

Company: Caerus Piceance LLC

Well: Puckett 43B-2

Field: Wildcat

County: Garfield State: Colorado

Reservoir Saturation Tool

Sigma

County:	Garfield
Field:	Wildcat
Location:	SHL: S2, T7S, R97W
Well:	Puckett 43B-2
Company:	Caerus Piceance LLC
Location:	
SHL: S2, T7S, R97W	Elev.: K.B. 8509.00 ft
2122' FSL & 1154' FEL	G.L. 8479.00 ft
LAT: 39.475678 / LONG: -108.180261	D.F. 8509.00 ft
Permanent Datum:	Ground Level
Log Measured From:	Kelly Bushing
Drilling Measured From:	Kelly Bushing
API Serial No.	Section: 2
05-045-22624	Township: 7S
	Range: 97W

Logging Date	24-Jul-2015
Run Number	ONE
Depth Driller	8915.00 ft
Schlumberger Depth	8848.00 ft
Bottom Log Interval	8848.00 ft
Top Log Interval	2500.00 ft
Casing Fluid Type	3% KCl
Salinity	
Density	9 lbm/gal
Fluid Level	0.00 ft
BIT/CASING/TUBING STRING	
Bit Size	8.75 in
From	2500.00 ft
To	8915.00 ft
Casing/Tubing Size	4.5 in
Weight	11.6 lbm/ft
Grade	P110
From	0.00 ft
To	8911.00 ft
Max Recorded Temperatures	225 degF
Logger on Bottom	24-Jul-2015 14:37:00
Unit Number	2135
Recorded By	Benjamin Mammon
Witnessed By	Natalie Naeve

Disclaimer

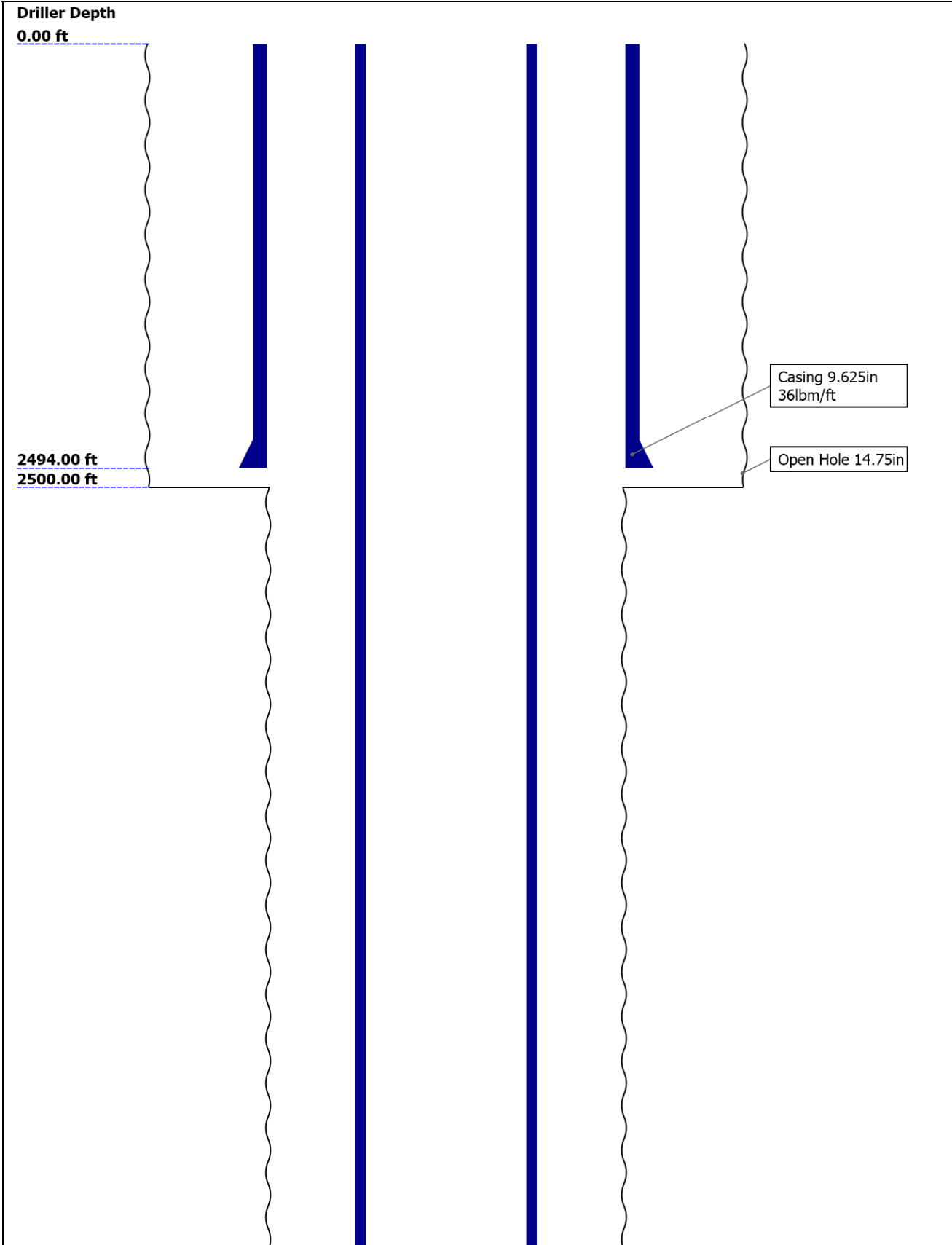
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Well Sketch



8911.00 ft

8915.00 ft

Casing 4.5in
11.6lbm/ft

Open Hole 8.75in

Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	14.75	8.75				
Top Driller (ft)	0	2500				
Top Logger (ft)	0	2500				
Bottom Driller (ft)	2500	8915				
Bottom Logger (ft)	2500	8915				
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)	2494	8911				
Bottom Logger (ft)	2494	8911				

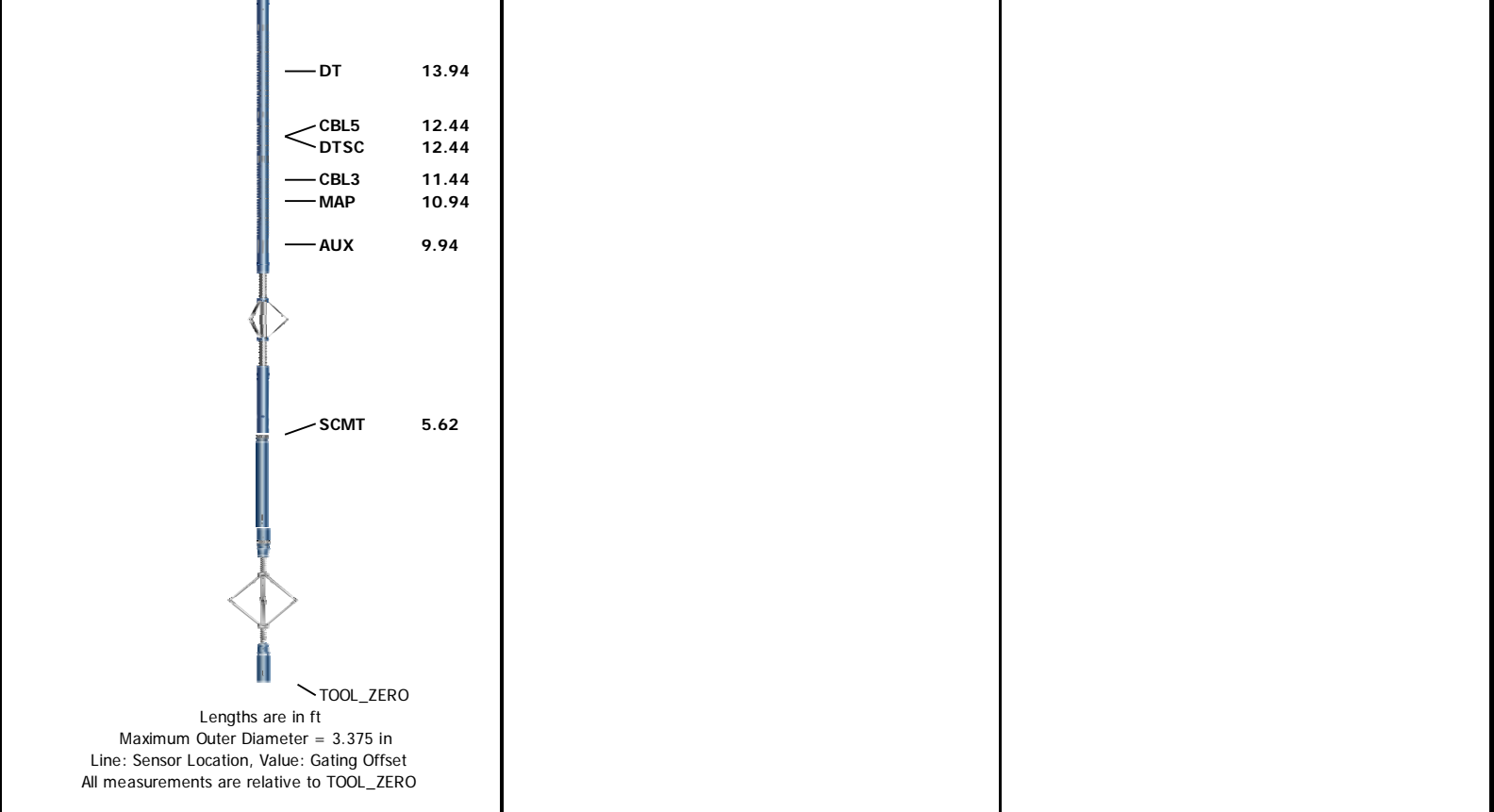
Operational Run Summary

Parameter (unit)	ONE					
Date Log Started	24-Jul-2015					
Time Log Started	13:16:34					
Date Log Finished	24-Jul-2015					
Time Log Finished	19:07:47					
Top Log Interval (ft)						
Bottom Log Interval (ft)						
Total Depth (ft)						
Max Hole Deviation (deg)						
Azimuth of Max Deviation (deg)						
Bit Size (in)	8.750					
Logging Unit Number	2135					
Logging Unit Location	Fort Morgan, CO					
Recorded By	Benjamin Marmon					

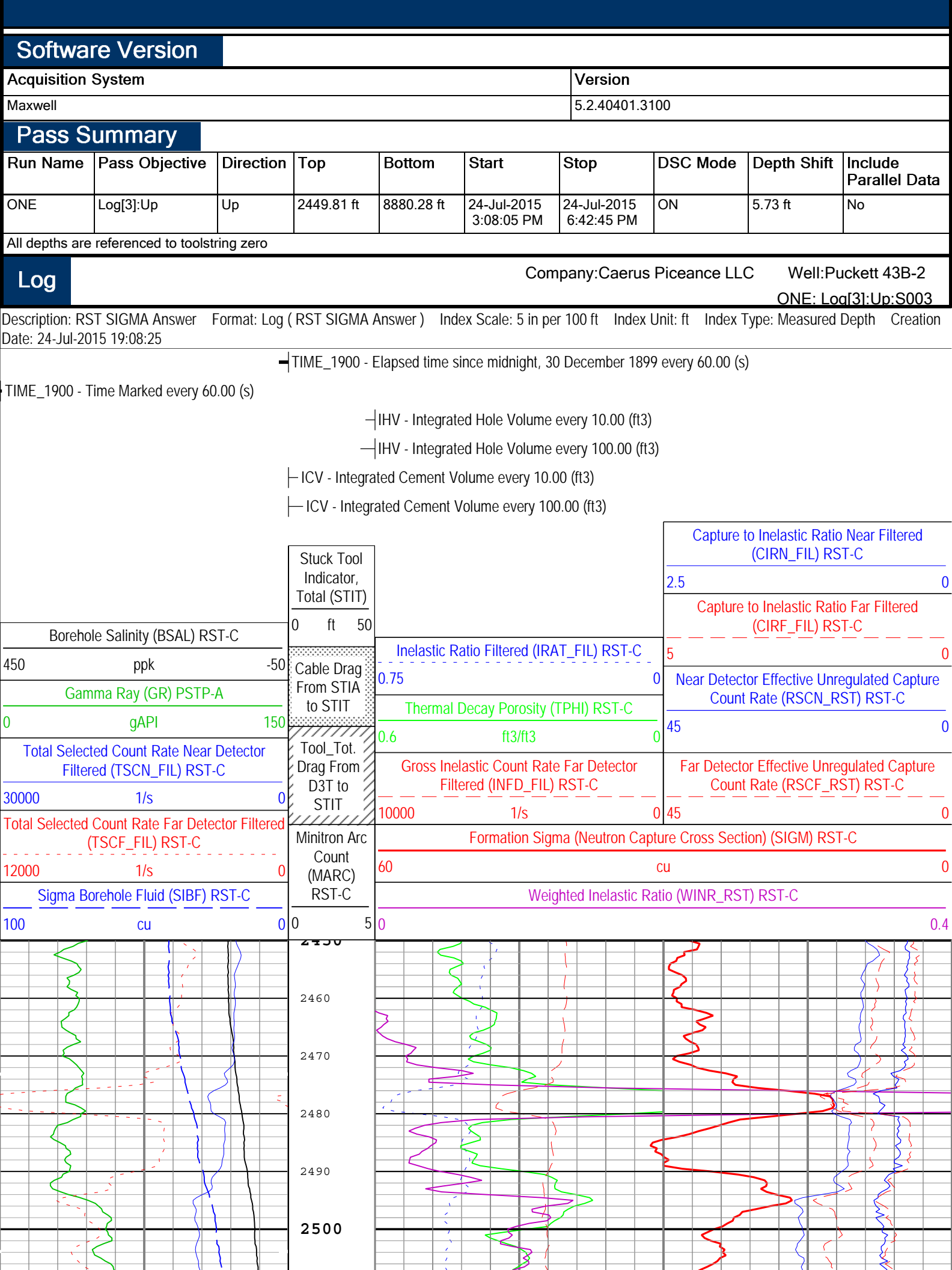
Witnessed By	Natalie Naeve					
Service Order Number	D5ND-00079					

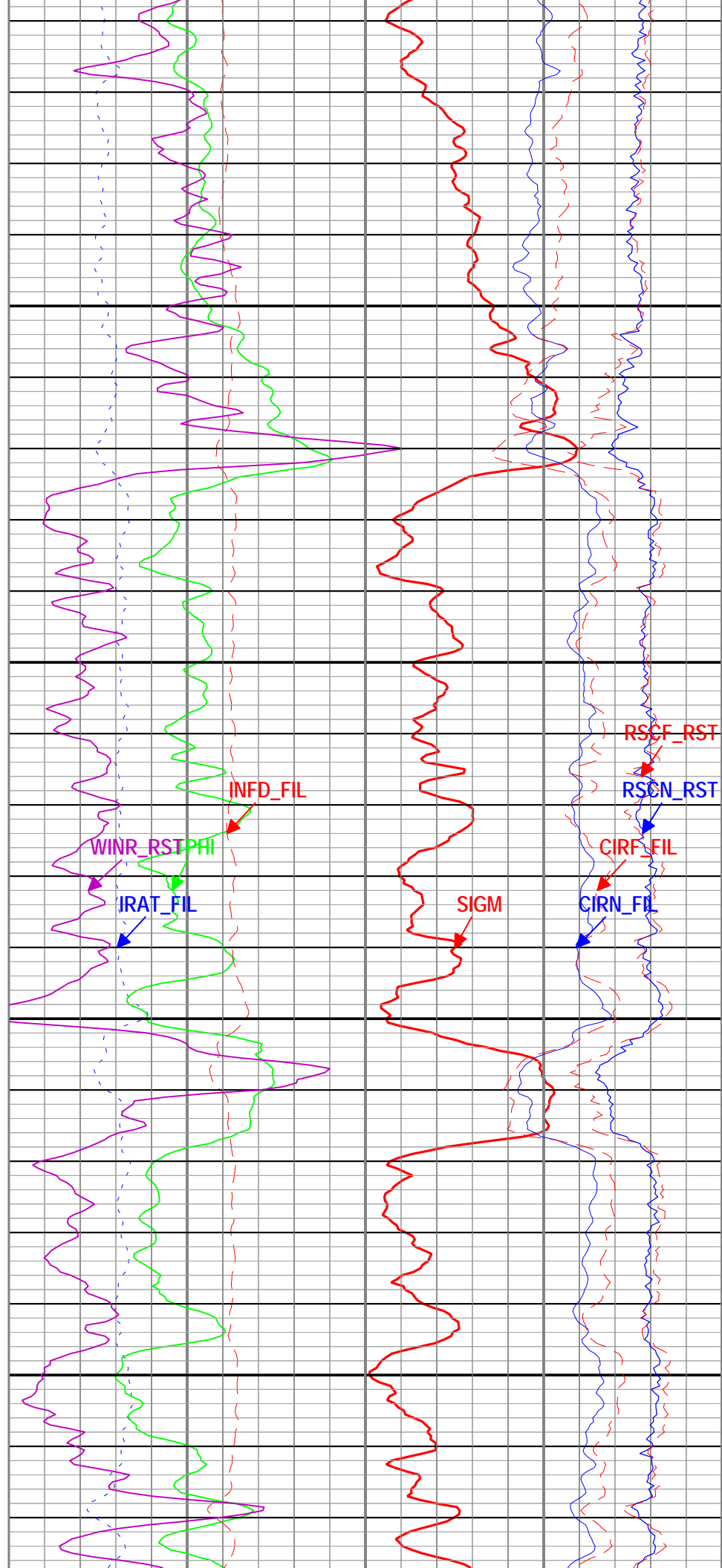
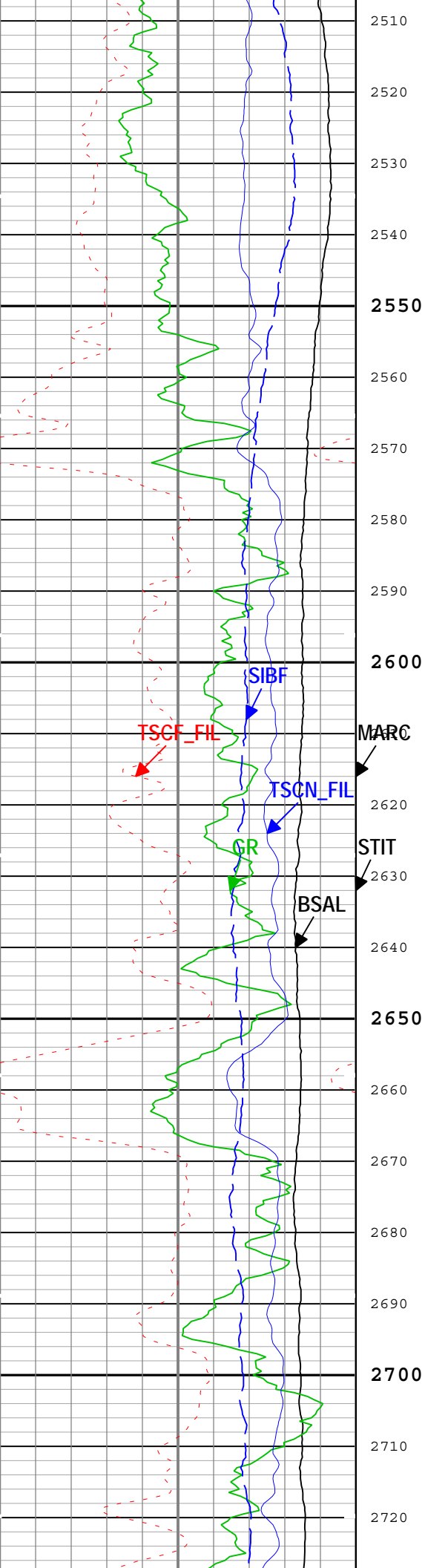
Remarks and Equipment Summary

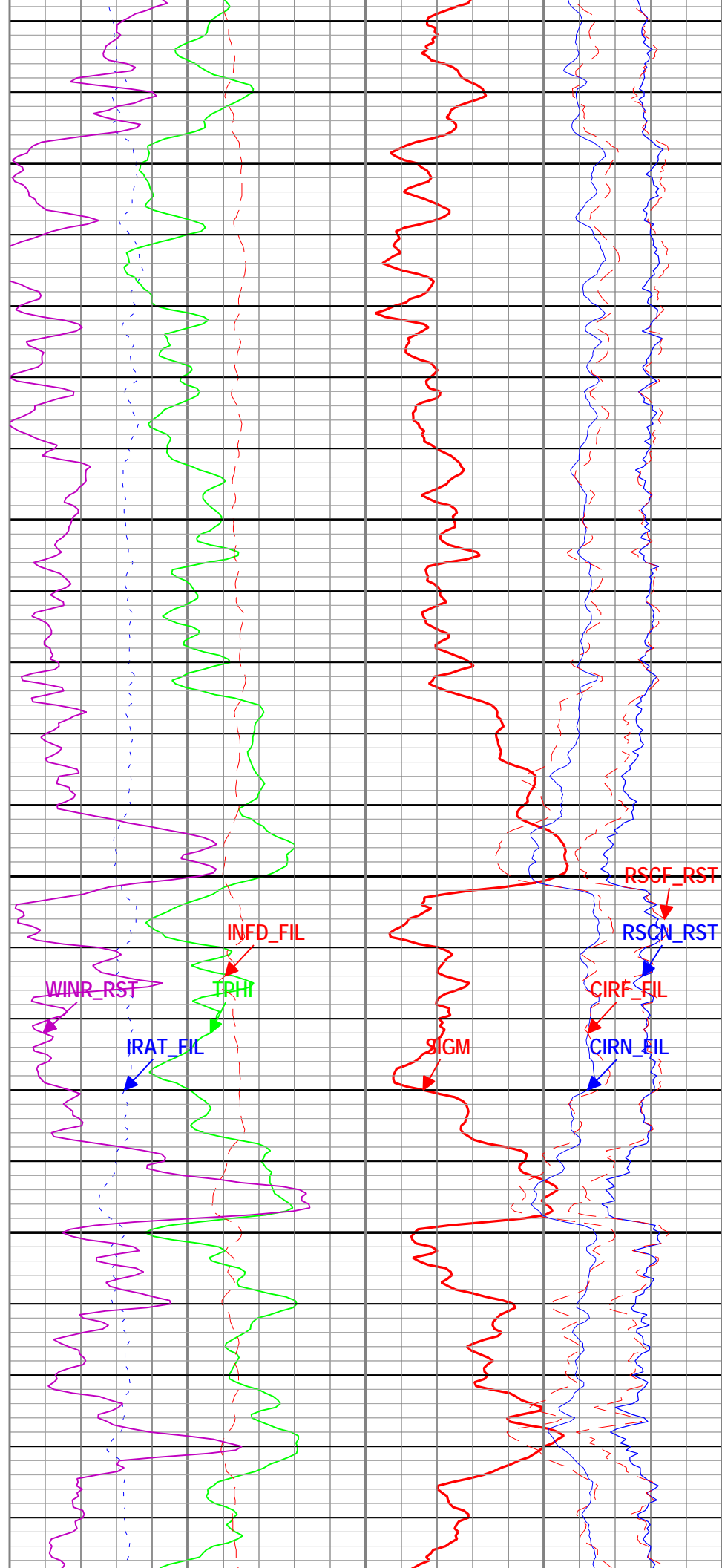
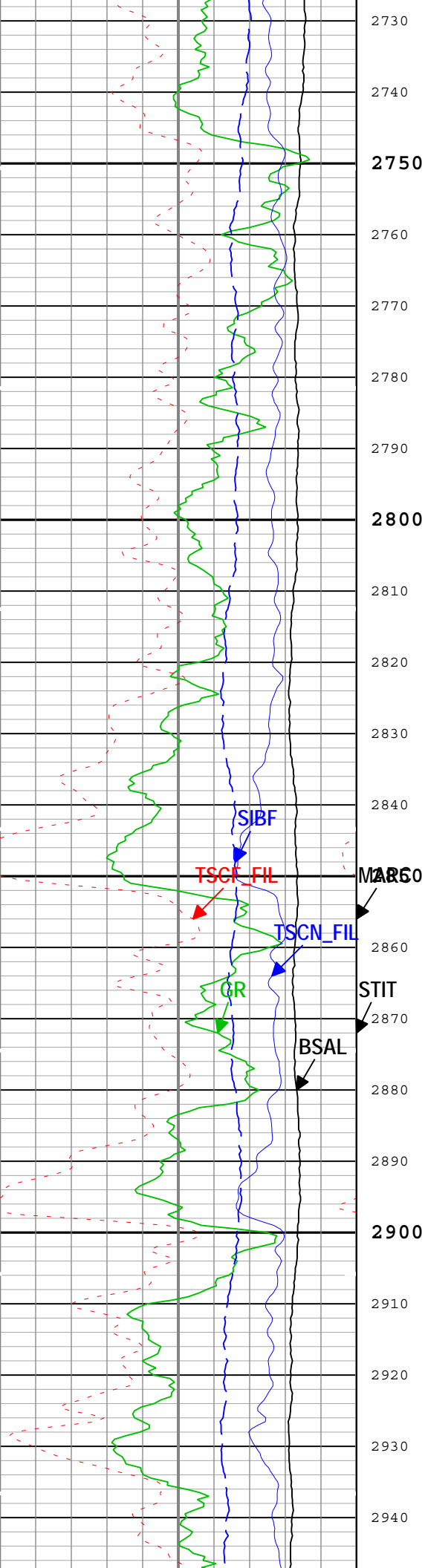
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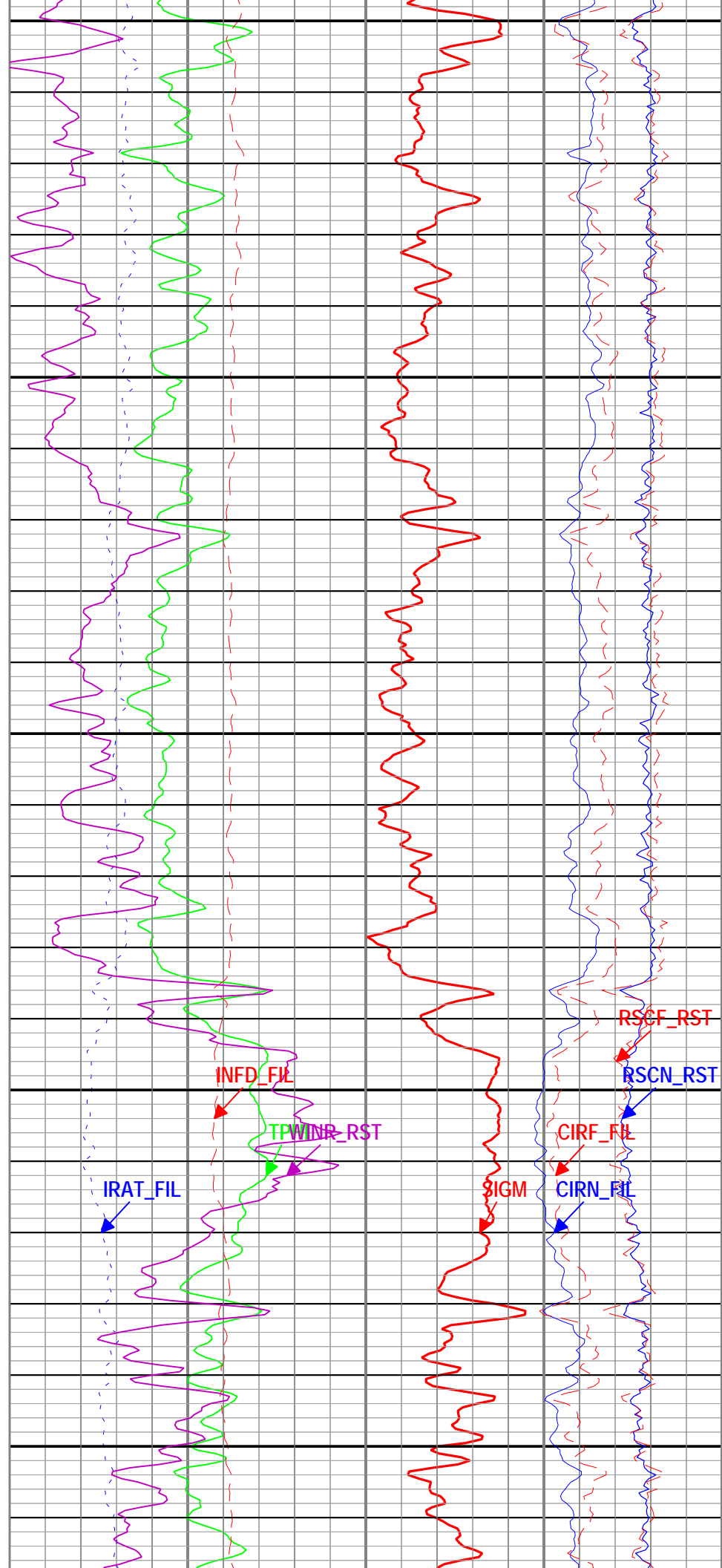
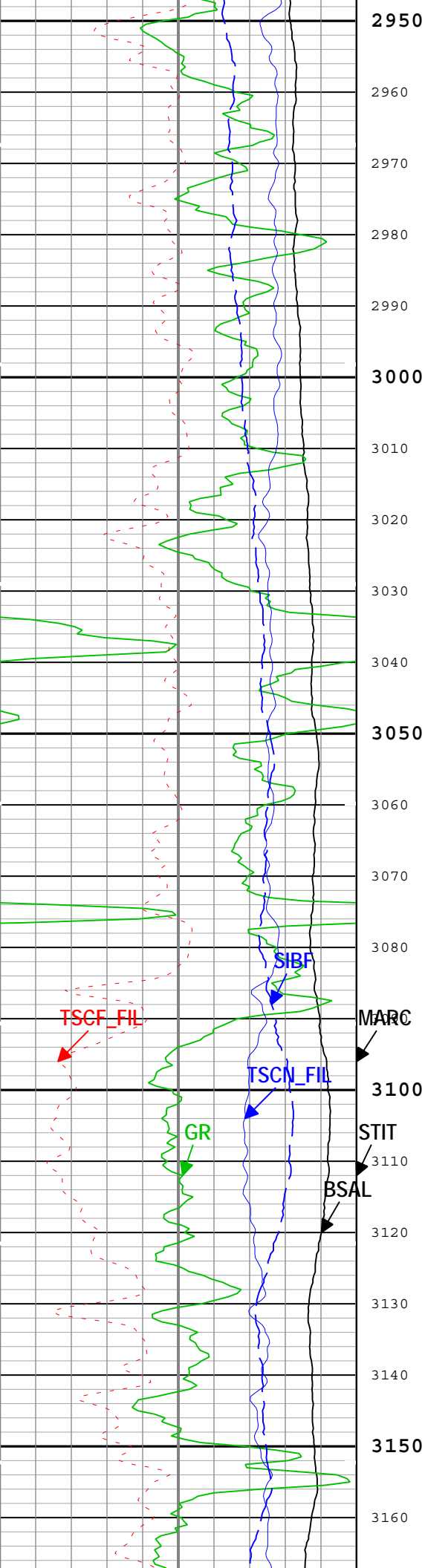


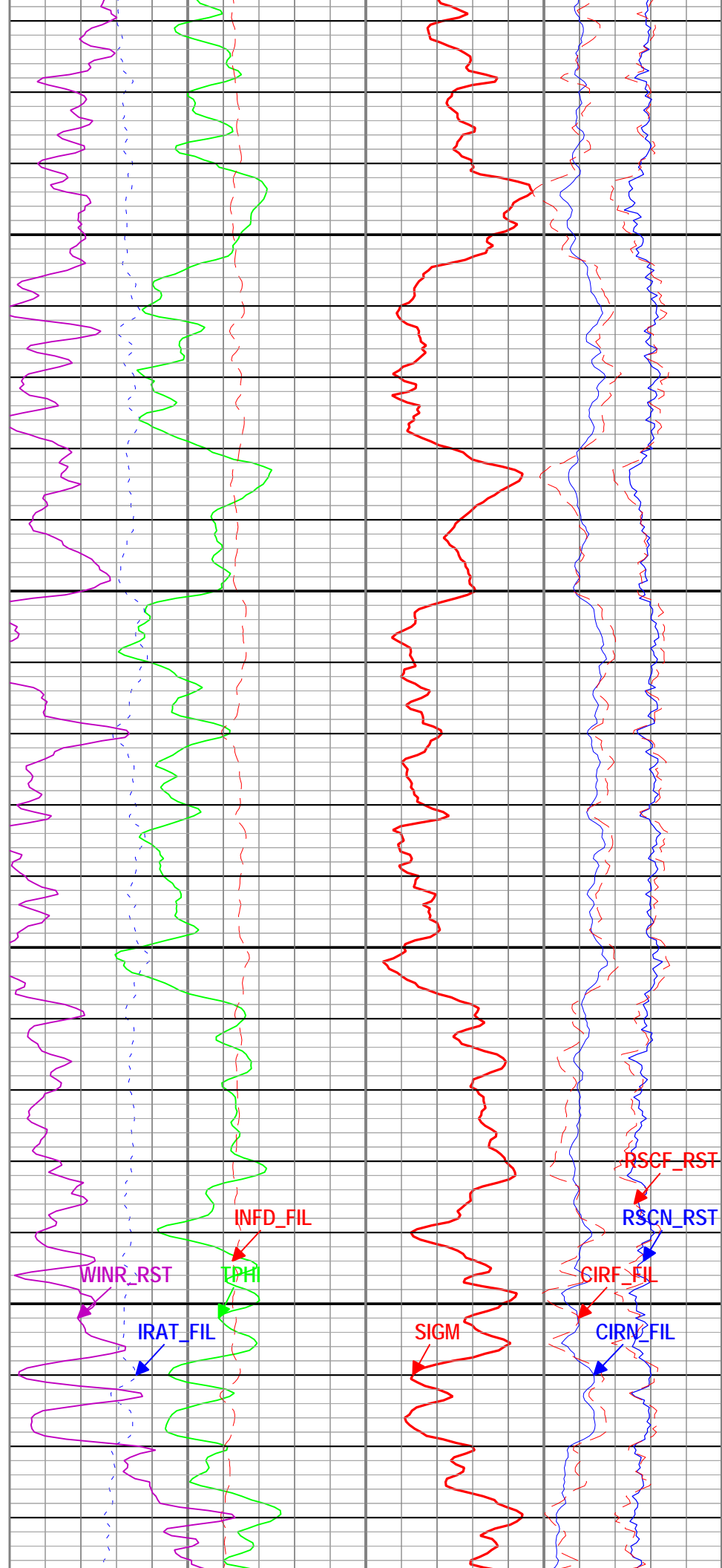
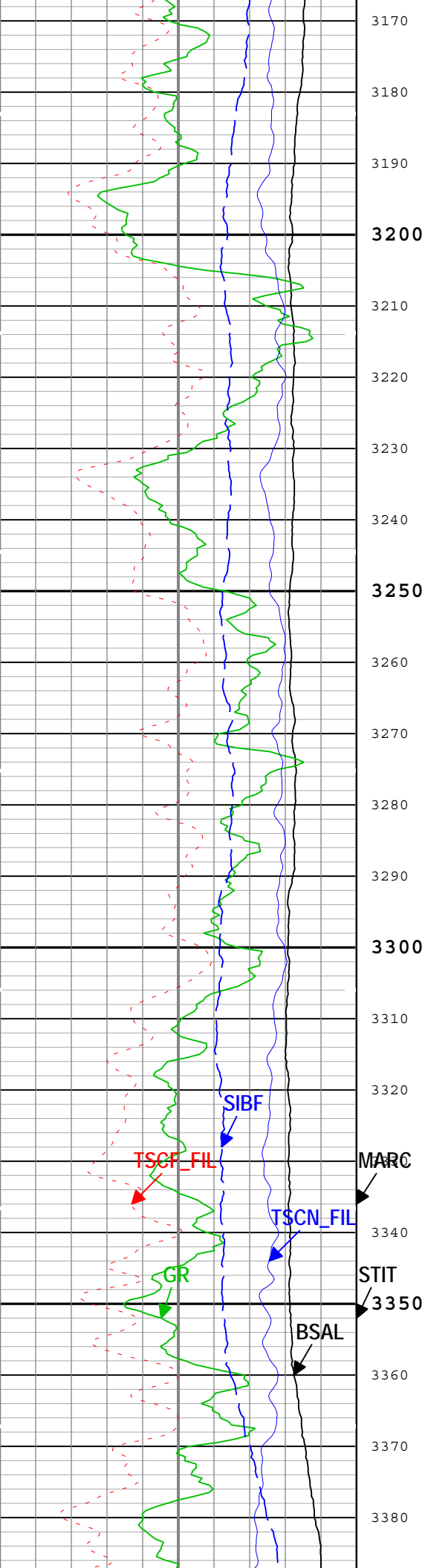
Depth Summary			
		ONE	
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		
Tension Device			
Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number 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 were followed during logging operations. IDW used as primary depth control. 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			
ONE			

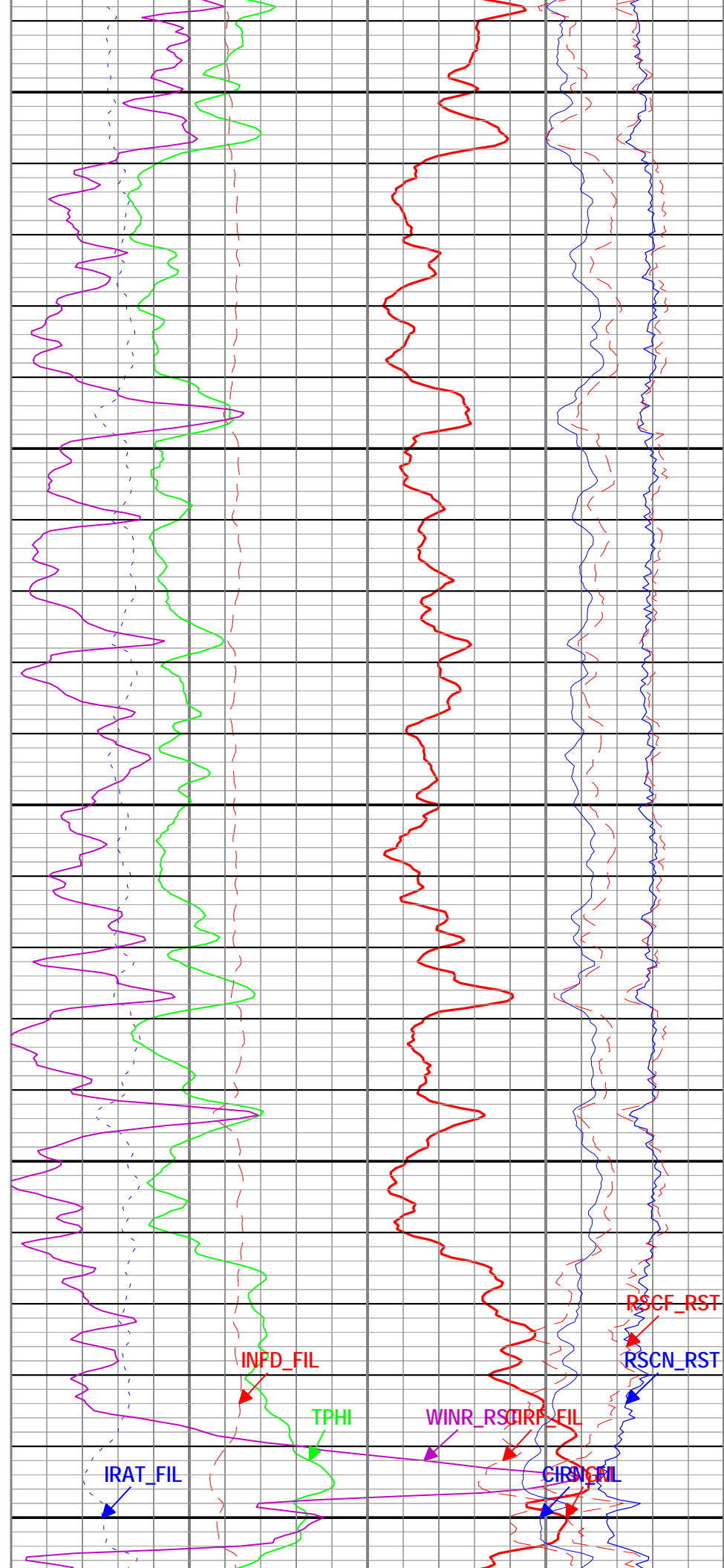
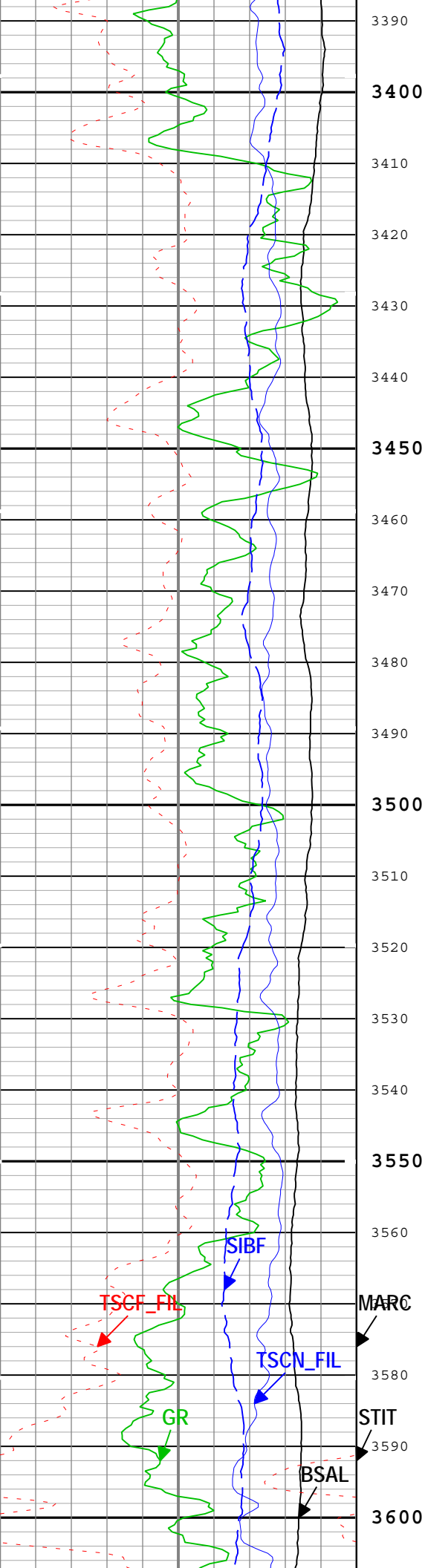


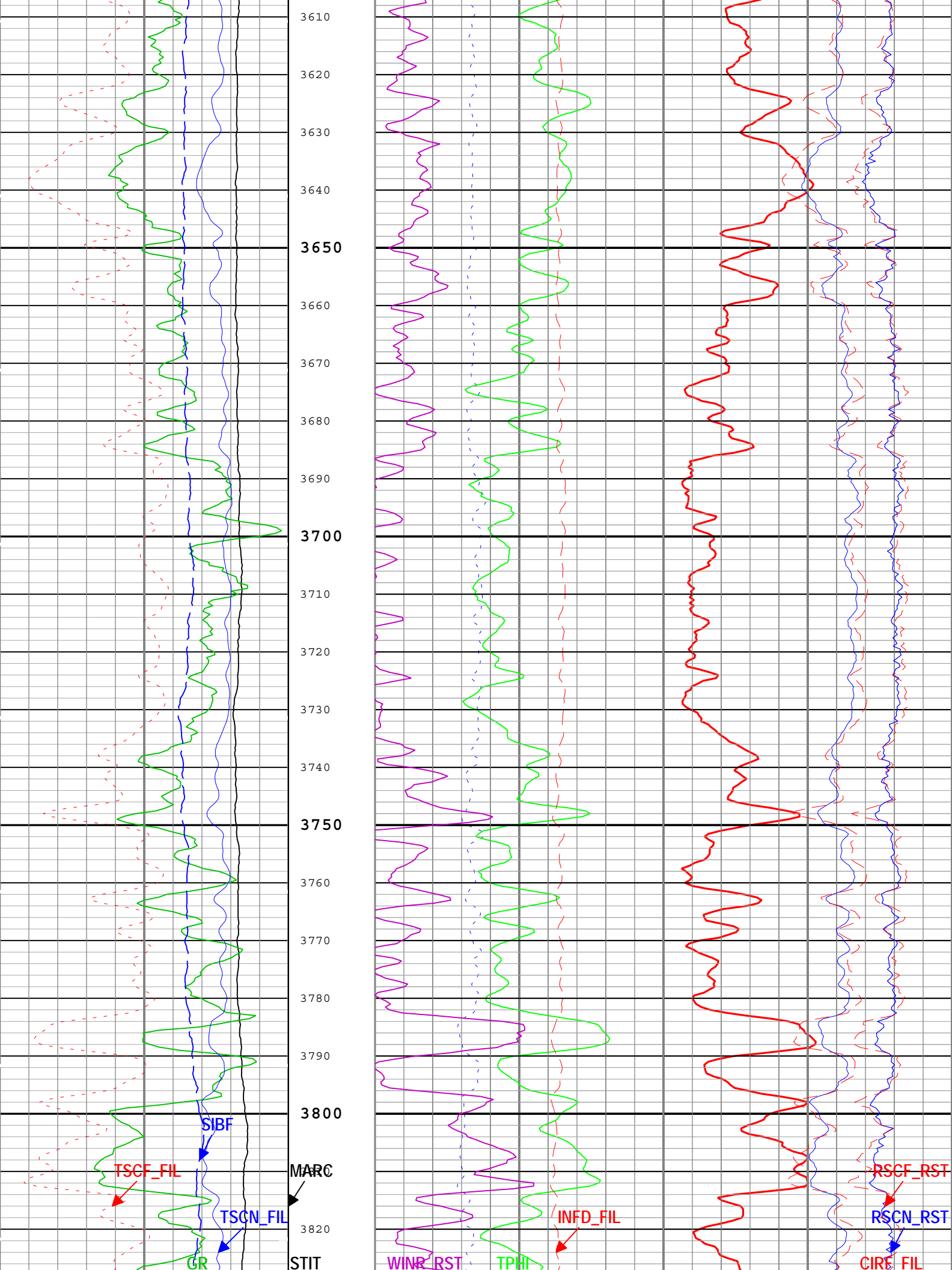


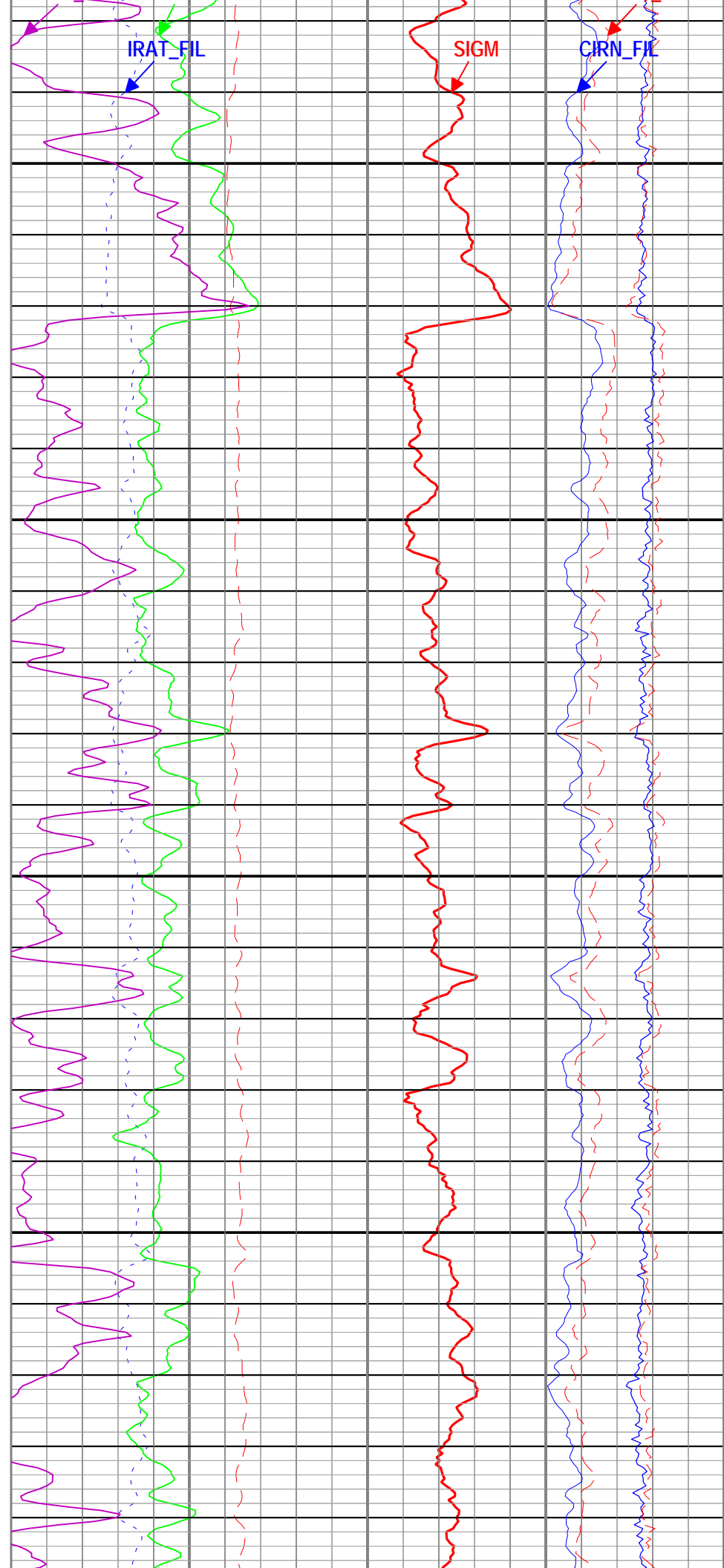
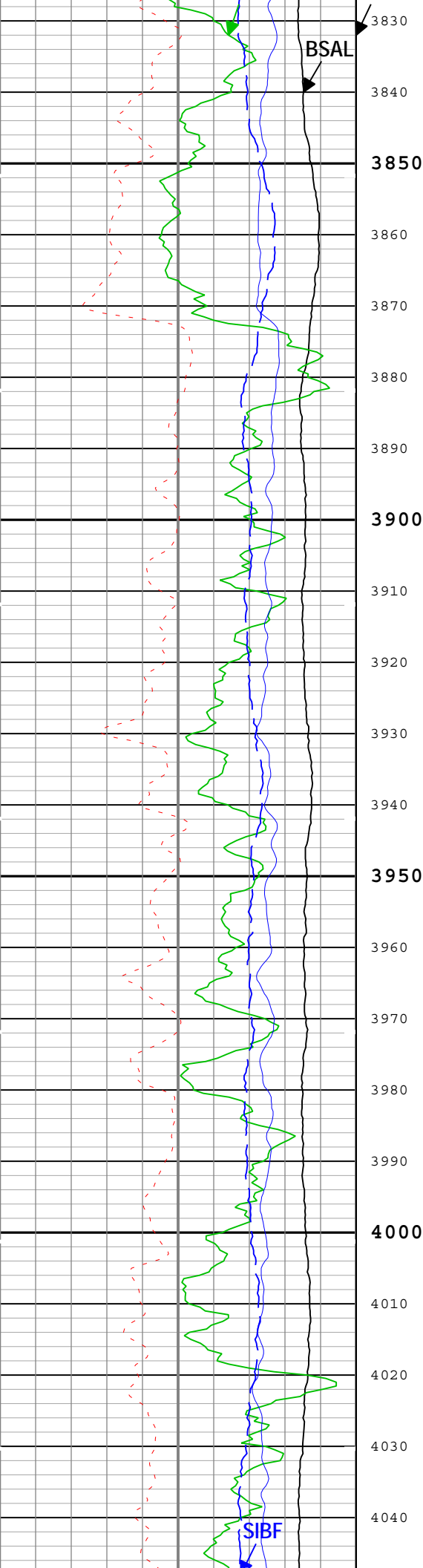


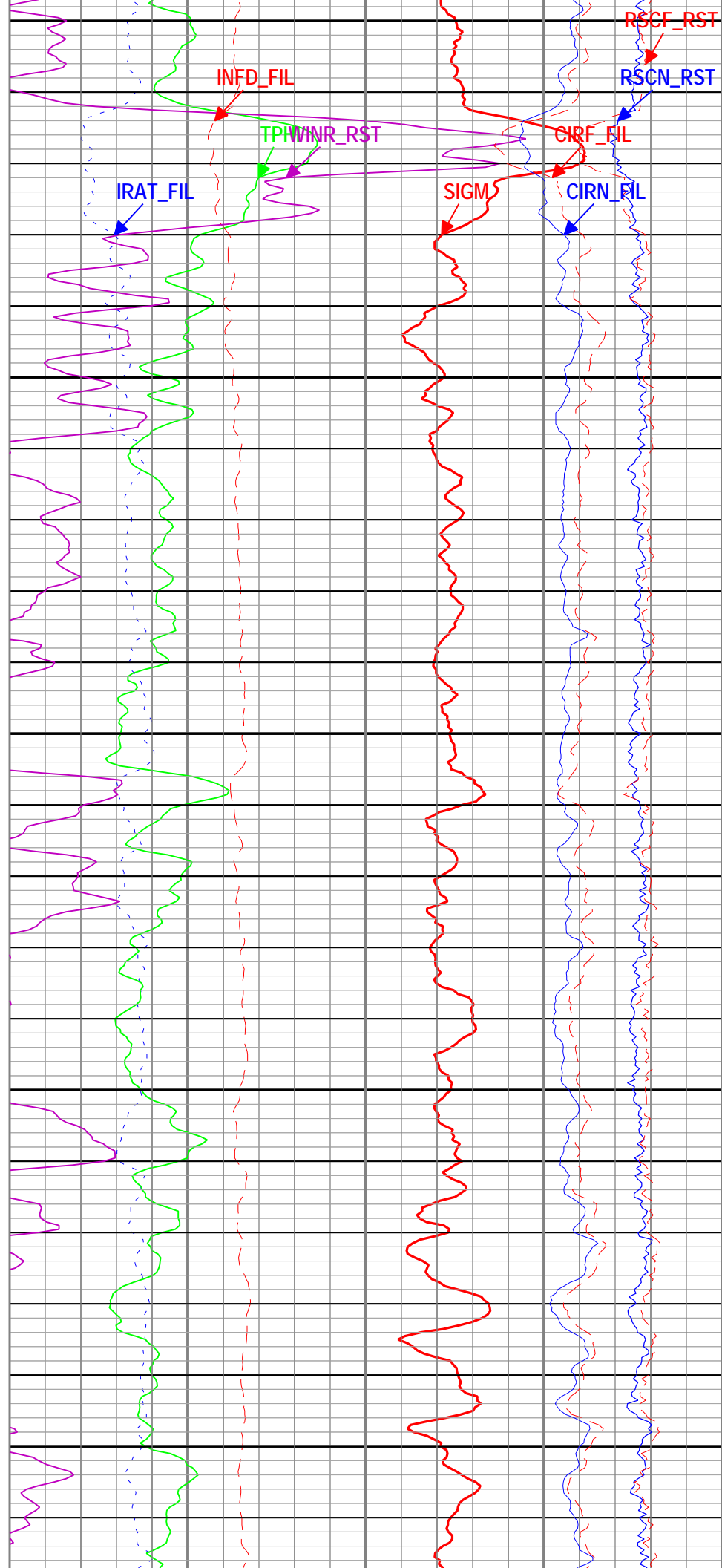
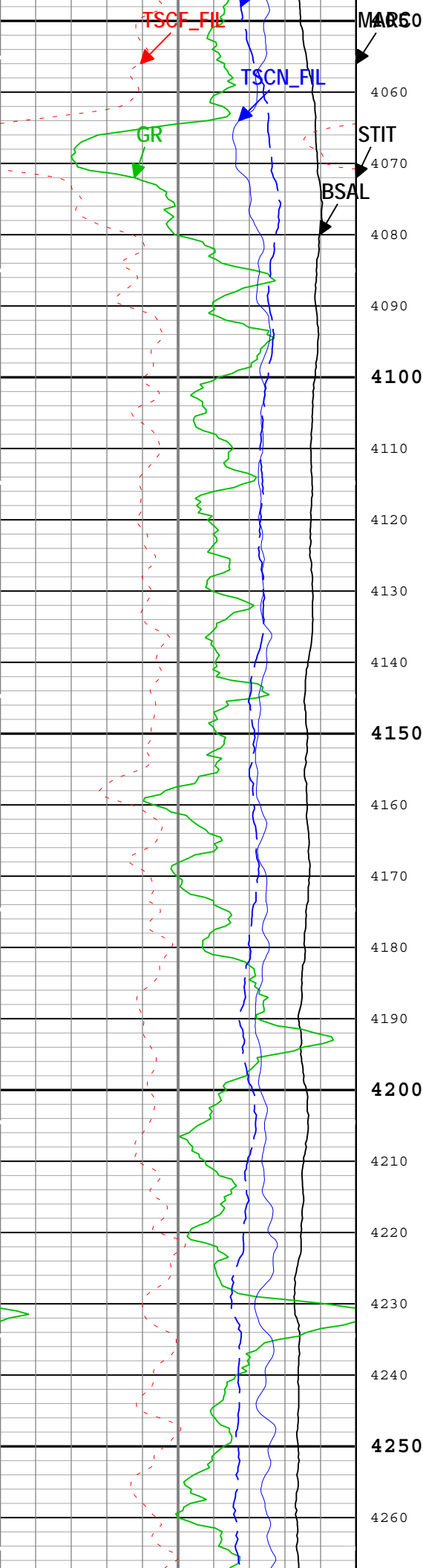


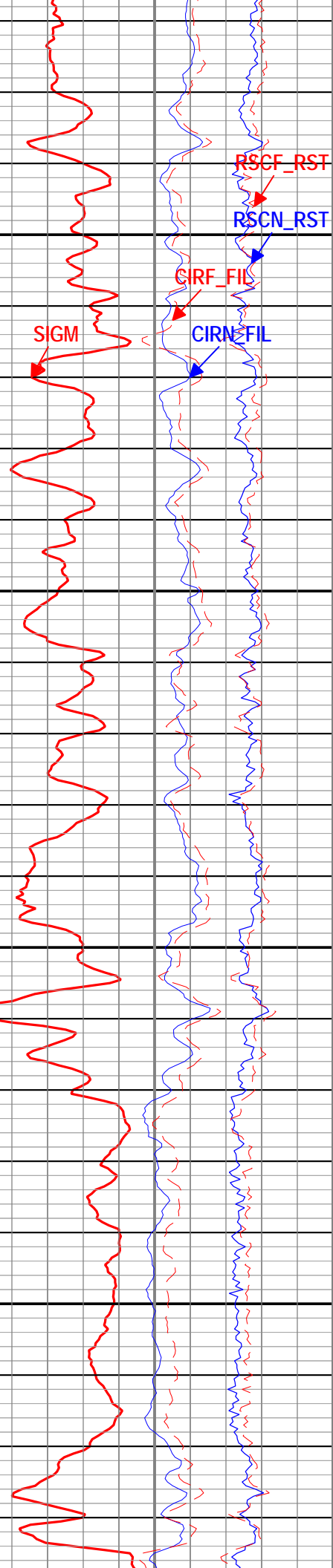
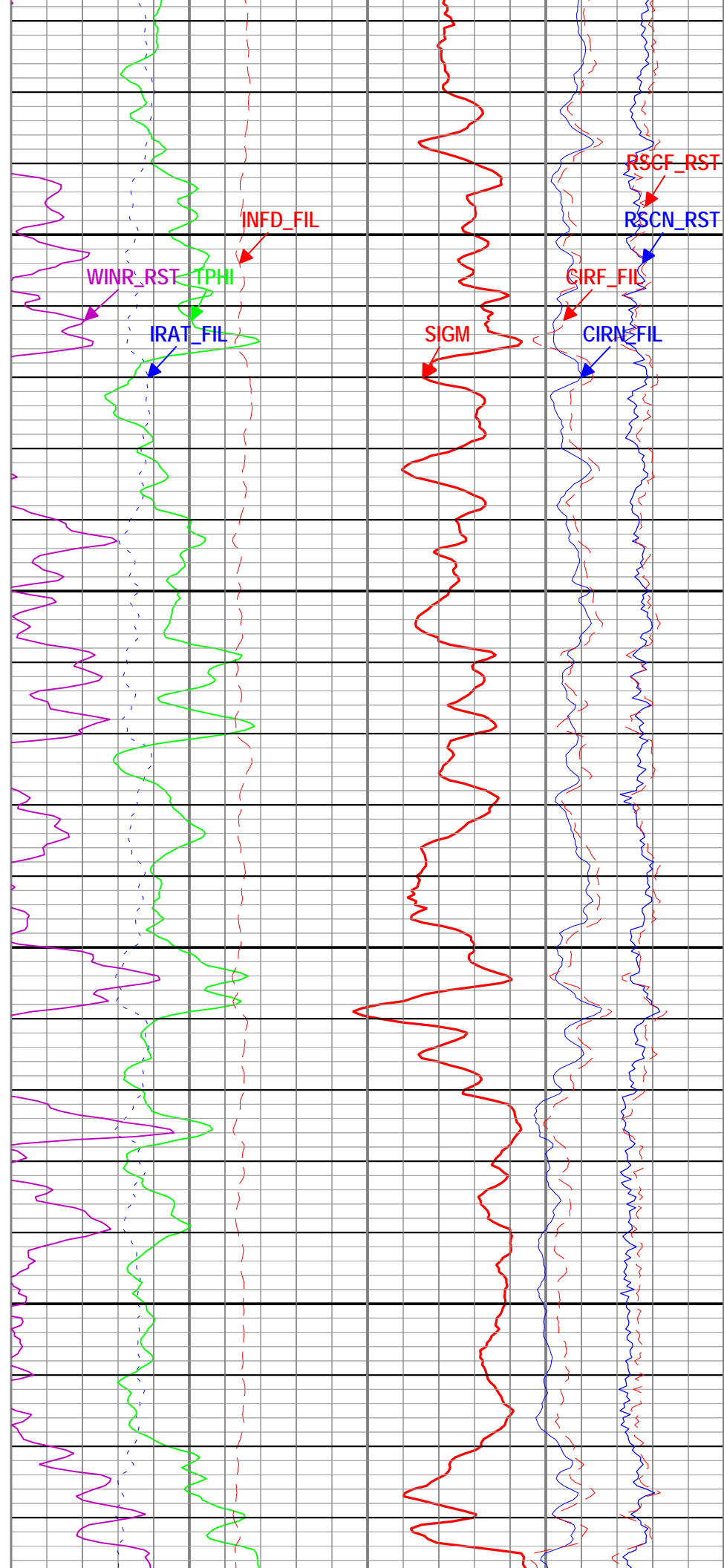
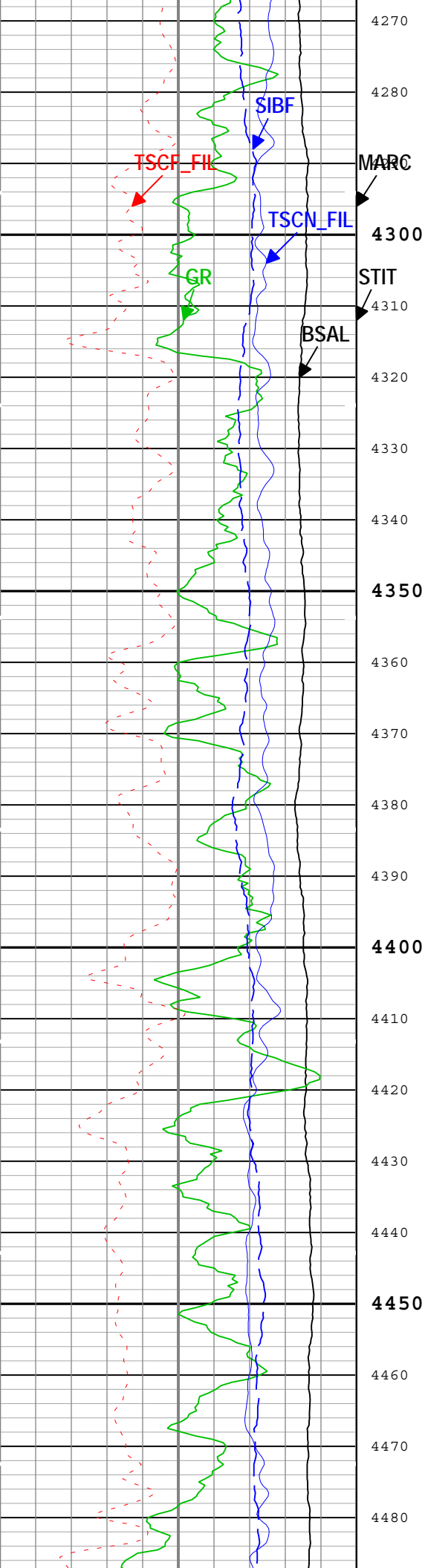


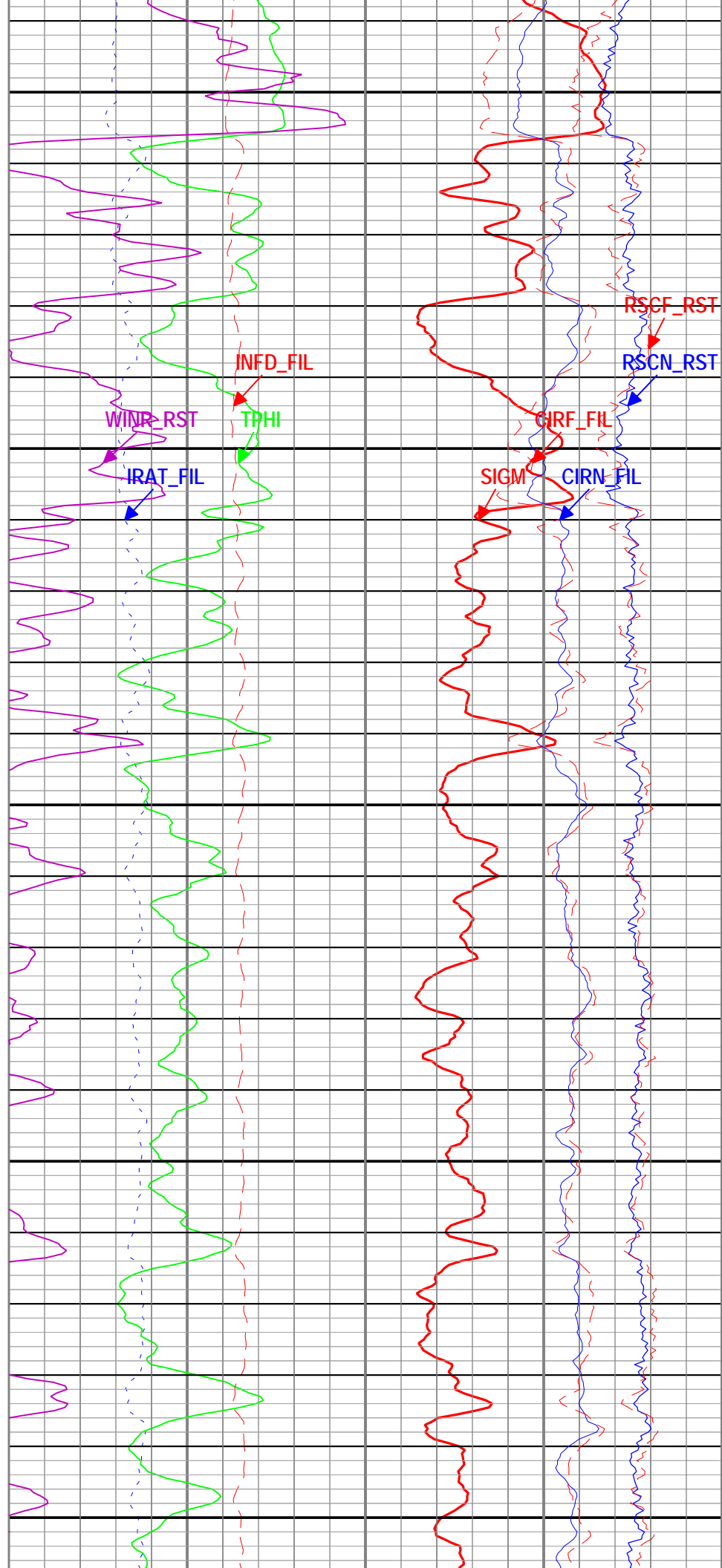
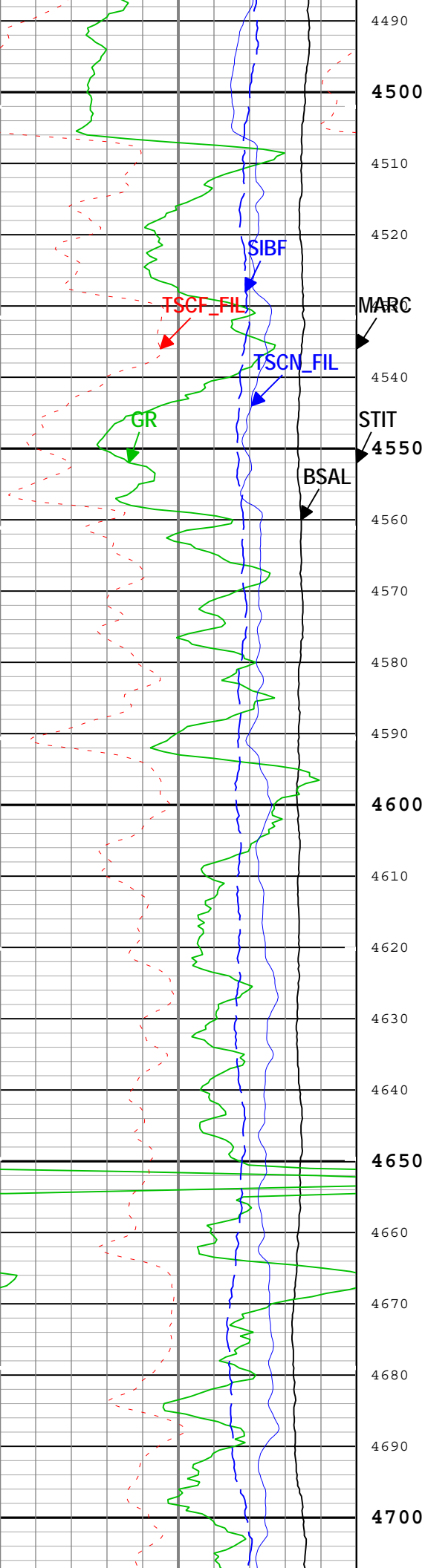


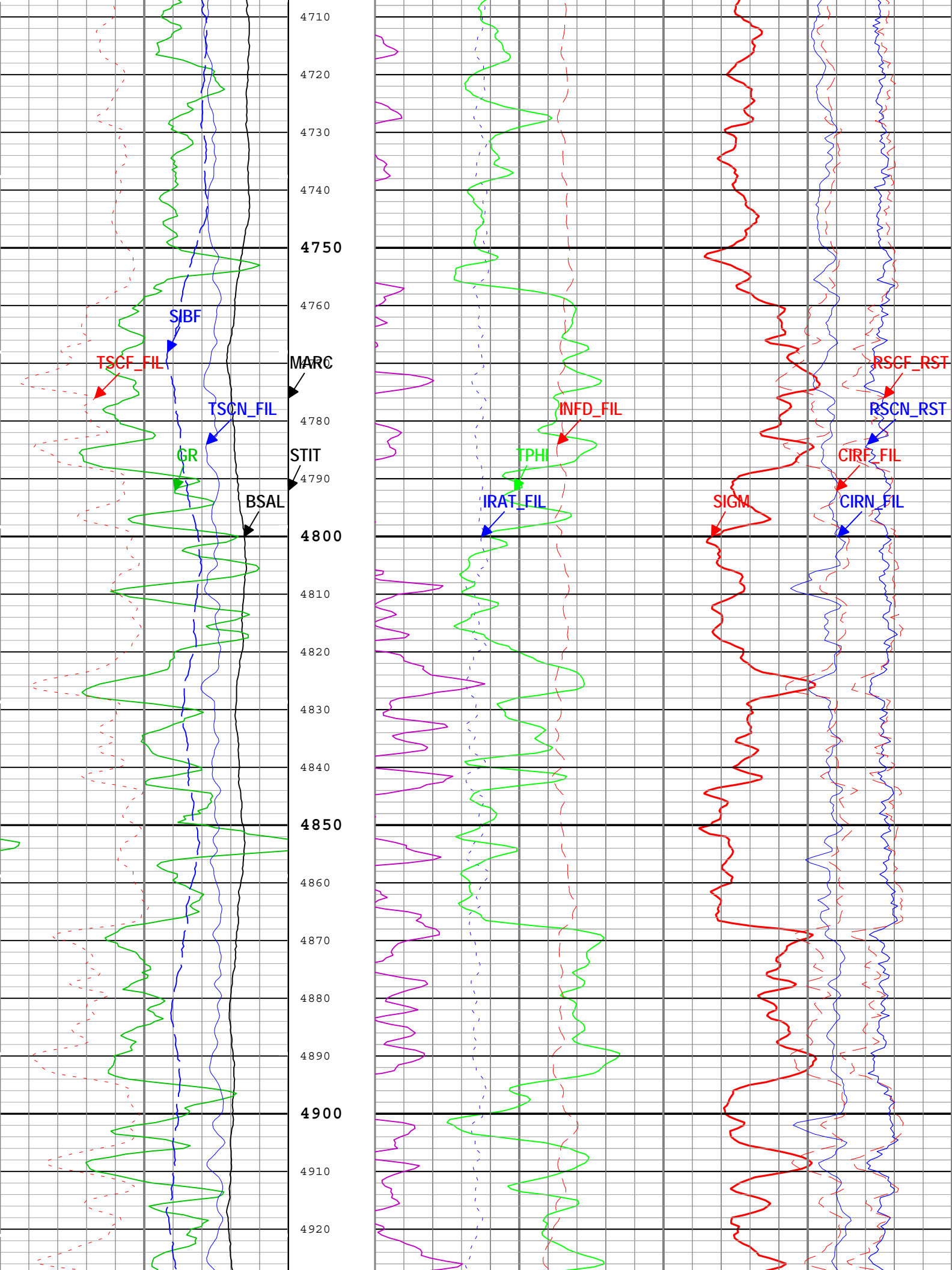


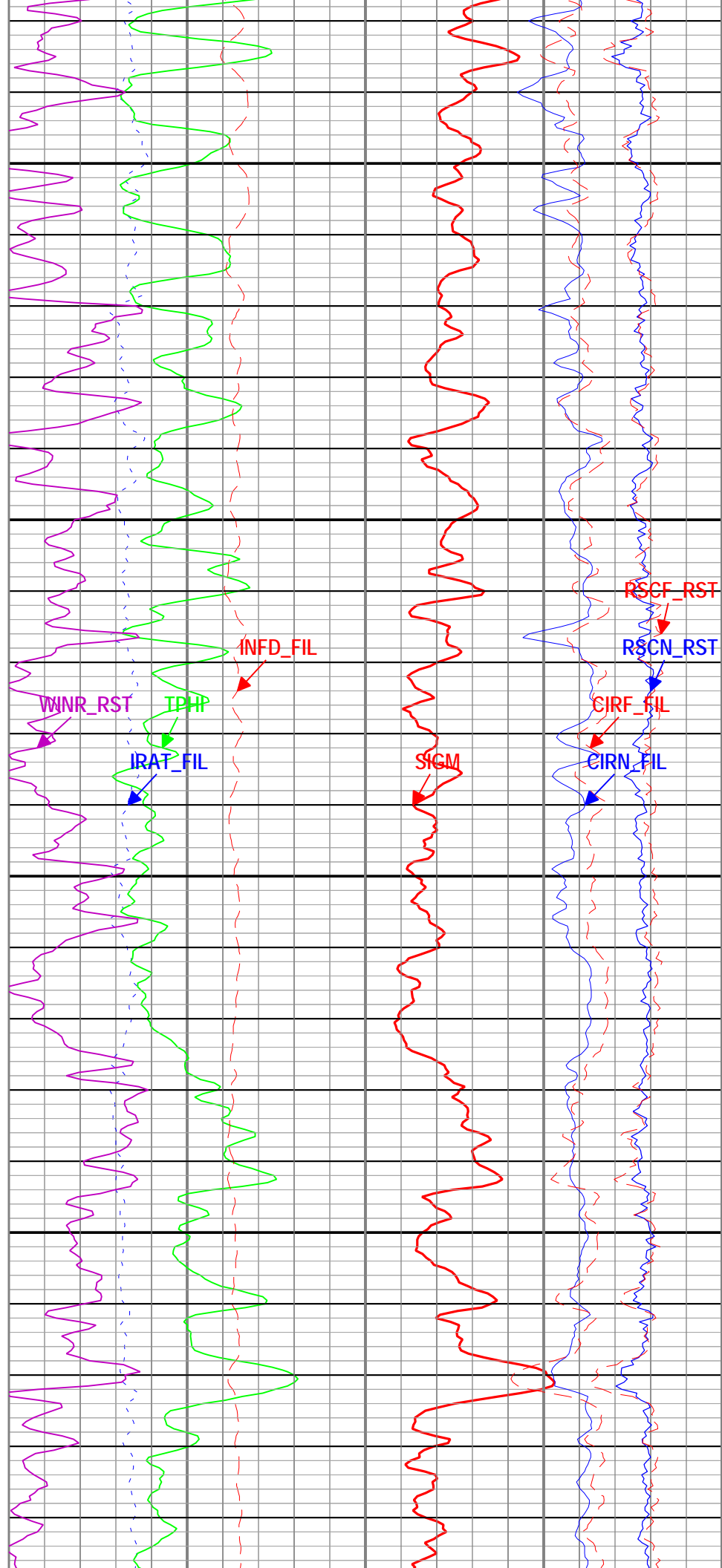
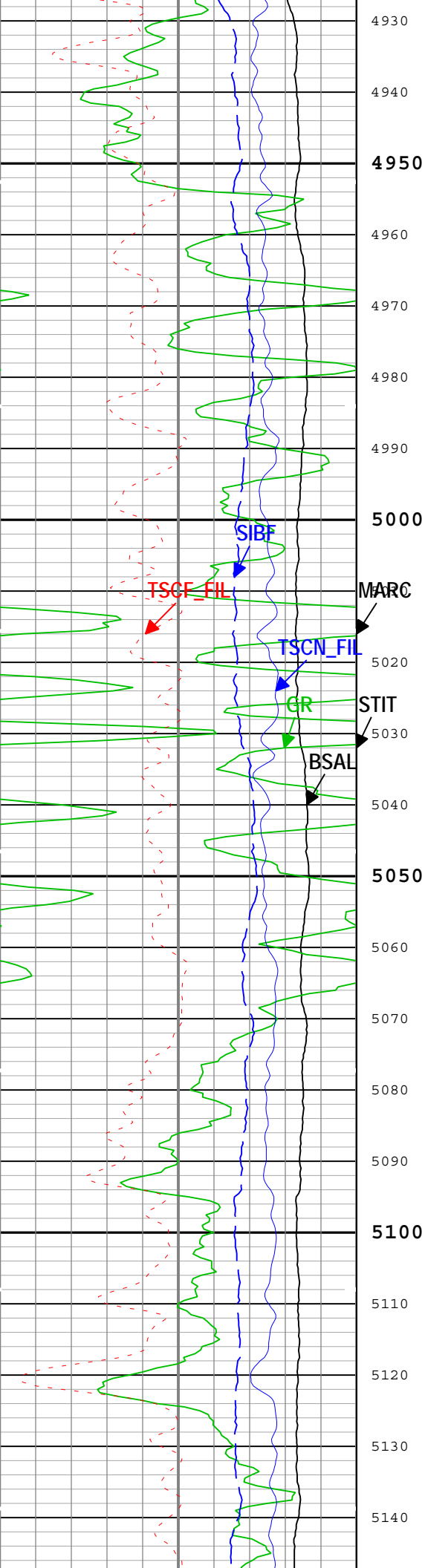


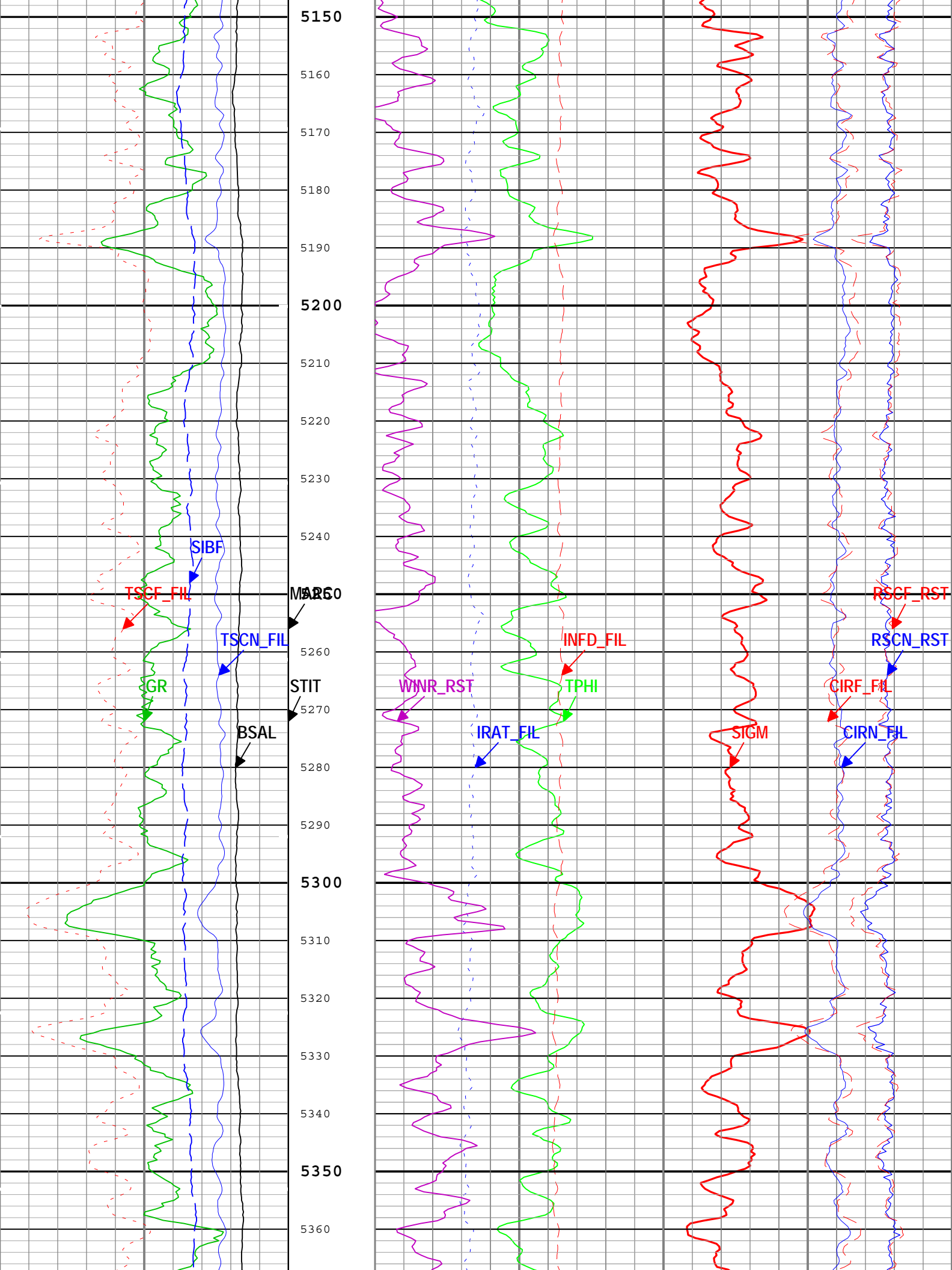


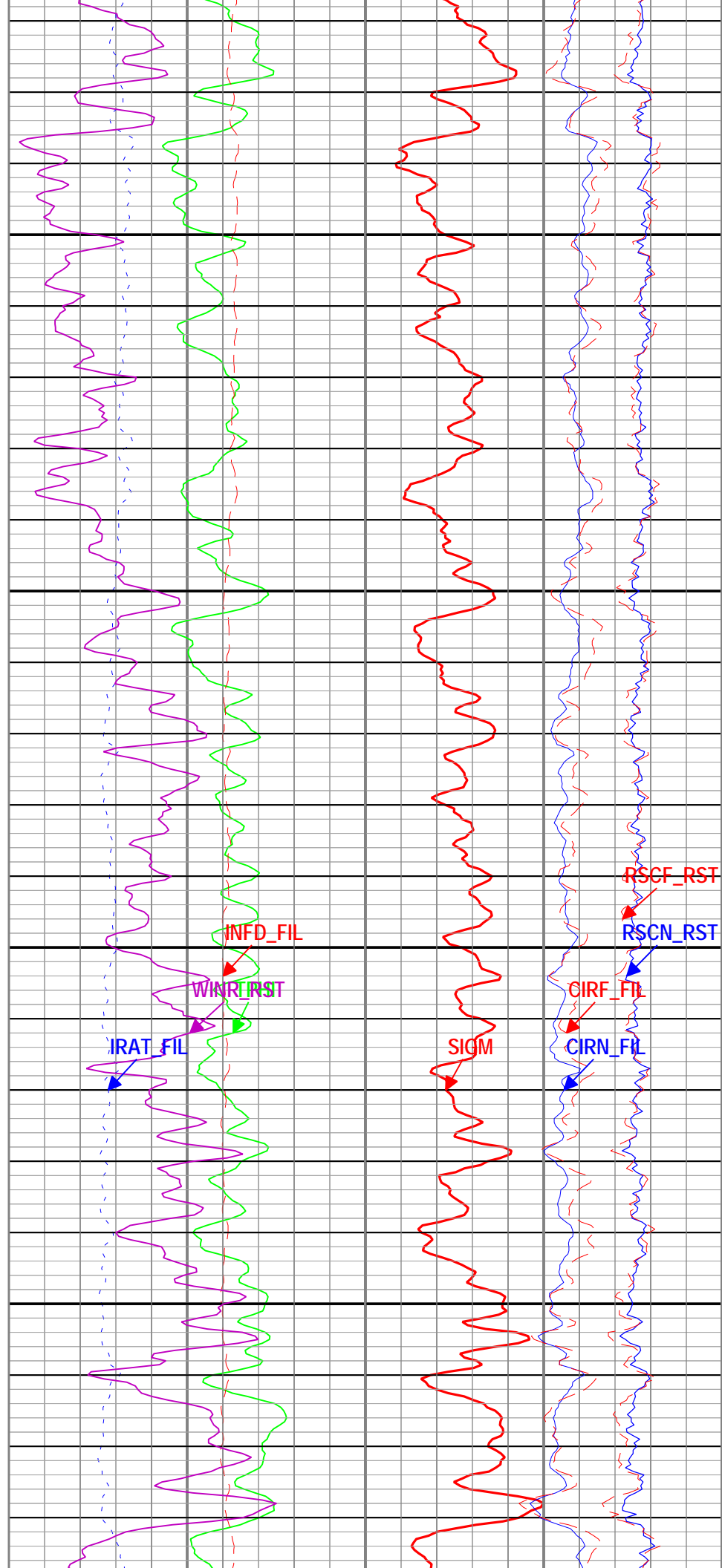
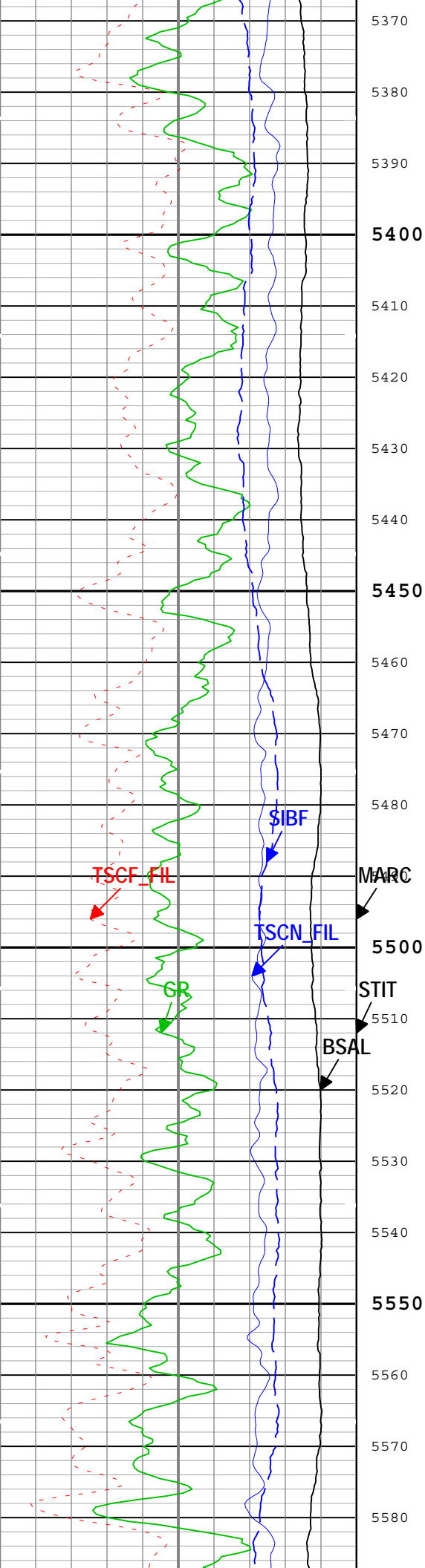


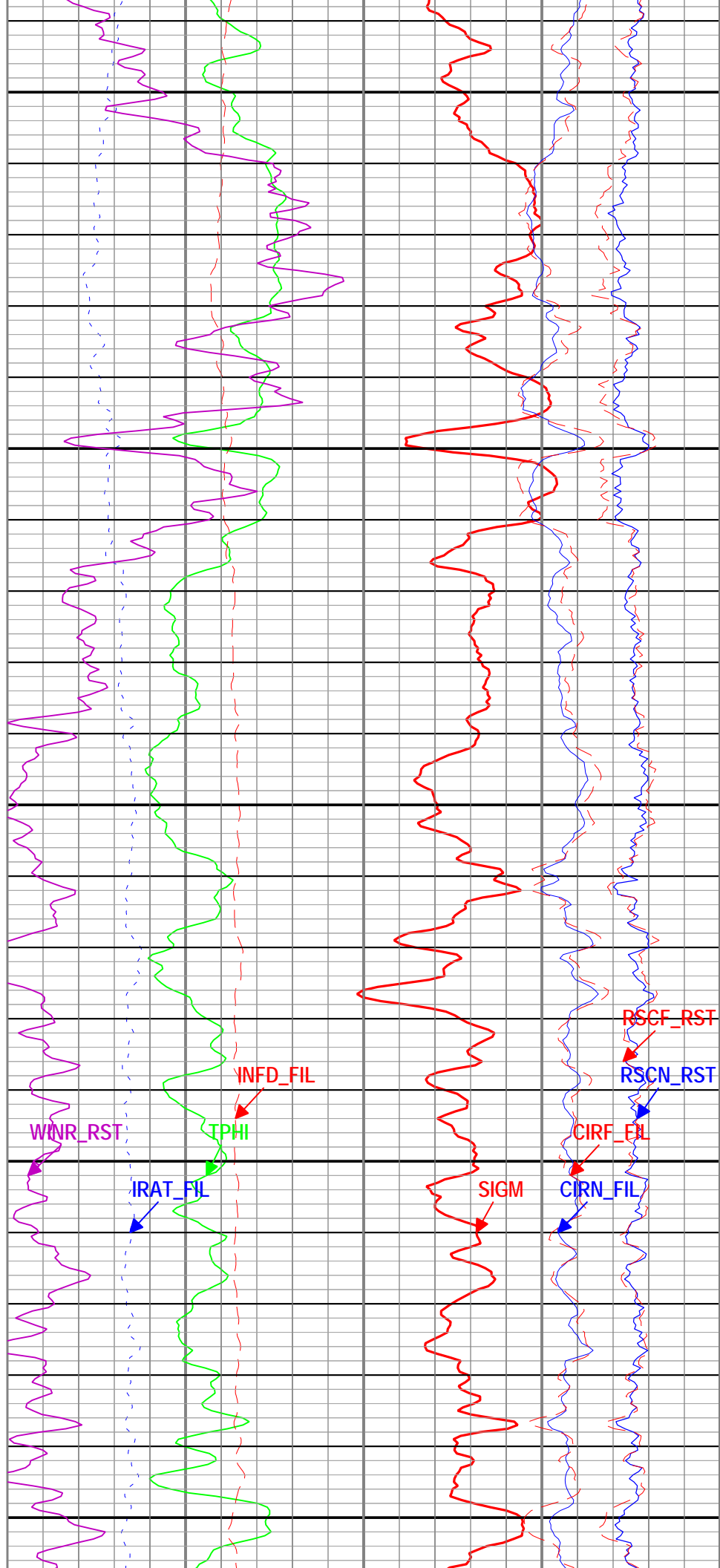
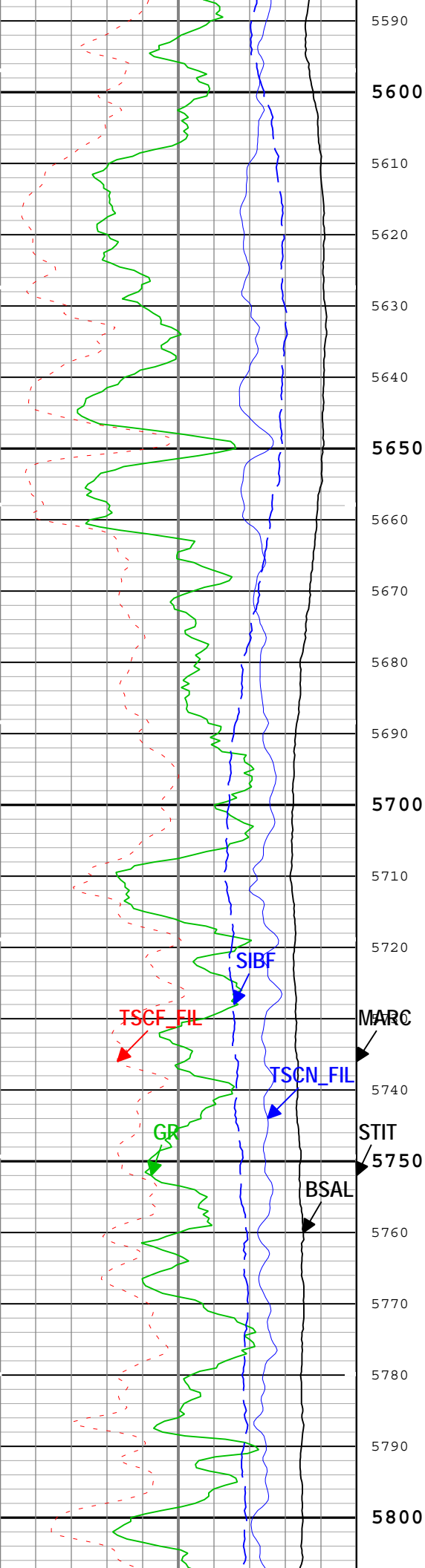


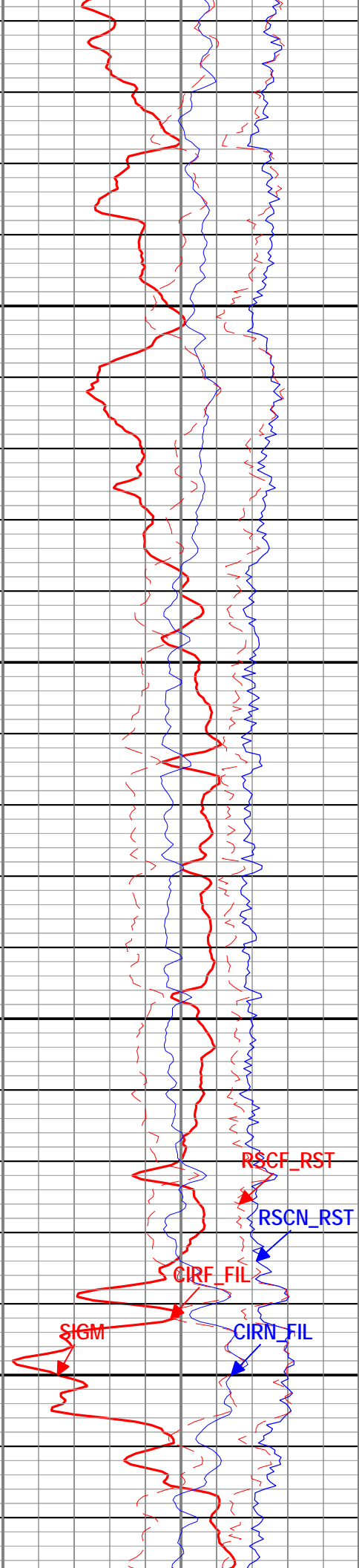
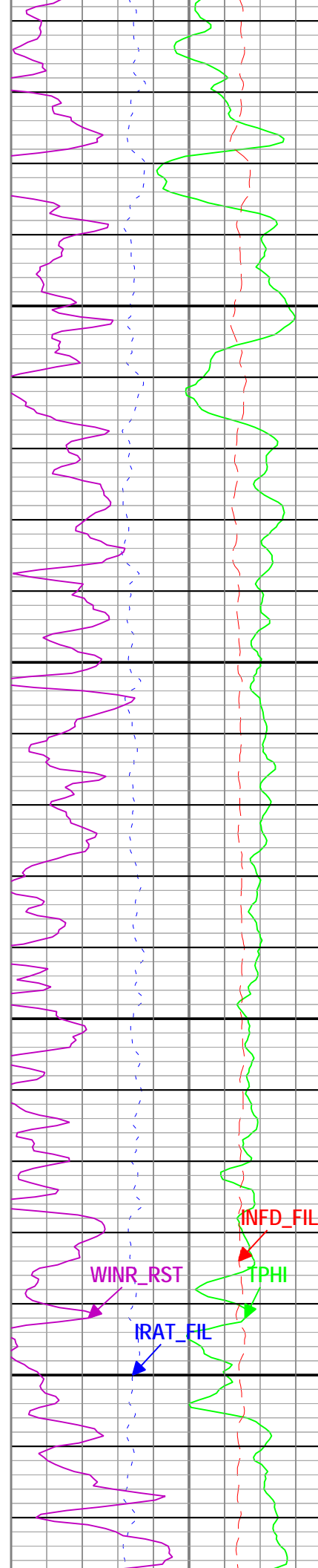
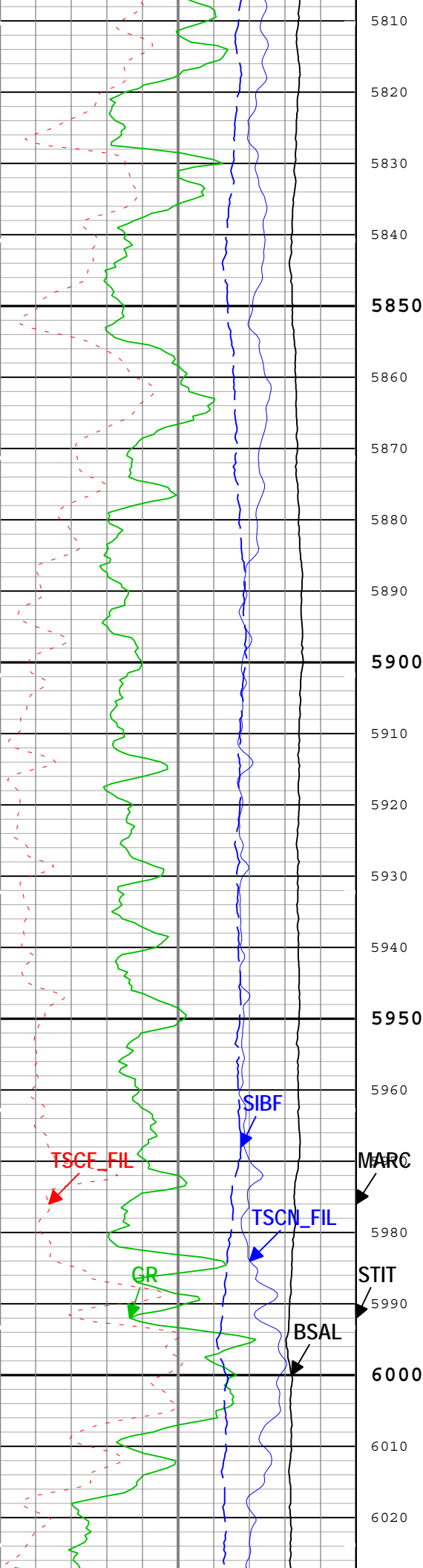


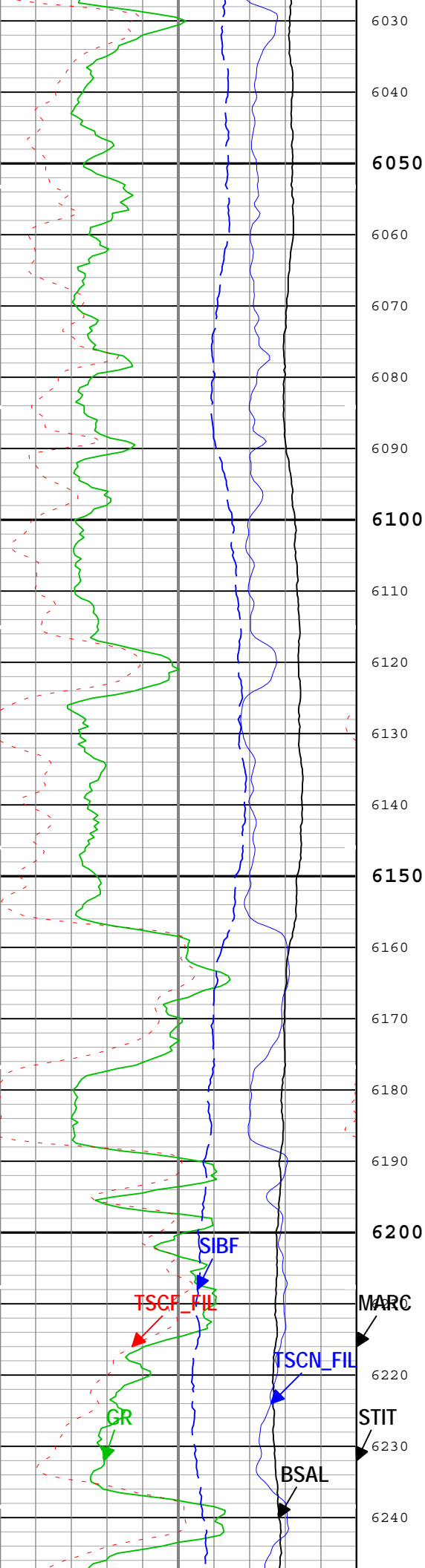










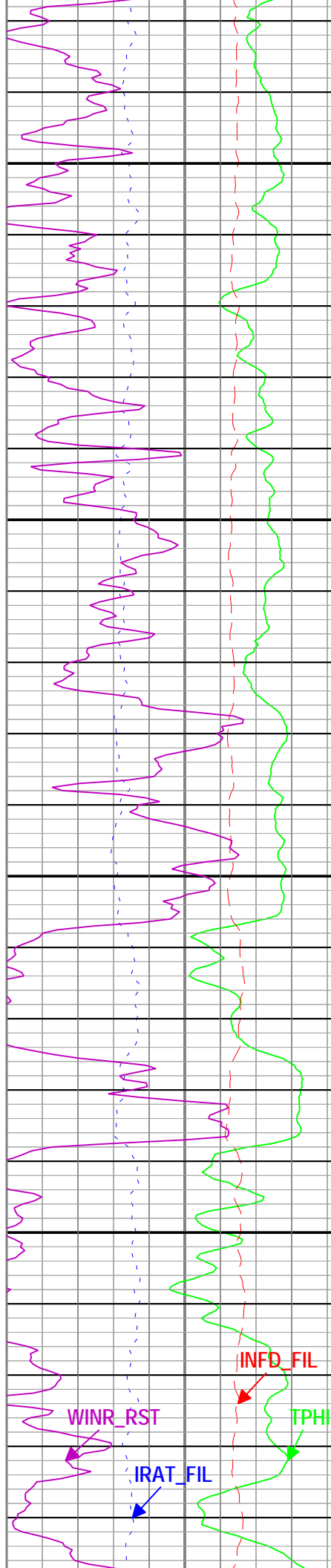


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MARC

STIT

BSAL

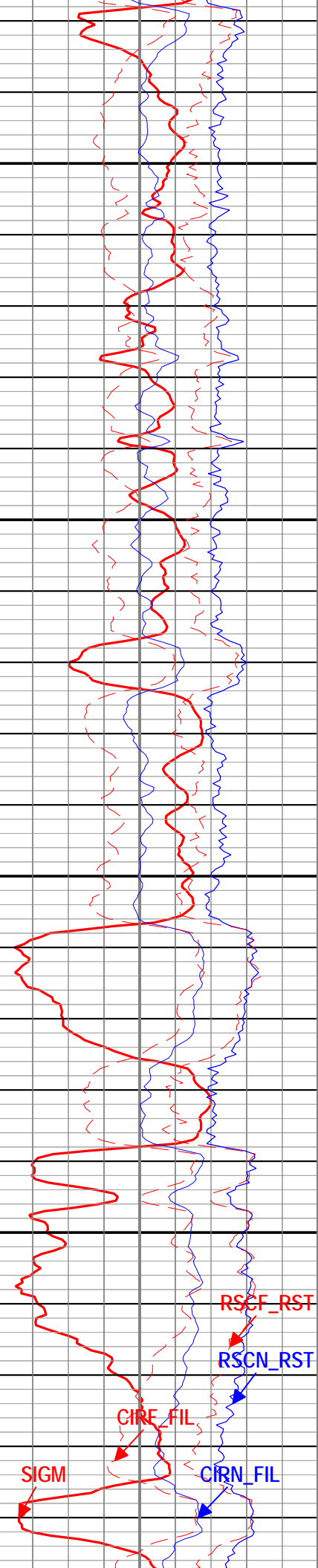


WINR_RST

IRAT_FIL

INFD_FIL

TPHI



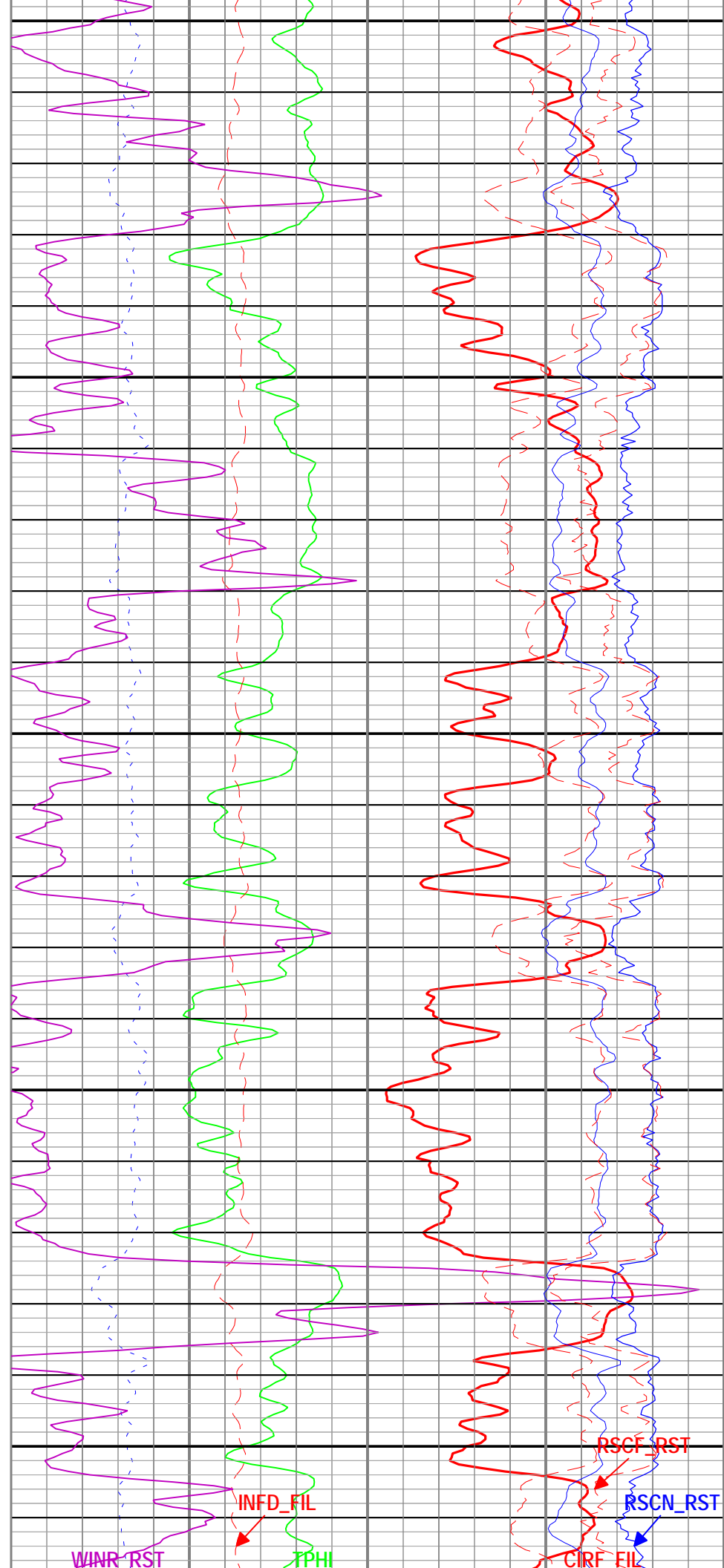
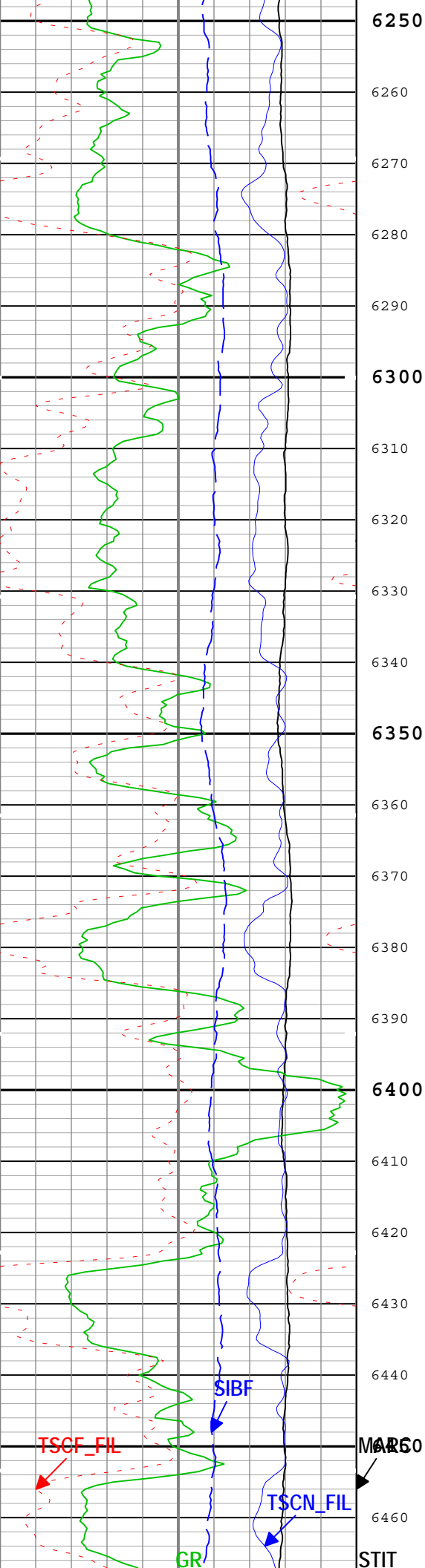
RSCF_RST

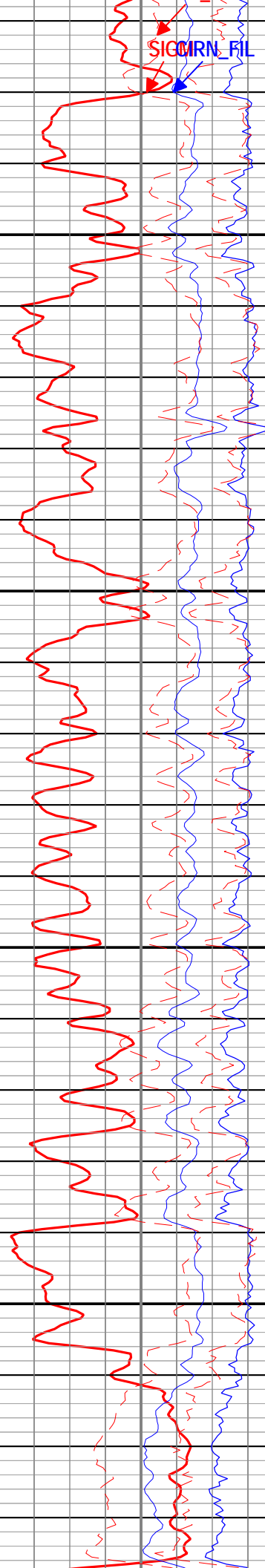
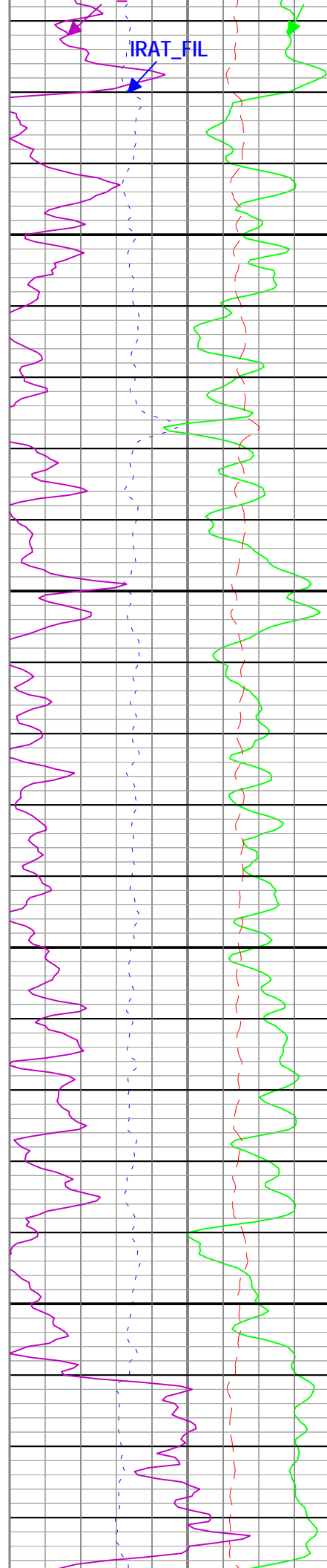
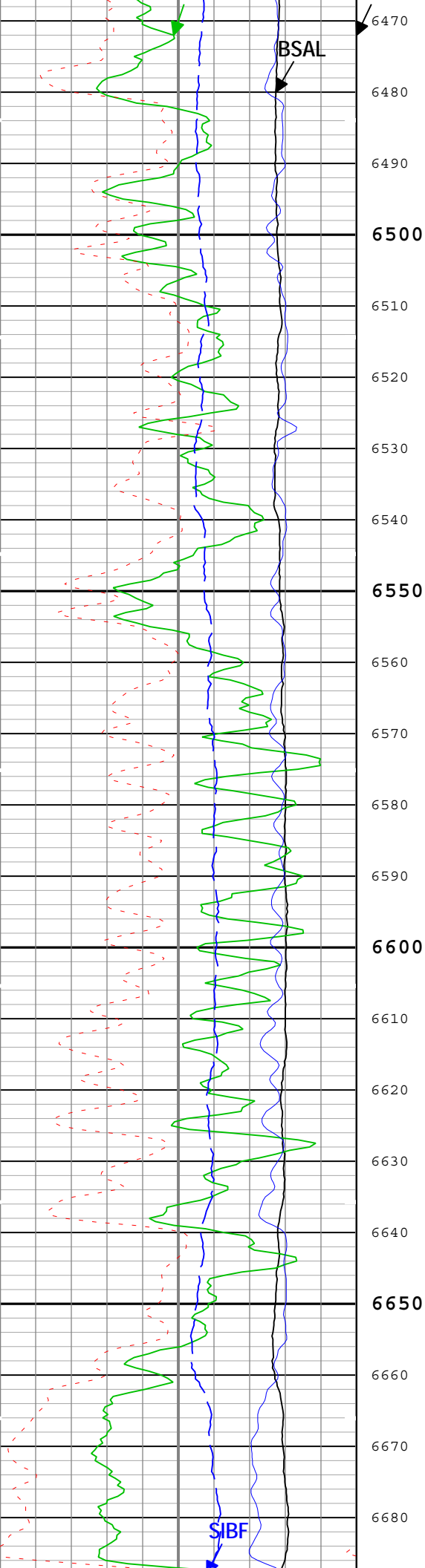
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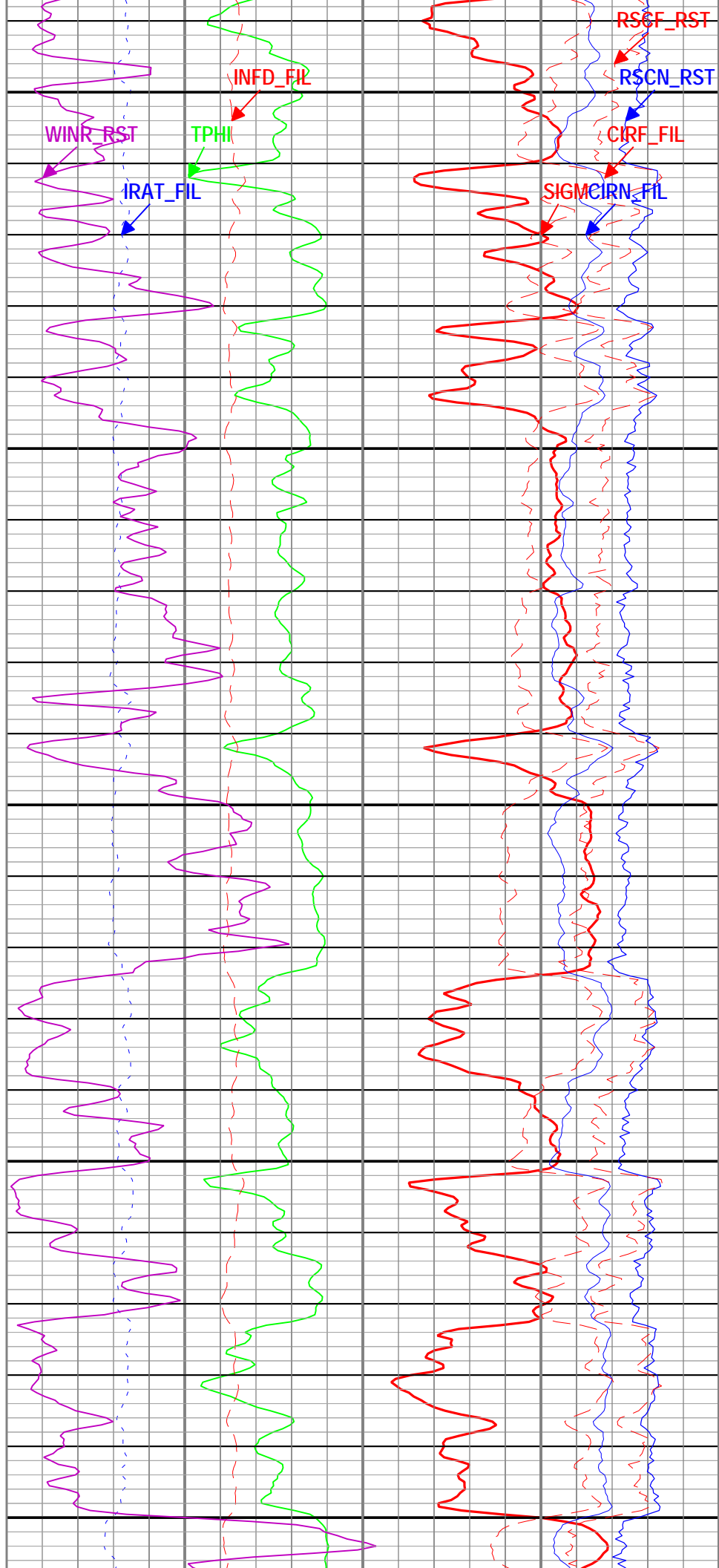
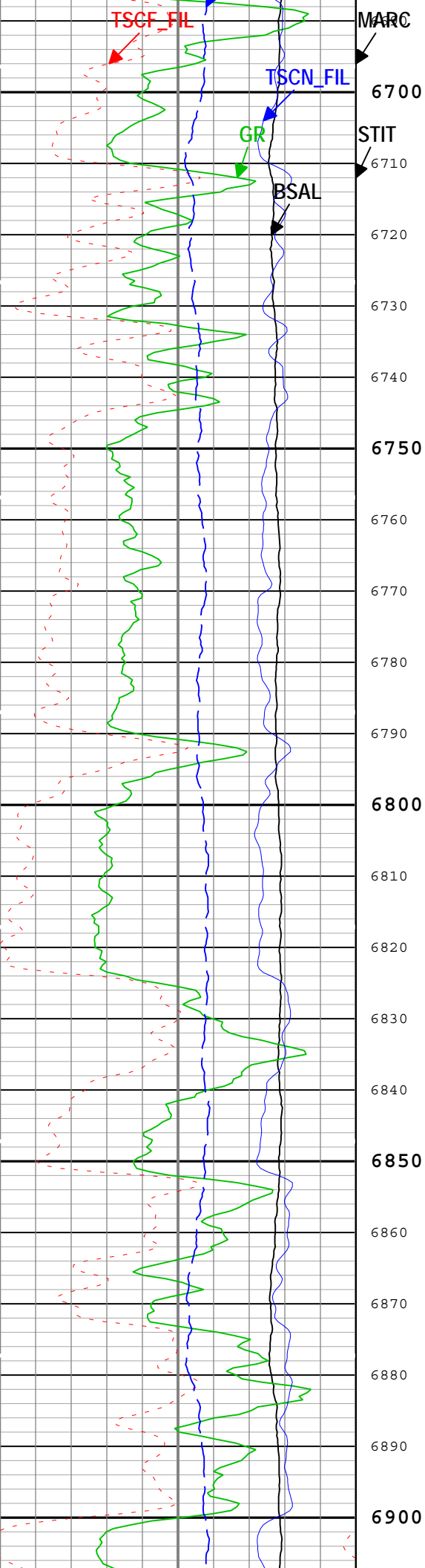
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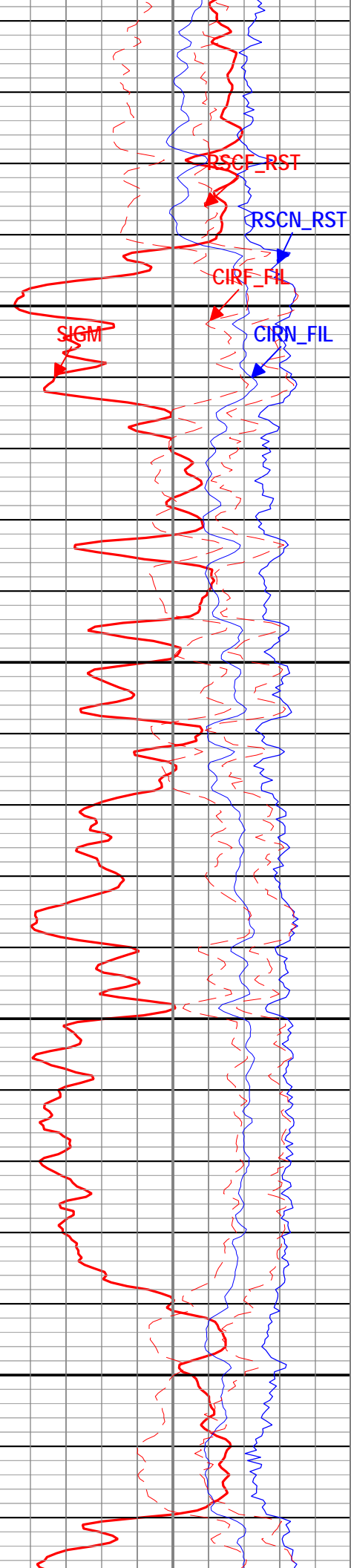
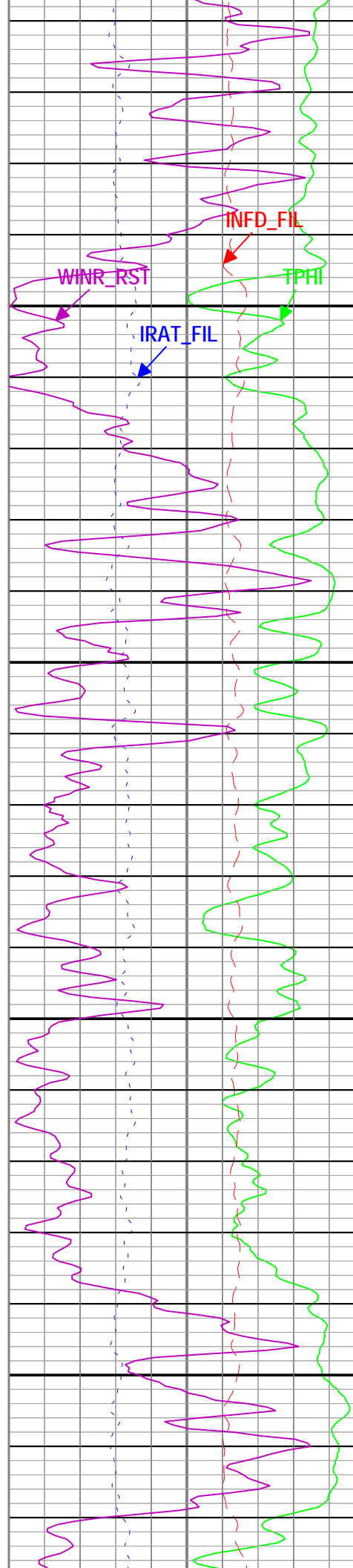
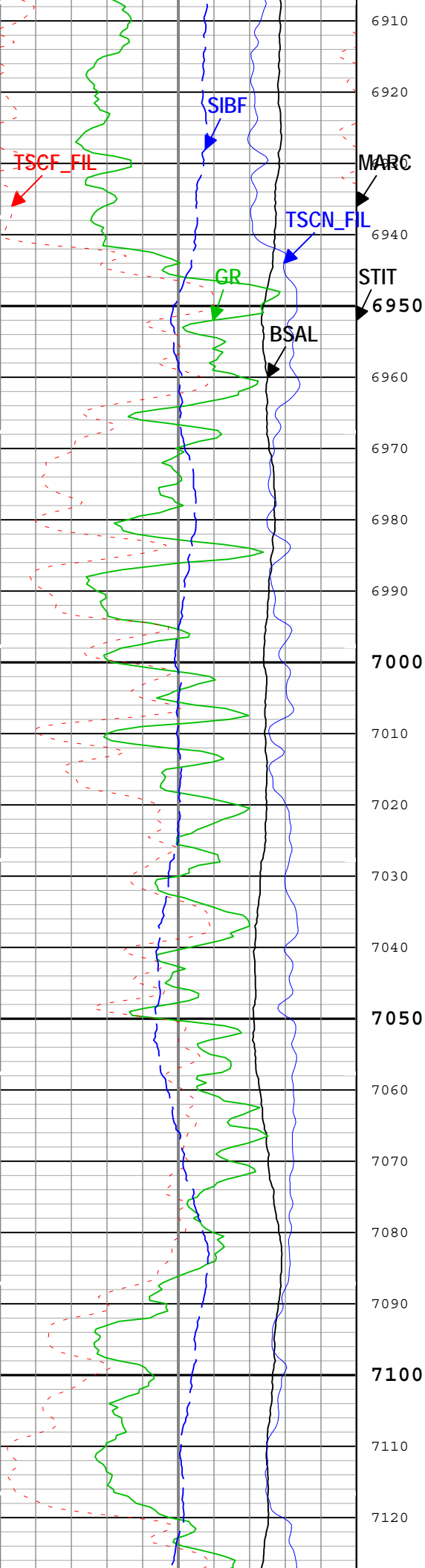
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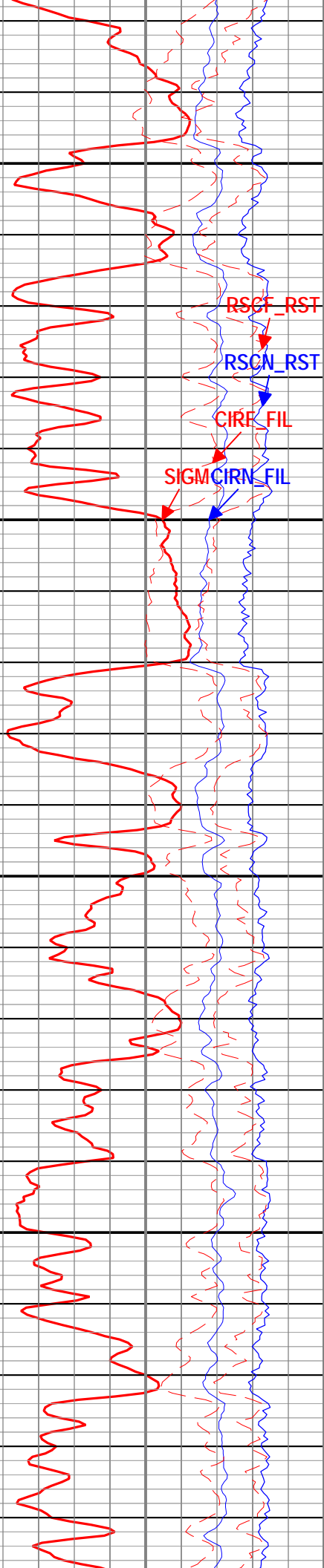
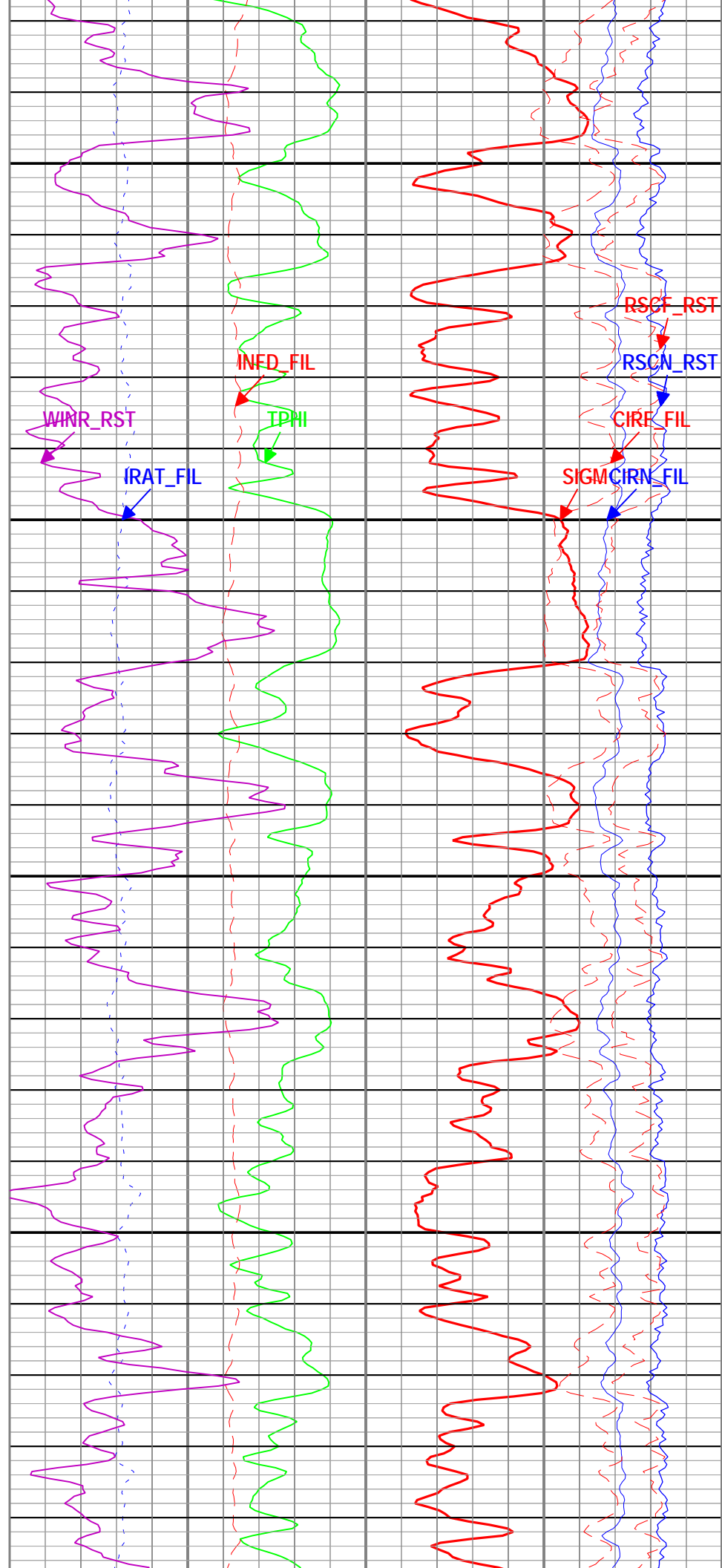
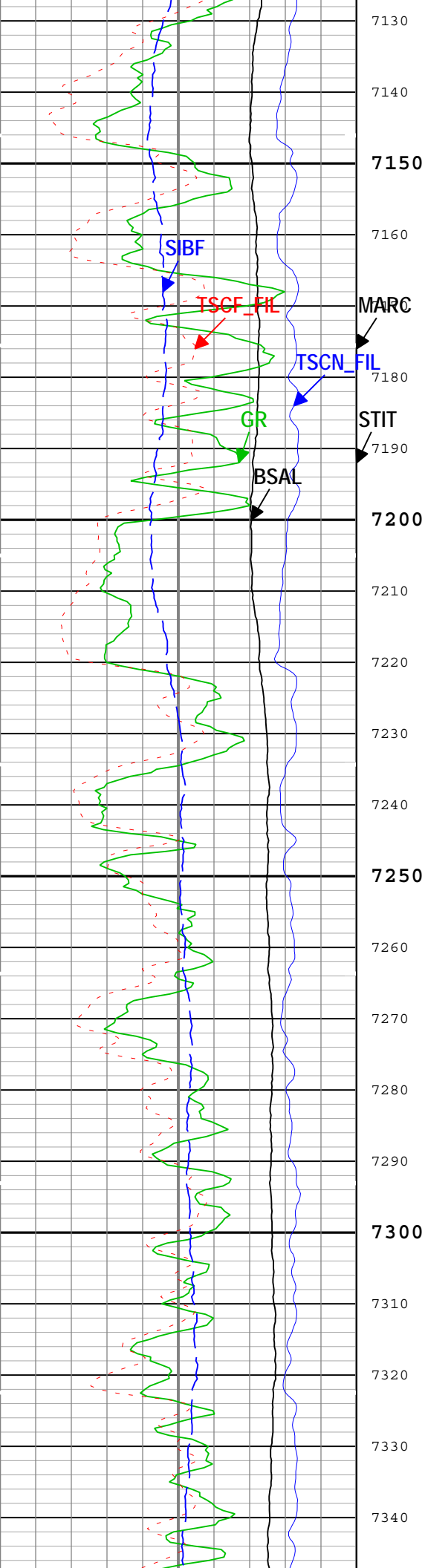
SIGM

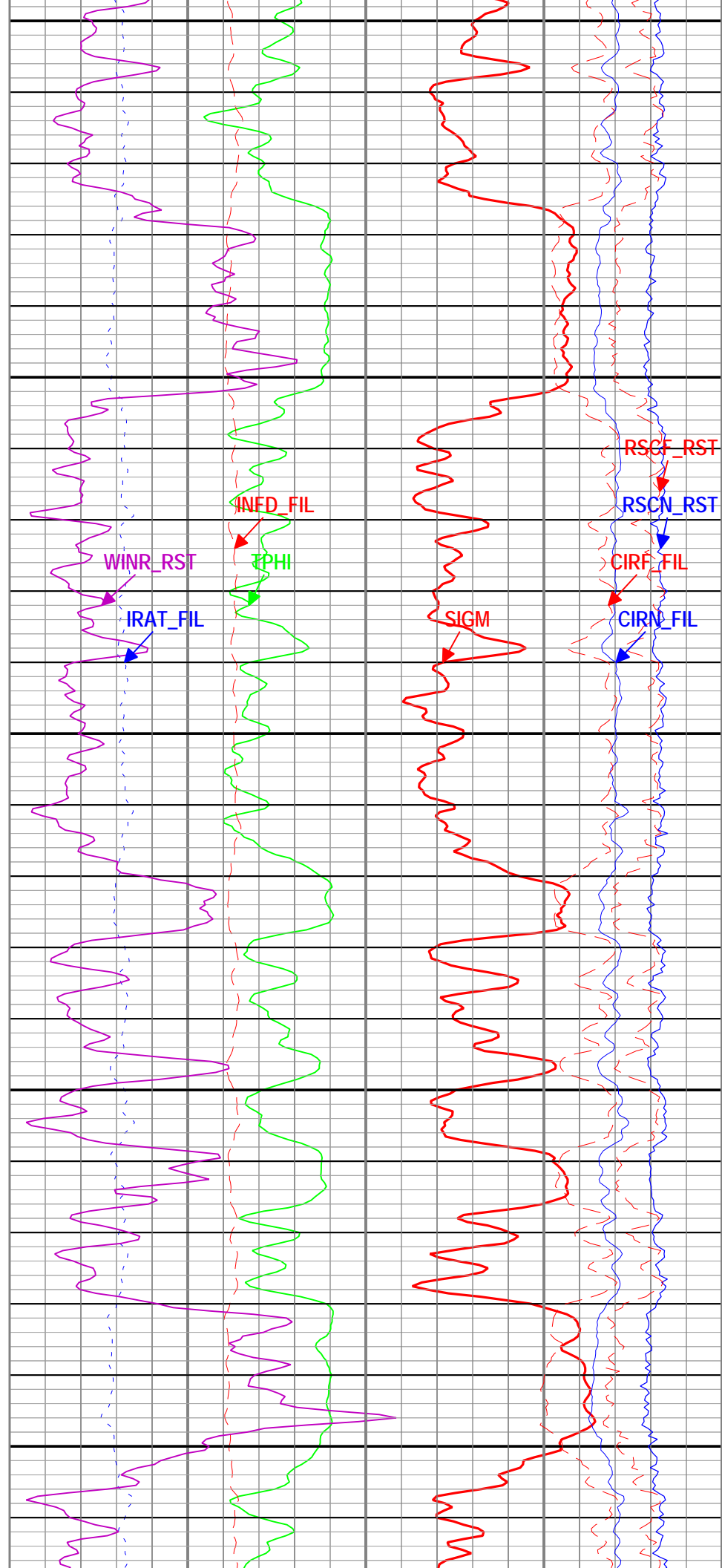
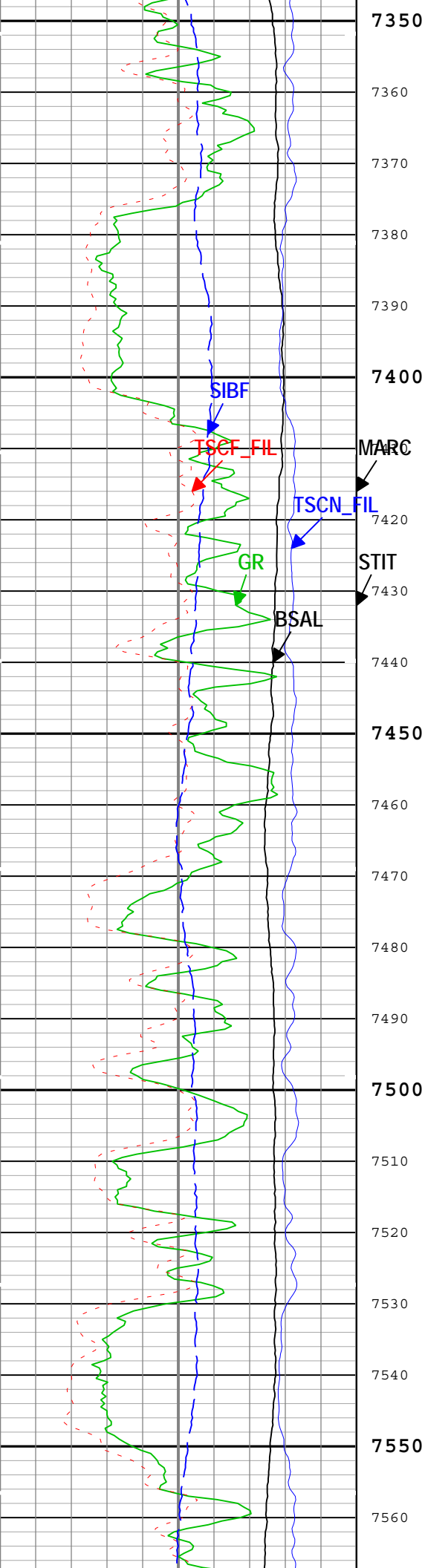


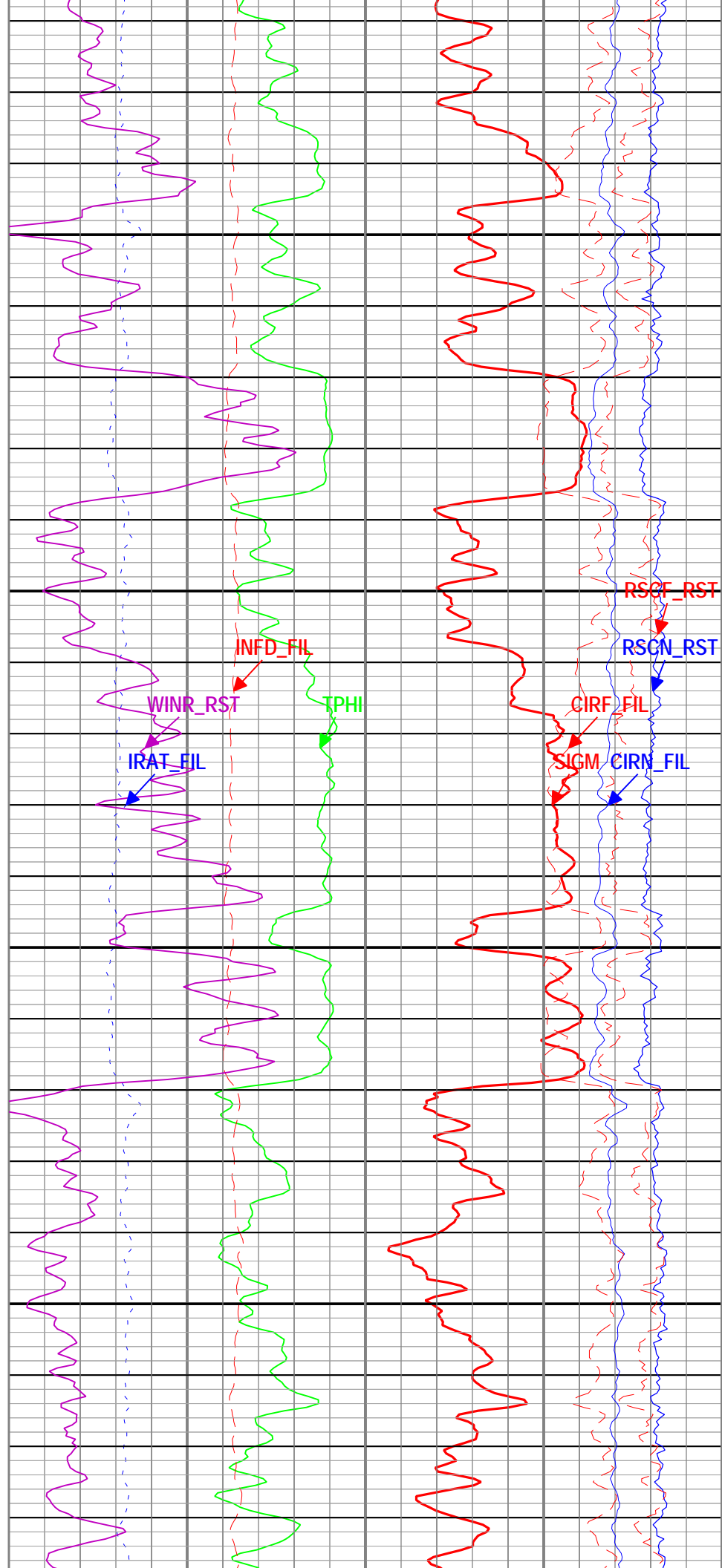
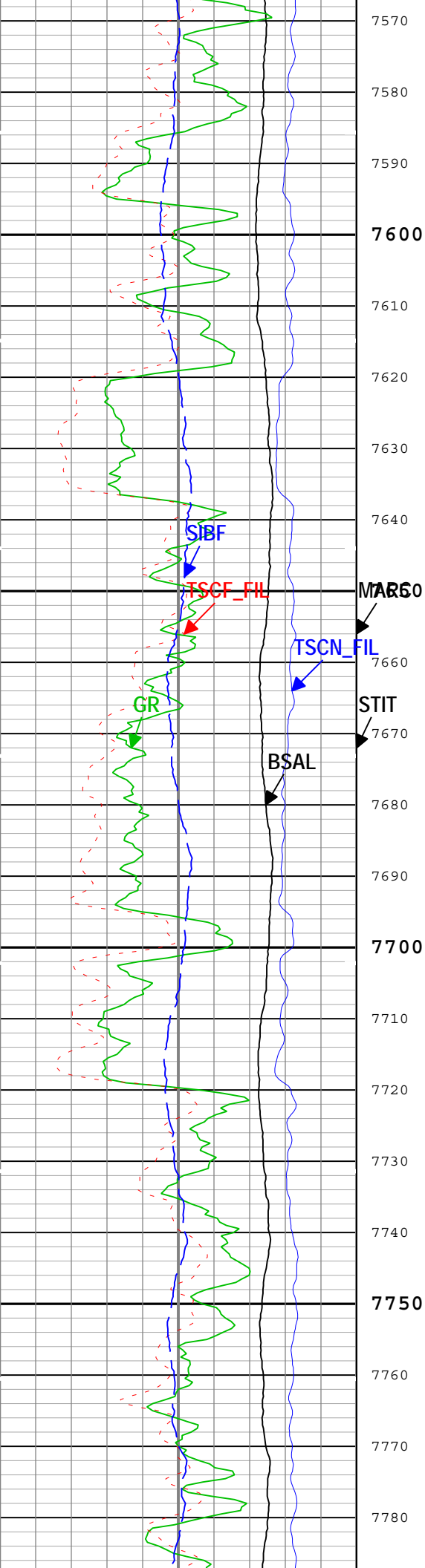


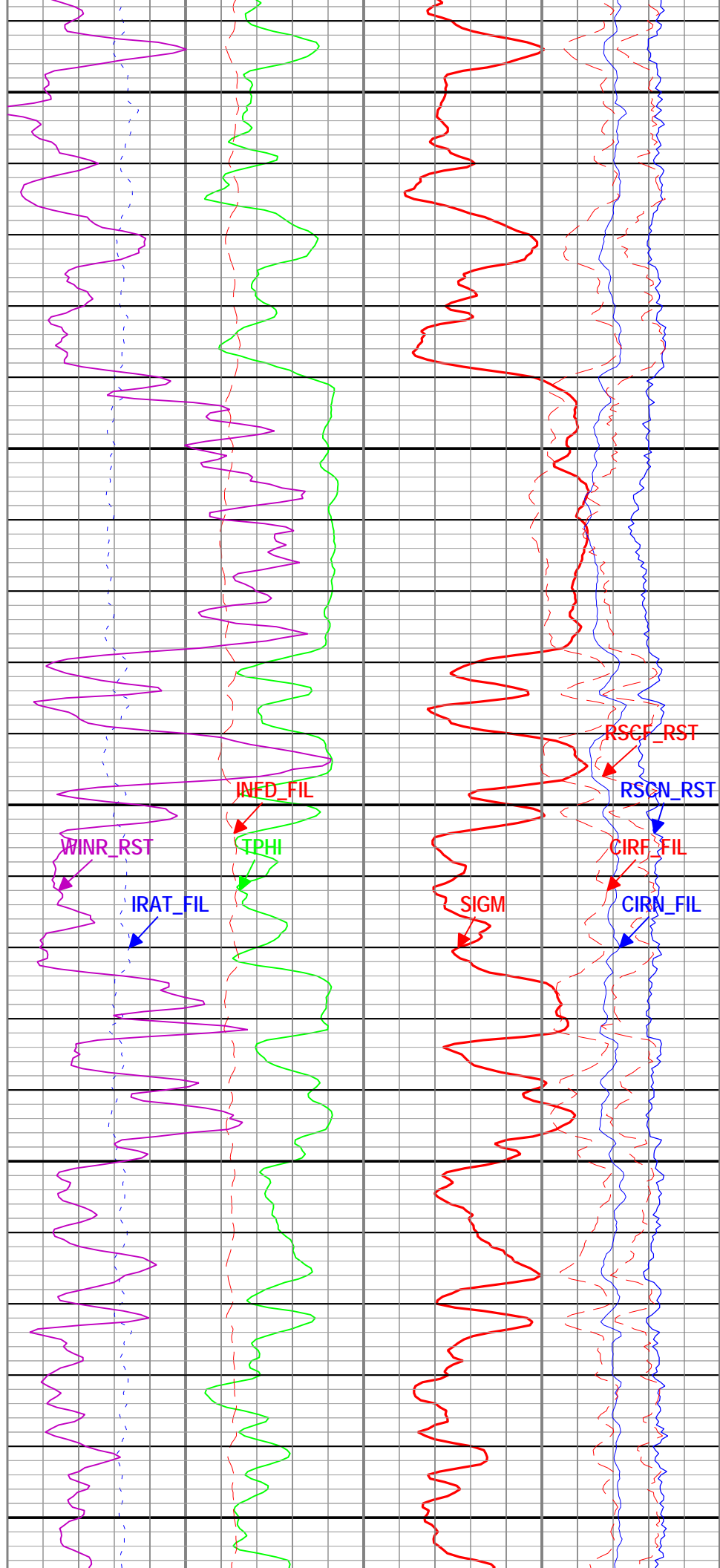
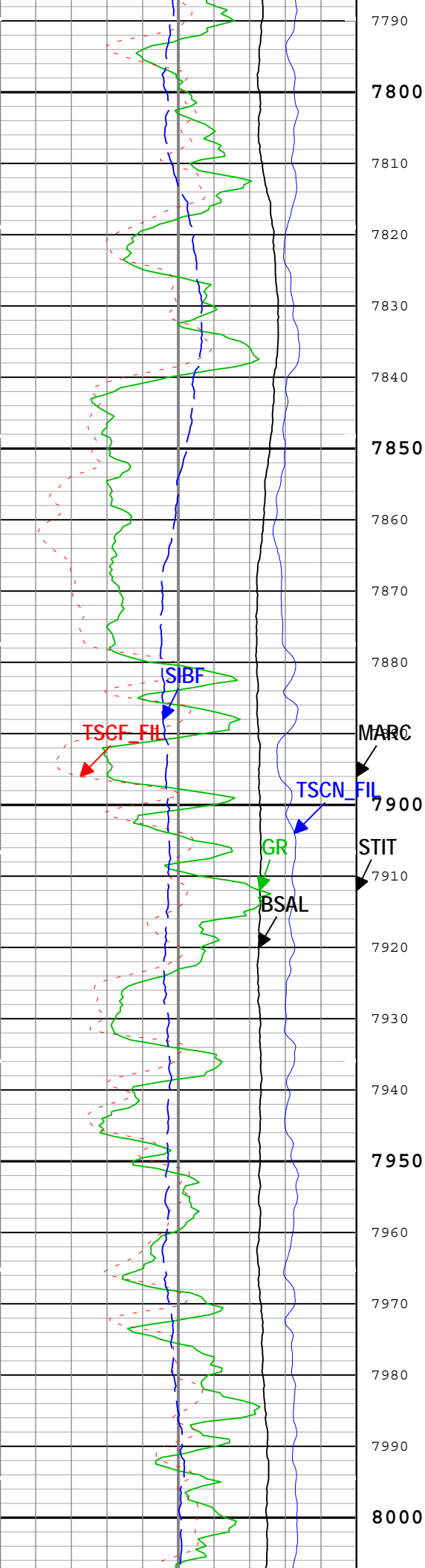


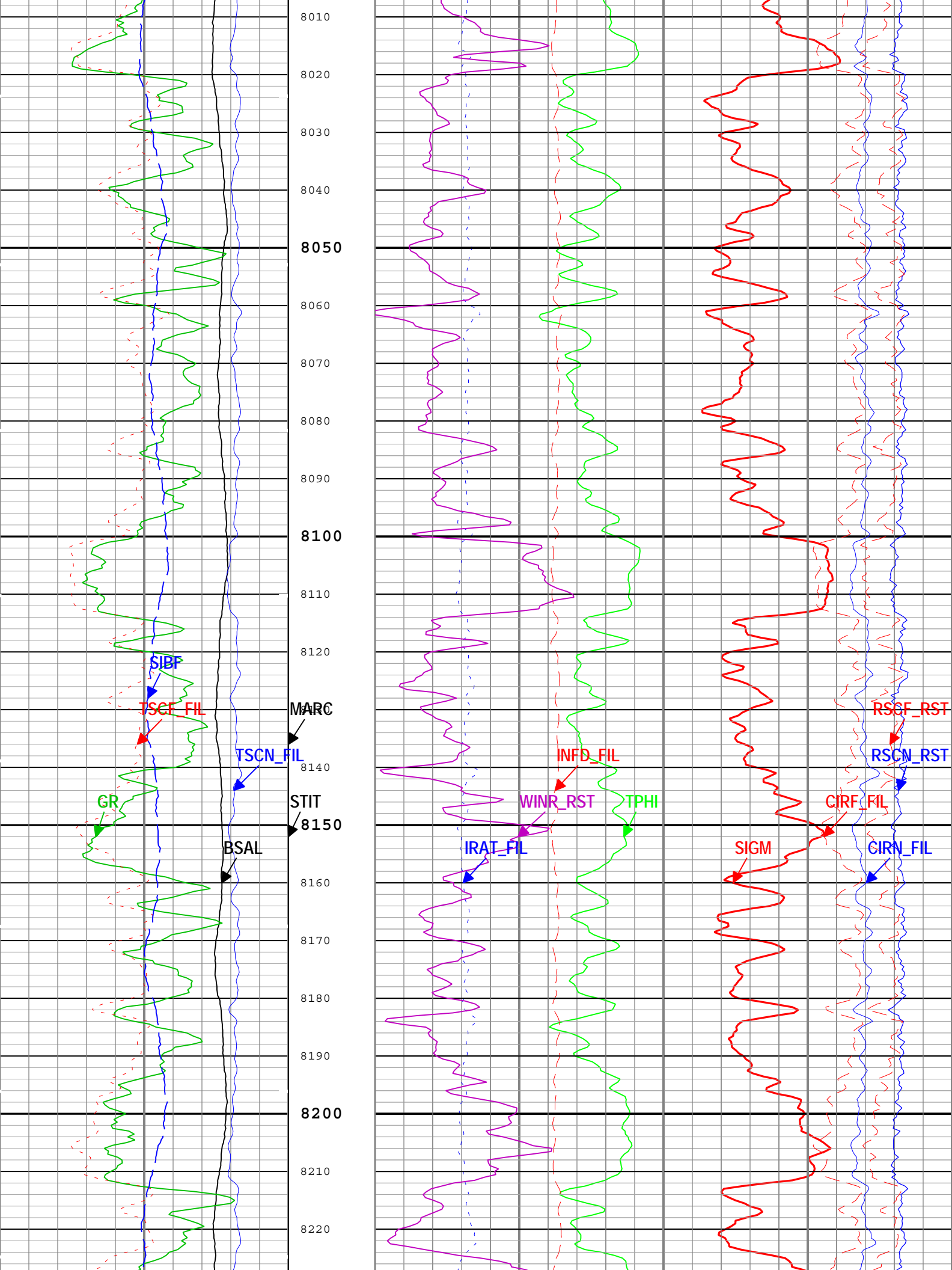


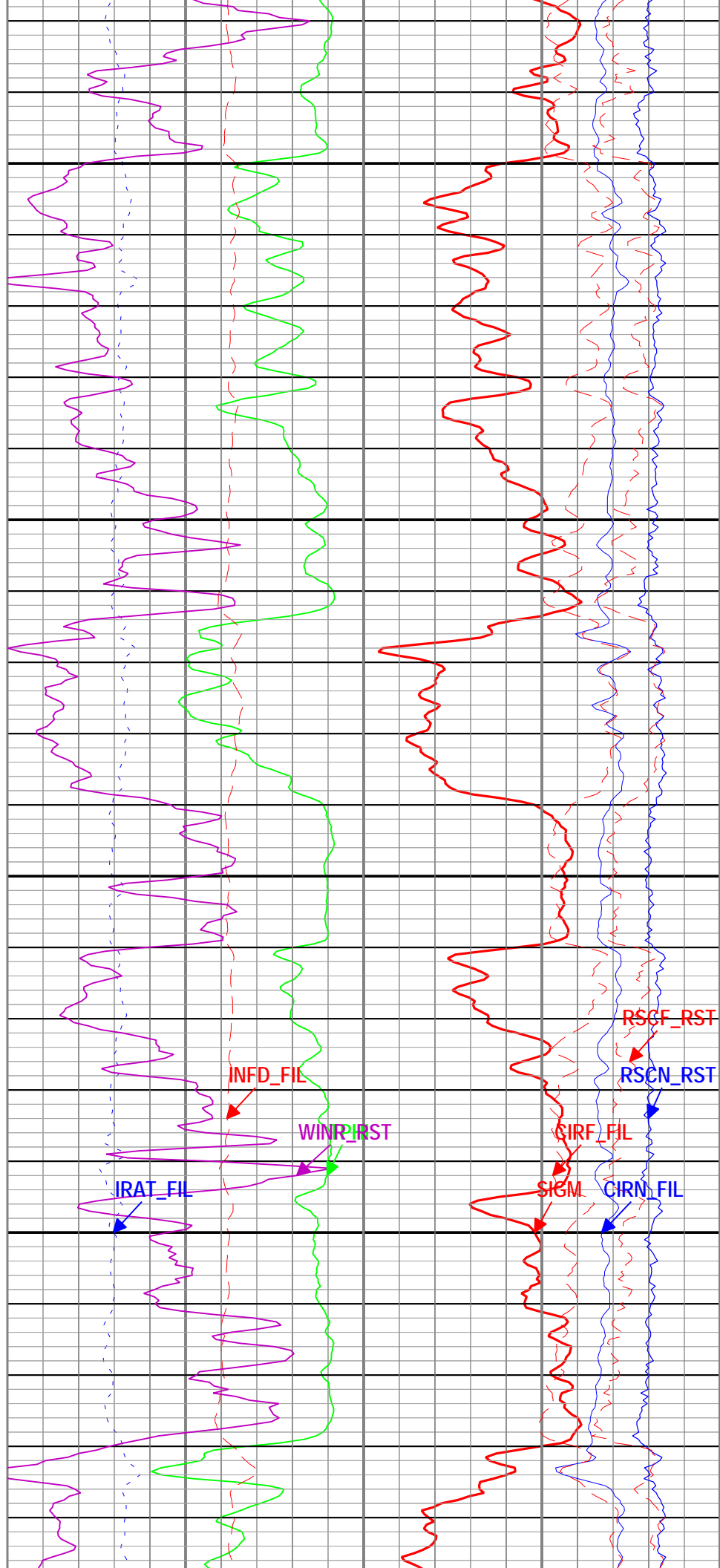
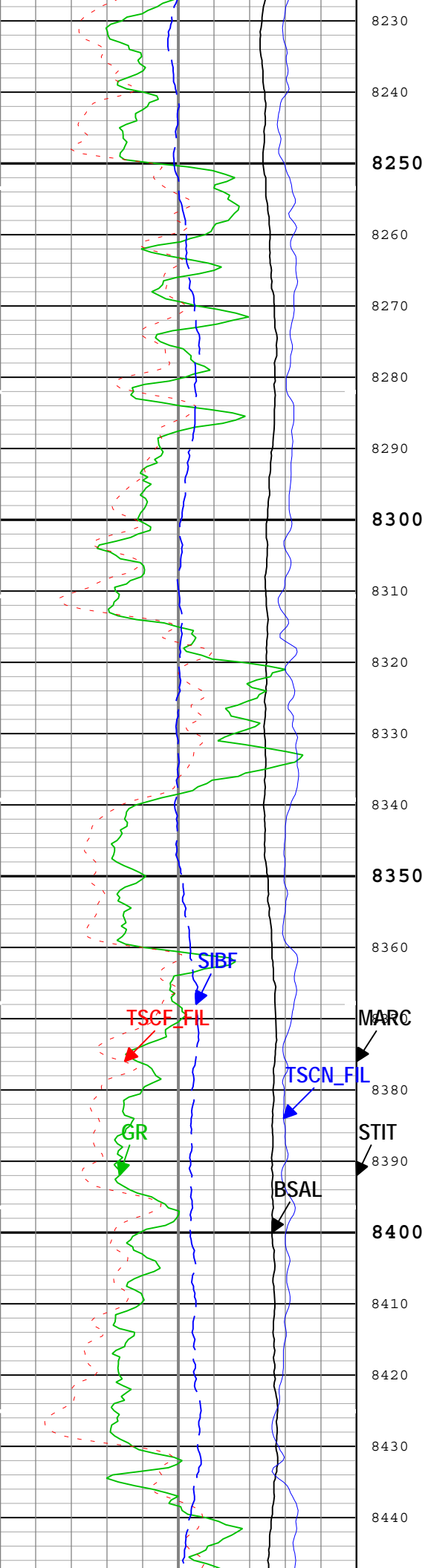


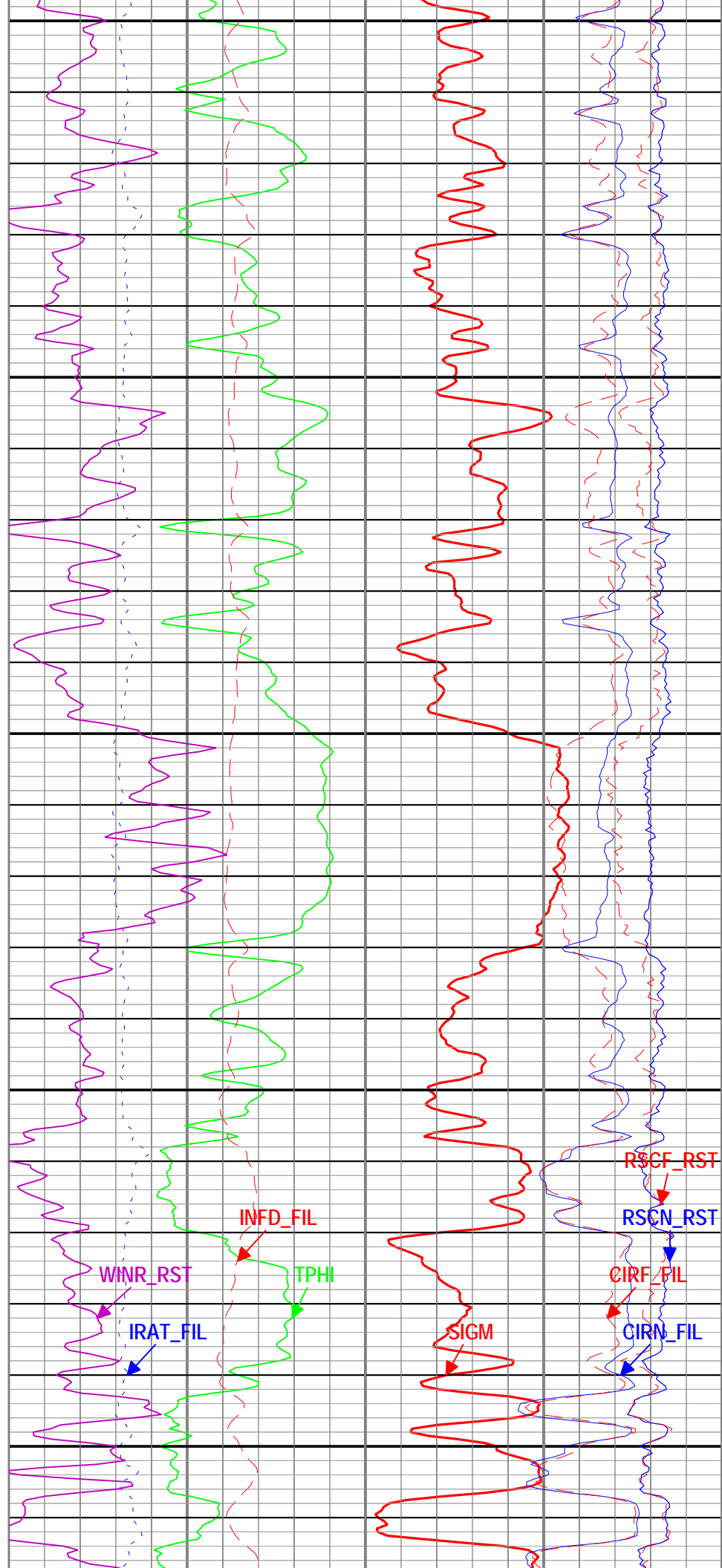
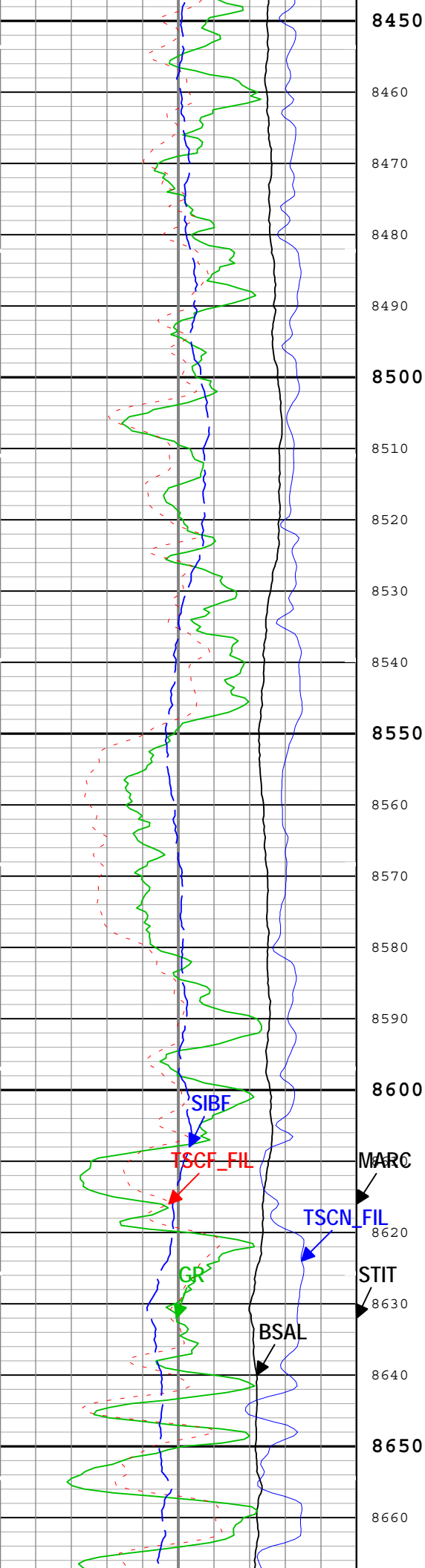


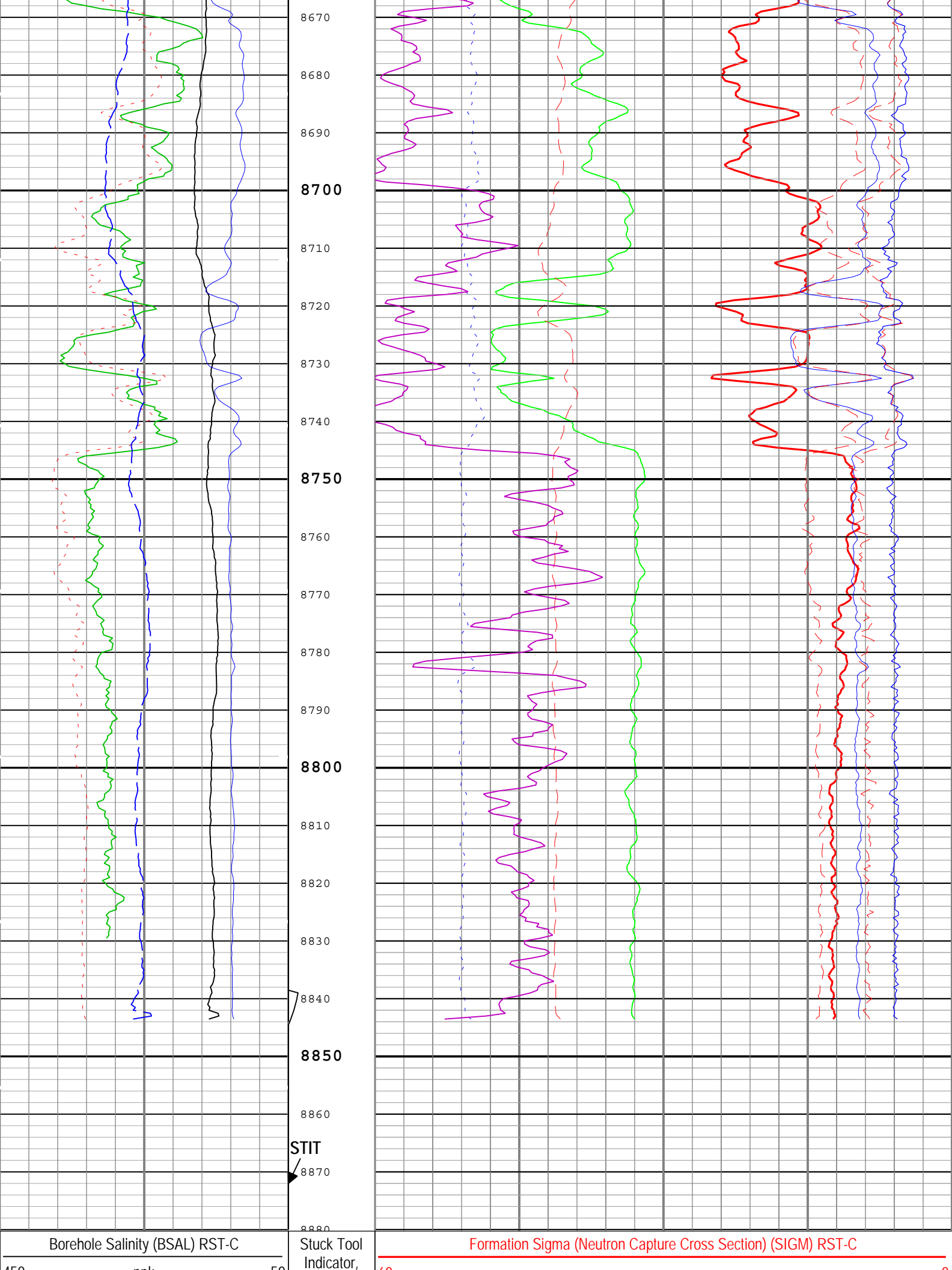












Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	Depth Zoned	in
BSAL	Borehole Salinity	Borehole	0	ppm
BSALOPT	Borehole Salinity Option	RST-C	Unknown	
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFT	Drilling Fluid Type	Borehole	Water	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	SANDSTONE	
Depth Zone Parameters				
Parameter	Value	Start (ft)	Stop (ft)	
BS	14.75	2450	2500	
BS	8.75	2500	8880.28	
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				

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[2]:Up	Up	8503.72 ft	8862.37 ft	24-Jul-2015 2:40:43 PM	24-Jul-2015 2:53:23 PM	ON	3.91 ft	No
ONE	Log[3]:Up	Up	2449.81 ft	8880.28 ft	24-Jul-2015 3:08:05 PM	24-Jul-2015 6:42:45 PM	ON	5.73 ft	No
All depths are referenced to toolstring zero									
Log	Company:Caerus Piceance LLC							Well:Puckett 43B-2	
								ONE: Log[3]:Up:S003	
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: 24-Jul-2015 19:08:29									
TIME_1900 - Elapsed time since midnight, 30 December 1899 every 60.00 (s)									
TIME_1900 - Time Marked every 60.00 (s)									
IHV - Integrated Hole Volume every 10.00 (ft3)									
IHV - Integrated Hole Volume every 100.00 (ft3)									
ICV - Integrated Cement Volume every 10.00 (ft3)									
ICV - Integrated Cement Volume every 100.00 (ft3)									

Total Selected Count Rate Far Detector Filtered
(TSCF_FIL) RST-C

12000 1/s 0

Main To Repeat

Repeat To Main

Gamma Ray (GR) PSTP-A

0 gAPI 150

Main To Repeat

Repeat To Main

Stuck Tool Indicator, Total (STIT)

0 ft 50

Formation Sigma (Neutron Capture Cross Section) (SIGM) RST-C

60

cu

0

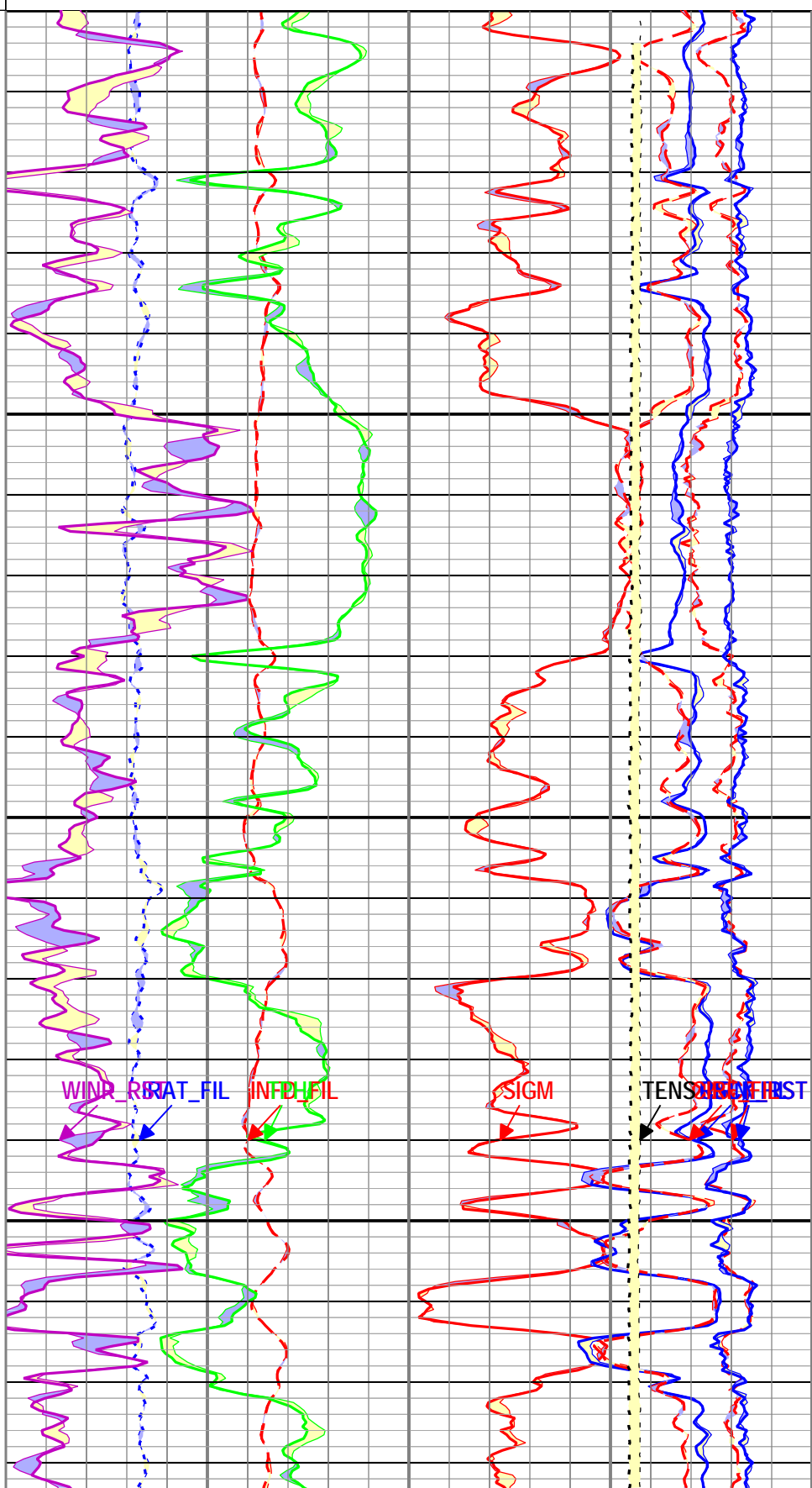
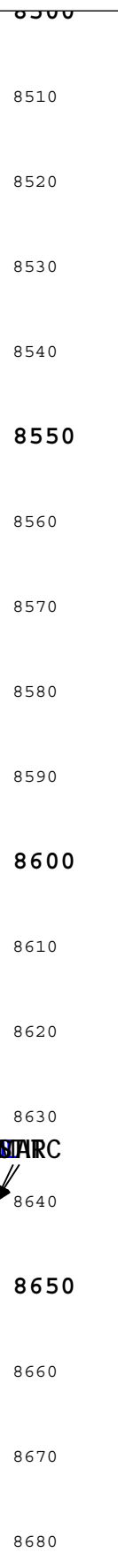
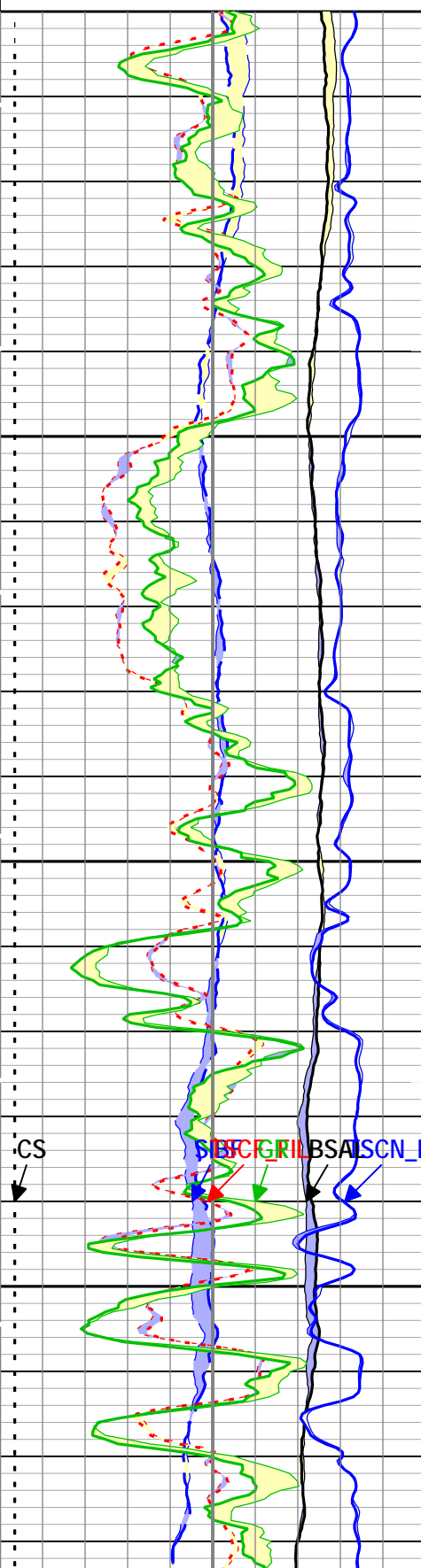
Main To Repeat

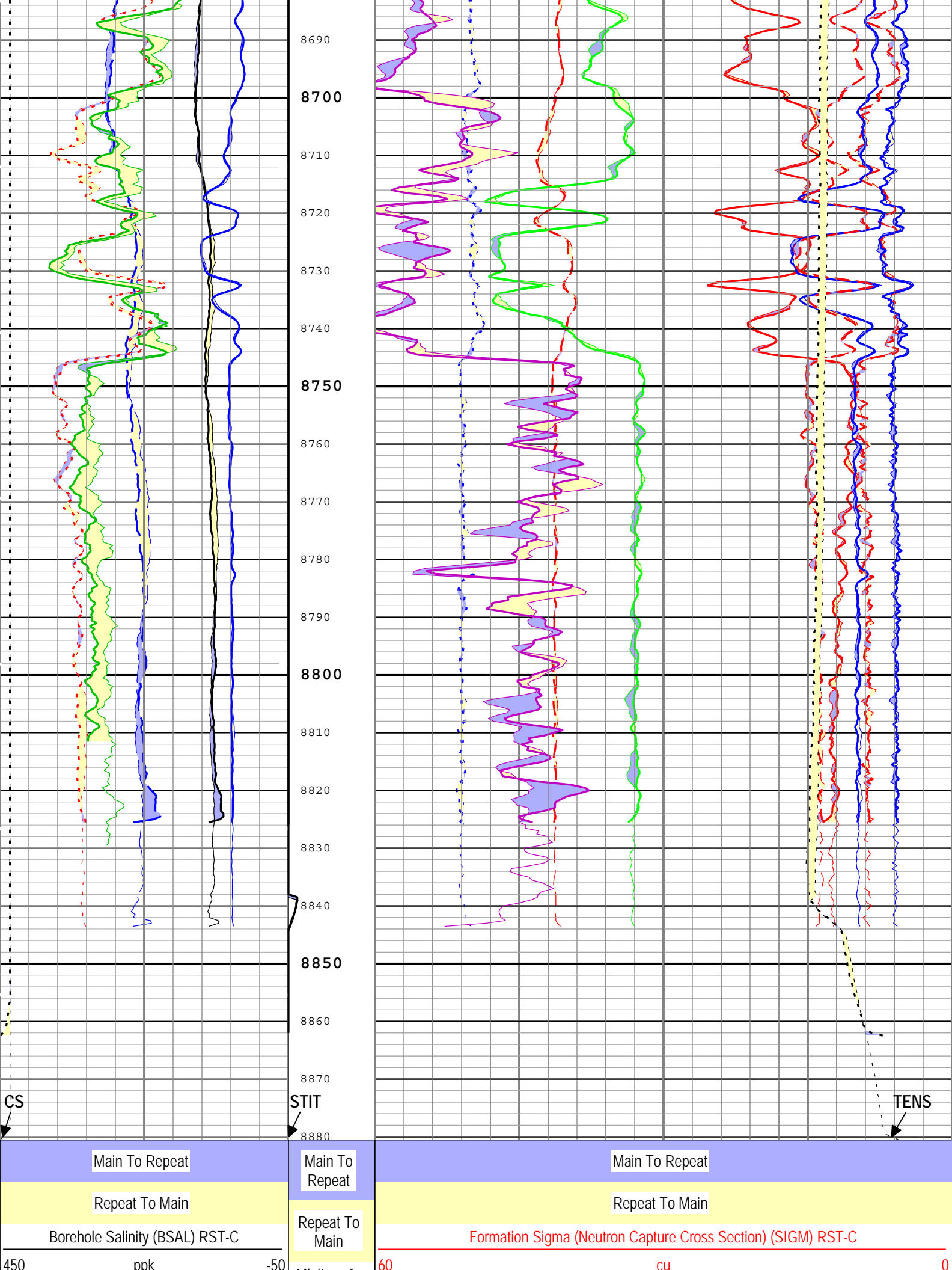
Repeat To Main

Weighted Inelastic Ratio (WINR_RST) RST-C

0

0.4





The screenshot displays the RST-C configuration screen with the following parameters and ranges:

- Main To Repeat** (Blue bar)
- Repeat To Main** (Yellow bar)
- Sigma Borehole Fluid (SIBF) RST-C** (Blue bar)
- 100** (Left value)
- cu** (Center value)
- 0** (Right value)
- Main To Repeat** (Blue bar)
- Repeat To Main** (Yellow bar)
- Cable Speed (CS)** (Blue bar)
- 0** (Left value)
- ft/h** (Center value)
- 50000** (Right value)
- Main To Repeat** (Blue bar)
- Repeat To Main** (Yellow bar)
- Total Selected Count Rate Near Detector Filtered (TSCN_FIL) RST-C** (Blue bar)
- 30000** (Left value)
- 1/s** (Center value)
- 0** (Right value)
- Main To Repeat** (Blue bar)
- Repeat To Main** (Yellow bar)
- Total Selected Count Rate Far Detector Filtered (TSCF_FIL) RST-C** (Red bar)
- 12000** (Left value)
- 1/s** (Center value)
- 0** (Right value)
- Main To Repeat** (Blue bar)
- Repeat To Main** (Yellow bar)
- Gamma Ray (GR) PSTP-A** (Green bar)
- 0** (Left value)
- gAPI** (Center value)
- 150** (Right value)

Minitron Arc Count (MARC) RST-C	0	5
Main To Repeat		
Repeat To Main		
Stuck Tool Indicator, Total (STIT)	0	50

Main To Repeat		Main To Repeat	
Repeat To Main		Repeat To Main	
Weighted Inelastic Ratio (WINR_RST) RST-C		Weighted Inelastic Ratio (WINR_RST) RST-C	
0	0.4	0	0.4
Main To Repeat		Main To Repeat	
Repeat To Main		Repeat To Main	
Gross Inelastic Count Rate Far Detector Filtered (INFD_FIL) RST-C		Far Detector Effective Unregulated Capture Count Rate (RSCF_RST) RST-C	
10000	1/s	0	0
Main To Repeat		Main To Repeat	
Repeat To Main		Repeat To Main	
Inelastic Ratio Filtered (IRAT_FIL) RST-C		Near Detector Effective Unregulated Capture Count Rate (RSCN_RST) RST-C	
0.75	0	45	0
Main To Repeat		Main To Repeat	
Repeat To Main		Repeat To Main	
Thermal Decay Porosity (TPHI) RST-C		Capture to Inelastic Ratio Near Filtered (CIRN_FIL) RST-C	
0.6	ft3/ft3	0	0
		2.5	
		Main To Repeat	
		Repeat To Main	
		Capture to Inelastic Ratio Far Filtered (CIRF_FIL) RST-C	
		5	
		Main To Repeat	
		Repeat To Main	
		Cable Tension (TENS)	
		5000 lbf	
		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 RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 24-Jul-2015 19:08:29

Calibration Report

RST-C (Reservoir Saturation Pro Tool C) Calibration - Run ONE

Primary Equipment :

RSC Acquisition Cartridge

RSC-E

381

RST IC Tank Calibration - RST IC Tank Calibration

Master:							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
Near Spectral Acquisition Time Calibration Coefficient - 0	s	Master	----	----	----	----	<div></div>
Near Carbon/Oxygen Ratio Calibration Coefficient - 0		Master	----	----	----	----	<div></div>
Far Carbon/Oxygen Ratio Calibration Coefficient - 0		Master	----	----	----	----	<div></div>
Near Windows Carbon/Oxygen Ratio Calibration Coefficient - 0		Master	----	----	----	----	<div></div>
Far Windows Carbon/Oxygen Ratio Calibration Coefficient - 0		Master	----	----	----	----	<div></div>
Near IC Mode Capture Optimization Resolution Degradation Factor Calibration Coefficient - 0		Master	----	----	----	----	<div></div>
Far IC Mode Capture Optimization Resolution Degradation Factor Calibration Coefficient - 0		Master	----	----	----	----	<div></div>
Near Pulse Shape Compensation Voltage Setting Echo Calibration Coefficient - 0	V	Master	----	----	----	----	<div></div>
Far Pulse Shape Compensation Voltage Setting Echo Calibration Coefficient - 0	V	Master	----	----	----	----	<div></div>
Near Photomultiplier High Voltage Setting Echo Calibration Coefficient - 0	V	Master	----	----	----	----	<div></div>
Far Photomultiplier High Voltage Setting Echo Calibration Coefficient - 0	V	Master	----	----	----	----	<div></div>
Minitron Measured Beam Current Calibration Coefficient - 0	uA	Master	----	----	----	----	<div></div>
Grid Current Peak Calibration Coefficient - 0	mA	Master	----	----	----	----	<div></div>
Minitron Measured Extractor Current Calibration Coefficient - 0	uA	Master	----	----	----	----	<div></div>
Minitron Measured High Voltage Calibration Coefficient - 0	kV	Master	----	----	----	----	<div></div>
Near Instantaneous Count Rate Calibration Coefficient - 0	kHz	Master	----	----	----	----	<div></div>
Near/Far Count Rate Ratio Calibration Coefficient - 0		Master	----	----	----	----	<div></div>

RST IC Tank Check - RST IC Tank Check

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

Count Rate Ratio Calibration	Master				NOT DONE		
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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)

150

PBMS Well Temp Master Calibration

Master (EEPROM): 00:00:00 12-May-2005						
PBMS_RTD_THERM RTD Coefficients (Master)						
	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 GR Coefficients (Master)		
	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 PBMS A Clock Coefficients (Master)						
	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_PRES 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 43B-2

Field: Wildcat

County:	Garfield
State:	Colorado
Reservoir Saturation Tool	
Sigma	