



# Weatherford®

## RAPTOR GAS ANALYSIS

Company			VANGUARD OPERATING LLC.		
Well			GGU_23A-28-691		
Field			MAMM CREEK		
County			GARFIELD		
Prov. / State			U.S.A./COLORADO		
Country			United States		
Location		Latitude		Other Services	
UWI / API NO.		Longitude			
License					
Permanent Datum MSL		Elevation		Elevations K.B. 6147.60 F	
Log Measured From KB		Above Permanent Datum		Elevations D.F. 6130.60 F	
Drill Measured From				Elevations G.L.	
Date		31-Dec-2017			
Run Number		ONE			
Service Order		5839-201849832			
Depth Driller		7665.00 FT			
Depth Logger		7616.00 FT			
First Reading		7583.00 FT			
Last Reading		3700.00 FT			
Casing Driller					
Casing Logger					
Bit Size					
Hole Fluid Type		WATER			
Density		Viscosity			
pH		Fluid Loss			
Sample Source					
Rm @ Measured Temperature					
Rmf @ Measured Temperature					
Rmc @ Measured Temperature					
Source Rmf		Source Rmc			
Rm @ BHT					
Time Since Circulation					
Maximum Recorded Temperature		211.00 DEGF			
Equipment No.		Base Location		14115/15108	
Recorded By		A. TAYLOR		CASPER, WY	
Witnessed By		R. SNOW			

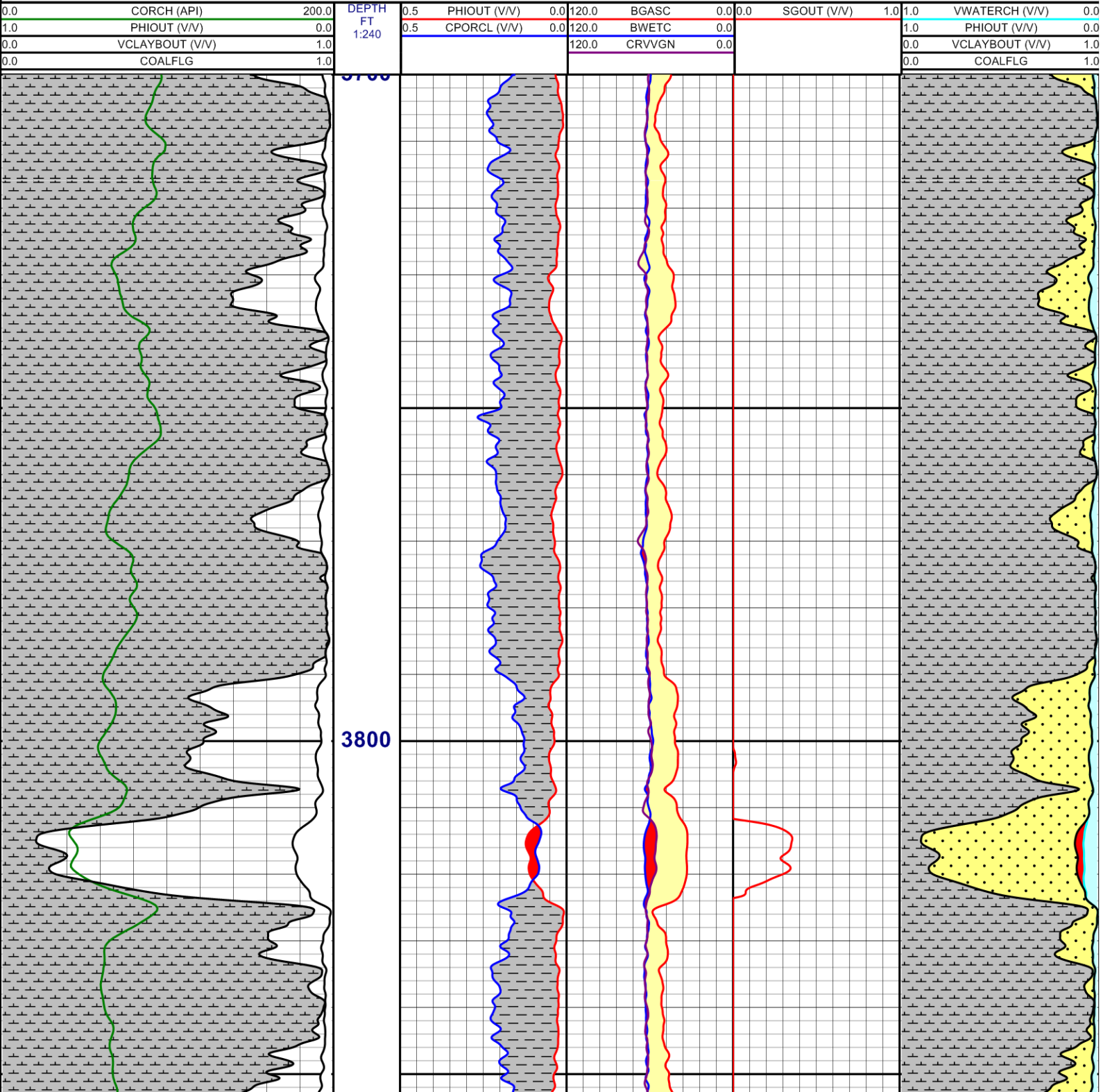
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.

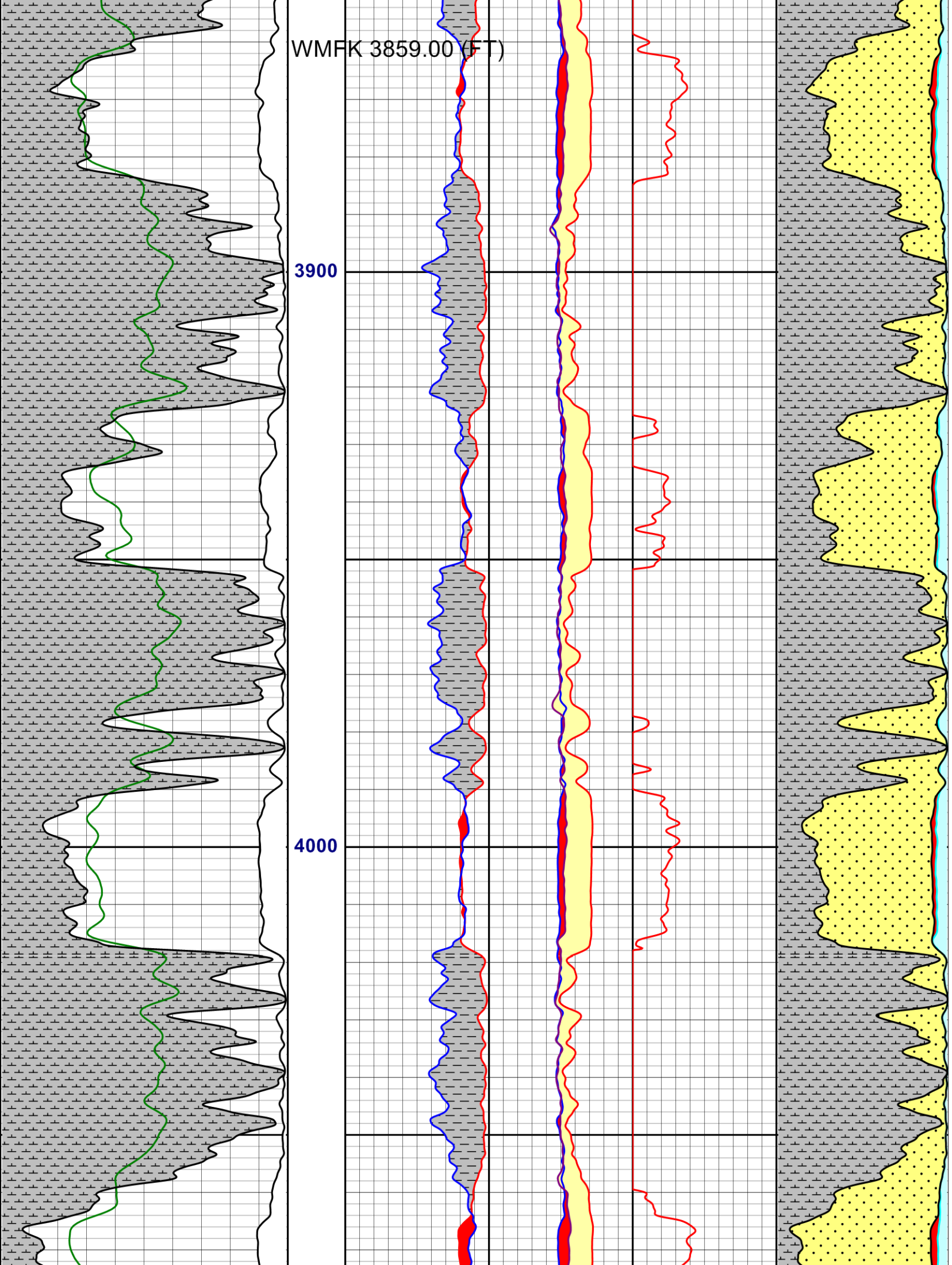
Rig:	Remarks:	Service Order # 5839-20184983
Drilling Stopped	Depth correlated to marker joint at 7488.4' from log supplied on location (RMWS)	
Circulation Stopped		
Tool on Bottom		
BHT		

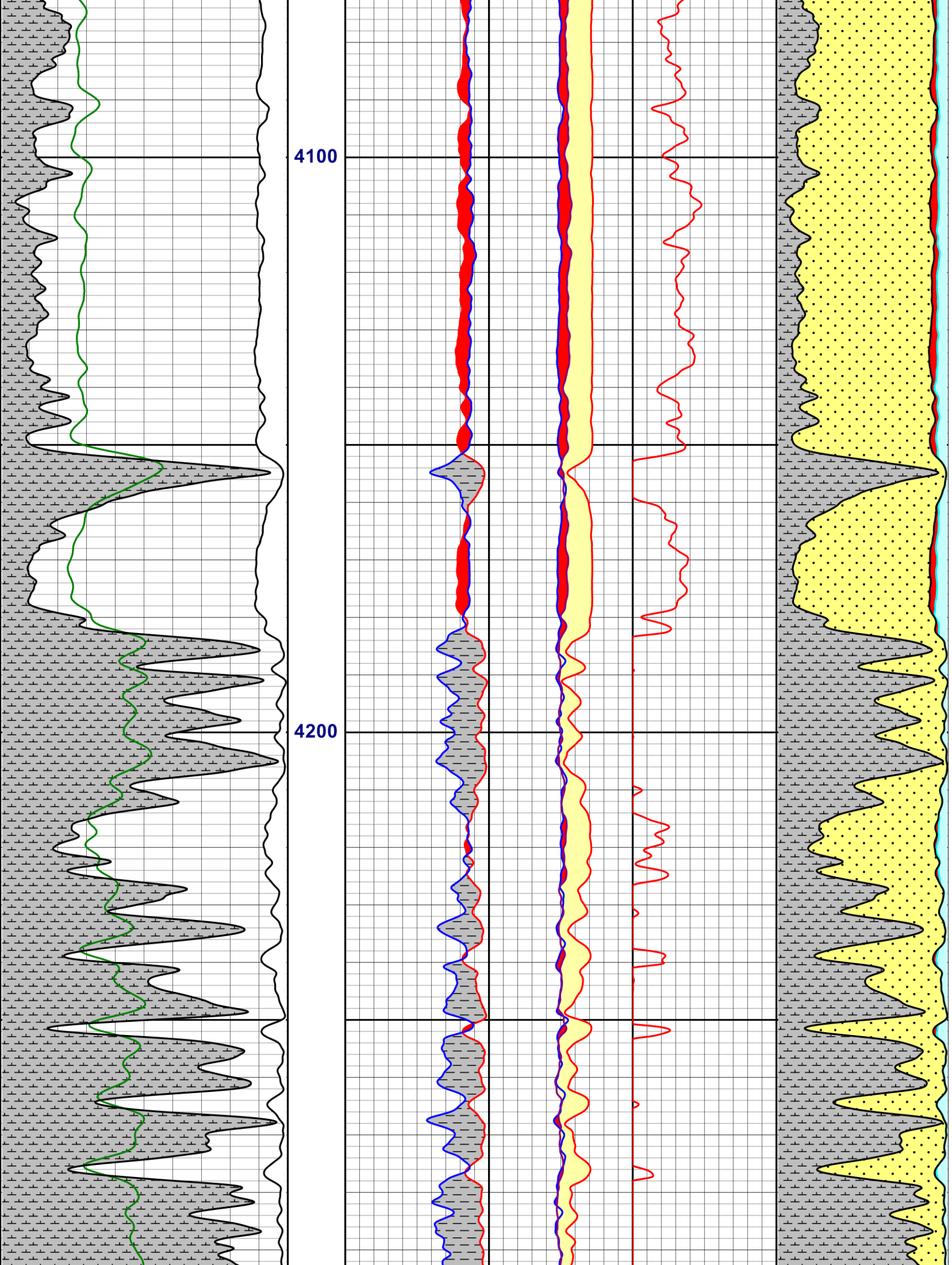
Equipment Data		
Tool Type	Tool Type	Other

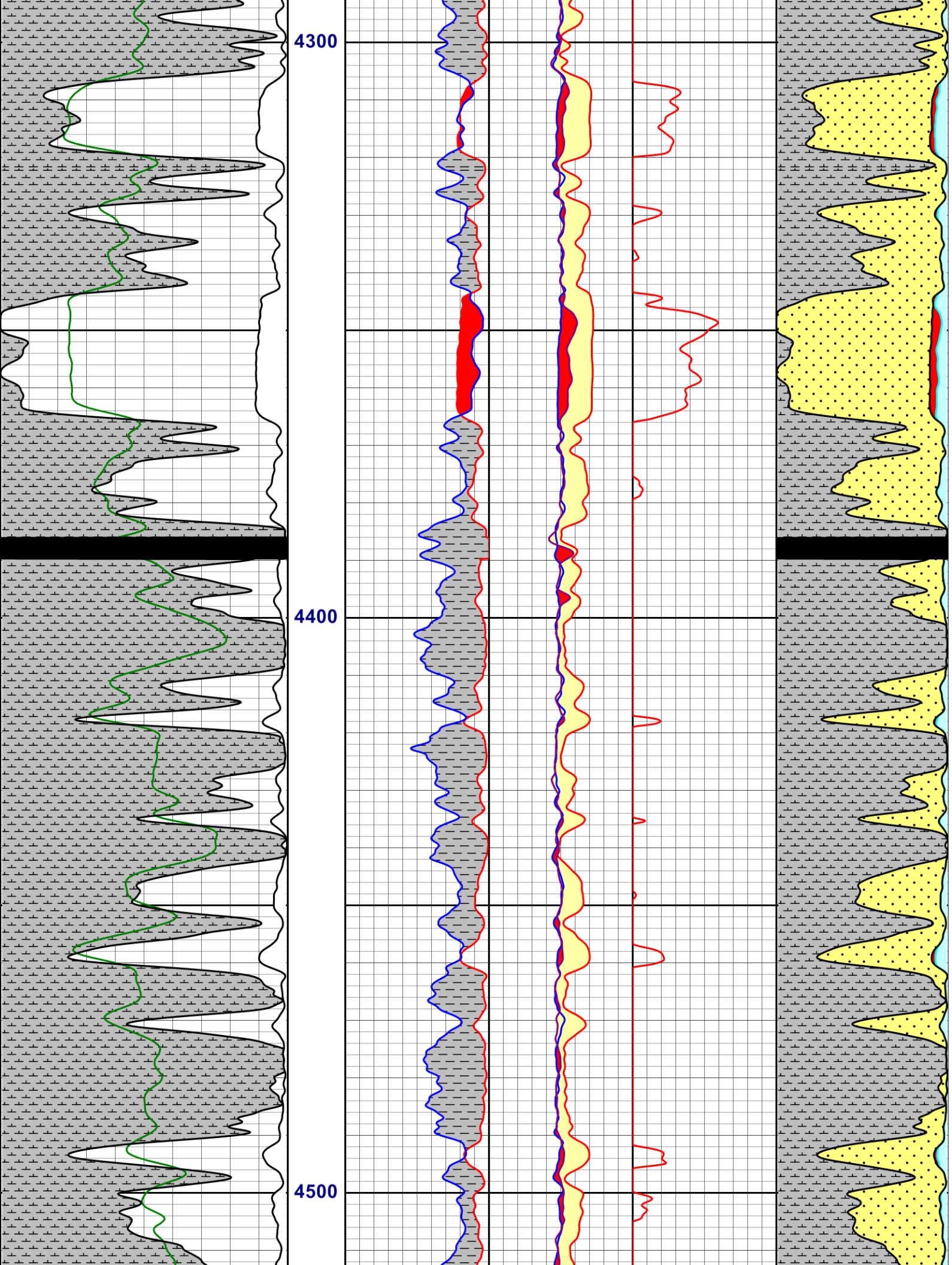
Log Description

CORCH	Cased hole gamma ray.
VWATERCH	Water pore volume for cased hole.
BGASC	Burst envelope for gas shale corrected.
BWETC	Burst envelope for wet shale corrected.
CRVVGN	Normalized measured burst curve.
PHIOUT	Porosity used in analysis.
VCLAYBOUT	Shale volume used in analysis.
COALFLG	Coal Flag
SGOUT	Cased Hole Gas saturation from burst.
CPORCL	Cased Hole Neutron Porosity in LMS units

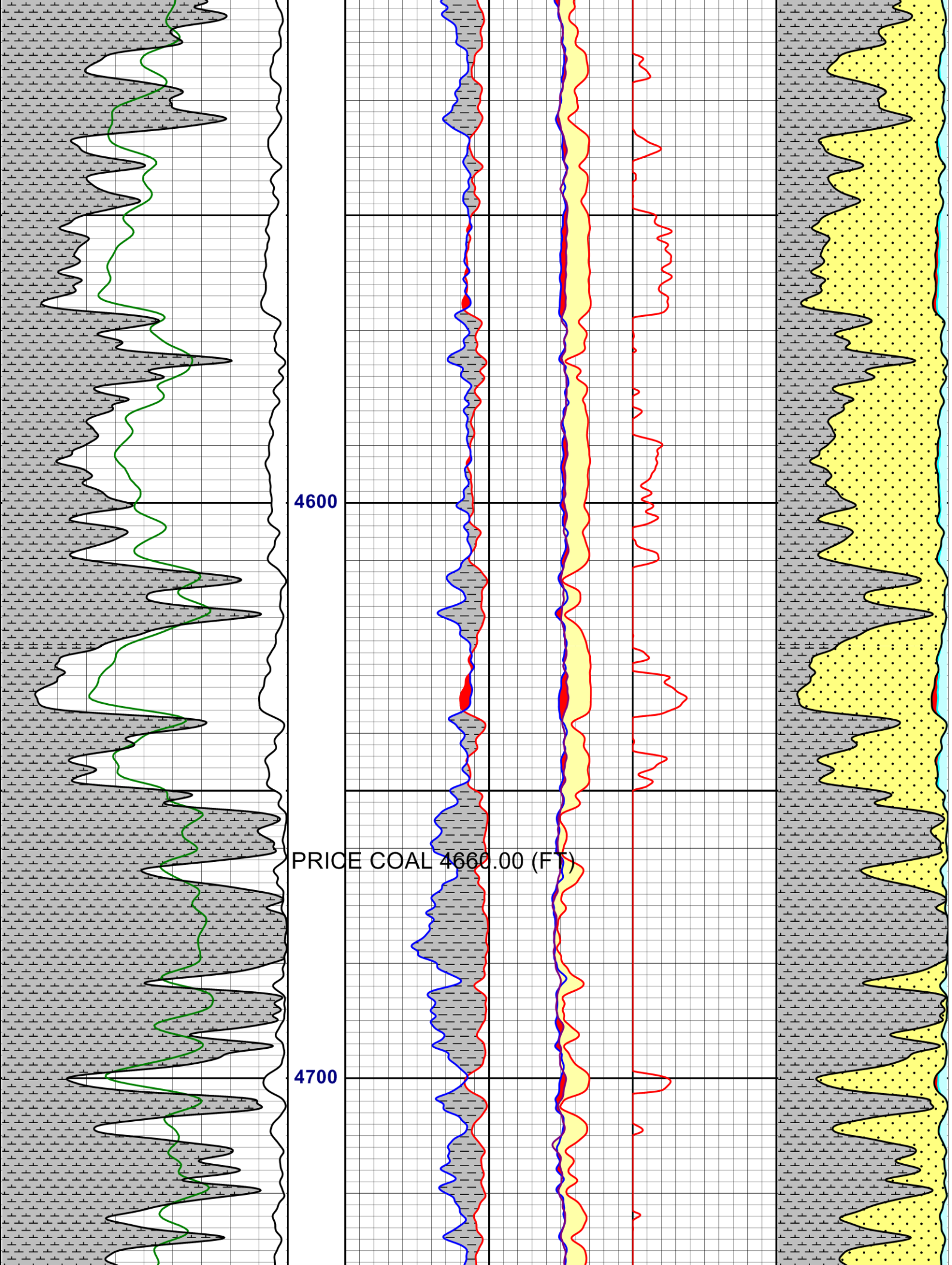


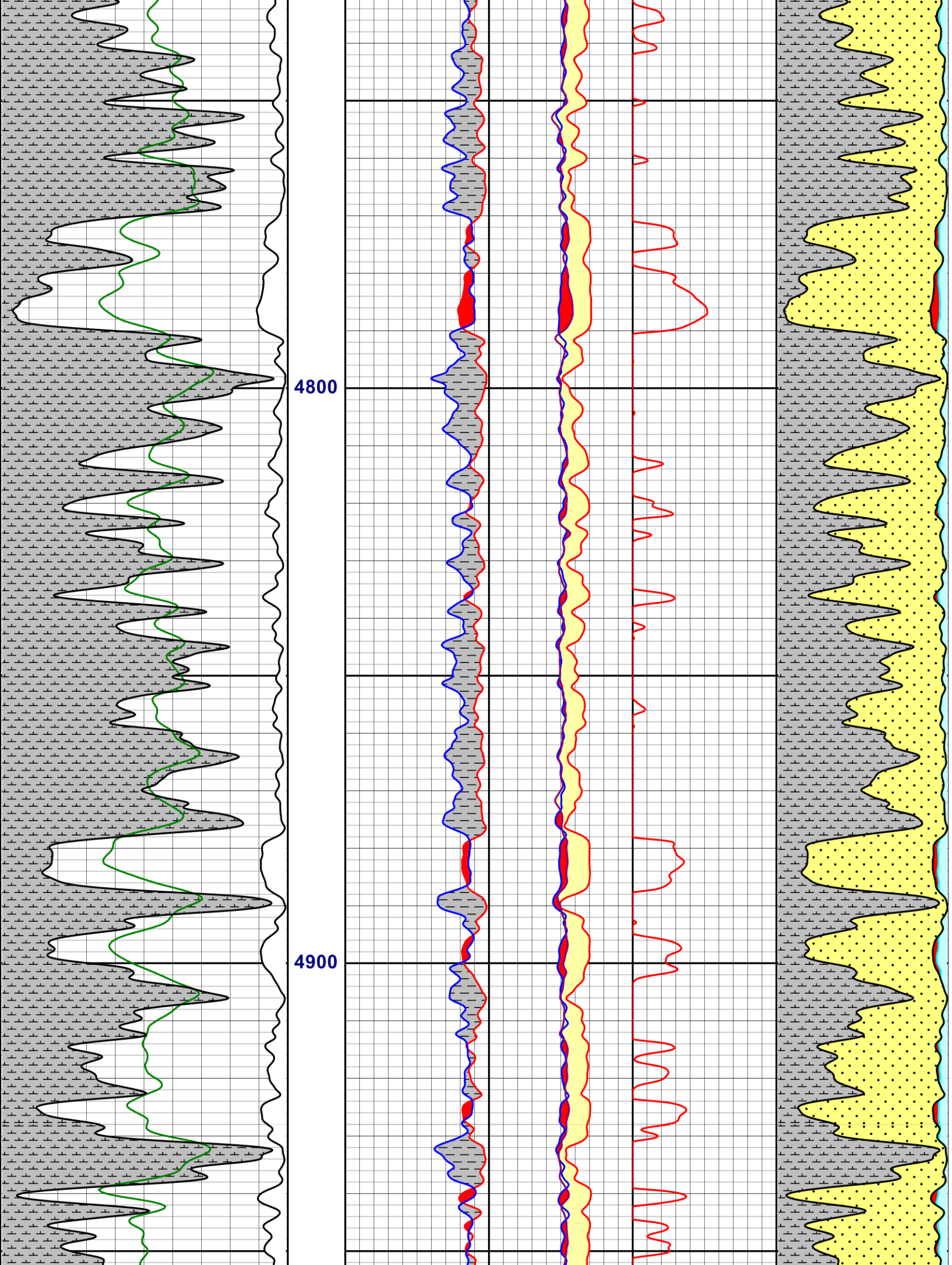


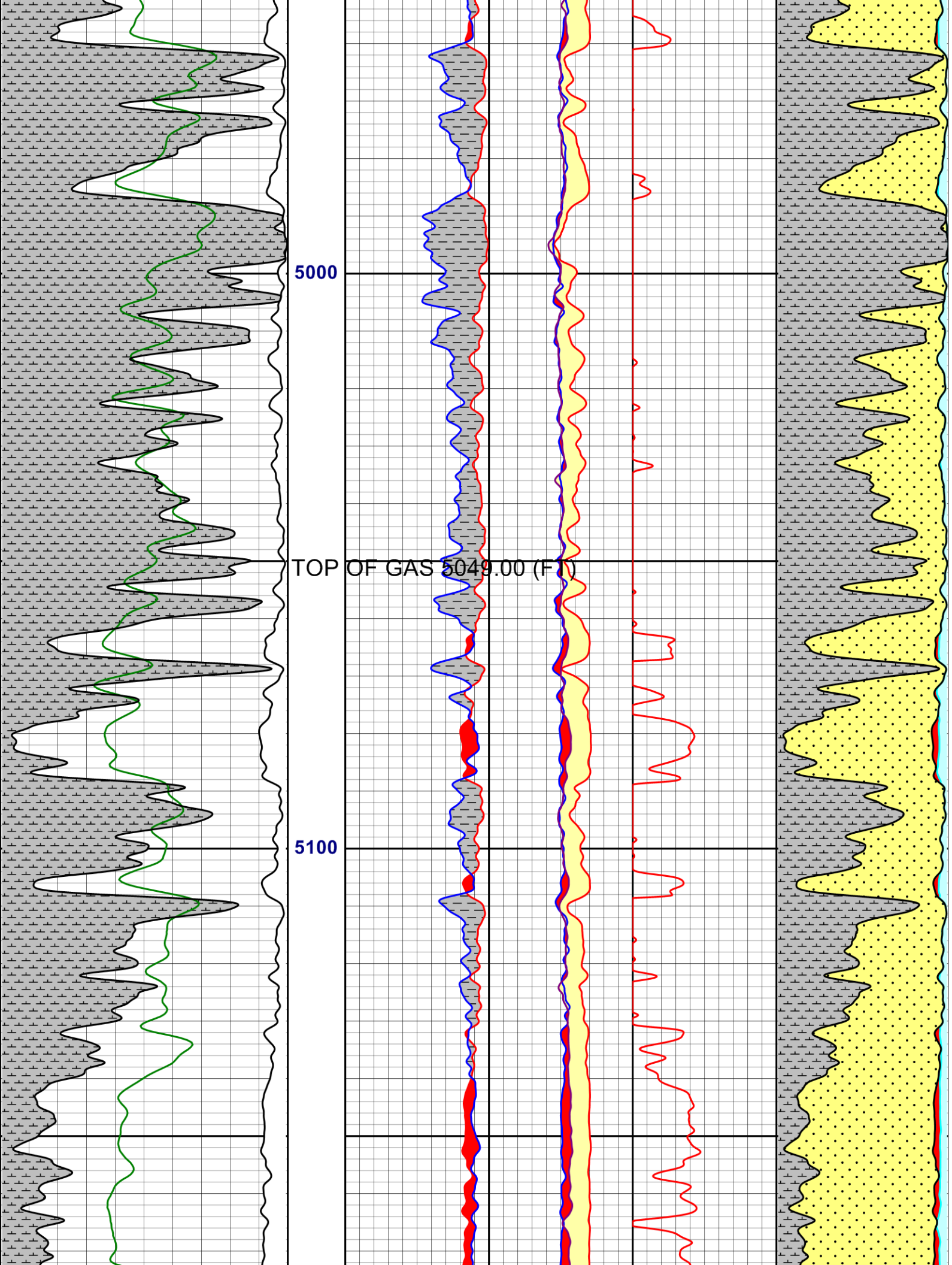




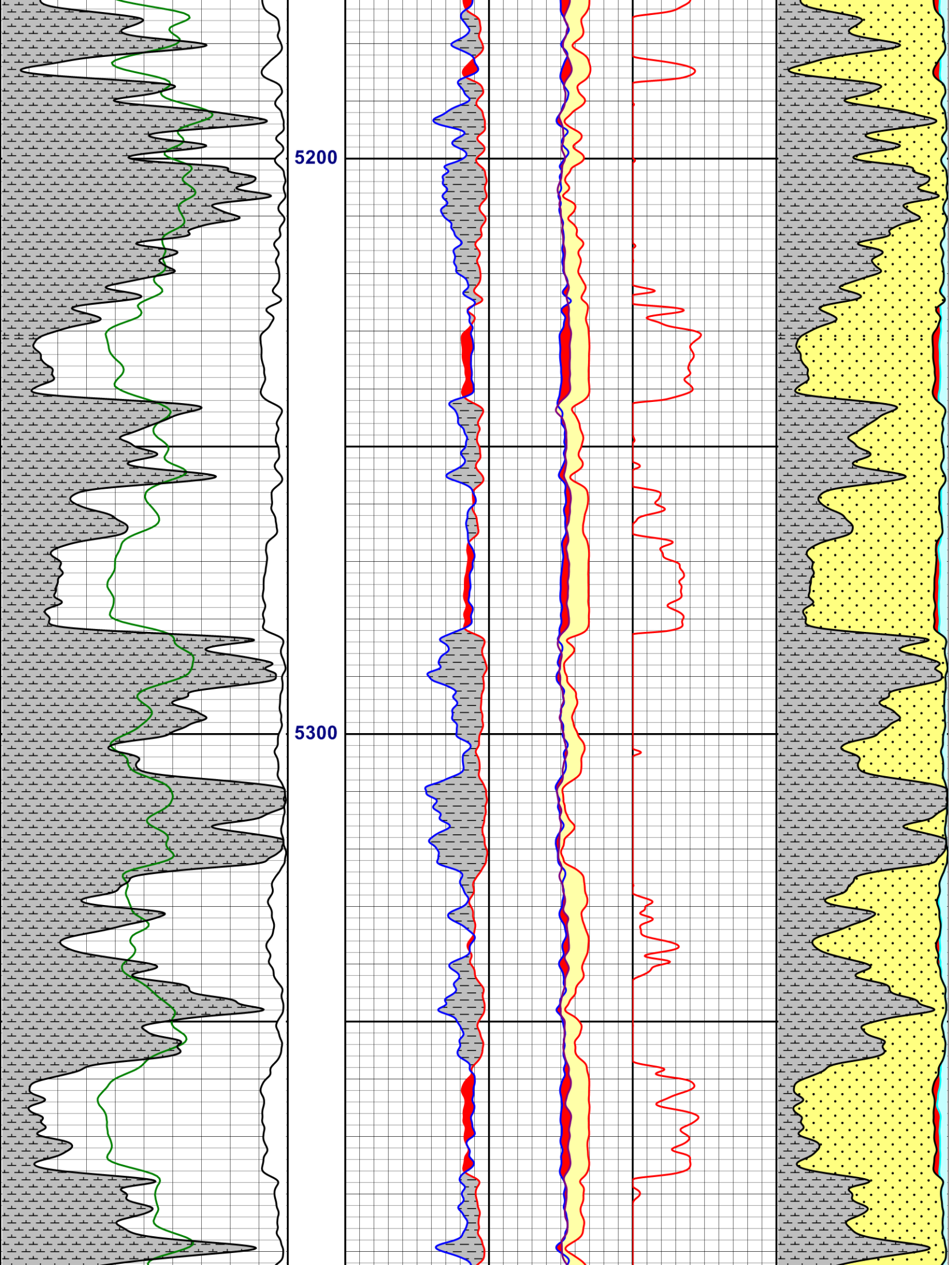


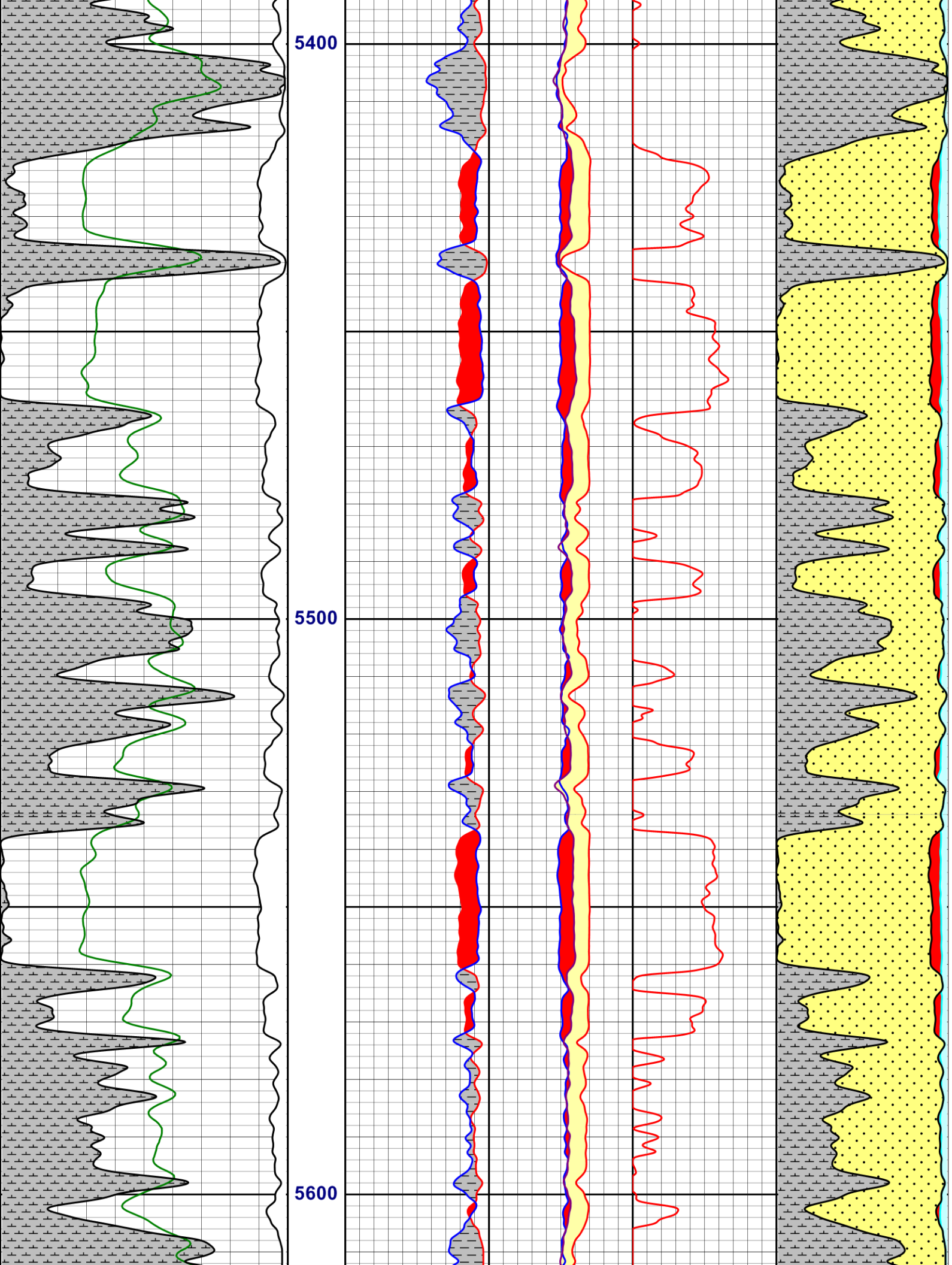


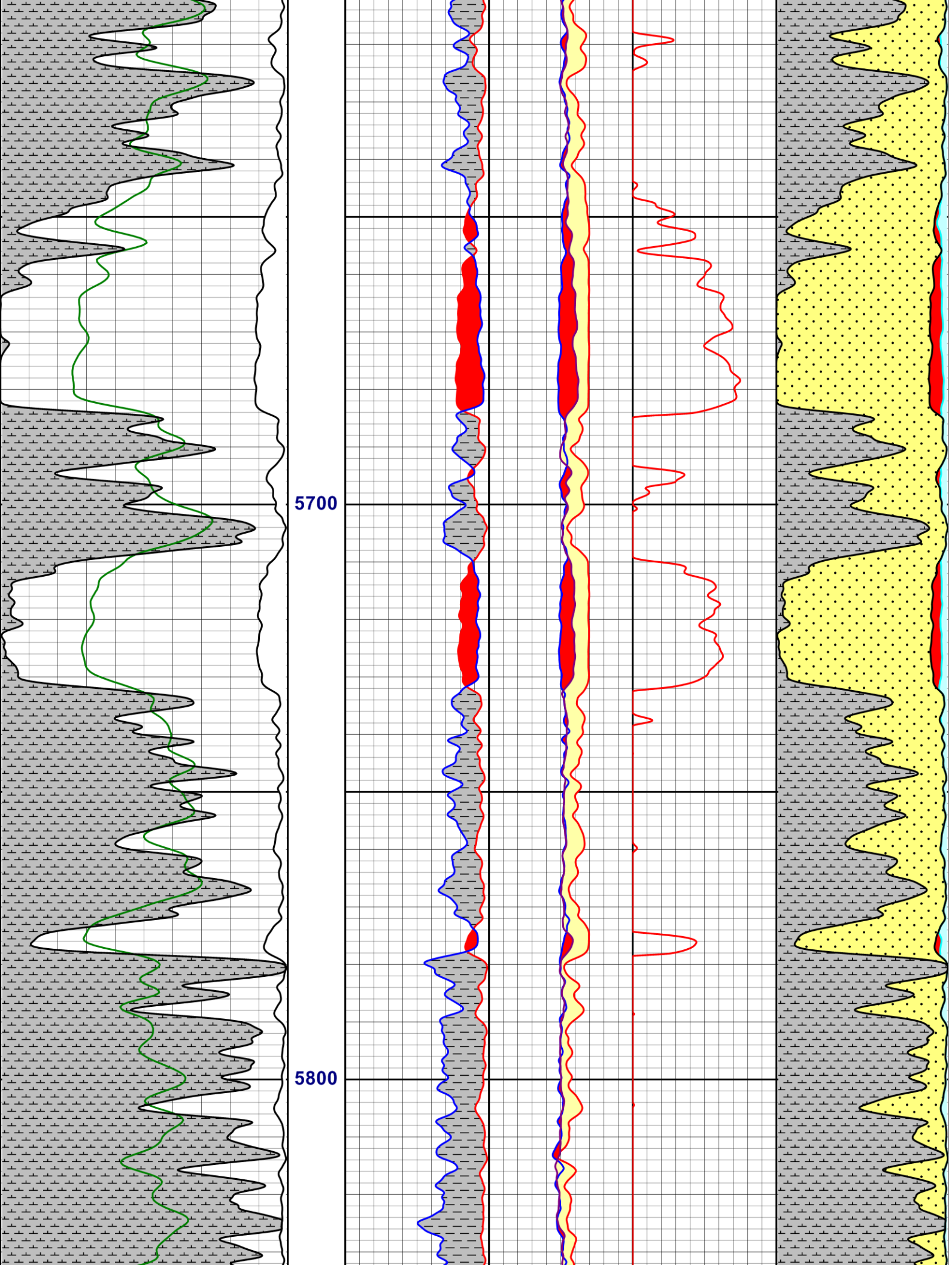


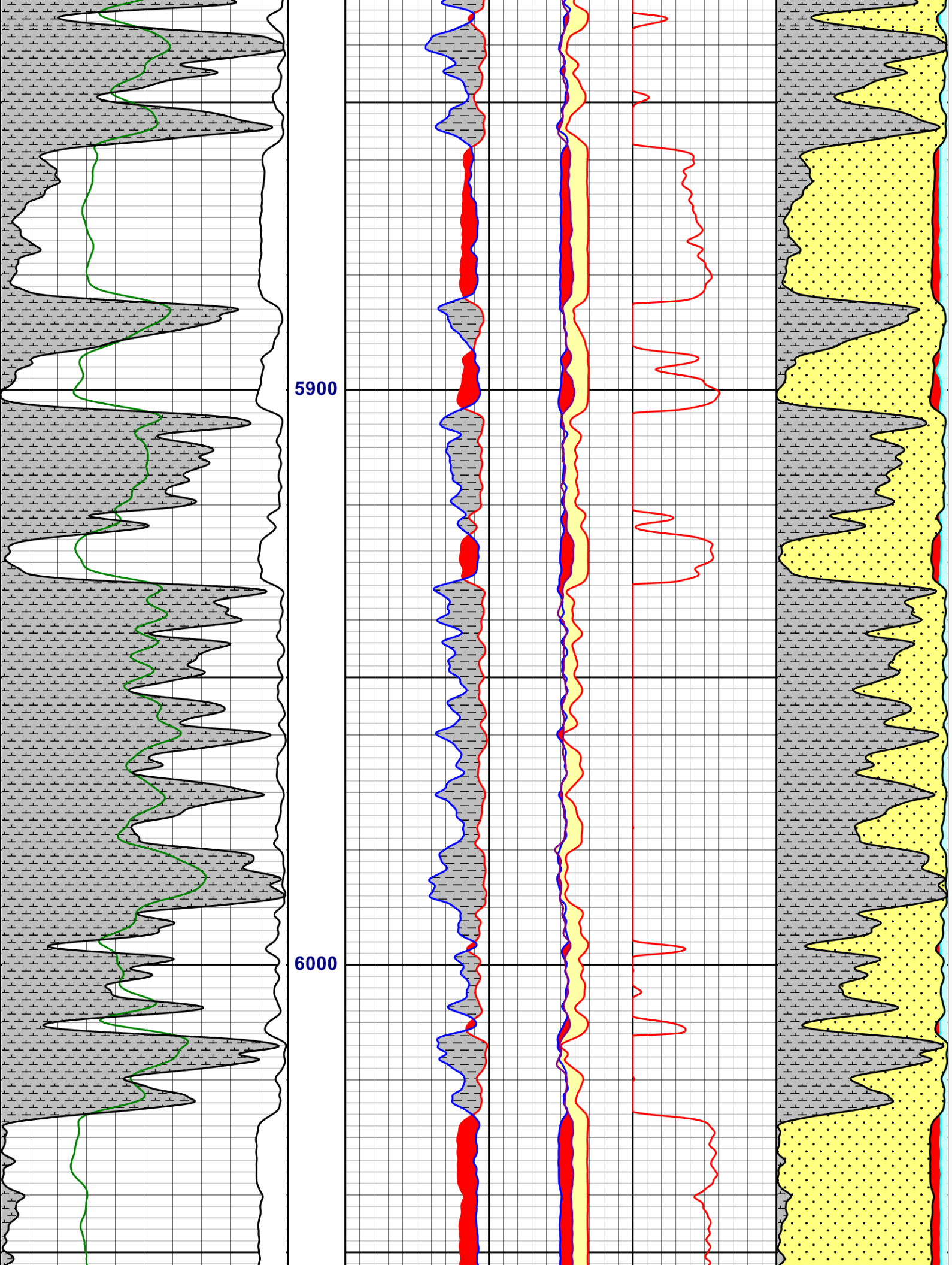




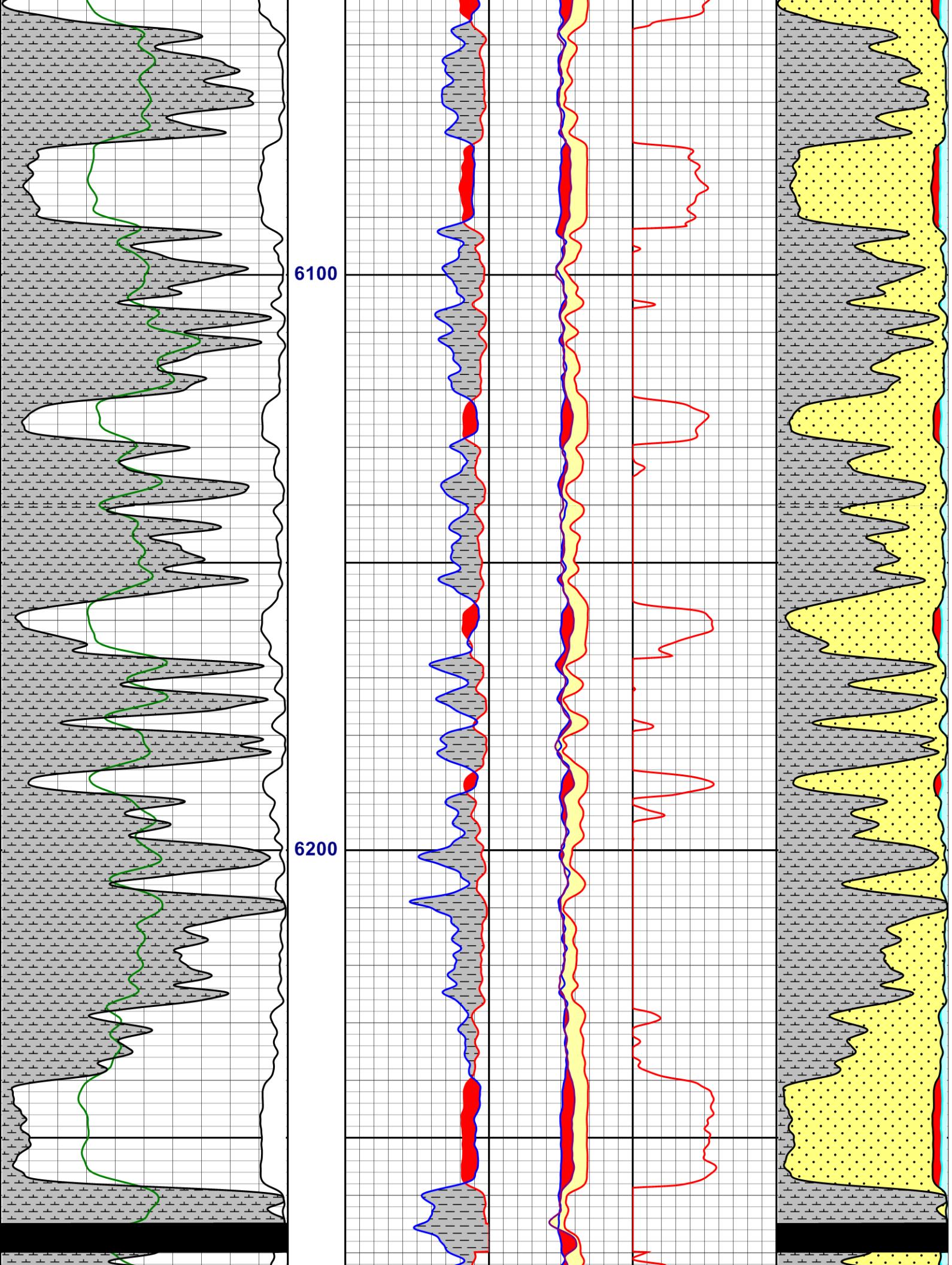


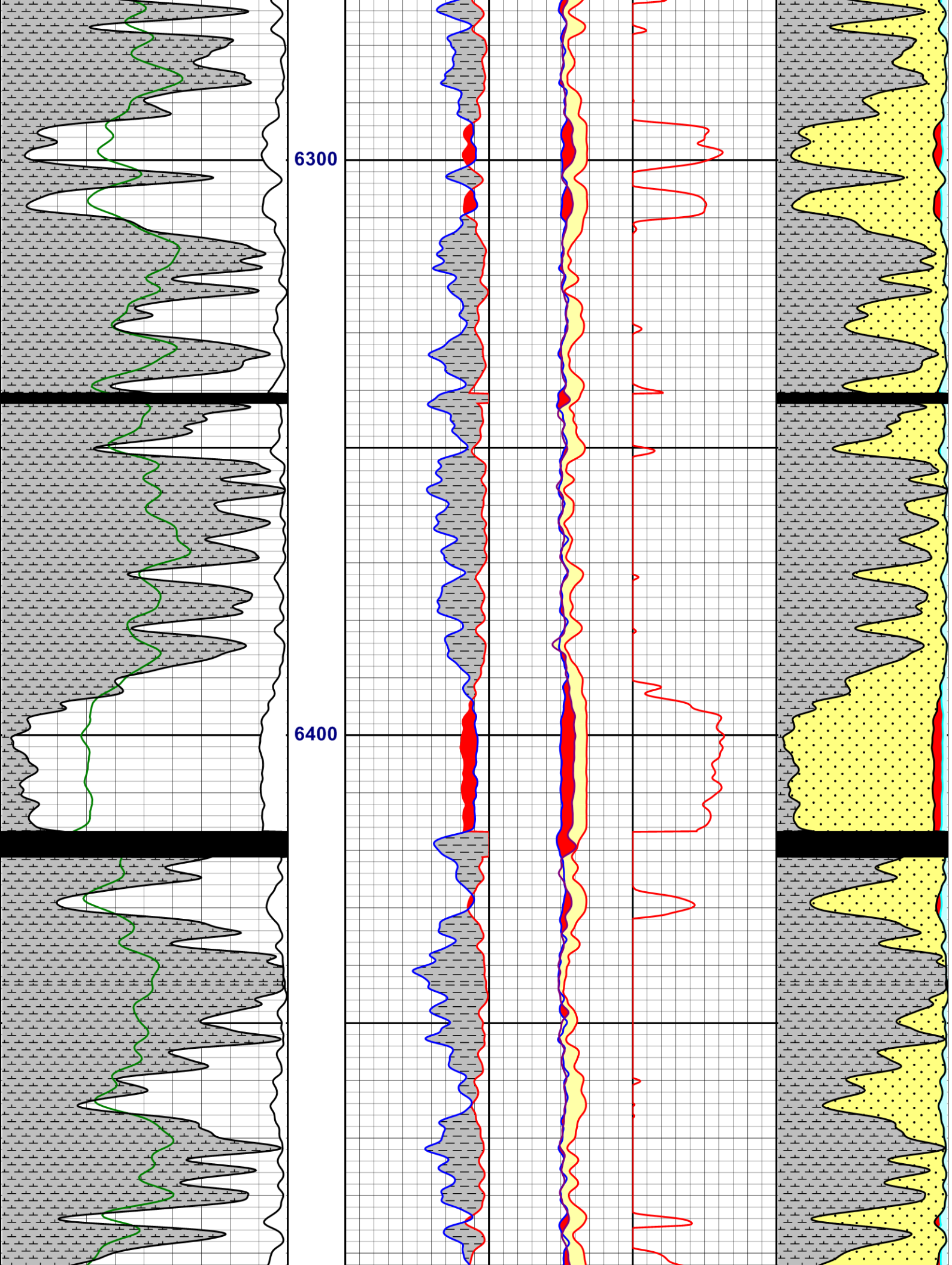


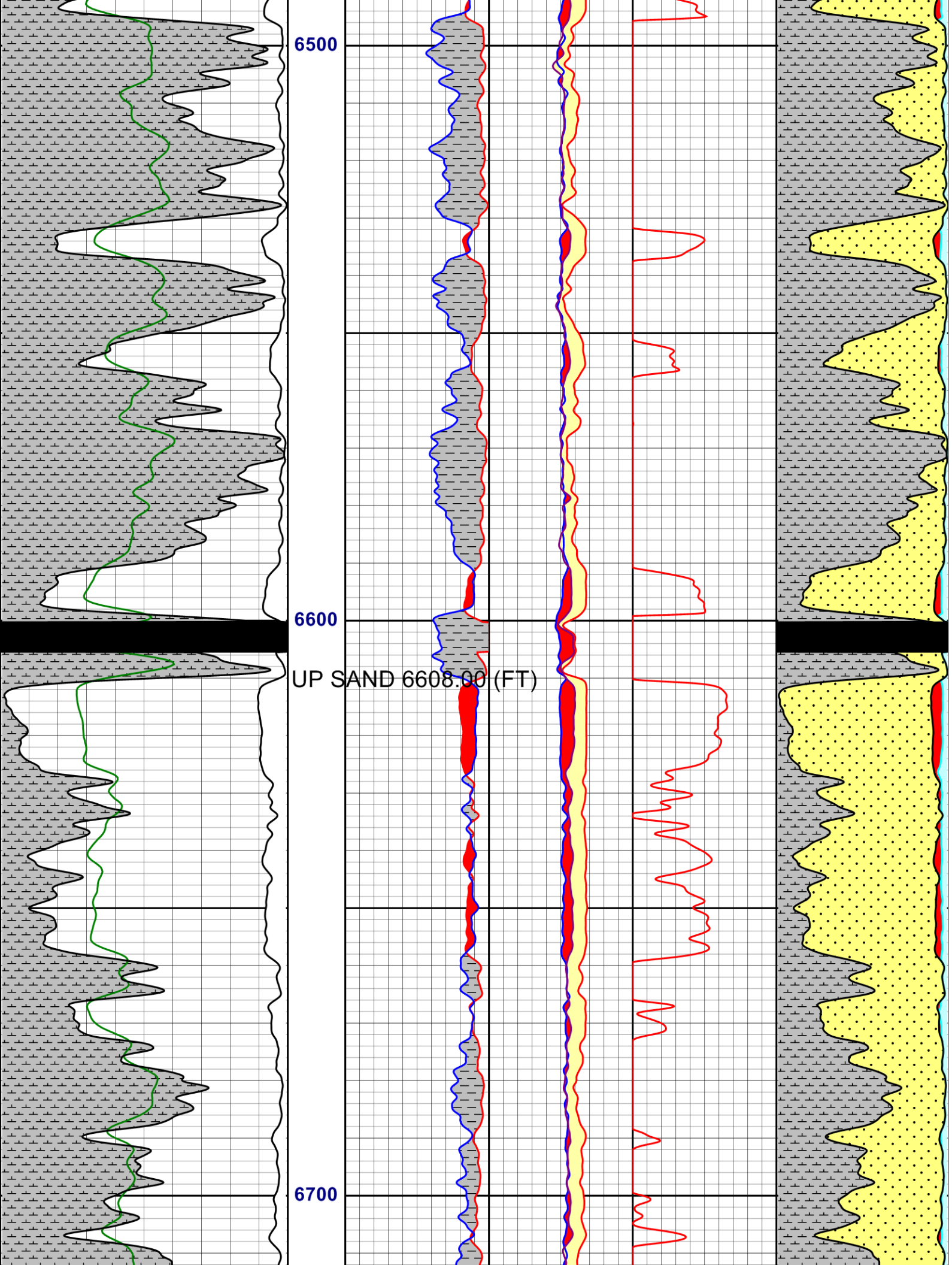


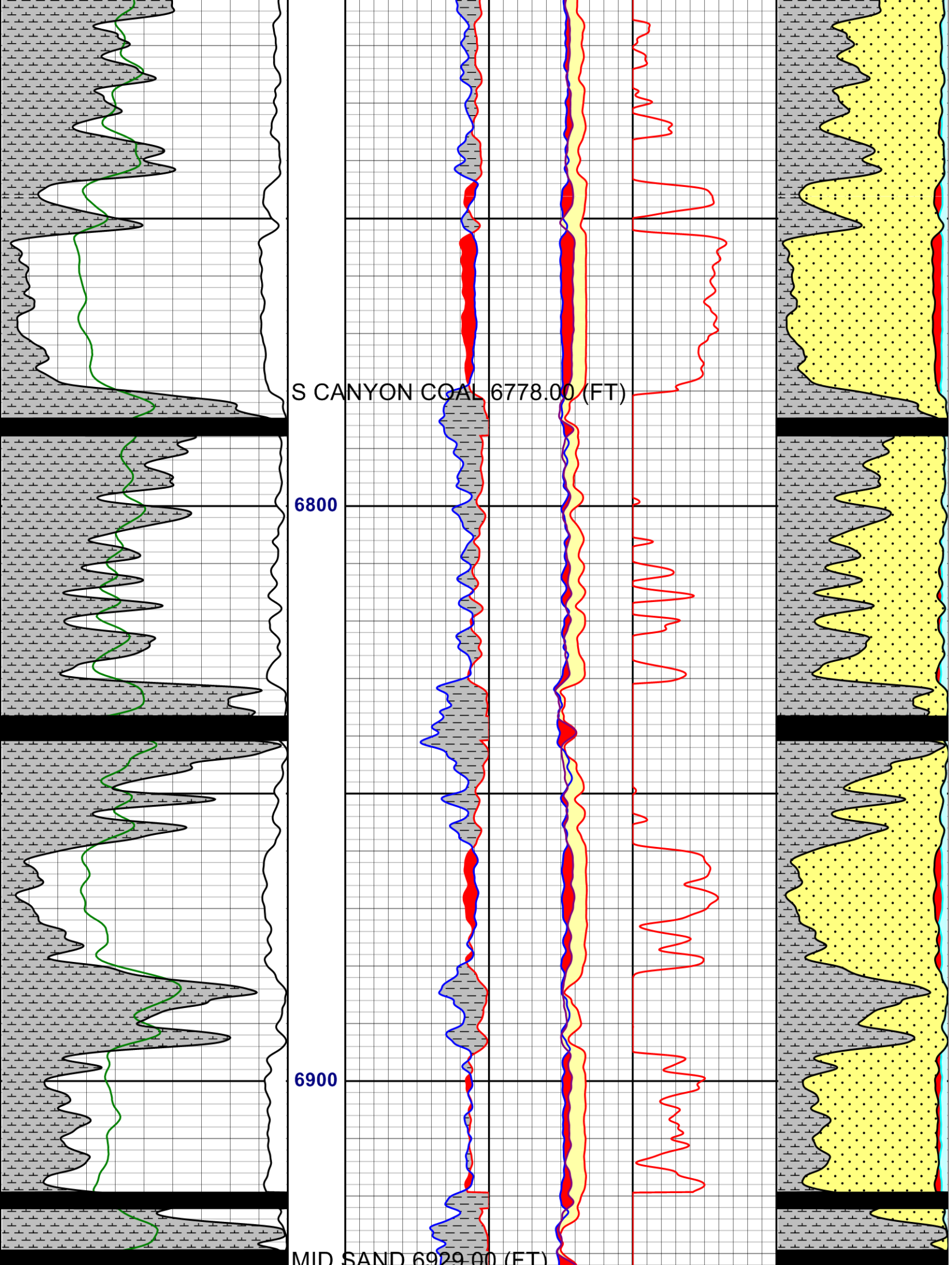




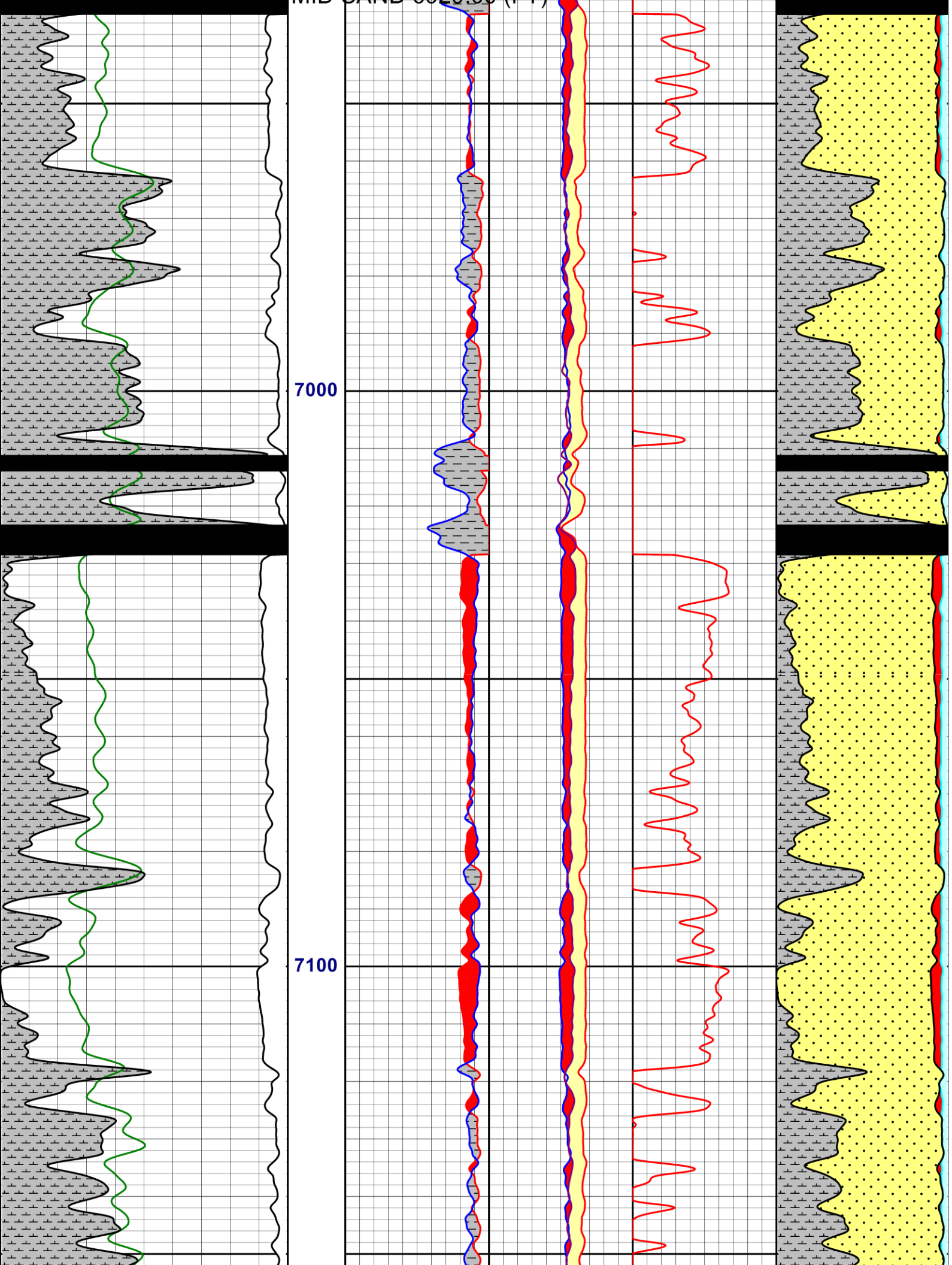


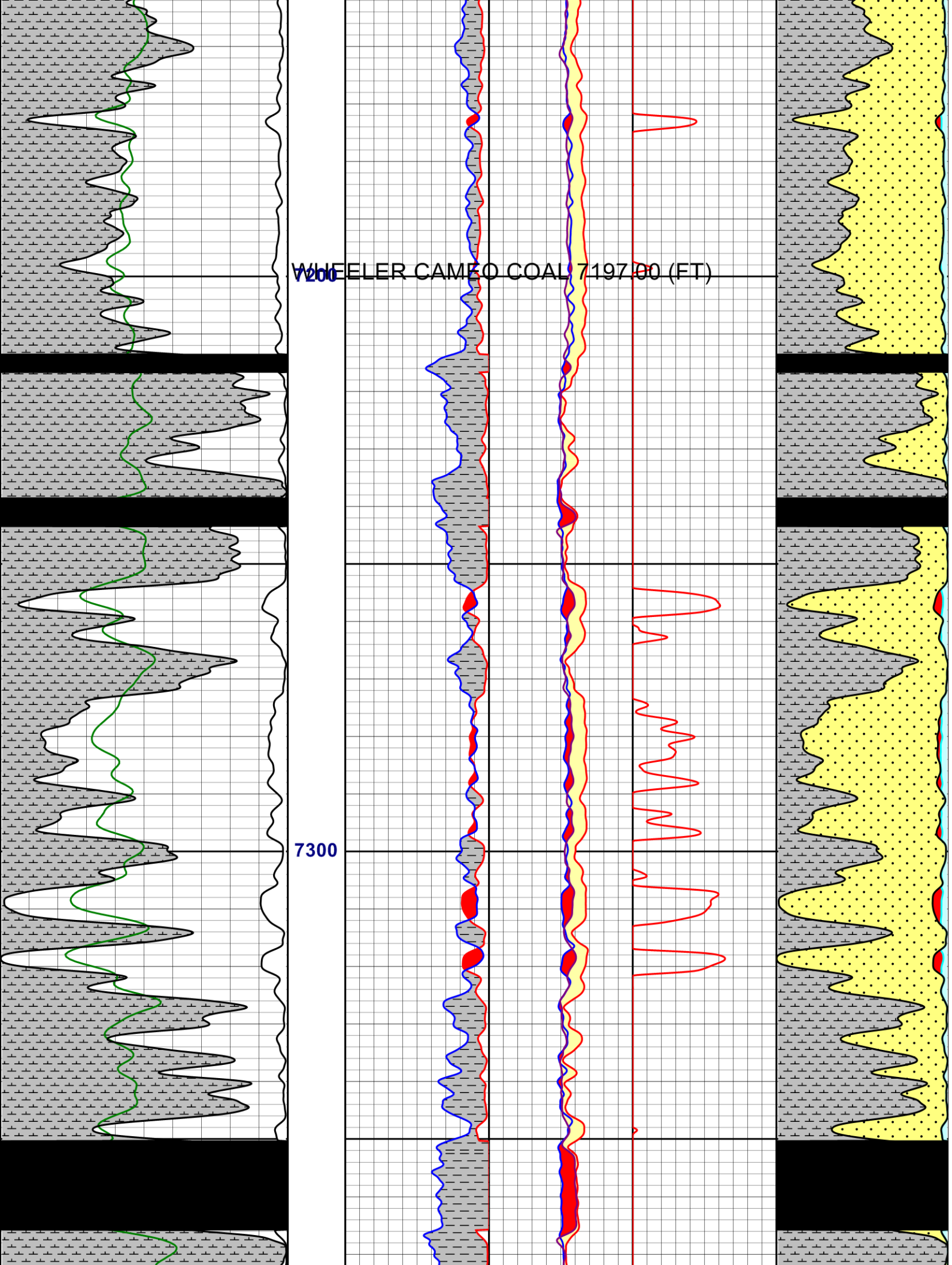


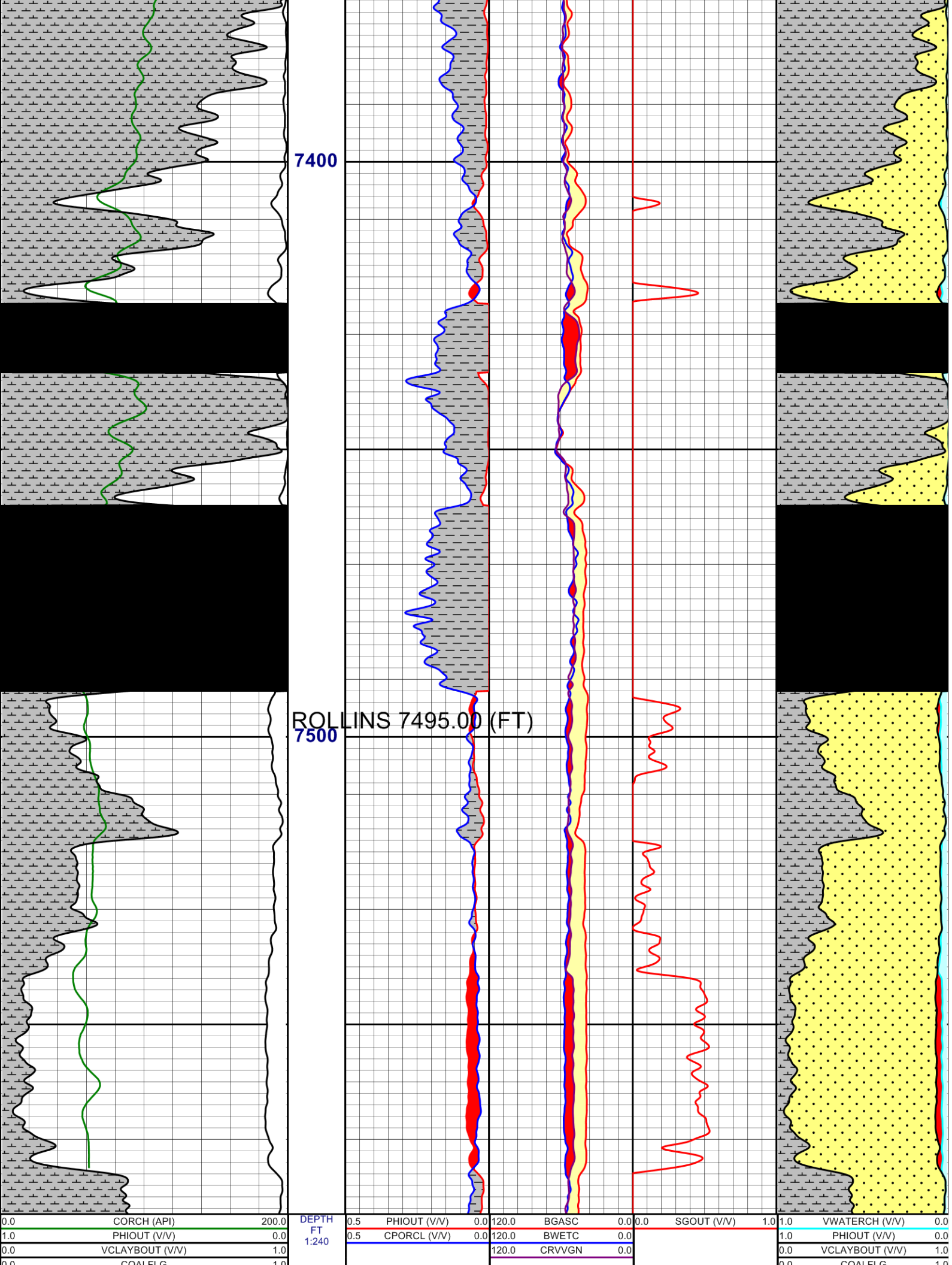












0.0	COALFES	1.0				0.0	COALFES	1.0
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Country	United States

  
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