



ThruBit
A Schlumberger Company

ARRAY INDUCTION
SPECTRAL DENSITY
GAMMA RAY
MEMORY LOG

Company	SOURCE ENERGY MIDCON LLC	Company	SOURCE ENERGY MIDCON LLC
Well	T & C ZIMMERMAN 34-14-34-11H	Well	T & C ZIMMERMAN 34-14-34-11H
Field	WILDCAT	Field	WILDCAT
County	SUMNER	County	SUMNER
State	KANSAS	State	KANSAS
Location:	API #: 15-191-22675-01-00 SHL: 330' FSL & 452' FWL PBHL: 571' FWL & 330' FNL SEC 34 TWP 31S RGE 01E	Other Services SONIC LOG	
Permanent Datum	G.L.	Elevation	1309'
Log Measured From	K.B. 17' ABOVE PERM DATUM	K.B. 1326'	D.F. 1326'
Drilling Measured From	K.B.	G.L. 1309'	
Date	27 MARCH 2013		
Run Number	ONE		
Depth Driller	8060'		
Depth Logger	7937'		
Bottom Logged Interval	7927'		
Top Log Interval	4238'		
Casing Driller	7.0" @ 4260'		
Casing Logger	4238'		
Bit Size	6.125		
Type Fluid in Hole	WBM		
Density / Viscosity	8.45 / 28		
pH / Fluid Loss	8.0 / 100		
Source of Sample	FLOWLINE		
Rim @ Meas. Temp	0.94 ohms @ 68 degf		
Rinf @ Meas. Temp	0.71 ohms @ 68 degf		
Rmc @ Meas. Temp	1.18 ohms @ 68 degf		
Source of Rinf / Rmc	CALCULATED		
Rim @ BHT	0.85 ohms @ 118 degf		
Time Circulation Stopped	22:000		
Time Logger on Bottom	00:45		
Maximum Recorded Temperature	118 degf		
Equipment Number	T004		
Location	OKC, OK		
Recorded By	J. DENGLER		
Witnessed By	ROY BLACK		

<<< Fold Here >>>

All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

SERVICE: HORIZONTAL PUMP DOWN MEMORY BIT DEPTH: 7885' LOGGED TO: 4238'
ALL SCALES AND PRESENTATIONS PER CLIENT REQUEST
LIMESTONE MATRIX, 2.71 g/cc. USED FOR POROSITY MEASUREMENTS
TOOLSTING RAN WITH SMALL DE-CENTRALIZER, SWIVEL, S. CENTRALIZERS AND NO STANDOFFS
TBHV REPRESENTS TOTAL BORHOLE VOLUME, ft3
ABHV REPRESENTS ANNULAR HOLE VOLUME, CALCULATED FOR 4.5" CSG., ft3
RIGMINDER AND PASON USED TO ACQUIRE LOG DEPTH
LOG CORRELATED TO PIPE TALLY
RIG: PISTOL # 2
CREW: J. DENGLER, E. PRICE, J. DOTY

Service Ticket No.	1817	API No.	15-191-22675-01-00	PGM Ver	WARRIOR 7.0
The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client					
EQUIPMENT DATA					
GAMMA RAY		NEUTRON		INDUCTION	

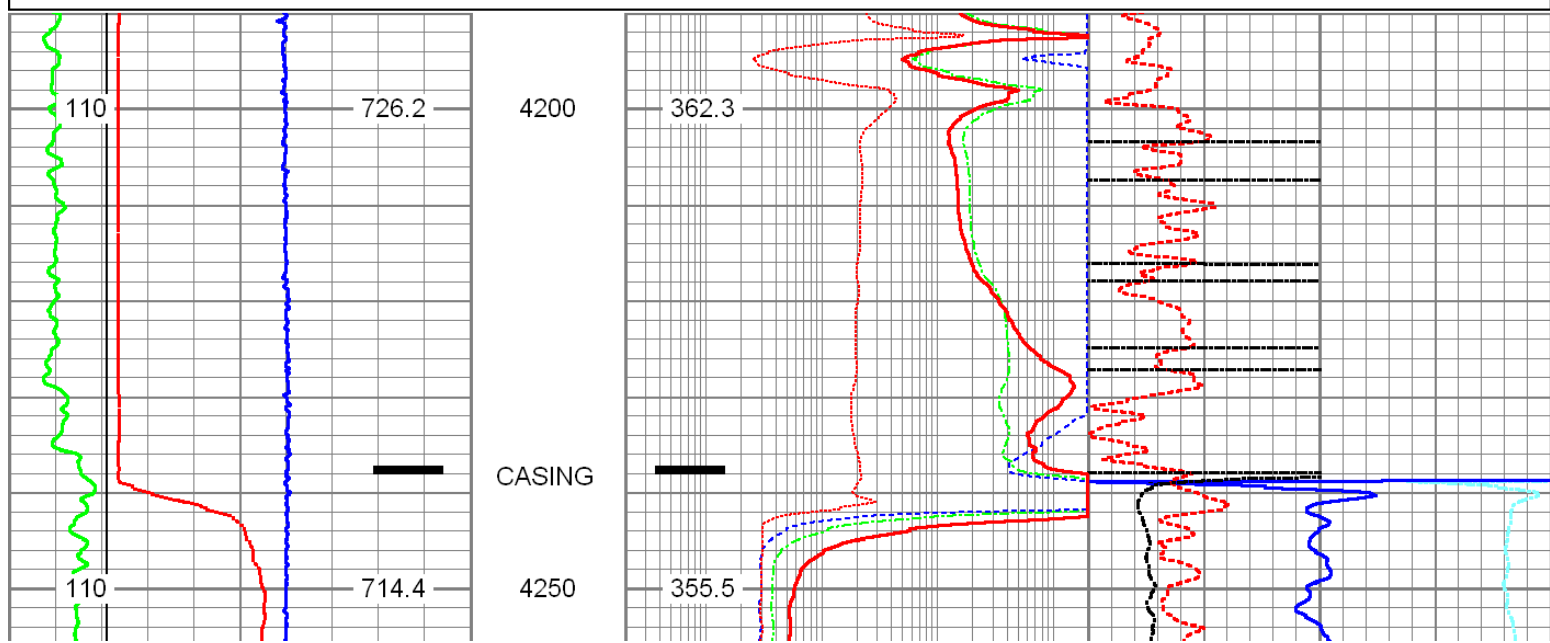
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE	
Serial No.	PS35T	Serial No.	PS06N	Serial No.	PS03D	Serial No.	ENP6	
Model No.	PS	Model No.	PS	Model No.	PS	Model No.	ENP	
Diameter	2.125"	Diameter	2.125"	Diameter	2.125"	Diameter	2.125"	
LOGGING DATA								
General Data								
Pass	Depths		Well Head	Speed	Logging Run Comments			
No.	From	To	Pressure	Ft/Min				
ONE	7937'	4238'		30				
	GAMMA RAY		NEUTRON		DENSITY		INDUCTION	
Pass	Scale		Scale		Scale		Scale	
No.	L	R	L	R	L	R	L	R
ONE	O API	150 API	30 %	-10 %	30%	-10%	0.2 OHM-M	2000 OHM-M
DIRECTIONAL INFORMATION								
Maximum Deviation		93.98	deg. @	4370'	KOP	3021'		

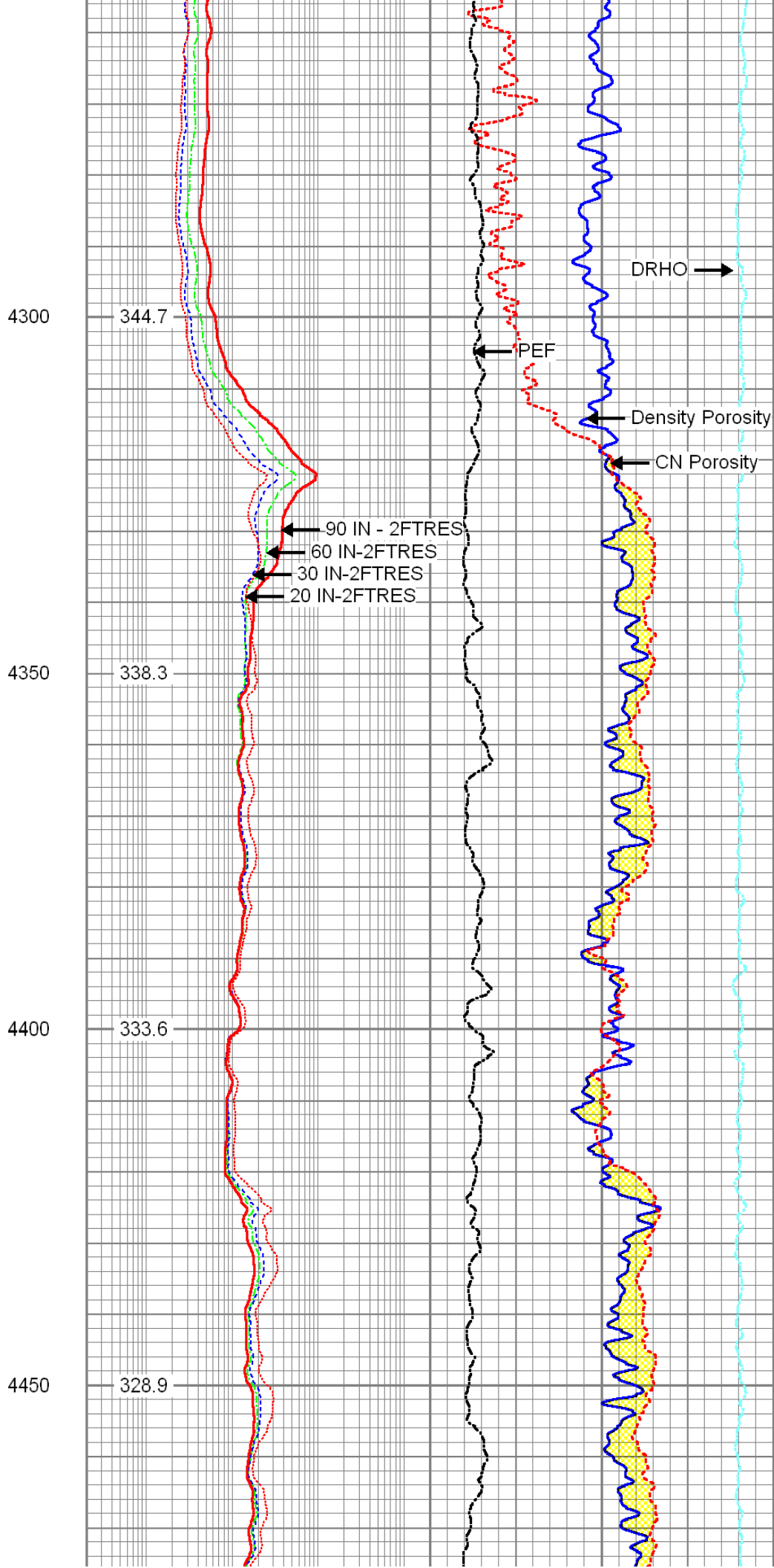
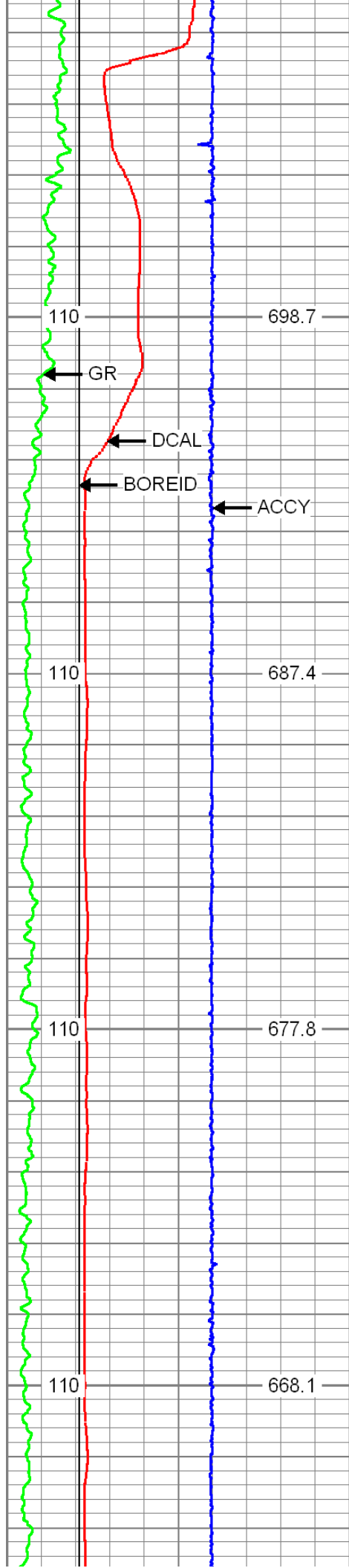


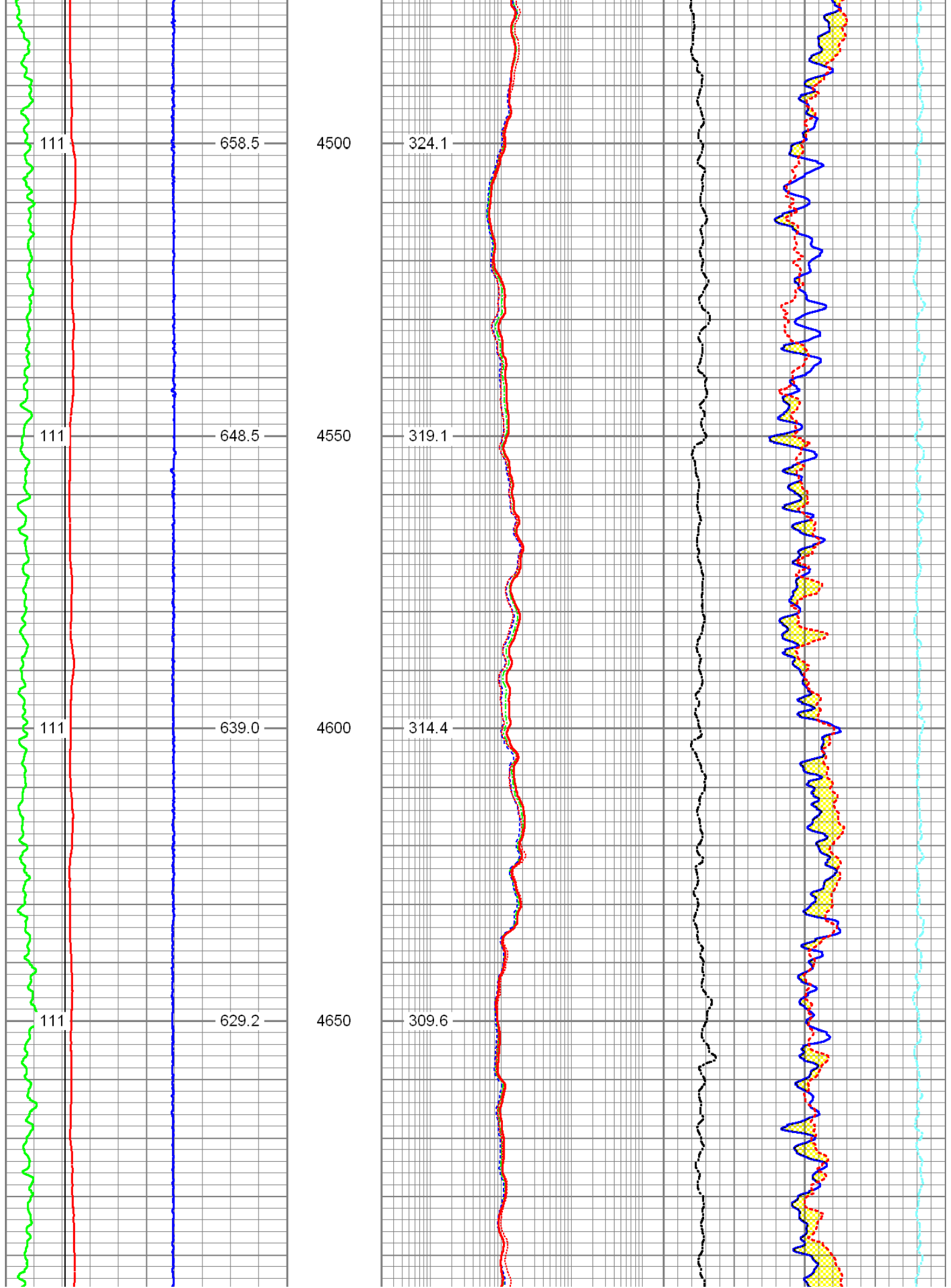
MAIN PASS

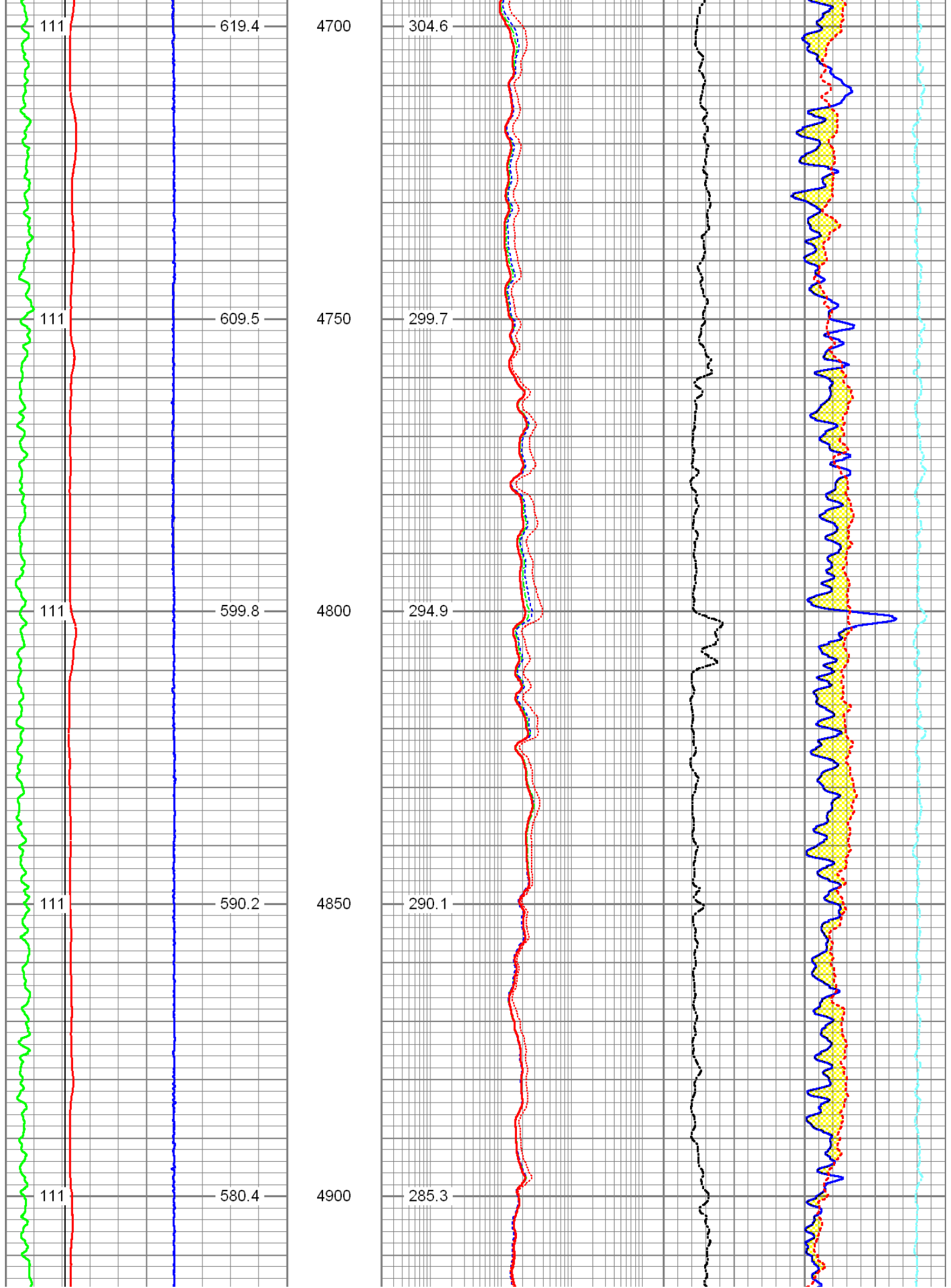
Database File: zimmerman_mem.db
 Dataset Pathname: proc1/pass1.2
 Presentation Format: combojoh
 Dataset Creation: Wed Mar 27 07:52:41 2013
 Charted by: Depth in Feet scaled 1:240

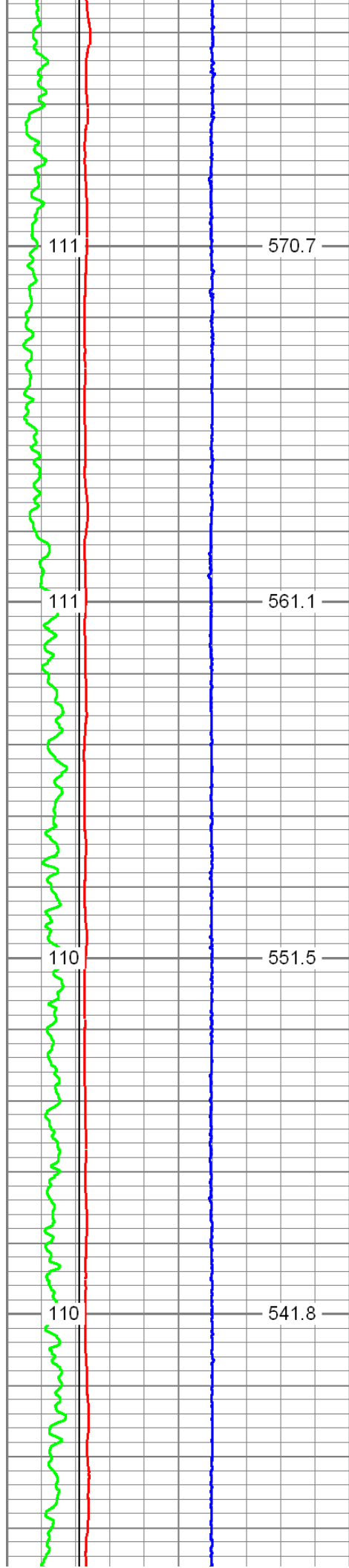
0	GR (GAPI)	150	0.2	60 IN-2FTRES (Ohm-m)	2000	30	Density Porosity (pu)	-10
4	BOREID (in)	14	0.2	30 IN-2FTRES (Ohm-m)	2000	30	CN Porosity (pu)	-10
4	DCAL (in)	14	0.2	20 IN-2FTRES (Ohm-m)	2000	0	PEF (barn)	10
-5	ACCY	5	0.2	90 IN - 2FTRES (Ohm-m)	2000		DRHO	
							-0.8 (g/cc)	0.2
GRTEMP		TBHV (ft3)	ABHV (ft3)					
(degF)								









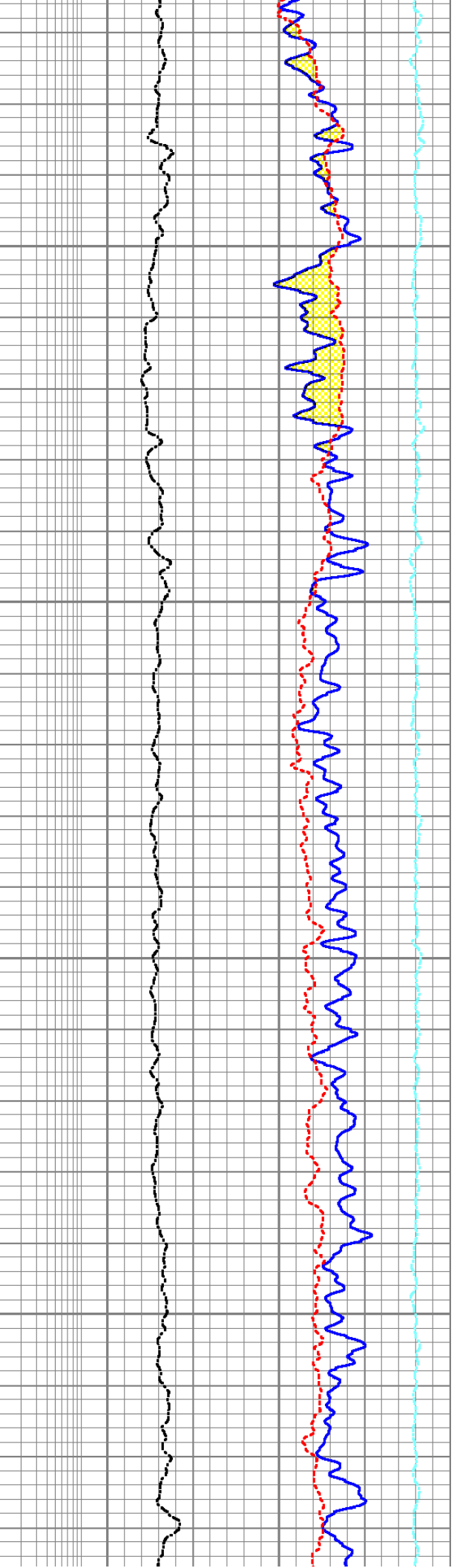
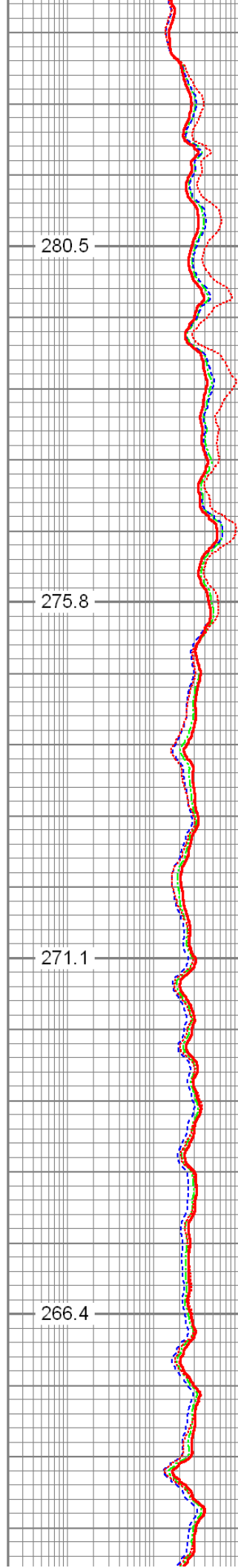


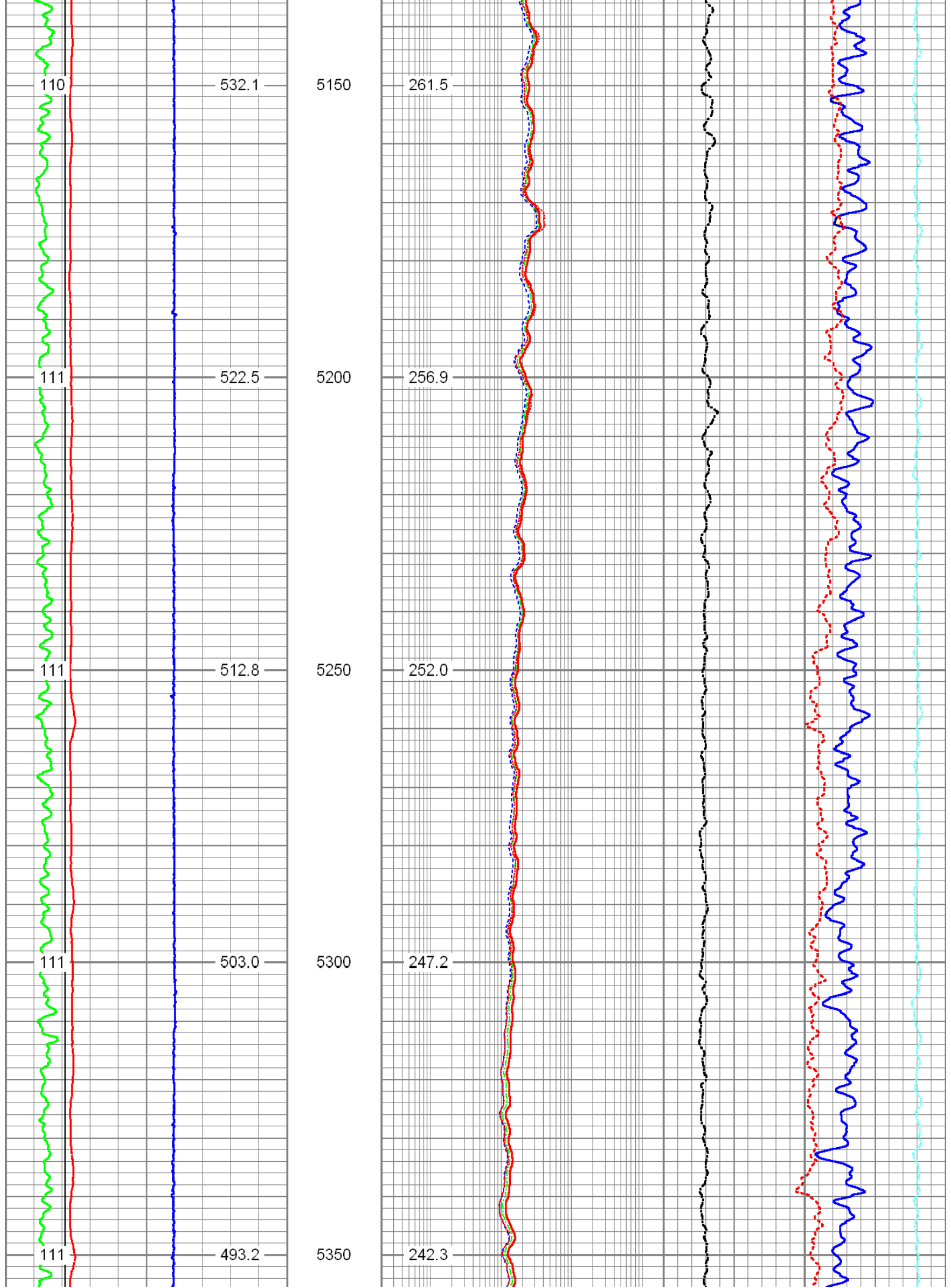
4950

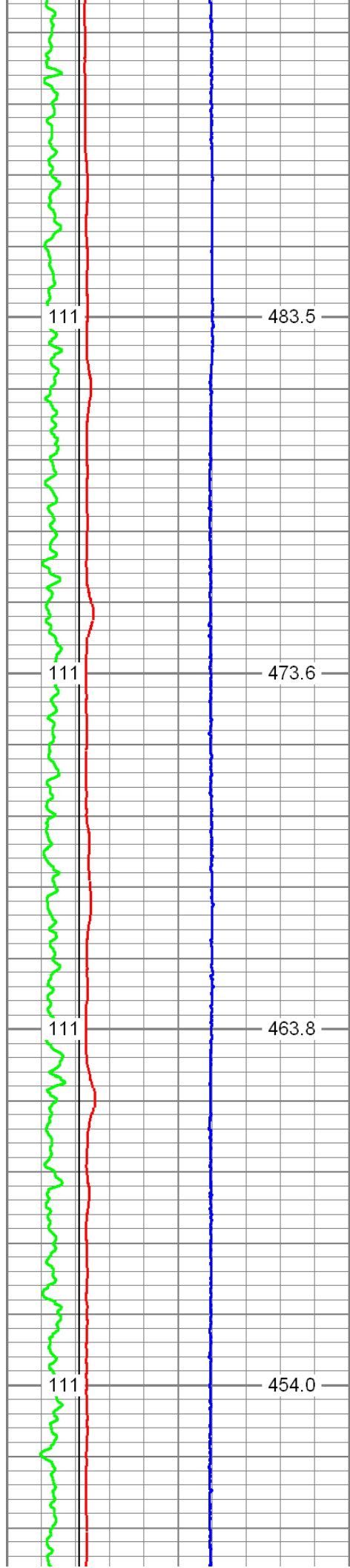
5000

5050

5100





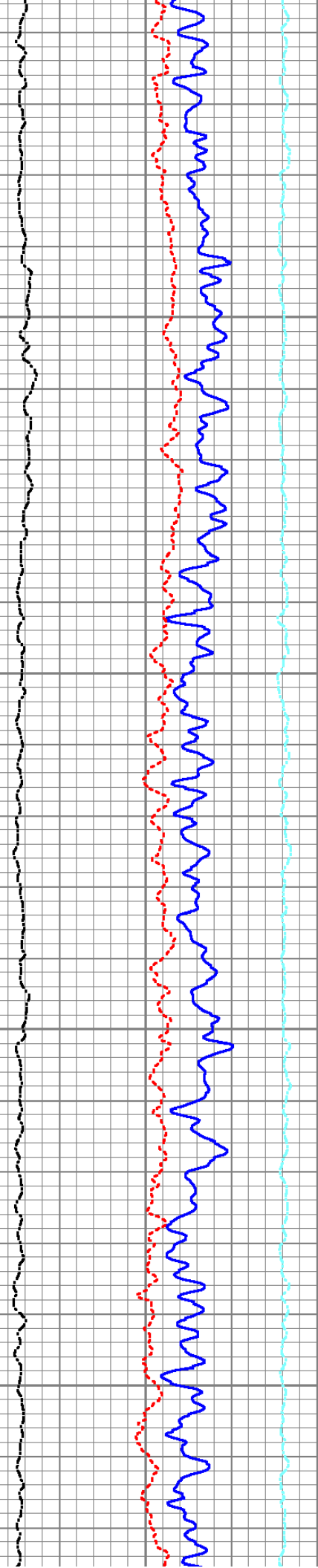
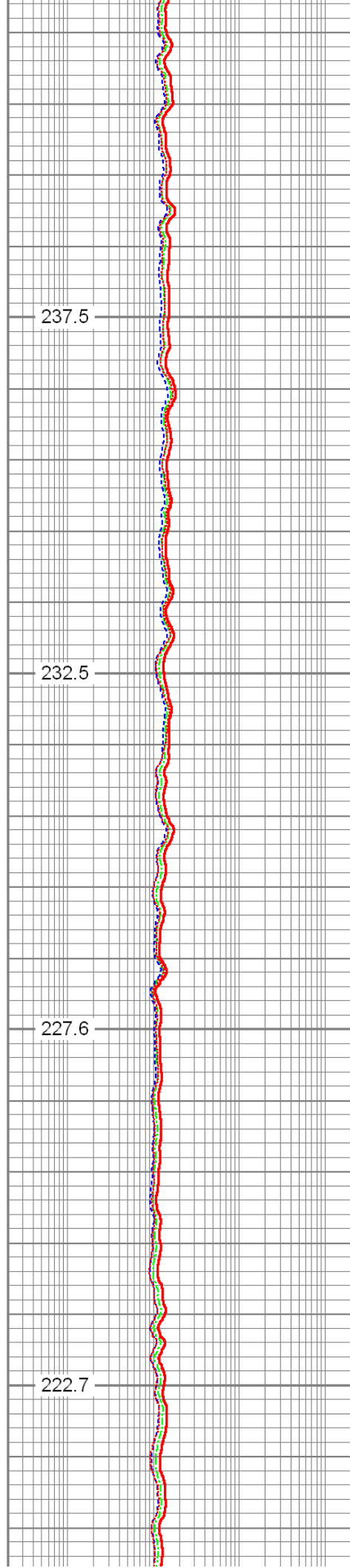


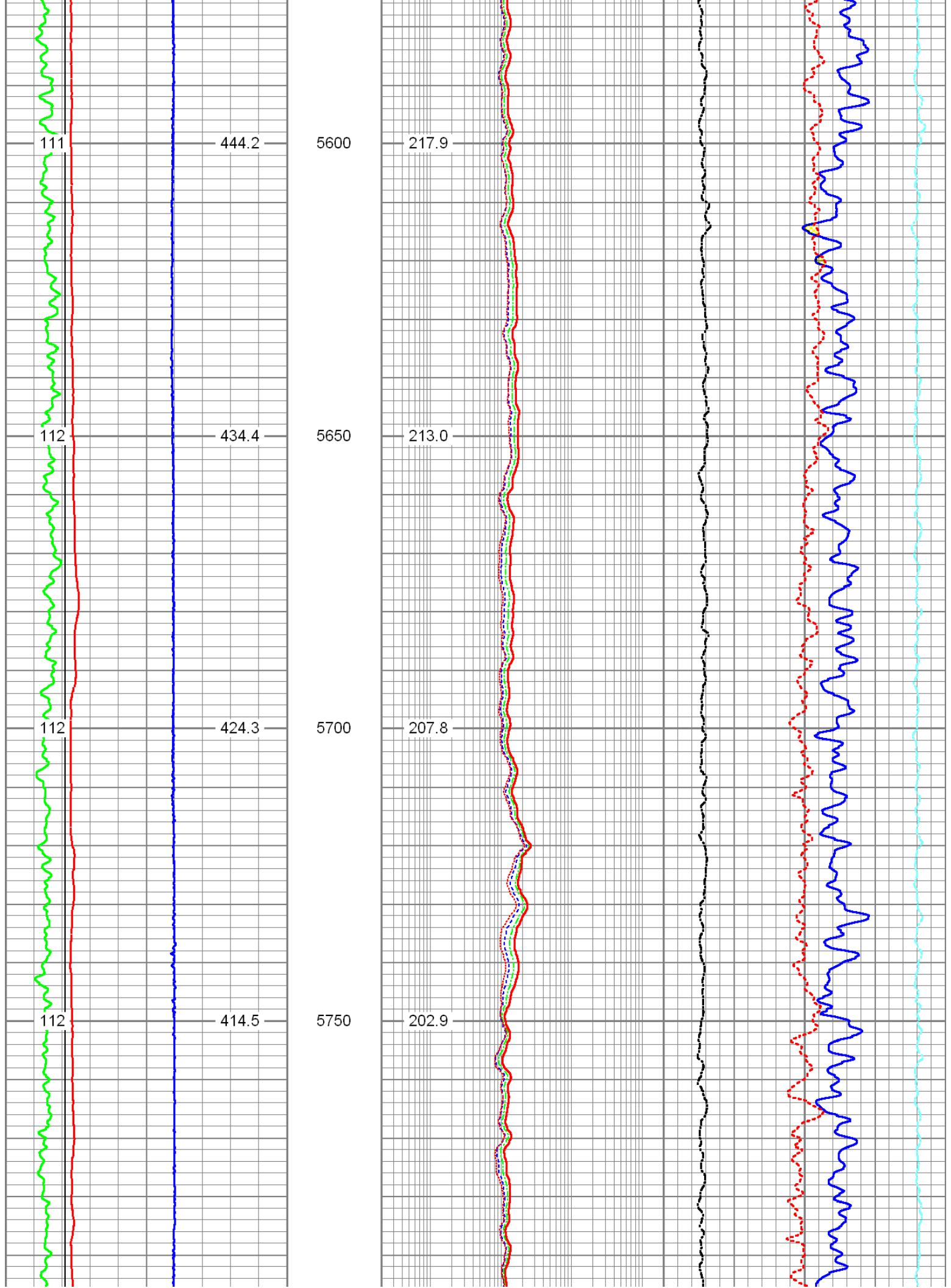
5400

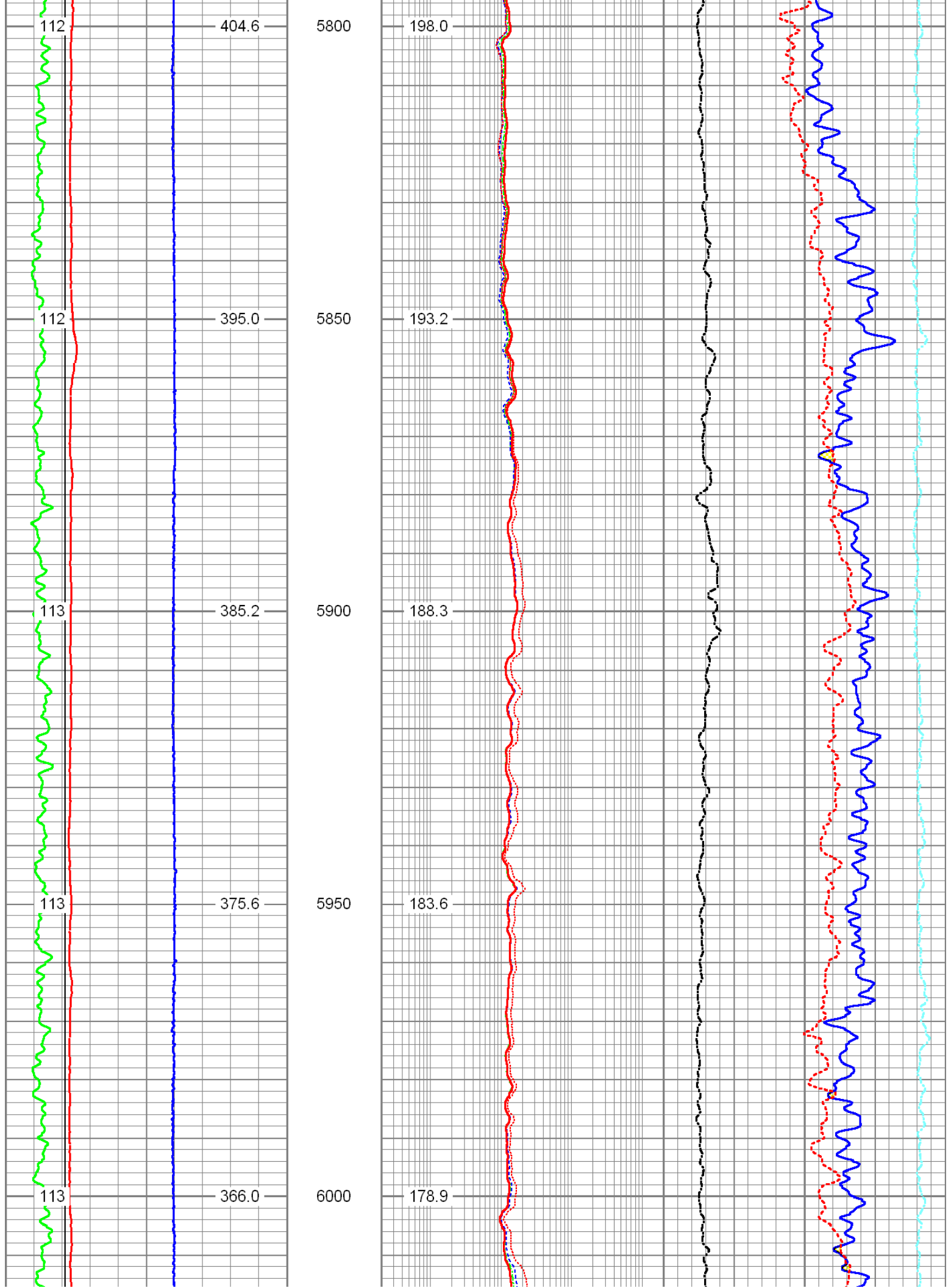
5450

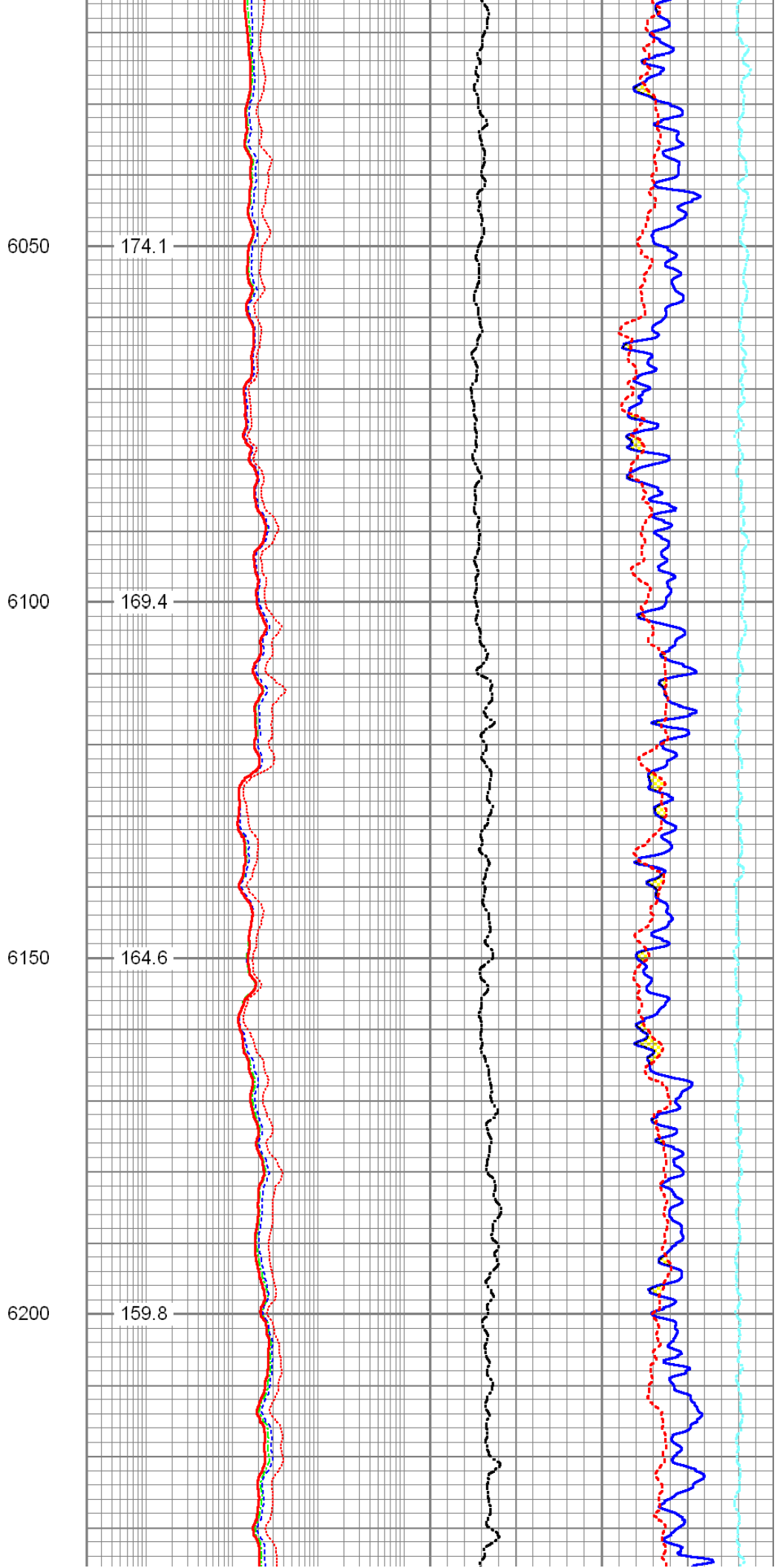
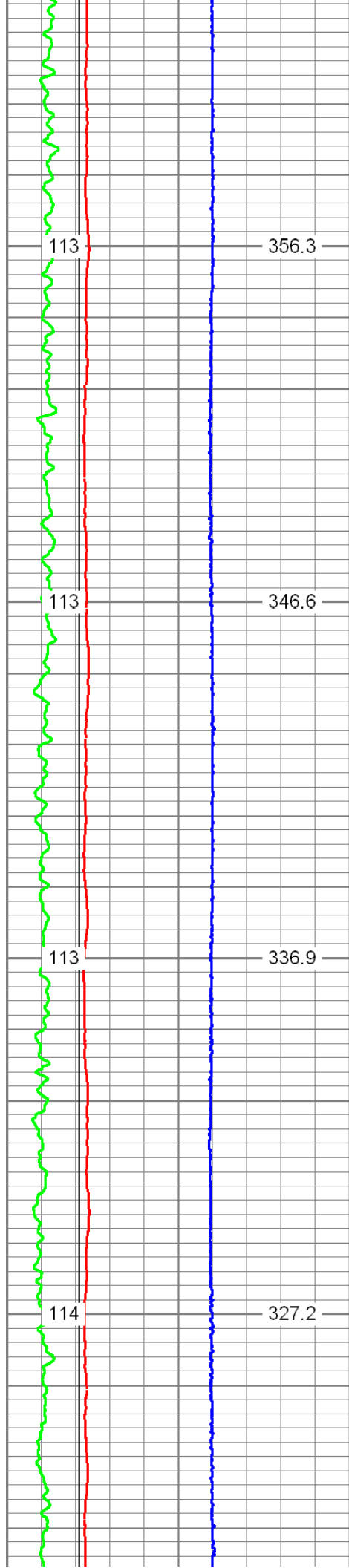
5500

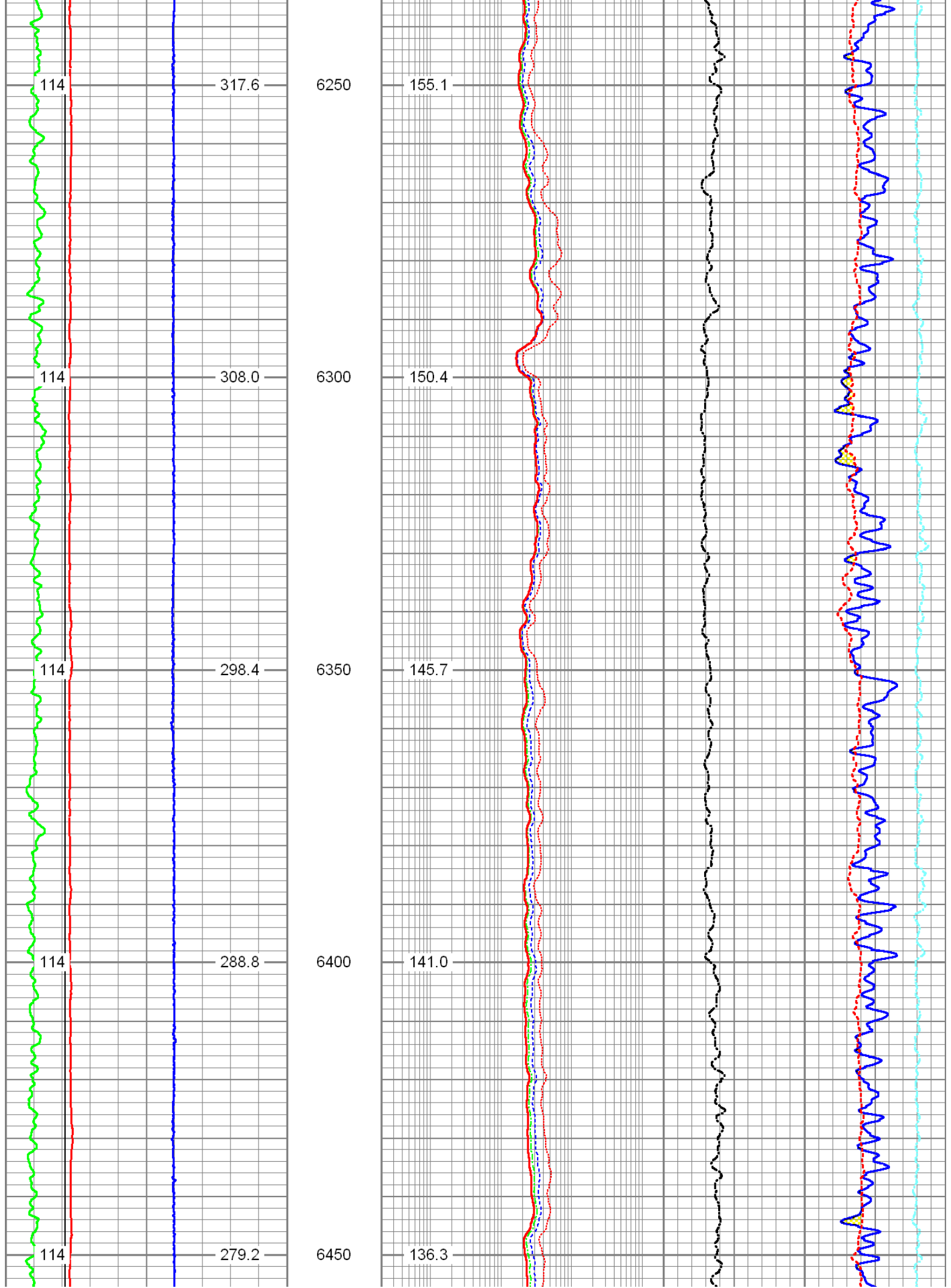
5550

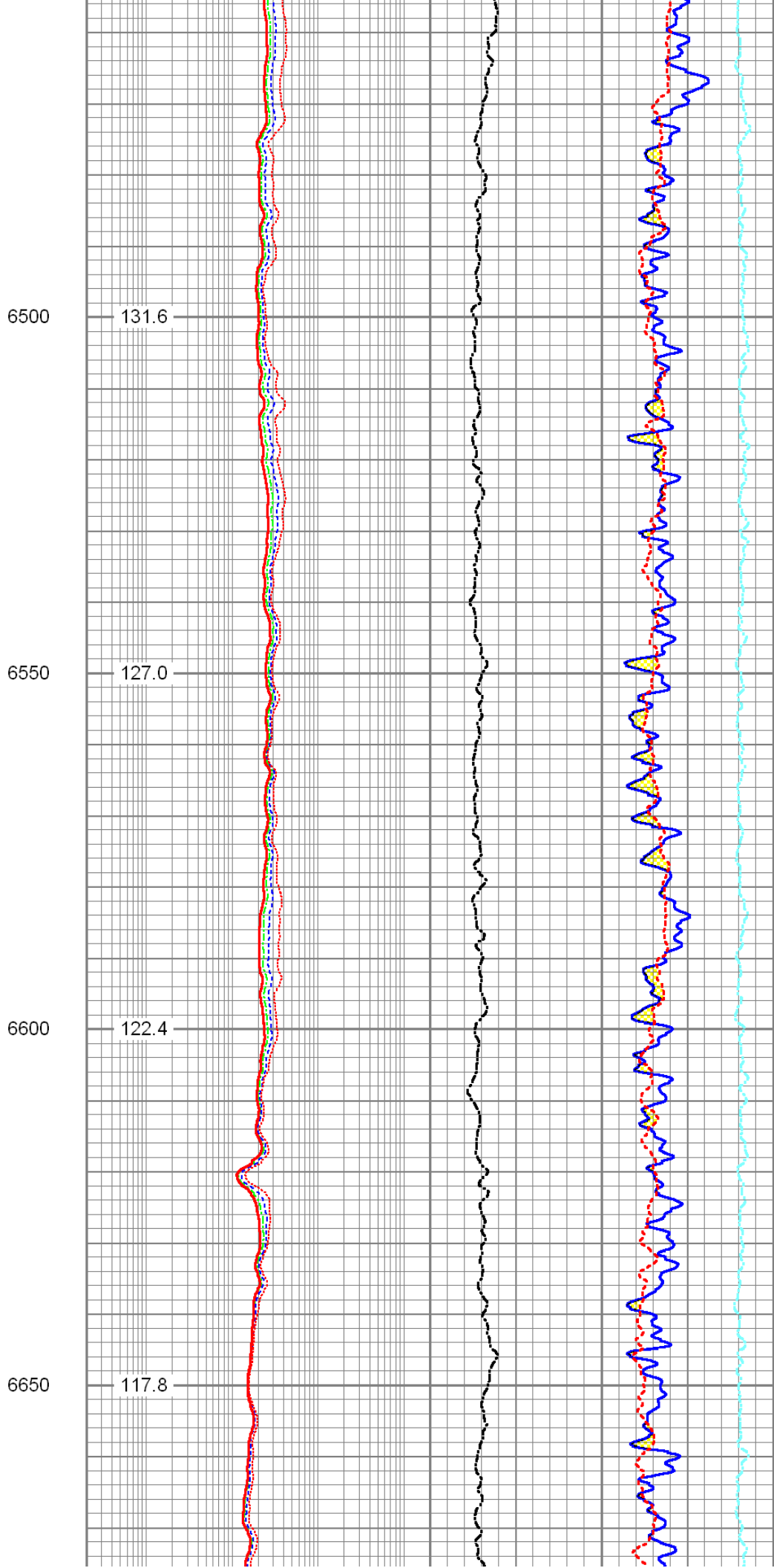
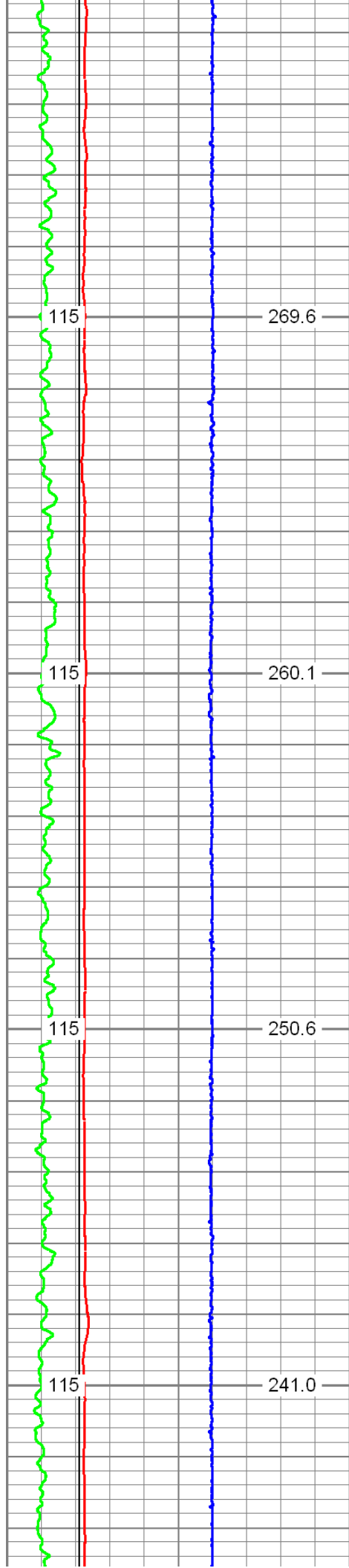


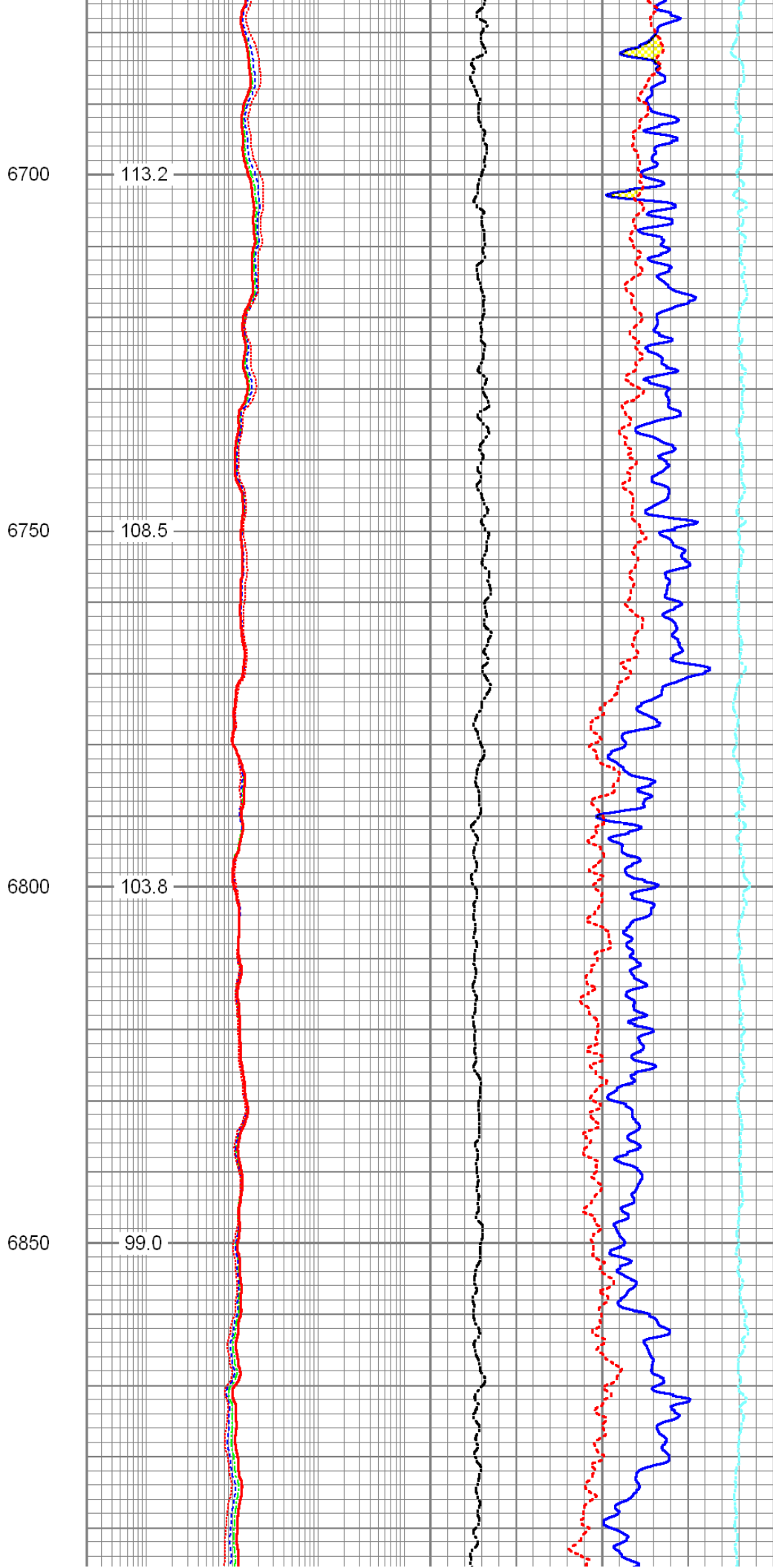
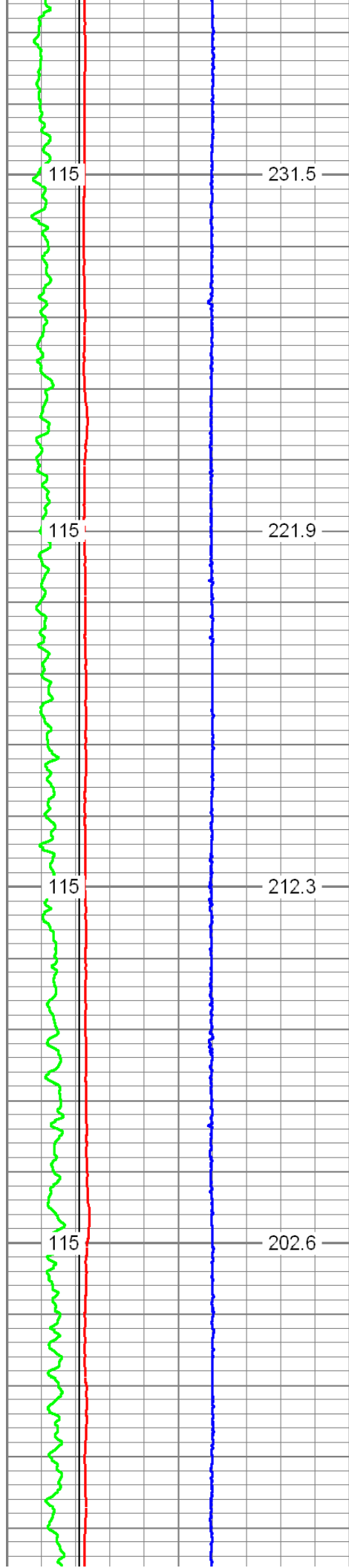


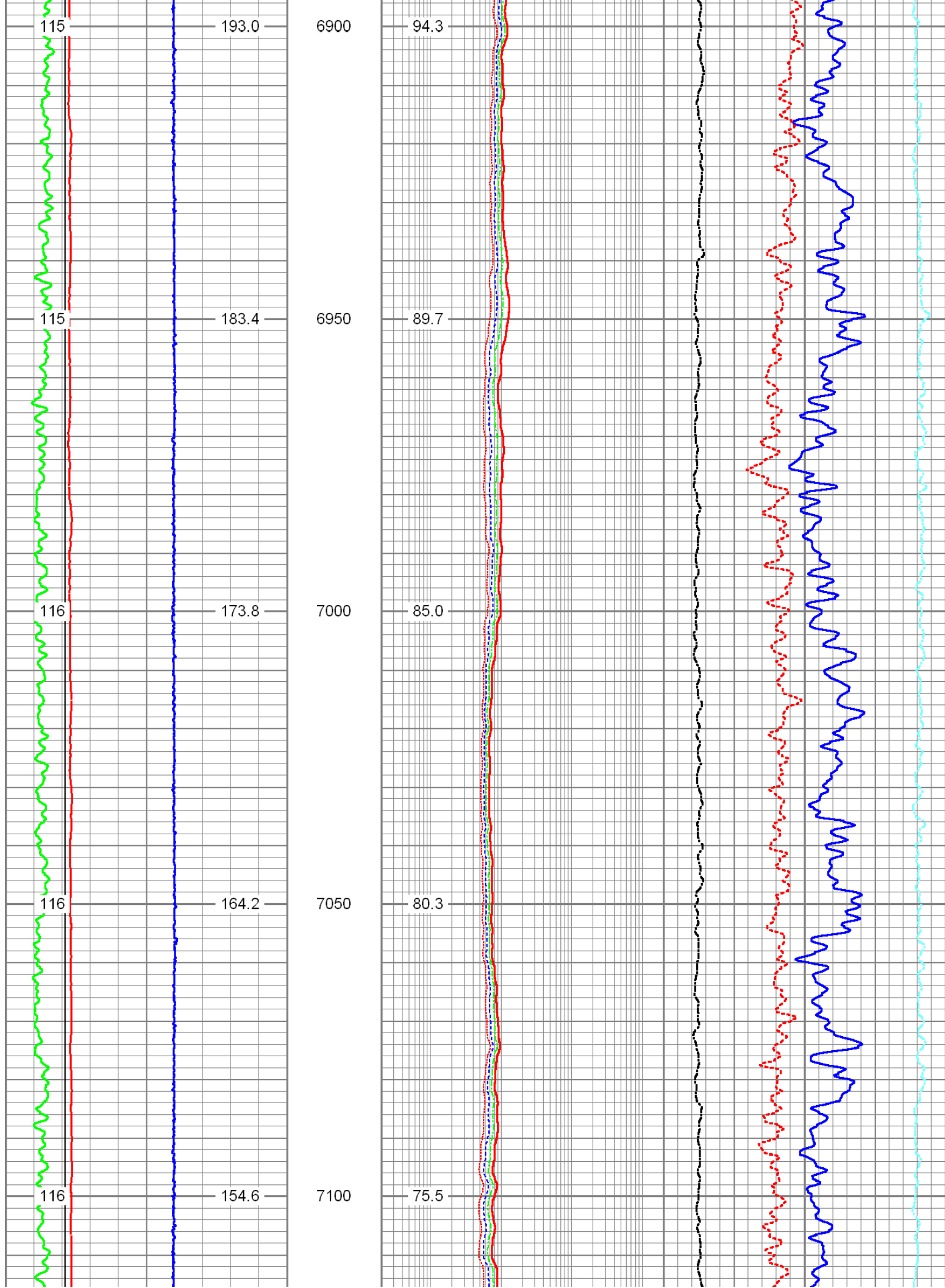


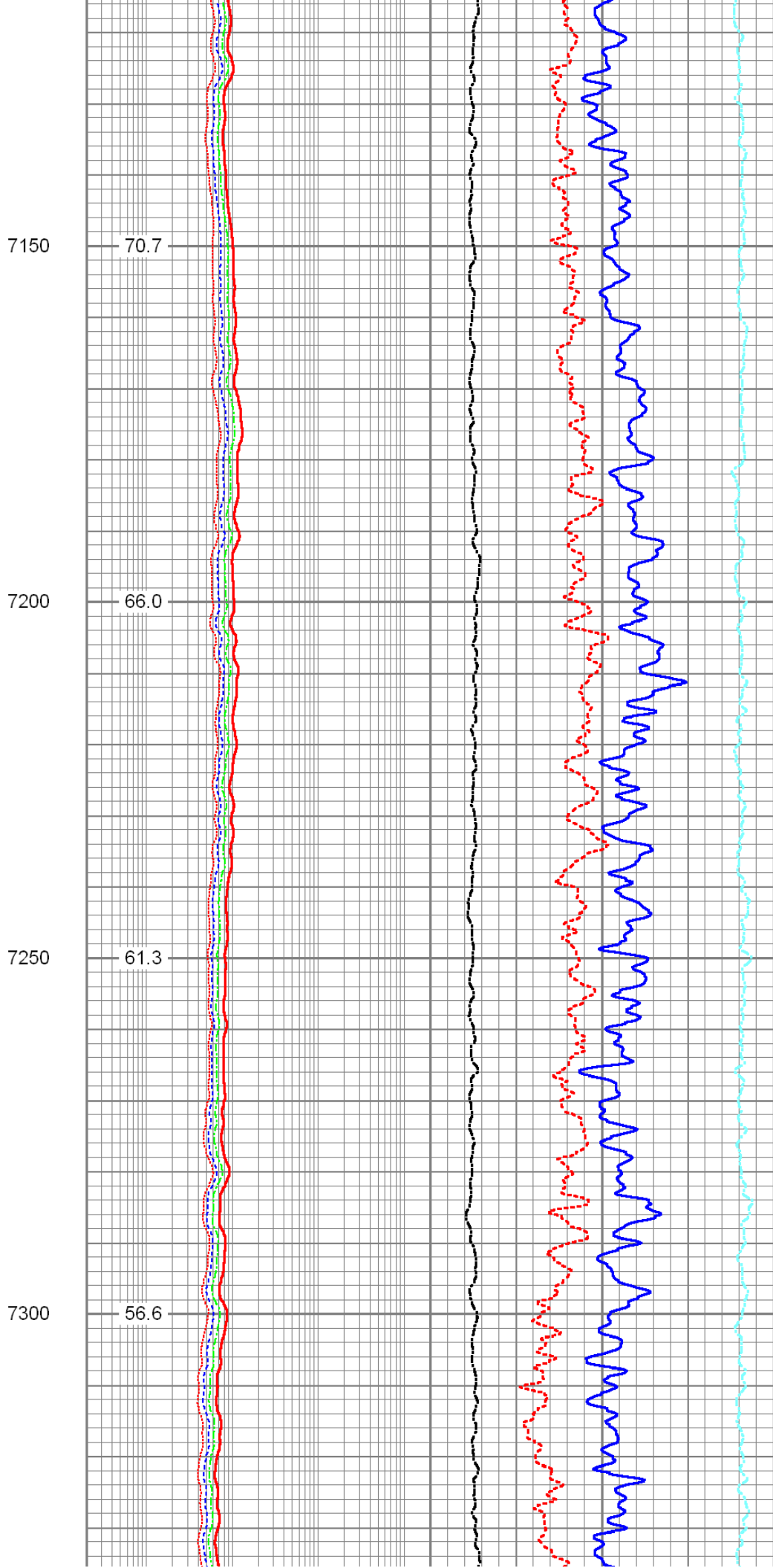
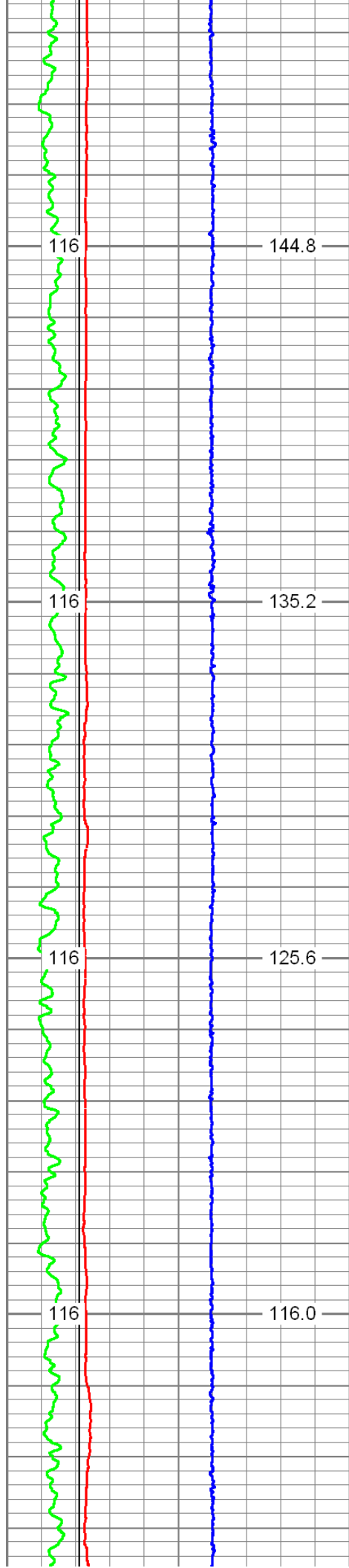


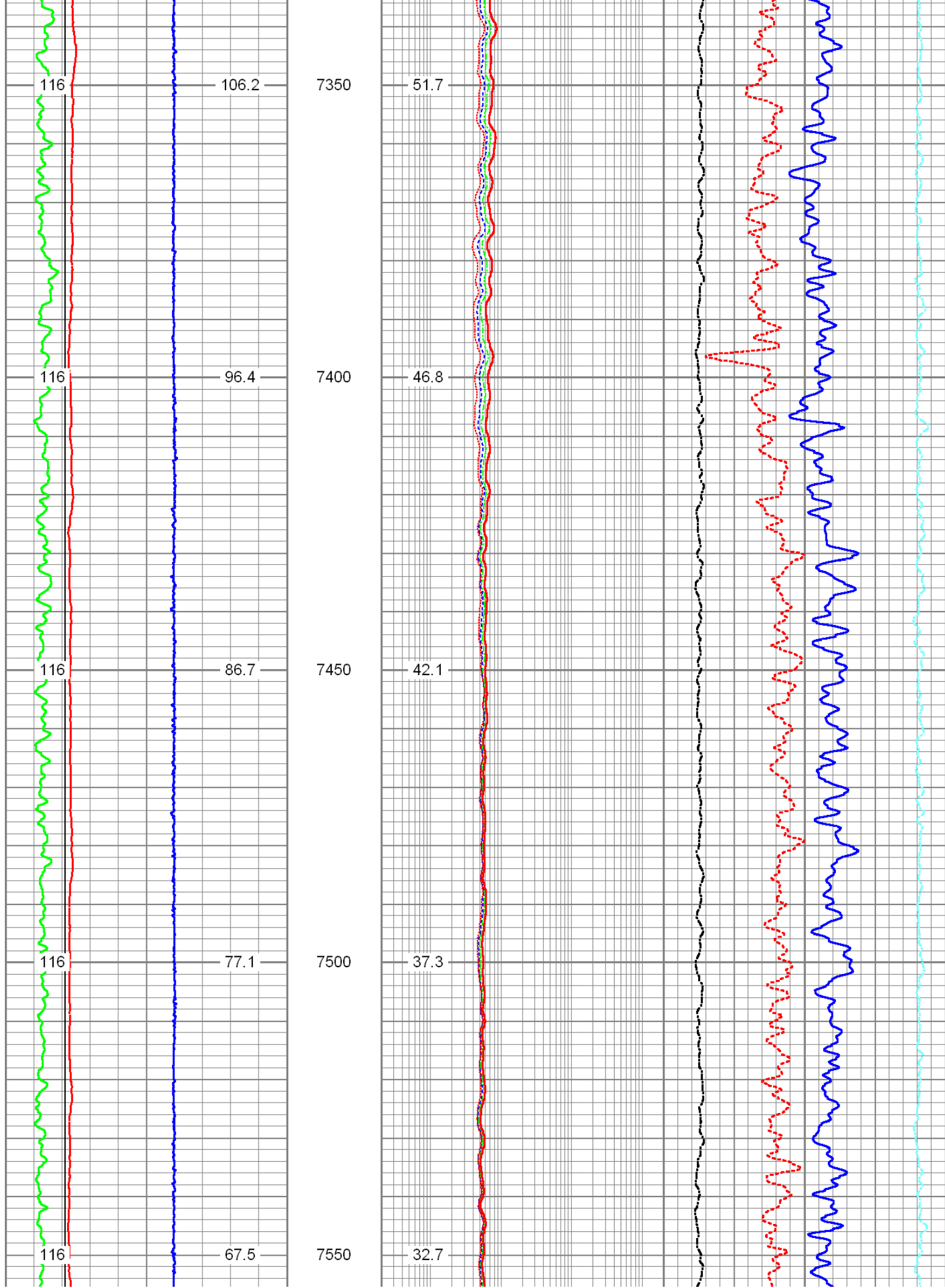


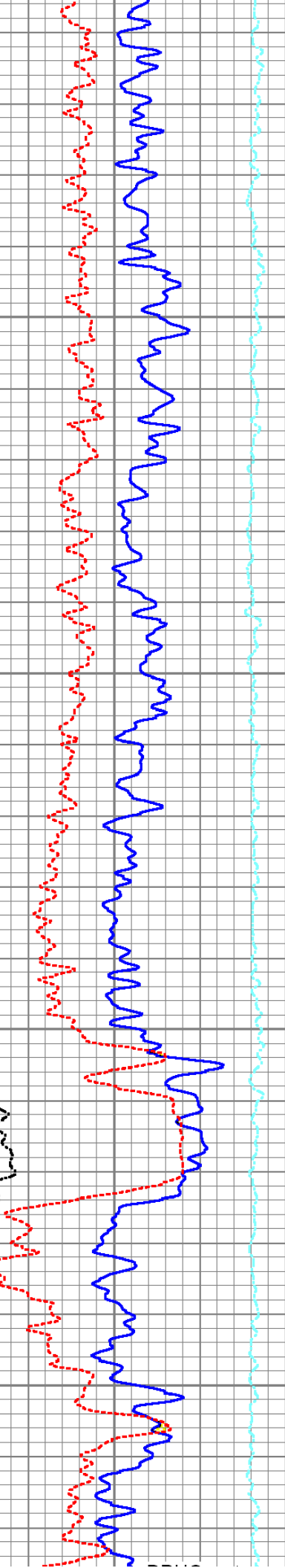
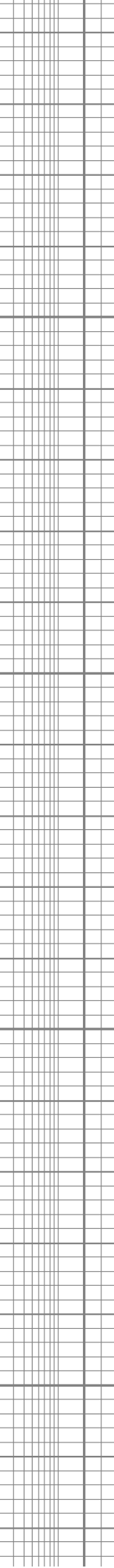
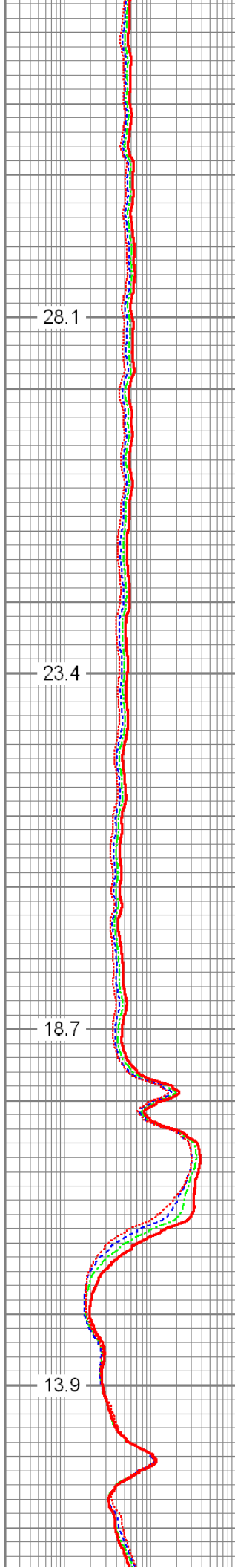
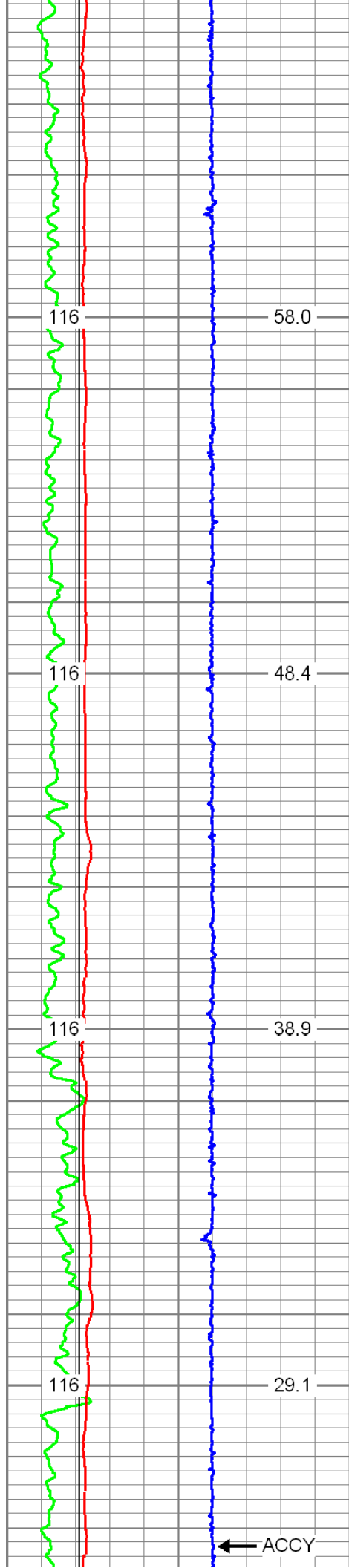


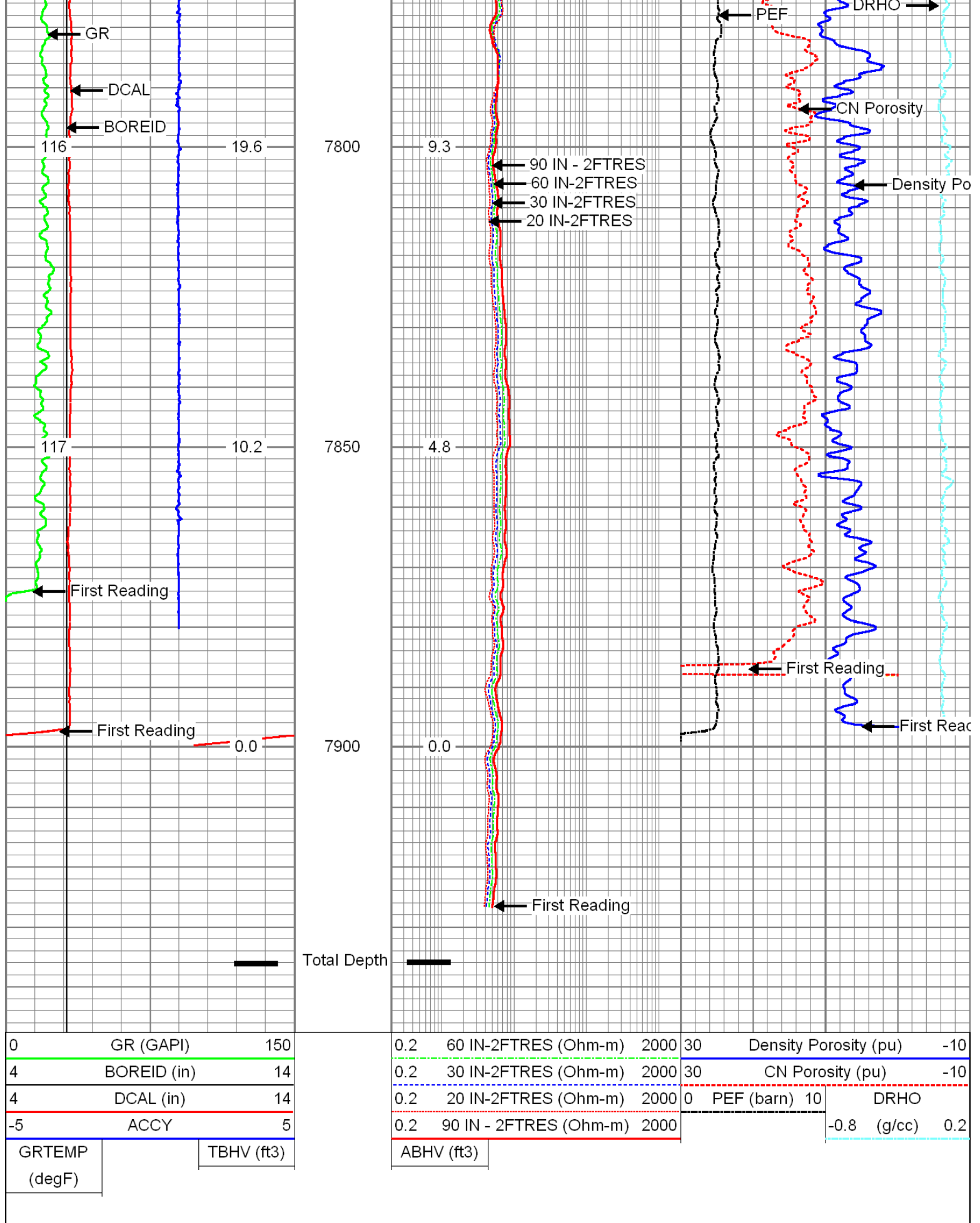










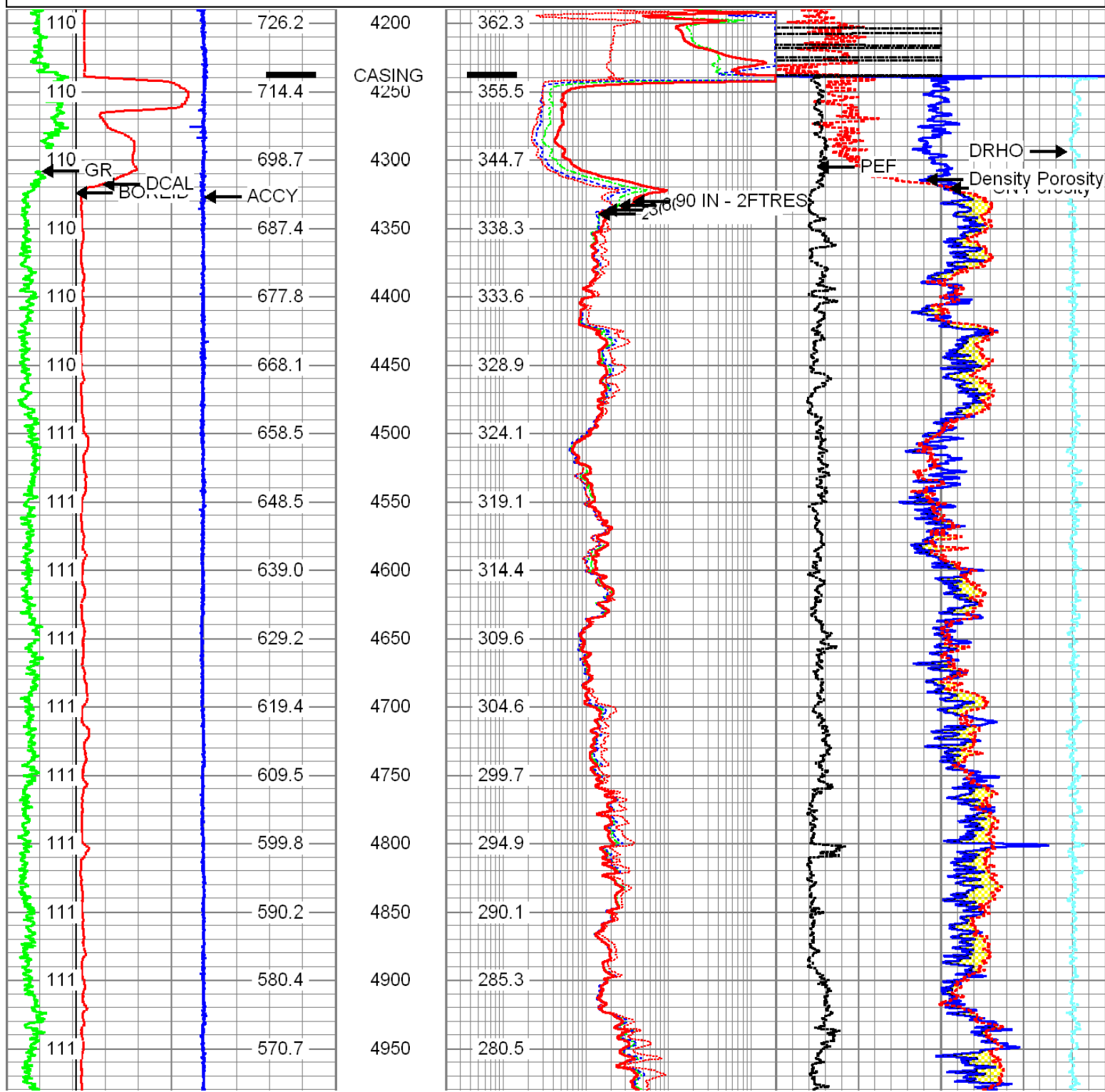


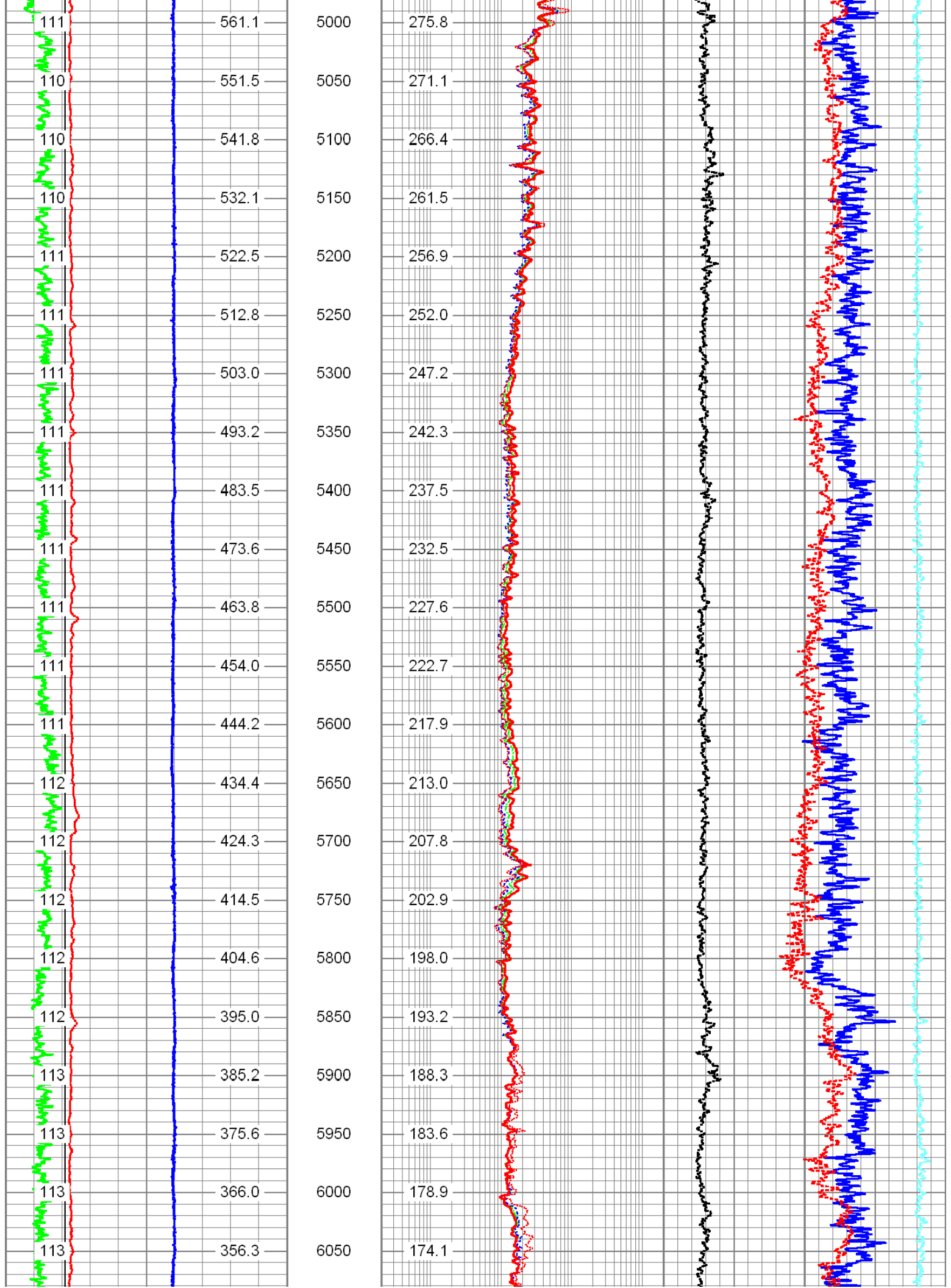
Database File: zimmerman_mem.db
Dataset Pathname: proc1/pass1.2
Presentation Format: combojoh
Dataset Creation: Wed Mar 27 07:52:41 2013
Charted by: Depth in Feet scaled 1:1200

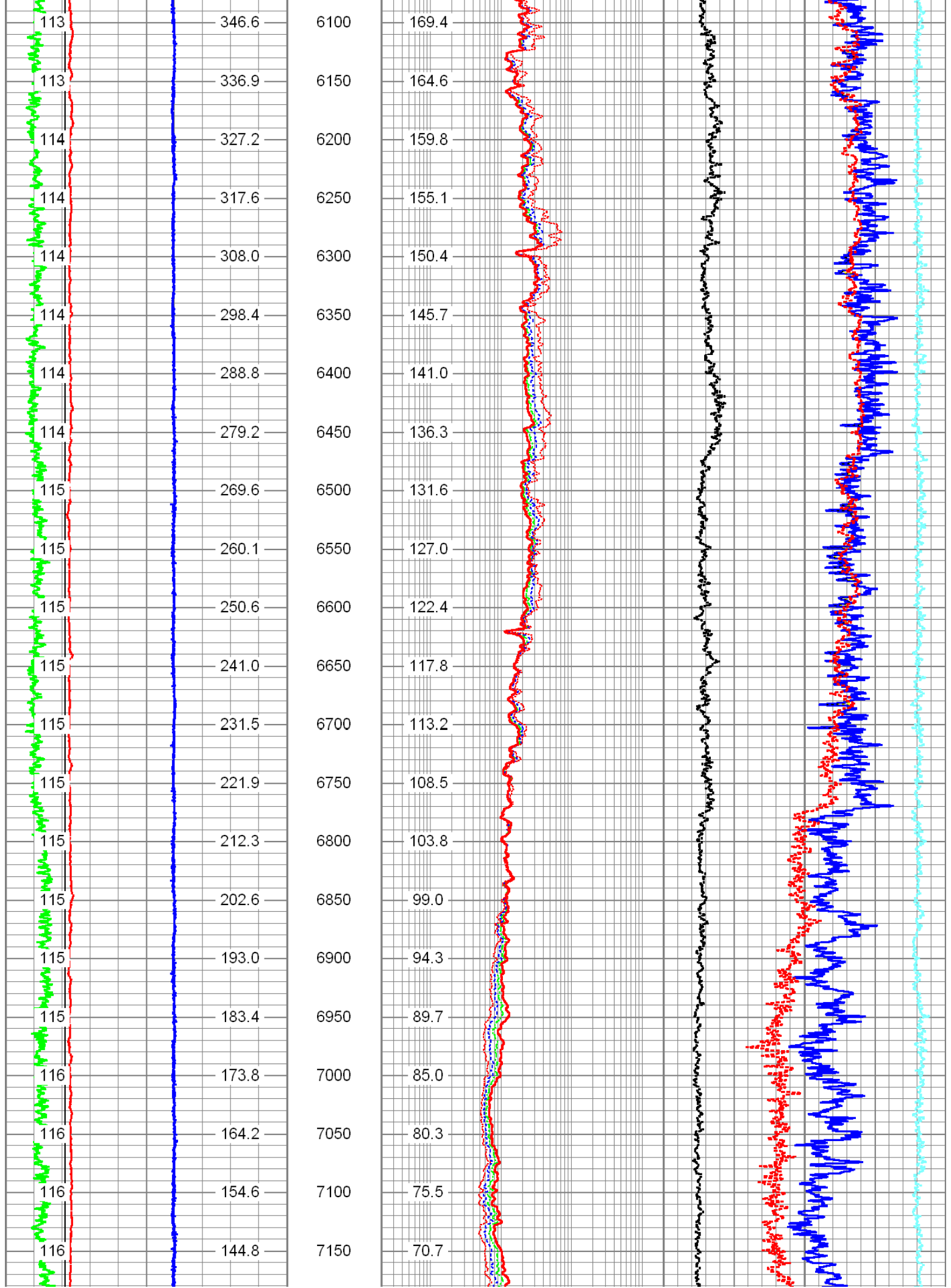
0	GR (GAPI)	150
4	BOREID (in)	14
4	DCAL (in)	14
-5	ACCY	5
GRTEMP (degF)	TBHV (ft3)	

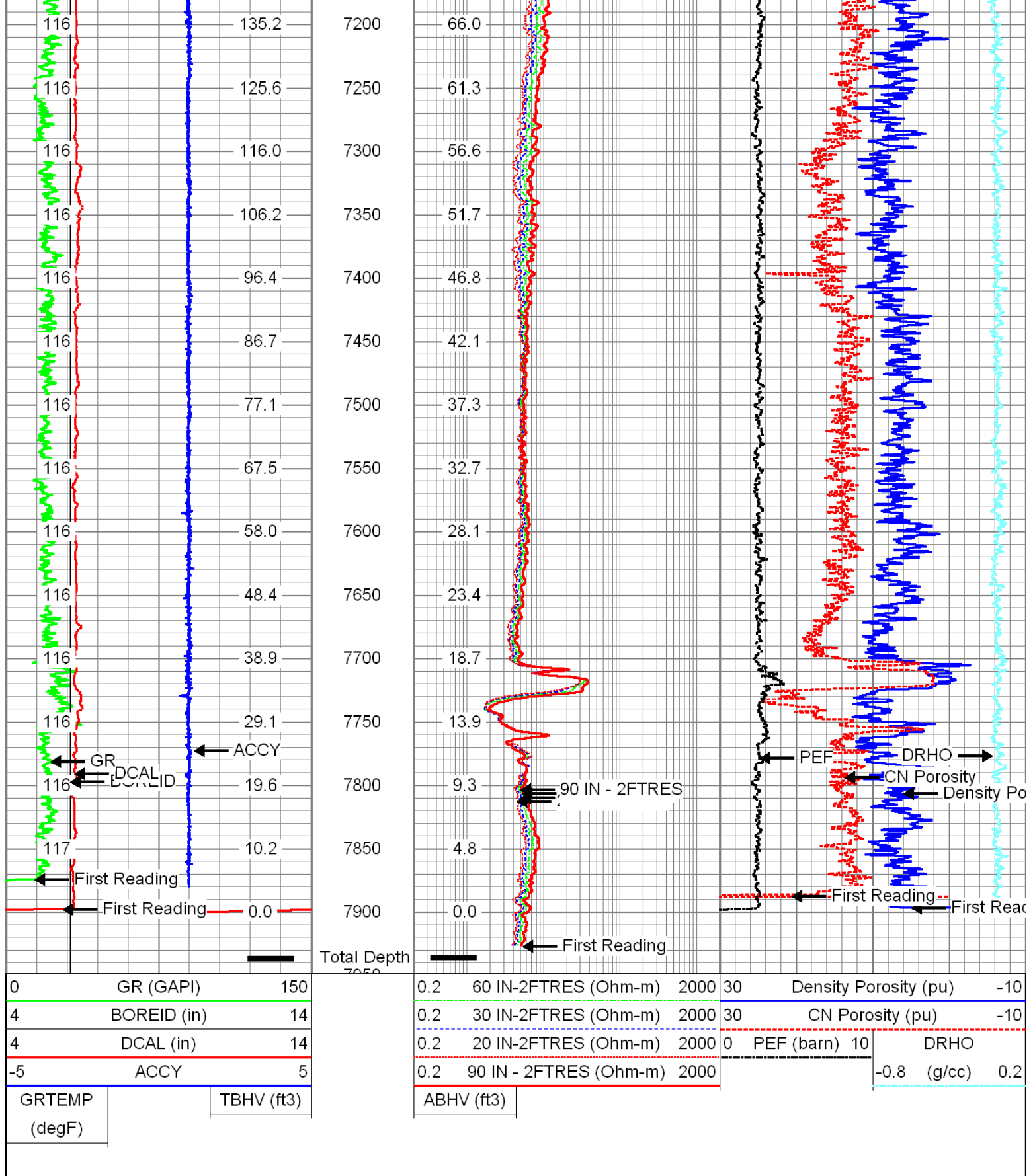
0.2	60 IN-2FTRES (Ohm-m)	2000
0.2	30 IN-2FTRES (Ohm-m)	2000
0.2	20 IN-2FTRES (Ohm-m)	2000
0.2	90 IN - 2FTRES (Ohm-m)	2000
ABHV (ft3)		

30	Density Porosity (pu)	-10
30	CN Porosity (pu)	-10
0	PEF (barn)	10
-0.8	DRHO (g/cc)	0.2









Log Variables

Database: C:\Warrior\Data\zimmerman_mem.db
Dataset: field/well/proc1/pass1.2

Top - Bottom

A	BHCOR	BHFL_TYPE	BHFLRES Ohm-m	BHFLRESSRC	BHIDSRC	BOREID in
1	On	WBM	1	MUDCELL	CURVE	6.125

BOTTEMP degF 118	CASED? No	CASEOD in 4.5	CASETHCK in 0	CEMWATERSA kppm 0	CMNTTHCK in 0	DNBHC?
DPORSEL RHOB	FLUIDDEN g/cc 1	FRMSALIN kppm 0	LATNOR Off	M 2	MATRXDEN g/cc 2.71	MUDSALIN kppm 1.9
MudWgt lb/gal 8.45	NPORSEL Limestone	PEBHC? YES	PERFS 0	RESTMPsrc INTERNAL	SO in 0.5	SRFTEMP degF 65
SZCOR On	TDEPTH ft 8060	TMPCOR On	TOOLPOS Ec-centered			

Calibration Report				
Database File:	zimmerman_mem.db			
Dataset Pathname:	proc1/pass1.2			
Dataset Creation:	Wed Mar 27 07:52:41 2013			
ThruBit Induction Calibration Report				
Tool Model-Serial Number:		ENP-ENP6R		
Shop Calibration Performed:		Mon Mar 04 11:56:53 2013		
BASELINE				
	R	Expected	X	Expected
Freq 1				
A1	-466.8740	[-500.00, -400.00]	239.5230	[-500.00, 500.00]
A2	-135.8530	[-180.00, -100.00]	265.6220	[-500.00, 500.00]
A3	-28.3581	[-50.00, -10.00]	114.3900	[-500.00, 500.00]
A4	-15.0337	[-30.00, -10.00]	269.0330	[-500.00, 500.00]
A5	-12.5936	[-30.00, -10.00]	139.5590	[-500.00, 500.00]
Freq 2				
A1	-245.4150	[-280.00, -180.00]	130.4780	[-500.00, 500.00]
A2	-86.1438	[-130.00, -50.00]	146.1510	[-500.00, 500.00]
A3	-20.7243	[-50.00, -10.00]	27.3541	[-500.00, 500.00]
A4	-18.1401	[-30.00, -10.00]	97.7529	[-500.00, 500.00]
A5	-17.4076	[-30.00, -10.00]	6.1811	[-500.00, 500.00]
Freq 3				
A1	-157.1430	[-180.00, -80.00]	30.7458	[-500.00, 500.00]
A2	-65.4037	[-130.00, -30.00]	67.4194	[-500.00, 500.00]
A3	-16.9324	[-50.00, -10.00]	-33.6495	[-500.00, 500.00]
A4	-19.8235	[-30.00, -10.00]	-13.4814	[-500.00, 500.00]
A5	-19.8567	[-30.00, -10.00]	-89.3321	[-500.00, 500.00]
Freq 4				
A1	-86.5600	[-120.00, -40.00]	-129.2740	[-500.00, 500.00]
A2	-46.8571	[-110.00, -10.00]	-39.3025	[-500.00, 500.00]
A3	-12.5235	[-50.00, -10.00]	-124.1590	[-500.00, 500.00]
A4	-21.7042	[-30.00, -10.00]	-174.9400	[-500.00, 500.00]
A5	-23.4259	[-30.00, -10.00]	-245.4910	[-500.00, 500.00]
CALIBRATION COEFFICIENTS				
	R	Expected	X	Expected

Freq 1				
A1	0.9851	[0.95, 1.05]	-0.0013	[-0.05, 0.05]
A2	0.9908	[0.95, 1.05]	0.0011	[-0.05, 0.05]
A3	0.9925	[0.95, 1.05]	-0.0053	[-0.05, 0.05]
A4	0.9856	[0.95, 1.05]	0.0051	[-0.05, 0.05]
A5	0.9934	[0.95, 1.05]	0.0009	[-0.05, 0.05]
Freq 2				
A1	0.9797	[0.95, 1.05]	-0.0089	[-0.05, 0.05]
A2	0.9851	[0.95, 1.05]	-0.0067	[-0.05, 0.05]
A3	0.9810	[0.95, 1.05]	-0.0062	[-0.05, 0.05]
A4	0.9815	[0.95, 1.05]	-0.0030	[-0.05, 0.05]
A5	0.9907	[0.95, 1.05]	-0.0081	[-0.05, 0.05]
Freq 3				
A1	0.9882	[0.95, 1.05]	-0.0052	[-0.05, 0.05]
A2	0.9942	[0.95, 1.05]	-0.0032	[-0.05, 0.05]
A3	0.9898	[0.95, 1.05]	-0.0032	[-0.05, 0.05]
A4	0.9903	[0.95, 1.05]	-0.0001	[-0.05, 0.05]
A5	1.0020	[0.95, 1.05]	-0.0053	[-0.05, 0.05]
Freq 4				
A1	0.9912	[0.95, 1.05]	0.0098	[-0.05, 0.05]
A2	0.9966	[0.95, 1.05]	0.0113	[-0.05, 0.05]
A3	0.9947	[0.95, 1.05]	0.0089	[-0.05, 0.05]
A4	0.9958	[0.95, 1.05]	0.0142	[-0.05, 0.05]
A5	1.0164	[0.95, 1.05]	0.0060	[-0.05, 0.05]
Temperature	18.0758 degC			

ThruBit Density Calibration Report	
Tool Model-Serial Number:	PS-PS03D
Source Number:	
Shop Calibration Performed:	Mon Mar 04 13:00:55 2013

REFERENCE			
	Density	Units	
Aluminium	2.607	g/cc	
Magnesium	1.752	g/cc	
READINGS			
Outputs	Counts	Units	Expected
SS1 Background	143.09	cps	[130.00, 170.00]
LS1 Background	153.61	cps	[130.00, 170.00]
LS4 Background	32.45	cps	[27.00, 35.00]
SS1 Aluminium	4684.00	cps	[4500.00, 5500.00]
LS1 Aluminium	841.57	cps	[750.00, 950.00]
LS4 Aluminium	925.10	cps	[843.00, 1068.00]
SS1 Magnesium	7767.46	cps	[7000.00, 9000.00]
LS1 Magnesium	5376.19	cps	[5250.00, 6250.00]
LS1 Al + Fe	728.26	cps	[650.00, 800.00]
LS4 Al + Fe	420.41	cps	[382.00, 471.00]
RESULTS			
SS Slope	1.65		[1.52, 1.77]
LS Slope	0.42		[0.38, 0.45]
PEF K Factor	4.979		[3.510, 6.170]
PEF B Factor	-0.531		[-0.700, -0.410]

Caliper Shop Calibration performed: Mon Mar 04 13:00:55 2013

RESULTS

Reference	Reading	Units
12.00	1958.49	in
9.00	2127.79	in
6.00	2292.60	in

DENSITY PRE-SURVEY CHECK Performed: Fri Mar 22 07:45:02 2013

Outputs	Counts	Units	Expected
SS1 Background	142.80	cps	[138.80, 147.38]
LS1 Background	152.76	cps	[149.00, 158.21]
LS4 Background	31.26	cps	[30.50, 34.39]

CALIPER PRE-SURVEY CHECK Performed: Fri Mar 22 07:36:54 2013

Reference	Readings	Units	Expected
9.00	9.16	in	[8.80, 9.20]

Compensated Neutron Calibration Report

Tool Model-Serial Number:	PS-PS06N
Source Number:	
Calibration Tank Temperature:	60.9 degF
Shop Calibration Performed:	Mon Mar 04 14:31:08 2013

BACKGROUND MEASUREMENT

Outputs	Measured	Units	Expected
SS Counts	0.8	cps	<10
LS Counts	0.1	cps	<4

WATER TANK REFERENCE

Outputs	Measured	Units	Expected
SS Counts	763.6	cps	
LS Counts	26.3	cps	
Tank Ratio Ref	30.9580	SS/LS	
Tank Ratio	29.0274	SS/LS	
Tank Ratio Gain	1.0665		[0.85, 1.15]

ALUMINUM SLEEVE REFERENCE

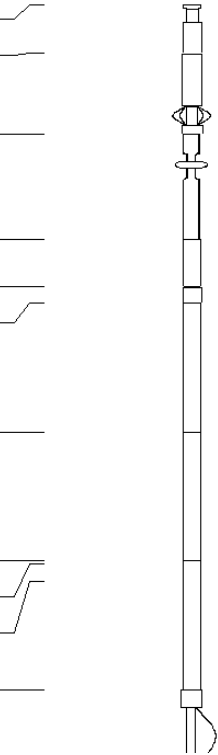
Outputs	Measured	Units	Expected
SS Counts	8438.0	cps	
LS Counts	825.4	cps	
Al Ratio Ref	10.797	SS/LS	

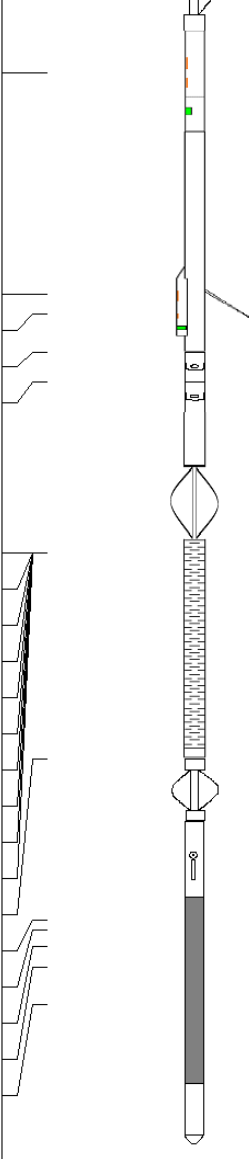
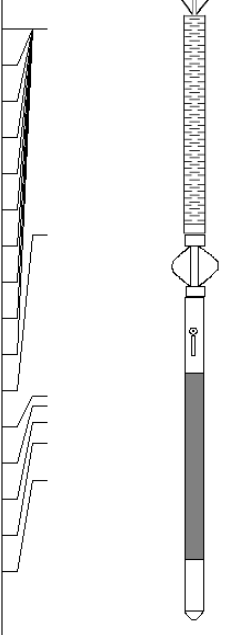
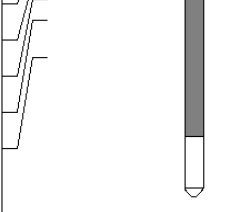
AI Ratio	10.903	SS/LS	
AI Ratio Gain	0.99		[0.90, 1.10]
Sleeve Porosity	14.46	pu	

PRE-SURVEY BACKGROUND CHECK Performed: Fri Mar 22 07:42:30 2013			
Outputs	Measured	Units	Expected
SS Counts	0.0	cps	<10
LS Counts	0.1	cps	<4

Gamma Ray Calibration Report			
Tool Model-Serial Number:	PS-PS35T		
Performed:	Wed Mar 06 08:25:20 2013		
Calibrator Value:	170.8	GAPI	
Background Reading:	54.7	cps	
Calibrator Reading:	437.3	cps	
Sensitivity:	0.3754	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	89.84		Cablehead-S	2.31	2.13	5.00
Thrubit	87.53		Solid Weakpoint			
			PSBDOT	3.87	2.25	35.00
Thrubit	83.66		HangOff_Tool	5.00	2.38	60.00
Thrubit	78.66		Swivel	2.25	2.06	25.00
Thrubit	76.41		10-1	0.75	2.13	3.95
TBBAT	75.66		TBBAT-A (PS07B) Thrubit Battery	6.13	2.13	38.20
TBBAT2	69.54		TBBAT2-A (PS40B) Thrubit Battery	6.13	2.13	40.00
TMG	63.41		TMG-PS (PS35T)	6.13	2.13	45.00
GR	63.29		ThruBit Telemetry Gamma Ray			
GRTEMP	62.45					
Thrubit	57.29		Decentralizer	4.50	2.13	70.00

CNLSC	50.85		Decentralizer (Small)			
			TBN-PS (PS06N) ThruBit Neutron	4.77	2.13	63.00
			TBD-PS (PS03D) ThruBit Density	10.48	2.13	91.00
LSW1	40.29					
DCAL	39.38					
Thrubit	37.54		Knuckle	1.42	2.13	11.50
Thrubit	36.13		Knuckle	1.42	2.13	11.50
DT	28.04					
TT	28.04					
RmbPk	28.04		TBS-A (TBS08) ThruBit Sonic -- Initial Support	16.46	2.13	75.00
WVF1	28.04					
WVF2	28.04					
WVF3	28.04					
WVF4	28.04					
WVF5	28.04		Sonic Centralizer	2.96	2.13	22.60
WVF6	28.04					
WVF7	28.04					
Thrubit	18.25					
A1_P	10.60					
A2_P	10.10		TBI-ENP (ENP6R) ThruBit Induction	15.29	2.13	94.00
A3_P	9.35					
A4_P	8.35					
A5_P	6.60					
Dataset: zimmerman_mem.db: field/well/proc1/pass1.2 Total Length: 89.84 ft Total Weight: 690.75 lb O.D. 2.38 in						



ThruBit
A Schlumberger Company

Company	SOURCE ENERGY MIDCON LLC
Well	T & C ZIMMERMAN 34-14-34-11H
Field	WILDCAT
County	SUMNER
State	KANSAS