

Company: Caerus Piceance LLC

Well: Puckett 13C-1

Field: Wildcat

County: Garfield State: Colorado

Reservoir Saturation Tool

Sigma

County:	Garfield		
Field:	Wildcat		
Location:	SHL: S2, T7S, R97W		
Well:	Puckett 13C-1		
Company:	Caerus Piceance LLC		
Location:	SHL: S2, T7S, R97W	Elev.:	K.B. 8509.00 ft
	2233' FNL & 634' FEL		G.L. 8479.00 ft
	LAT: 39.475658 / LONG: -108.180247		D.F. 8509.00 ft
	Permanent Datum:	Ground Level	Elev.: 8479.00 f
Log Measured From:		Kelly Bushing	30.00 ft above Perm.Datum
Drilling Measured From:		Kelly Bushing	
API Serial No.	Section:	Township:	Range:
05-045-22628	2	7S	97W

Logging Date	22-Jul-2015		
Run Number	ONE		
Depth Driller	9110.00 ft		
Schlumberger Depth	9110.00 ft		
Bottom Log Interval	9041.00 ft		
Top Log Interval	2500.00 ft		
Casing Fluid Type	3% KCl		
Salinity			
Density	9.1 lbm/gal		
Fluid Level	0.00 ft		
BIT/CASING/TUBING STRING			
Bit Size	8.75 in		
From	2488.00 ft		
To	9110.00 ft		
Casing/Tubing Size	4.5 in		
Weight	11.6 lbm/ft		
Grade	P110		
From	0.00 ft		
To	9105.00 ft		
Max Recorded Temperatures	235 degF		
Logger on Bottom	22-Jul-2015	03:30:00	
Unit Number	Location:	Time	
Recorded By	Benjamin Mammon	Fort Morgan, CO.	
Witnessed By	Natalie Naeve		

Disclaimer

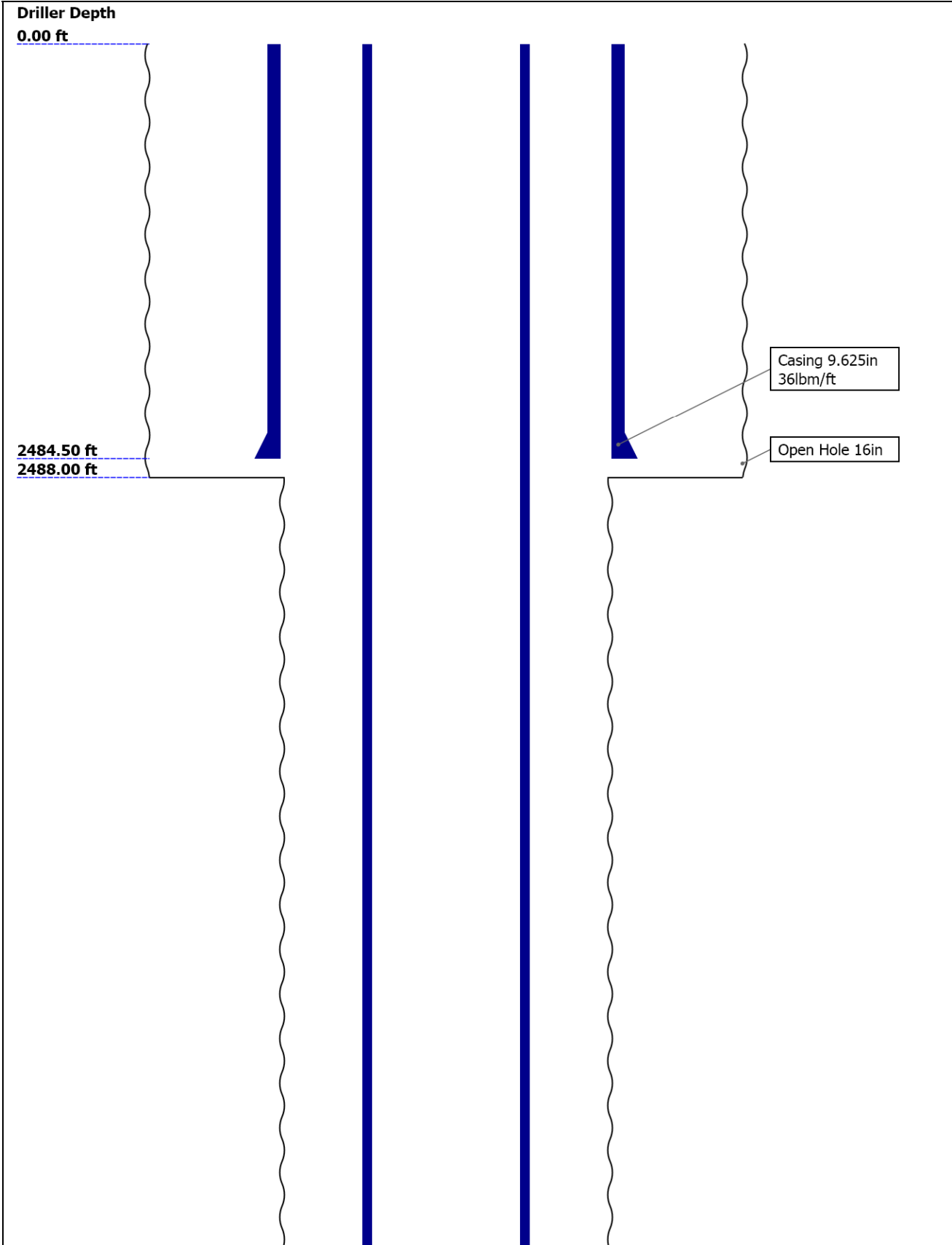
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE 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.

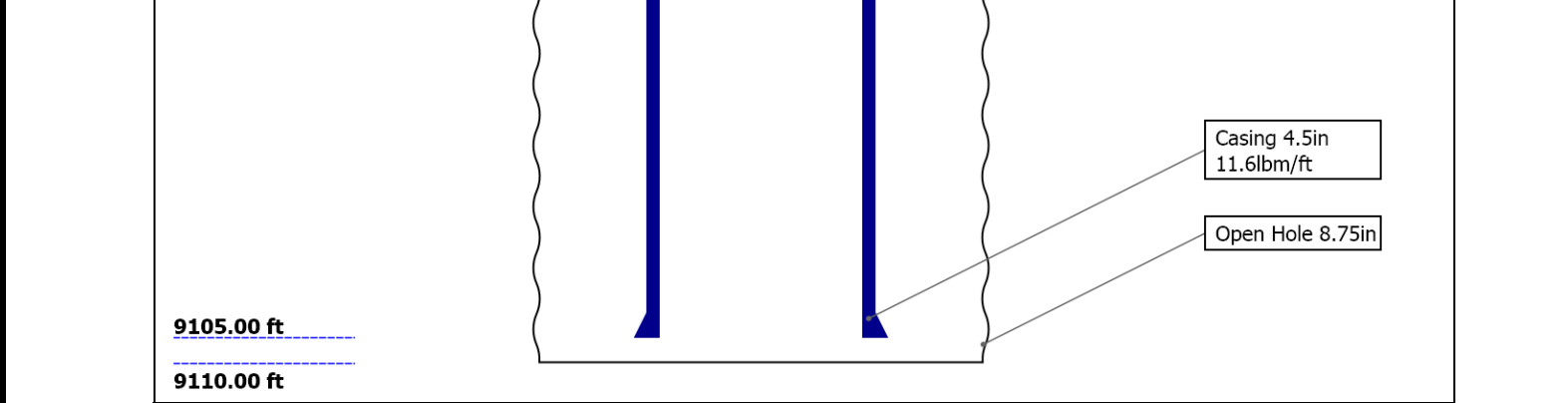
Contents

- 1. Header
- 2. Disclaimer
- 3. Contents
- 4. Well Sketch
- 5. Borehole Size/Casing/Tubing Record
- 6. Operational Run Summary
- 7. Remarks and Equipment Summary
- 8. Depth Summary
- 9. ONE
 - 9.1 Integration Summary
 - 9.2 Software Version
 - 9.3 Composite Summary
 - 9.4 Log (RST SIGMA Answer)
 - 9.5 Parameter Listing
- 10. ONE
 - 10.1 Composite Summary
 - 10.2 Log (RST SIGMA Answer RA)

- 11. Calibration Report
- 12. Tail

Well Sketch





Borehole Size/Casing/Tubing Record

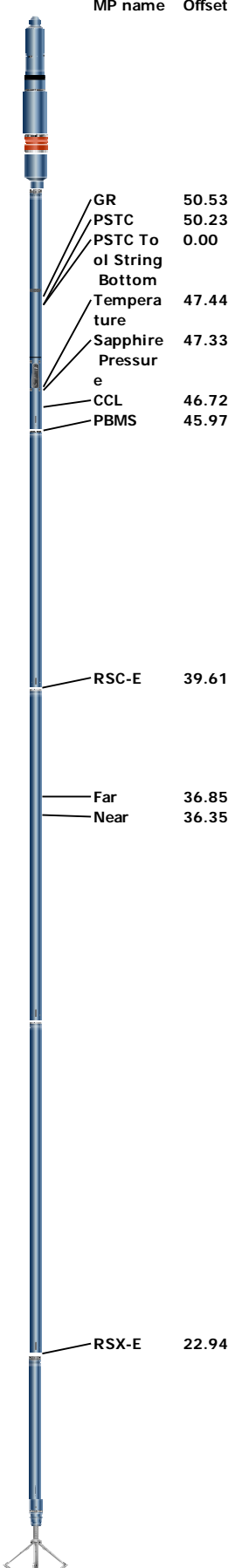
Bit						
Bit Size (in)	16	8.75				
Top Driller (ft)	0	2488				
Top Logger (ft)	0	2488				
Bottom Driller (ft)	2488	9110				
Bottom Logger (ft)	2488	9110				
Casing						
Size (in)	9.625	4.5				
Weight (lbm/ft)	36	11.6				
Inner Diameter (in)	8.921	4				
Grade	J55	P110				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	2484.5	9105				
Bottom Logger (ft)	2484.5	9105				

Operational Run Summary

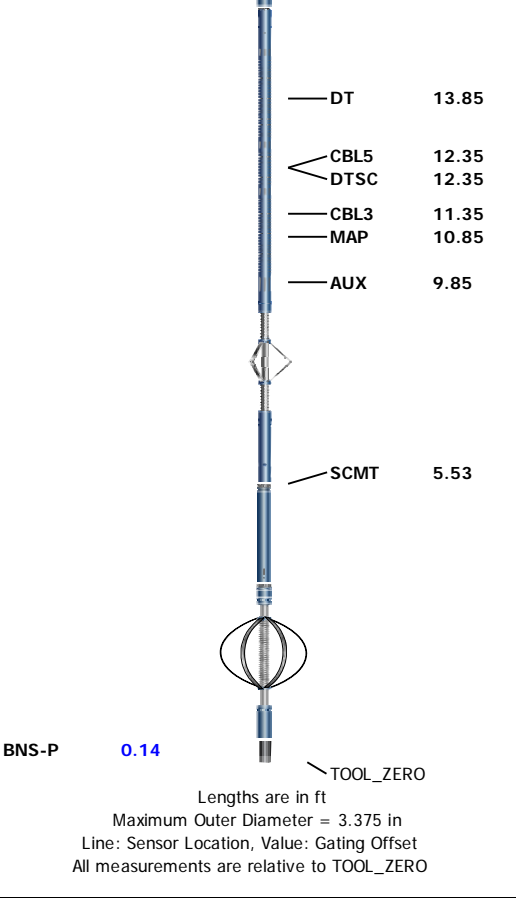
Parameter (unit)	ONE					
Date Log Started	22-Jul-2015					
Time Log Started	02:14:09					
Date Log Finished						
Time Log Finished						
Top Log Interval (ft)						
Bottom Log Interval (ft)						
Total Depth (ft)	9059.00					
Max Hole Deviation (deg)						
Azimuth of Max Deviation (deg)						
Bit Size (in)	8.750					
Logging Unit Number	9115					
Logging Unit Location	Fort Morgan, CO.					
Recorded By	Benjamin Marmon					

Witnessed By	Natalie Naeve					
Service Order Number	D5ND-00068					

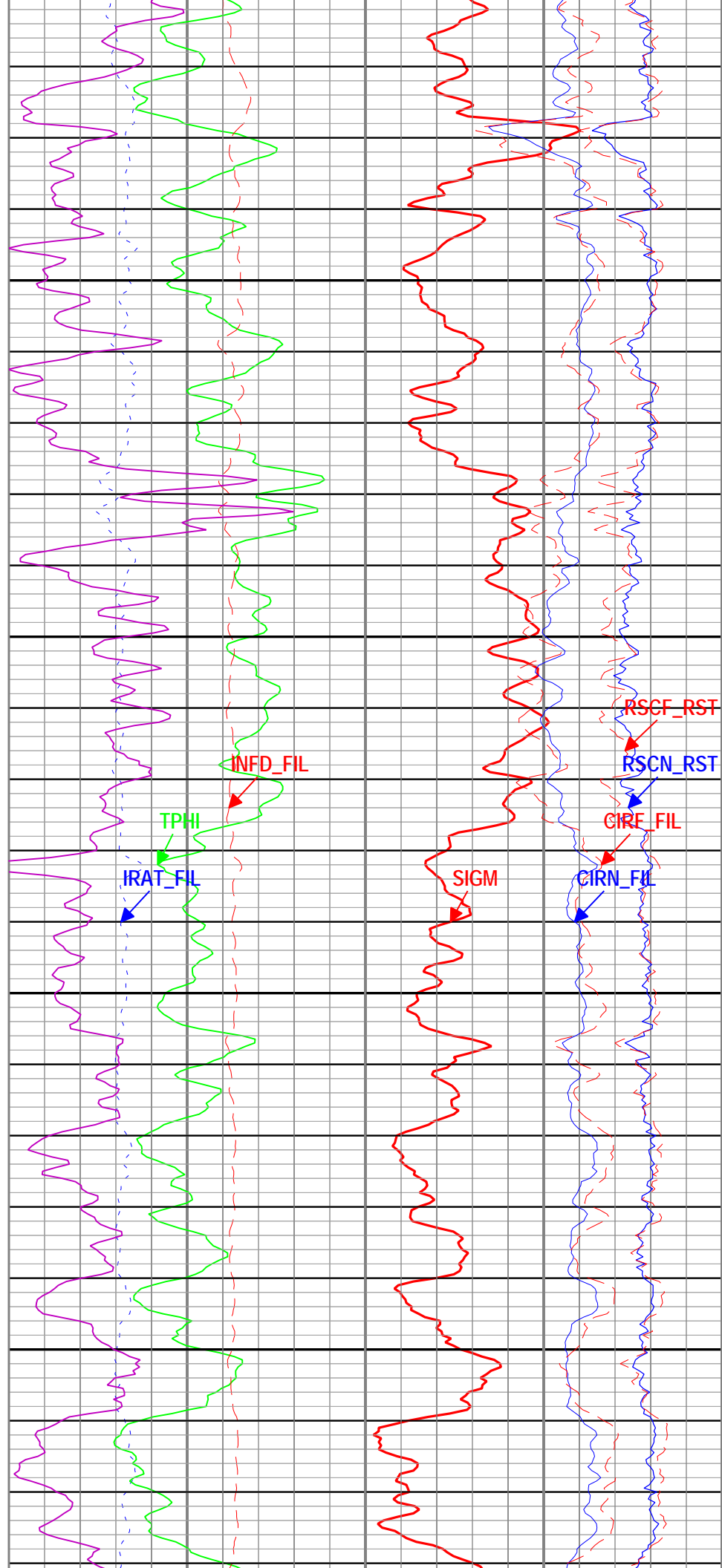
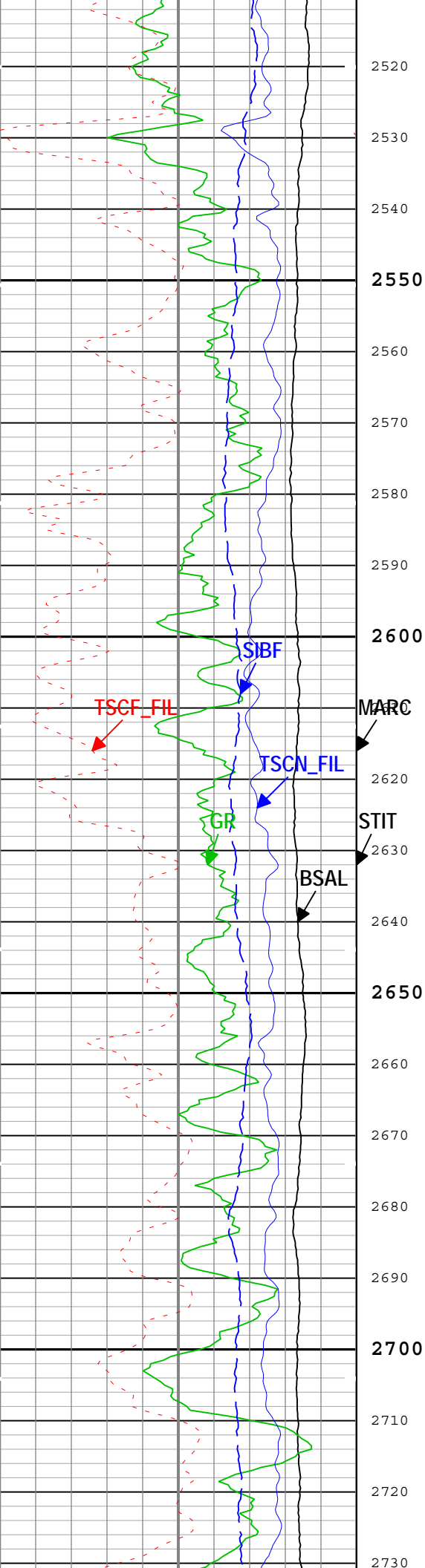
Remarks and Equipment Summary

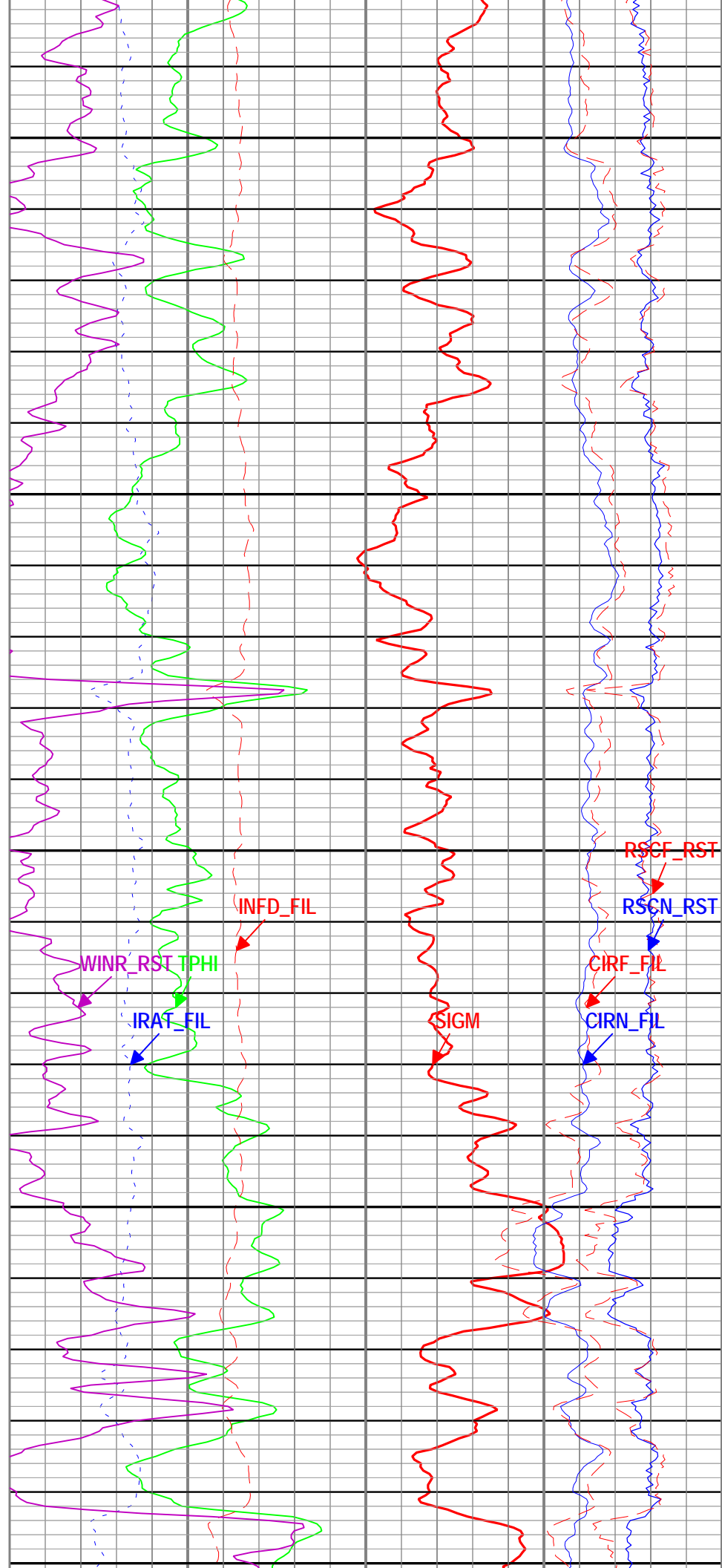
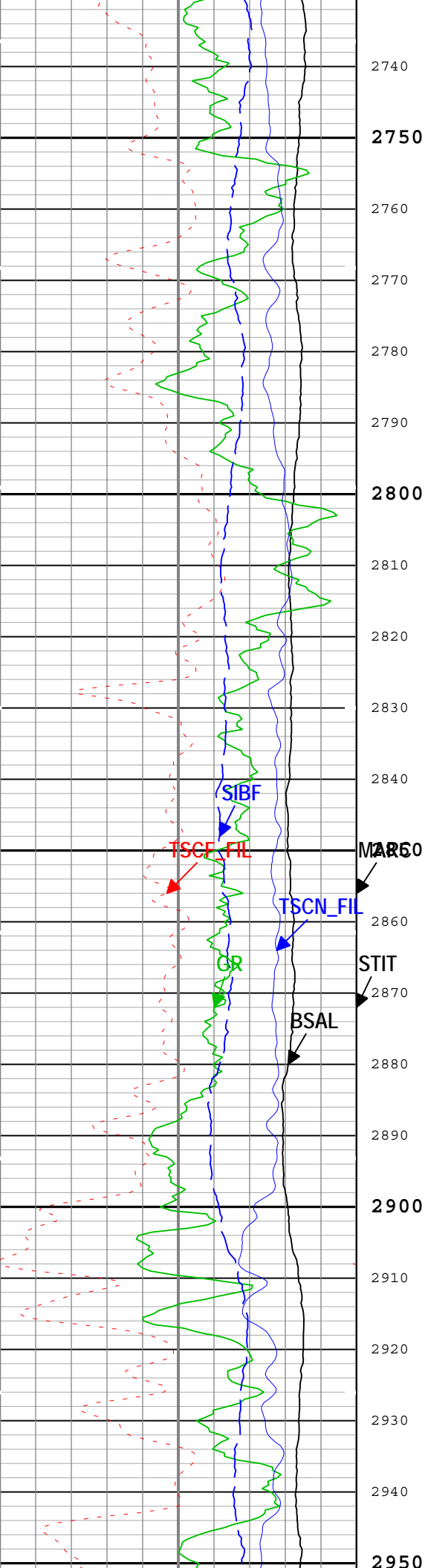
ONE: Toolstring				ONE: Remarks	
<div><div><div><div>Equip name</div><div>Length</div></div><div>LEH-QT</div><div>58.3</div></div><div><div><div>MP name</div><div>Offset</div></div><div>LEH-QT</div><div></div></div></div> <div></div>				Toolstring ran as per tool sketch	
				This is first run in hole	
				Main and repeat passes are correlated to down log.	
				RST ran in Sigma mode	
				Matrix: Sandstone, 2.68 g/cc	
				Tagged float collar at 9042 ft	
				Repeat pass is done with 0 psi	
				Main pass is done with 2200 psi	
				Log stopped at 2500 ft as per client's request	

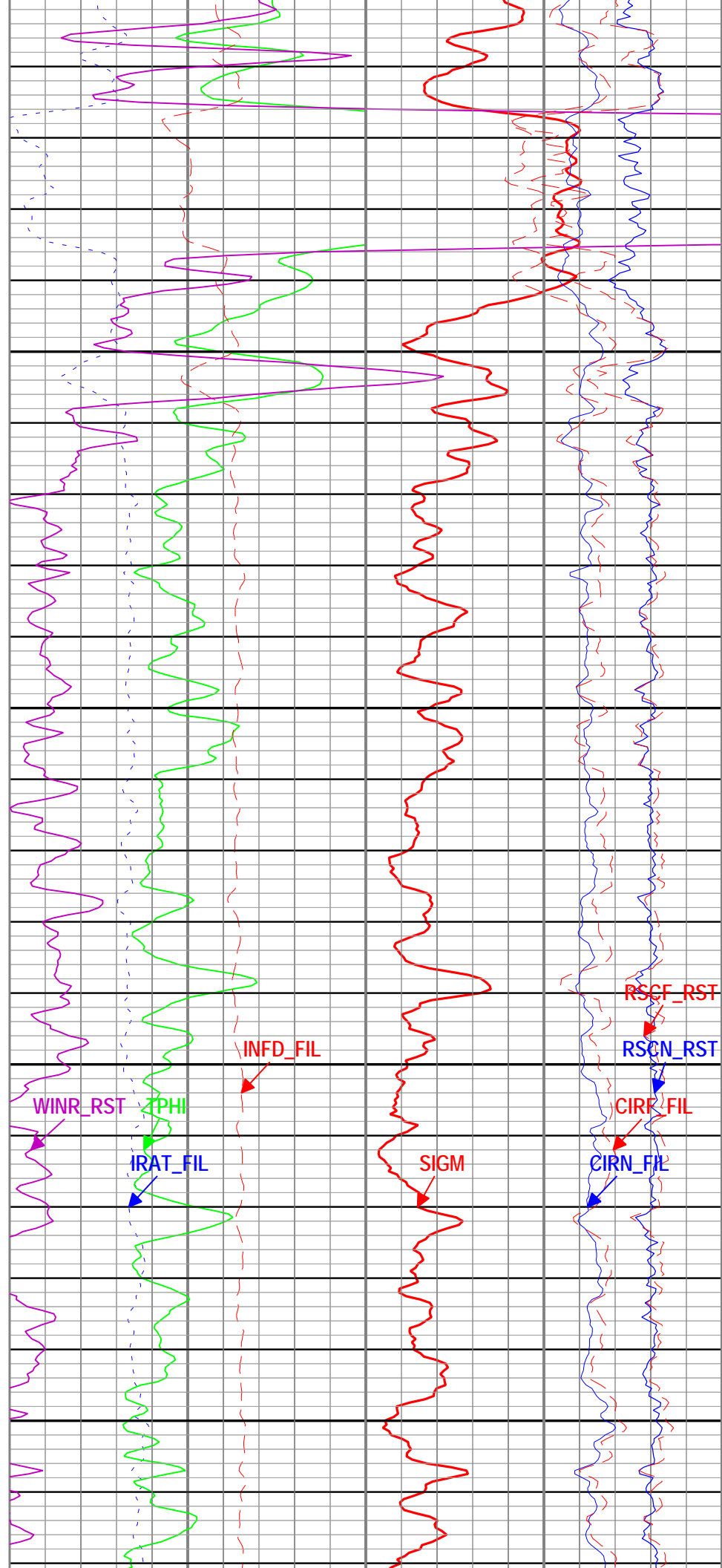
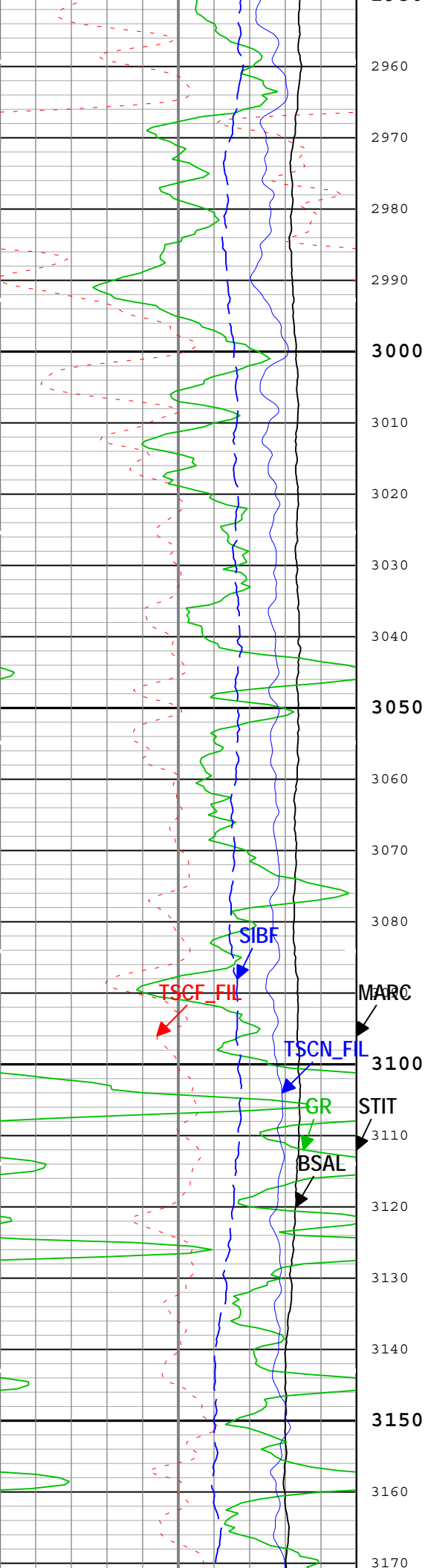


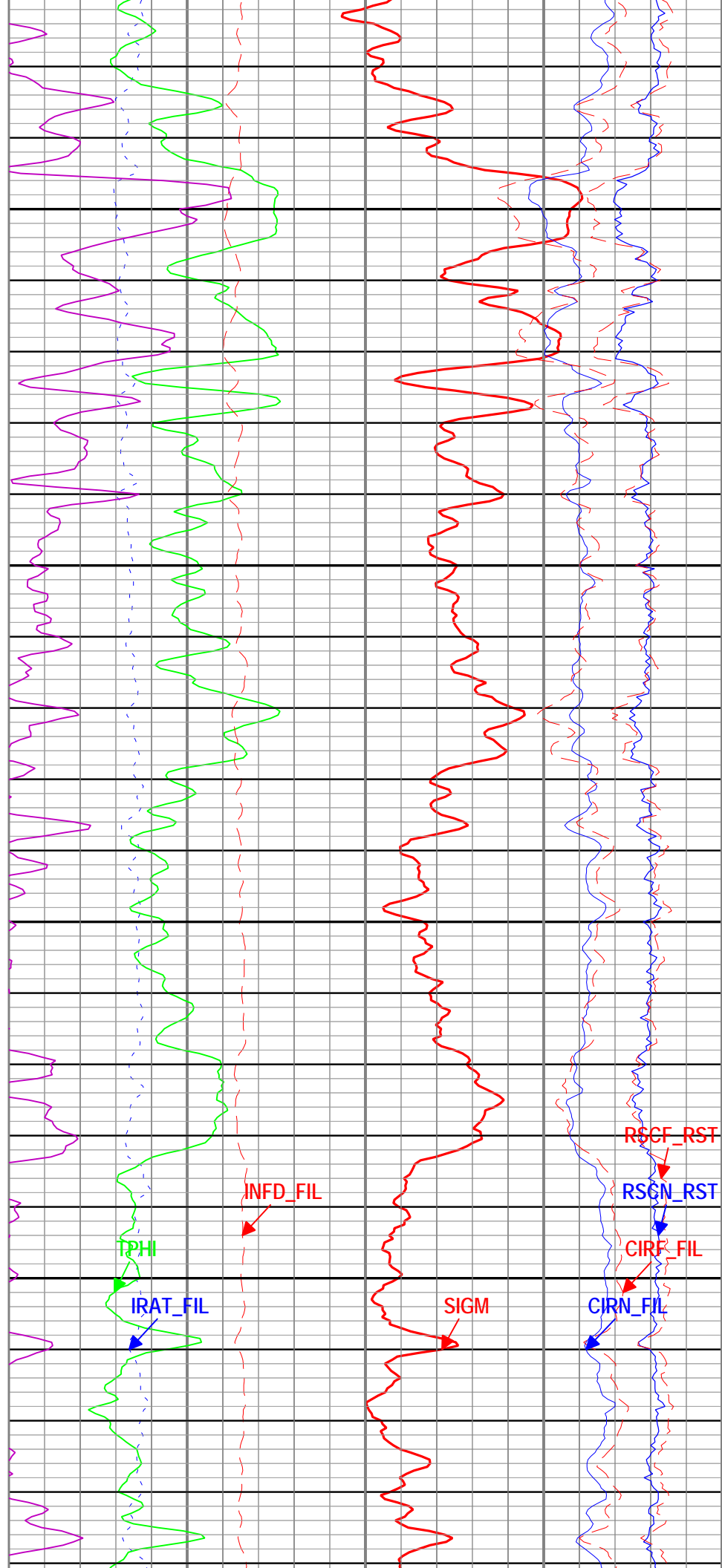
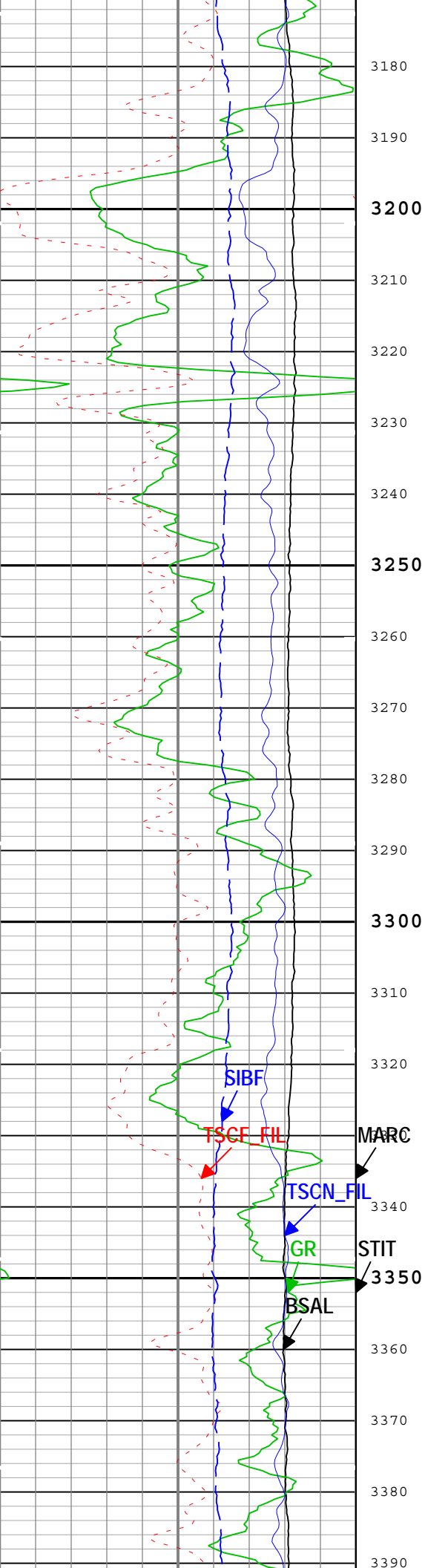


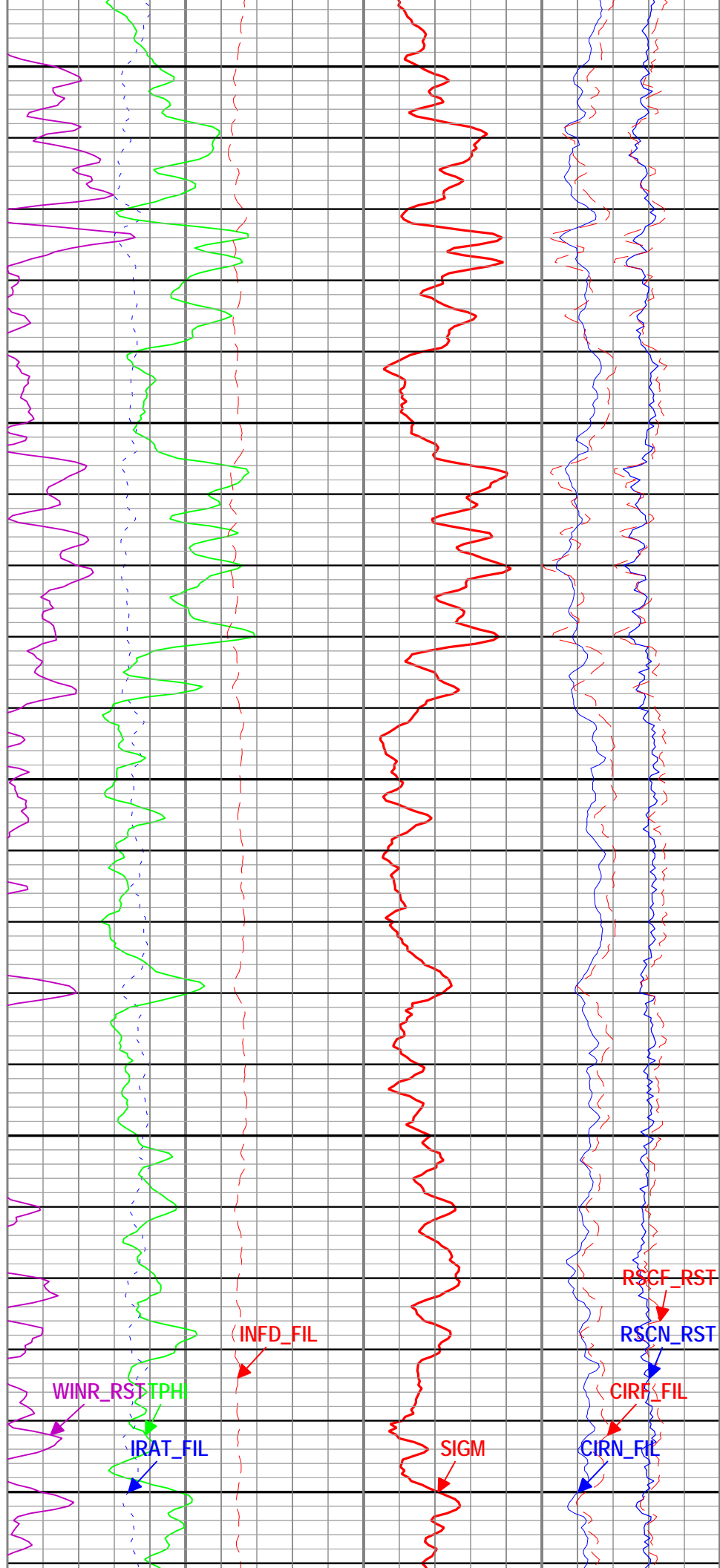
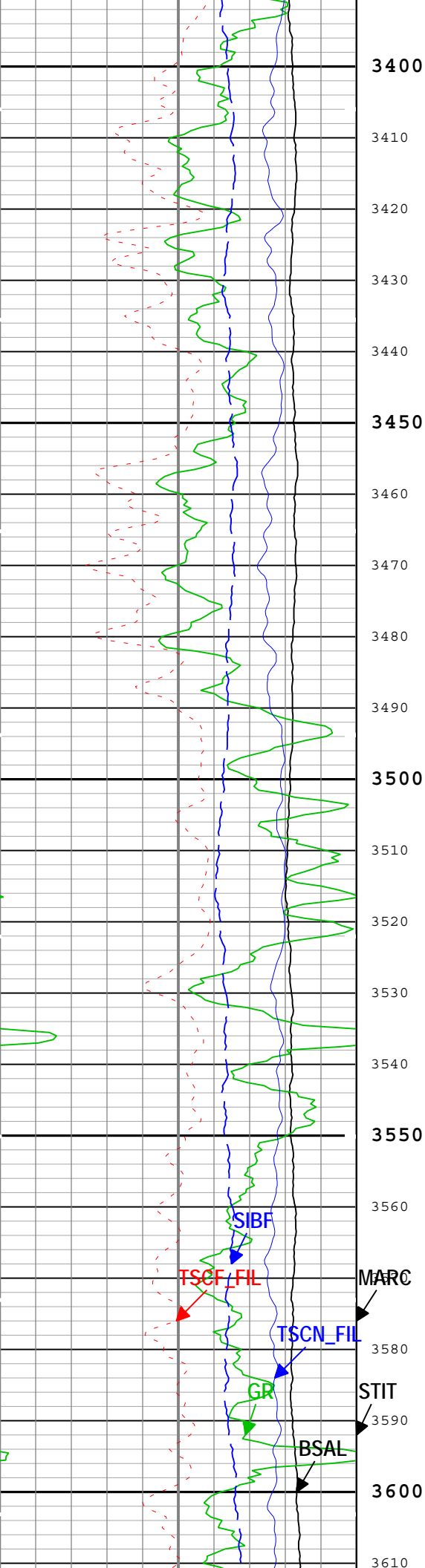
Depth Summary			
ONE			
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		
Tension Device			
Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		
Logging Cable			
Type	7-46A-XS		
Serial Number			
Length	21000.00 ft		
Conveyance Type	Wireline		
Rig Type	Crane		
ONE:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	All Schlumberger depth control procedures followed during logging operations. IDW used as primary depth control device. Z-Chart used as secondary depth control.	
Rig Up Length At Surface			
Rig Up Length At Bottom			
Rig Up Length Correction			
Stretch Correction			
Tool Zero Check At Surface			

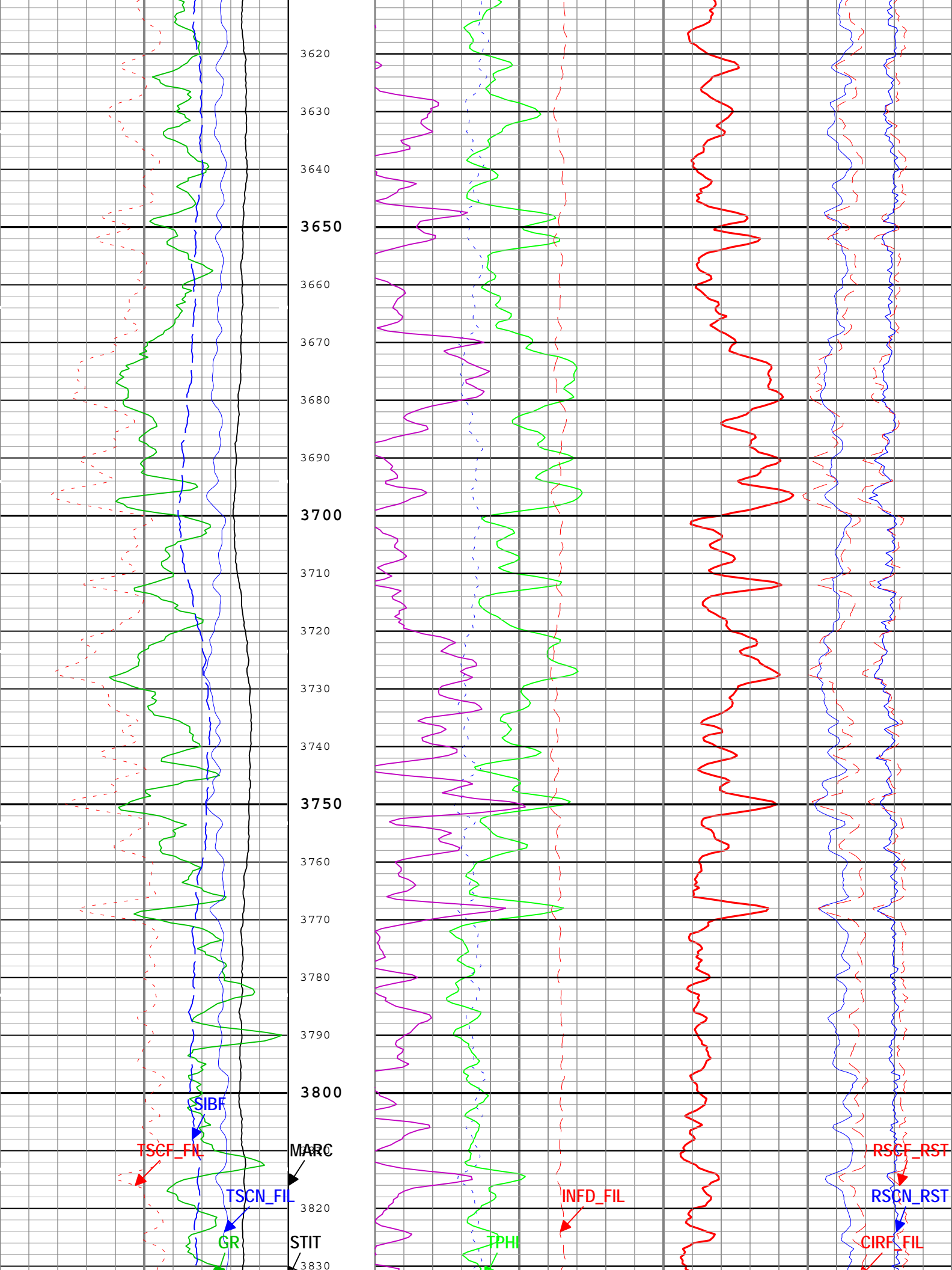


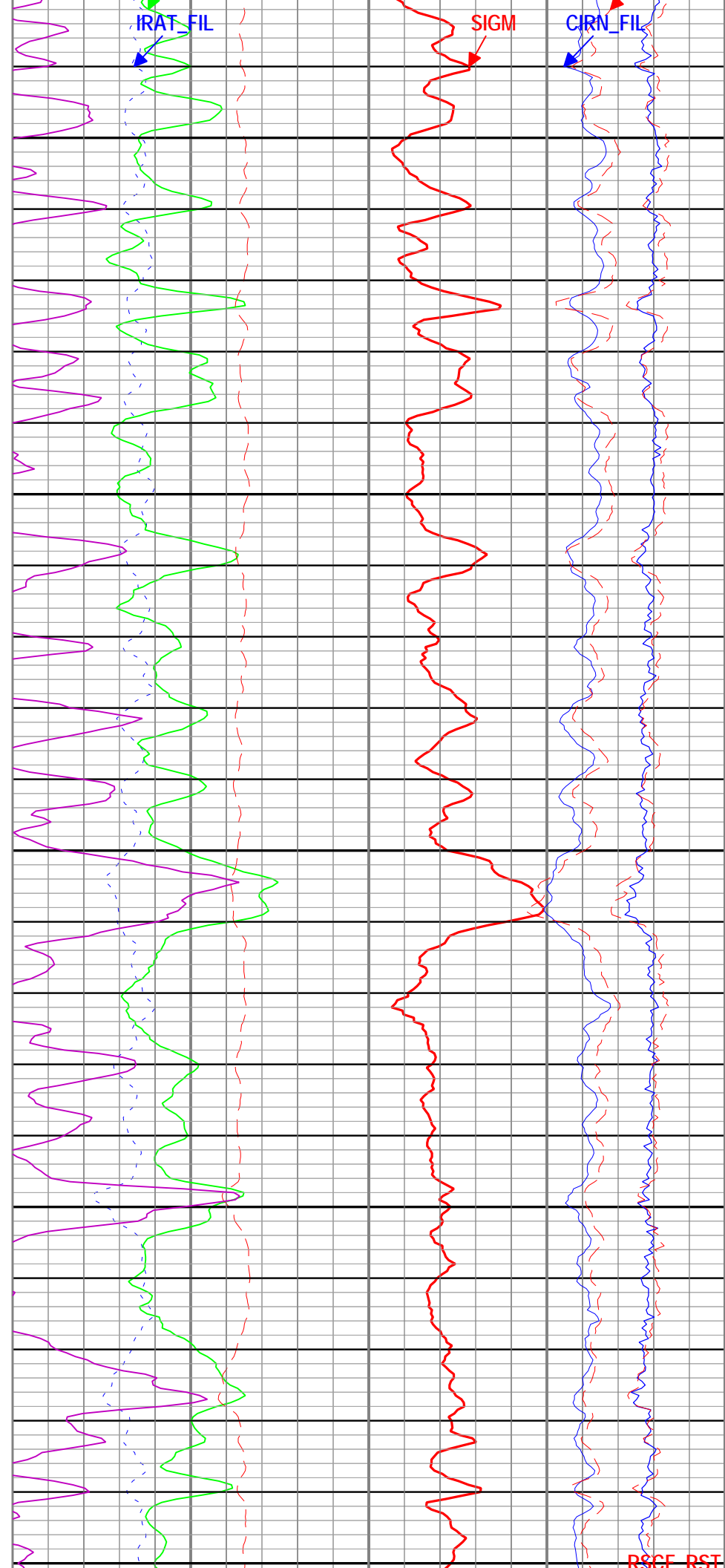
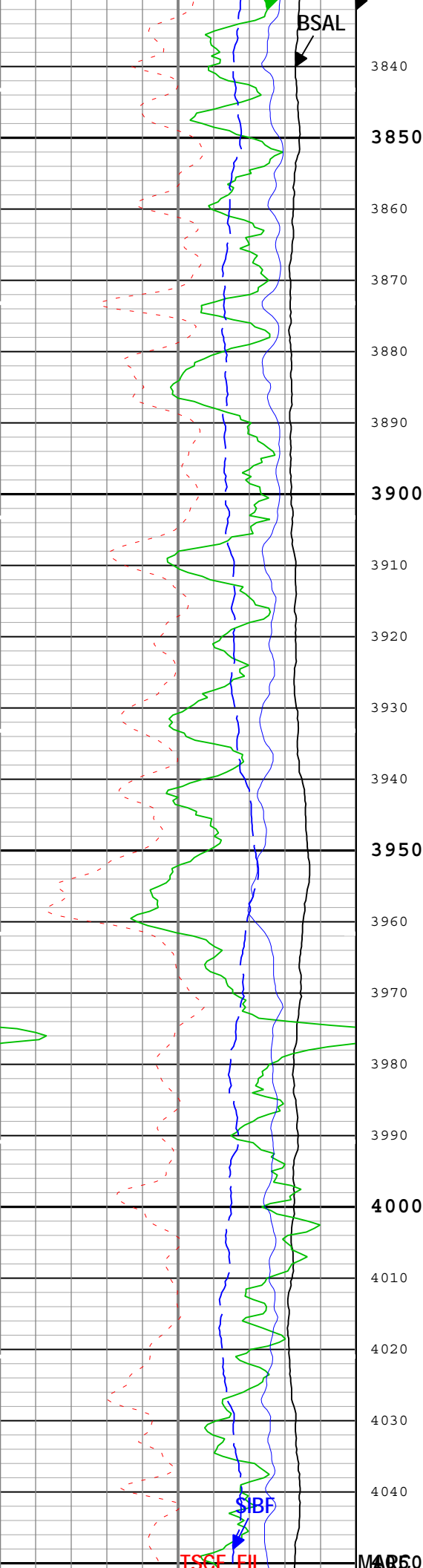


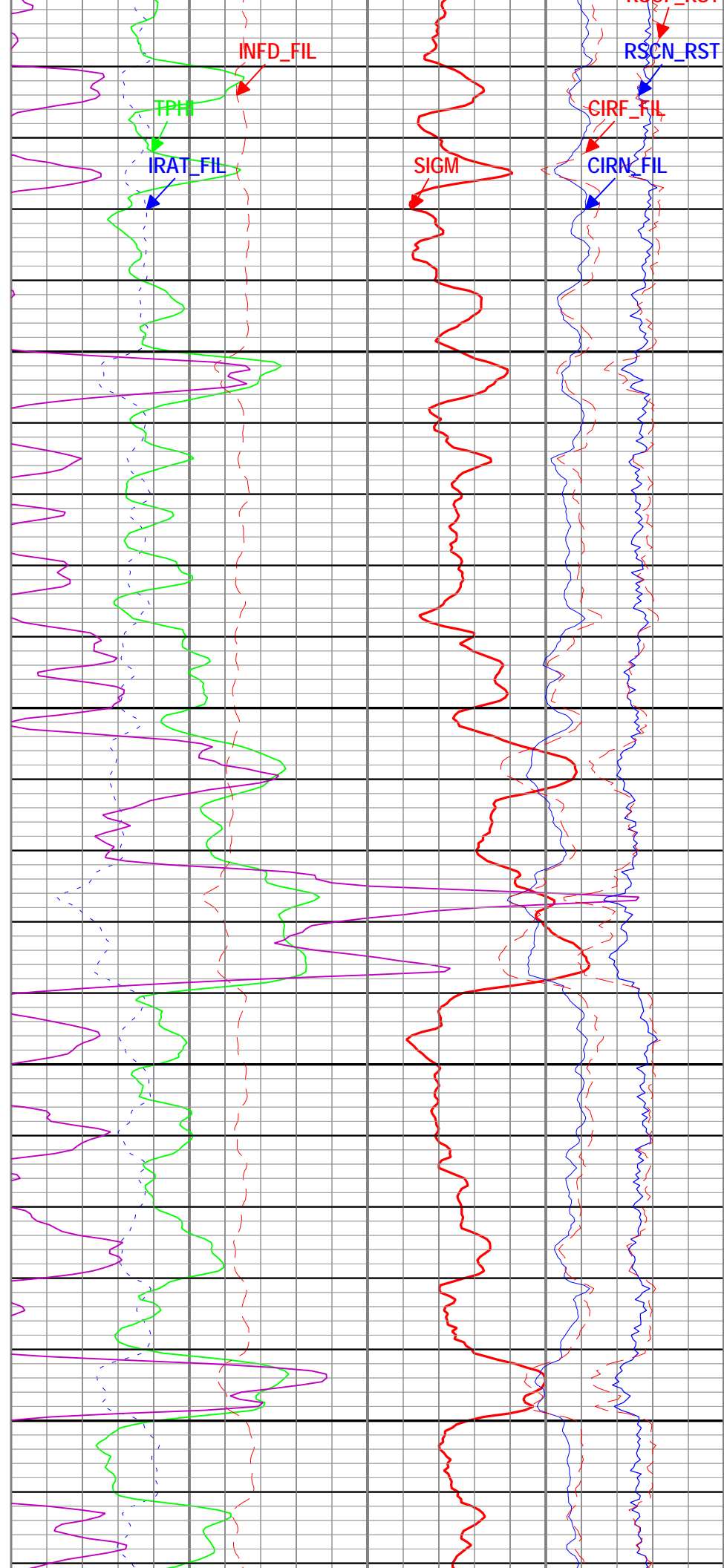
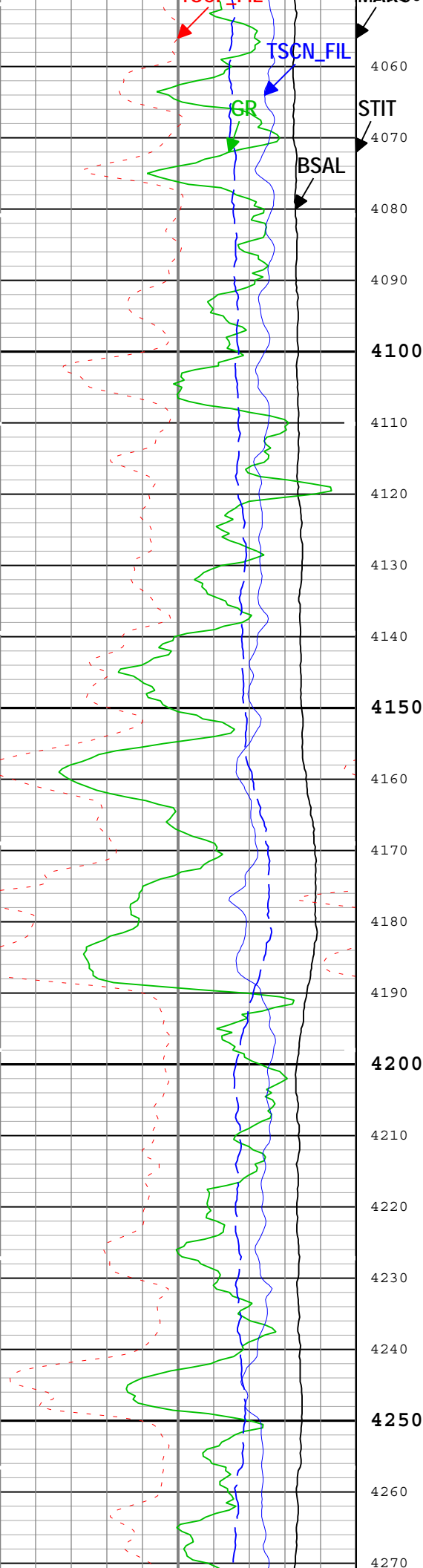


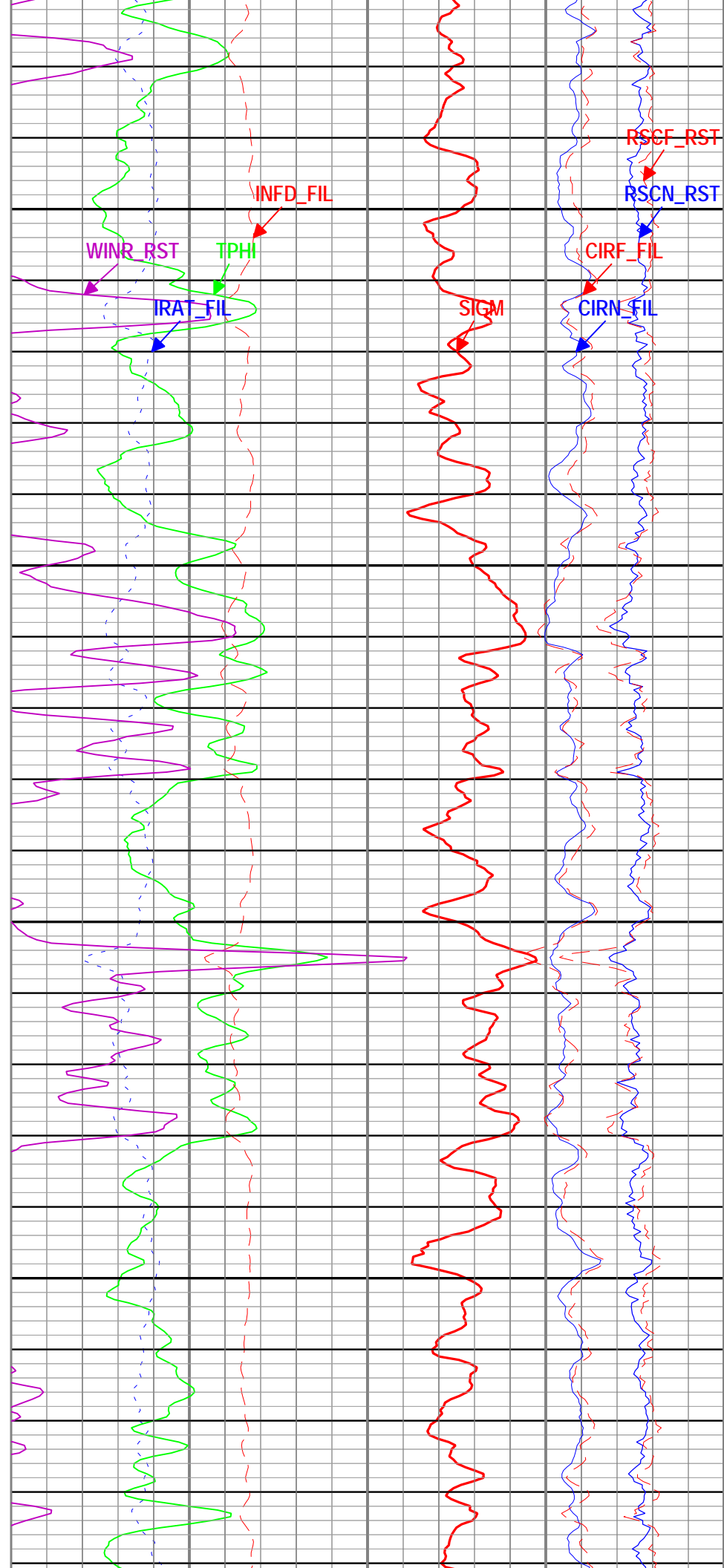
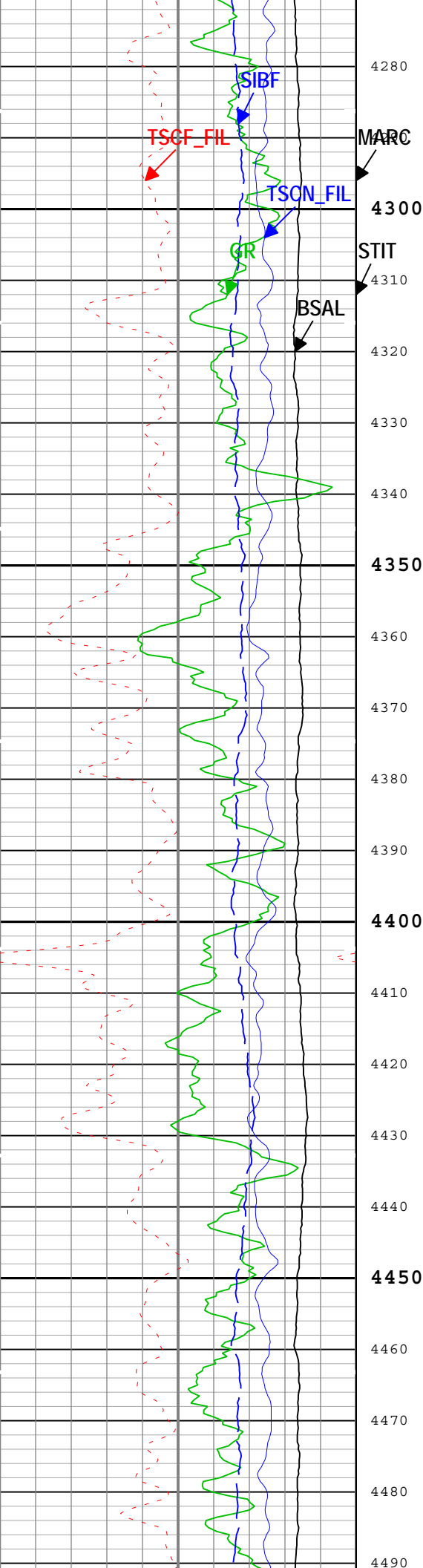


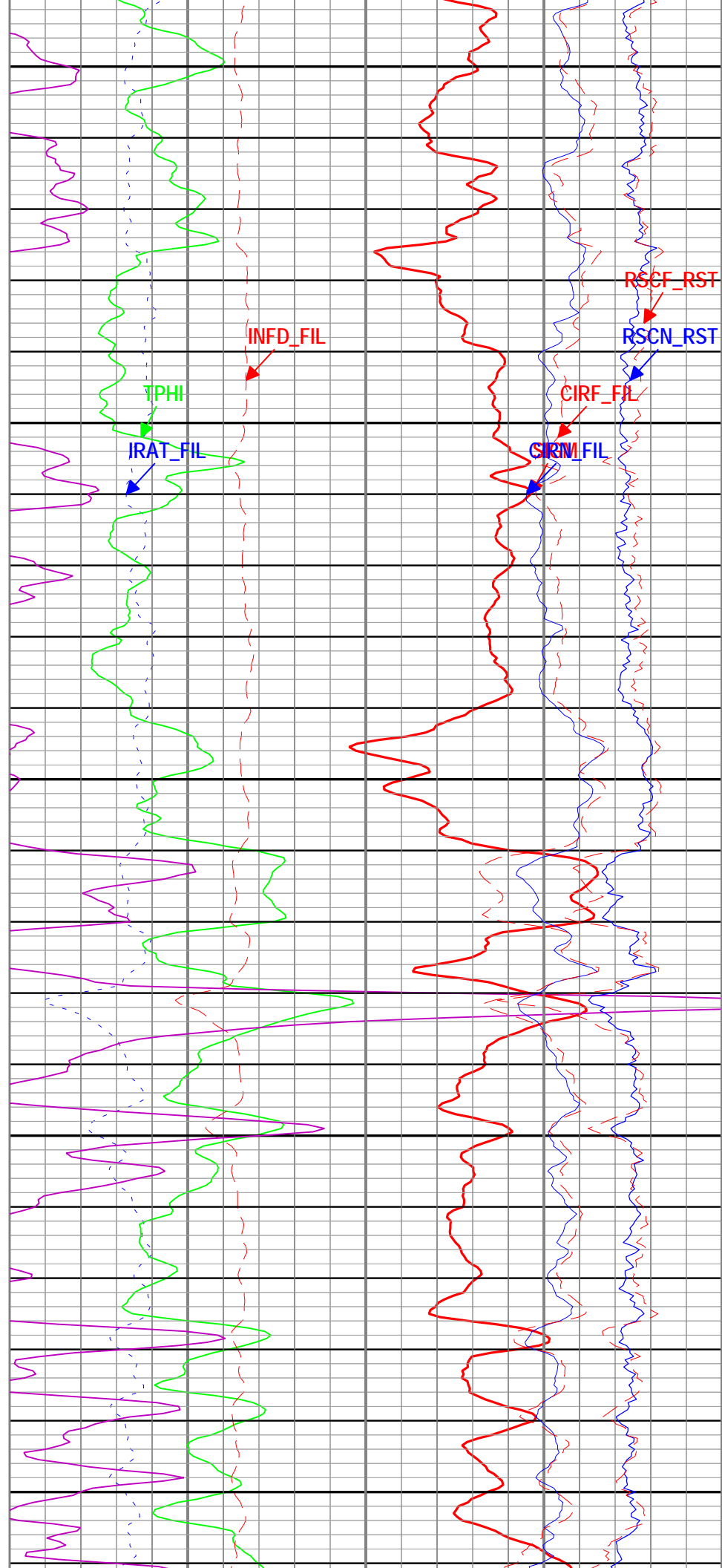
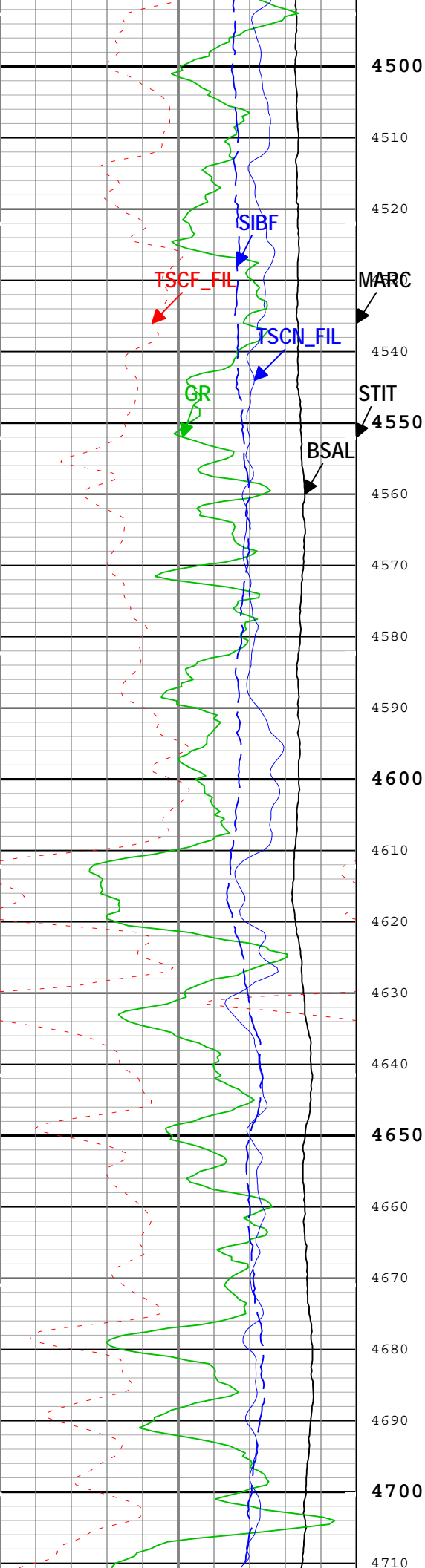


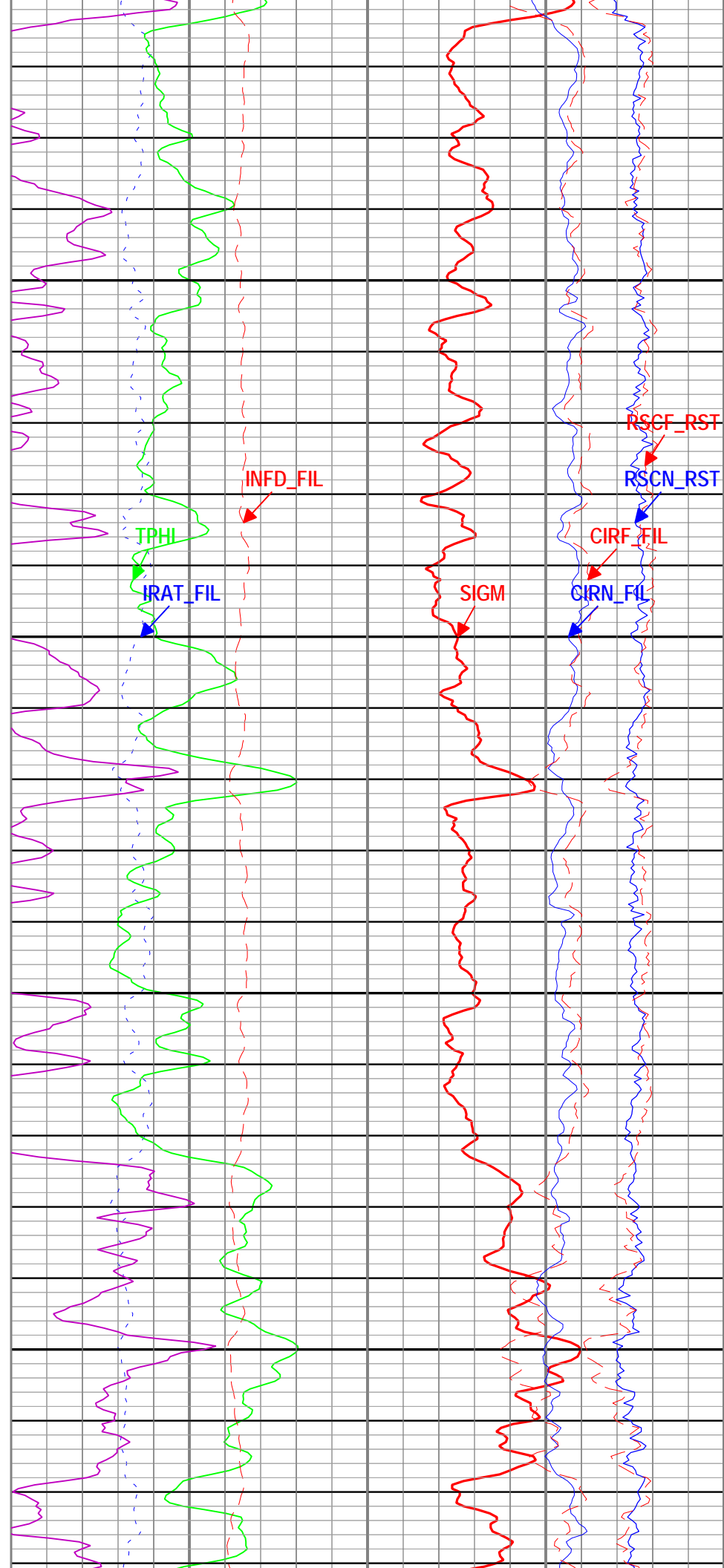
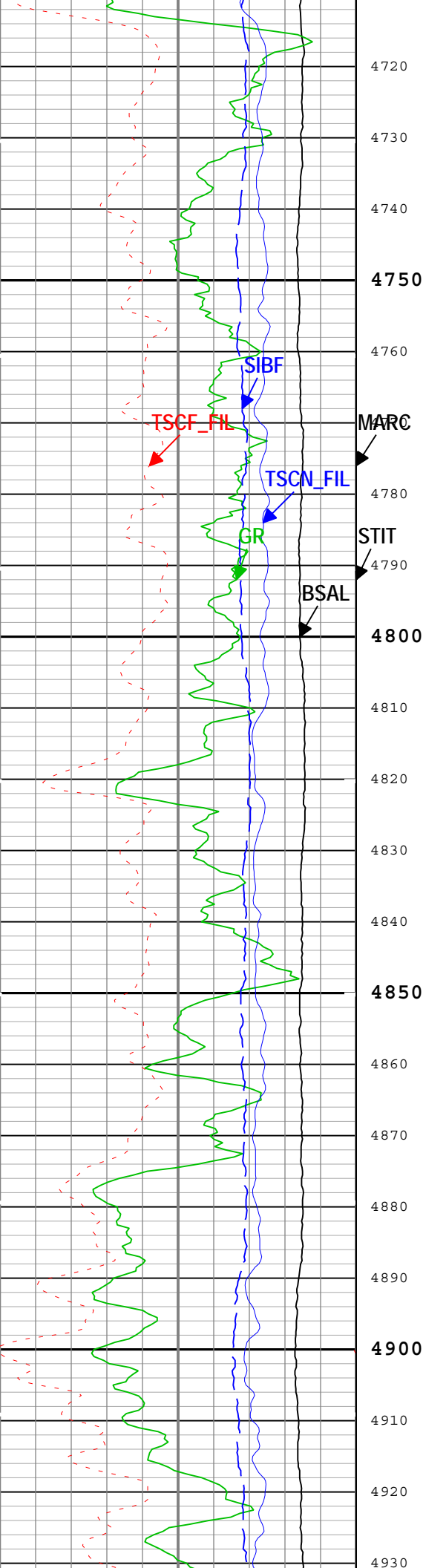


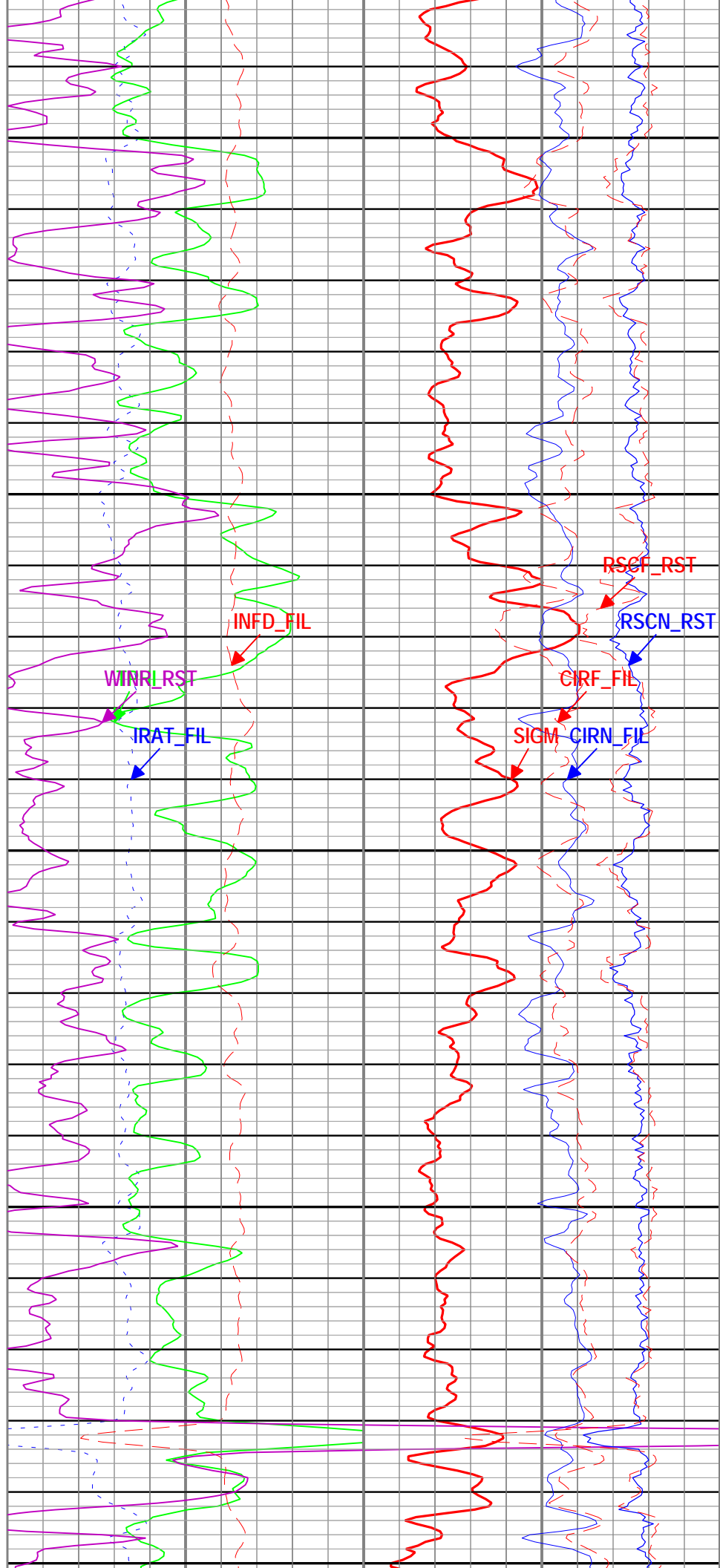
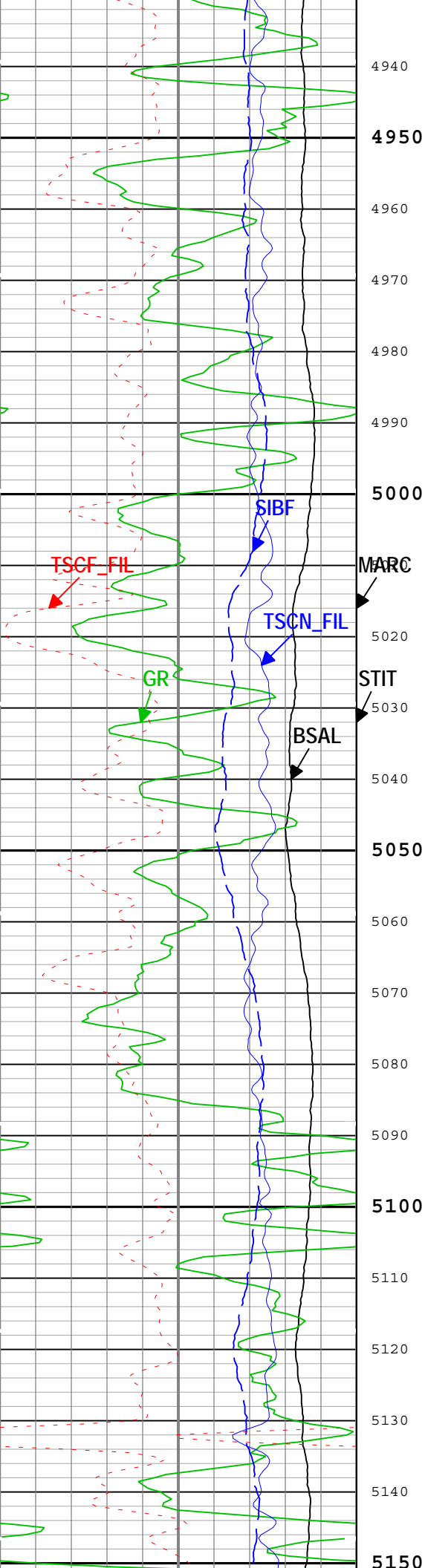


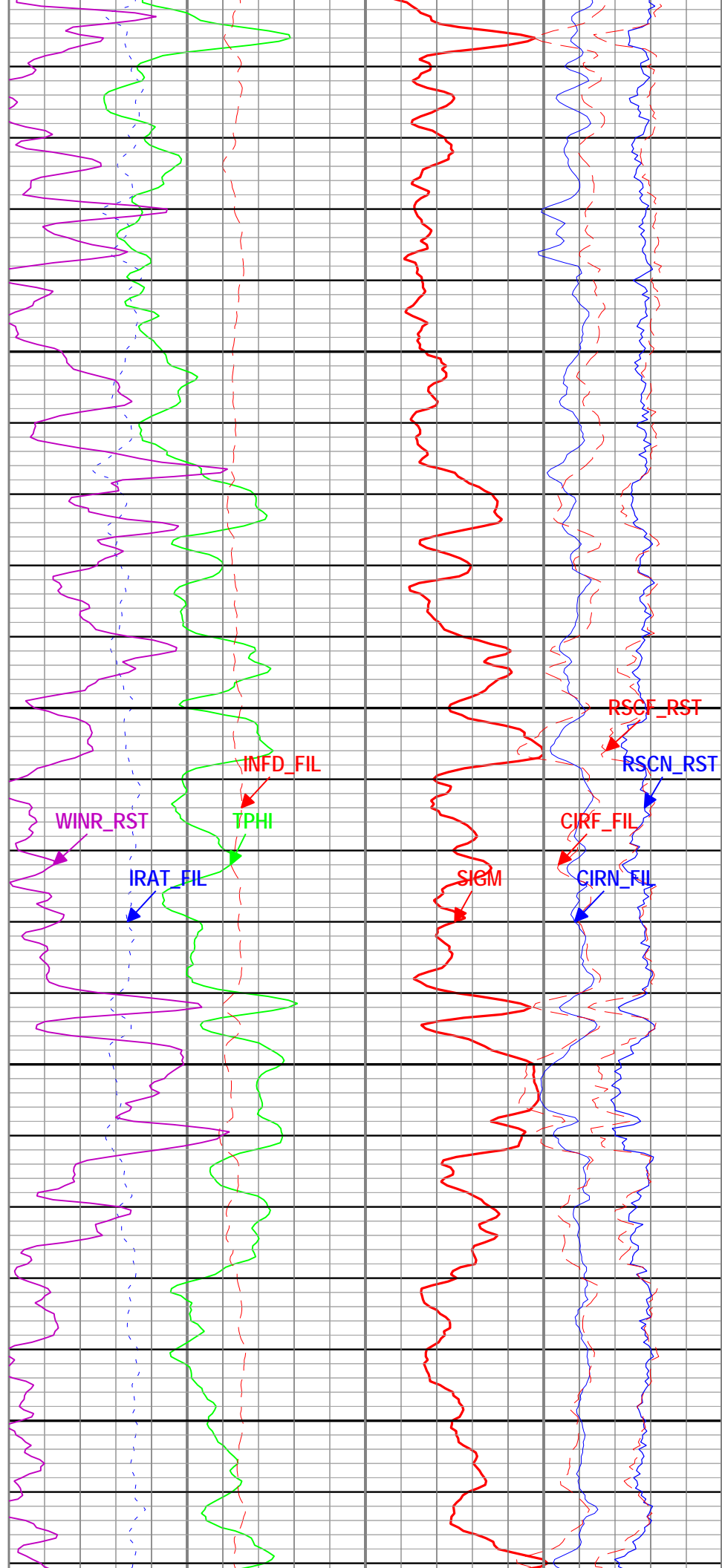
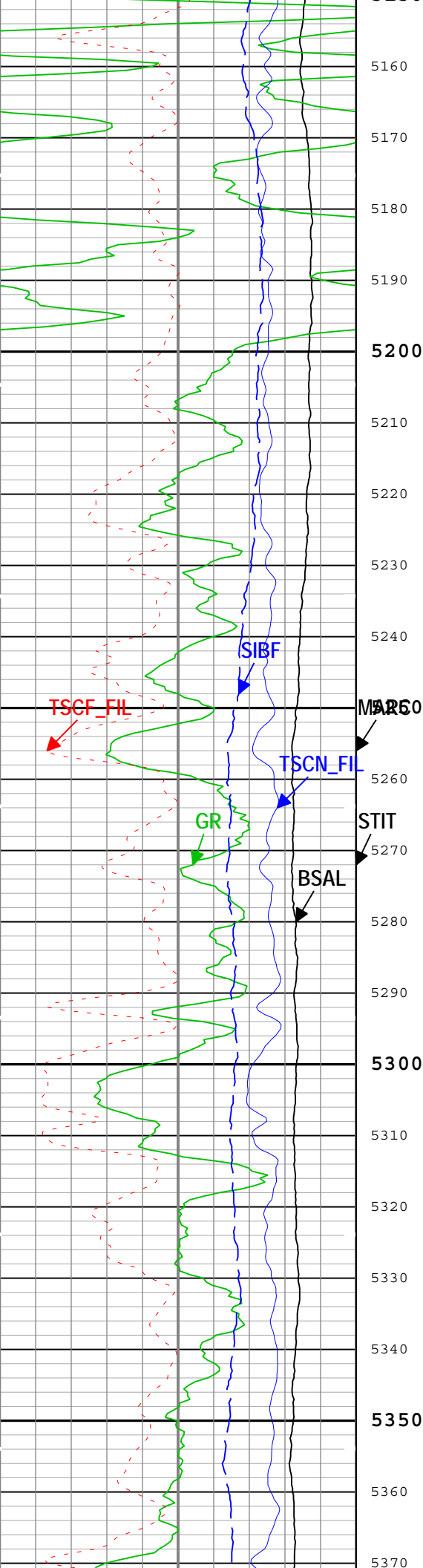


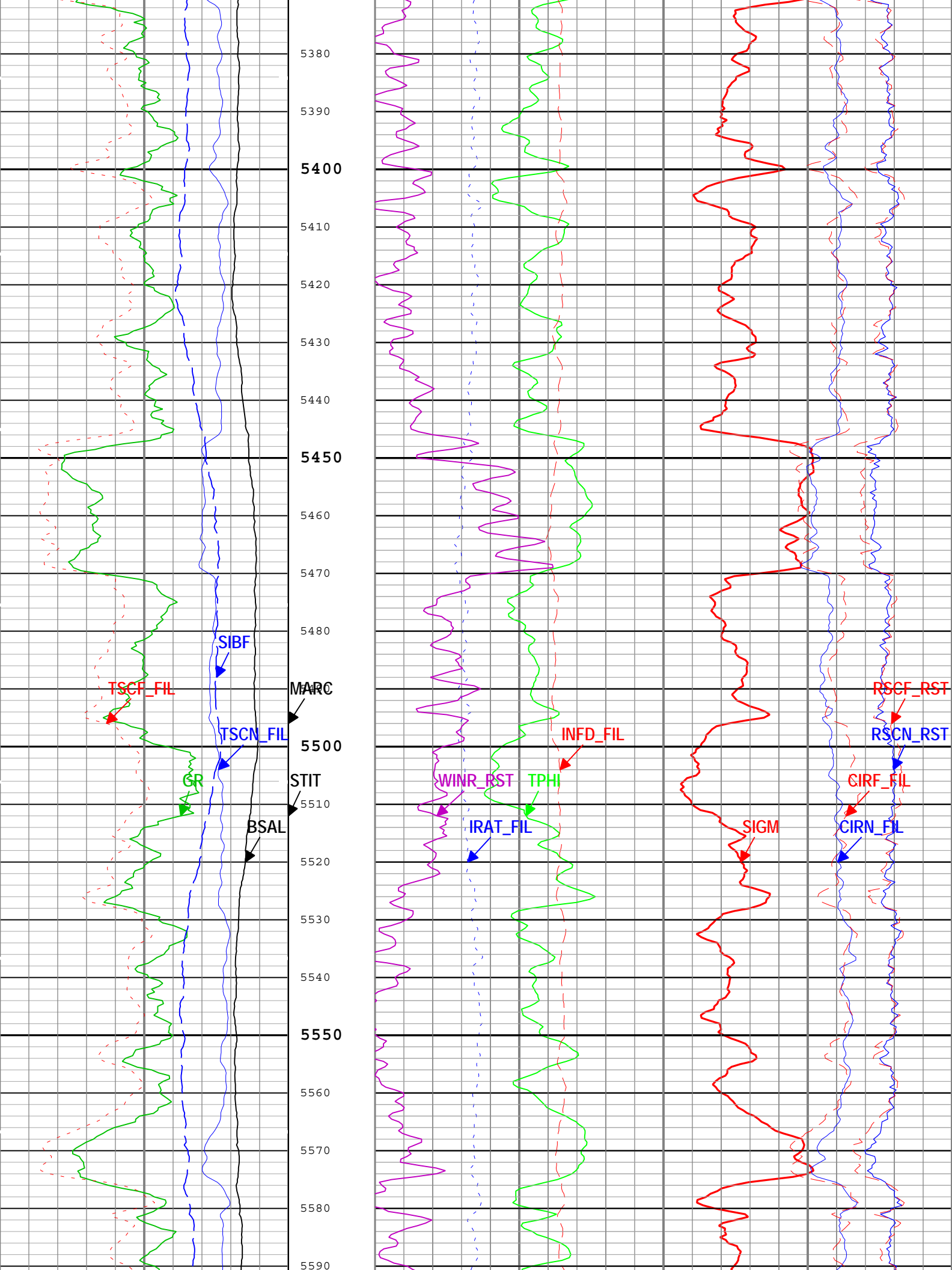


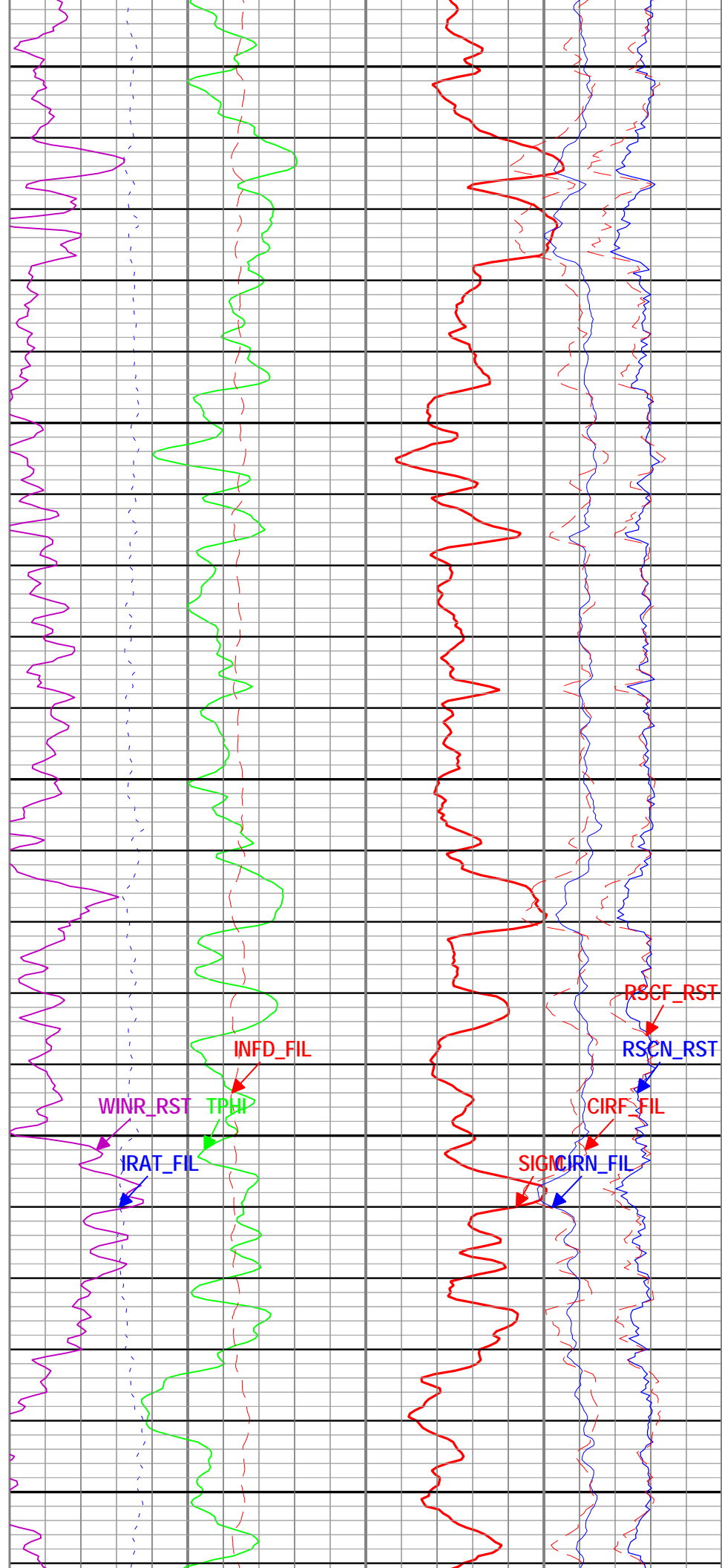
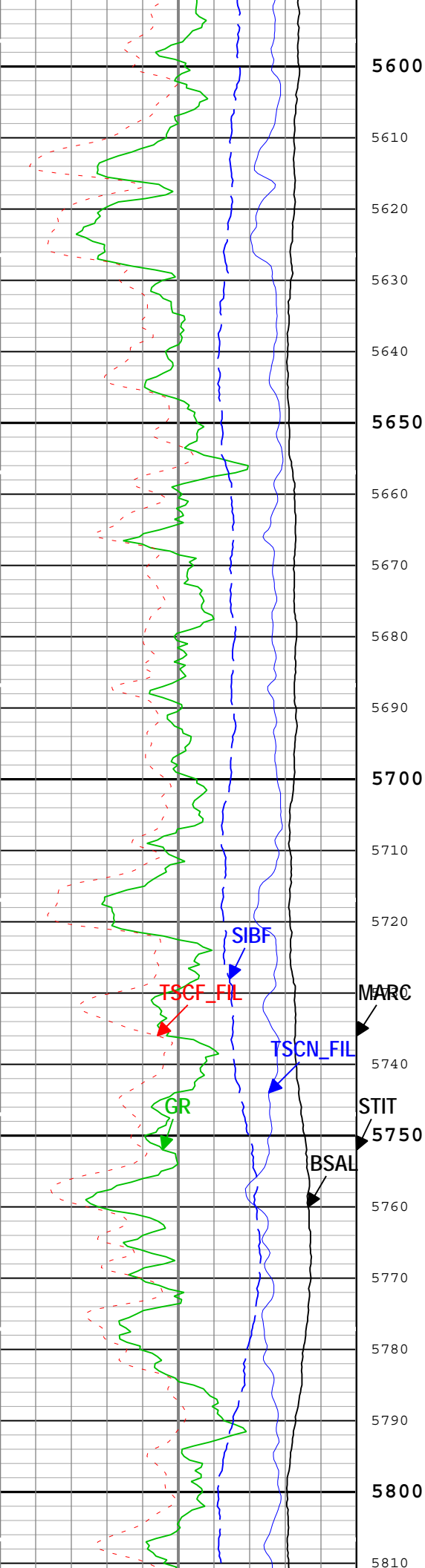


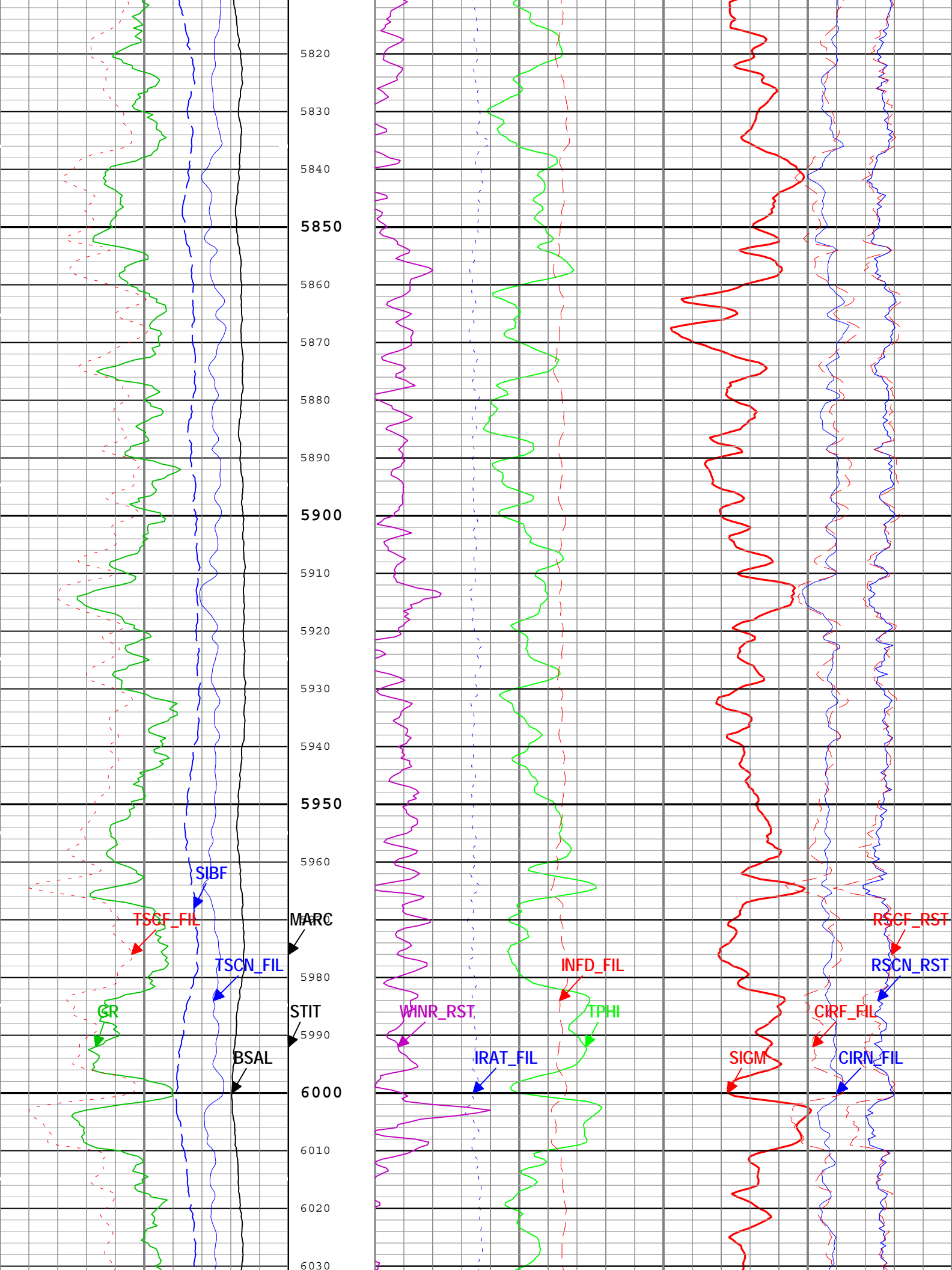


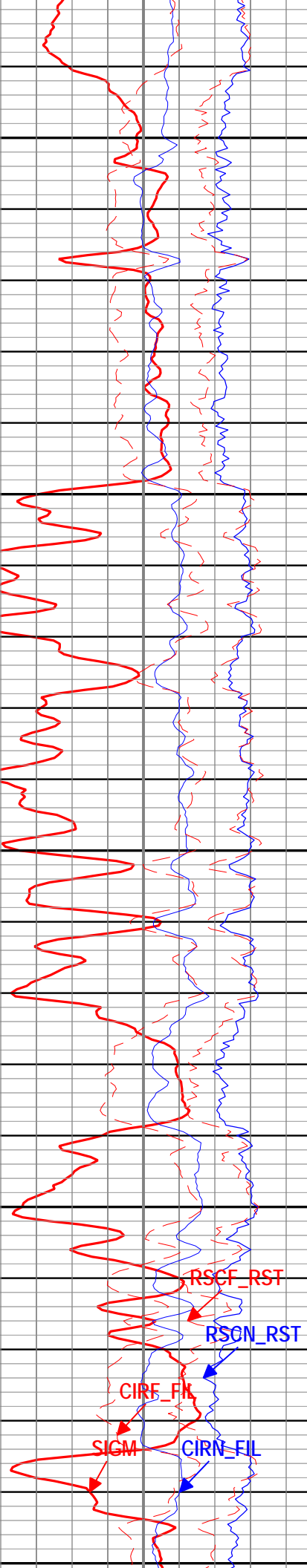
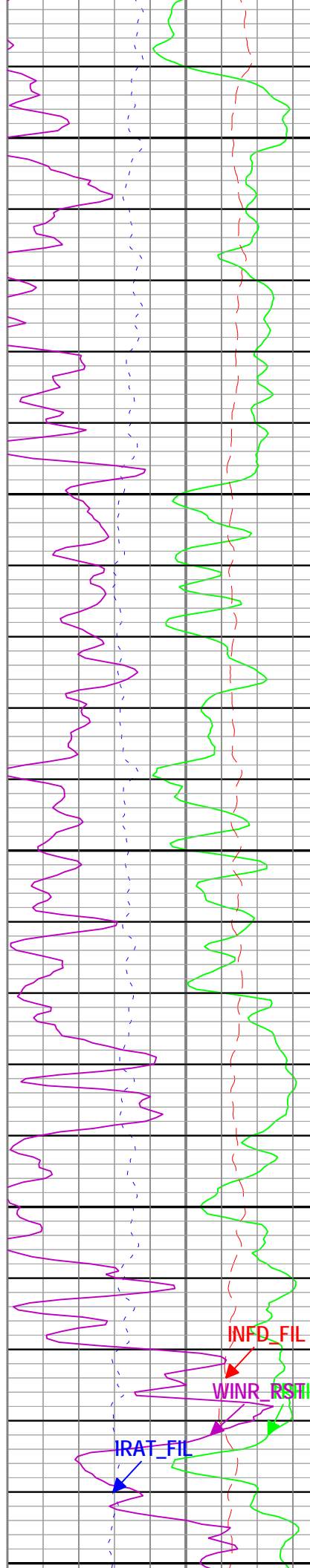
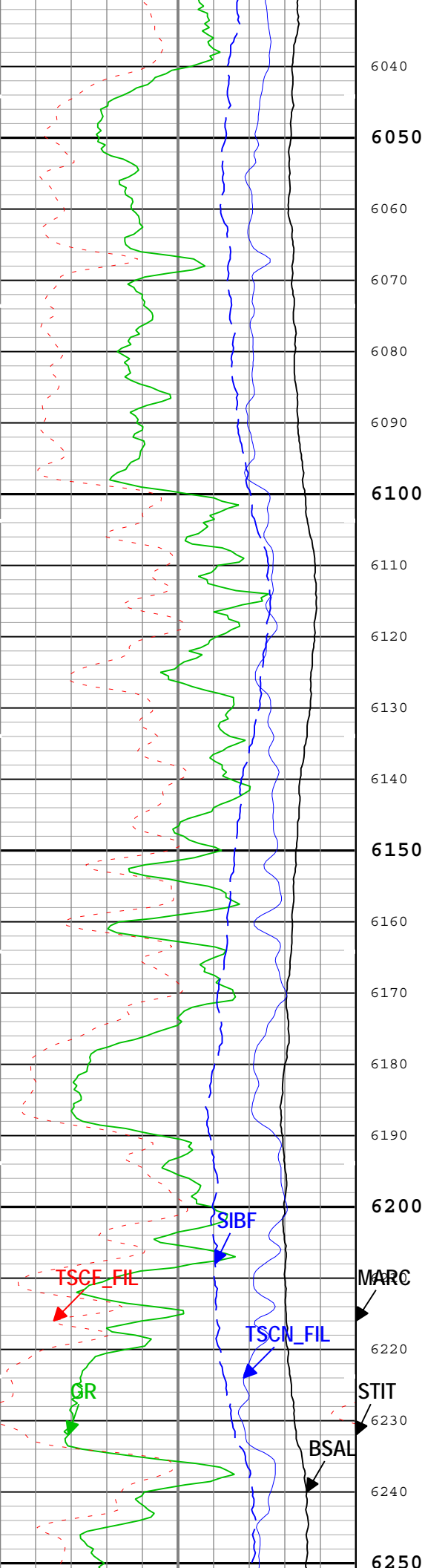


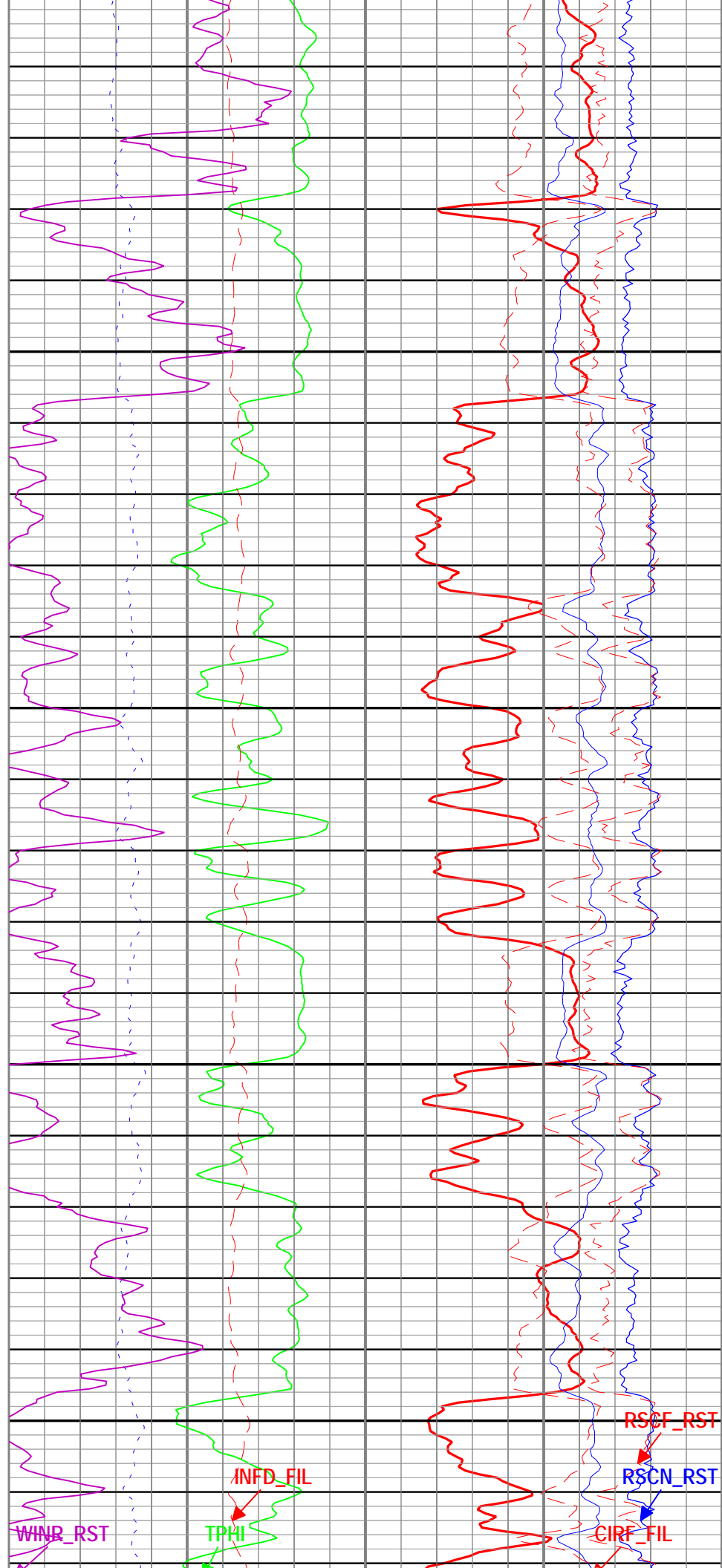
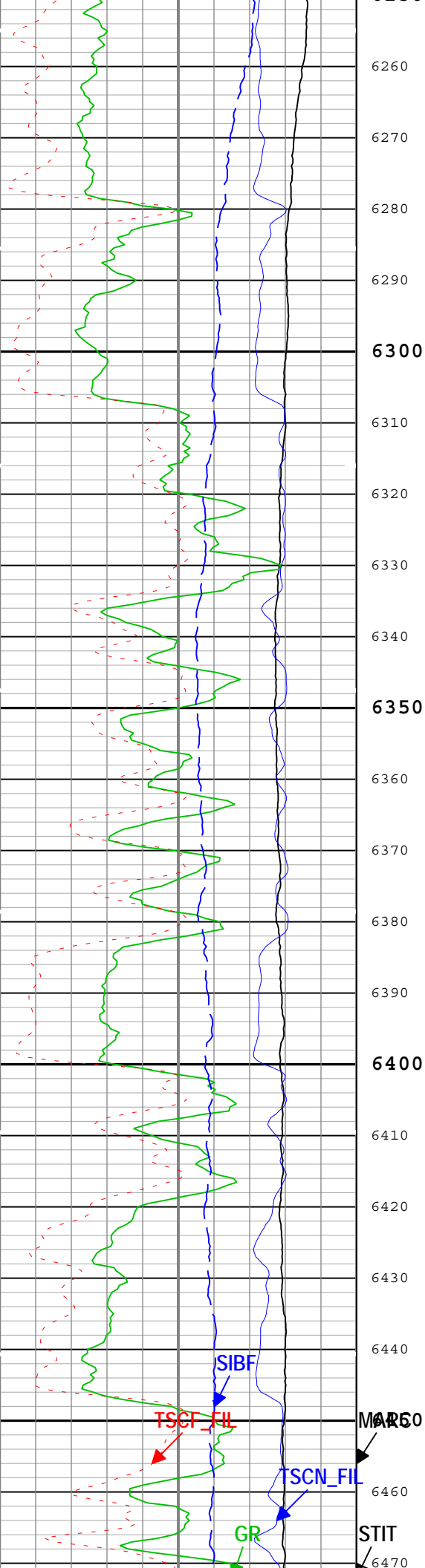


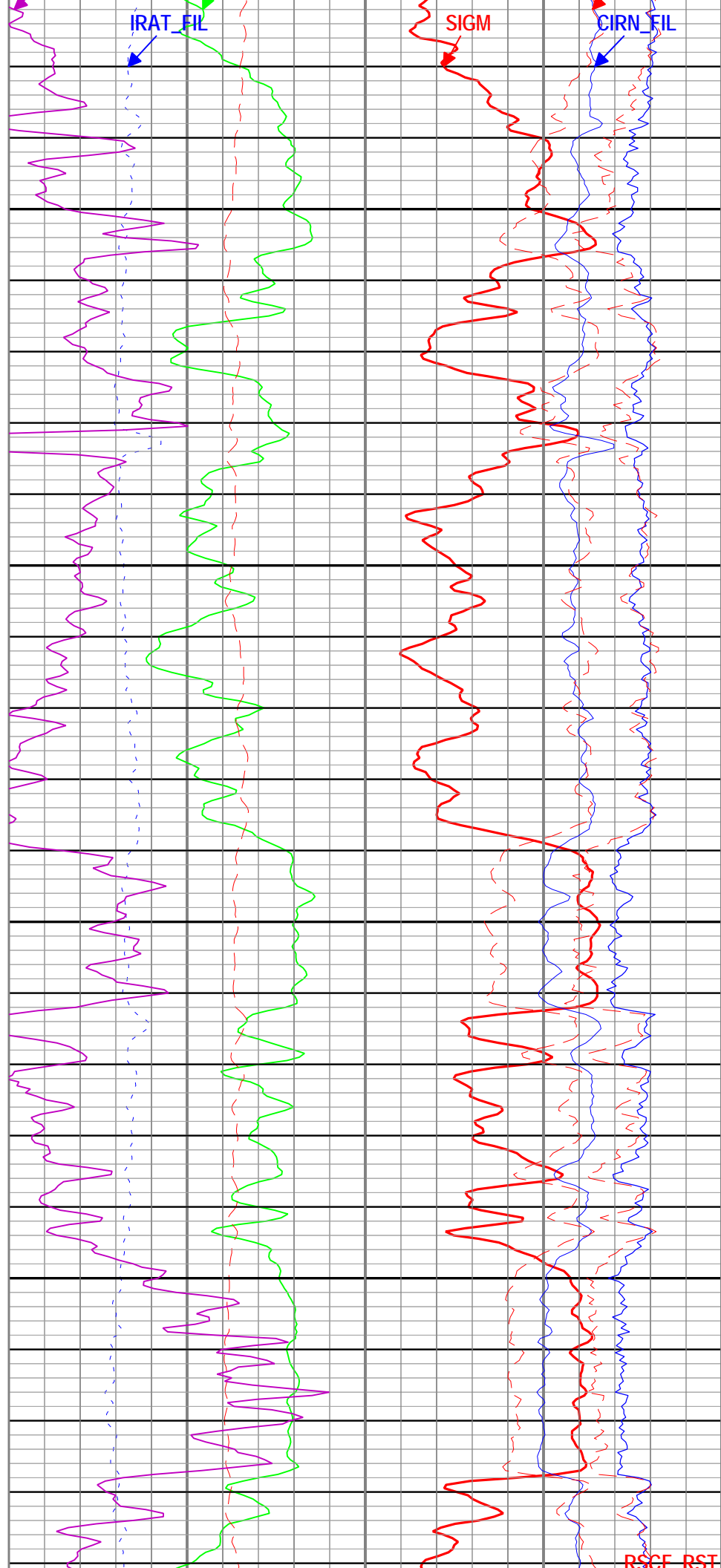
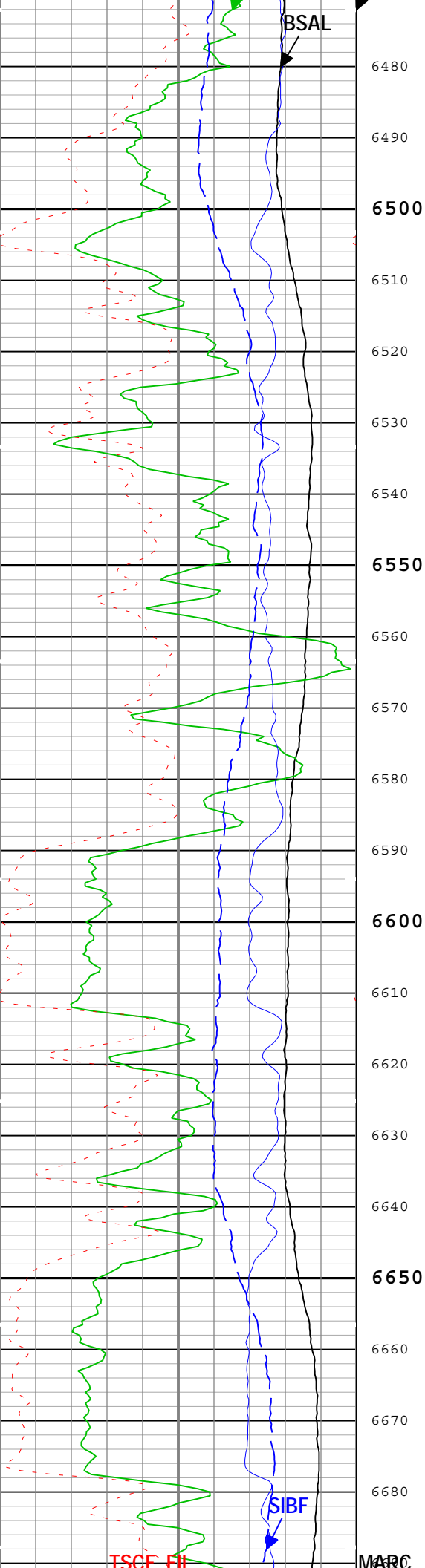


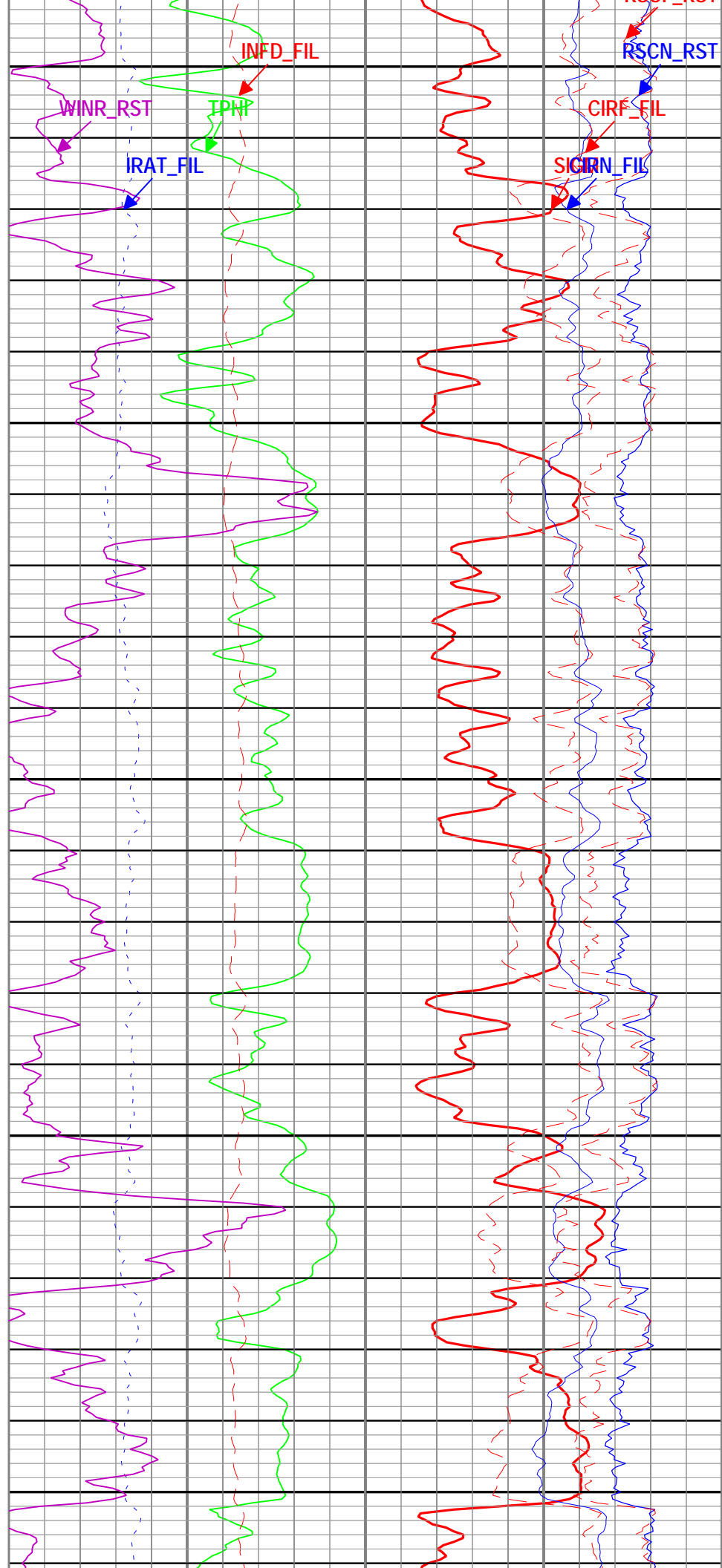
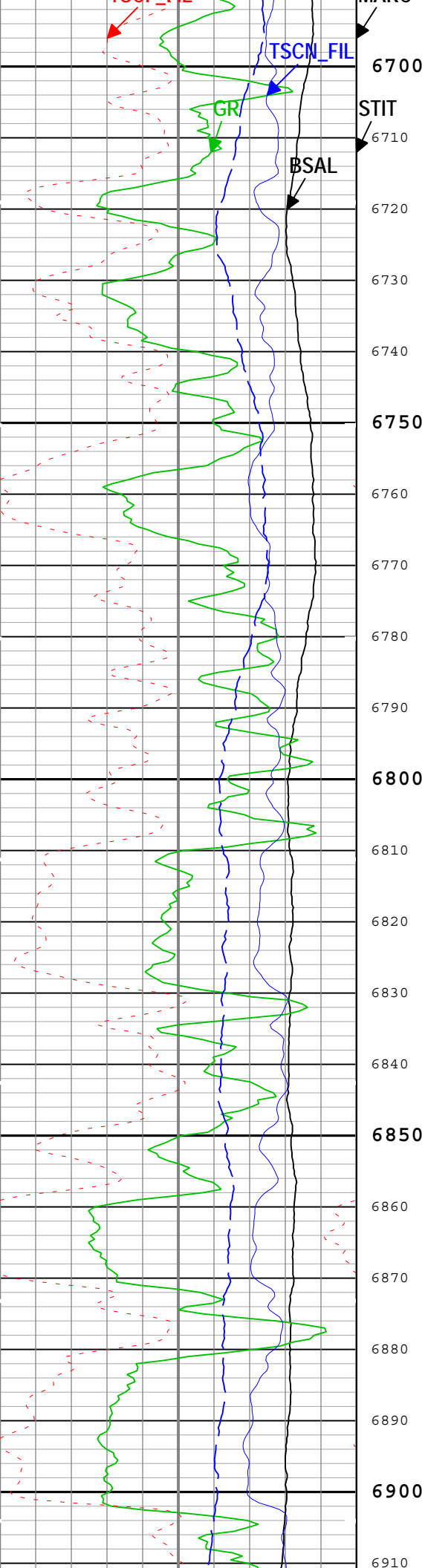


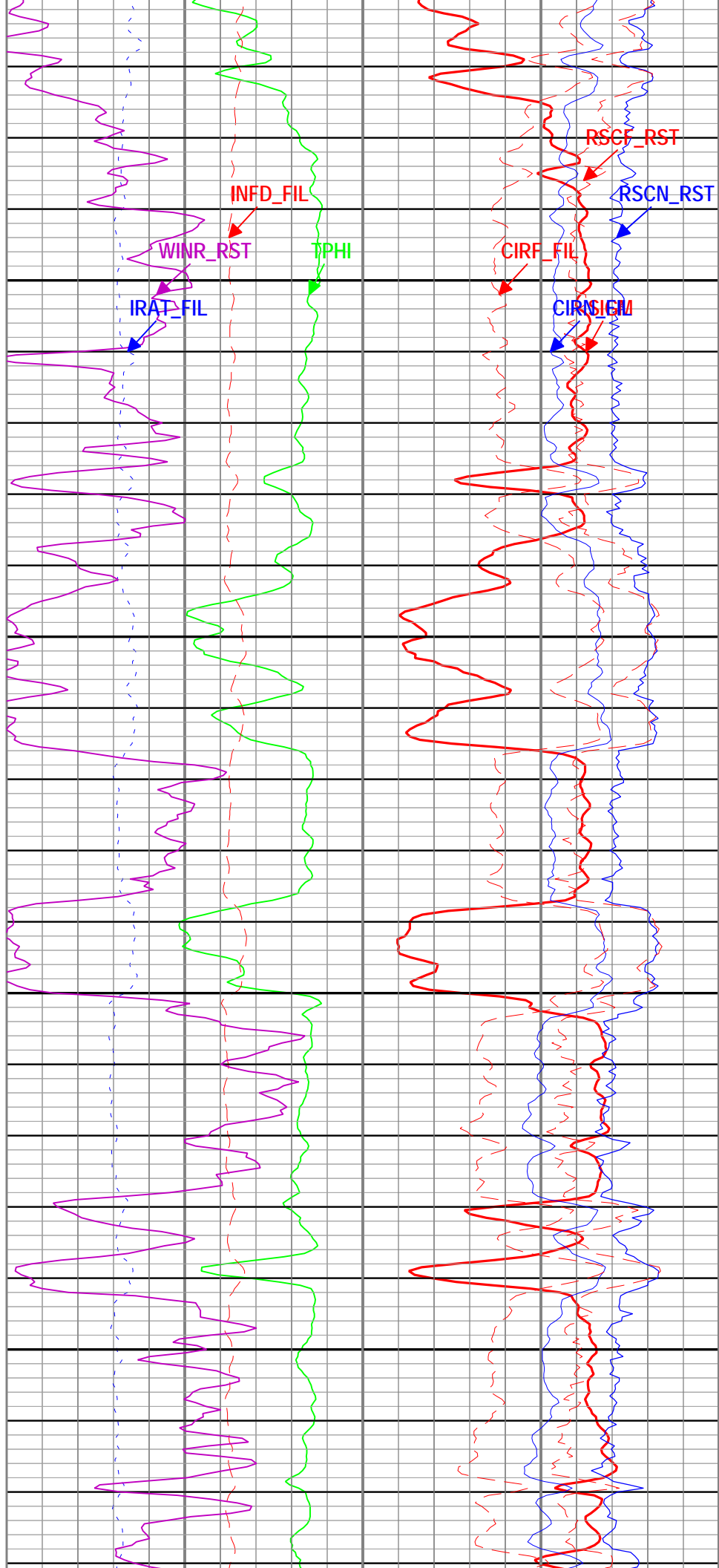
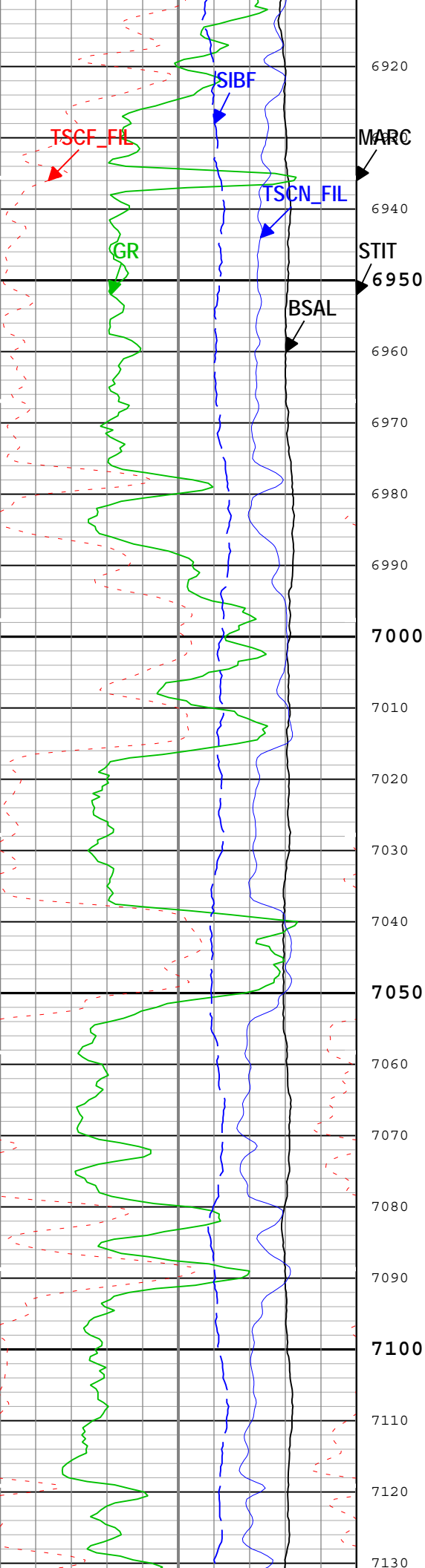


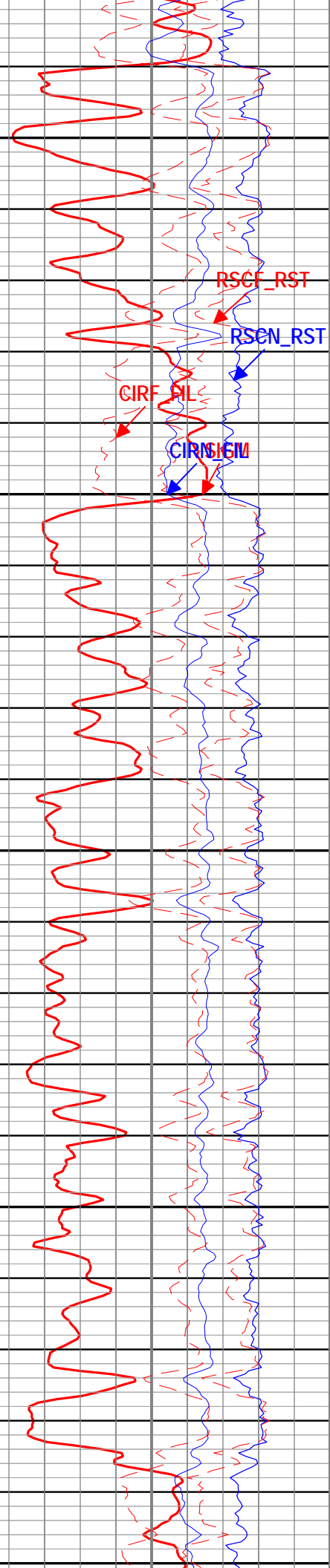
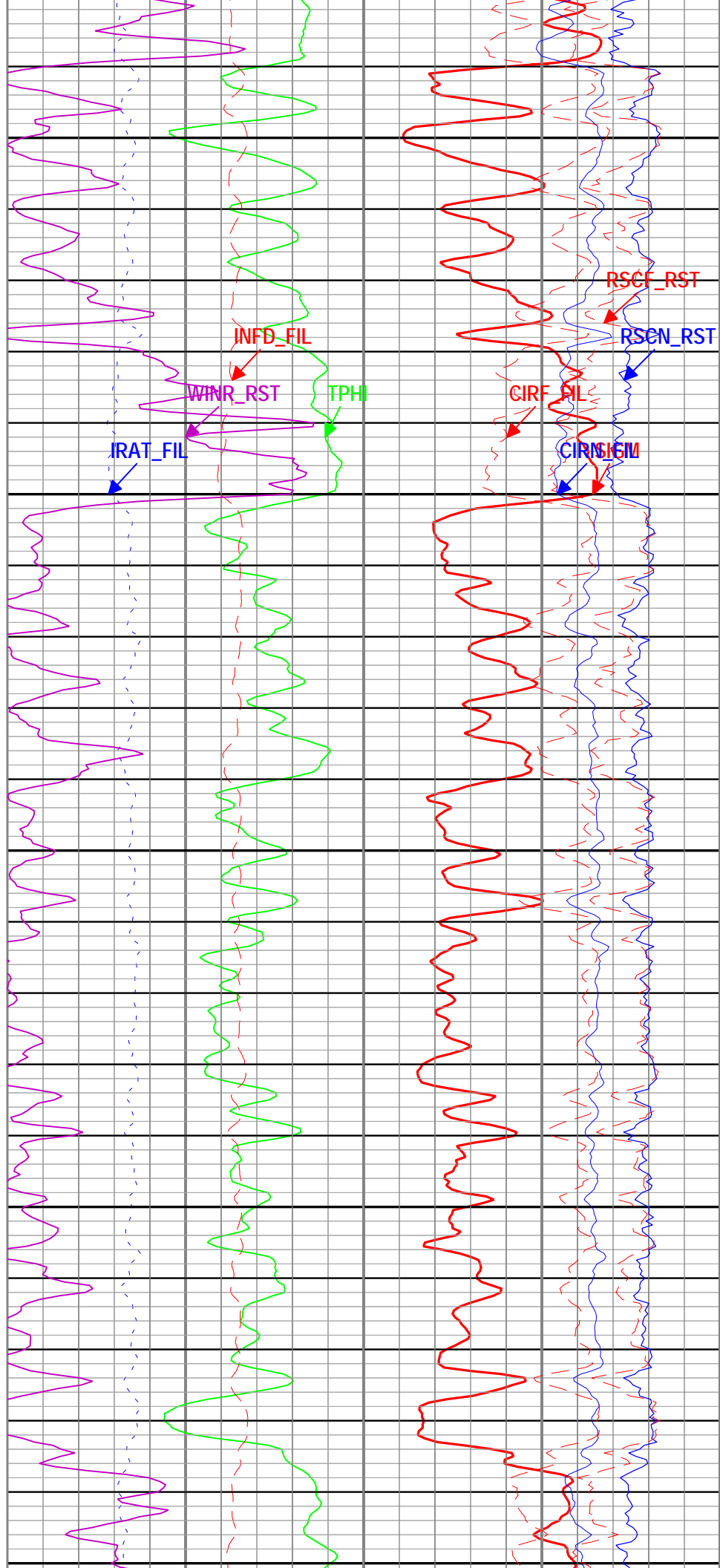
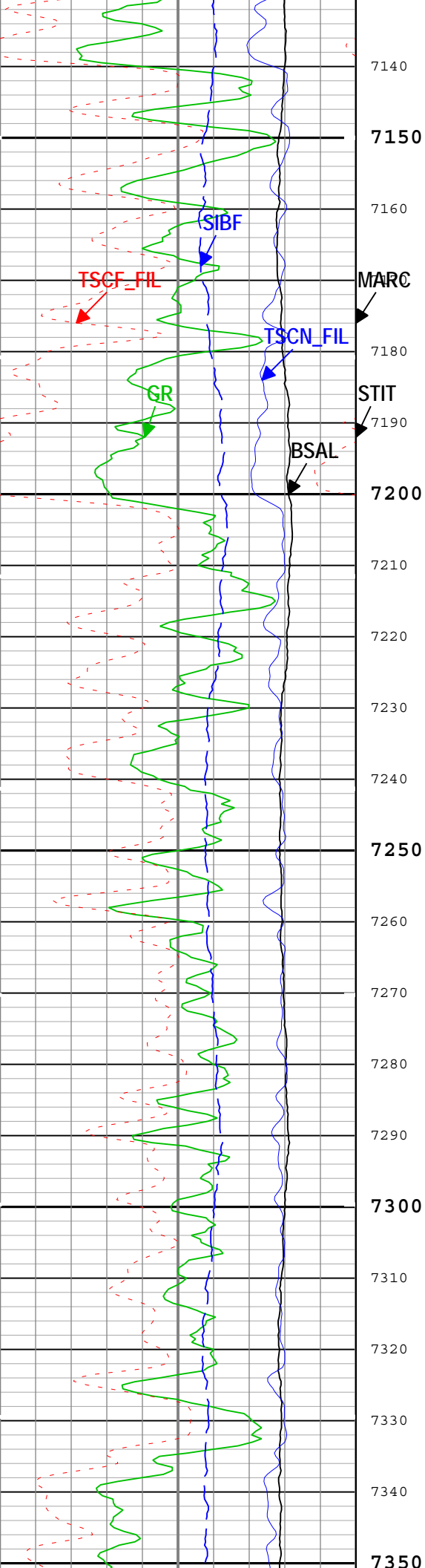


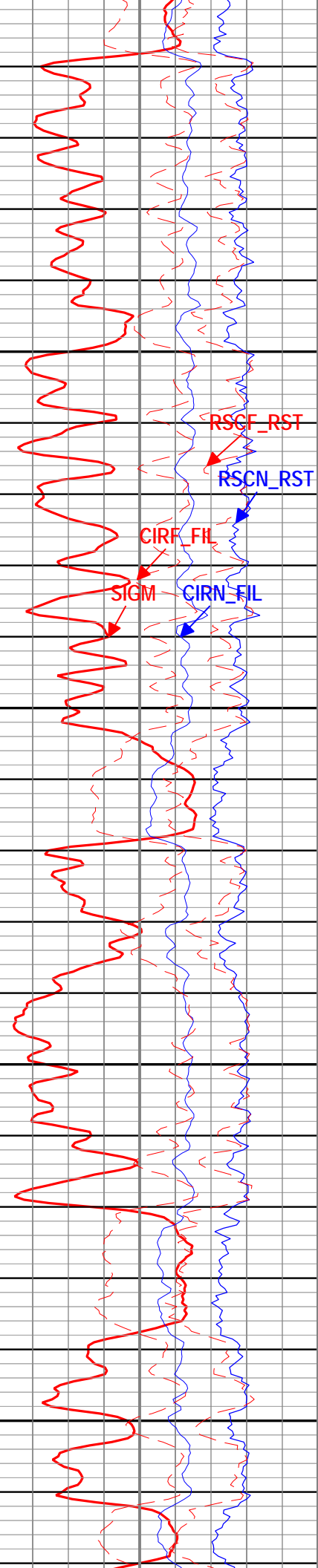
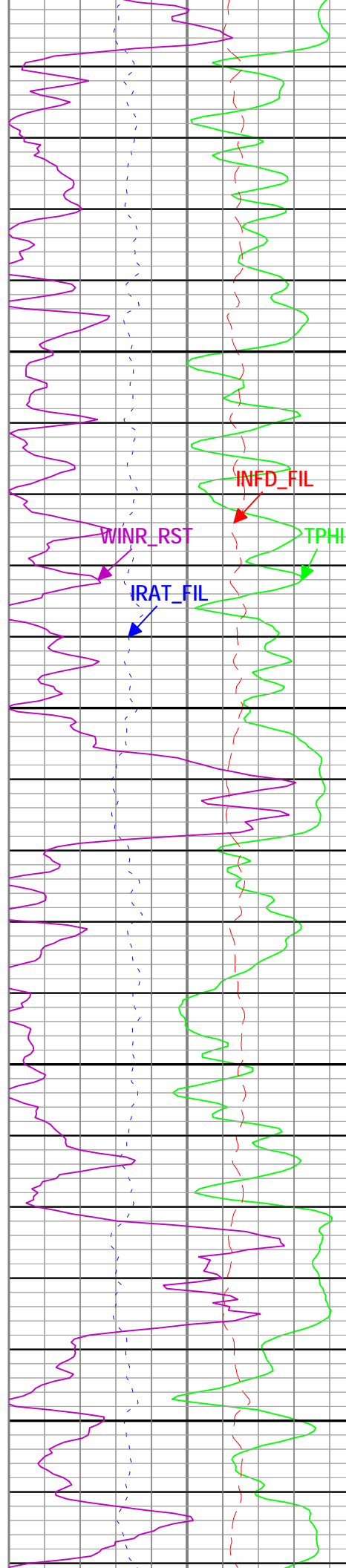
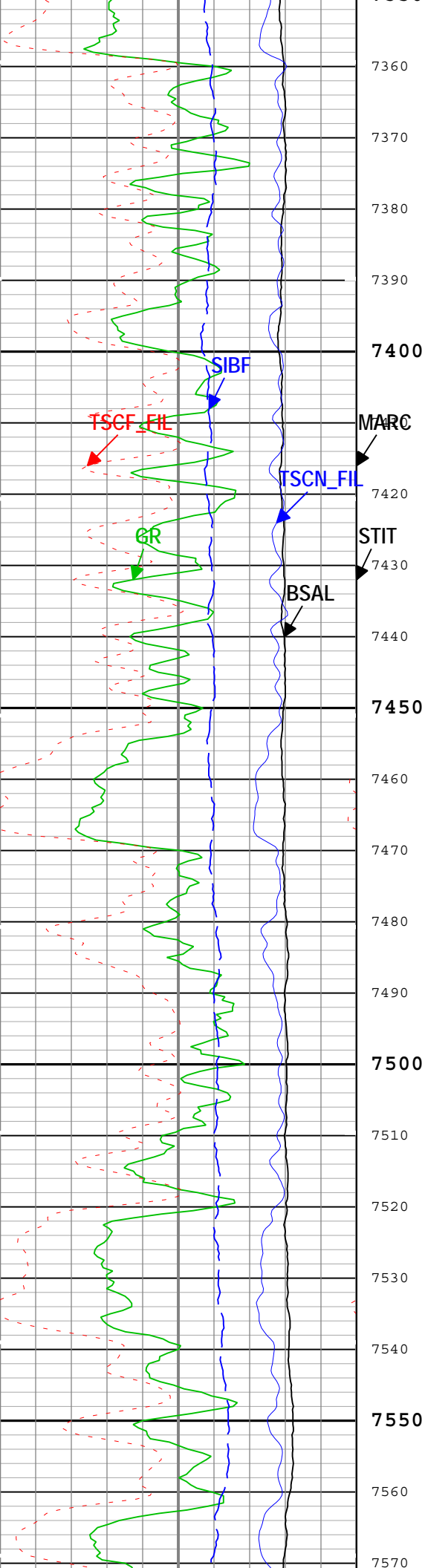


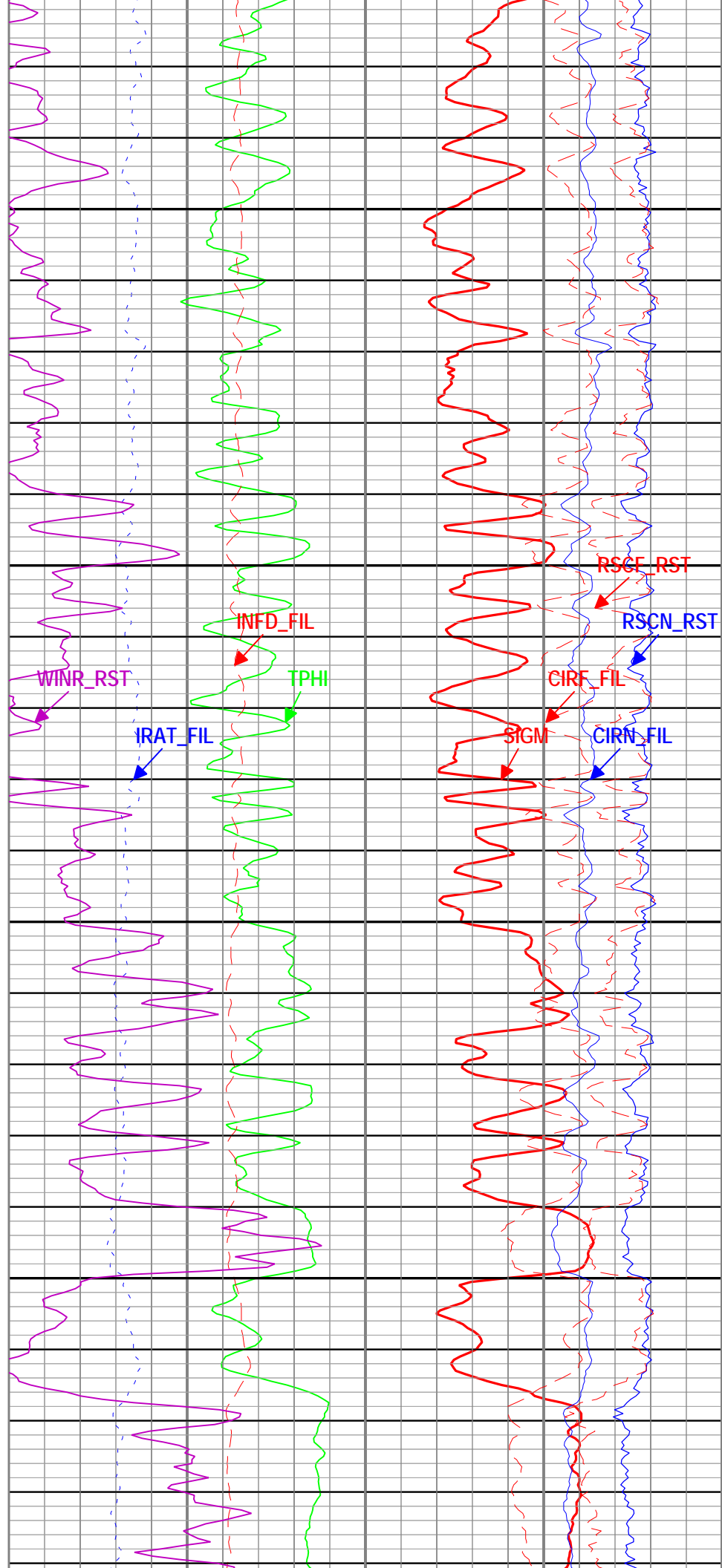
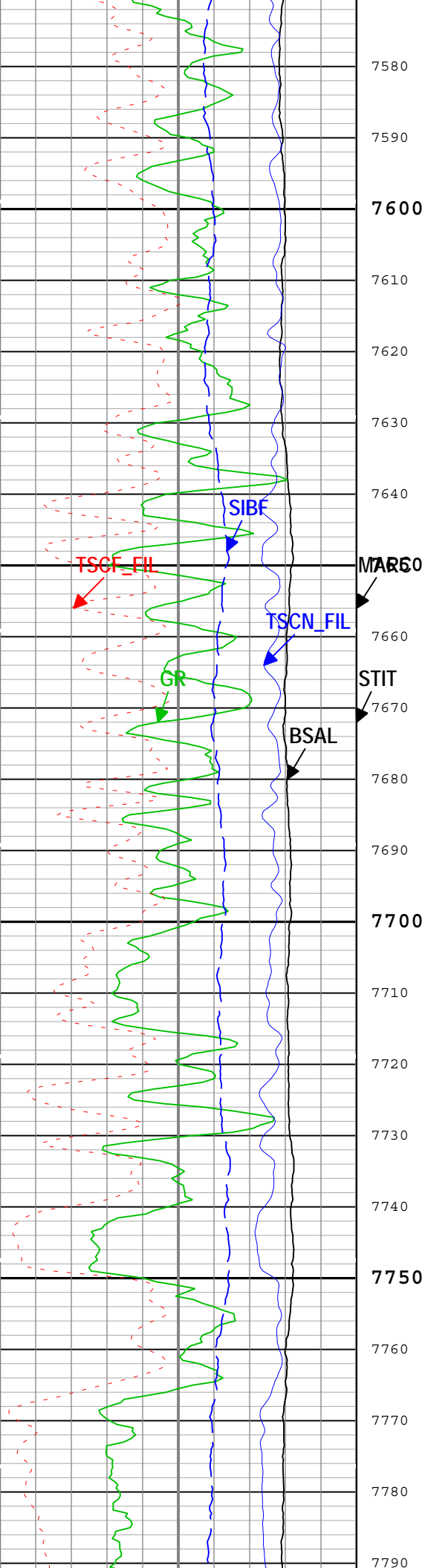


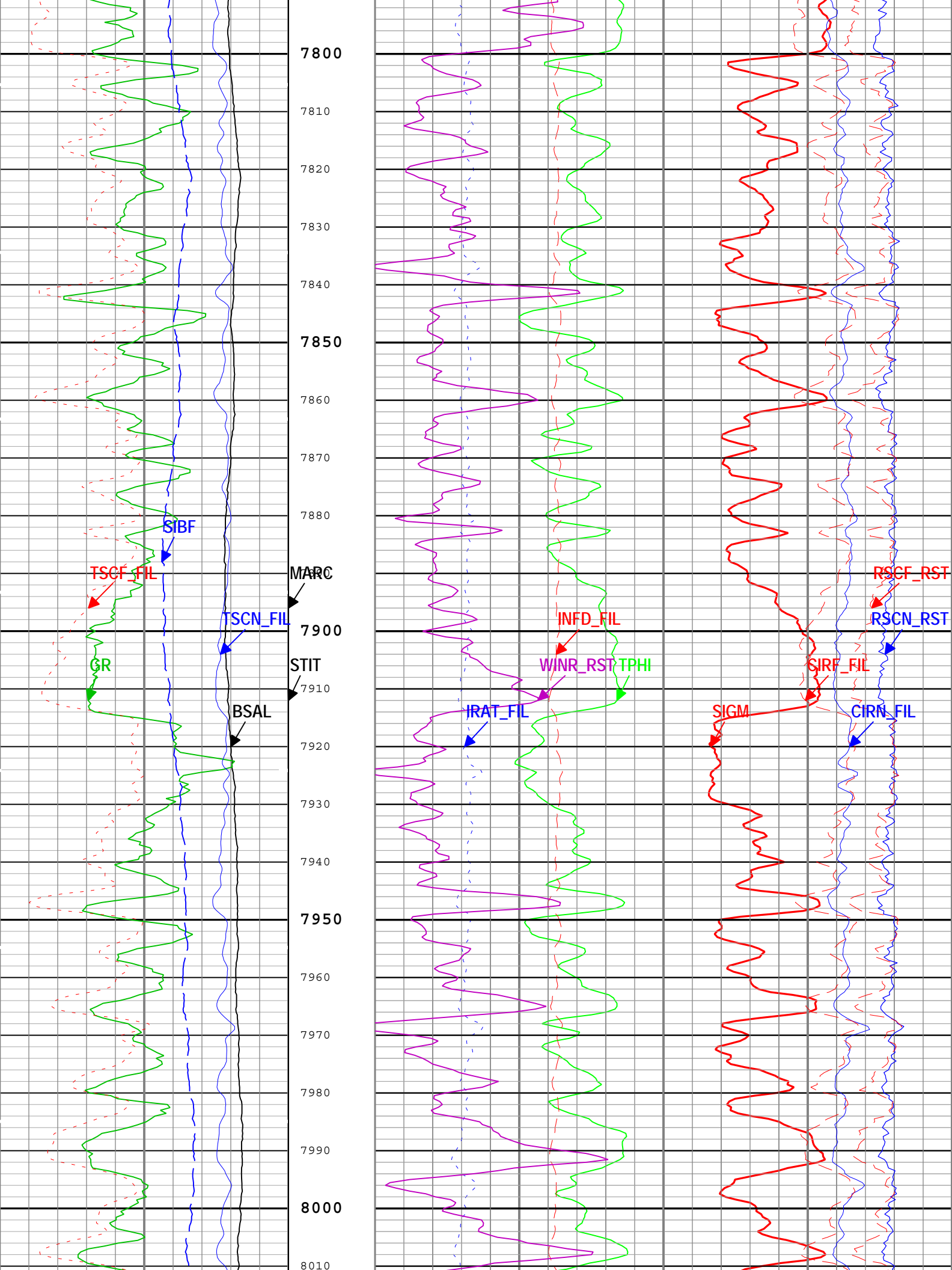


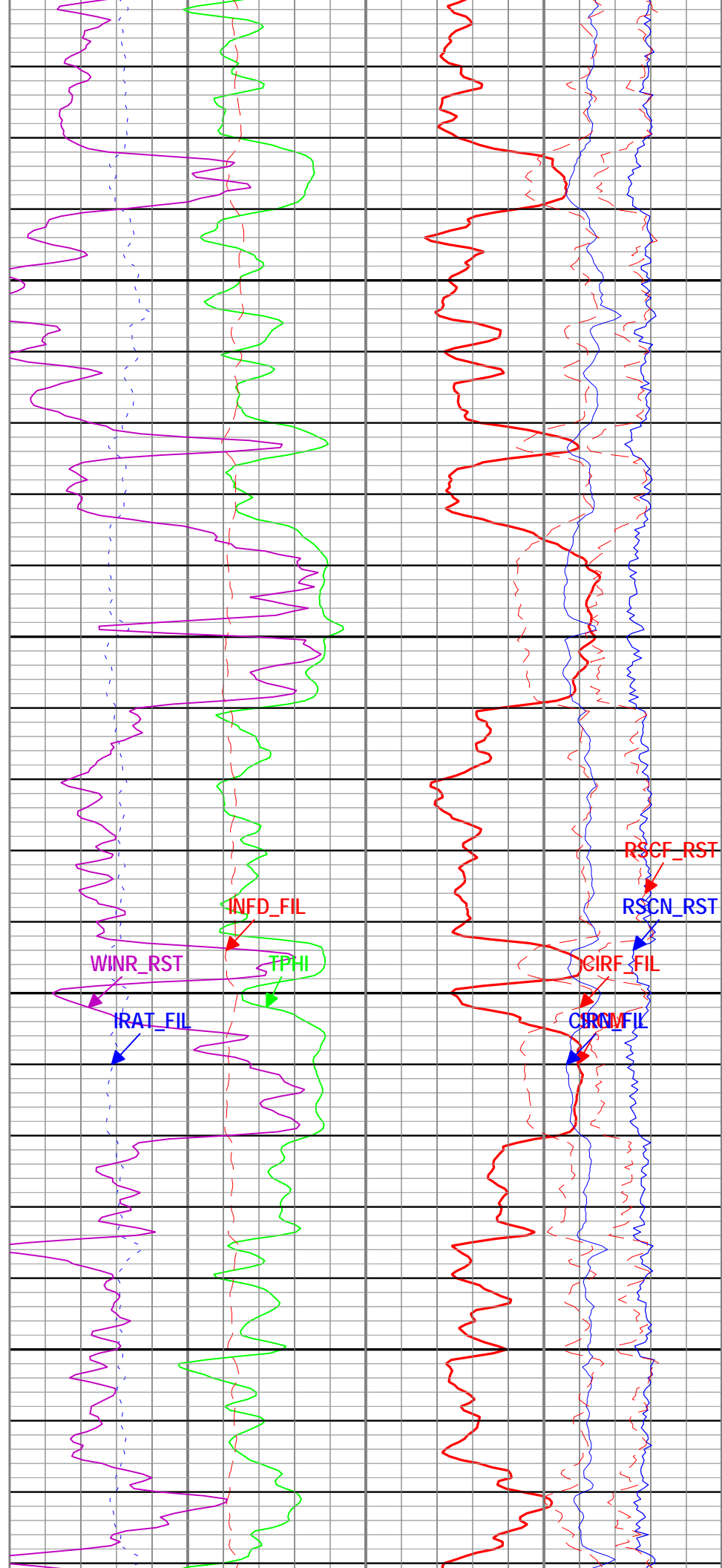
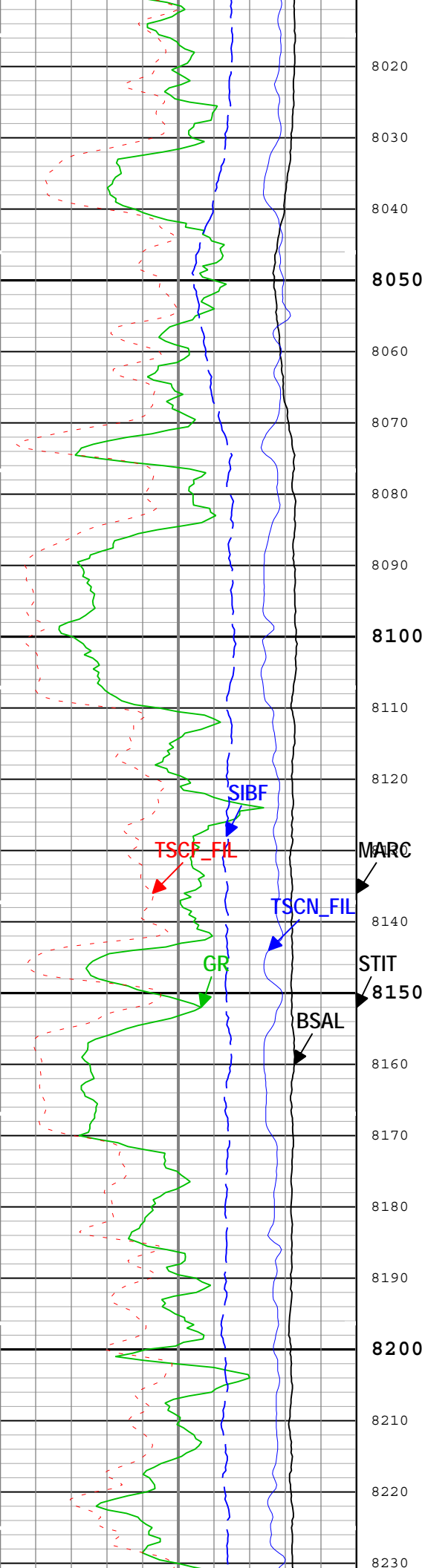


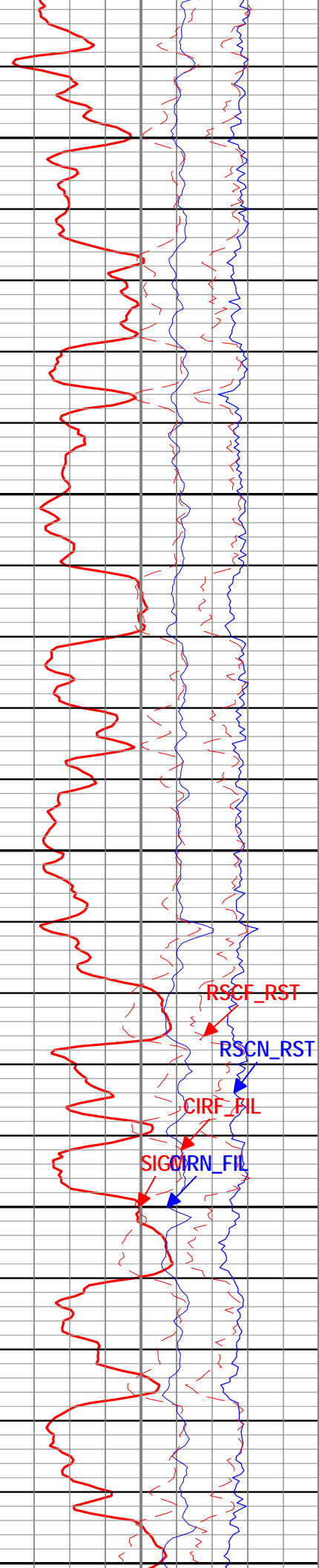
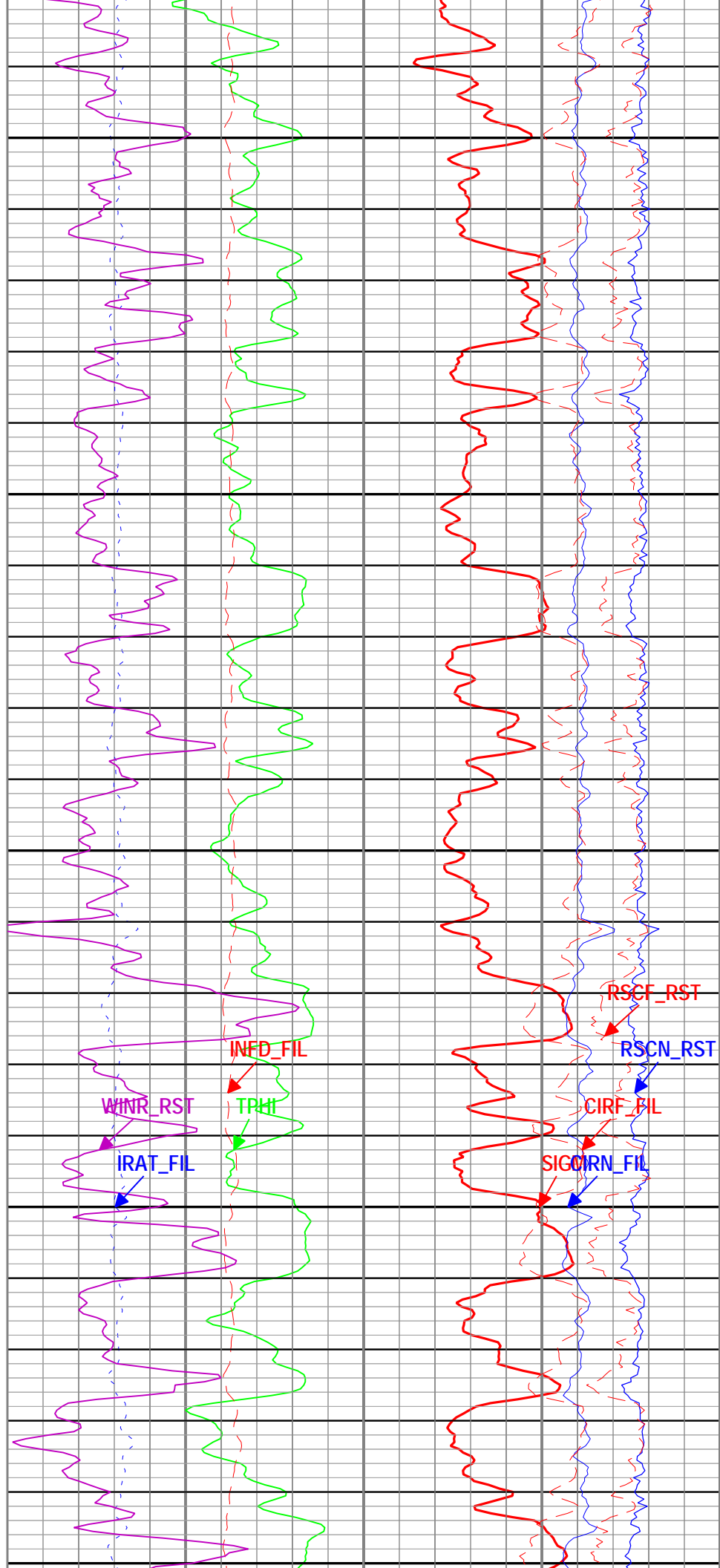
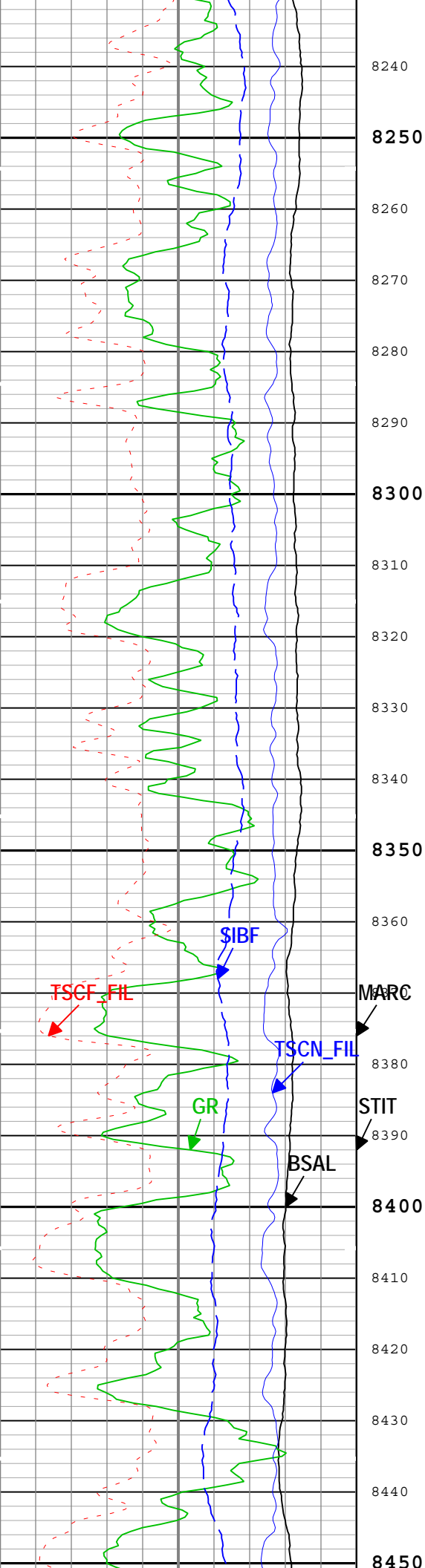


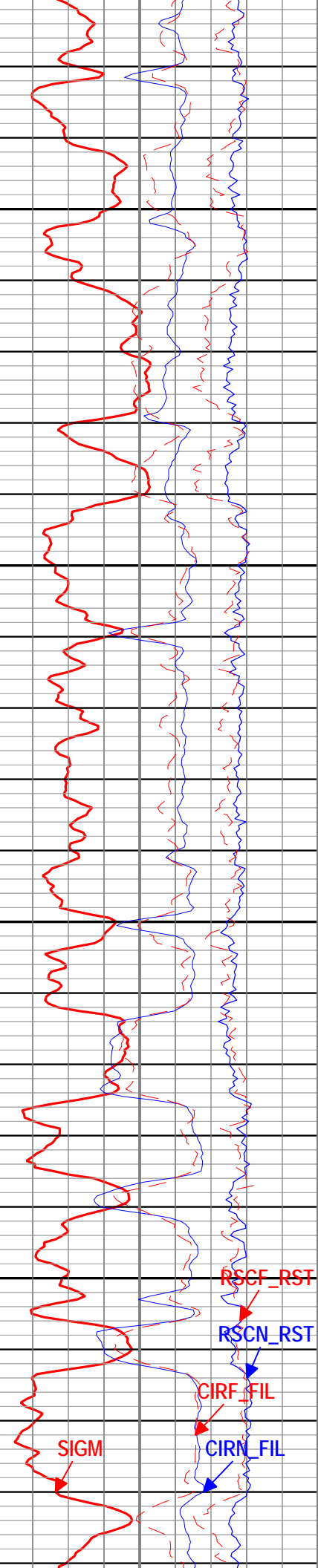
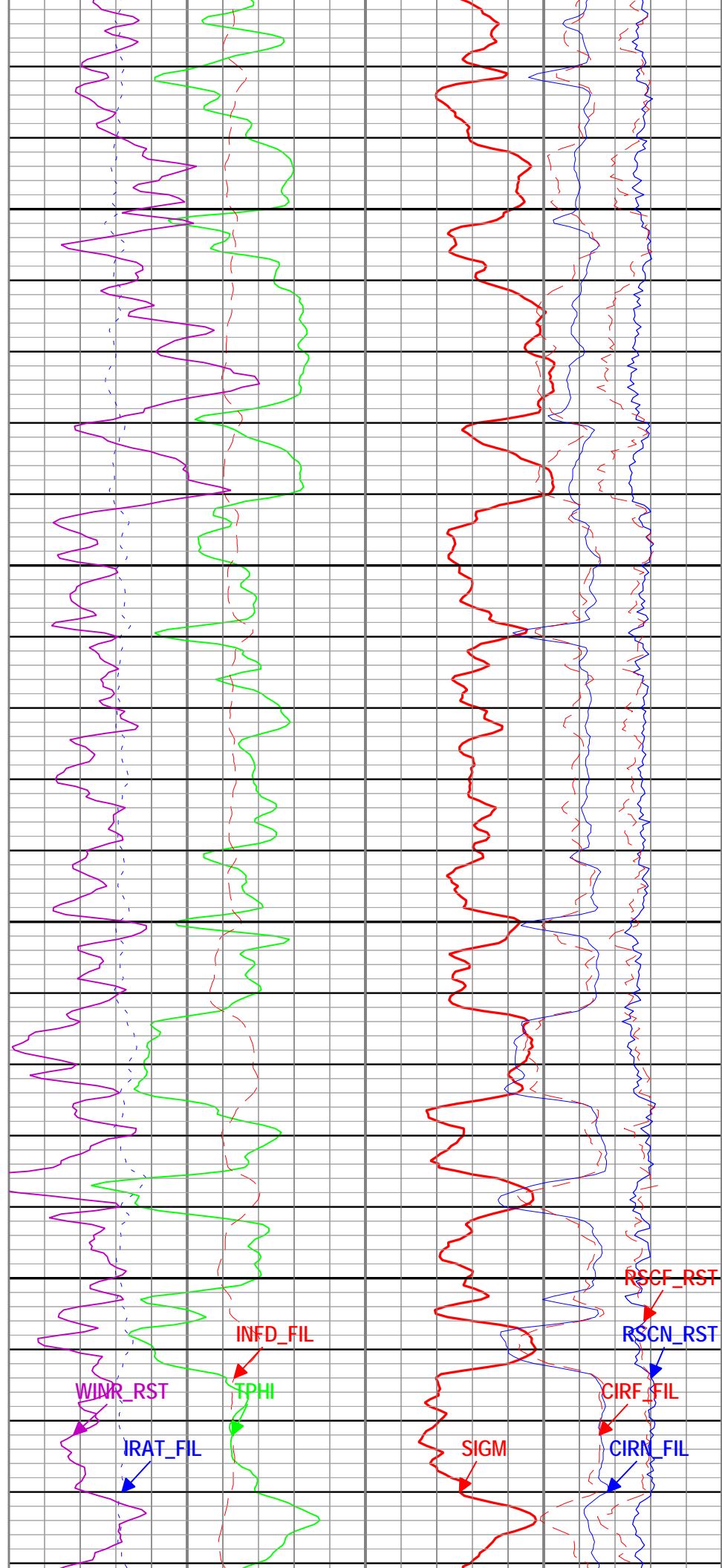
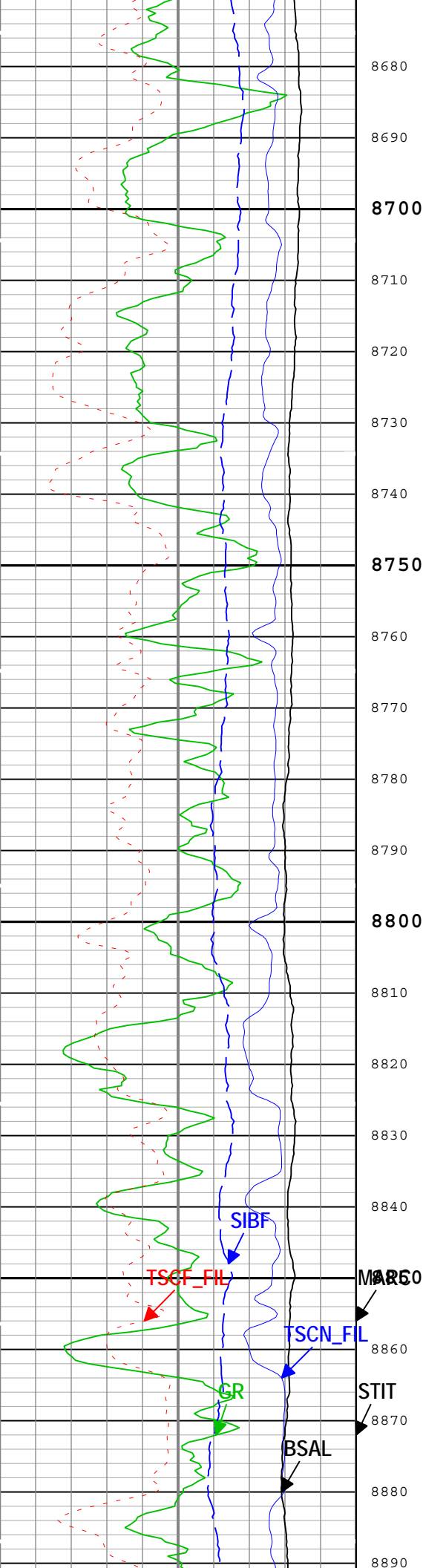


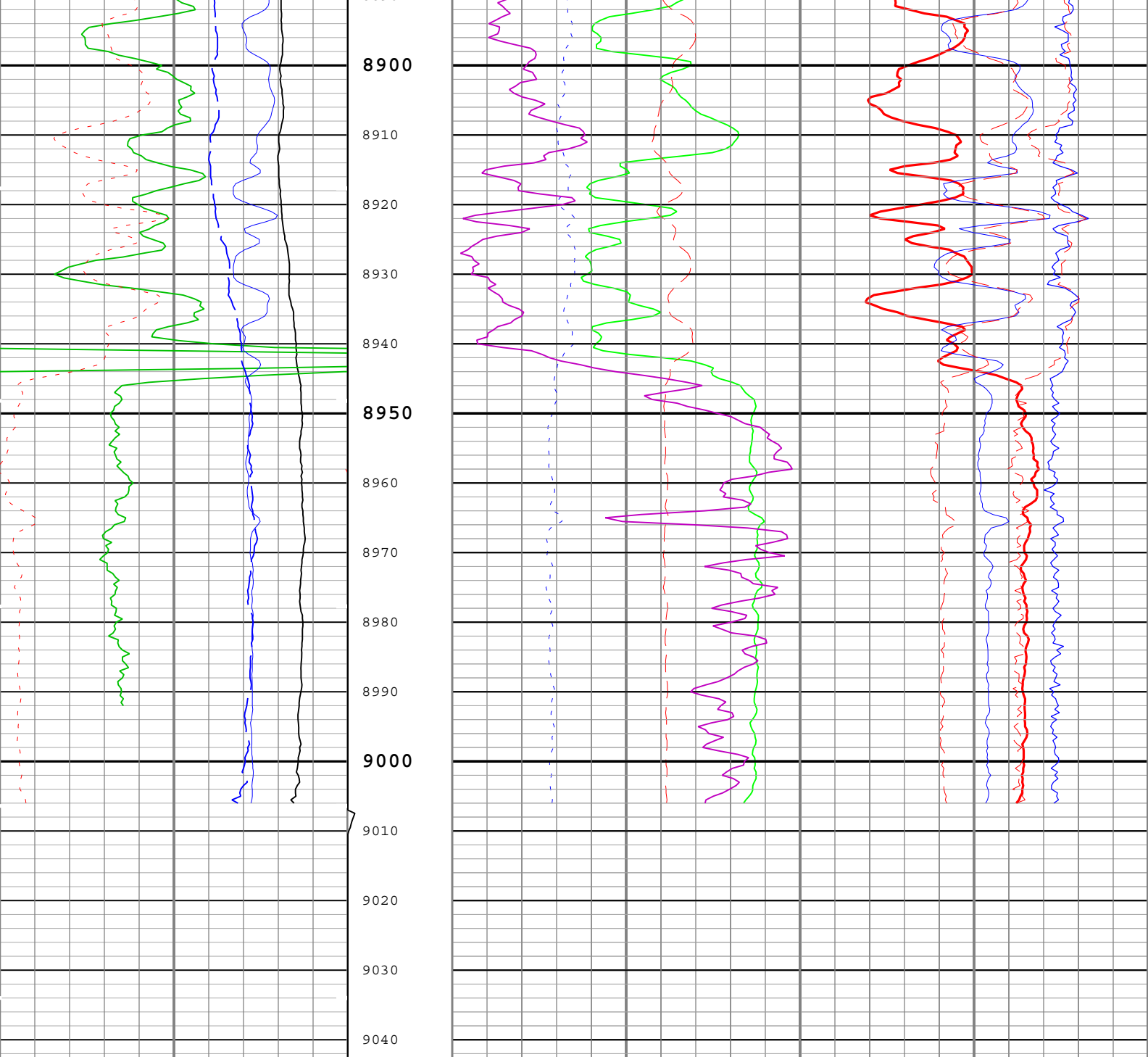












Borehole Salinity (BSAL) RST-C			Stuck Tool Indicator, Total (STIT)			Formation Sigma (Neutron Capture Cross Section) (SIGM) RST-C		
450	ppk	-50	0	ft	50	60	cu	0
Gamma Ray (GR) PSTP-A			Cable Drag From STIA to STIT			Weighted Inelastic Ratio (WINR_RST) RST-C		
0	gAPI	150	Tool_Tot. Drag From D3T to STIT			0		0.4
Total Selected Count Rate Near Detector Filtered (TSCN_FIL) RST-C			Minitron Arc Count (MARC) RST-C			Inelastic Ratio Filtered (IRAT_FIL) RST-C		
30000	1/s	0	0		5	0.75		0
Total Selected Count Rate Far Detector Filtered (TSCF_FIL) RST-C						Thermal Decay Porosity (TPHI) RST-C		
12000	1/s	0				0.6	ft3/ft3	0
Sigma Borehole Fluid (SIBF) RST-C						Gross Inelastic Count Rate Far Detector Filtered (INFD_FIL) RST-C		
100	cu	0				10000	1/s	0
						Capture to Inelastic Ratio Near Filtered (CIRN_FIL) RST-C		
						2.5		0
						Capture to Inelastic Ratio Far Filtered (CIRF_FIL) RST-C		
						5		0
						Near Detector Effective Unregulated Capture Count Rate (RSCN_RST) RST-C		
						45		0
						Far Detector Effective Unregulated Capture Count Rate (RSCF_RST) RST-C		

45

0

└─ICV - Integrated Cement Volume every 100.00 (ft3)

└─ICV - Integrated Cement Volume every 10.00 (ft3)

└─IHV - Integrated Hole Volume every 100.00 (ft3)

└─IHV - Integrated Hole Volume every 10.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

└─TIME_1900 - Elapsed time since midnight, 30 December 1899 every 60.00 (s)

Description: RST SIGMA Answer Format: Log (RST SIGMA Answer) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 22-Jul-2015 08:01:58

Channel Processing Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	Depth Zoned	in
BSAL	Borehole Salinity	Borehole	0	ppm
BSALOPT	Borehole Salinity Option	RST-C	Unknown	
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFT	Drilling Fluid Type	Borehole	Water	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	SANDSTONE	
TD	Total Measured Depth	Borehole	9059	ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	16	2460	2488
BS	8.75	2488	9042.63

All depth are actual.

Tool Control Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	150	ft/h
RST_DLM	Depth Log Mode	RST-C	Sigma	

ONE

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Repeat[2]:Up	Up	8665.93 ft	9041.98 ft	22-Jul-2015 3:31:19 AM	22-Jul-2015 3:55:39 AM	ON	5.73 ft	No
ONE	Main[3]:Up	Up	2435.96 ft	9042.63 ft	22-Jul-2015 4:01:20 AM	22-Jul-2015 7:41:43 AM	ON	8.33 ft	No

All depths are referenced to toolstring zero

Log

Company:Caerus Piceance LLC Well:Puckett 13C-1

ONE: Main[3]:Up:S009

Description: RST SIGMA Answer Format: Log (RST SIGMA Answer RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 22-Jul-2015 08:02:02

└─TIME_1900 - Elapsed time since midnight, 30 December 1899 every 60.00 (s)

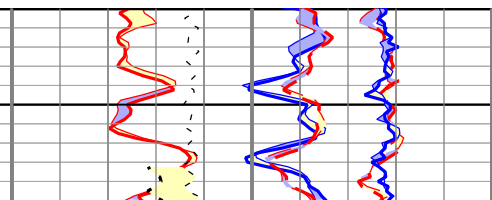
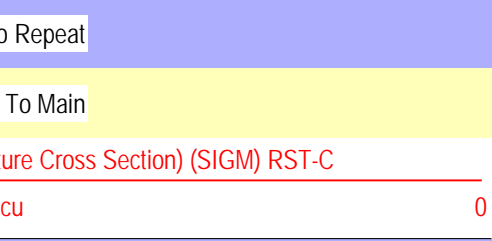
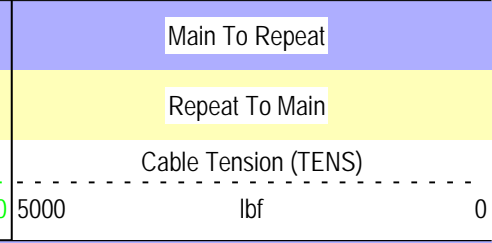
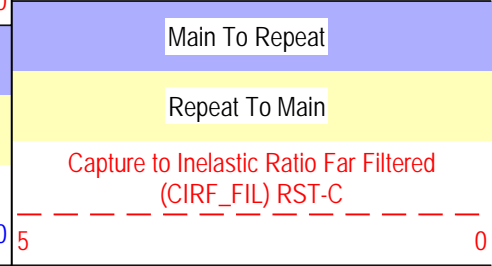
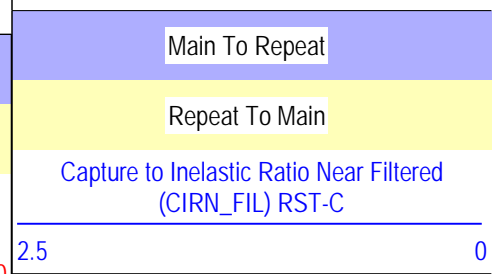
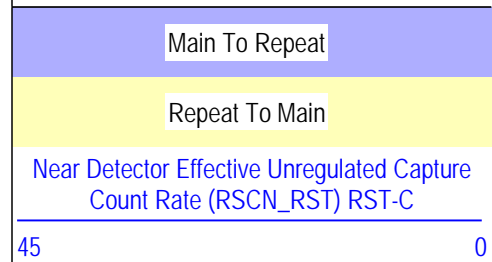
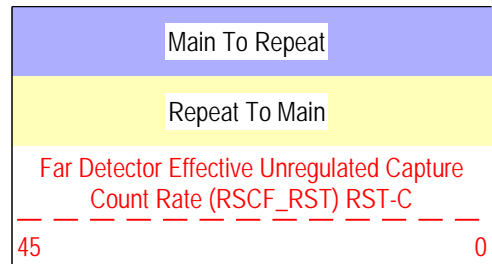
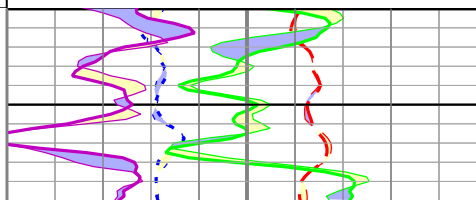
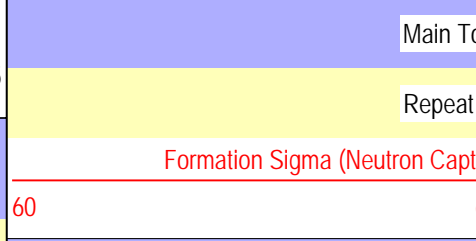
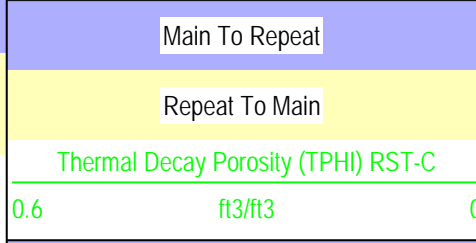
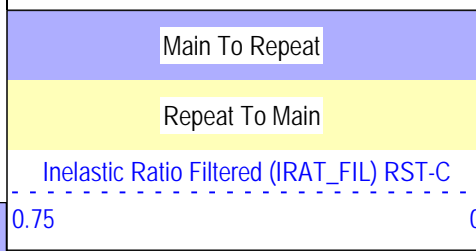
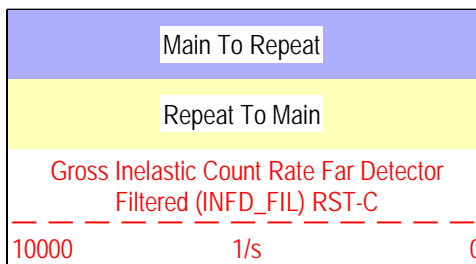
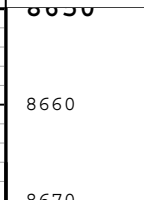
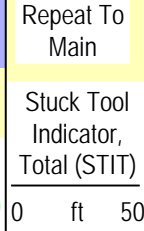
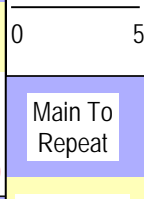
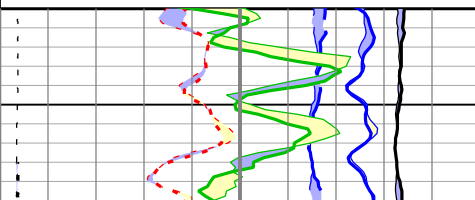
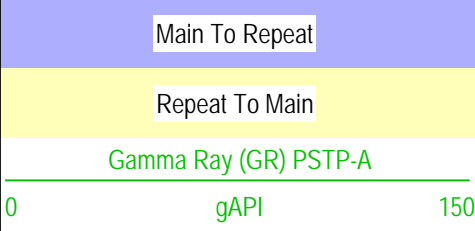
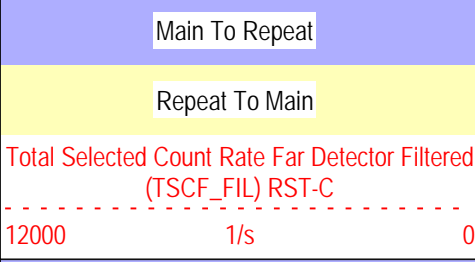
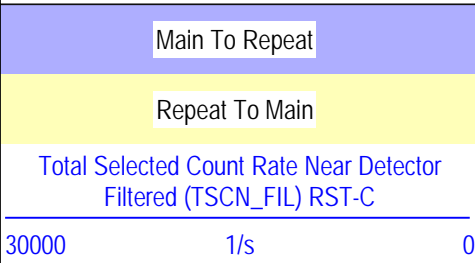
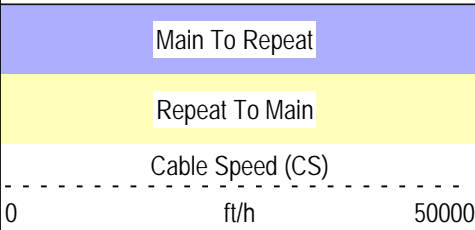
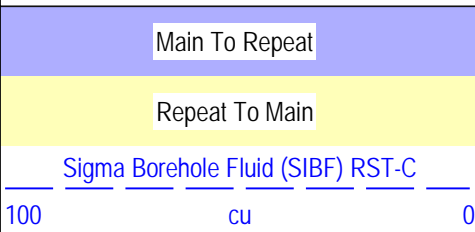
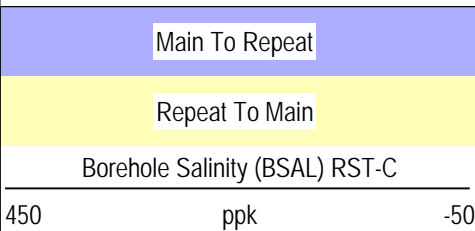
└─IHV - Integrated Hole Volume every 10.00 (ft3)

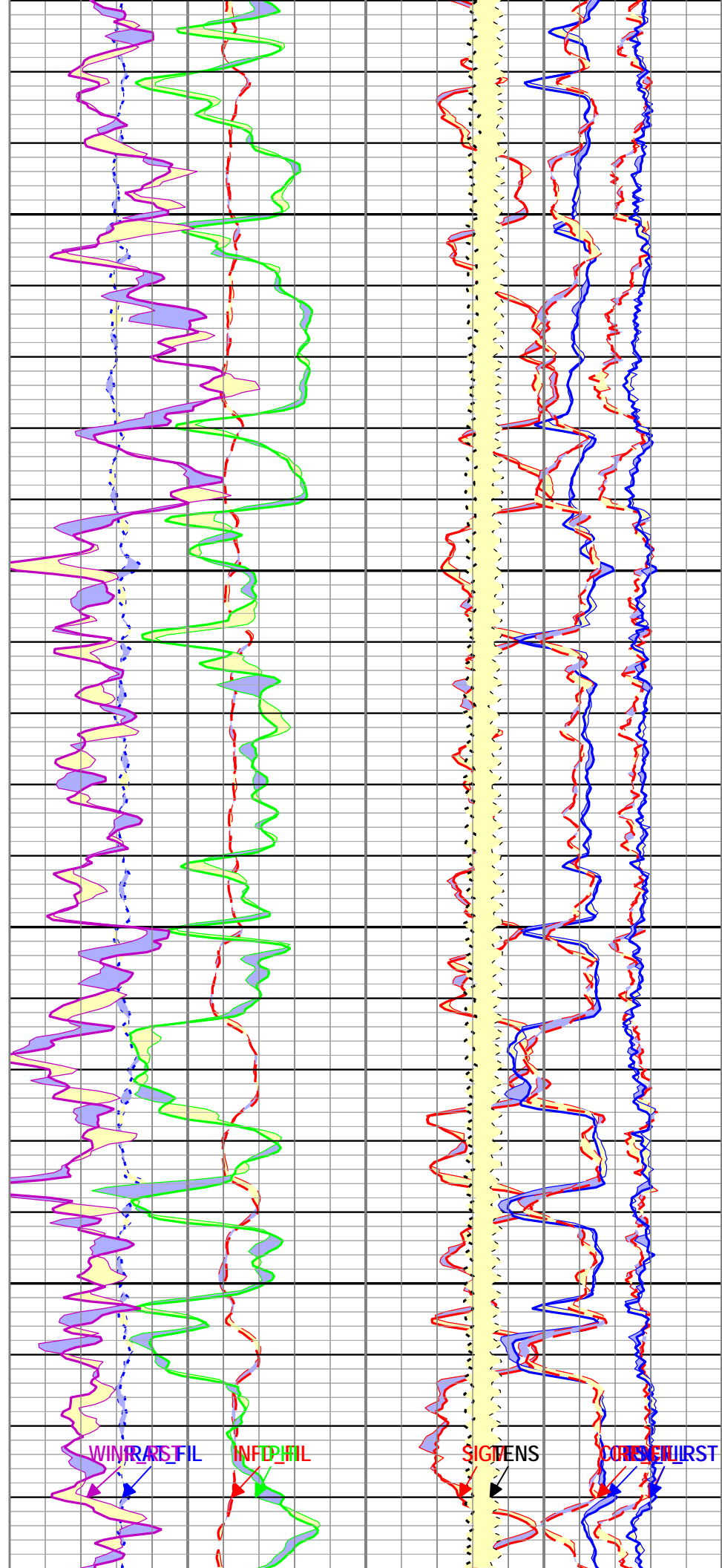
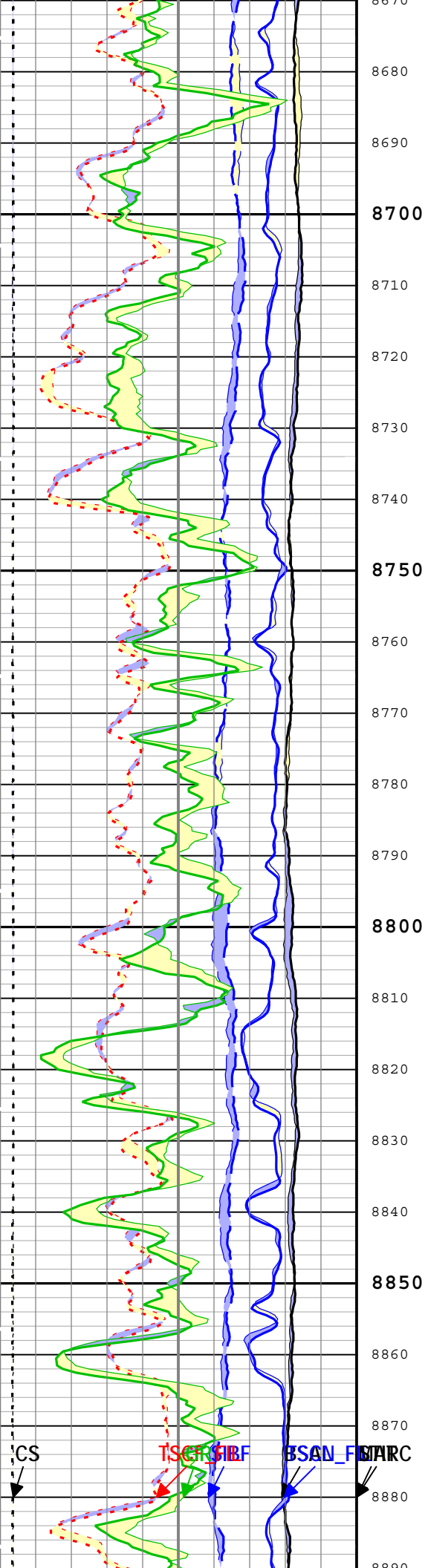
└─IHV - Integrated Hole Volume every 100.00 (ft3)

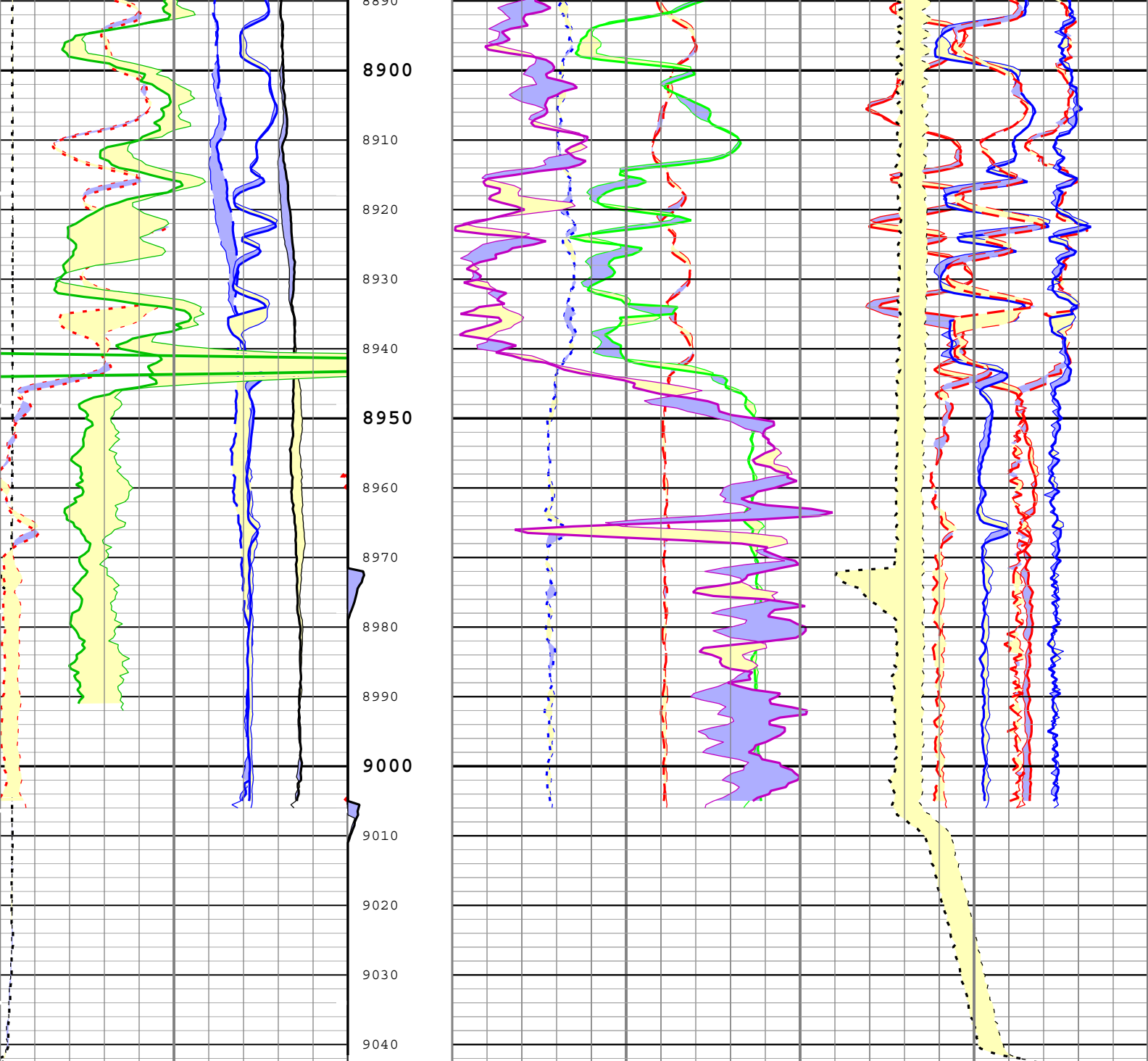
TIME_1900 - Time Marked every 60.00 (s)

└ ICV - Integrated Cement Volume every 10.00 (ft3)

└ ICV - Integrated Cement Volume every 100.00 (ft3)







Main To Repeat		Main To Repeat	
Repeat To Main		Repeat To Main	
Borehole Salinity (BSAL) RST-C		Formation Sigma (Neutron Capture Cross Section) (SIGM) RST-C	
450	ppk	-50	
Main To Repeat		Main To Repeat	
Repeat To Main		Repeat To Main	
Sigma Borehole Fluid (SIBF) RST-C		Weighted Inelastic Ratio (WINR_RST) RST-C	
100	cu	0	0.4
Main To Repeat		Main To Repeat	Main To Repeat
Repeat To Main		Repeat To Main	Repeat To Main
Cable Speed (CS)		Gross Inelastic Count Rate Ear Detector	
		Ear Detector Effective Unregulated Capture	

Cable Speed (CS)			Indicator, Total (STIT)			Gross Inelastic Count Rate Far Detector Filtered (INFD_FIL) RST-C			Far Detector Effective Unregulated Capture Count Rate (RSCF_RST) RST-C		
0	ft/h	50000	0	ft	50	10000	1/s	0	45		0
Main To Repeat						Main To Repeat			Main To Repeat		
Repeat To Main						Repeat To Main			Repeat To Main		
Total Selected Count Rate Near Detector Filtered (TSCN_FIL) RST-C						Inelastic Ratio Filtered (IRAT_FIL) RST-C			Near Detector Effective Unregulated Capture Count Rate (RSCN_RST) RST-C		
30000	1/s	0				0.75		0	45		0
Main To Repeat						Main To Repeat			Main To Repeat		
Repeat To Main						Repeat To Main			Repeat To Main		
Total Selected Count Rate Far Detector Filtered (TSCF_FIL) RST-C						Thermal Decay Porosity (TPHI) RST-C			Capture to Inelastic Ratio Near Filtered (CIRN_FIL) RST-C		
12000	1/s	0				0.6	ft3/ft3	0	2.5		0
Main To Repeat									Main To Repeat		
Repeat To Main									Repeat To Main		
Gamma Ray (GR) PSTP-A									Capture to Inelastic Ratio Far Filtered (CIRF_FIL) RST-C		
0	gAPI	150							5		0
									Main To Repeat		
									Repeat To Main		
									Cable Tension (TENS)		
									5000	lbf	0

Degradation Factor Calibration Coefficient - 0							
Far IC Mode Capture Optimization Resolution Degradation Factor Calibration Coefficient - 0		Master	----	----	----	----	
Near Pulse Shape Compensation Voltage Setting Echo Calibration Coefficient - 0	V	Master	----	----	----	----	
Far Pulse Shape Compensation Voltage Setting Echo Calibration Coefficient - 0	V	Master	----	----	----	----	
Near Photomultiplier High Voltage Setting Echo Calibration Coefficient - 0	V	Master	----	----	----	----	
Far Photomultiplier High Voltage Setting Echo Calibration Coefficient - 0	V	Master	----	----	----	----	
Minitron Measured Beam Current Calibration Coefficient - 0	uA	Master	----	----	----	----	
Grid Current Peak Calibration Coefficient - 0	mA	Master	----	----	----	----	
Minitron Measured Extractor Current Calibration Coefficient - 0	uA	Master	----	----	----	----	
Minitron Measured High Voltage Calibration Coefficient - 0	kV	Master	----	----	----	----	
Near Instantaneous Count Rate Calibration Coefficient - 0	kHz	Master	----	----	----	----	
Near/Far Count Rate Ratio Calibration Coefficient - 0		Master	----	----	----	----	

RST IC Tank Check - RST IC Tank Check

Master:							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Spectral Acquisition Time Calibration Coefficient	s	Master			NOT DONE		
Near Carbon/Oxygen Ratio Calibration Coefficient - 0		Master	----	----	----	----	
Far Carbon/Oxygen Ratio Calibration Coefficient - 0		Master	----	----	----	----	
Near Windows Carbon/Oxygen Ratio Calibration Coefficient - 0		Master	----	----	----	----	
Far Windows Carbon/Oxygen Ratio Calibration Coefficient - 0		Master	----	----	----	----	
Near IC Mode Capture Optimization Resolution Degradation Factor Calibration Coefficient - 0		Master	----	----	----	----	
Far IC Mode Capture Optimization Resolution Degradation Factor Calibration Coefficient - 0		Master	----	----	----	----	
Near Pulse Shape Compensation Voltage Setting Echo Calibration Coefficient - 0	V	Master	----	----	----	----	
Far Pulse Shape Compensation Voltage Setting Echo Calibration Coefficient - 0	V	Master	----	----	----	----	
Near Photomultiplier High Voltage Setting Echo Calibration Coefficient - 0	V	Master	----	----	----	----	
Far Photomultiplier High Voltage Setting Echo Calibration Coefficient - 0	V	Master	----	----	----	----	
Minitron Measured Beam Current Calibration Coefficient - 0	uA	Master	----	----	----	----	
Grid Current Peak Calibration Coefficient - 0	mA	Master	----	----	----	----	
Minitron Measured Extractor Current Calibration Coefficient - 0	uA	Master	----	----	----	----	
Minitron Measured High Voltage Calibration Coefficient - 0	kV	Master	----	----	----	----	
Near Instantaneous Count Rate Calibration Coefficient	kHz	Master			NOT DONE		
Near/Far Count Rate Ratio Calibration Coefficient		Master			NOT DONE		

RST Sigma Tank Check - RST Sigma Tank Check

Master (Measured): 14:57:24 17-Jul-2015							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Spectral Acquisition Time Calibration Coefficient	s	Master		300.0	300.3		
Near/Far Capture Ratio Calibration Coefficient		Master	0.980	0.930	0.982	1.030	
Sigma Formation Near Apparent Calibration Coefficient - 0	1/m	Master	----	----	----	----	
Sigma Formation Far Apparent Calibration Coefficient - 0	1/m	Master	----	----	----	----	
Near Pulse Shape Compensation Voltage Setting Echo Calibration Coefficient	V	Master	3.500	2.445	3.700	4.555	

Far Pulse Shape Compensation Voltage Setting Echo Calibration Coefficient	V	Master	3.325	2.095	2.433	4.555	
Near Photomultiplier High Voltage Setting Echo Calibration Coefficient	V	Master	1400.000	1100.000	1145.795	1700.000	
Far Photomultiplier High Voltage Setting Echo Calibration Coefficient	V	Master	1400.000	1100.000	1183.172	1700.000	
Minitron Measured Beam Current Calibration Coefficient	uA	Master	75.000	50.000	85.102	100.000	
Grid Current Peak Calibration Coefficient	mA	Master	60.000	58.000	60.036	62.000	
Minitron Measured Extractor Current Calibration Coefficient	uA	Master	499.500	0	0.000	999.000	
Minitron Measured High Voltage Calibration Coefficient	kV	Master	73.000	50.000	80.028	96.000	
Near Instantaneous Count Rate Calibration Coefficient	kHz	Master	400.000	340.000	349.576	460.000	
Near/Far Count Rate Ratio Calibration Coefficient		Master	1.300	1.000	1.471	1.600	

PSTP-A (PSP Telemetry Platform A - Sapphire) Calibration - Run ONE

Primary Equipment :

PBMS-A

PBMS-A

1963

Calibration Parameter :

JIG-BKGD (Jig minus background reference)

160

PBMS Well Temp Master Calibration

Master (EEPROM): 00:00:00 12-May-2005

PBMS_RTD_THERM (Master) RTD Coefficients

	Tt**0	Tt**1	Tt**2	Tt**3	Tt**4	Tt**5
Tt**0	-1418.501	1118.407	-362.1241	56.89739	-3.317989	0

PBMS Gamma Ray Master Calibration

Master (EEPROM): 00:00:00 01-Dec-2003

PBMS_GR_MODEL (Master) GR Coefficients

	Rt**0	Rt**1
Rt**0	2000	4740

PBMS A Reference Clock Master Calibration

Master (EEPROM): 00:00:00 12-May-2005

PBMS_REF_CLOCK (Master) PBMS A Clock Coefficients

	Temp**0	Temp**1	Temp**2	Temp**3	Temp**4	Temp**5
Temp**0	45.0069	-9.445683	-0.02744274	0.0002354008	3.654205E-06	0

PBMS A Sapphire Master Calibration

Master (EEPROM): 00:00:00 12-May-2005

PBMS_P_GAUGE_PRE_Sapphire Pressure Model Coefficients (Master)

	Tt**0	Tt**1	Tt**2	Tt**3	Tt**4	Tt**5
Tp**0	4187.029	-3429.79	773.3541	-119.1729	7.244876	0
Tp**1	698.9312	545.2234	21.97955	-3.948855	0.2235462	0
Tp**2	-6.430802	9.633142	-3.005254	0	0	0
Tp**3	-2.550163	0.6971294	0	0	0	0

Tp**4	0	0	0	0	0	0
Tp**5	0	0	0	0	0	0
PBMS_P_GAUGE_TEMP Sapphire Temperature Model Coefficients (Master)						
	Tp**0	Tp**1	Tp**2	Tp**3	Tp**4	Tp**5
Tt**0	-293.9637	10.31608	-5.693609	1.308318	-0.1107738	0
Tt**1	63.53009	-2.347224	1.230874	-0.2610083	0.02165993	0
Tt**2	8.593975	0.03386374	-0.01621674	0	0	0
Tt**3	-0.487141	0.005250175	0	0	0	0
Tt**4	0	0	0	0	0	0
Tt**5	0	0	0	0	0	0

Company:	Caerus Piceance LLC	Schlumberger
Well:	Puckett 13C-1	
Field:	Wildcat	
County:	Garfield	
State:	Colorado	

Reservoir Saturation Tool
Sigma