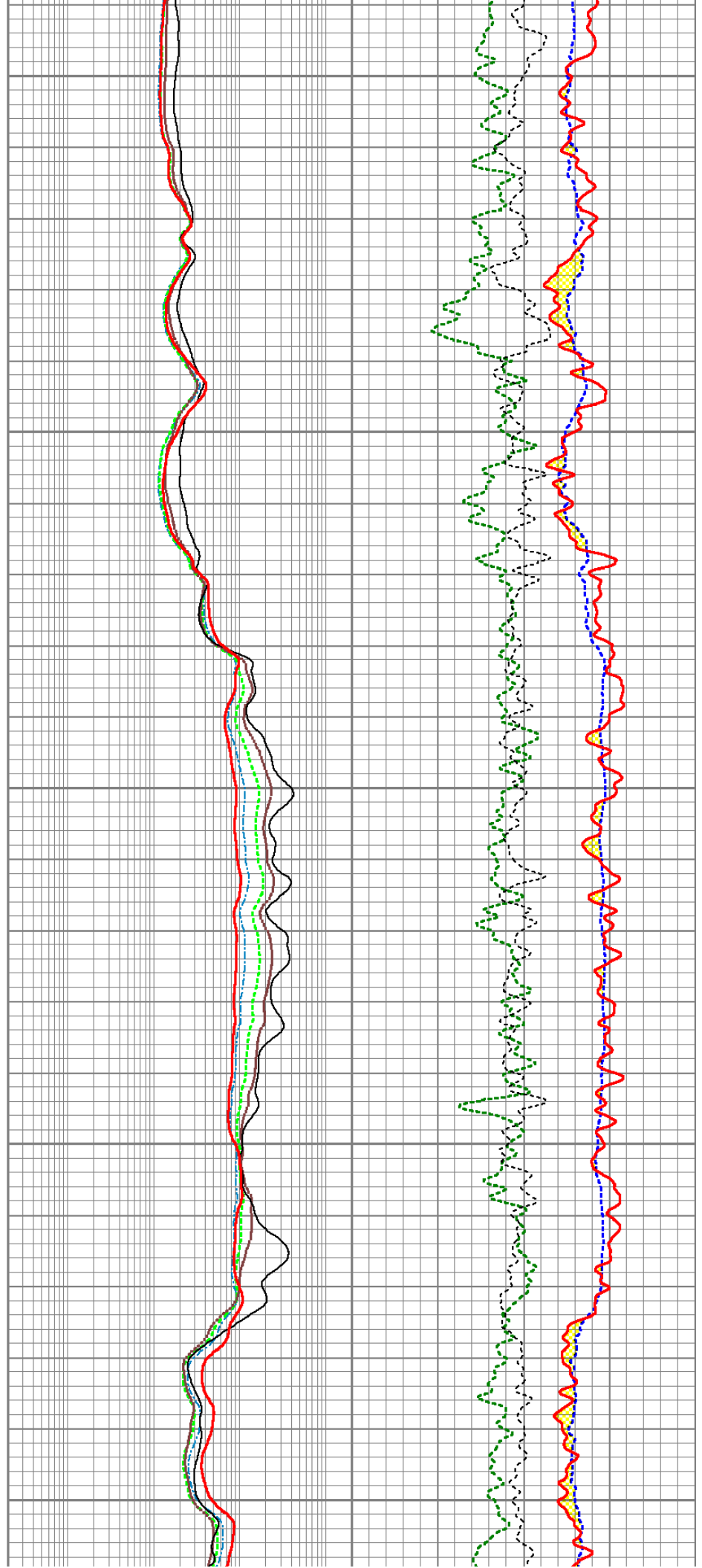
8000

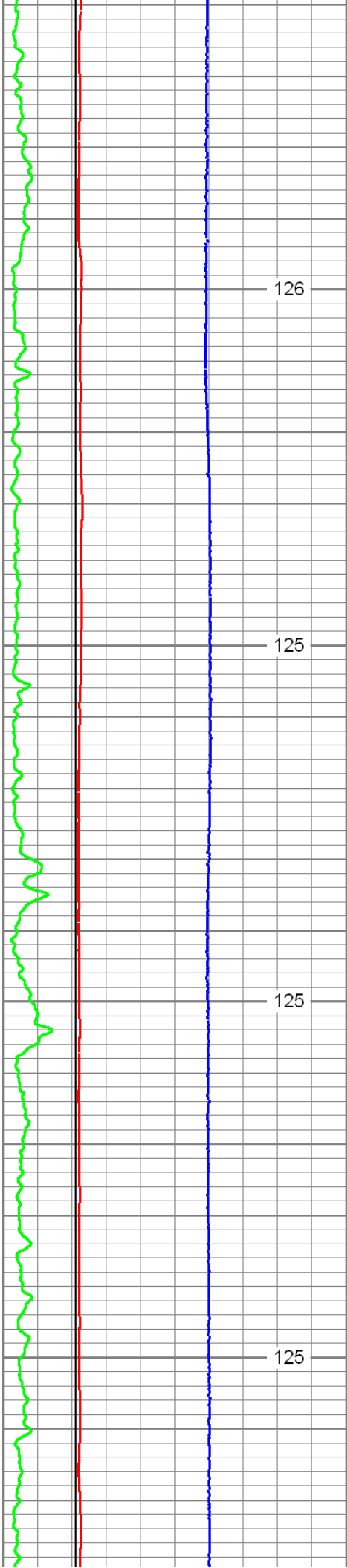
126

126

8050

126



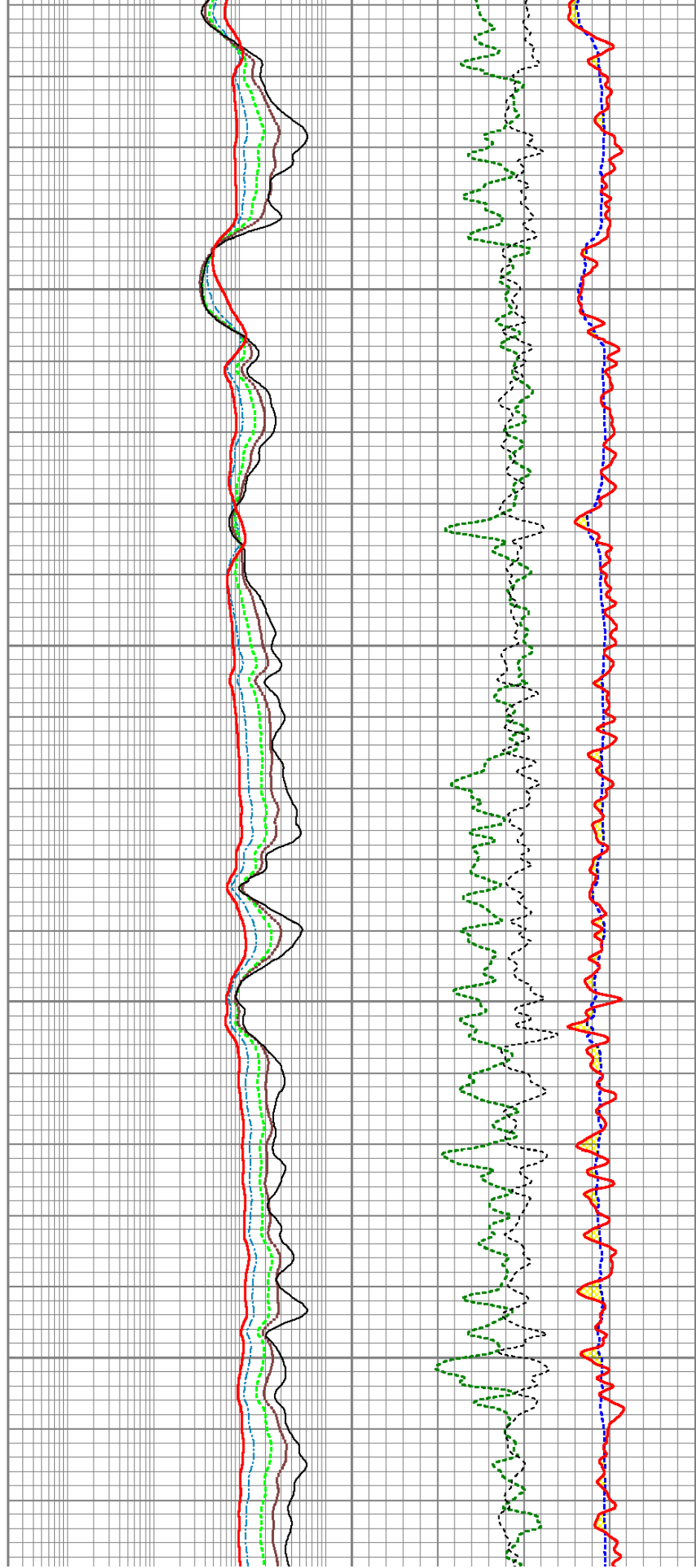


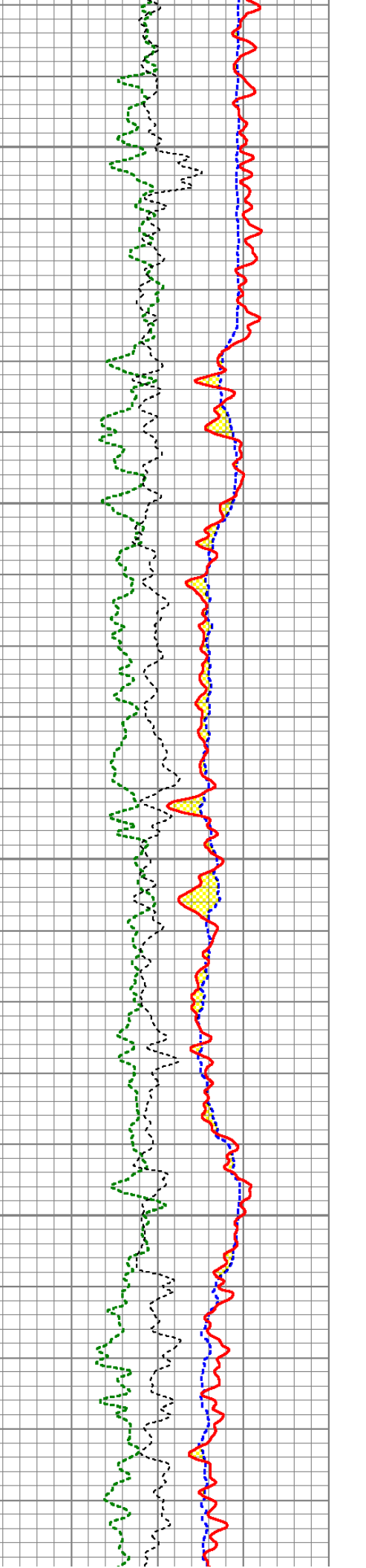
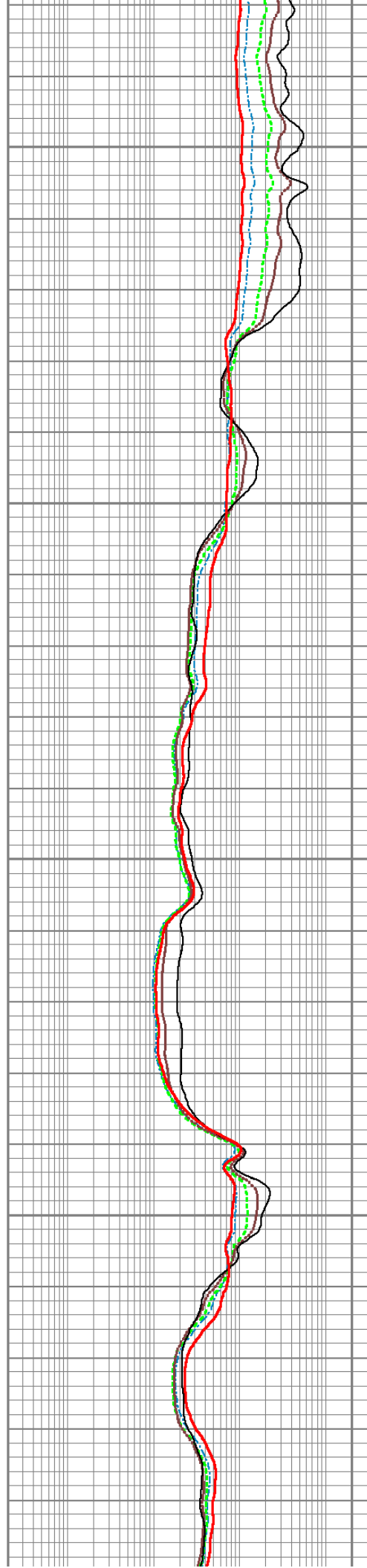
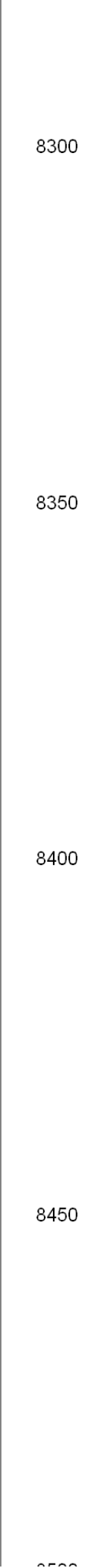
8100

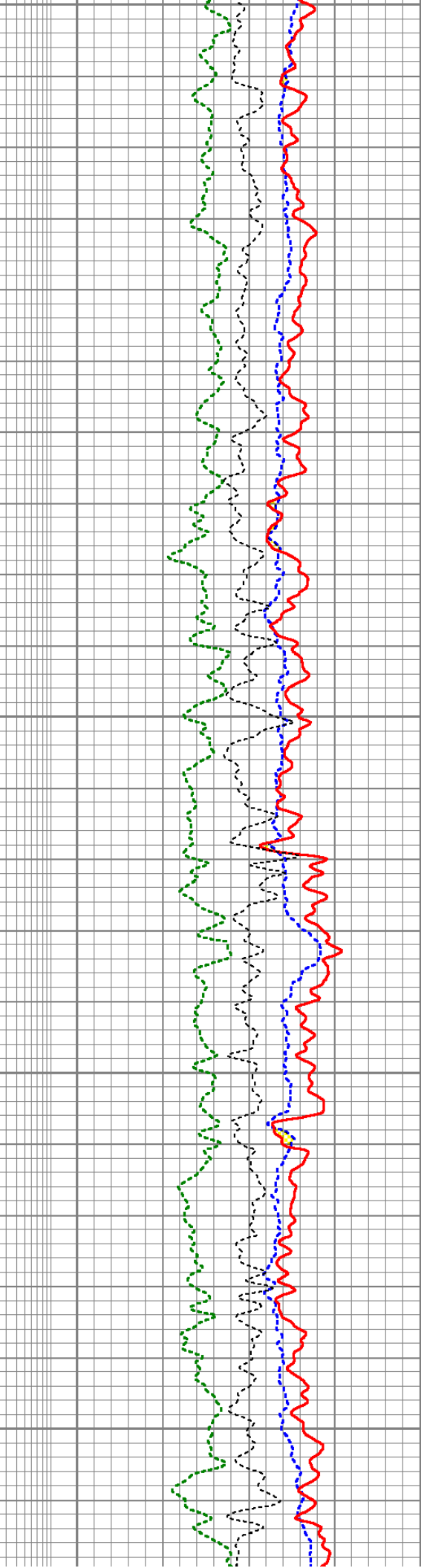
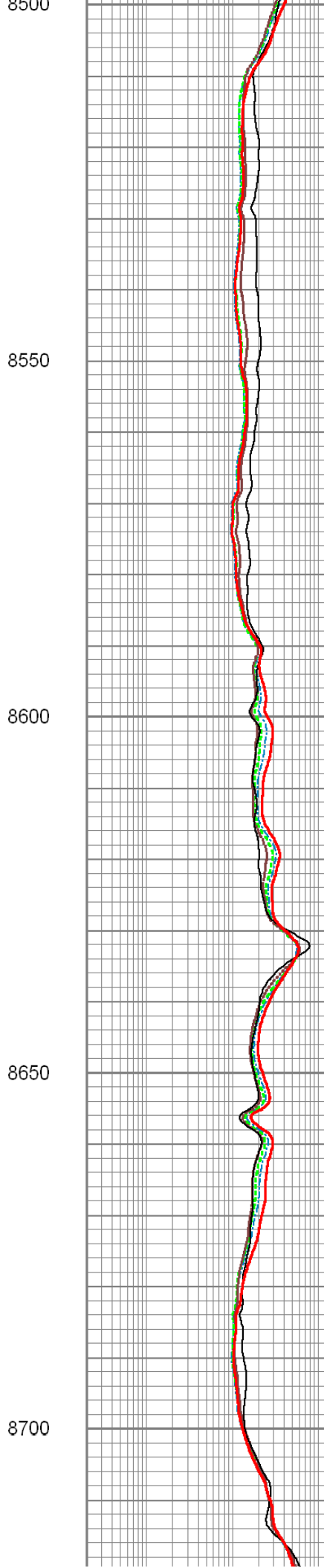
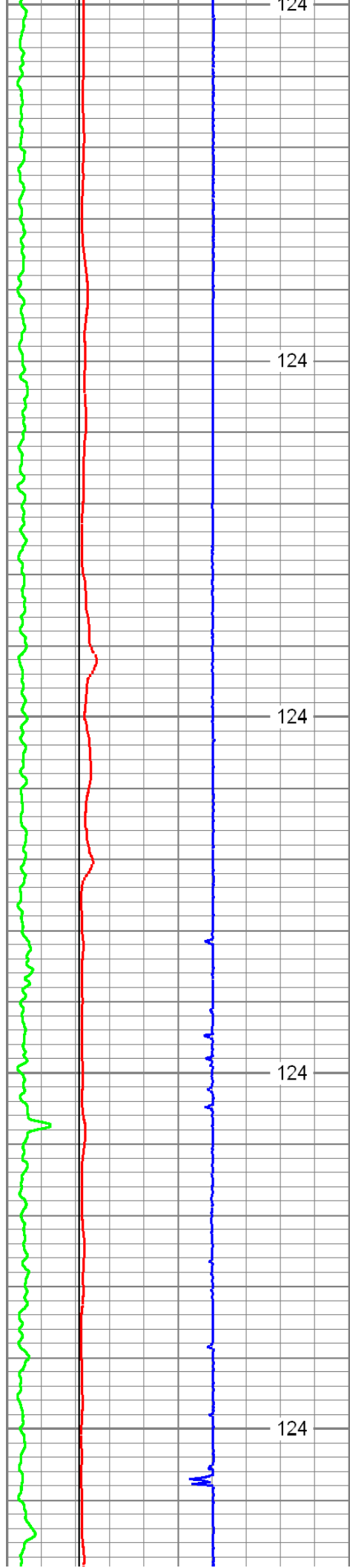
8150

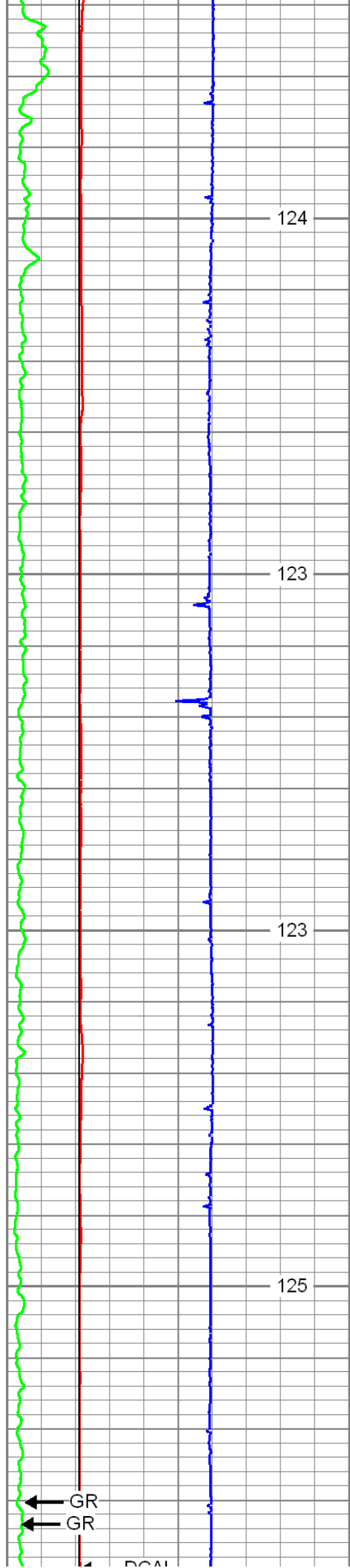
8200

8250







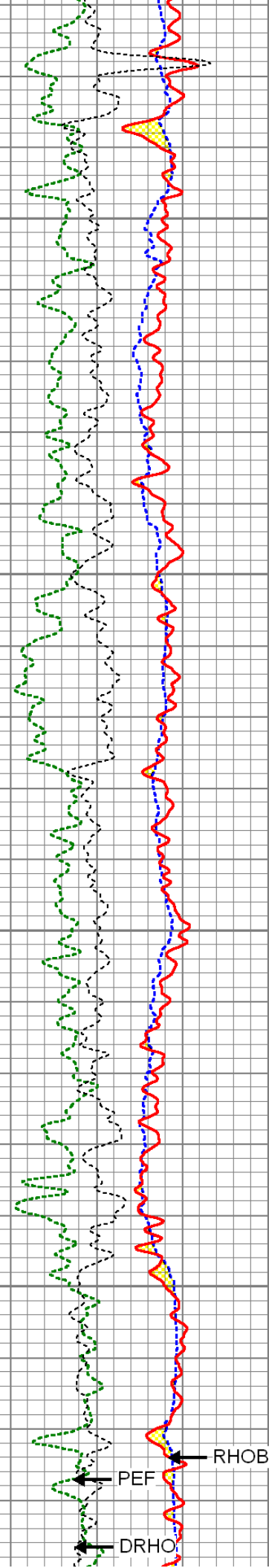
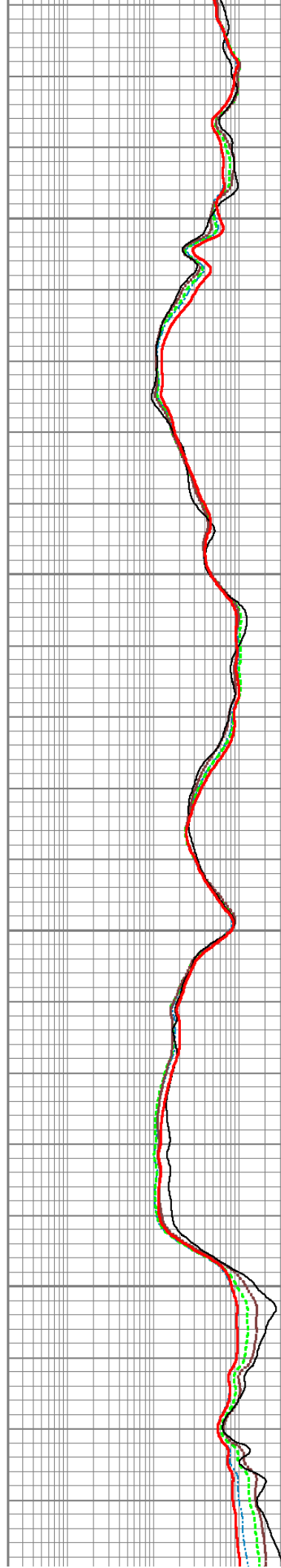


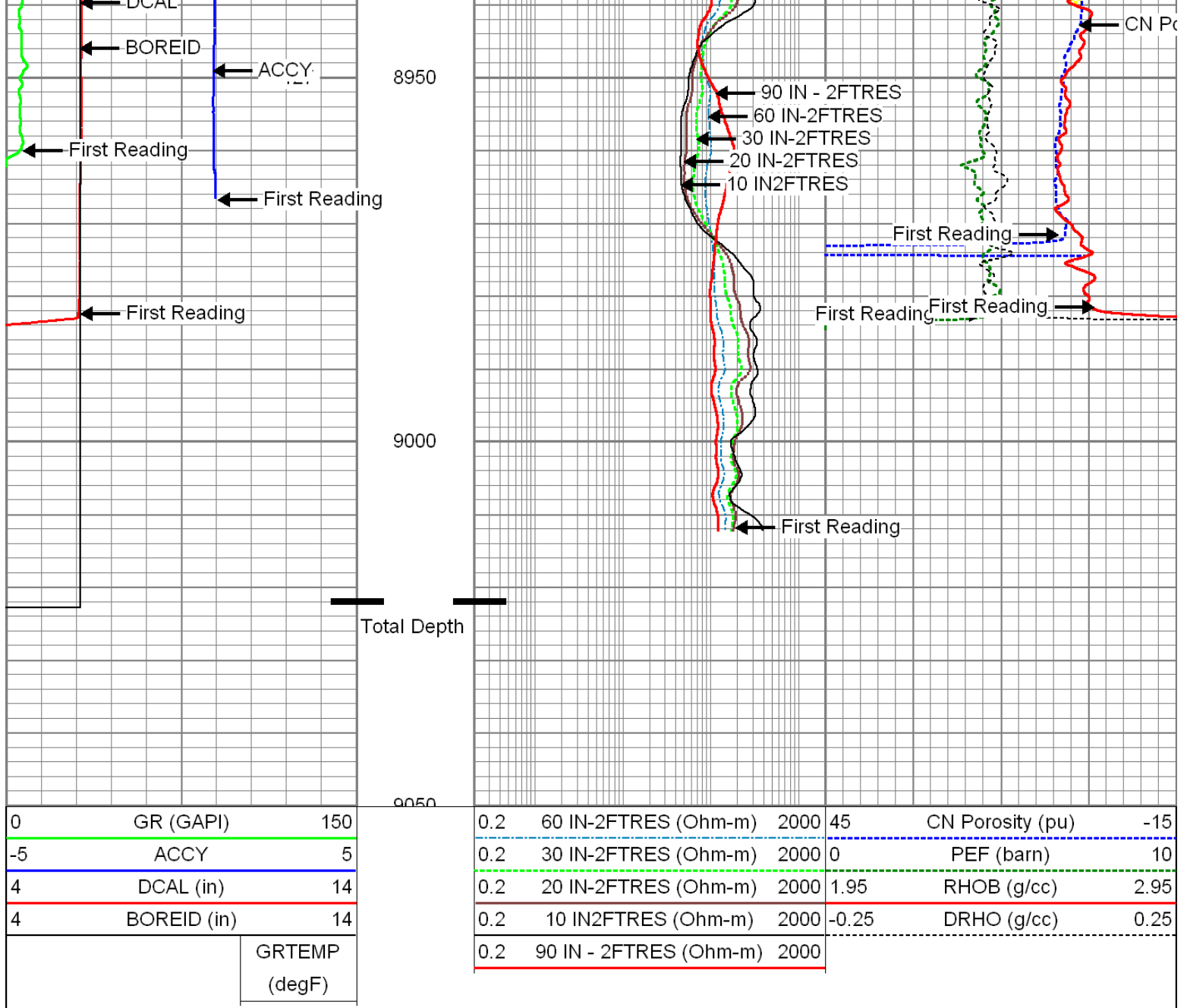
8750

8800

8850

8900





Log Variables

Database: c:\documents and settings\t006\desktop\shell koblitz3409 28-1h\koblitz_3409_28_1h_mem
 Dataset: field/well/proc1/pass1.5

Top - Bottom

BHCOR	BHFL_TYPE	BHFLRES Ohm-m	BHFLRESSRC	BHIDSRC	BOREID in	BOTTEMP degF
On	WBM	1	MUDCELL	CURVE	6.125	126
CASED?	CASEOD in	CASETHCK in	CEMWATERSA kppm	CMNTTHCK in	DPOSEL	FLUIDDEN g/cc
No	4.5	0	0	0	RHOB	1
FRMSALIN kppm	LATNOR	MATRXDEN g/cc	MUDSALIN kppm	MudWgt lb/gal	NPOSEL	PERFS
0	Off	2.71	1.8	8.7	Limestone	0
RESTMPSRC	SO in	SRFTEMP degF	SZCOR	TDEPTH ft	TMPCOR	TOOLPOS
INTERNAL	0.5	65	On	9100	On	Ec-centered
XXXX						

Calibration Report

Database File: c:\documents and settings\t006\desktop\shell koblitz3409 28-1h\koblitz_3409_28_1h_mem.db
 Dataset Pathname: proc1/pass1.6
 Dataset Creation: Tue Dec 18 13:40:45 2012

ThruBit Induction Calibration Report

Tool Model-Serial Number: PS-PS38R
 Shop Calibration Performed: Wed Sep 19 09:28:12 2012

BASELINE

	R	Expected	X	Expected
Freq 1				
A1	-478.6470	[-500.00, -400.00]	173.0000	[-500.00, 500.00]
A2	-136.1660	[-180.00, -100.00]	298.4330	[-500.00, 500.00]
A3	-26.9944	[-50.00, -10.00]	-68.1870	[-500.00, 500.00]
A4	-16.5753	[-30.00, -10.00]	252.8430	[-500.00, 500.00]
A5	-14.5693	[-30.00, -10.00]	150.3510	[-500.00, 500.00]
Freq 2				
A1	-252.6960	[-280.00, -180.00]	84.1946	[-500.00, 500.00]
A2	-87.5233	[-130.00, -50.00]	165.5460	[-500.00, 500.00]
A3	-19.5990	[-50.00, -10.00]	-97.2460	[-500.00, 500.00]
A4	-19.8898	[-30.00, -10.00]	75.3812	[-500.00, 500.00]
A5	-19.5554	[-30.00, -10.00]	-0.3546	[-500.00, 500.00]
Freq 3				
A1	-163.6960	[-180.00, -80.00]	-7.9103	[-500.00, 500.00]
A2	-67.0263	[-130.00, -30.00]	78.9750	[-500.00, 500.00]
A3	-16.3076	[-50.00, -10.00]	-130.2510	[-500.00, 500.00]
A4	-21.4341	[-30.00, -10.00]	-42.9782	[-500.00, 500.00]
A5	-22.0719	[-30.00, -10.00]	-109.4460	[-500.00, 500.00]
Freq 4				
A1	-91.5984	[-120.00, -40.00]	-163.9400	[-500.00, 500.00]
A2	-48.3989	[-110.00, -10.00]	-37.1792	[-500.00, 500.00]
A3	-13.2104	[-50.00, -10.00]	-195.2460	[-500.00, 500.00]
A4	-24.0555	[-30.00, -10.00]	-219.8520	[-500.00, 500.00]
A5	-26.9658	[-30.00, -10.00]	-291.9350	[-500.00, 500.00]

CALIBRATION COEFFICIENTS

	R	Expected	X	Expected
Freq 1				
A1	0.9932	[0.95, 1.05]	-0.0014	[-0.05, 0.05]
A2	0.9912	[0.95, 1.05]	0.0015	[-0.05, 0.05]
A3	1.0012	[0.95, 1.05]	-0.0059	[-0.05, 0.05]
A4	0.9886	[0.95, 1.05]	0.0041	[-0.05, 0.05]
A5	0.9941	[0.95, 1.05]	0.0005	[-0.05, 0.05]
Freq 2				
A1	0.9875	[0.95, 1.05]	-0.0069	[-0.05, 0.05]
A2	0.9856	[0.95, 1.05]	-0.0048	[-0.05, 0.05]
A3	0.9898	[0.95, 1.05]	-0.0048	[-0.05, 0.05]
A4	0.9843	[0.95, 1.05]	-0.0026	[-0.05, 0.05]
A5	0.9899	[0.95, 1.05]	-0.0066	[-0.05, 0.05]
Freq 3				

A1	0.9906	[0.95, 1.05]	-0.0084	[-0.05, 0.05]
A2	0.9890	[0.95, 1.05]	-0.0064	[-0.05, 0.05]
A3	0.9929	[0.95, 1.05]	-0.0065	[-0.05, 0.05]
A4	0.9861	[0.95, 1.05]	-0.0043	[-0.05, 0.05]
A5	0.9936	[0.95, 1.05]	-0.0085	[-0.05, 0.05]
Freq 4				
A1	0.9898	[0.95, 1.05]	-0.0038	[-0.05, 0.05]
A2	0.9878	[0.95, 1.05]	-0.0023	[-0.05, 0.05]
A3	0.9935	[0.95, 1.05]	-0.0043	[-0.05, 0.05]
A4	0.9844	[0.95, 1.05]	0.0001	[-0.05, 0.05]
A5	0.9985	[0.95, 1.05]	-0.0062	[-0.05, 0.05]
Temperature	26.7102 degC			

ThruBit Density Calibration Report

Tool Model-Serial Number: PS-PS44D
Source Number:
Shop Calibration Performed: Thu Nov 29 11:41:46 2012

REFERENCE

	Density	Units
Aluminium	2.607	g/cc
Magnesium	1.752	g/cc

READINGS

Outputs	Counts	Units	Expected
SS1 Background	130.13	cps	[130.00, 170.00]
LS1 Background	146.20	cps	[130.00, 170.00]
LS4 Background	29.56	cps	[27.00, 35.00]
SS1 Aluminium	5613.30	cps	[4500.00, 5500.00]
LS1 Aluminium	950.33	cps	[750.00, 950.00]
LS4 Aluminium	1057.35	cps	[843.00, 1068.00]
SS1 Magnesium	9246.22	cps	[7000.00, 9000.00]
LS1 Magnesium	6219.22	cps	[5250.00, 6250.00]
LS1 Al + Fe	795.70	cps	[650.00, 800.00]
LS4 Al + Fe	456.59	cps	[382.00, 471.00]

RESULTS

SS Slope	1.68	[1.52, 1.77]
LS Slope	0.42	[0.38, 0.45]
PEF K Factor	5.058	[3.510, 6.170]
PEF B Factor	-0.501	[-0.700, -0.410]

Caliper Shop Calibration performed: Thu Nov 29 11:41:46 2012

RESULTS

Reference	Reading	Units
12.00	1853.08	in
9.00	2007.18	in
6.00	2165.36	in

DENSITY PRE-SURVEY CHECK Performed: Sun Dec 16 20:21:30 2012

Outputs	Counts	Units	Expected
SS1 Background	129.01	cps	[126.23, 134.04]
LS1 Background	145.93	cps	[141.82, 150.59]
LS4 Background	28.94	cps	[27.79, 31.34]
DENSITY POST-SURVEY CHECK Performed:		Wed Dec 31 18:00:00 1969	
Outputs	Counts	Units	Expected
SS1 Background	0.00	cps	[126.23, 134.04]
LS1 Background	0.00	cps	[141.82, 150.59]
LS4 Background	0.00	cps	[27.79, 31.34]
CALIPER PRE-SURVEY CHECK Performed:		Sun Dec 16 20:18:23 2012	
Reference	Readings	Units	Expected
9.00	9.01	in	[8.80, 9.20]
CALIPER POST-SURVEY CHECK Performed:		Wed Dec 31 18:00:00 1969	
Reference	Readings	Units	Expected
0.00	0.00	in	[-0.20, 0.20]

Compensated Neutron Calibration Report

Tool Model-Serial Number:	ENP-ENP5N
Source Number:	
Calibration Tank Temperature:	63.7 degF
Shop Calibration Performed:	Fri Nov 16 09:23:04 2012

BACKGROUND MEASUREMENT

Outputs	Measured	Units	Expected
SS Counts	0.1	cps	<10
LS Counts	0.3	cps	<4

WATER TANK REFERENCE

Outputs	Measured	Units	Expected
SS Counts	875.1	cps	
LS Counts	29.6	cps	
Tank Ratio Ref	30.9580	SS/LS	
Tank Ratio	29.5826	SS/LS	
Tank Ratio Gain	1.0465		[0.85, 1.15]

ALUMINUM SLEEVE REFERENCE

Outputs	Measured	Units	Expected
SS Counts	9775.7	cps	
LS Counts	925.1	cps	
Al Ratio Ref	10.797	SS/LS	

AI Ratio	11.059	SS/LS	
AI Ratio Gain	0.98		[0.90, 1.10]
Sleeve Porosity	14.46	pu	

PRE-SURVEY BACKGROUND CHECK Performed: Sun Dec 16 20:16:51 2012

Outputs	Measured	Units	Expected
SS Counts	0.0	cps	<10
LS Counts	0.5	cps	<4

POST-SURVEY BACKGROUND CHECK Performed:


Outputs	Measured	Units	Expected
SS Counts	0.0	cps	<10
LS Counts	0.0	cps	<4

Gamma Ray Calibration Report

Tool Model-Serial Number:	PS-PS27T	
Performed:	Thu Sep 27 07:45:16 2012	
Calibrator Value:	162.7	GAPI
Background Reading:	65.1	cps
Calibrator Reading:	402.7	cps
Sensitivity:	0.3750	GAPI/cps

Inclinometer Calibration Report

Performed:	Sun Jun 13 14:33:21 1993			
	Low Read.	High Read.	Low Ref.	High Ref.
X Accelerometer	0.00	1.00	0.00	1.00 gee
Y Accelerometer	0.00	1.00	0.00	1.00 gee
Z Accelerometer	0.00	1.00	0.00	1.00 gee

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
Thrubit	88.85		Cablehead-S	2.31	2.13	5.00
Thrubit	86.54		Solid Weakpoint			
			BDOT	3.54	2.25	35.00
Thrubit	83.00		HangOff_Tool	5.00	2.38	60.00
Thrubit	78.00		Universal Joint	1.46	2.06	15.00
Thrubit	76.54		10-1	0.88	2.13	3.95
TBBAT2	75.66		TBBAT2-A (PS33B) Thrubit Battery	6.13	2.13	40.00
TBBAT	69.54					

			TBBAT-A (PS34B) ThruBit Battery	6.13	2.13	38.20
TMG	63.41					
GR	63.29					
GRTEMP	62.45		TMG-PS (PS27T) ThruBit Telemetry Gamma Ray	6.13	2.13	45.00
ThruBit	57.29		Decentralizer Decentralizer (Small)	4.50	2.13	70.00
CNLSC	50.85		TBN-ENP (ENP5N) ThruBit Neutron	4.77	2.13	63.00
LSW1	40.29		TBD-PS (PS44D) ThruBit Density	10.48	2.13	91.00
DCAL	39.38		Knuckle	1.42	2.13	11.50
ThruBit	37.54		Knuckle	1.42	2.13	11.50
ThruBit	36.13					
DT	28.04					
TT	28.04		TBS-A (TBS07) ThruBit Sonic -- Initial Support	16.46	2.13	75.00
RmbPk	28.04					
WVF1	28.04					
WVF2	28.04					
WVF3	28.04					
WVF4	28.04		Sonic Centralizer	2.96	2.13	22.60
WVF5	28.04					
WVF6	28.04					
WVF7	28.04					
ThruBit	18.25					
A1_P	10.60					
A2_P	10.10		TBI-PS (PS38R) ThruBit Induction	15.29	2.13	94.00
A3_P	9.35					
A4_P	8.35					
A5_P	6.60					
Dataset:		koblitz_3409_28_1h_mem.db: field/well/proc1/pass1.6				
Total Length:		88.85 ft				
Total Weight:		680.75 lb				
O.D.		2.38 in				



ThruBit
A Schlumberger Company

Company SHELL EXP. & PROD. CO., INC.
Well KOBLITZ 3409 28-1H
Field WILDCAT
County HARPER
State KANSAS