



Company: **GRYNBERG PETROLEUM COMPANY**

Well: **HIAWATHA DEEP 4-36**

Field: **SUGAR LOAF**

County: **MOFFAT**

State: **COLORADO**

County:	MOFFAT				
Field:	SUGAR LOAF				
Location:	707 FSL & 633 FWL				
Well:	HIAWATHA DEEP 4-36				
Company:	GRYNBERG PETROLEUM COM				
PLATFORM EXPRESS TRIPLE COMBO PRINT GAMMA RAY		707 FSL & 633 FWL	Elev.: K.B. 6921.00 ft G.L. 6900.00 ft D.F. 6921.00 ft		
		LOCATION			
		Permanent Datum: _____	GROUND LEVEL _____		
		Log Measured From: _____	KELLY BUSHING _____		
		Drilling Measured From: _____	KELLY BUSHING _____		
		API Serial No. 081-07427-00	Section 36	Township 12N	Range 101W

PVT DATA			Run 1	Run 2	Run
Oil Density					
Water Salinity			700 ppm		
Gas Gravity					
Bo					
Bw					
1/Bg					
Bubble Point Pressure					
Bubble Point Temperature					
Solution GOR					
Maximum Deviation					
CEMENTING DATA					
Primary/Squeeze			Primary		
Casing String No					
Lead Cement Type					
Volume					
Density					
Water Loss					
Additives					
Tail Cement Type					
Volume					
Density					
Water Loss					
Additives					
Expected Cement Top					

Logging Date	12-Jan-2009	
Run Number	1	
Depth Driller	5744 ft	
Schlumberger Depth	5707 ft	
Bottom Log Interval	5707 ft	
Top Log Interval	524 ft	
Casing Fluid Type	WBM	
Salinity	700 ppm	
Density	10.6 lbm/gal	
Fluid Level	30 ft	
BIT/CASING/TUBING STRING		
Bit Size	12.250 in	
From		
To		
Casing/Tubing Size	13.375 in	
Weight	54.5 lbm/ft	
Grade		
From		
To		
Maximum Recorded Temperatures	150 degF	
Logger On Bottom	12-Jan-2009	8:15
Unit Number	2210	VERNAL
Recorded By	TRENT JACKSON AND REBECCA DODD	
Witnessed By	JOE MARTINEZ	

Logging Date				
Run Number				
Depth Driller				
Schlumberger Depth				
Bottom Log Interval				
Top Log Interval				
Casing Fluid Type				
Salinity				
Density				
Fluid Level				
BIT/CASING/TUBING STRING				
Bit Size				
From				
To				
Casing/Tubing Size				
Weight				
Grade				
From				
To				
Maximum Recorded Temperatures				
Logger On Bottom				
Unit Number				
Recorded By				
Witnessed By				

DEPTH SUMMARY LISTING

Date Created: 12-JAN-2009 11:32:01

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW-B	Type:	CMTD-B/A	Type:	7-46P XS
Serial Number:	6080	Serial Number:	2811	Serial Number:	-999
Calibration Date:	5-Oct-2008	Calibration Date:	04-Jan-2009	Length:	19450 FT
Calibrator Serial Number:	1	Calibrator Serial Number:	100518	Conveyance Method:	Wireline
Calibration Cable Type:	7-46P XS	Calibration Gain:	0.89	Rig Type:	LAND
Wheel Correction 1:	-7	Calibration Offset:	485.00		
Wheel Correction 2:	-7				

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	213.70 FT
Rig Up Length At Bottom:	213.40 FT
Rig Up Length Correction:	0.30 FT
Stretch Correction:	4.00 FT
Tool Zero Check At Surface:	0.40 FT

Depth Control Remarks

1. First run in hole
2. All Schlumberger Depth Control Procedures Followed
3. IDW used as primary depth control device, z-chart used as secondary reference
- 4.
- 5.
- 6.

DISCLAIMER

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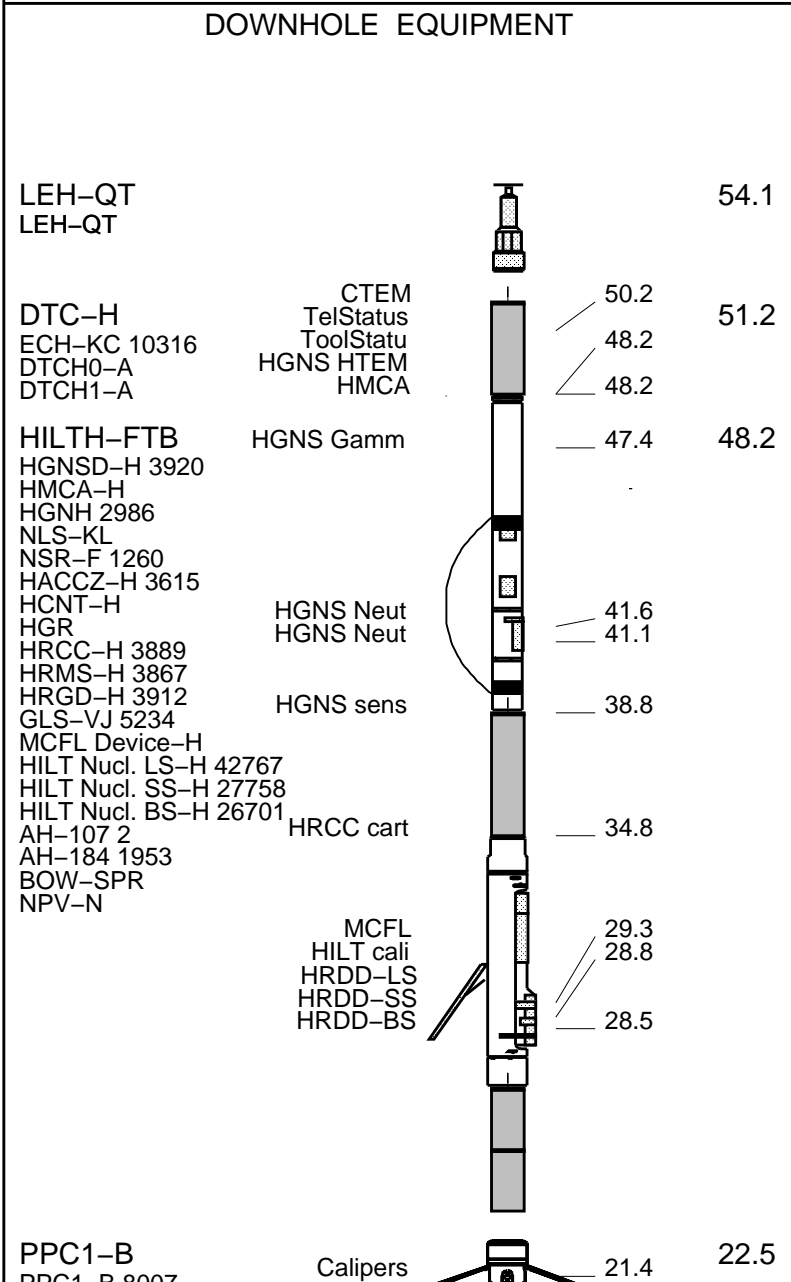
OTHER SERVICES1	OTHER SERVICES2
OS1: PPC	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
Tool ran as per tool sketch	
HGNS ran eccentralized with bowspring	
AIT ran with two 1.5in standoffs	
Logged at 3200 ft/hr	
Neutron log corrected for hole size and standoffs	
Density log corrected for hole size	

PPC logged on Power level 3	
Caliper check in casing = 12.6" in tolerance	
Hole volume from future casing diameter and caliper.	
AIT 2 ft curves presented.	
AIT recomputed for compute Rm instead of compute	
standoff due to intermittent mud sensor.	
Data affected by tight pulls and washouts	

RUN 1			RUN 2		
SERVICE ORDER #:			SERVICE ORDER #:		
PROGRAM VERSION:			PROGRAM VERSION:		
FLUID LEVEL:			FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION					
RUN 1			RUN 2		

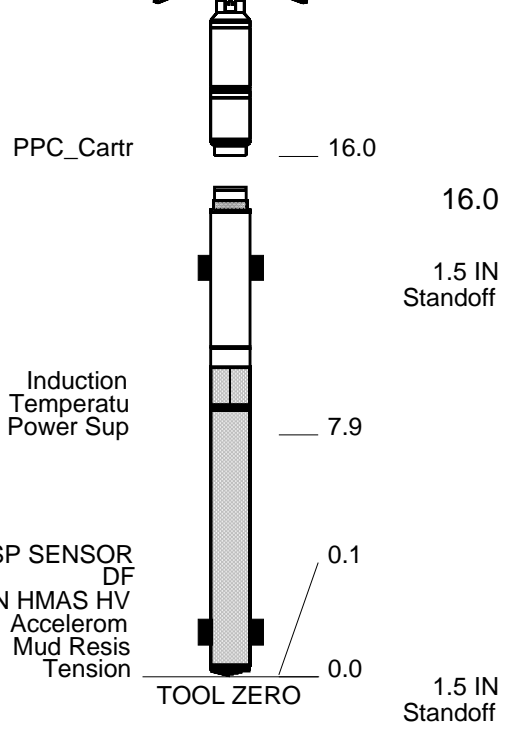
SURFACE EQUIPMENT
WITM (DTS)-A
GSR-U/Y
NCT-B
CNB-AB
NCS-VB



PPC1-B 22.5

PPC1-B 8007

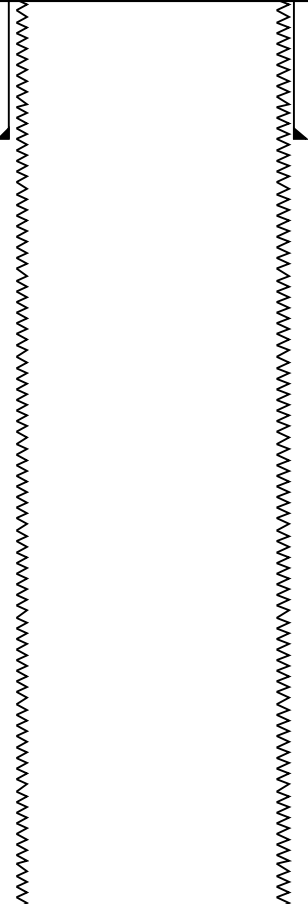
HAIT-H
AHIS-BA 166
AHRM-A



MAXIMUM STRING DIAMETER 6.88 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Client: GRYNBERG PETROLEUM COMPANY
Well: HIAWATHA DEEP 4-36
Field: SUGAR LOAF
State: COLORADO
Country: US

Drawing Date: 1/12/2009
API #: 081-07427-00
Rig Name: Universal 1
Reference Datum: Kelly Bushing
Elevation: 6900.0 ft

Production String	(in) (ft)			Well Schematic	(ft) (in)			Casing String
	OD	ID	MD		MD	OD	ID	
					0.0	12.250	<div>Borehole Segment</div> <div>Casing String</div>	
					500.0	13.375		<div>Casing Shoe</div>

				<div> <div></div> <div></div> </div>				
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ALL DEPTHS ARE DRILLERS
DEPTHS

Schlumberger

Main Pass S5

MAXIS Field Log

Company: GRYNBERG PETROLEUM COMPANY

Well: HIAWATHA DEEP 4-36

Input DLIS Files						
DEFAULT	AIT_CAL_TLD_MCFL_024PUP	FN:22	PRODUCER	12-Jan-2009 11:29	5719.0 FT	53.5 FT
Output DLIS Files						
DEFAULT	AIT_CAL_TLD_MCFL_025PUP	FN:23	PRODUCER	12-Jan-2009 11:43	5719.0 FT	53.5 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 4429.22 F3

Cement Volume = 1810.23 F3 (assuming 9.63 IN casing O.D.)

Computed from 5707.0 FT to 524.0 FT using data channel(s) CRD1_PPC1 CRD2_PPC1 CRD3_PPC1 CRD4_PPC1

HAIT-H 16C0-147
HILTH-FTB 16C0-147

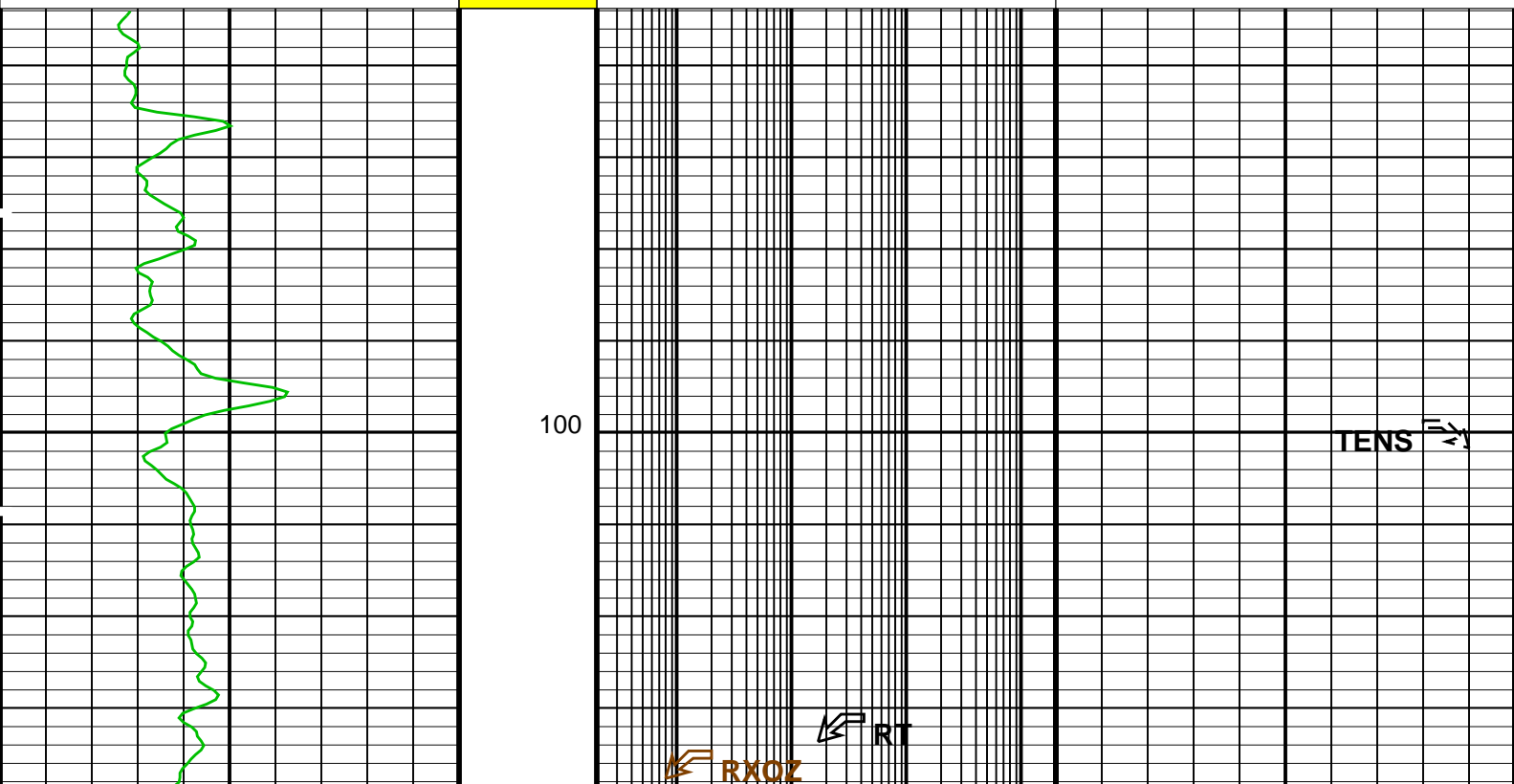
PPC1-B 16C0-147
DTC-H 16C0-147

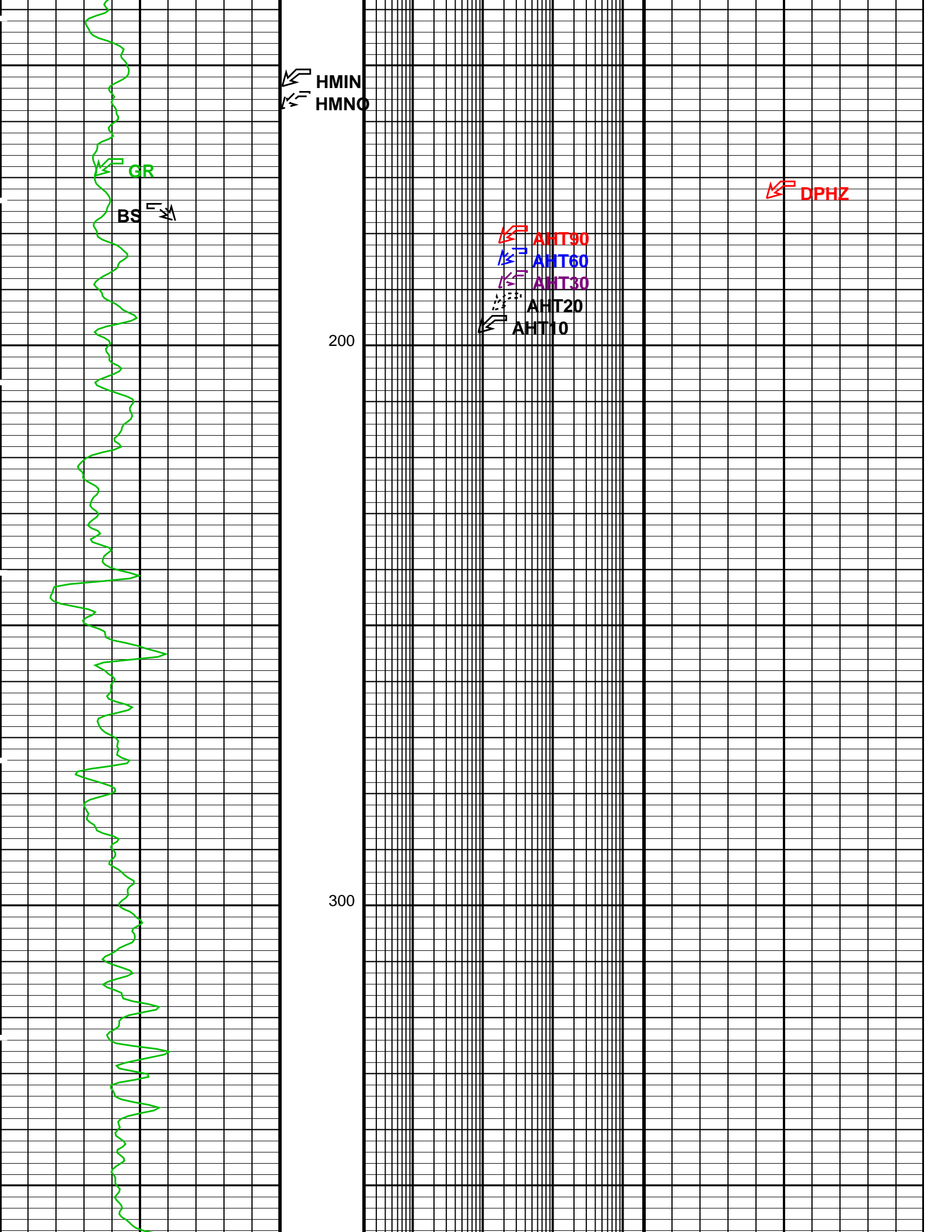
PIP SUMMARY

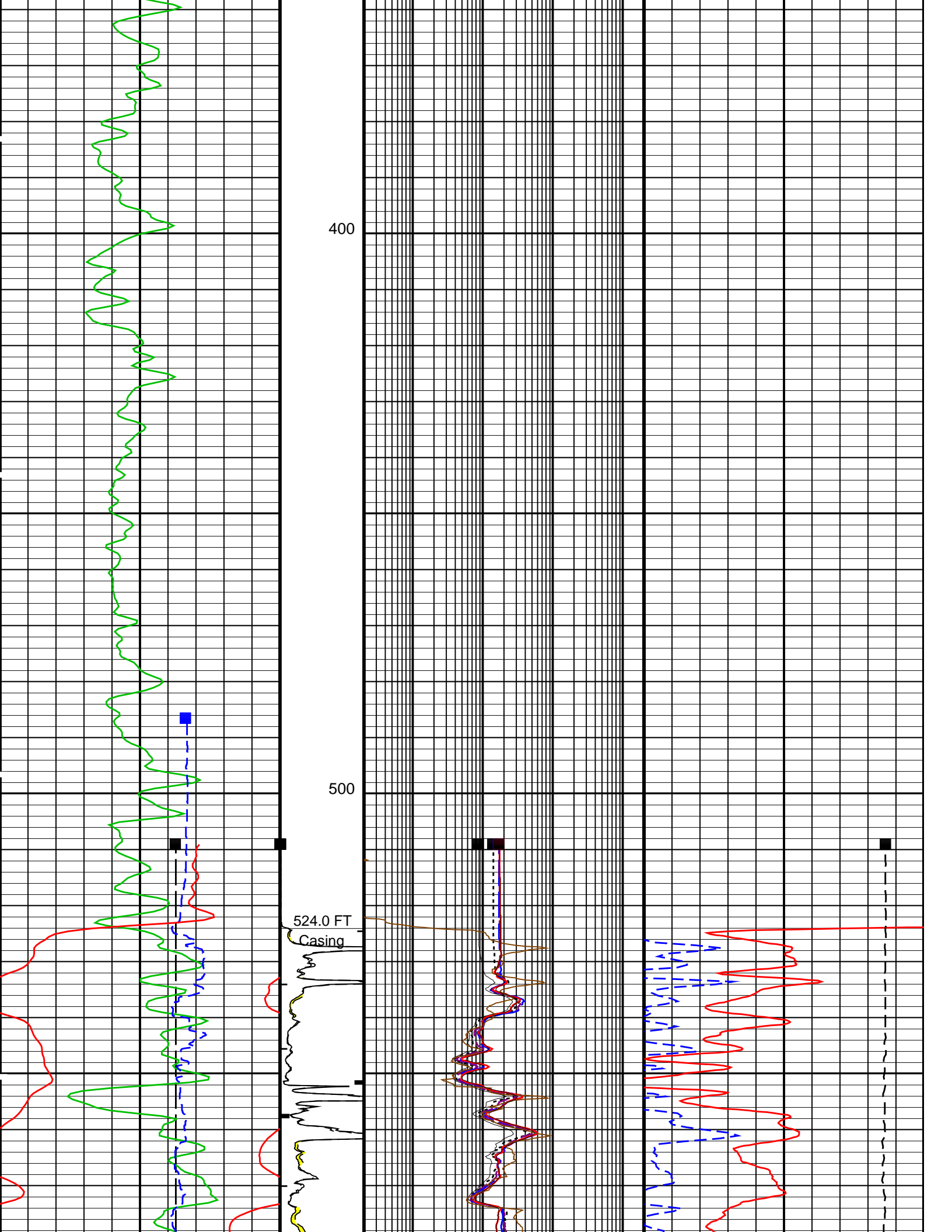
- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
 - Integrated Cement Volume Minor Pip Every 10 F3
 - Integrated Cement Volume Major Pip Every 100 F3

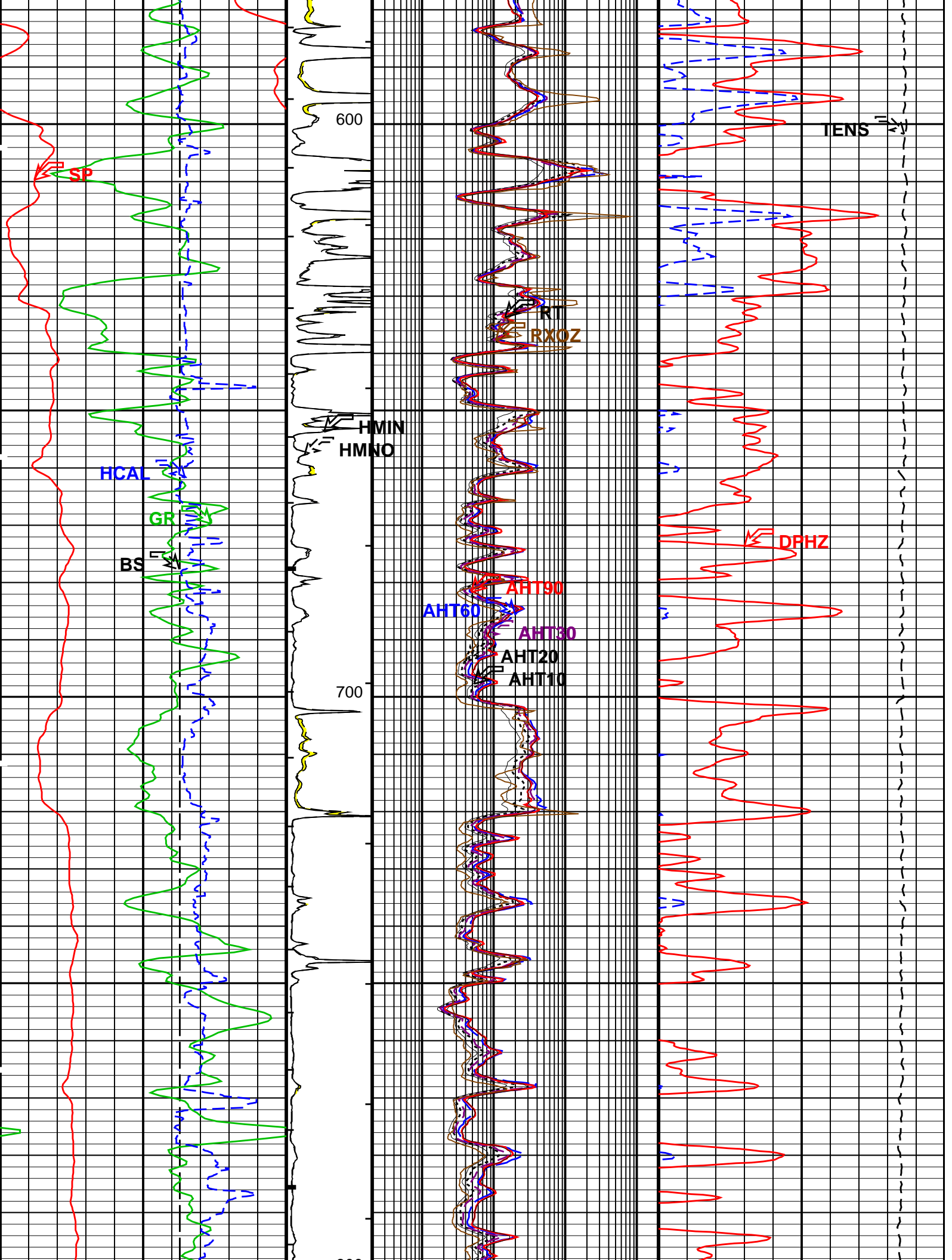
Time Mark Every 60 S

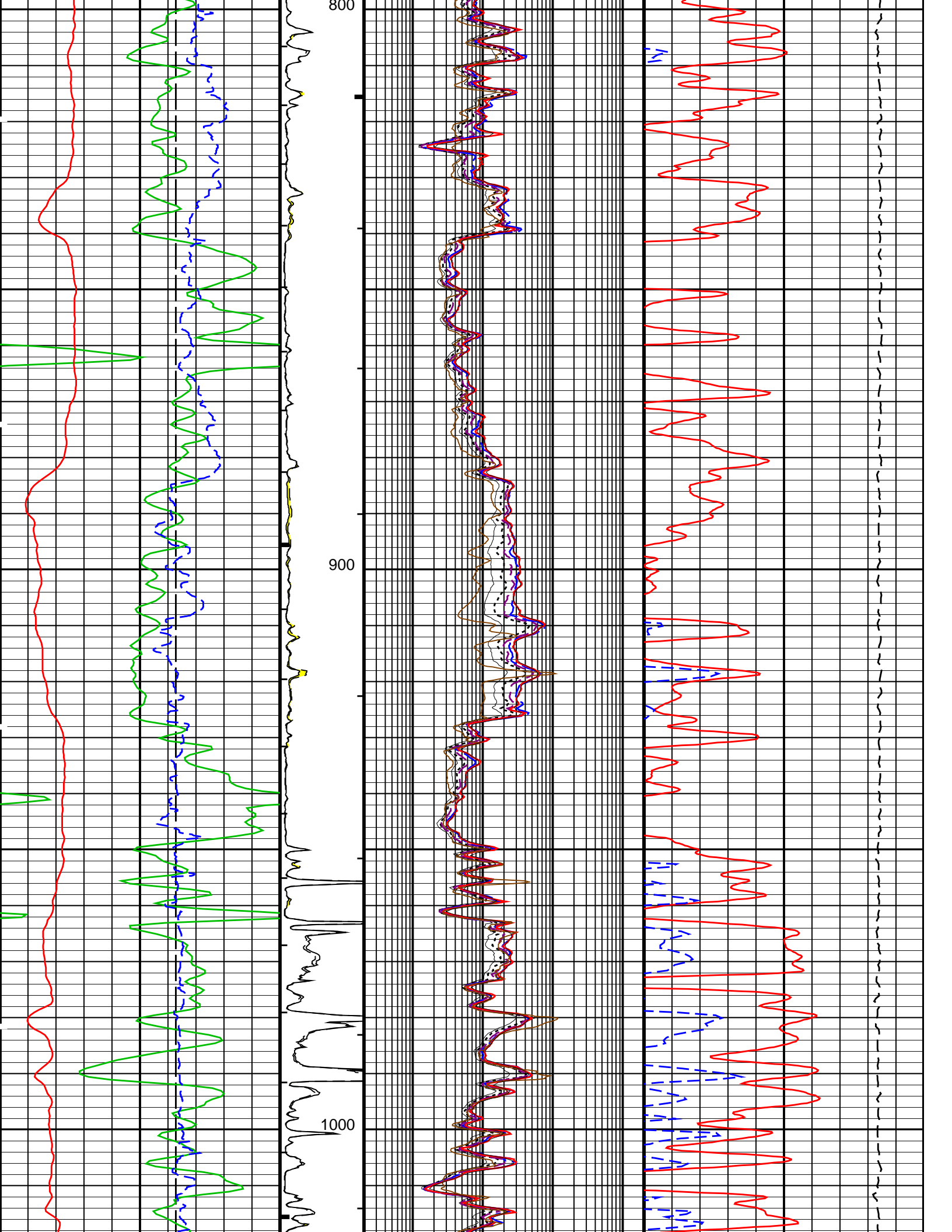
		Std. Res. Invaded Zone Resistivity (RXOZ)			
		0.2	(OHMM)	2000	
		AIT-H 90 Inch Investigation (AHT90)			
		0.2	(OHMM)	2000	
		True Resistivity (RT)			
		0.2	(OHMM)	2000	
SP (SP) -80 (MV) 20		AIT-H 60 Inch Investigation (AHT60)		Gas Indicator From DPHZ to NPOR	
		0.2	(OHMM)	2000	
HILT Caliper (HCAL) 6 (IN) 16		AIT-H 30 Inch Investigation (AHT30)		Tension (TENS) 10000 (LBF) 0	
		0.2	(OHMM)	2000	
Gamma Ray (GR) 0 (GAPI) 150		AIT-H 20 Inch Investigation (AHT20)		Alpha Processed Neutron Porosity (NPOR) 0.3 (V/V) -0.1	
		0.2	(OHMM)	2000	
Bit Size (BS) 6 (IN) 16		AIT-H 10 Inch Investigation (AHT10)		Std. Res. Density Porosity (DPHZ) 0.3 (V/V) -0.1	
		0.2	(OHMM)	2000	
		Permeability From HMIN to HMNO			

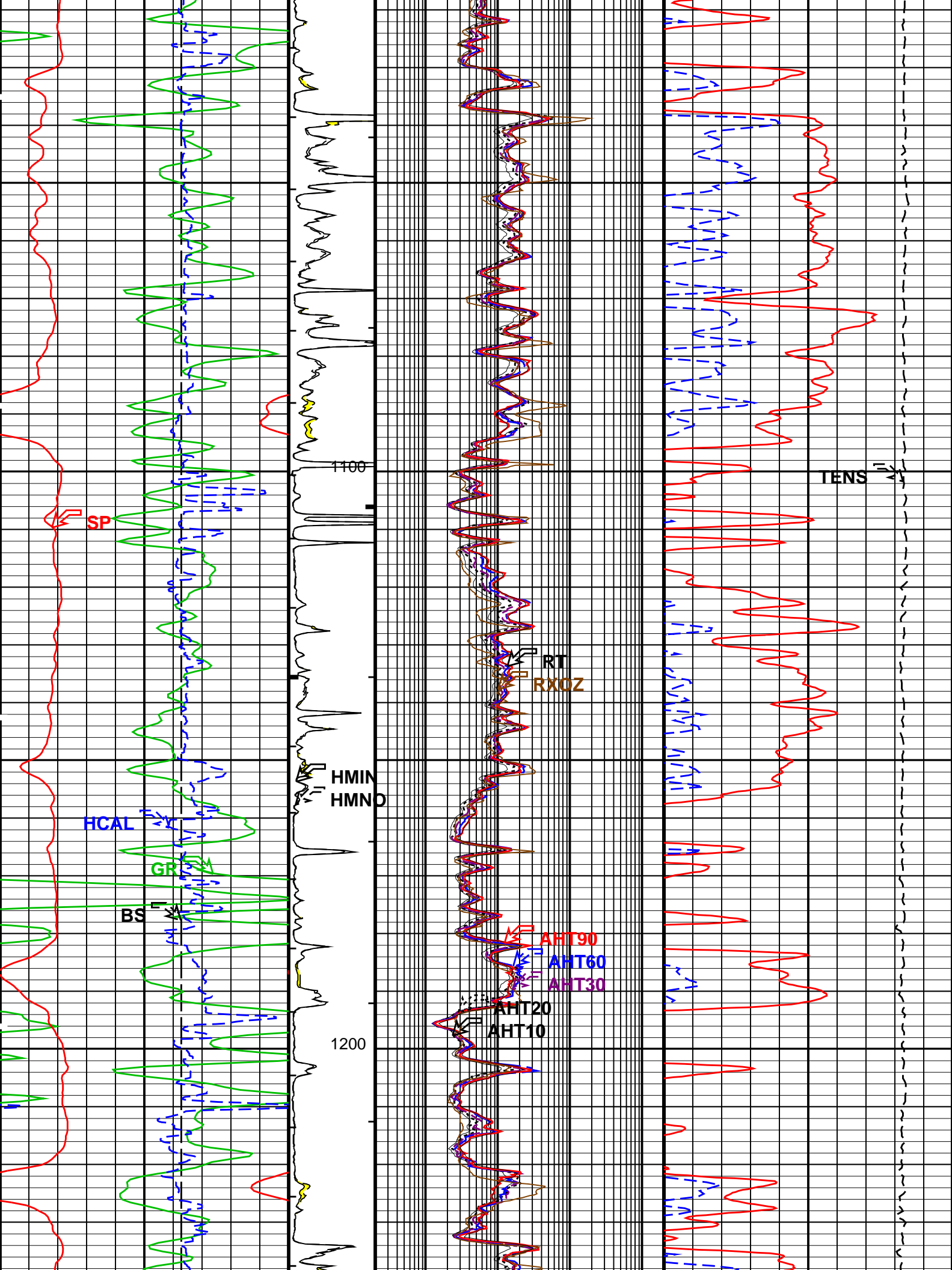


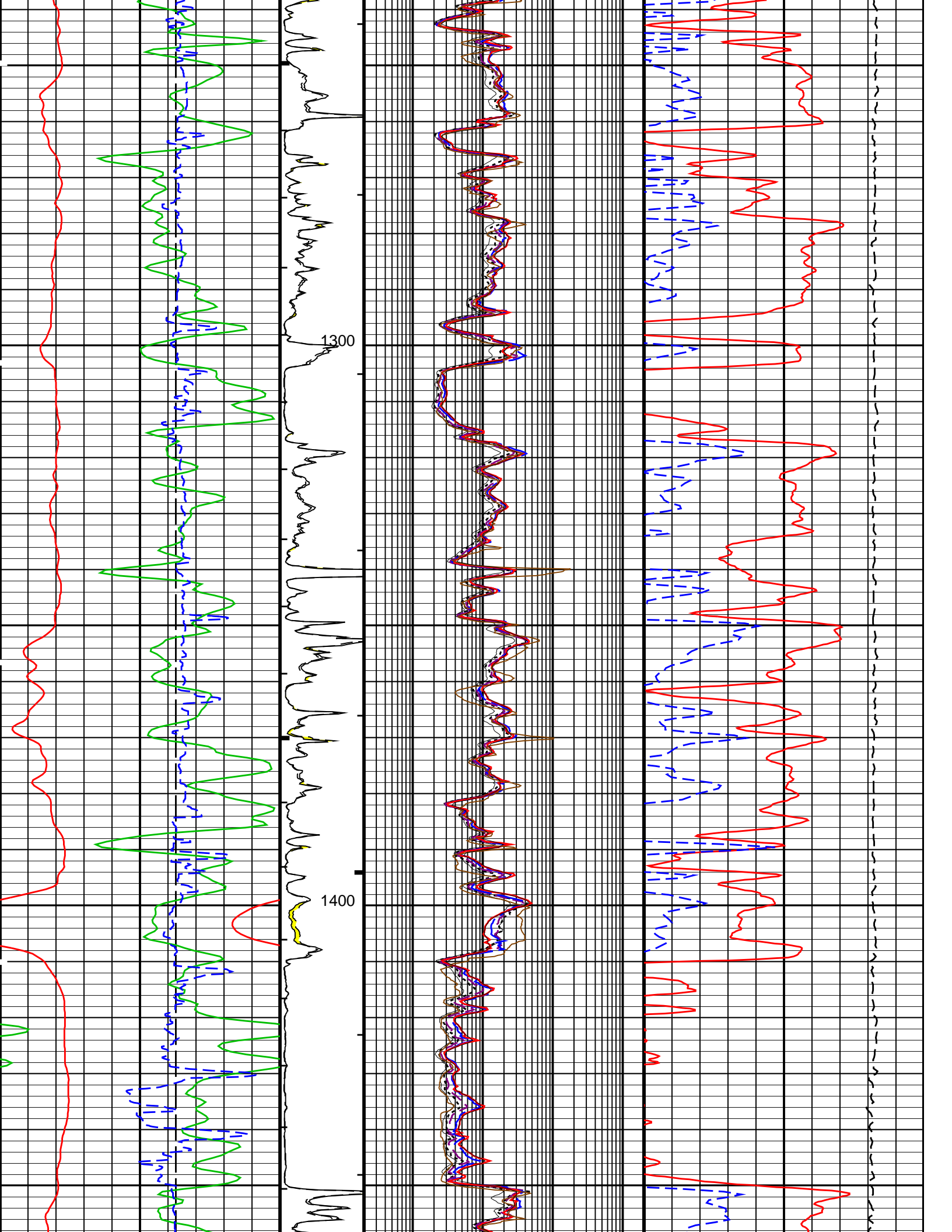


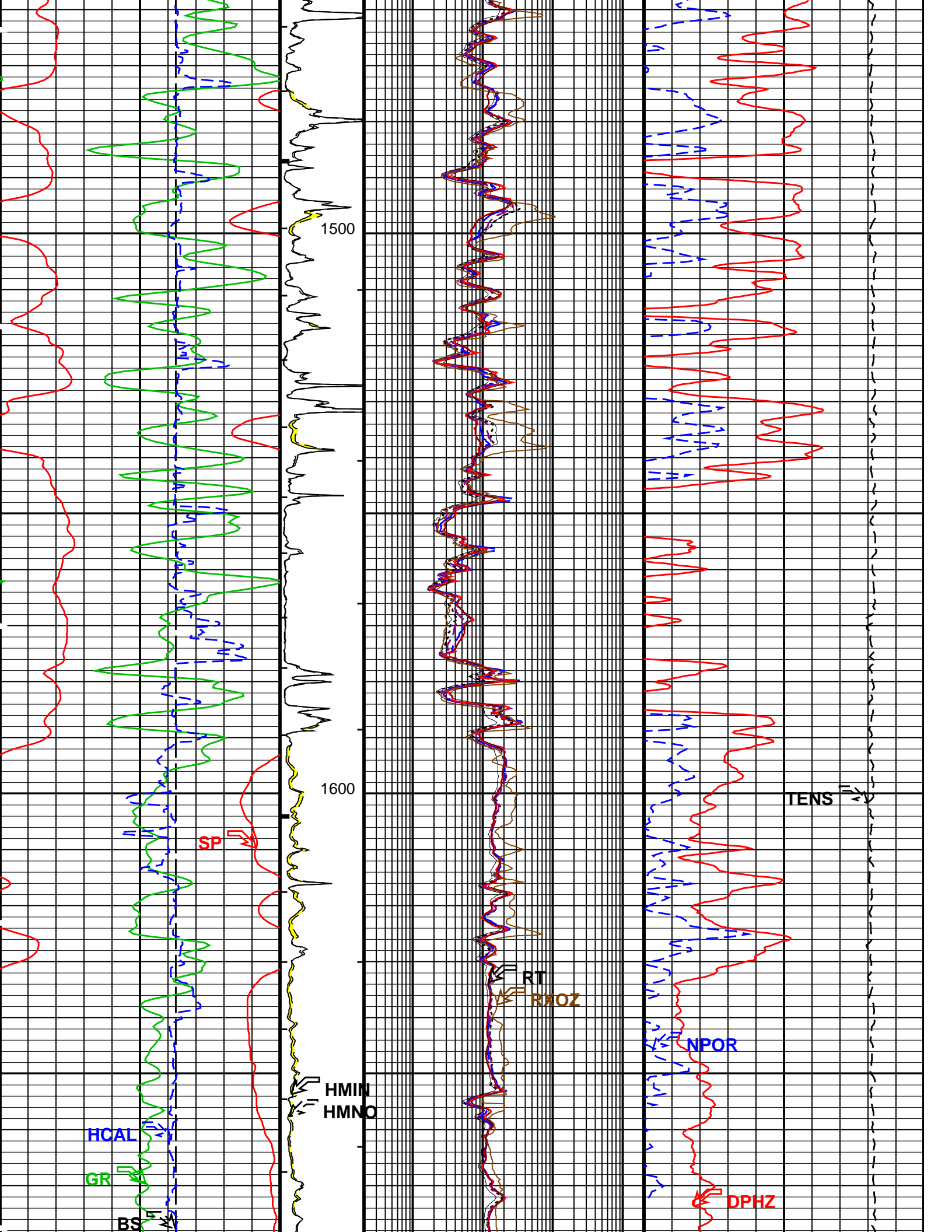


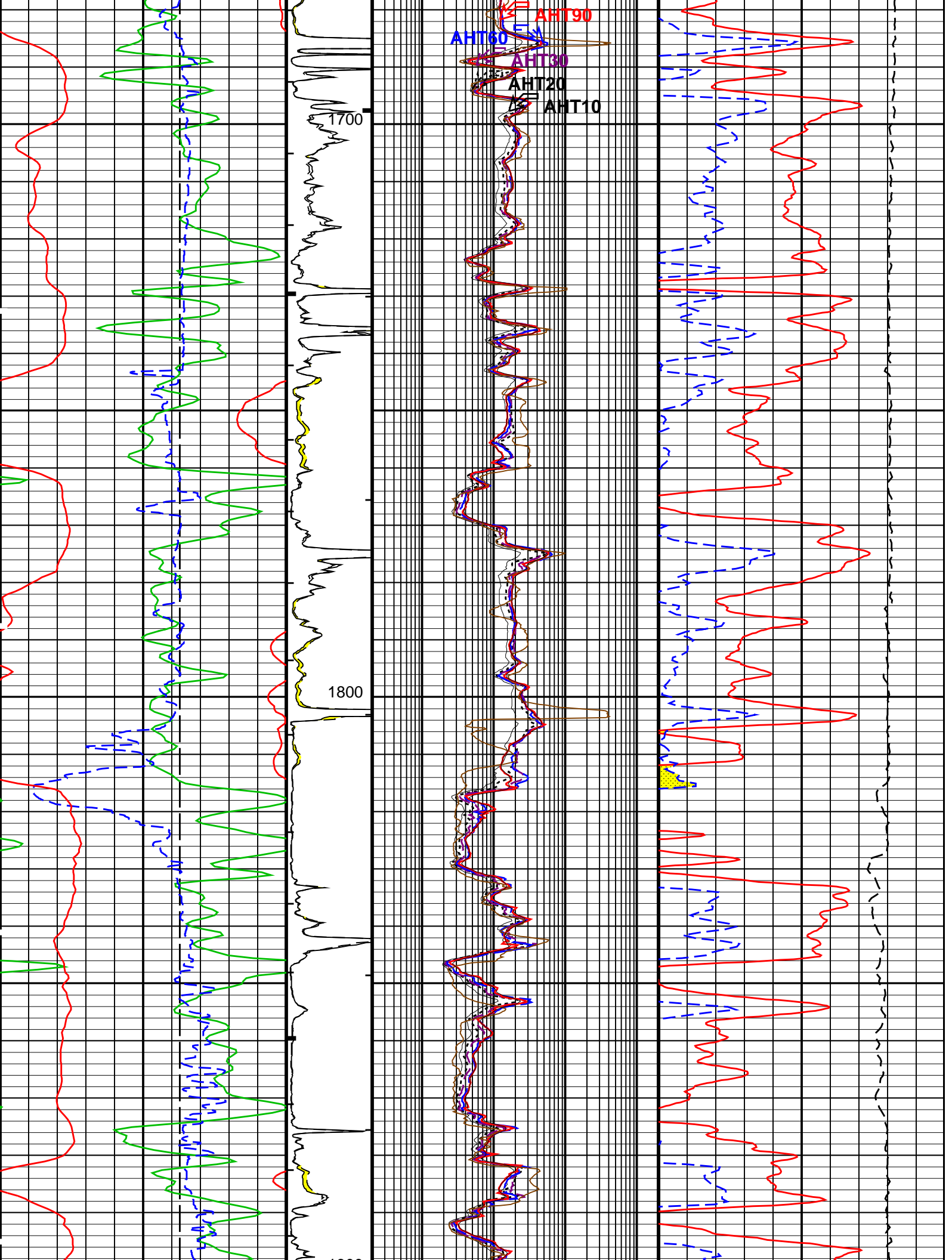


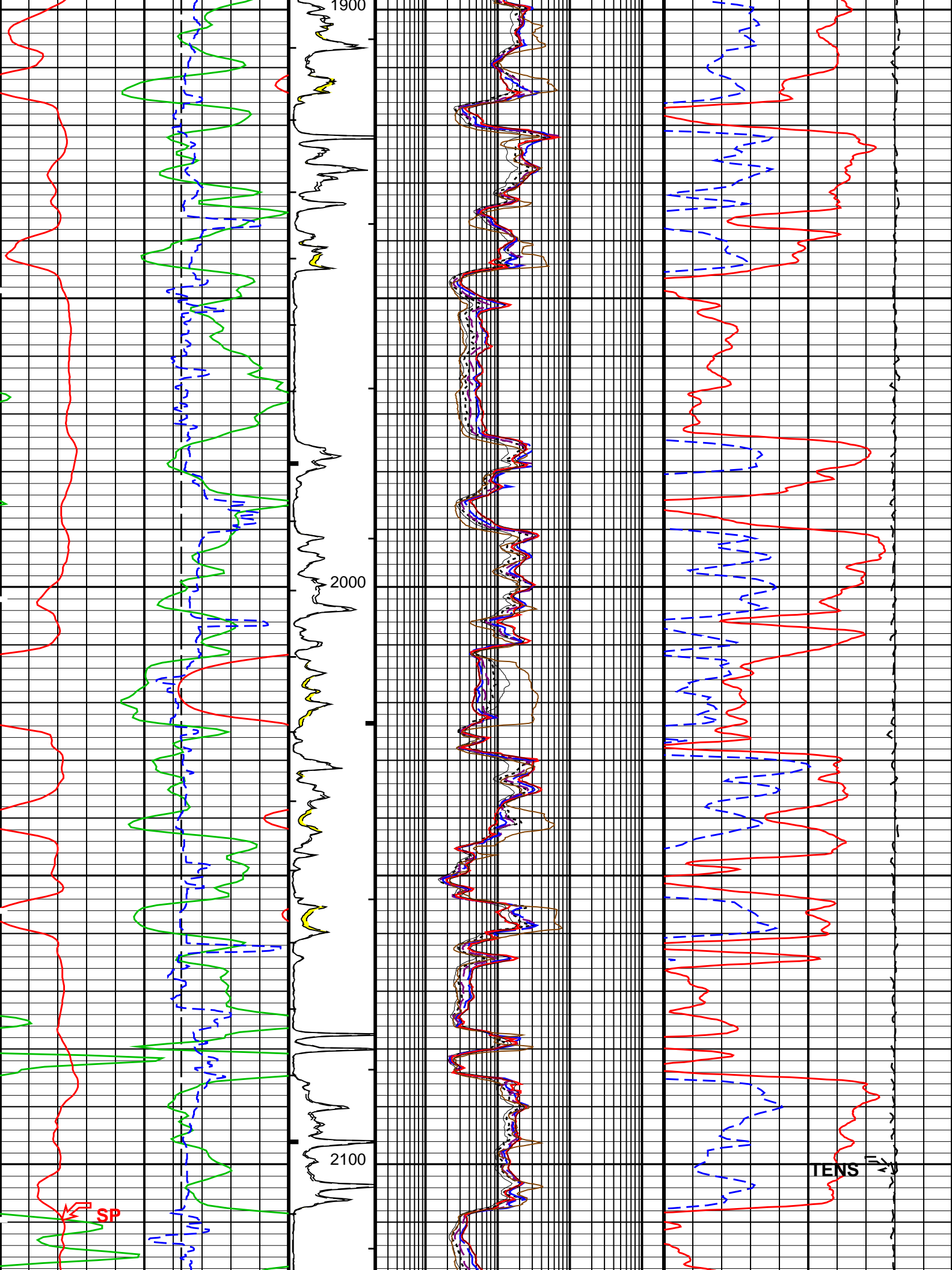


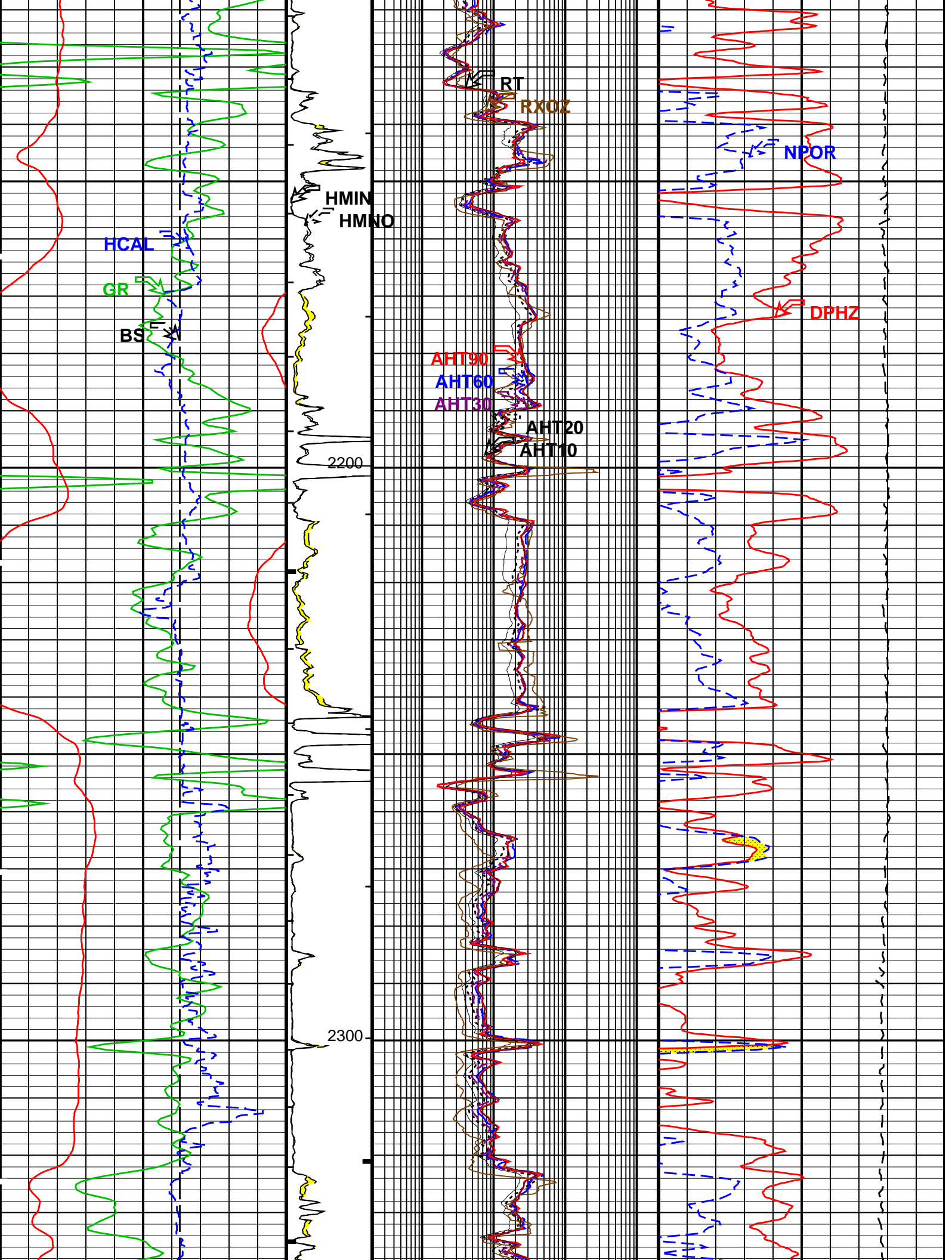


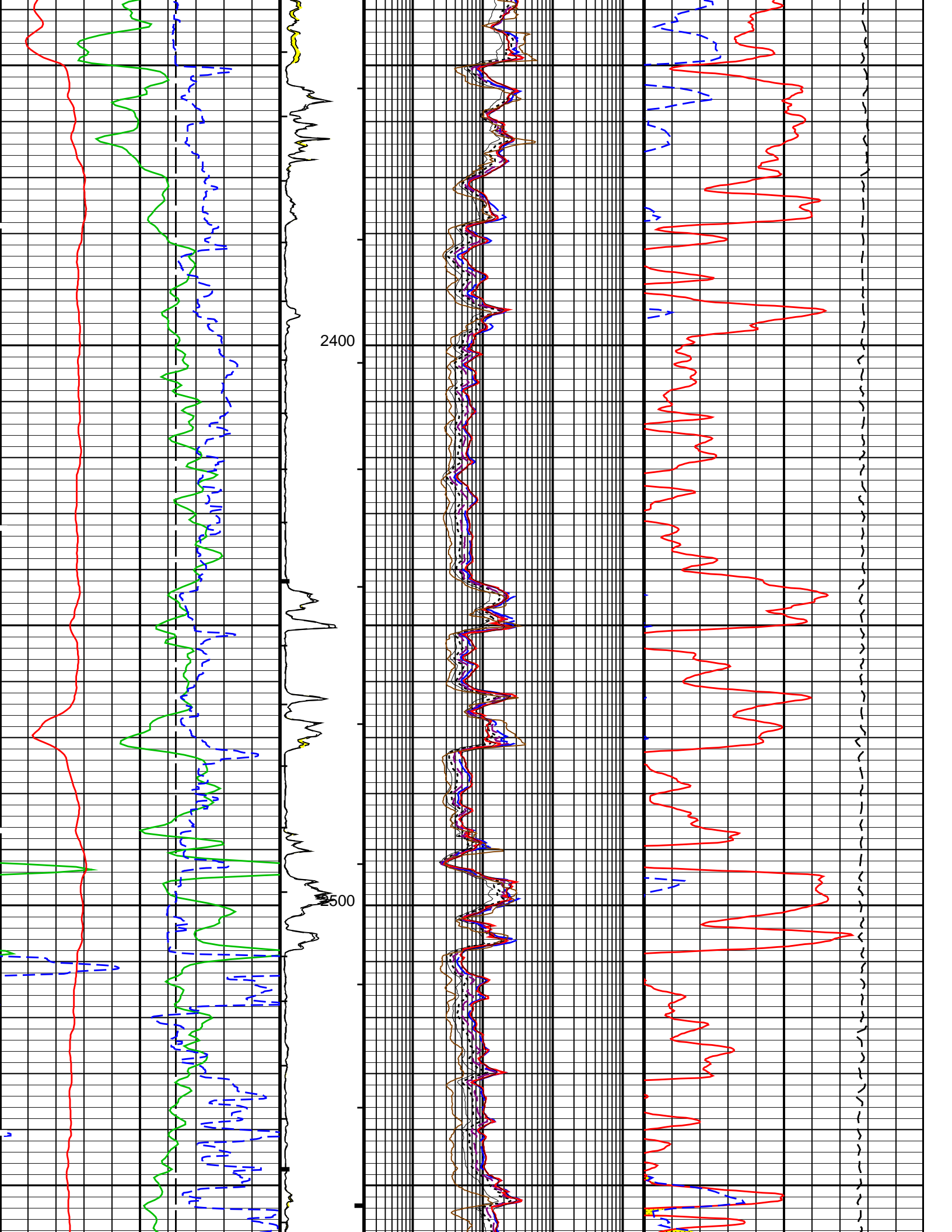


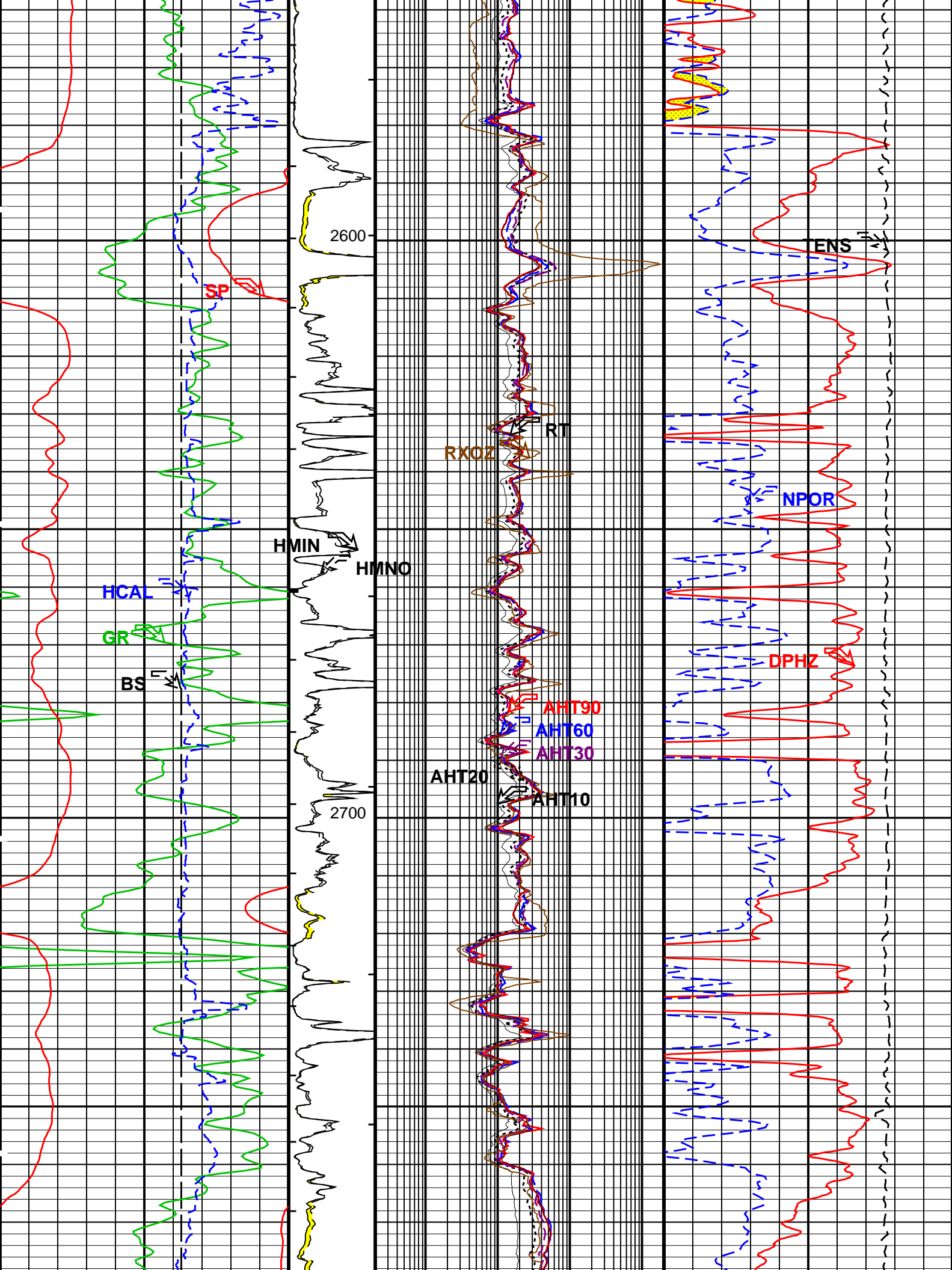


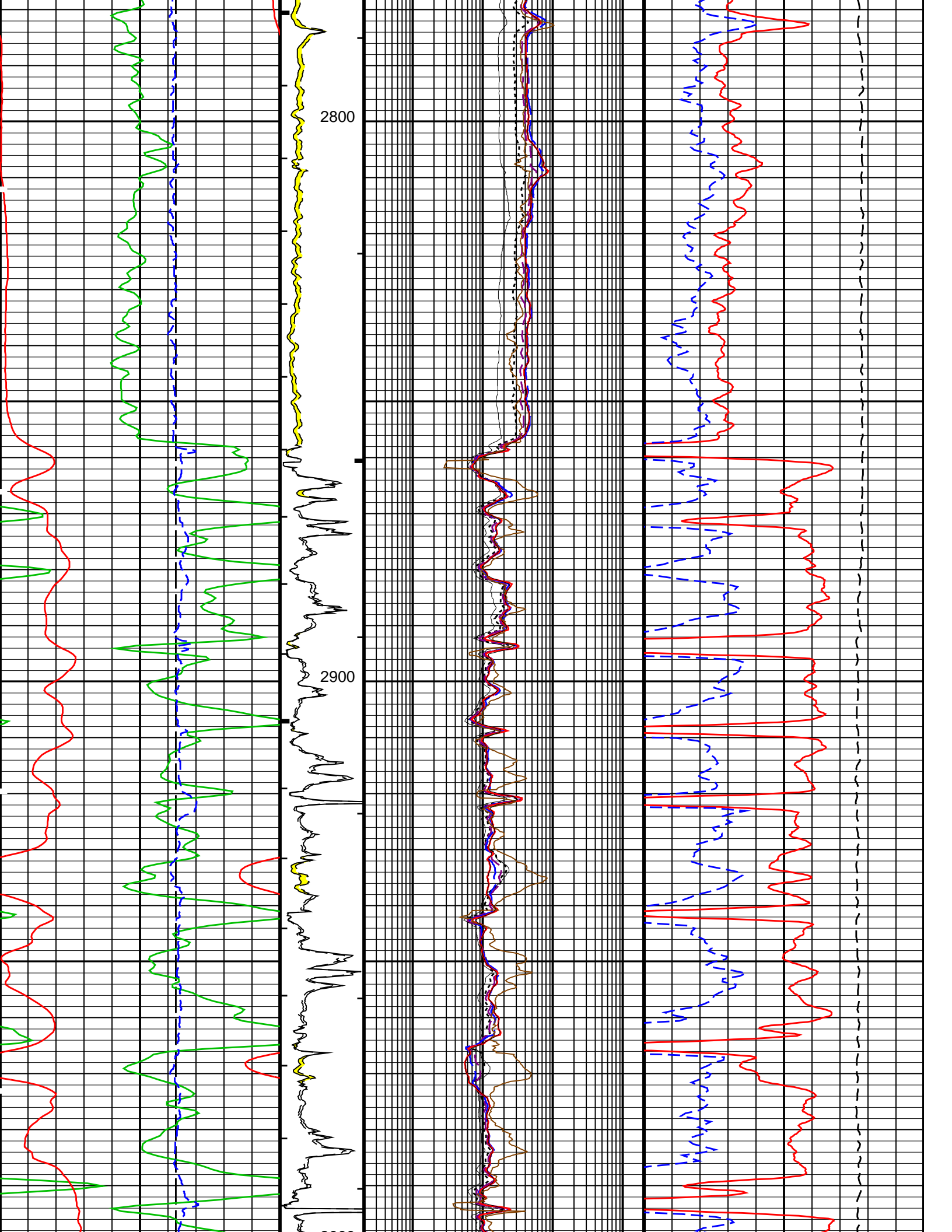


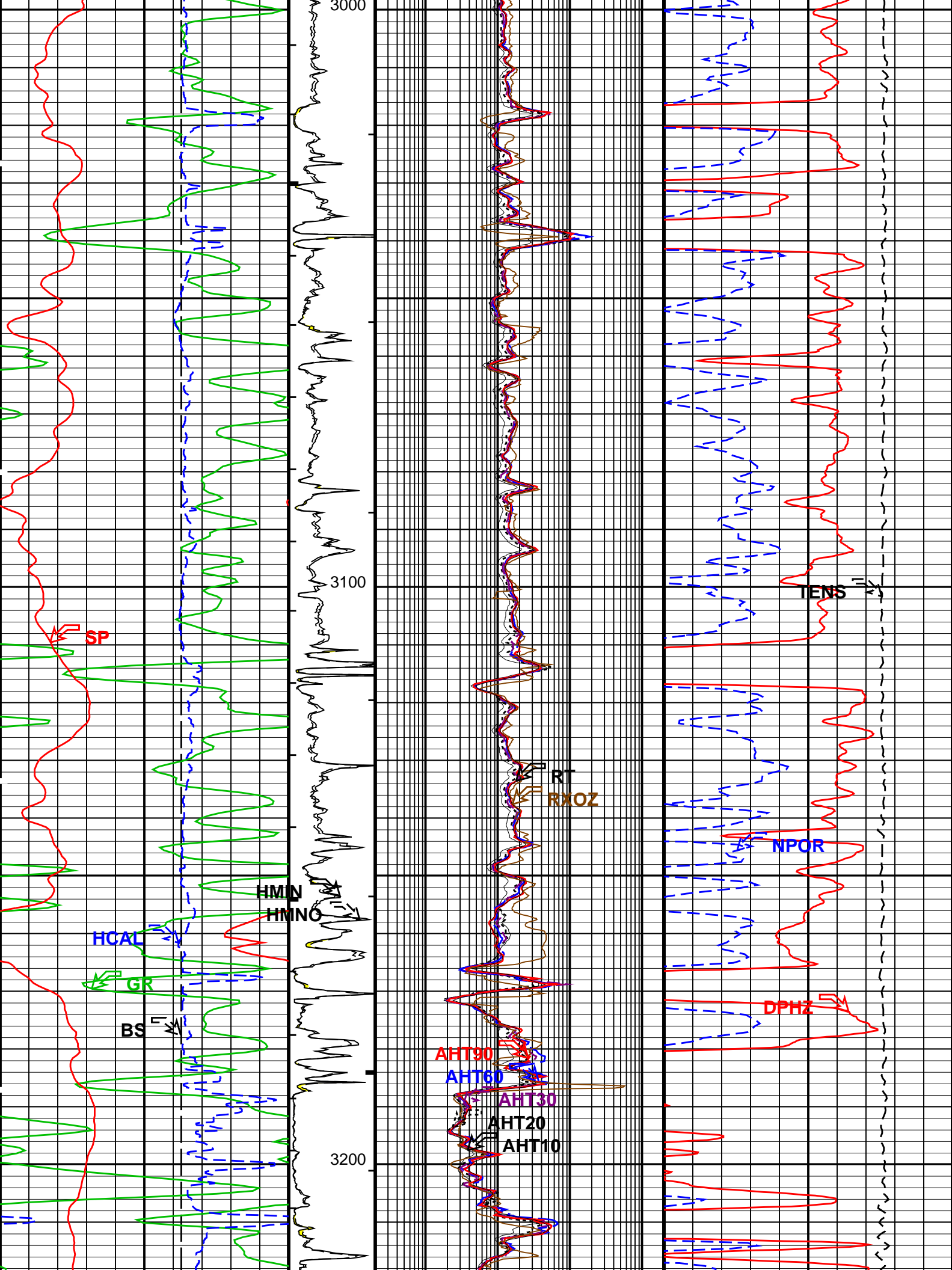


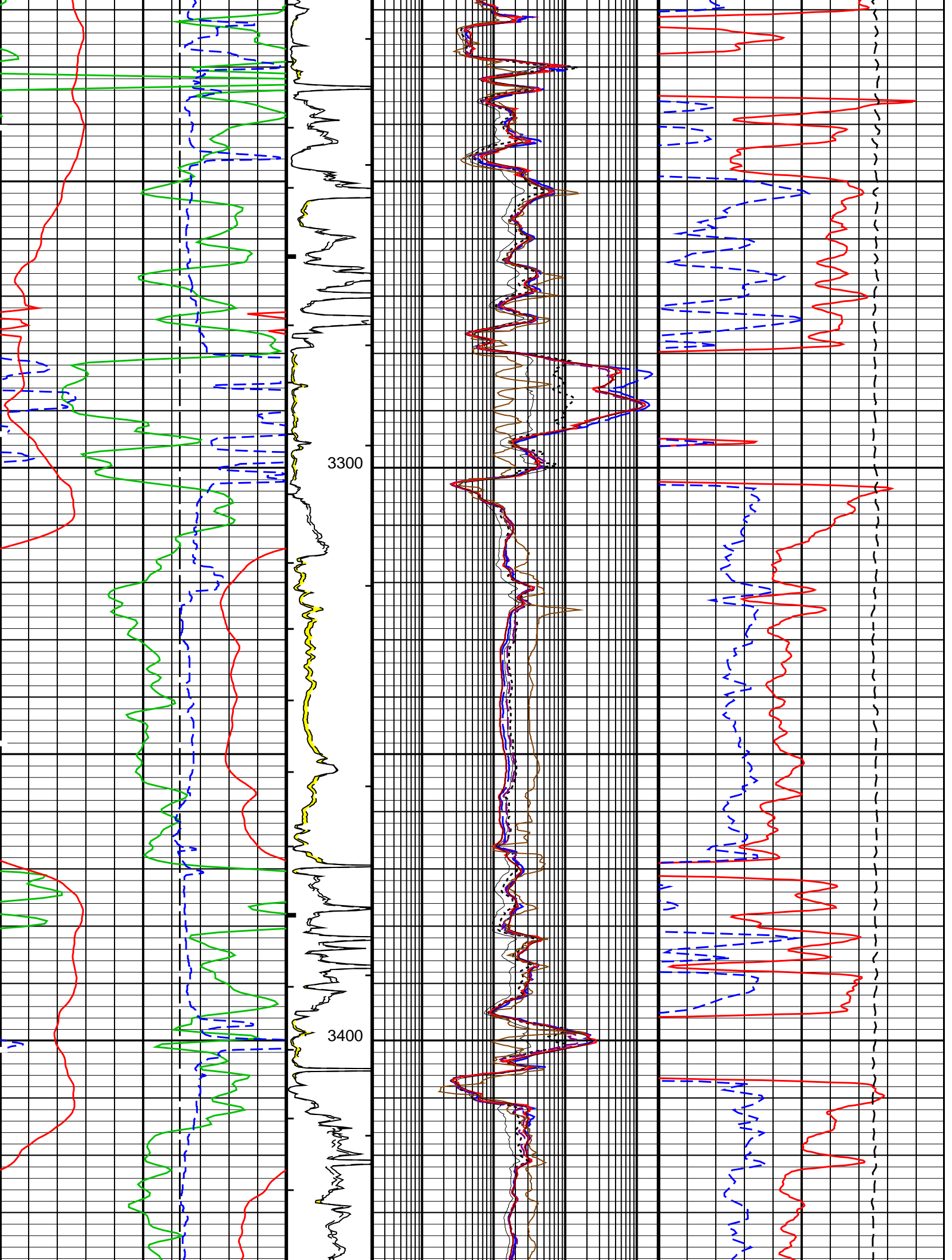


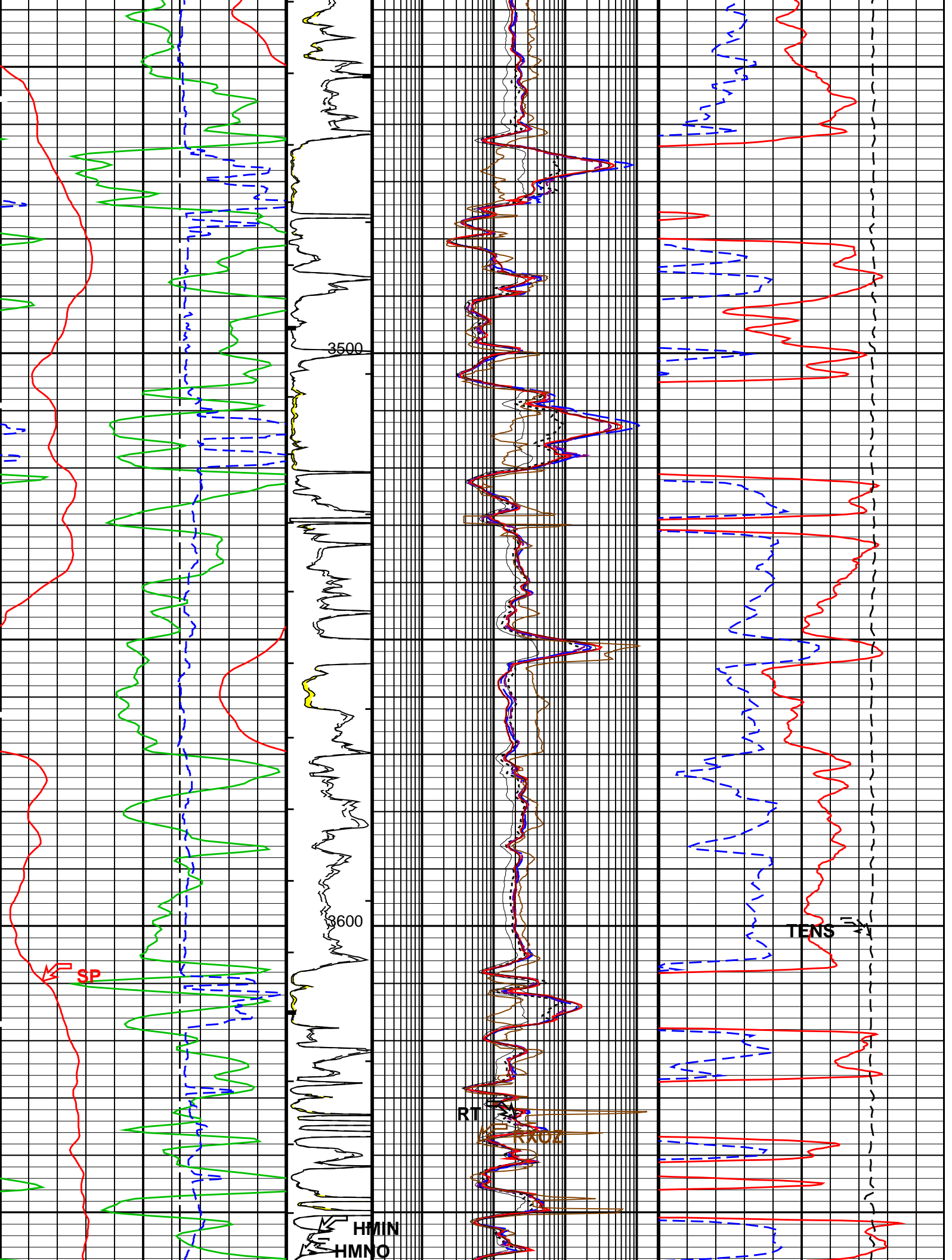


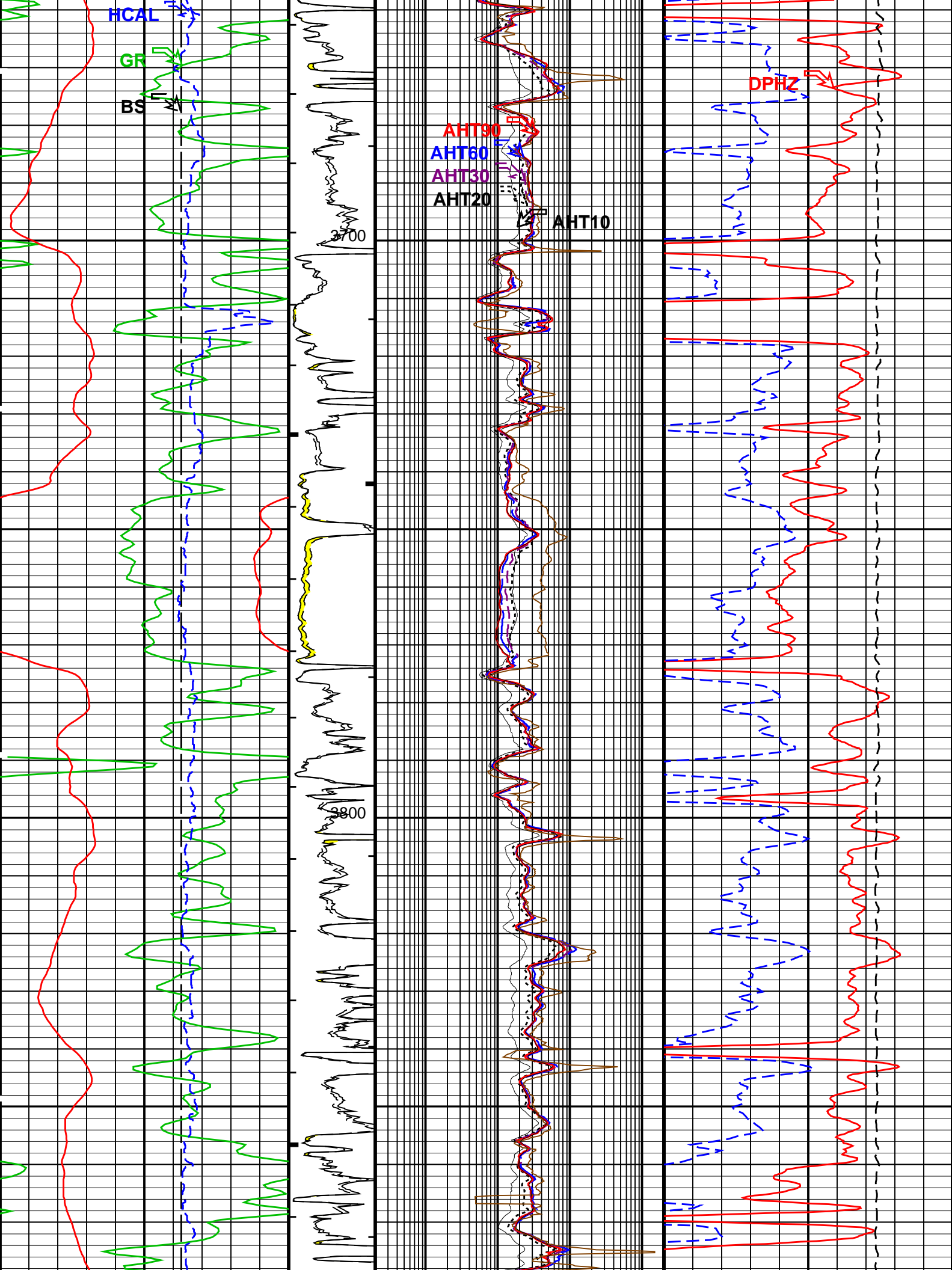


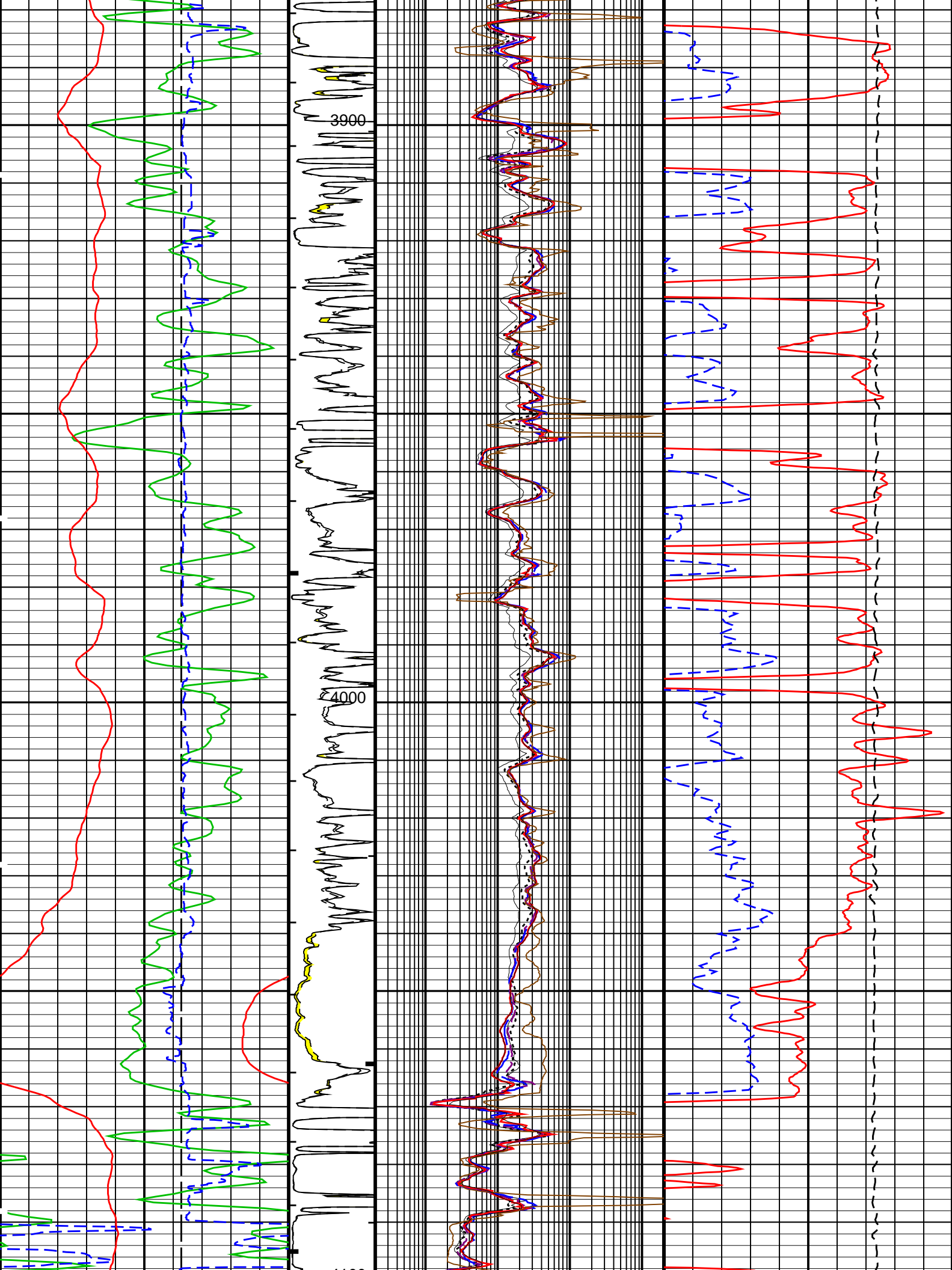


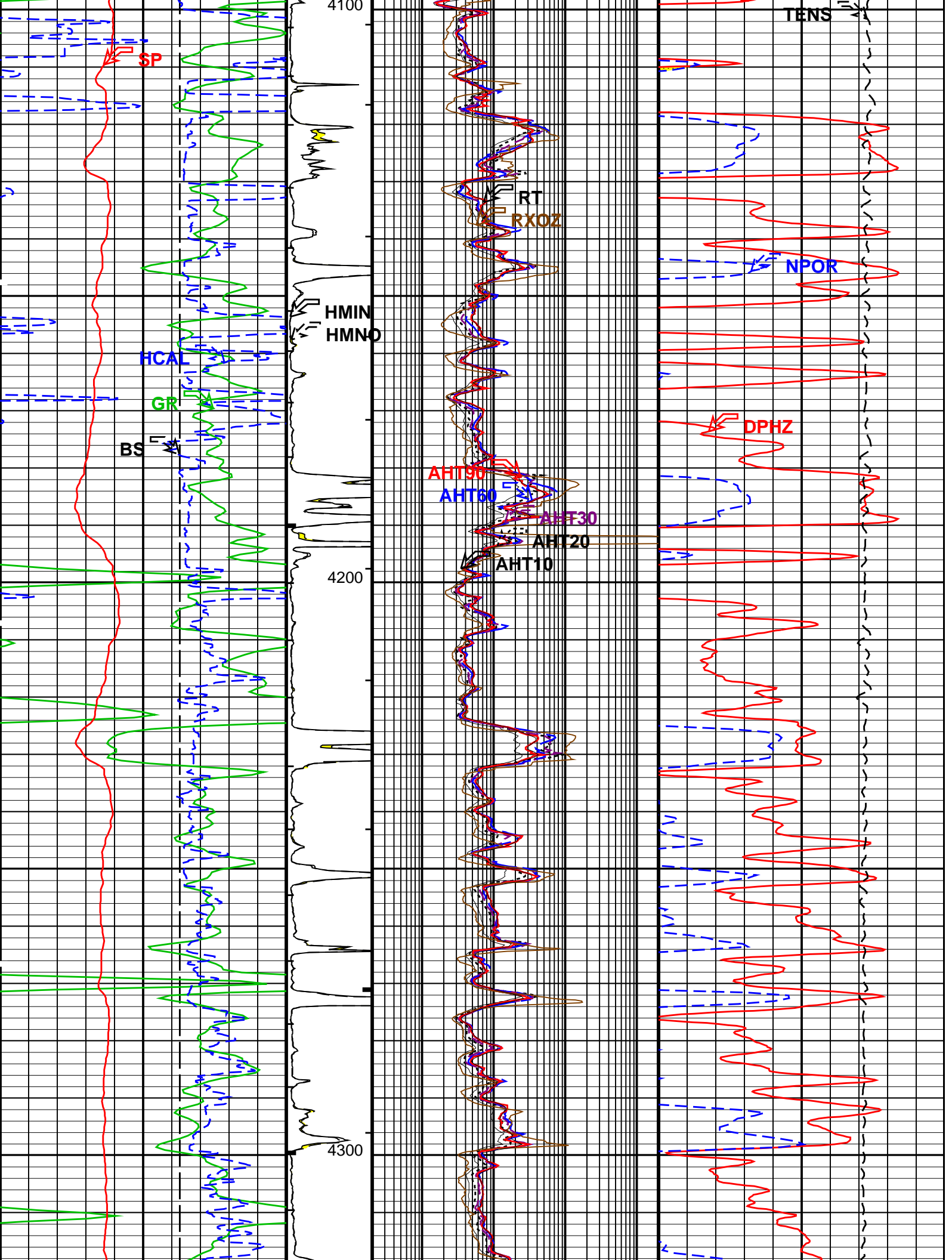


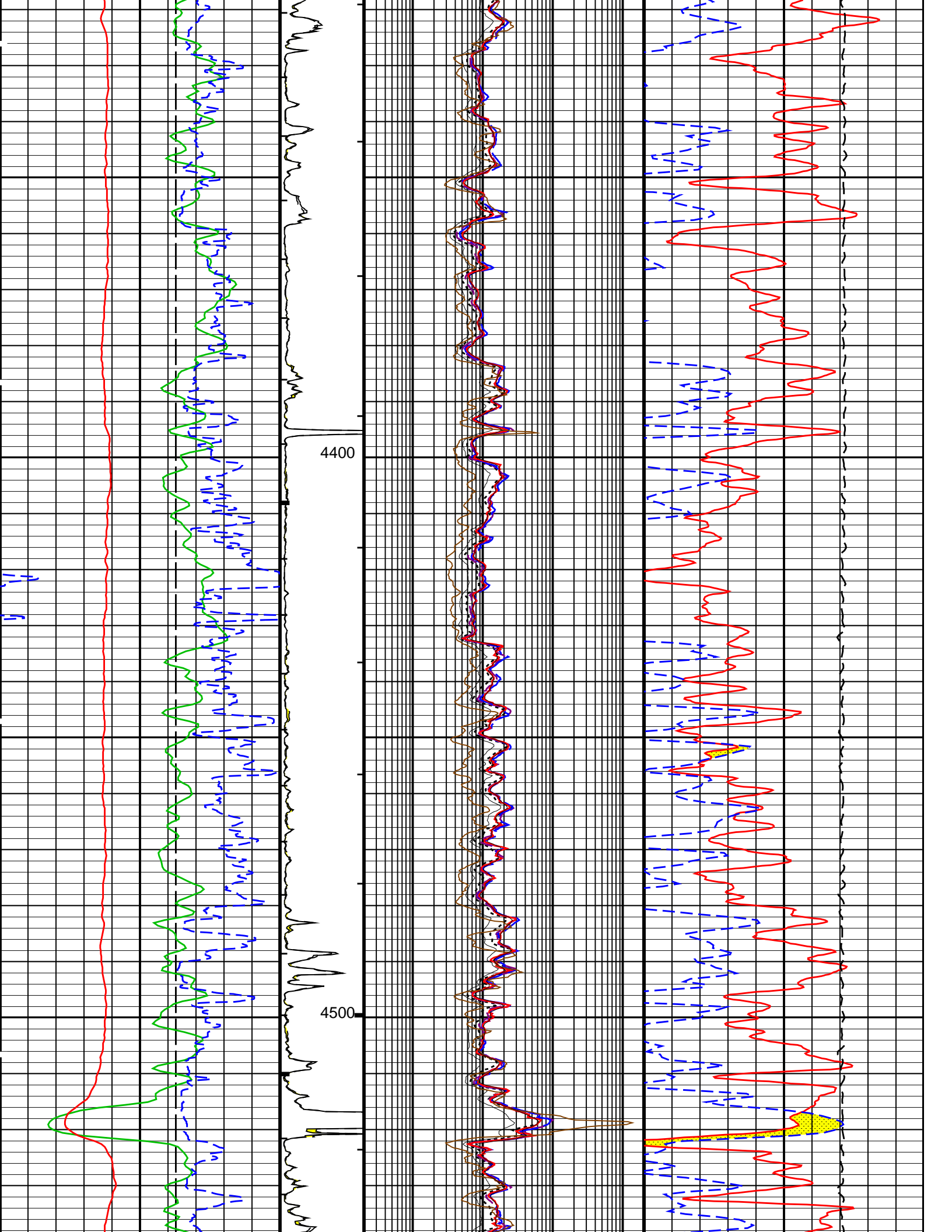


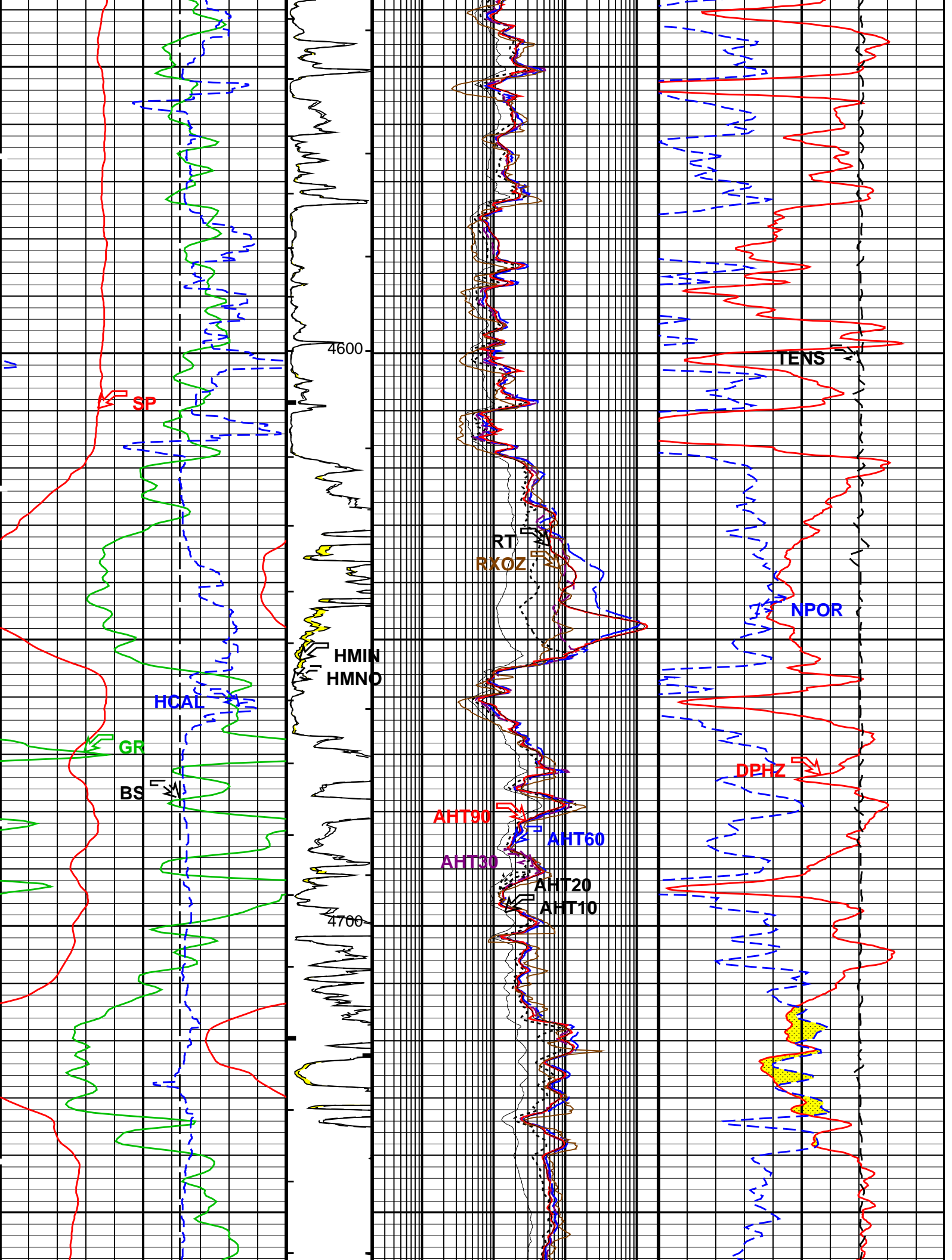


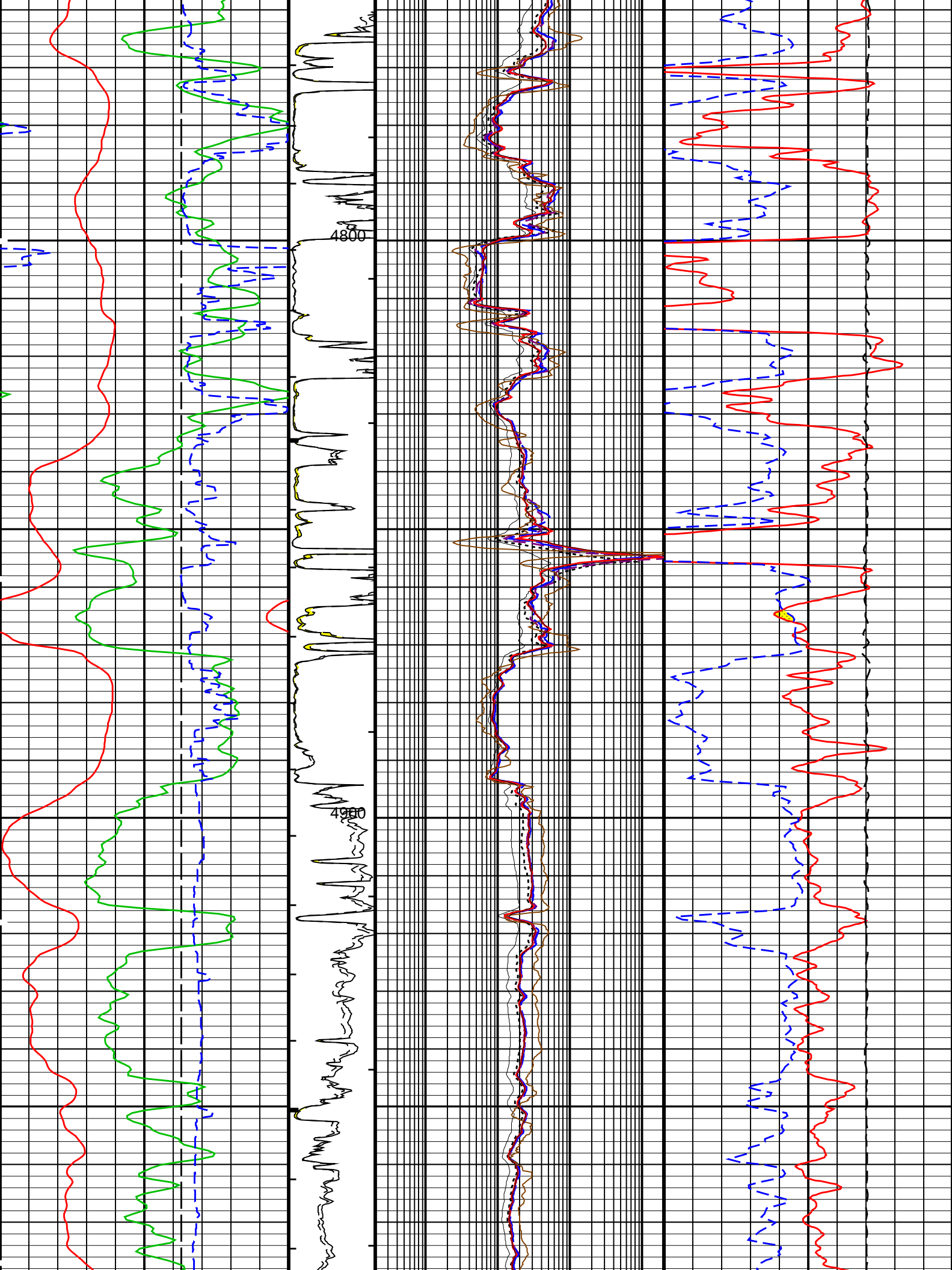


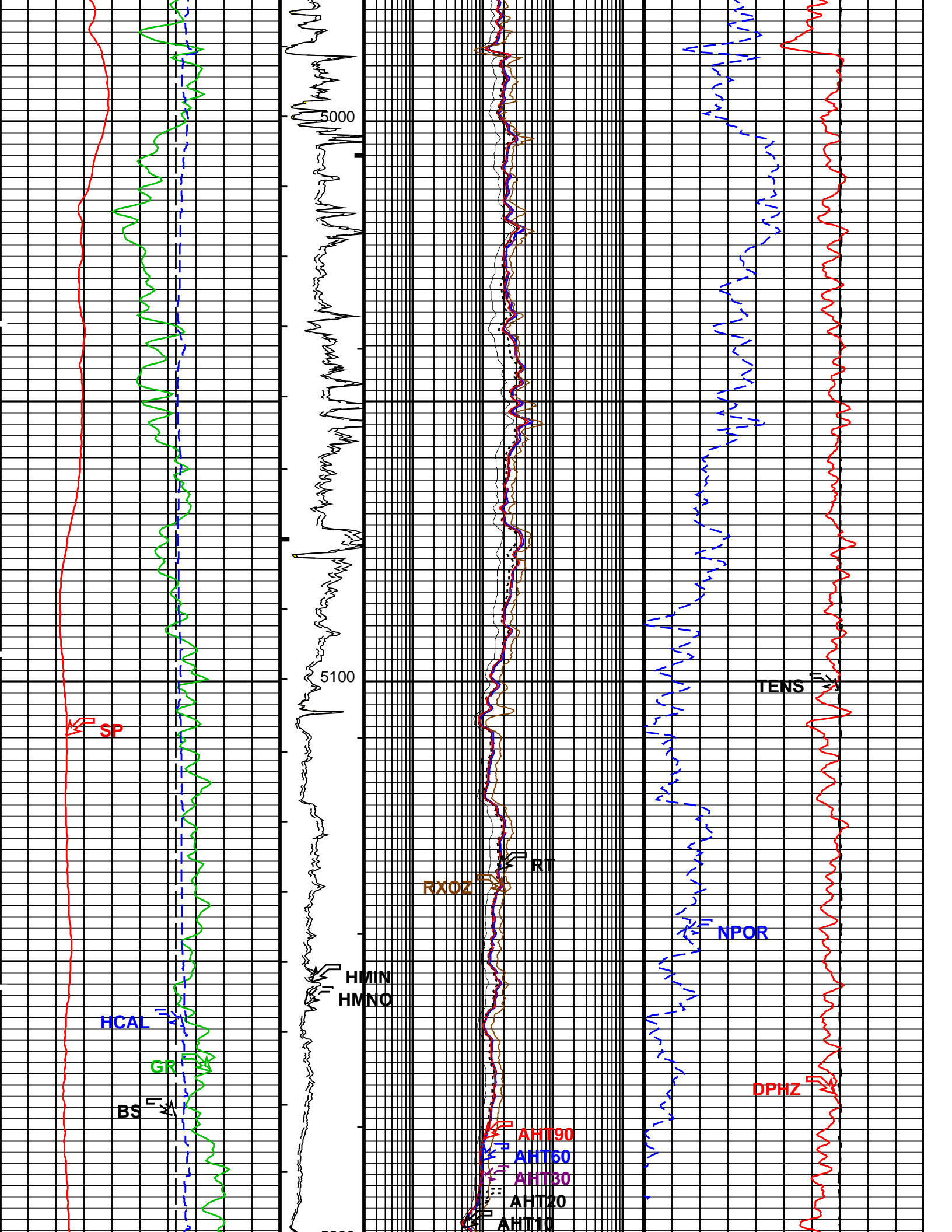


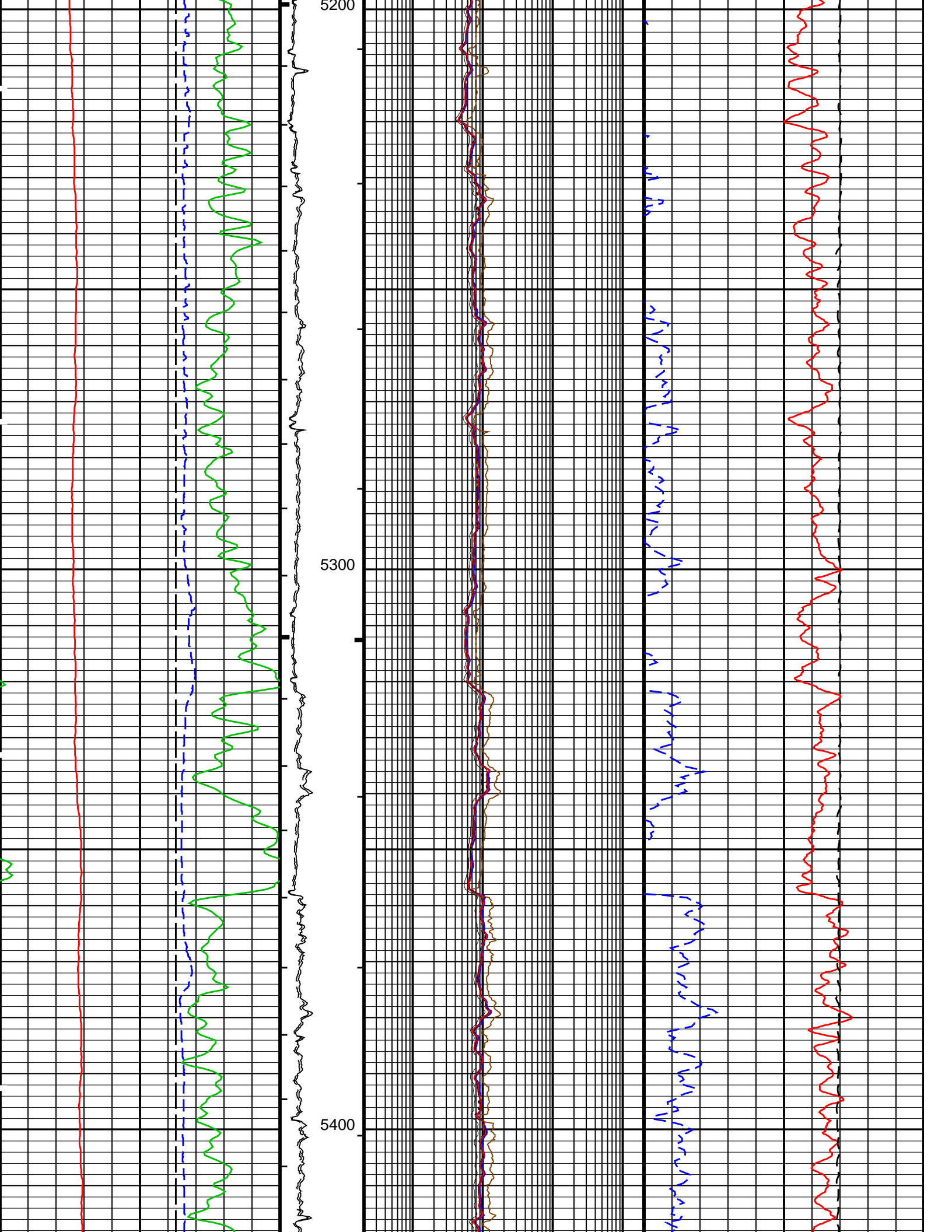


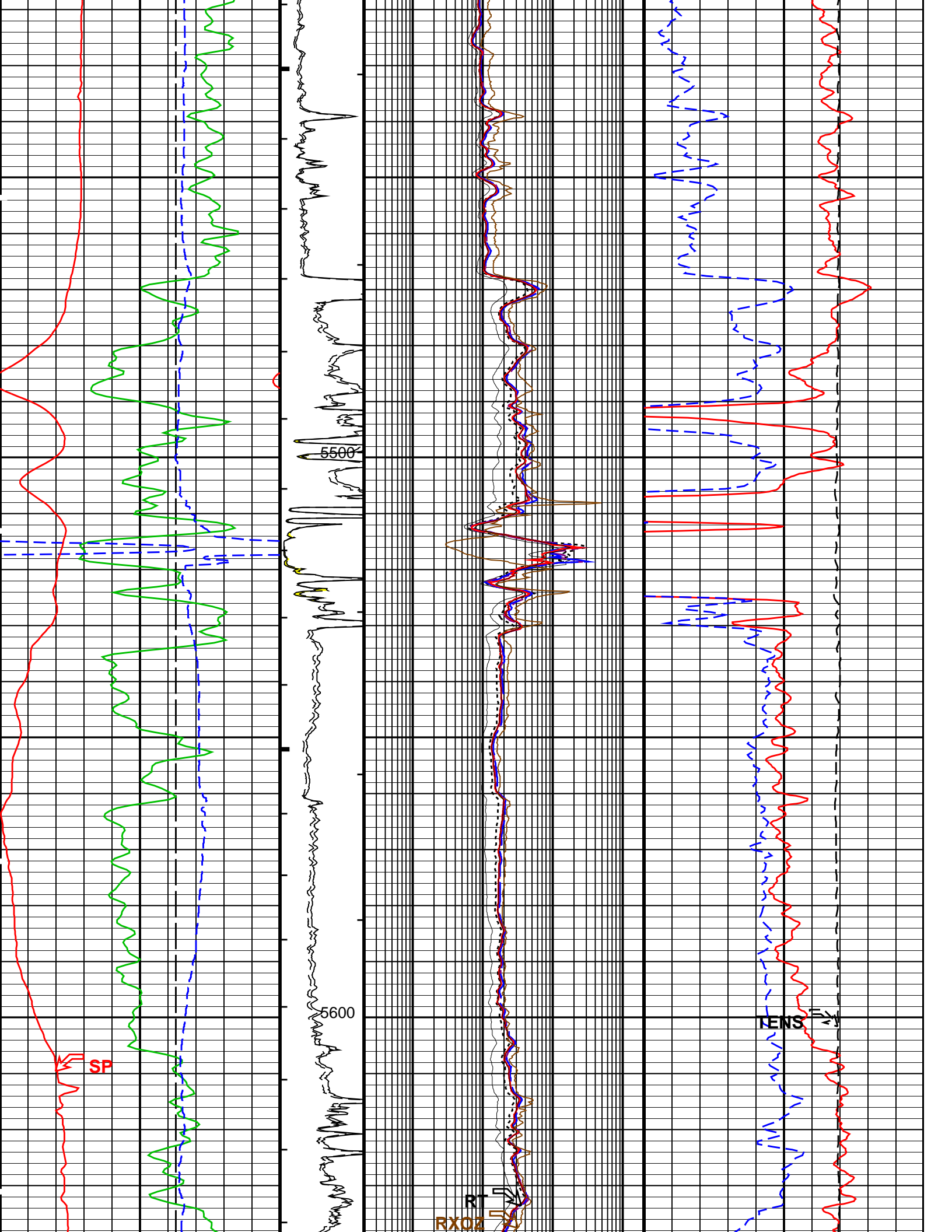


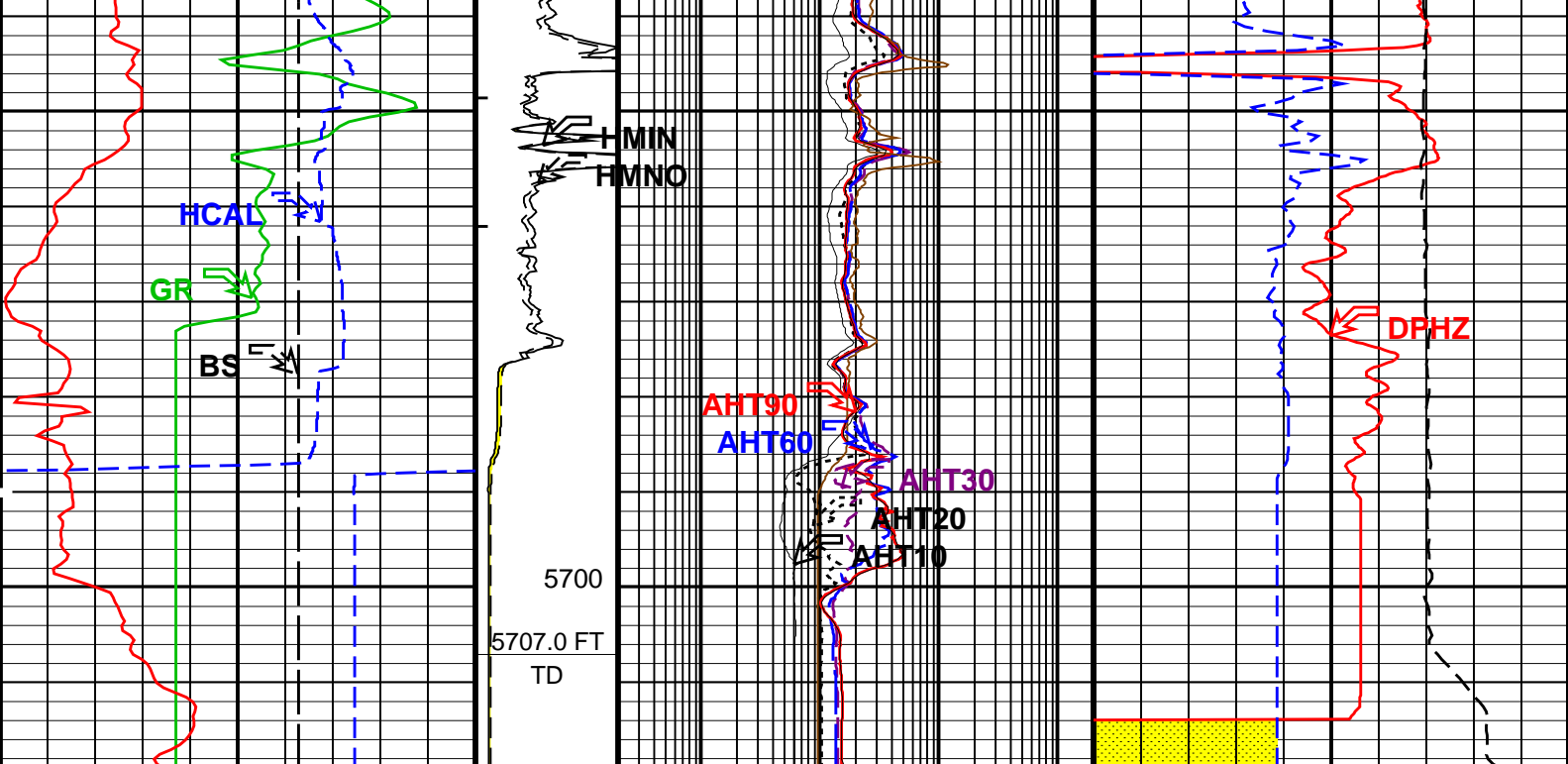












616Bit Size (BS) (IN)	Permeability From HMIN to HMNO	0.2AIT-H 10 Inch Investigation (AHT10) (OHMM)2000	0.3Std. Res. Density Porosity (DPHZ) (V/V)-0.1
0150Gamma Ray (GR) (GAPI)	Computed Micro Normal (HMNO) (OHMM) 040	0.2AIT-H 20 Inch Investigation (AHT20) (OHMM)2000	0.3Alpha Processed Neutron Porosity (NPOR) (V/V)-0.1
616HILT Caliper (HCAL) (IN)	Computed Micro Inverse (HMIN) (OHMM) 040	0.2AIT-H 30 Inch Investigation (AHT30) (OHMM)2000	10000Tension (TENS) (LBF)0
-8020SP (SP) (MV)		0.2AIT-H 60 Inch Investigation (AHT60) (OHMM)2000	Gas Indicator From DPHZ to NPOR
		0.2True Resistivity (RT) (OHMM)2000	
		0.2AIT-H 90 Inch Investigation (AHT90) (OHMM)2000	
		0.2Std. Res. Invaded Zone Resistivity (RXOZ) (OHMM)2000	

PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- ┐ Integrated Hole Volume Major Pip Every 100 F3
- └ Integrated Cement Volume Minor Pip Every 10 F3
- ┐ Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
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HAIT-H: Array Induction Tool - H		
AHAPI	Array Induction Answer Product Level (Depth Log/View only)	

3_BholeCorr_BasicLogs_Radial_Processing			
AHBHM	Array Induction Borehole Correction Mode	0_ComputeMudResistivity	
AHBHV	Array Induction Borehole Correction Code Version Number	900	
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
AHBLV	Array Induction Basic Logs Code Version Number	223	
AHCDE	Array Induction Casing Detection Enable	Yes	
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
AHDITM	Array Induction Desired Tool Mode	0x00_Log_000	
AHEBC	Array Induction Enable Borehole Correction	Yes	
AHEBL	Array Induction Enable Basic Logs	Yes	
AHERP	Array Induction Enable Radial Processing	Yes	
AHETP	Array Induction Enable Sonde Error Temp&Pres Corr	Yes	
AHFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AHIGS	Array Induction Select Akima Interpolation Gating	On	
AHLNV	Array Induction Log Not Valid Flag	Log_Valid-No_Default_Parameters	
AHMRD	Array Induction Mud Resistivity Calibration Depth	0	FT
AHMRF	Array Induction Mud Resistivity Factor	1	
AHORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
AHRFV	Array Induction Radial Profiling Code Version Number	701	
AHRPM	Array Induction Radial Processing Mode	1_Two	
AHRPV	Array Induction Radial Parametrization Code Version Number	232	
AHSTA	Array Induction Tool Standoff	1.5	IN
AHTNO	Array Induction Tool Serial Number	166	
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
AHTSE	Array Induction Temperature Selection (Sonde Error Correction)	Internal	
AHTTY	Array Induction Tool Type (of acquired data)	HAIT	
AHULV	Array Induction User Level Control	Normal	
ARTS	AIT Rt Selection (for ALLRES computation)	AITH_TwoResA90	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	150	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
RTCO	RTCO - Rt Invasion Correction	YES	
SHT	Surface Hole Temperature	68	DEGF
SPNV	SP Next Value	0	MV
PPC1-B: Powered Positioning Device/Caliper 1			
	PPC1 Caliper Type	CAL_STD	
CLBD_PPC	PPC Calibration data selection	ROM	
PWEL_PPC	PPC Primary Tool for WellCAD	PPC1	
SWEL_PPC	PPC Secondary Tool for WellCAD (45 Degrees Rotation PPC Tool)	NONE	
WRDR_PPC	PPC Rotation Direction for Secondary Tool	NONE	
HILTH-FTB: High resolution Integrated Logging Tool-DTS			
BHFL	Borehole Fluid Type	WATER	
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	150	DEGF
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
EXSICL	External Shale Indicator Clean Value	20	
EXSISH	External Shale Indicator Shale Value	150	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCLF	Germany Coal-like Formation Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HACPP	Accelerometer PROM Presence	PRESENT_FILE	
HART	Accelerometer Reference Temperature	77	DEGF
HDCOD	HILT Density Coal detection	2	G/C3
HDSAD	HILT Density Salt detection	2.1	G/C3
HILT_GAS_DENSITY	HILT Gas Downhole Density	0	G/C3
HILT_GAS_OPTION	HILT Gas Computation Option	OFF	
HNCOD	HILT Neutron Coal detection	45	PU
HNSAD	HILT Neutron Salt detection	5	PU
HPHIECUT	HILT effective Porosity Cutoff	5	PU
HSCO	Hole Size Correction Option	YES	
HSIS	HILT Shale Indicator Selection	GR	
HSSO	HRDD Nuclear Source Strength Option	NORMAL	
HSSOUT	HILT Nuclear Source Strength Option	50	%

HSWCUT	HILT Water Saturation from AITH cutoff	50	%
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.68	G/C3
MHC0	MCFL B0 Contrast Correction Coefficient	2.2e-005	OHMS
MHC1	MCFL B1 Contrast Correction Coefficient	3.2e-005	OHMS
MHCC	MCFL High Contrast Correction Switch	NO	
MPOF	MCFL Processing Operation Mode	ON	
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PEA_FILTER	PEA Filter	NO_FILTER	
PEFC_FILTER	PEFC Filter	NO_FILTER	
PHIMAX	HILT max porosity	35	PU
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SEXP_HILT	HILT Saturation Exponent	2	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	YES	
	HOLEV: Integrated Hole/Cement Volume		
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	150	DEGF
FCD	Future Casing (Outer) Diameter	9.625	IN
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN 9	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HVCS	Integrated Hole Volume Caliper Selection	PPC1_Calipers	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
	STI: Stuck Tool Indicator		
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	5	FT
TDD	Total Depth - Driller	5700.00	FT
TDL	Total Depth - Logger	5707.00	FT
	ALLRES: Basic Resistivity Transforms		
ARTS	AIT Rt Selection (for ALLRES computation)	AITH_TwoResA90	
RTCO	RTCO - Rt Invasion Correction	YES	
	System and Miscellaneous		
ALTDPCCHAN	Name of alternate depth channel	SpeedCorrectedDepth	
BS	Bit Size	12.250	IN
BSAL	Borehole Salinity	700.00	PPM
CSIZ	Current Casing Size	13.375	IN
CWEI	Casing Weight	54.50	LB/F
DFD	Drilling Fluid Density	10.60	LB/G
DO	Depth Offset for Playback	0.0	FT
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	30.00	FT
MST	Mud Sample Temperature	77.80	DEGF
PBVSADP	Use alternate depth channel for playback	NO	
PP	Playback Processing	RECOMPUTE	
RMFS	Resistivity of Mud Filtrate Sample	1.7280	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	5707	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF

Format: TCOMBO_S5 Vertical Scale: 5" per 100' Graphics File Created: 12-Jan-2009 11:44

OP System Version: 16C0-147

MCM

HAIT-H	16C0-147	PPC1-B	16C0-147
HILTH-FTB	16C0-147	DTC-H	16C0-147

Input DLIS Files

DEFAULT	AIT_CAL_TLD_MCFL_024PUP	FN:22	PRODUCER	12-Jan-2009 11:29	5719.0 FT	53.5 FT
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Output DLIS Files

DEFAULT	AIT_CAL_TLD_MCFL_025PUP	FN:23	PRODUCER	12-Jan-2009 11:43
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MAXIS Field Log

Company: GRYNBERG PETROLEUM COMPANY

Well: HIAWATHA DEEP 4-36

Input DLIS Files

DEFAULT	AIT_CAL_TLD_MCFL_023PUP	FN:21	PRODUCER	12-Jan-2009 11:28	5721.0 FT	5226.5 FT
DEFAULT	AIT_CAL_TLD_MCFL_024PUP	FN:22	PRODUCER	12-Jan-2009 11:29	5719.0 FT	53.5 FT

Output DLIS Files

DEFAULT	AIT_CAL_TLD_MCFL_025PUP	FN:23	PRODUCER	12-Jan-2009 11:43
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OP System Version: 16C0-147

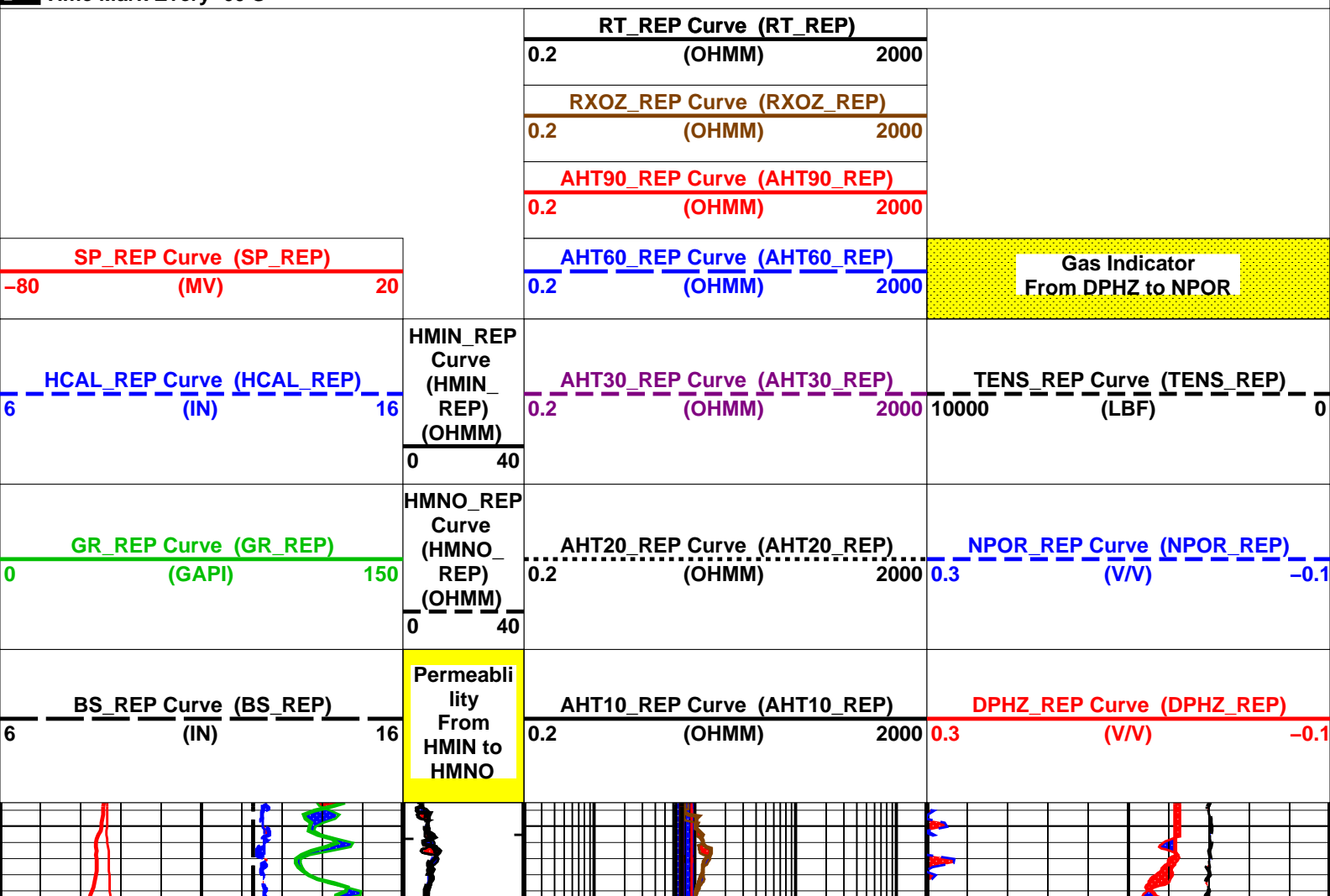
MCM

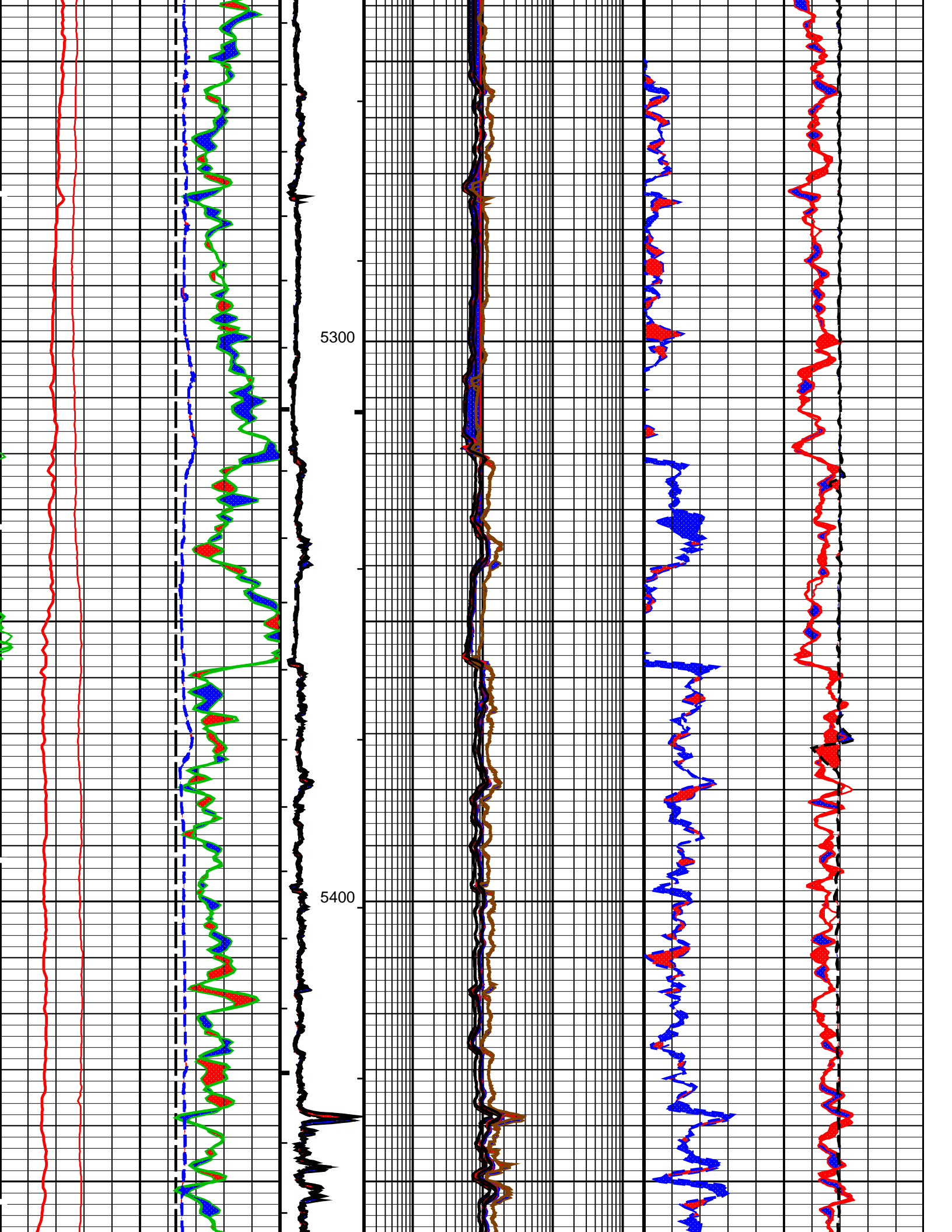
HAIT-H	16C0-147	PPC1-B	16C0-147
HILTH-FTB	16C0-147	DTC-H	16C0-147

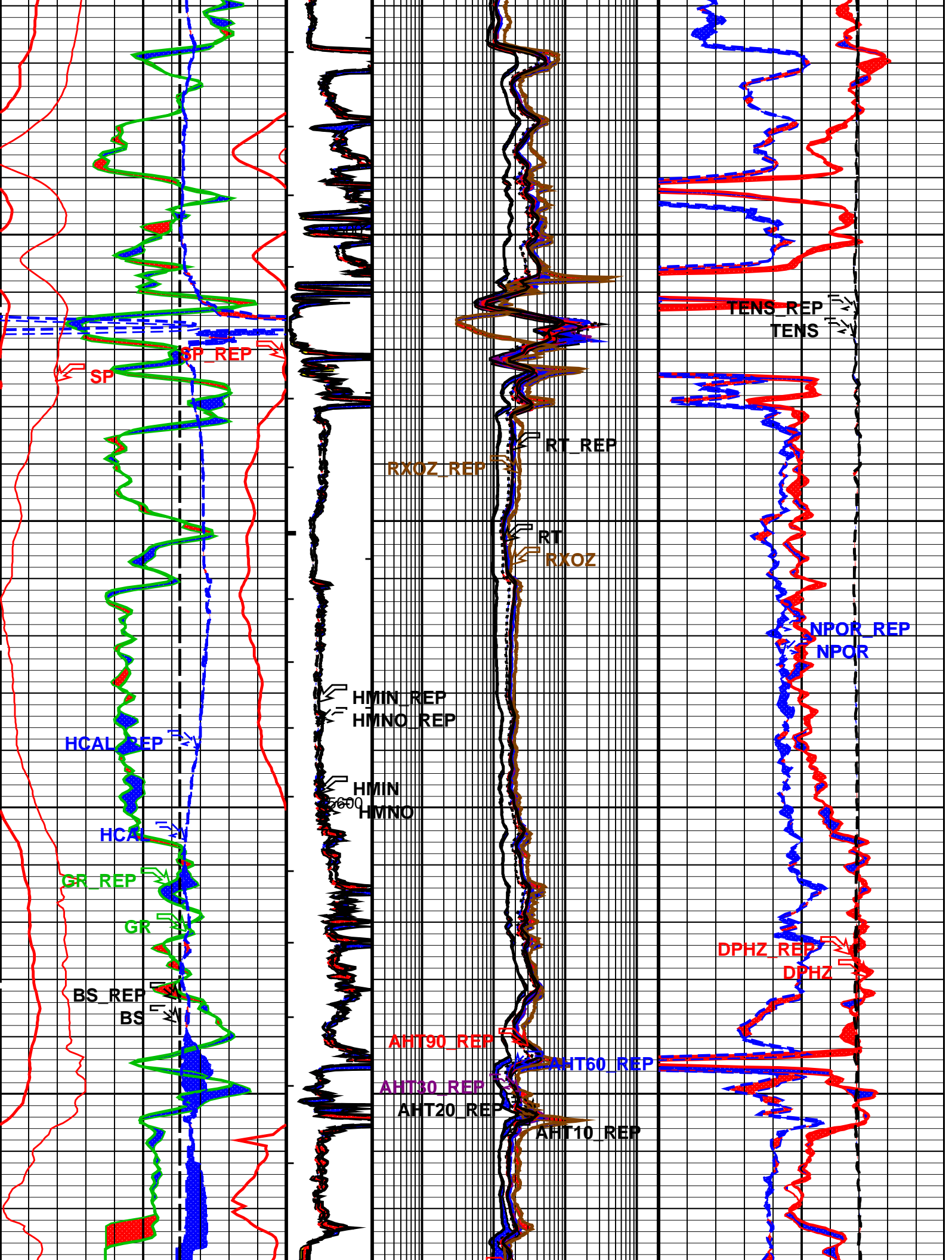
PIP SUMMARY

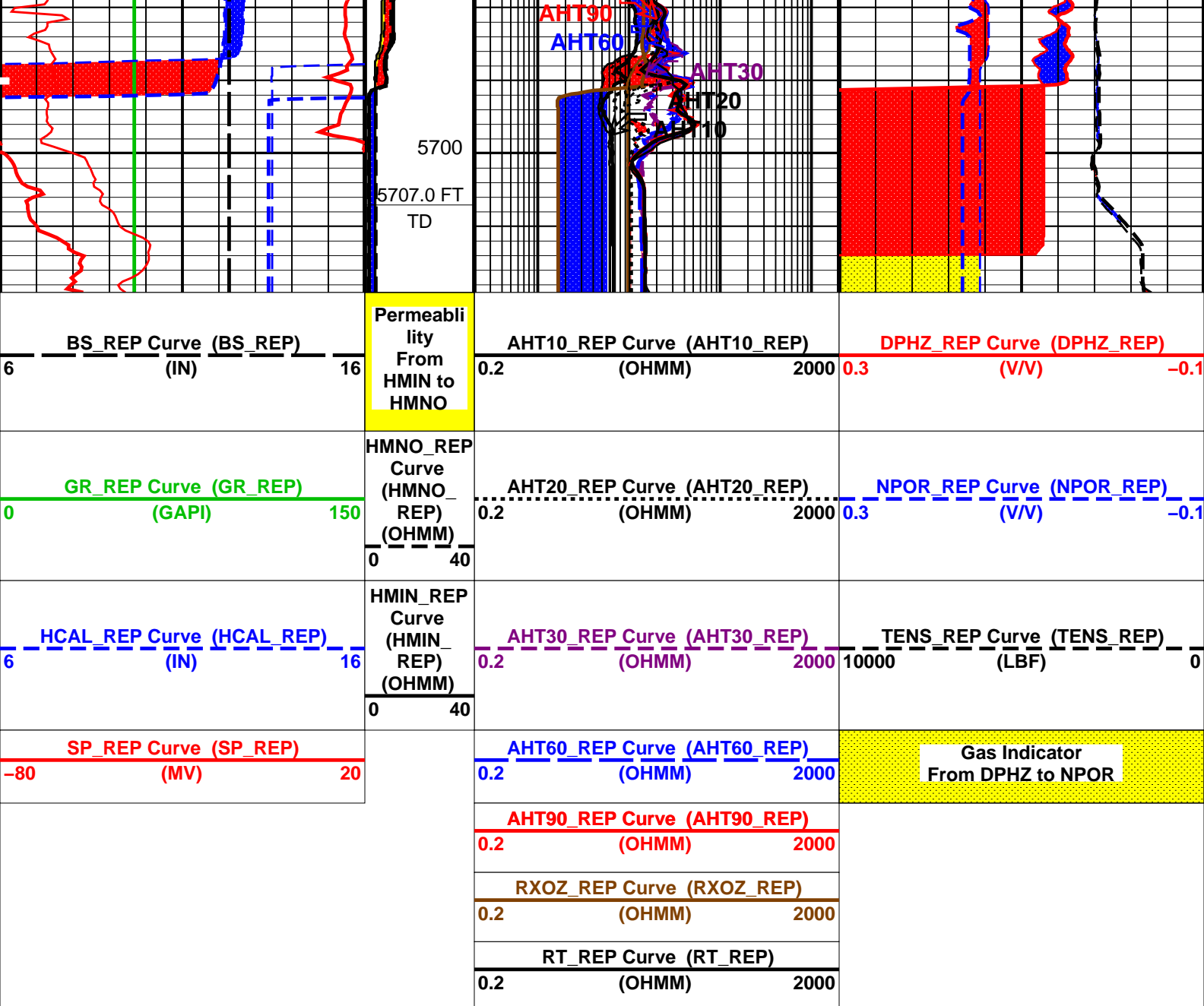
- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
 - └ Integrated Cement Volume Minor Pip Every 10 F3
 - └ Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S









PIP SUMMARY

- ┌ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
- ┌ Integrated Cement Volume Minor Pip Every 10 F3
- └ Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
HAIT-H: Array Induction Tool - H		
AHBHM	Array Induction Borehole Correction Mode	0_ComputeMudResistivity
AHBHV	Array Induction Borehole Correction Code Version Number	900
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four
AHBLV	Array Induction Basic Logs Code Version Number	223
AHCDE	Array Induction Casing Detection Enable	Yes
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered
AHFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20
AHMRF	Array Induction Mud Resistivity Factor	1
AHORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20
AHRFV	Array Induction Radial Profiling Code Version Number	701
AHRPV	Array Induction Radial Parametrization Code Version Number	232
AHSTA	Array Induction Tool Standoff	1.5 IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20
ARTS	AIT Rt Selection (for ALLRES computation)	AITH_TwoResA90
BHS	Borehole Status	OPEN
BHT	Bottom Hole Temperature (used in calculations)	150 DEGF
FEXP	Form Factor Exponent	2

FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
RTCO	RTCO – Rt Invasion Correction	YES	
SHT	Surface Hole Temperature	68	DEGF
SPNV	SP Next Value	0	MV
HILTH-FTB: High resolution Integrated Logging Tool-DTS			
BHFL	Borehole Fluid Type	WATER	
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	150	DEGF
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCLF	Germany Coal-like Formation Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HSCO	Hole Size Correction Option	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.68	G/C3
MPOF	MCFL Processing Operation Mode	ON	
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	YES	
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	150	DEGF
FCD	Future Casing (Outer) Diameter	9.625	IN
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HVCS	Integrated Hole Volume Caliper Selection	PPC1_Calipers	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
STI: Stuck Tool Indicator			
TDL	Total Depth – Logger	5707.00	FT
ALLRES: Basic Resistivity Transforms			
ARTS	AIT Rt Selection (for ALLRES computation)	AITH_TwoResA90	
RTCO	RTCO – Rt Invasion Correction	YES	
System and Miscellaneous			
BS	Bit Size	12.250	IN
BSAL	Borehole Salinity	700.00	PPM
CSIZ	Current Casing Size	13.375	IN
DFD	Drilling Fluid Density	10.60	LB/G
DO	Depth Offset for Playback	0.0	FT
DORL	Depth Offset for Repeat Analysis	0.0	FT
MST	Mud Sample Temperature	77.80	DEGF
PP	Playback Processing	RECOMPUTE	
RMFS	Resistivity of Mud Filtrate Sample	1.7280	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	5707	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF

Format: TCOMBO_S5_REP Vertical Scale: 5" per 100' Graphics File Created: 12-Jan-2009 11:44

OP System Version: 16C0-147

MCM

HAIT-H	16C0-147	PPC1-B	16C0-147
HILTH-FTB	16C0-147	DTC-H	16C0-147

Input DLIS Files

DEFAULT	AIT_CAL_TLD_MCFL_023PUP	FN:21	PRODUCER	12-Jan-2009 11:28	5721.0 FT	5226.5 FT
DEFAULT	AIT_CAL_TLD_MCFL_024PUP	FN:22	PRODUCER	12-Jan-2009 11:29	5719.0 FT	53.5 FT

Output DLIS Files

DEFAULT	AIT_CAL_TLD_MCFL_025PUP	FN:23	PRODUCER	12-Jan-2009 11:43
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Schlumberger

Calibrations

MAXIS Field Log

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
Array Induction Tool – H Wellsite Calibration – Electronics Calibration Check – Thru Cal Mag. & Phase							
Master: 31-Oct-2008 11:37 Before: 11-Jan-2009 11:43							
Thru Cal Magnitude – 0	0	0.6226	0.6223	N/A	N/A	N/A	V
Thru Cal Magnitude – 1	0	1.278	1.278	N/A	N/A	N/A	V
Thru Cal Magnitude – 2	0	0.6337	0.6335	N/A	N/A	N/A	V
Thru Cal Magnitude – 3	0	0.7169	0.7166	N/A	N/A	N/A	V
Thru Cal Magnitude – 4	0	1.339	1.338	N/A	N/A	N/A	V
Thru Cal Magnitude – 5	0	1.955	1.954	N/A	N/A	N/A	V
Thru Cal Magnitude – 6	0	1.950	1.949	N/A	N/A	N/A	V
Thru Cal Magnitude – 7	0	1.410	1.409	N/A	N/A	N/A	V
Phase – 0	0	69.35	69.32	N/A	N/A	N/A	DEG
Phase – 1	0	68.22	68.19	N/A	N/A	N/A	DEG
Phase – 2	0	64.37	64.33	N/A	N/A	N/A	DEG
Phase – 3	0	63.56	63.52	N/A	N/A	N/A	DEG
Phase – 4	0	57.14	57.10	N/A	N/A	N/A	DEG
Phase – 5	0	55.19	55.14	N/A	N/A	N/A	DEG
Phase – 6	0	55.22	55.18	N/A	N/A	N/A	DEG
Phase – 7	0	51.41	51.35	N/A	N/A	N/A	DEG
Array Induction Tool – H Wellsite Calibration – Electronics Calibration Check – Auxilliary							
Master: 31-Oct-2008 11:37 Before: 11-Jan-2009 11:43							
Array Induction SPA Plus	990.5	991.0	991.1	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	-0.1851	-0.2142	N/A	N/A	N/A	MV
Array Induction Temperature PI	0.9150	0.9180	0.9180	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	-0.0001863	-0.0001906	N/A	N/A	N/A	V
Array Induction Tool – H Wellsite Calibration – Test Loop Gain Correction							
Master: 31-Oct-2008 11:37							
Test Loop Gain Magnitude – 0	0	1.022	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 1	0	1.022	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 2	0	1.025	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 3	0	1.022	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 4	0	1.006	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 5	0	0.9998	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 6	0	1.010	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 7	0	1.027	N/A	N/A	N/A	N/A	V
Phase – 0	0	0.3997	N/A	N/A	N/A	N/A	DEG
Phase – 1	0	0.5084	N/A	N/A	N/A	N/A	DEG
Phase – 2	0	-0.01268	N/A	N/A	N/A	N/A	DEG
Phase – 3	0	0.05847	N/A	N/A	N/A	N/A	DEG
Phase – 4	0	0.01637	N/A	N/A	N/A	N/A	DEG
Phase – 5	0	-0.1534	N/A	N/A	N/A	N/A	DEG
Phase – 6	0	0.2088	N/A	N/A	N/A	N/A	DEG
Phase – 7	0	-0.08153	N/A	N/A	N/A	N/A	DEG

Array Induction Tool – H Wellsite Calibration – Sonde Error Correction

Master: 31-Oct-2008 11:37								
R Sonde Error Correction – 0	0	–86.80	N/A	N/A	N/A	N/A	MM/M	
R Sonde Error Correction – 1	0	160.0	N/A	N/A	N/A	N/A	MM/M	
R Sonde Error Correction – 2	0	109.7	N/A	N/A	N/A	N/A	MM/M	
R Sonde Error Correction – 3	0	63.72	N/A	N/A	N/A	N/A	MM/M	
R Sonde Error Correction – 4	0	24.17	N/A	N/A	N/A	N/A	MM/M	
R Sonde Error Correction – 5	0	13.40	N/A	N/A	N/A	N/A	MM/M	
R Sonde Error Correction – 6	0	10.13	N/A	N/A	N/A	N/A	MM/M	
R Sonde Error Correction – 7	0	–0.3709	N/A	N/A	N/A	N/A	MM/M	
X Sonde Error Correction – 0	0	711.5	N/A	N/A	N/A	N/A	MM/M	
X Sonde Error Correction – 1	0	–232.4	N/A	N/A	N/A	N/A	MM/M	
X Sonde Error Correction – 2	0	60.69	N/A	N/A	N/A	N/A	MM/M	
X Sonde Error Correction – 3	0	–102.2	N/A	N/A	N/A	N/A	MM/M	
X Sonde Error Correction – 4	0	–10.27	N/A	N/A	N/A	N/A	MM/M	
X Sonde Error Correction – 5	0	–12.55	N/A	N/A	N/A	N/A	MM/M	
X Sonde Error Correction – 6	0	4.544	N/A	N/A	N/A	N/A	MM/M	
X Sonde Error Correction – 7	0	4.296	N/A	N/A	N/A	N/A	MM/M	
Array Induction Tool – H Wellsite Calibration – Mud Gain Correction								
Master: 31-Oct-2008 11:37								
Coarse – Mag, Real, Imag – 0	0	0.9502	N/A	N/A	N/A	N/A		
Coarse – Mag, Real, Imag – 1	0	0.9530	N/A	N/A	N/A	N/A		
Coarse – Mag, Real, Imag – 2	0	0.9530	N/A	N/A	N/A	N/A		
Fine – Mag, Real, Imag – 0	0	0.9464	N/A	N/A	N/A	N/A		
Fine – Mag, Real, Imag – 1	0	0.9464	N/A	N/A	N/A	N/A		
Fine – Mag, Real, Imag – 2	0	0.9464	N/A	N/A	N/A	N/A		
Powered Positioning Device/Caliper 1 Wellsite Calibration – PPC1 Caliper Calibration								
Before: 11-Jan-2009 12:31								
PPC1 Radius 1 Raw Small Radius	3.500	N/A	4.321	N/A	N/A	0.5000	IN	
PPC1 Radius 1 Raw Large Radius	8.000	N/A	8.498	N/A	N/A	0.5000	IN	
PPC1 Radius 2 Raw Small Radius	3.500	N/A	4.438	N/A	N/A	0.5000	IN	
PPC1 Radius 2 Raw Large Radius	8.000	N/A	8.543	N/A	N/A	0.5000	IN	
PPC1 Radius 3 Raw Small Radius	3.500	N/A	4.415	N/A	N/A	0.5000	IN	
PPC1 Radius 3 Raw Large Radius	8.000	N/A	8.592	N/A	N/A	0.5000	IN	
PPC1 Radius 4 Raw Small Radius	3.500	N/A	4.193	N/A	N/A	0.5000	IN	
PPC1 Radius 4 Raw Large Radius	8.000	N/A	8.404	N/A	N/A	0.5000	IN	
Powered Positioning Device/Caliper 1 Master Calibration – PPC1 LVDT5 Master Calibration								
Master: 11-Jan-2009 12:07								
LVDT5 Full Close Position	–1.510	–1.481	--	--	--	--	IN	
LVDT5 Powered 4 Position	1.410	1.286	--	--	--	--	IN	
LVDT5 Full Open Position	–1.310	–1.073	--	--	--	--	IN	
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Stab Measurement Summary								
Before: 11-Jan-2009 11:47								
BS Window Ratio	0.7498	N/A	0.7487	N/A	N/A	N/A		
BS Window Sum	26990	N/A	27000	N/A	N/A	N/A	CPS	
SS Window Ratio	0.4834	N/A	0.4824	N/A	N/A	N/A		
SS Window Sum	12060	N/A	12040	N/A	N/A	N/A	CPS	
LS Window Ratio	0.2974	N/A	0.3011	N/A	N/A	N/A		
LS Window Sum	1336	N/A	1337	N/A	N/A	N/A	CPS	
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Photo-multiplier High Voltages Calibrations								
Before: 11-Jan-2009 11:47								
BS PM High Voltage (Command)	1241	N/A	1252	N/A	N/A	N/A	V	
SS PM High Voltage (Command)	1309	N/A	1325	N/A	N/A	N/A	V	
LS PM High Voltage (Command)	1344	N/A	1353	N/A	N/A	N/A	V	
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Crystal Quality Resolutions Calibration								
Before: 11-Jan-2009 11:47								
BS Crystal Resolution	10.95	N/A	11.01	N/A	N/A	N/A	%	
SS Crystal Resolution	9.962	N/A	10.06	N/A	N/A	N/A	%	
LS Crystal Resolution	8.684	N/A	8.490	N/A	N/A	N/A	%	
High resolution Integrated Logging Tool–DTS Wellsite Calibration – MCFL Calibration								
Before: 11-Jan-2009 11:57								
Raw B0 Resistivity	3875	N/A	3876	N/A	N/A	N/A	OHMM	
Raw B1 Resistivity	3830	N/A	3822	N/A	N/A	N/A	OHMM	
Raw B2 Resistivity	3830	N/A	3825	N/A	N/A	N/A	OHMM	
High resolution Integrated Logging Tool–DTS Wellsite Calibration – HILT Caliper Calibration								
Before: 11-Jan-2009 11:45								
HILT Caliper Zero Measurement	8.000	N/A	9.001	N/A	N/A	N/A	IN	
HILT Caliper Plus Measurement	12.00	N/A	13.08	N/A	N/A	N/A	IN	
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Detector Calibration								
Before: 11-Jan-2009 11:47								
Gamma Ray Background	30.00	N/A	42.72	N/A	N/A	N/A	GAPI	
Gamma Ray (Jig – Bkg)	161.6	N/A	161.6	N/A	N/A	14.70	GAPI	
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI	

High resolution Integrated Logging Tool–DTS Wellsite Calibration – Zero Measurement								
Master: 7–Jan–2009 12:36 Before: 11–Jan–2009 11:44								
CNTC Background	27.28	27.28	26.38	N/A	N/A	4.092	CPS	
CFTC Background	29.62	29.62	28.03	N/A	N/A	4.443	CPS	
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Ratio Measurement								
Master: 7–Jan–2009 12:36								
Thermal Near Corr. (Tank)	5800	5345	N/A	N/A	N/A	N/A	CPS	
Thermal Far Corr. (Tank)	2400	2263	N/A	N/A	N/A	N/A	CPS	
CNTC/CFTC (Tank)	2.159	2.362	N/A	N/A	N/A	N/A		
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Accelerometer Calibration								
Before: 12–Jan–2009 6:40								
Z–Axis Acceleration	32.19	N/A	32.11	N/A	N/A	N/A	F/S2	
High resolution Integrated Logging Tool–DTS Master Calibration – Inversion results								
Master: 4–Jan–2009 16:08								
Rho Aluminum	2.596	2.600	--	--	--	--	G/C3	
Rho Magnesium	1.686	1.691	--	--	--	--	G/C3	
Pe Aluminum	2.570	2.505	--	--	--	--		
Pe Magnesium	2.650	2.626	--	--	--	--		
High resolution Integrated Logging Tool–DTS Master Calibration – Deviation Summary								
Master: 4–Jan–2009 16:08								
BS Average Deviation	0	0.3268	--	--	--	--	%	
BS Max Deviation	0	0.6793	--	--	--	--	%	
SS Average Deviation	0	0.3033	--	--	--	--	%	
SS Max Deviation	0	0.8463	--	--	--	--	%	
LS Average Deviation	0	0.6730	--	--	--	--	%	
LS Max Deviation	0	3.215	--	--	--	--	%	

The GLS–VJ source activity is acceptable.

The HGNS Neutron Master Calibration was done with the following parameters :

NCT–B Water Temperature 60.1 DEGF.
 Thermal Housing Size 3.381 IN.
 NSR–F serial number 1260

Array Induction Tool – H / Equipment Identification

Primary Equipment:
 Rm/SP Bottom Nose
 Array Induction Sonde

AHRM – A
 AHIS – BA

166

Auxiliary Equipment:











Array Induction Tool – H Wellsite Calibration							
Electronics Calibration Check – Thru Cal Mag. & Phase							
Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6226		0.6050	69.35		71.00
	Before	0.6223			69.32		
1	Master	1.278		1.270	68.22		70.00
	Before	1.278			68.19		
2	Master	0.6337		0.6230	64.37		66.00
	Before	0.6335			64.33		
3	Master	0.7169		0.7040	63.56		65.00
	Before	0.7166			63.52		
4	Master	1.339		1.337	57.14		59.00
	Before	1.338			57.10		
5	Master	1.955		1.955	55.19		57.00
	Before	1.954			55.14		







6	Before	1.934		1.955	55.22		57.00
	Master	1.950			55.18		
7	Before	1.949		1.415	51.41		53.00
	Master	1.410			51.35		
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom -60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)
Master: 31-Oct-2008 11:37				Before: 11-Jan-2009 11:43			

















Array Induction Tool – H Wellsite Calibration							
Electronics Calibration Check – Auxilliary							
Phase	Array Induction SPA Plus MV		Value	Phase	Array Induction SPA Zero MV		Value
Master			991.0	Master			-0.1851
Before			991.1	Before			-0.2142
941.0 (Minimum)			990.5 (Nominal)	1040 (Maximum)			
-50.00 (Minimum)			0 (Nominal)	50.00 (Maximum)			
Phase	Array Induction Temperature Plus V		Value	Phase	Array Induction Temperature Zero V		Value
Master			0.9180	Master			-0.0001863
Before			0.9180	Before			-0.0001906
0.8700 (Minimum)			0.9150 (Nominal)	0.9600 (Maximum)			
-0.05000 (Minimum)			0 (Nominal)	0.05000 (Maximum)			
Master: 31-Oct-2008 11:37				Before: 11-Jan-2009 11:43			





Array Induction Tool – H Wellsite Calibration						
Test Loop Gain Correction						
Idx	Value	Test Loop Gain Magnitude V			Value	Phase DEG
0	1.022				0.3997	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
1	1.022				0.5084	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
2	1.025				-0.01268	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
3	1.022				0.05847	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
4	1.006				0.01637	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
5	0.9998				-0.1534	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
6	1.010				0.2088	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
7	1.027				-0.08153	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
Master: 31-Oct-2008 11:37						



Array Induction Tool – H Wellsite Calibration							
Sonde Error Correction							
Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M	
0	-86.80	<div><div></div></div>			711.5	<div><div></div></div>	
		-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)		-2250 (Minimum)	0 (Nominal) 2250 (Maximum)
1	160.0	<div><div></div></div>			-232.4	<div><div></div></div>	
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		-625.0 (Minimum)	0 (Nominal) 625.0 (Maximum)
2	109.7	<div><div></div></div>			60.69	<div><div></div></div>	
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		-350.0 (Minimum)	0 (Nominal) 350.0 (Maximum)

	(Minimum)	(Nominal)	(Maximum)		(Minimum)	(Nominal)	(Maximum)
3	63.72			-102.2			
	39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)	-250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)	
4	24.17			-10.27			
	15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)	-63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)	
5	13.40			-12.55			
	4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)	-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)	
6	10.13			4.544			
	5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)	-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)	
7	-0.3709			4.296			
	-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)	-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)	
Master: 31-Oct-2008 11:37							

Array Induction Tool – H Wellsite Calibration								
Mud Gain Correction								
Idx	Value	Coarse – Mag, Real, Imag			Value	Fine – Mag, Real, Imag		
0	0.9502				0.9464			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	0.9530				0.9464			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	0.9530				0.9464			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
Master: 31-Oct-2008 11:37								

Array Induction Tool – H Master Calibration							
Electronics Calibration Check – Thru Cal Mag. & Phase							
Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6226		0.6050	69.35		71.00
1	Master	1.278		1.270	68.22		70.00
2	Master	0.6337		0.6230	64.37		66.00
3	Master	0.7169		0.7040	63.56		65.00
4	Master	1.339		1.337	57.14		59.00
5	Master	1.955		1.955	55.19		57.00
6	Master	1.950		1.955	55.22		57.00
7	Master	1.410		1.415	51.41		53.00
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom -60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)
Master: 31-Oct-2008 11:37							

Array Induction Tool – H Master Calibration									
Electronics Calibration Check – Auxilliary									
Phase	Array Induction SPA Plus MV			Value	Phase	Array Induction SPA Zero MV			Value
Master				991.0	Master				-0.1851
	941.0 (Minimum)	990.5 (Nominal)	1040 (Maximum)			-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)	
Phase	Array Induction Temperature Plus V			Value	Phase	Array Induction Temperature Zero V			Value
Master				0.9180	Master				-0.0001863
	0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)			-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)	
Master: 31-Oct-2008 11:37									

Array Induction Tool – H Master Calibration				
Test Loop Gain Correction				
Idx	Value	Test Loop Gain Magnitude V	Value	Phase DEG
				

0	1.022	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	0.3997	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.022				0.5084			
2	1.025	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-0.01268	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.022	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	0.05847	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
4	1.006	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	0.01637	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	0.9998	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-0.1534	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	1.010	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	0.2088	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.027	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-0.08153	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

Master: 31-Oct-2008 11:37

Array Induction Tool – H Master Calibration								
Sonde Error Correction								
Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M		
0	-86.80				711.5			
		-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)		-2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	160.0				-232.4			
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		-625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	109.7				60.69			
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		-350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	63.72				-102.2			
		39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)		-250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	24.17				-10.27			
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		-63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	13.40				-12.55			
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	10.13				4.544			
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	-0.3709				4.296			
		-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

Master: 31-Oct-2008 11:37

Array Induction Tool – H Master Calibration								
Mud Gain Correction								
Idx	Value	Coarse – Mag, Real, Imag			Value	Fine – Mag, Real, Imag		
0	0.9502				0.9464			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	0.9530				0.9464			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	0.9530				0.9464			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)

Powered Positioning Device/Caliper 1 / Equipment Identification









Primary Equipment:

PPC Powered Positioning Device/Caliper
PPC1 Caliper Standard


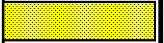

PPC1 – B
PPC_ –

8007

Auxiliary Equipment:

Powered Positioning Device/Caliper 1 Wellsite Calibration											
PPC1 Caliper Calibration											
Phase	PPC1 Radius 1 Raw Small Radius IN			Value	Phase	PPC1 Radius 1 Raw Large Radius IN			Value		
Before				4.321	Before				8.498		
	1.600 (Minimum)	3.500 (Nominal)	5.200 (Maximum)			5.700 (Minimum)	8.000 (Nominal)	10.10 (Maximum)			
Phase	PPC1 Radius 2 Raw Small Radius IN			Value	Phase	PPC1 Radius 2 Raw Large Radius IN			Value		
Before				4.438	Before				8.543		
	1.600 (Minimum)	3.500 (Nominal)	5.200 (Maximum)			5.700 (Minimum)	8.000 (Nominal)	10.10 (Maximum)			
Phase	PPC1 Radius 3 Raw Small Radius IN			Value	Phase	PPC1 Radius 3 Raw Large Radius IN			Value		
Before				4.415	Before				8.592		
	1.600 (Minimum)	3.500 (Nominal)	5.200 (Maximum)			5.700 (Minimum)	8.000 (Nominal)	10.10 (Maximum)			
Phase	PPC1 Radius 4 Raw Small Radius IN			Value	Phase	PPC1 Radius 4 Raw Large Radius IN			Value		
Before				4.193	Before				8.404		
	1.600 (Minimum)	3.500 (Nominal)	5.200 (Maximum)			5.700 (Minimum)	8.000 (Nominal)	10.10 (Maximum)			

Before: 11-Jan-2009 12:31

Powered Positioning Device/Caliper 1 Master Calibration									
PPC1 LVDT5 Master Calibration									
Phase	LVDT5 Full Close Position IN			Value	Phase	LVDT5 Full Open Position IN			Value
Master				-1.481	Master				-1.073
	-1.710 (Minimum)	-1.510 (Nominal)	-1.310 (Maximum)			-1.550 (Minimum)	-1.310 (Nominal)	-1.070 (Maximum)	
Phase	LVDT5 Powered 4 Position IN			Value					
Master				1.286					
	1.200 (Minimum)	1.410 (Nominal)	1.610 (Maximum)						

Master: 11-Jan-2009 12:07

High resolution Integrated Logging Tool-DTS / Equipment Identification

Primary Equipment:







HILT high-Resolution Mechanical Sonde
HILT Rxo Gamma-ray Device
HILT Micro Cylindrically Focused Log Dev
GR Logging Source
HILT High Res. Control Cartridge
HILT Gamma-Ray Neutron Sonde-DTS
HGNS Gamma-Ray Device
HGNS Neutron Detector with Alpha Source

HRMS – H 3867
HRGD – H 3912
MCFL – H
GLS – VJ 5234
HRCC – H 3889
HGNS – H 3920
HGR –
HCNT – H




Auxiliary Equipment:




Neutron Calibration Tank
Gamma Source Radioactive
HGNS Housing




NCT – B
GSR – U/Y
HGNH – 2986



High resolution Integrated Logging Tool–DTS Wellsite Calibration																	
Stab Measurement Summary																	
Phase	BS Window Ratio			Value	Phase	SS Window Ratio			Value	Phase	LS Window Ratio			Value			
Before				0.7487	Before				0.4824	Before				0.3011			
0.7123 (Minimum)				0.7498 (Nominal)	0.7873 (Maximum)	0.4592 (Minimum)				0.4834 (Nominal)	0.5076 (Maximum)	0.2826 (Minimum)				0.2974 (Nominal)	0.3123 (Maximum)
Phase	BS Window Sum CPS			Value	Phase	SS Window Sum CPS			Value	Phase	LS Window Sum CPS			Value			
Before				27000	Before				12040	Before				1337			
25640				26990	28340	11450				12060	12660	1269				1336	1403




(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)
Before: 11-Jan-2009 11:47								





High resolution Integrated Logging Tool–DTS Wellsite Calibration														
Photo-multiplier High Voltages Calibrations														
Phase	BS PM High Voltage (Command) V			Value	Phase	SS PM High Voltage (Command) V			Value	Phase	LS PM High Voltage (Command) V			Value
Before				1252	Before				1325	Before				1353
	1141 (Minimum)	1241 (Nominal)	1341 (Maximum)		1209 (Minimum)	1309 (Nominal)	1409 (Maximum)			1244 (Minimum)	1344 (Nominal)	1444 (Maximum)		
Before: 11–Jan–2009 11:47														




High resolution Integrated Logging Tool–DTS Wellsite Calibration											
Crystal Quality Resolutions Calibration											
Phase	BS Crystal Resolution %		Value	Phase	SS Crystal Resolution %		Value	Phase	LS Crystal Resolution %		Value
Before			11.01	Before			10.06	Before			8.490
	9.953 (Minimum)	10.95 (Nominal)	11.95 (Maximum)		8.962 (Minimum)	9.962 (Nominal)	10.96 (Maximum)		7.684 (Minimum)	8.684 (Nominal)	9.684 (Maximum)
Before: 11–Jan–2009 11:47											


High resolution Integrated Logging Tool–DTS Wellsite Calibration														
MCFL Calibration														
Phase	Raw B0 Resistivity OHMM			Value	Phase	Raw B1 Resistivity OHMM			Value	Phase	Raw B2 Resistivity OHMM			Value
Before				3876	Before				3822	Before				3825
	3565 (Minimum)	3875 (Nominal)	4185 (Maximum)		3524 (Minimum)	3830 (Nominal)	4136 (Maximum)			3524 (Minimum)	3830 (Nominal)	4136 (Maximum)		
Before: 11–Jan–2009 11:57														

High resolution Integrated Logging Tool-DTS Wellsite Calibration							
HILT Caliper Calibration							
Phase	HILT Caliper Zero Measurement IN		Value	Phase	HILT Caliper Plus Measurement IN		Value
Before			9.001	Before			13.08
	6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)		9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)
Before: 11-Jan-2009 11:45							





High resolution Integrated Logging Tool-DTS Wellsite Calibration											
Detector Calibration											
Phase	Gamma Ray Background GAPI		Value	Phase	Gamma Ray (Jig – Bkg) GAPI		Value	Phase	Gamma Ray (Calibrated) GAPI		Value
Before			42.72	Before			161.6	Before			165.0
	0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)		147.0 (Minimum)	161.6 (Nominal)	176.3 (Maximum)		150.0 (Minimum)	165.0 (Nominal)	180.0 (Maximum)
Before: 11-Jan-2009 11:47											

High resolution Integrated Logging Tool–DTS Wellsite Calibration										
Zero Measurement										
Phase	CNTC Background CPS			Value	Phase	CFTC Background CPS			Value	
Master				27.28	Master				29.62	
Before				26.38	Before				28.03	
5.000 (Minimum)				27.28 (Nominal)	5.000 (Minimum)				29.62 (Nominal)	40.00 (Maximum)
Master: 7-Jan-2009 12:36					Before: 11-Jan-2009 11:44					



High resolution Integrated Logging Tool–DTS Wellsite Calibration														
Ratio Measurement														
Phase	Thermal Near Corr. (Tank) CPS			Value	Phase	Thermal Far Corr. (Tank) CPS			Value	Phase	CNTC/CFTC (Tank)			Value
Master				5345	Master				2263	Master				2.362
	4700 (Minimum)	5800 (Nominal)	6900 (Maximum)		1900 (Minimum)	2400 (Nominal)	2900 (Maximum)			2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)		
Master: 7–Jan–2009 12:36														

High resolution Integrated Logging Tool-DTS Wellsite Calibration		
Accelerometer Calibration		
Phase	Z-Axis Acceleration F/S2	Value
Before		32.11

31.53 (Minimum)	32.19 (Nominal)	32.84 (Maximum)
Before: 12-Jan-2009 6:40		

High resolution Integrated Logging Tool-DTS Master Calibration							
Inversion results							
Phase	Rho Aluminum G/C3		Value	Phase	Rho Magnesium G/C3		Value
Master			2.600	Master			1.691
	2.586 (Minimum)	2.596 (Nominal)	2.606 (Maximum)		1.676 (Minimum)	1.686 (Nominal)	1.696 (Maximum)
Phase	Pe Aluminum		Value	Phase	Pe Magnesium		Value
Master			2.505	Master			2.626
	2.470 (Minimum)	2.570 (Nominal)	2.670 (Maximum)		2.550 (Minimum)	2.650 (Nominal)	2.750 (Maximum)
Master: 4-Jan-2009 16:08							

High resolution Integrated Logging Tool-DTS Master Calibration														
Deviation Summary														
Phase	BS Average Deviation %			Value	Phase	SS Average Deviation %			Value	Phase	LS Average Deviation %			Value
Master	<div><div></div></div>			0.3268	Master	<div><div></div></div>			0.3033	Master	<div><div></div></div>			0.6730
	-0.6000 (Minimum)	0 (Nominal)	0.6000 (Maximum)		-1.000 (Minimum)	0 (Nominal)	1.000 (Maximum)			-1.500 (Minimum)	0 (Nominal)	1.500 (Maximum)		
Phase	BS Max Deviation %			Value	Phase	SS Max Deviation %			Value	Phase	LS Max Deviation %			Value
Master	<div><div></div></div>			0.6793	Master	<div><div></div></div>			0.8463	Master	<div><div></div></div>			3.215
	-1.600 (Minimum)	0 (Nominal)	1.600 (Maximum)		-2.500 (Minimum)	0 (Nominal)	2.500 (Maximum)			-3.500 (Minimum)	0 (Nominal)	3.500 (Maximum)		
Master: 4-Jan-2009 16:08														

High resolution Integrated Logging Tool-DTS Master Calibration									
Zero Measurement									
Phase	CNTC Background CPS			Value	Phase	CFTC Background CPS			Value
Master				27.28	Master				29.62
	5.000 (Minimum)	27.28 (Nominal)	40.00 (Maximum)			5.000 (Minimum)	29.62 (Nominal)	40.00 (Maximum)	
Master: 7-Jan-2009 12:36									

High resolution Integrated Logging Tool-DTS Master Calibration											
Tank Measurement											
Phase	Thermal Near Corr. (Tank) CPS		Value	Phase	Thermal Far Corr. (Tank) CPS		Value	Phase	CNTC/CFTC (Tank)		Value
Master	<div><div></div></div>		5345	Master	<div><div></div></div>		2263	Master	<div><div></div></div>		2.362
	4700 (Minimum)	5800 (Nominal)	6900 (Maximum)		1900 (Minimum)	2400 (Nominal)	2900 (Maximum)		2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)
Master: 7-Jan-2009 12:36											

DTS Telemetry Tool / Equipment Identification		
Primary Equipment:		
DTC—H Auxiliary Cartridge	DTCH – A	
DTC—H Telemetry Cartridge	DTCH – A	
Auxiliary Equipment:		
DTCH Telemetry Cartridge Housing	ECH – KC	10316

Well: **HIAWATHA DEEP 4-36**
Field: **SUGAR LOAF**
County: **MOFFAT**
State: **COLORADO**

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