

Schlumberger

Company: **Orr Energy LLC**

Well: **Spencer 21-14**

Field: **Wattenberg**

County: **Weld**

State: **Colorado**

Well: **Spencer 21-14**
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County: **Weld** State: **Colorado**

1

[illegible]

Logging Date					
Run Number					
Depth Driller					
Schlumberger Depth					
Bottom Log Interval					
Top Log Interval					
Casing Driller Size @ Depth		@			
Casing Schlumberger					
Bit Size					
Type Fluid In Hole					
Density		Viscosity			
Fluid Loss		PH			
Source Of Sample					
RM @ Measured Temperature		@			
RMF @ Measured Temperature		@			
RMC @ Measured Temperature		@			
Source RMF	RMF				
RM @ MRT		@		@	
Maximum Recorded Temperatures					
Circulation Stopped		Time			
Logger On Bottom		Time			
Unit Number		Location			
Recorded By					
Witnessed By					

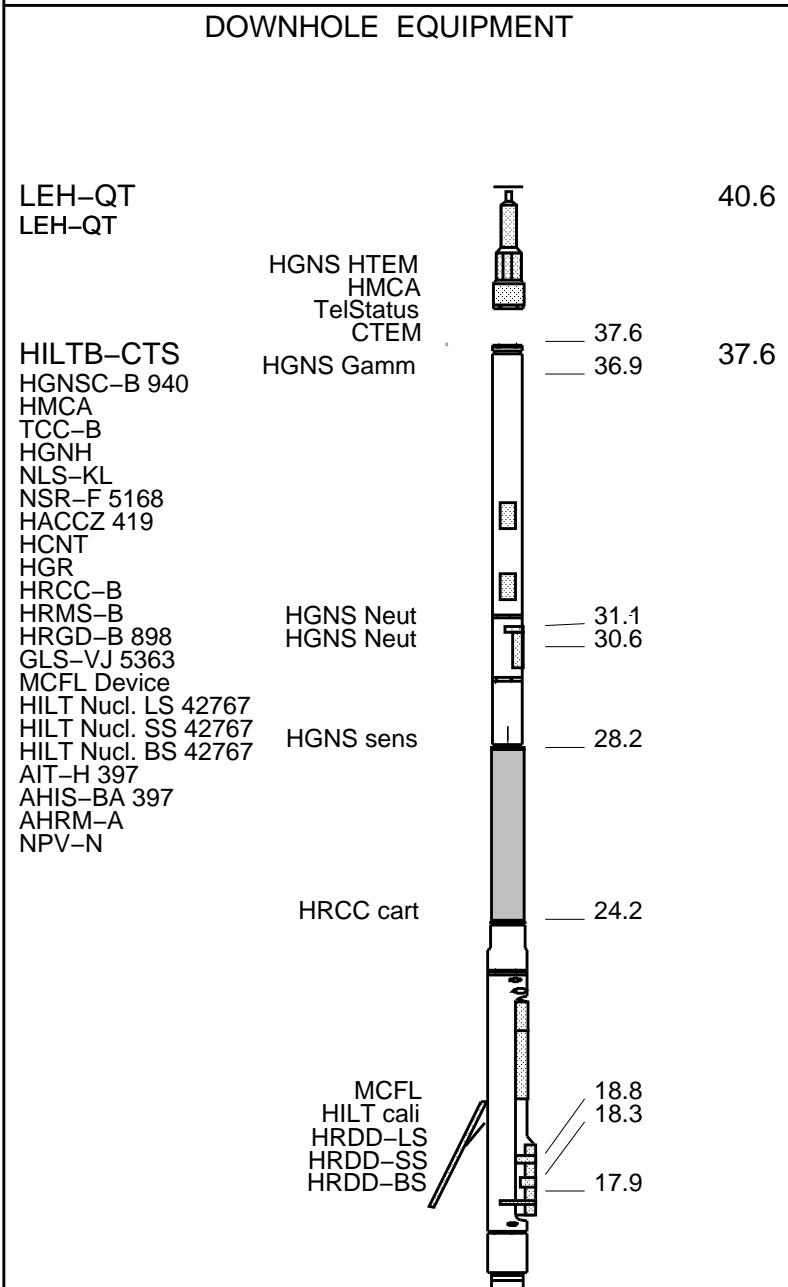
Rig: MidCon #1	
Crew: Roger Wiley	

RUN 1			RUN 2		
SERVICE ORDER #:		B03C-00065	SERVICE ORDER #:		
PROGRAM VERSION:		17C0-154	PROGRAM VERSION:		
FLUID LEVEL:		10 ft	FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION					
RUN 1			RUN 2		

SURFACE EQUIPMENT

WITM (CTS)-A NCS-VB
GSR-U/Y
NCT-B
CNB-AB



Induction
Temperatu
Power Sup

7.9

SP SENSOR
HTEN HMAS
Accelerom HV
Mud Resis
Tension

0.1

0.0

TOOL ZERO

MAXIMUM STRING DIAMETER 4.63 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Production String

(in) (ft)
OD ID MD

Well Schematic

(ft) (in)
MD OD ID

Casing String

Casing String

Casing Shoe
Borehole Segment

--	--	--	--	--	--	--	--	--	--

All depths are driller's depths

Schlumberger

COMBO LOG 5" = 100'

MAXIS Field Log

Output DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_007LUP FN:5 PRODUCER 08-Nov-2009 14:06 7440.0 FT 539.0 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 2763.37 F3
Cement Volume = 2011.72 F3 (assuming 4.50 IN casing O.D.)
Computed from 7417.0 FT to 612.0 FT using data channel(s) HCAL

OP System Version: 17C0-154

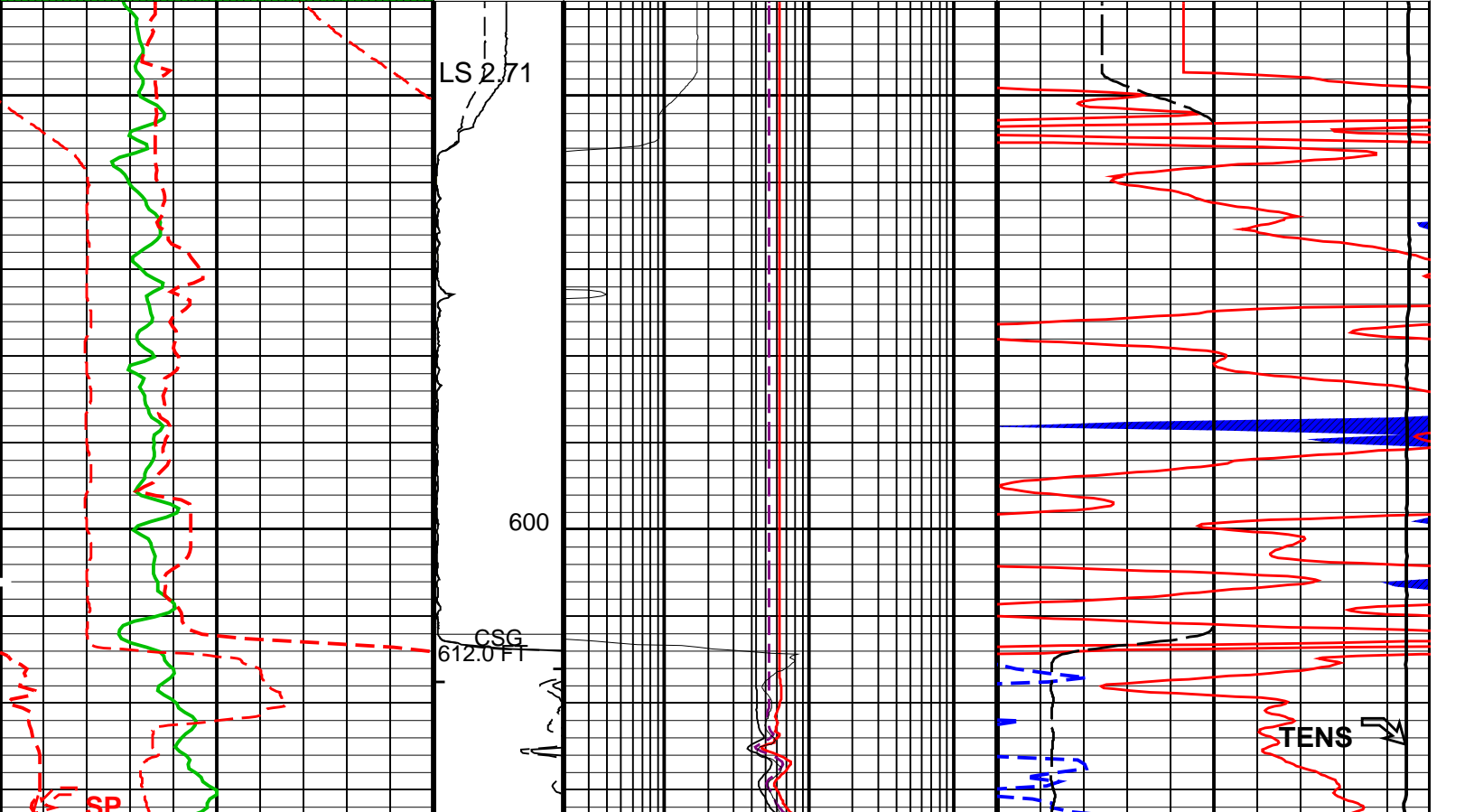
HILTB-CTS 17C0-154

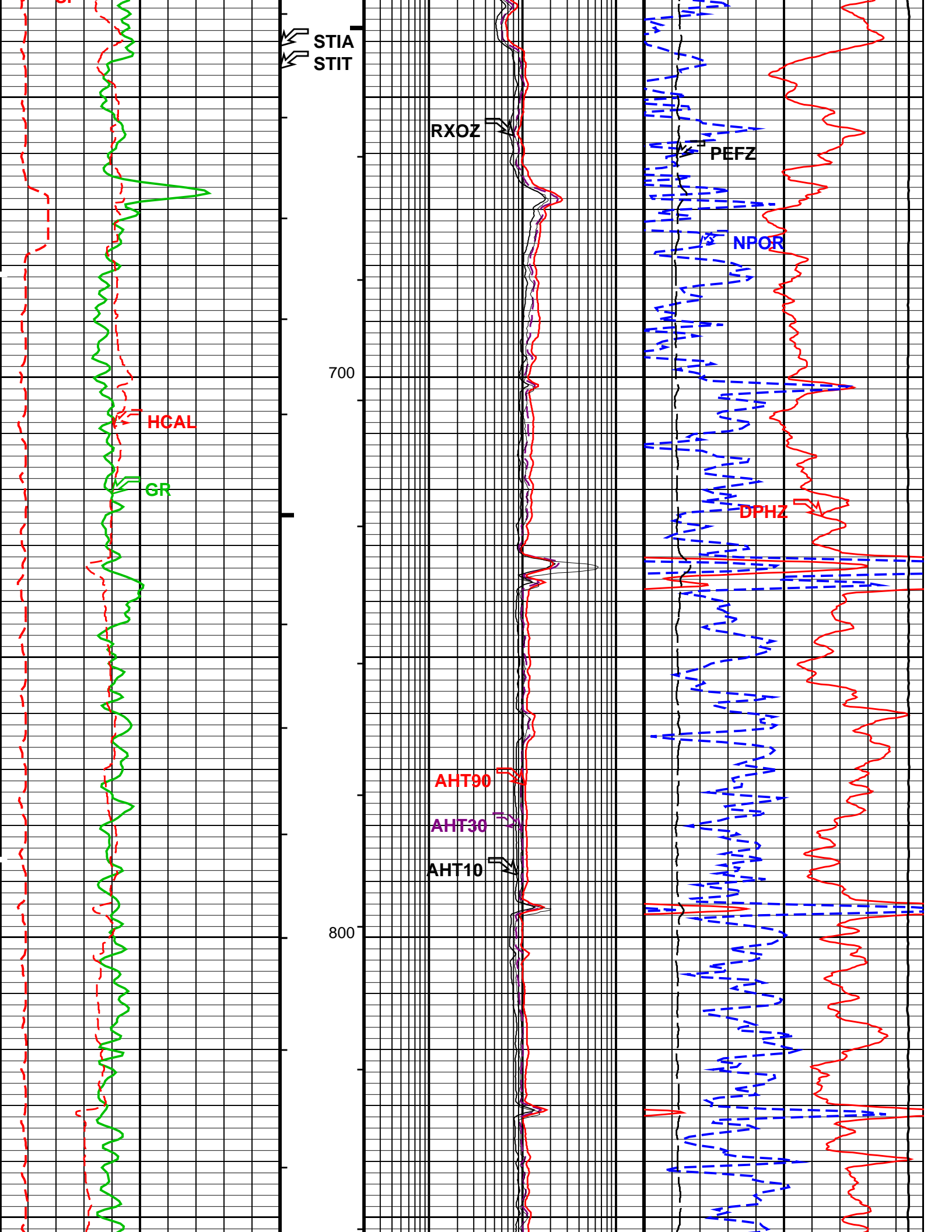
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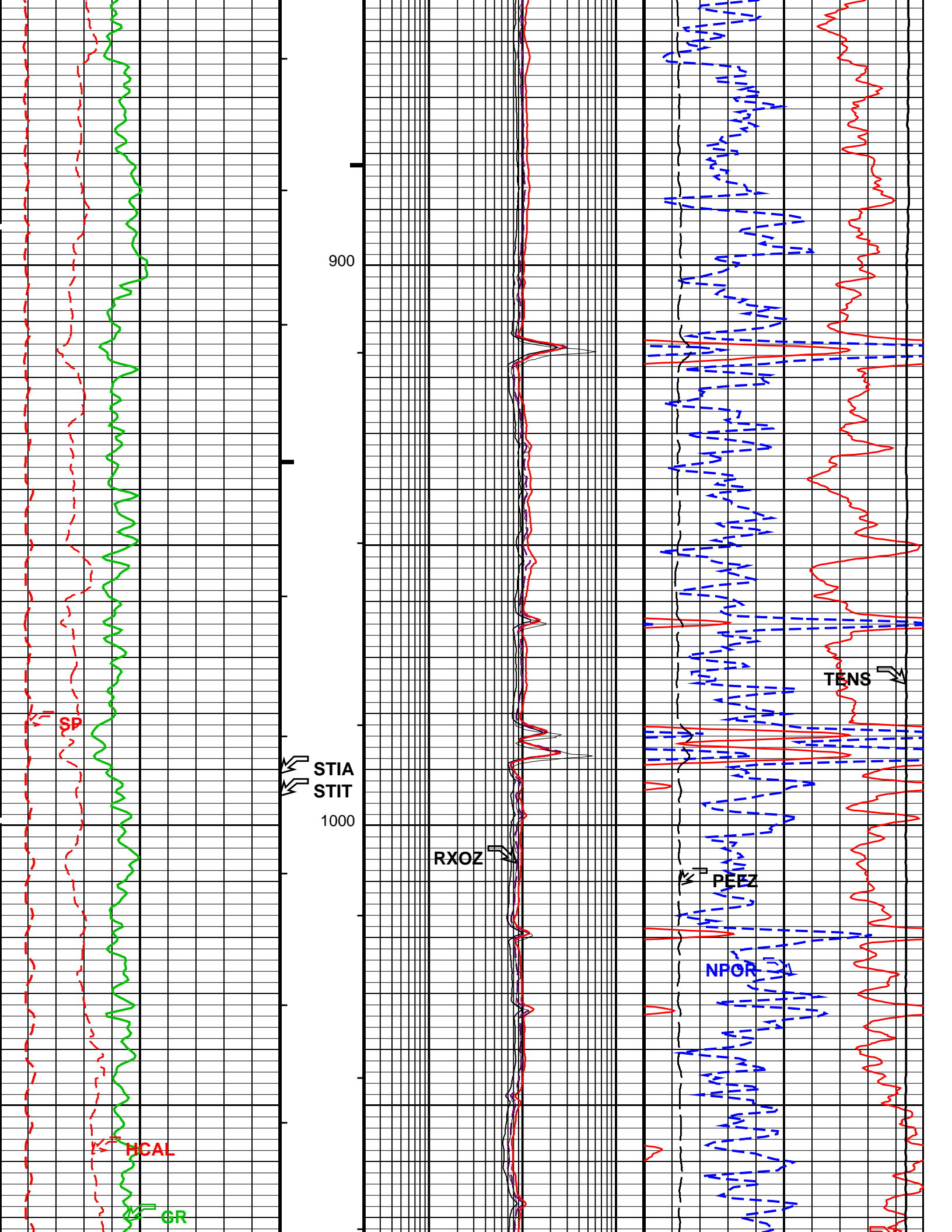
DLIS Name	New Value		Previous Value		Depth & Time
MATR	SANDSTONE		LIMESTONE		7440.0 14:06:42
MDEN	LIMESTONE		SANDSTONE		7246.0 14:09:38
	2.68	G/C3	2.71	G/C3	7440.0 14:06:42
	2.71	G/C3	2.68	G/C3	7246.0 14:09:38
TD	7420	FT	7417	FT	7095.1 14:11:50
TDL	7420.00	FT	7417.00	FT	7095.0 14:11:50

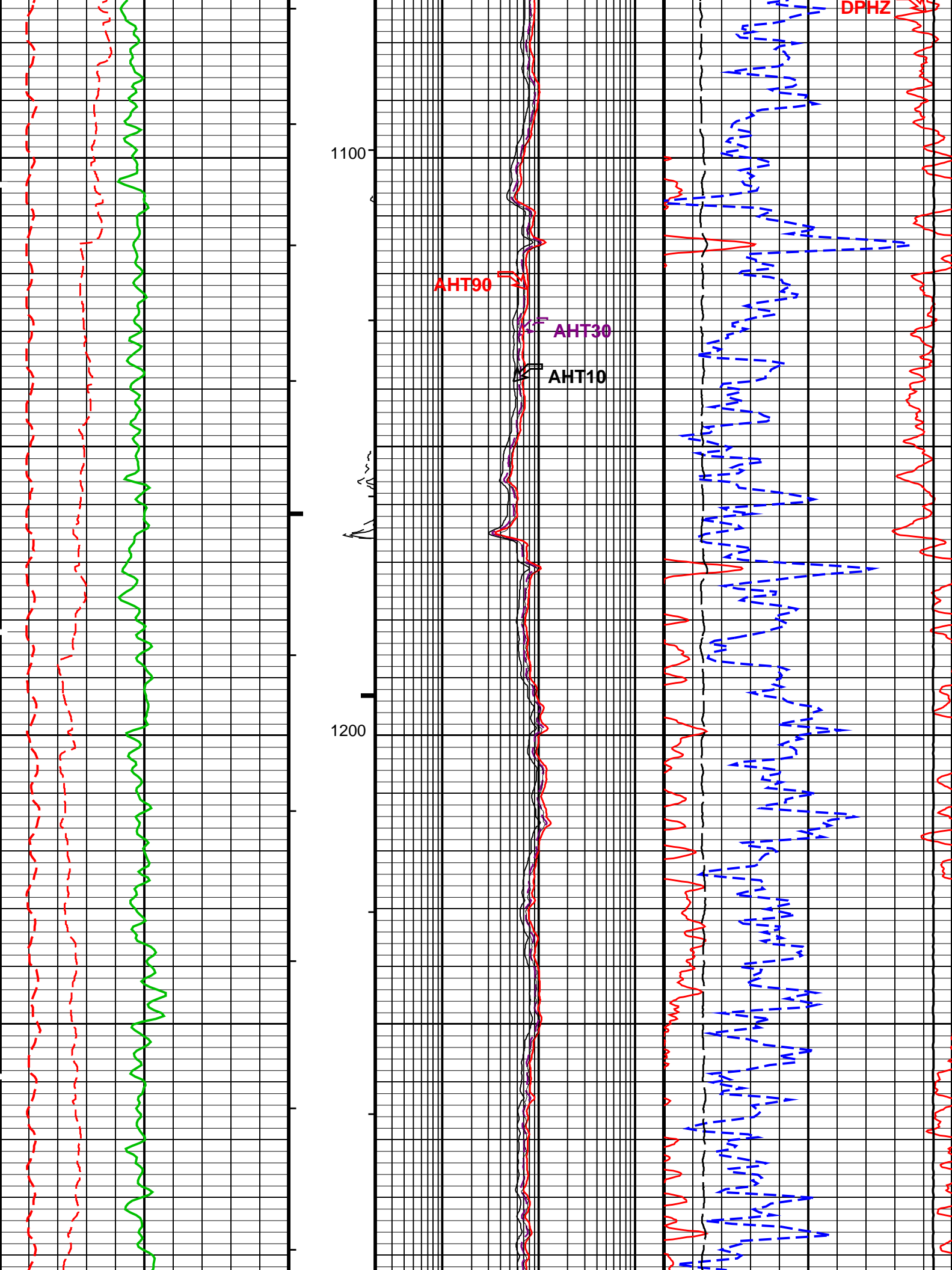
PIP SUMMARY					
<div> <div></div> Integrated Hole Volume Minor Pip Every 10 F3 </div> <div> <div></div> Integrated Hole Volume Major Pip Every 100 F3 </div> <div> <div></div> Integrated Cement Volume Minor Pip Every 10 F3 </div> <div> <div></div> Integrated Cement Volume Major Pip Every 100 F3 </div>					
<div> <div></div> Time Mark Every 60 S </div>					

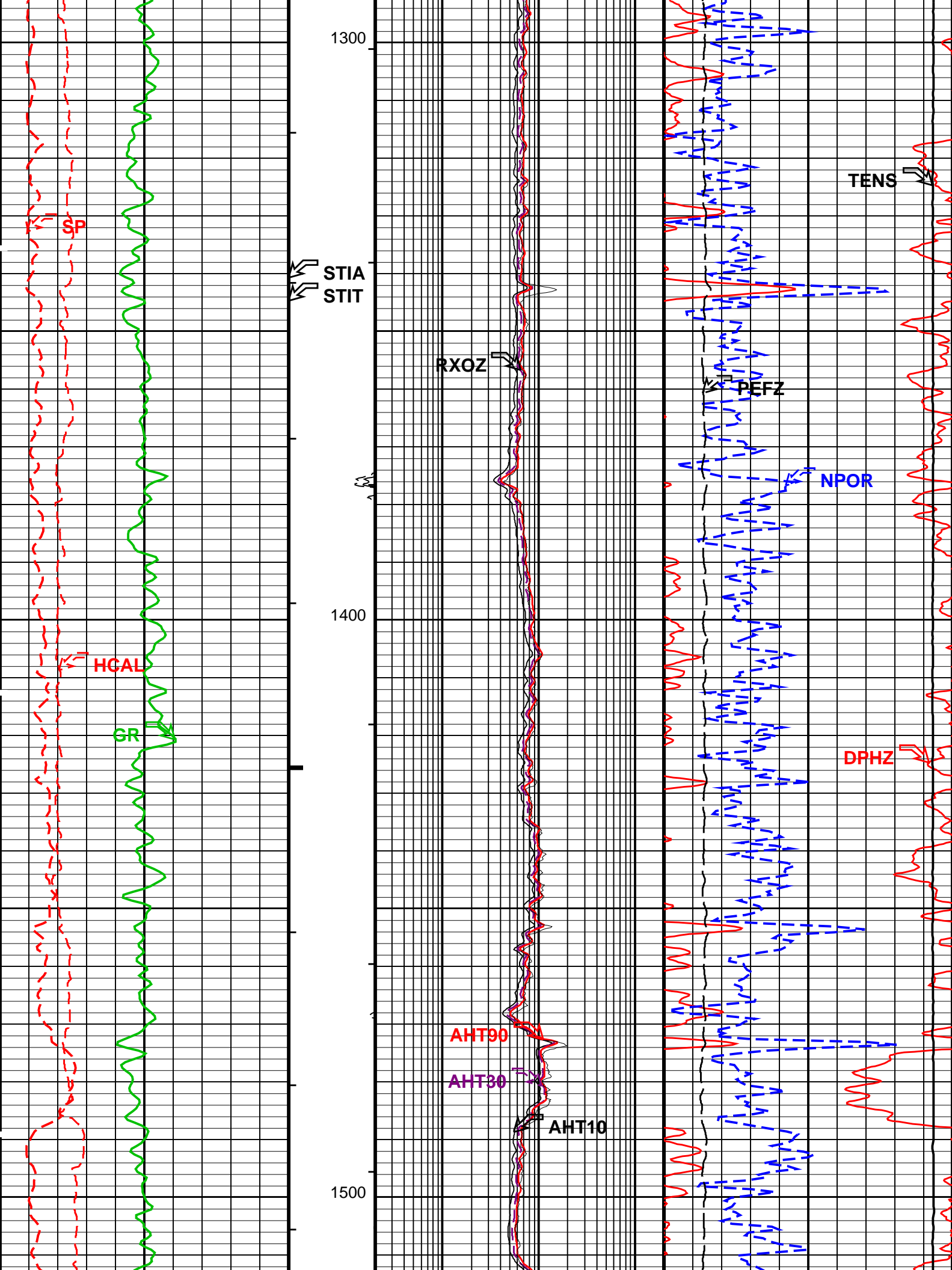
				NPOR BACKUP	
				Gas Effect	
<div>SP (SP)</div> <div>(MV)</div> <div>160</div> <div>40</div>	PERM	Std. Res. Invaded Zone Resistivity (RXOZ)	Tension (TENS)		
		(OHMM)	200	10000	(LBF)
<div>Gamma Ray (GR)</div> <div>(GAPI)</div> <div>0</div> <div>200</div>	Computed Micro Normal (HMNO) (OHMM)	AIT-H 90 Inch Investigation (AHT90) (OHMM)	Std. Res. Formation Pe (PEFZ)		
			0.2	200	
<div>HILT Caliper (HCAL)</div> <div>(IN)</div> <div>6</div> <div>16</div>	Computed Micro Inverse (HMIN) (OHMM)	AIT-H 30 Inch Investigation (AHT30) (OHMM)	Alpha Processed Neutron Porosity (NPOR)		
			0.2	200	0.2
GR BACKUP	Stuck Stretch (STIT)	AIT-H 10 Inch Investigation (AHT10) (OHMM)	Std. Res. Density Porosity (DPHZ)		
			0.2	200	0.2

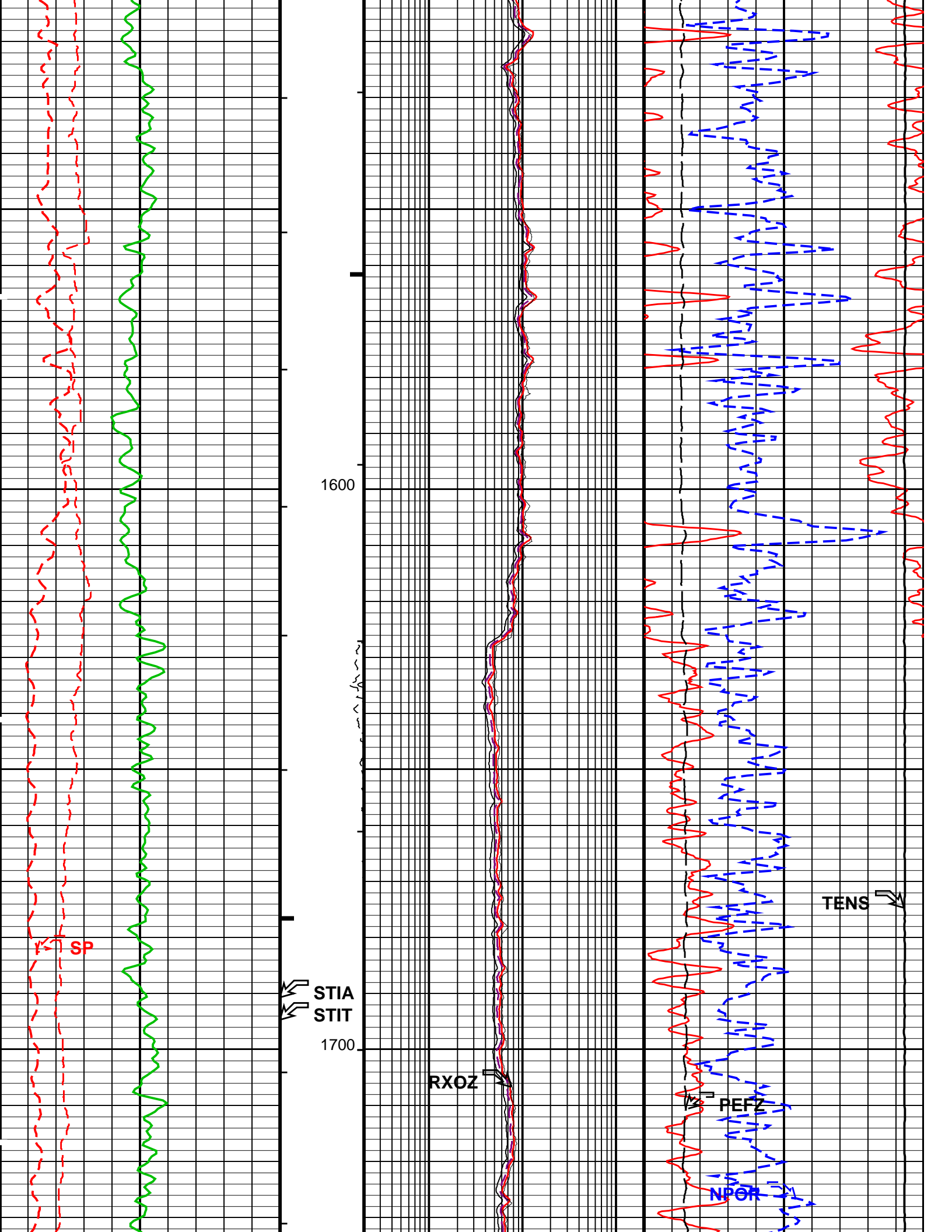


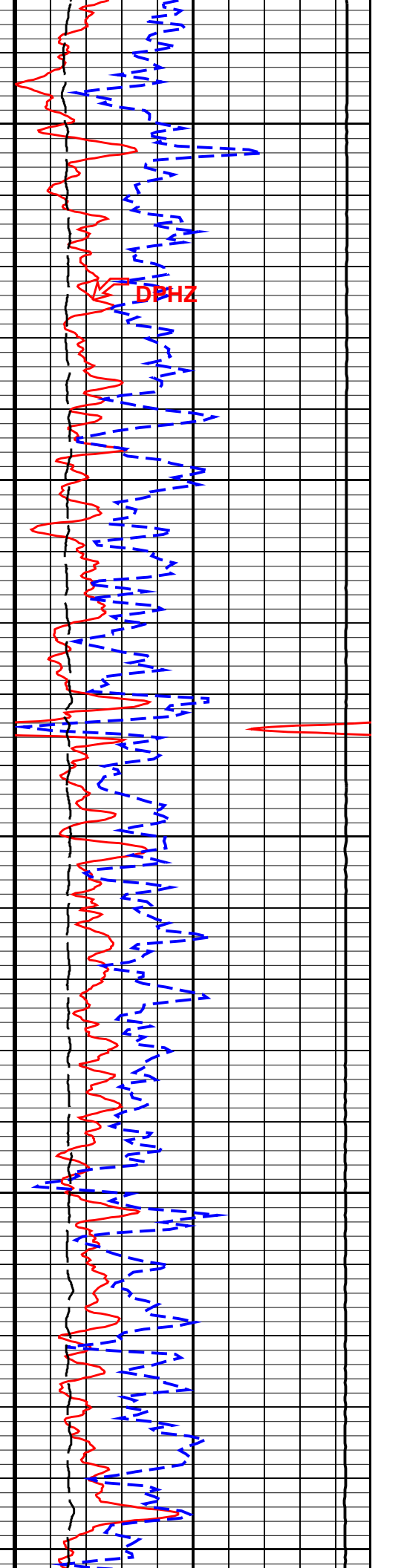
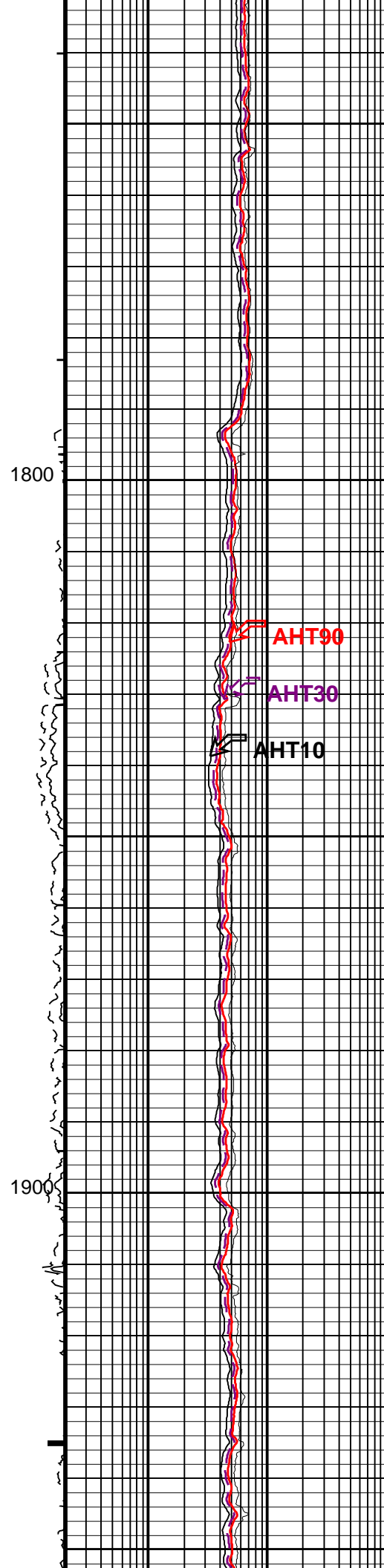
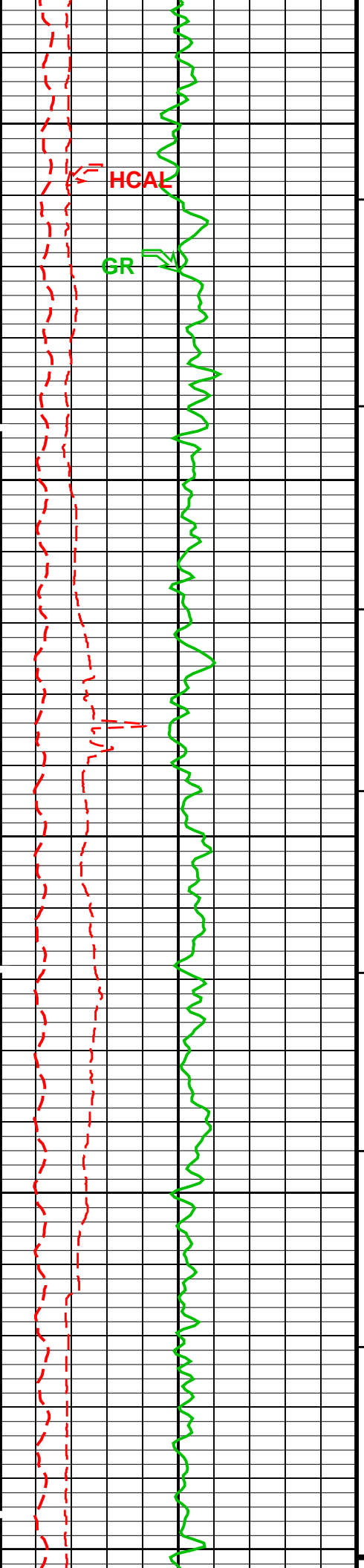


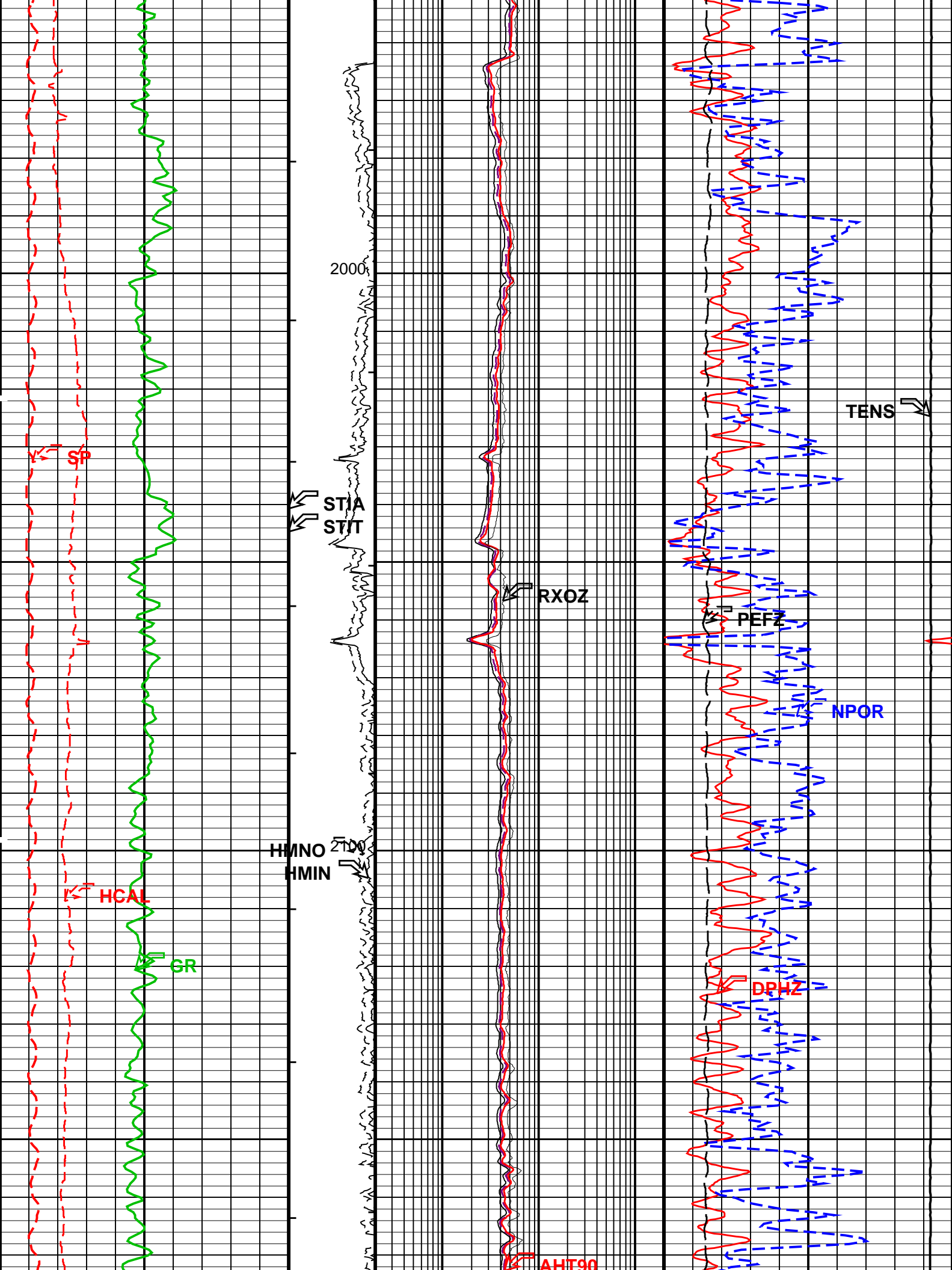


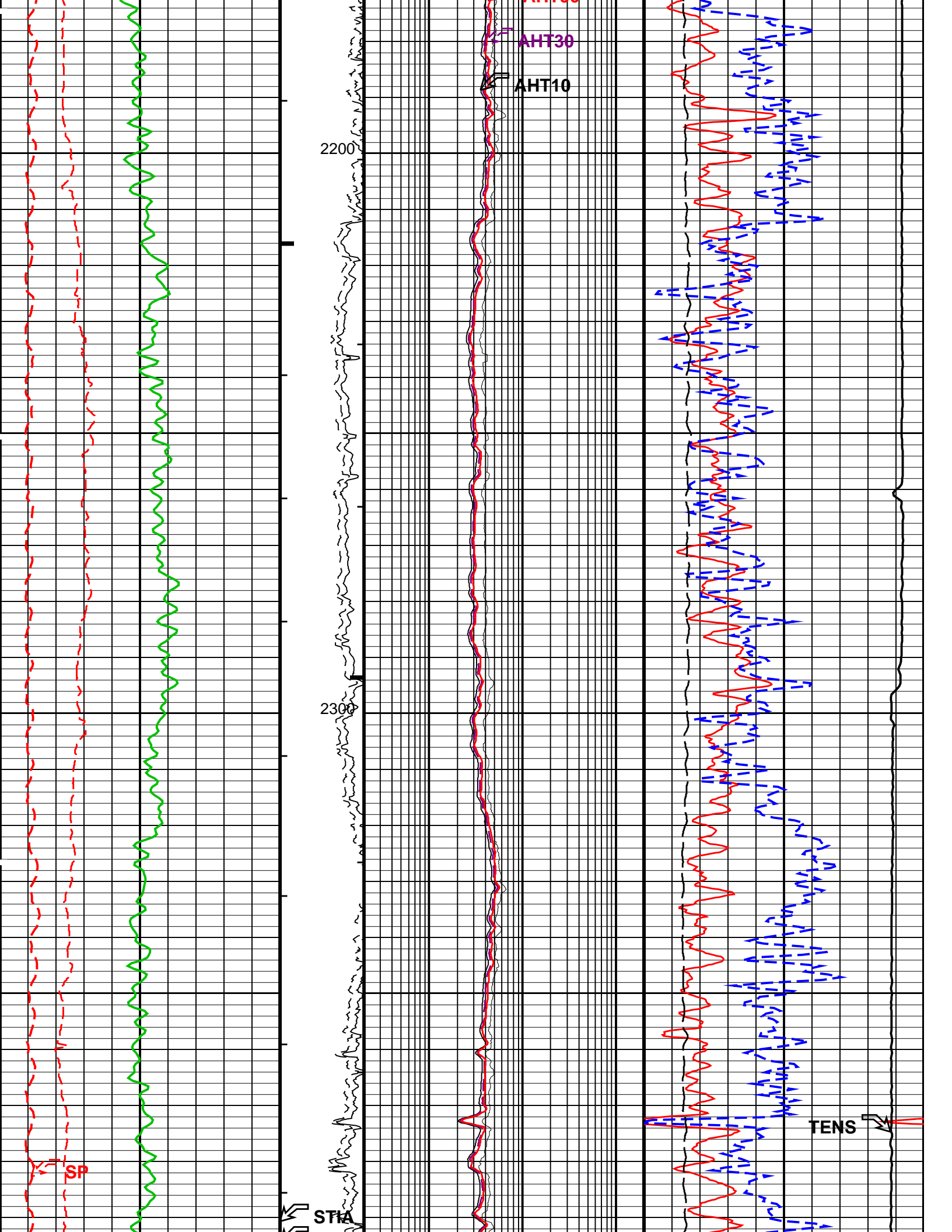


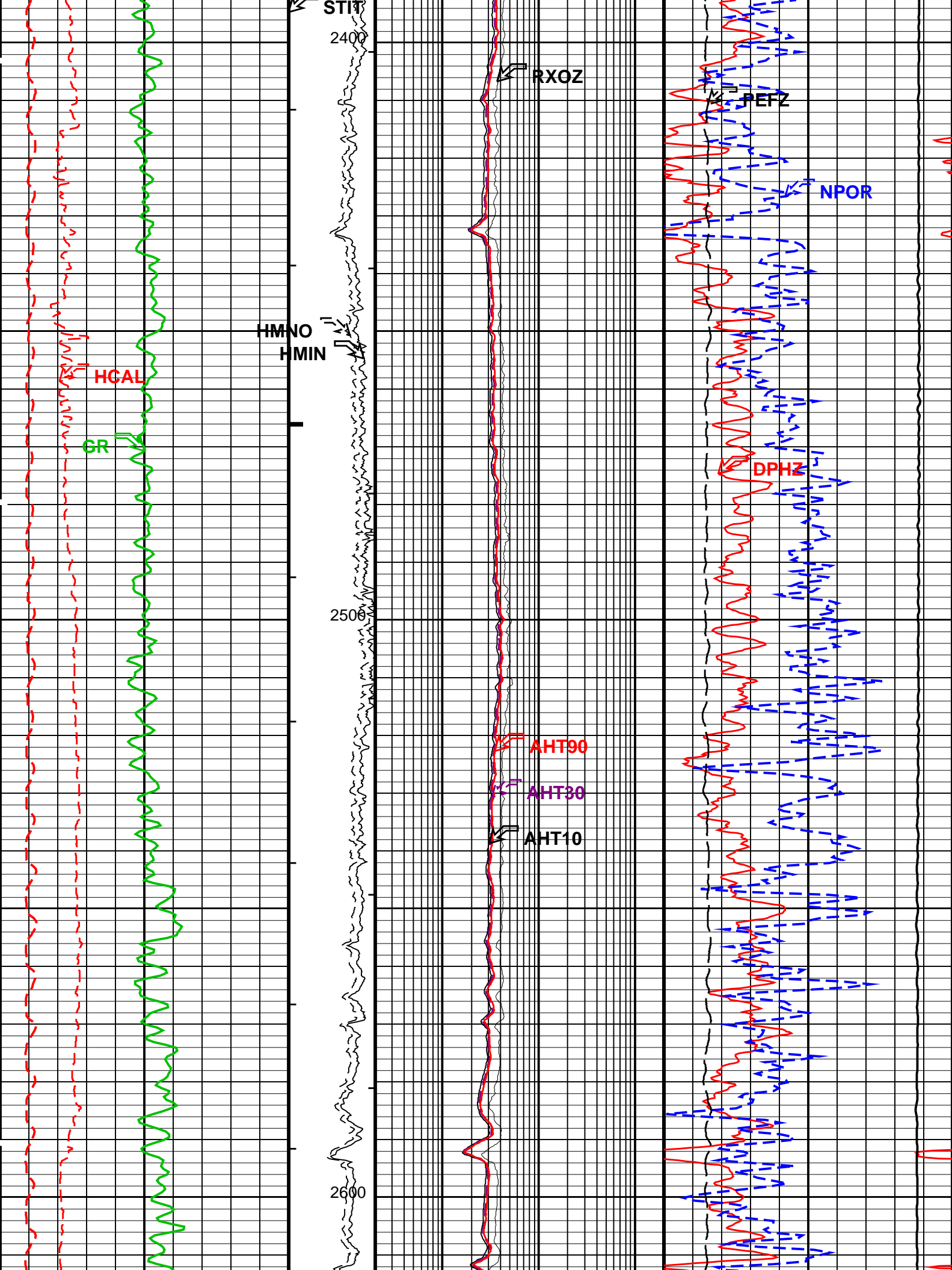


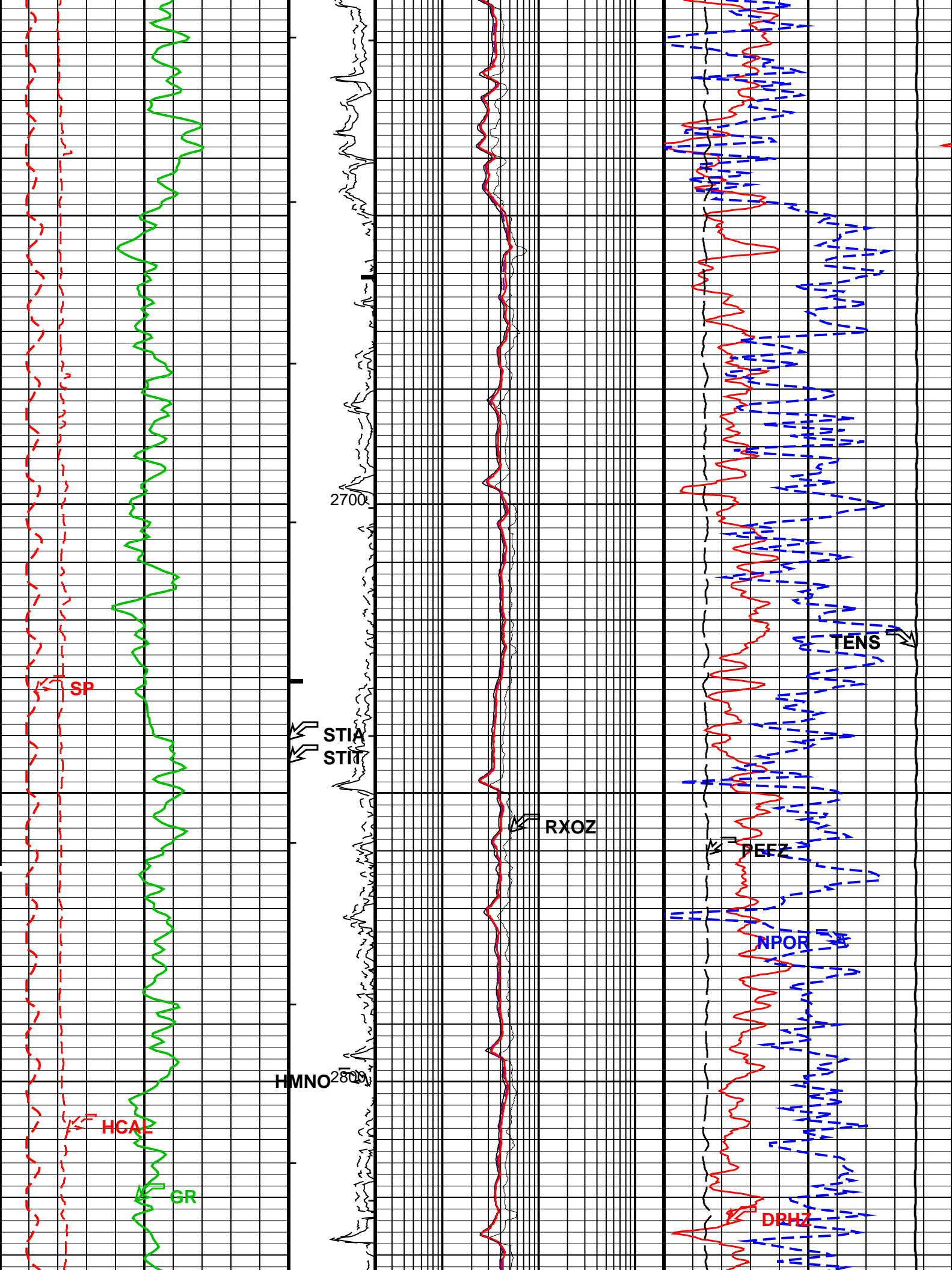


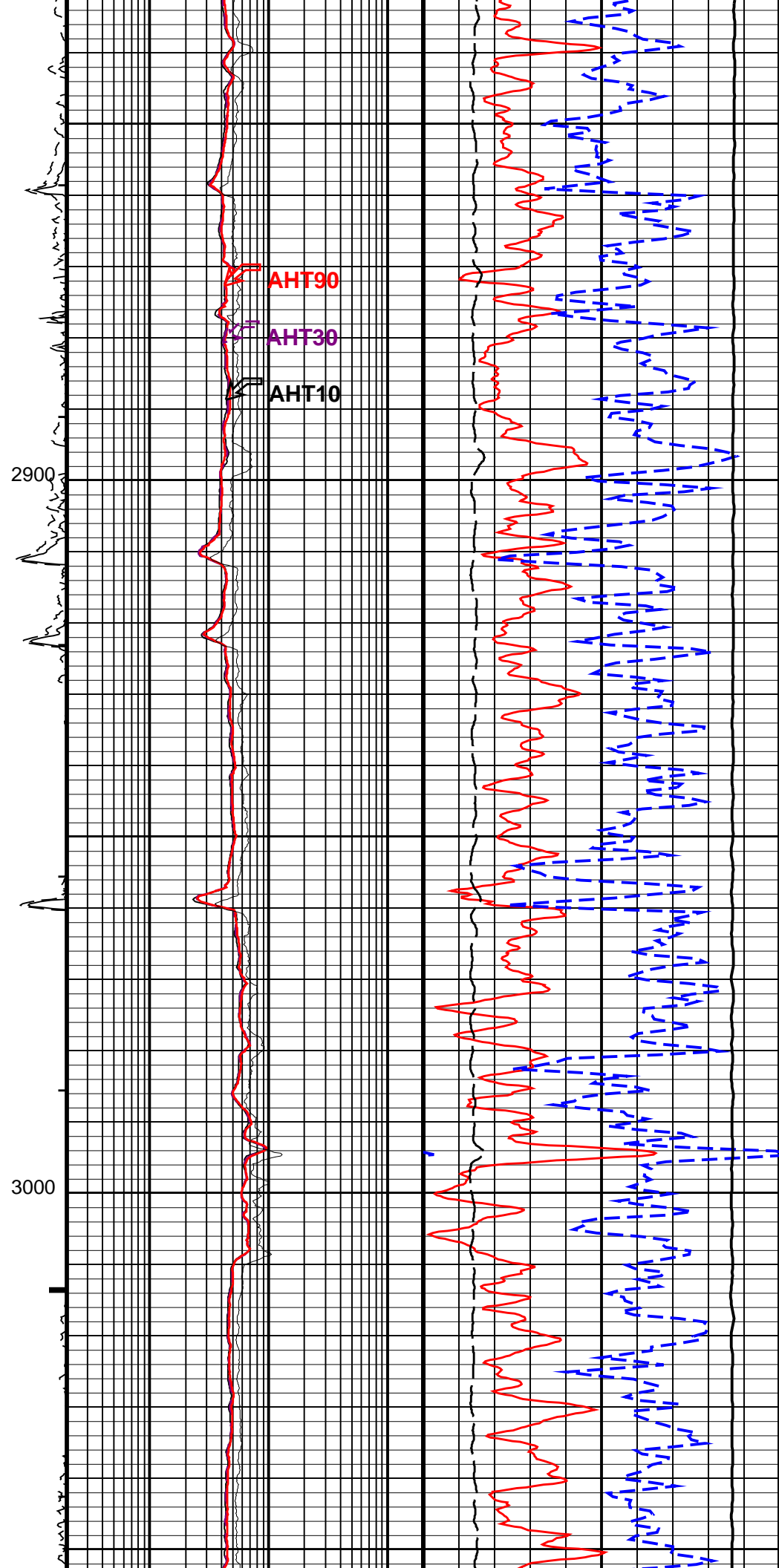
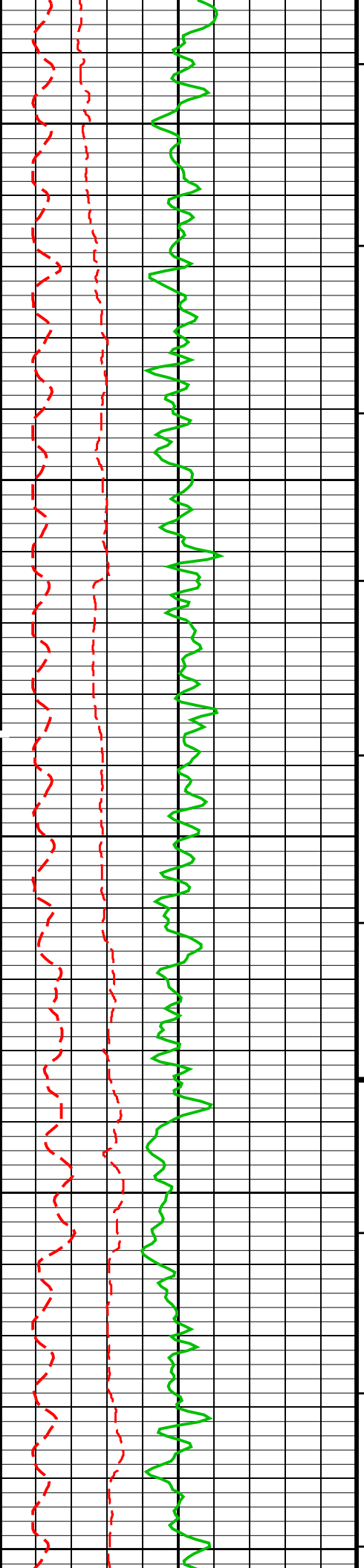


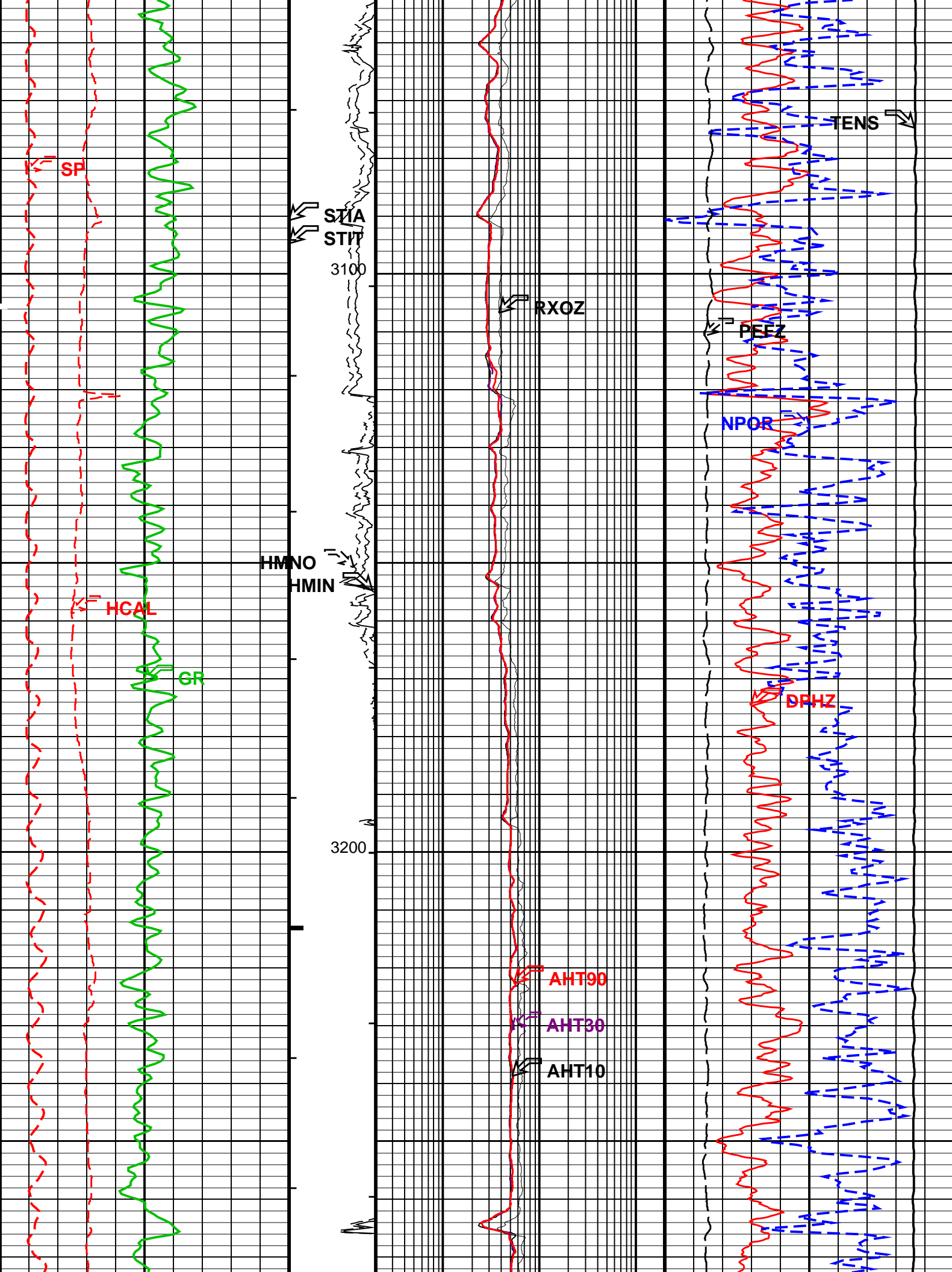


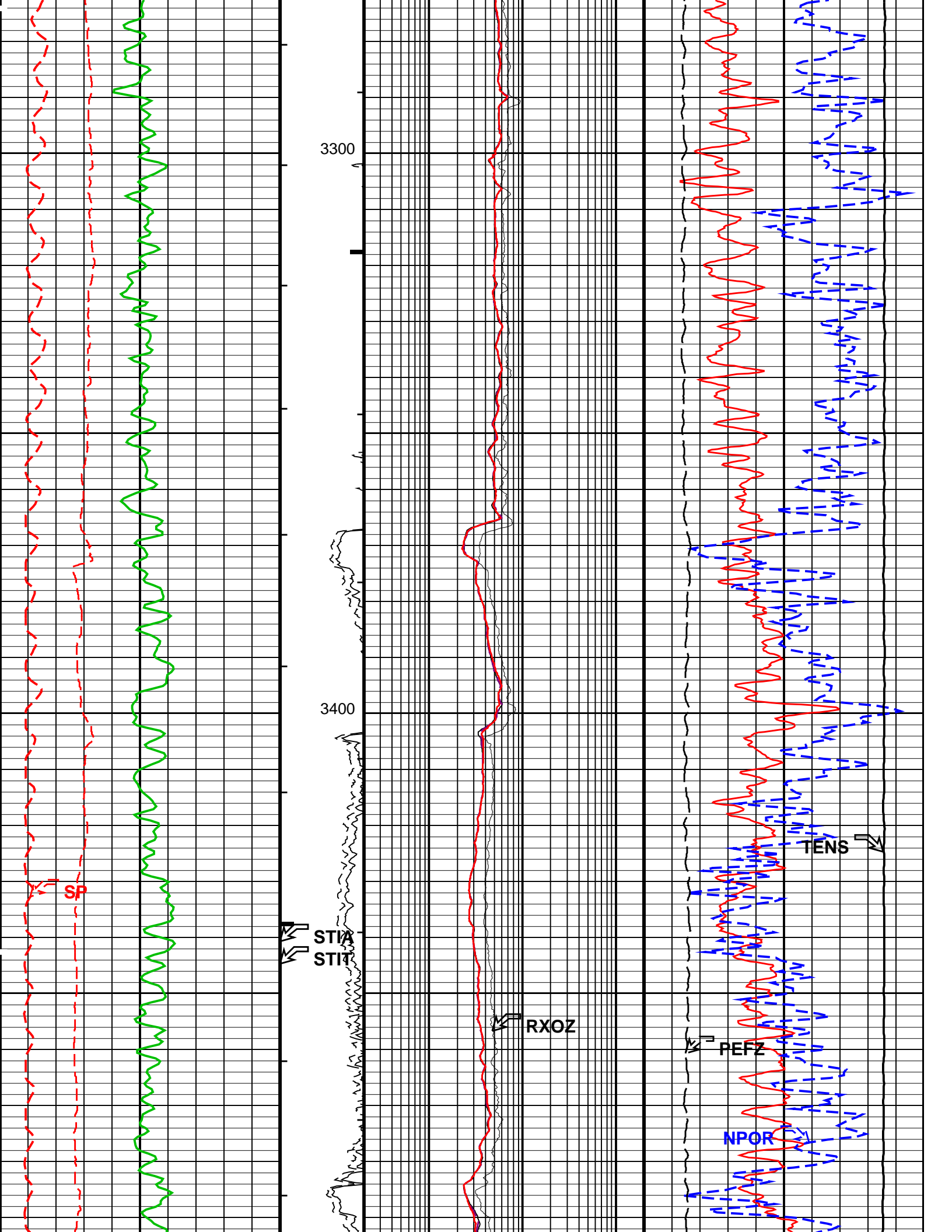


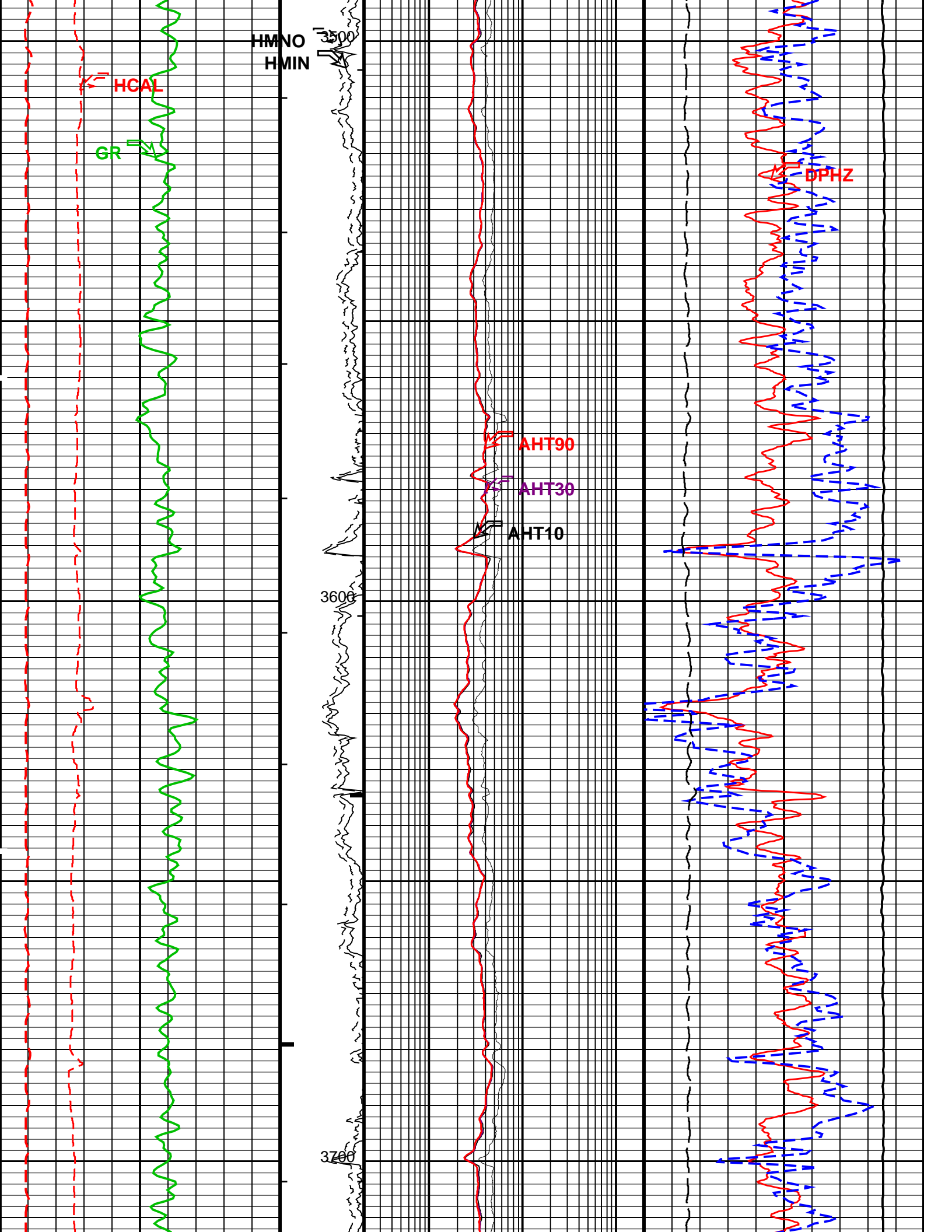


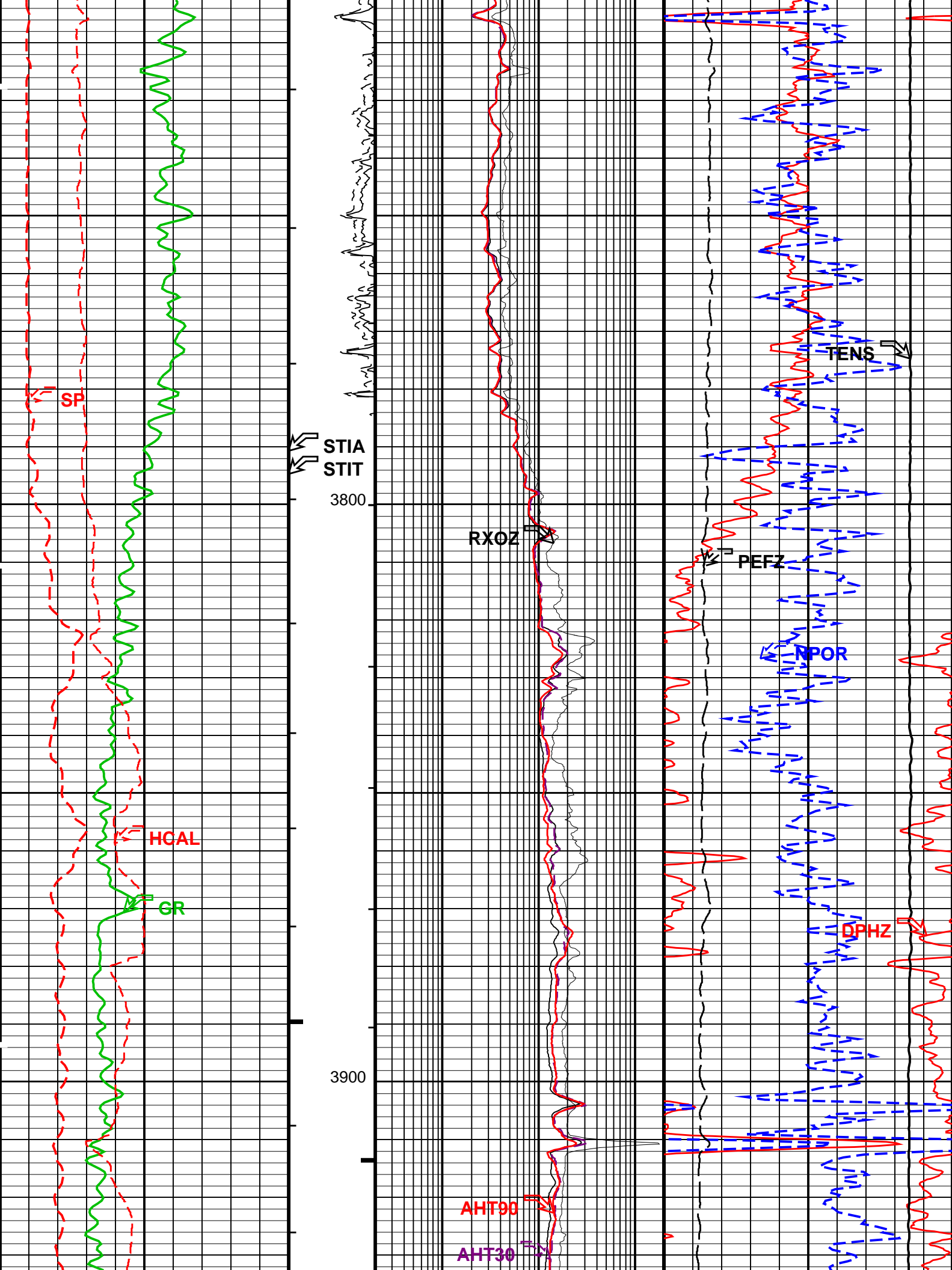


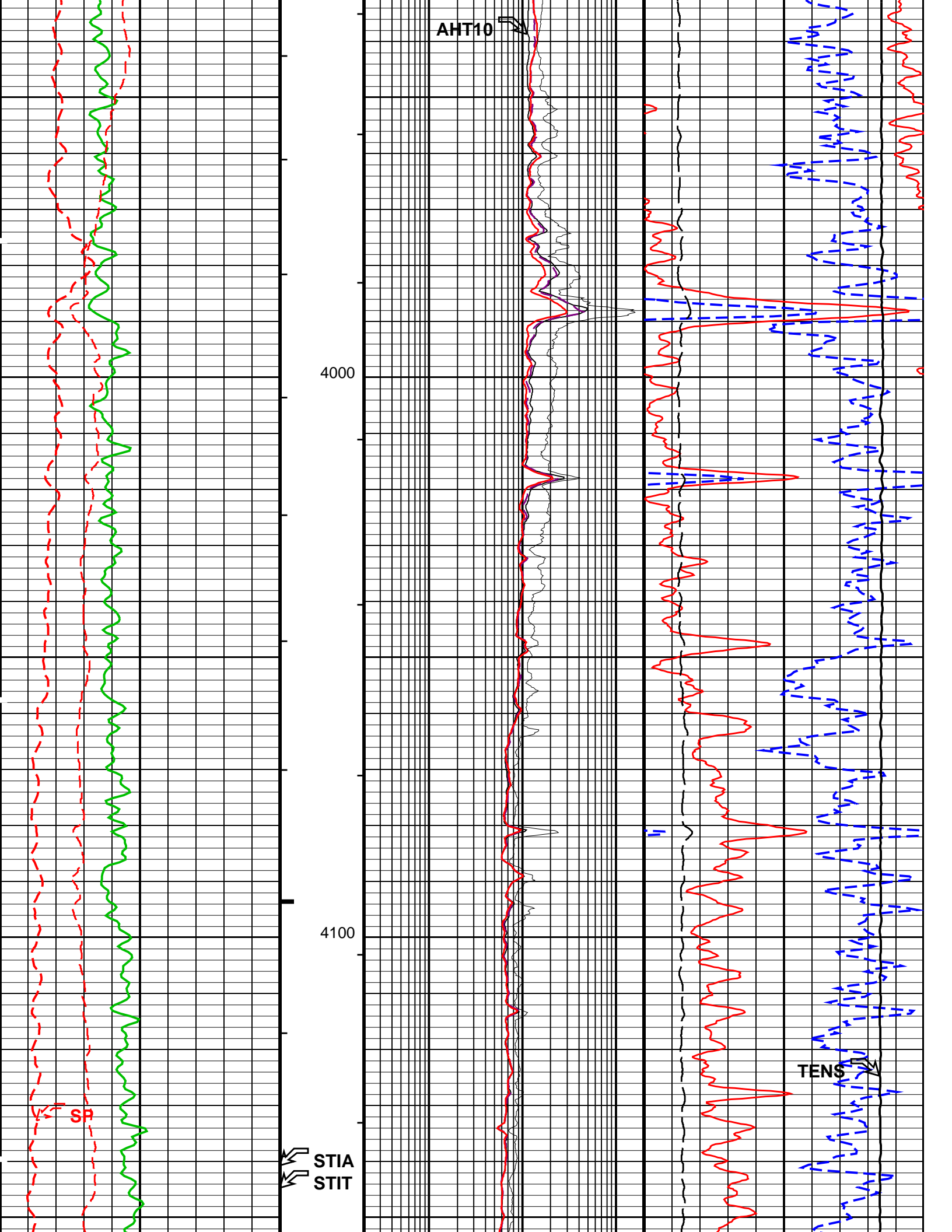


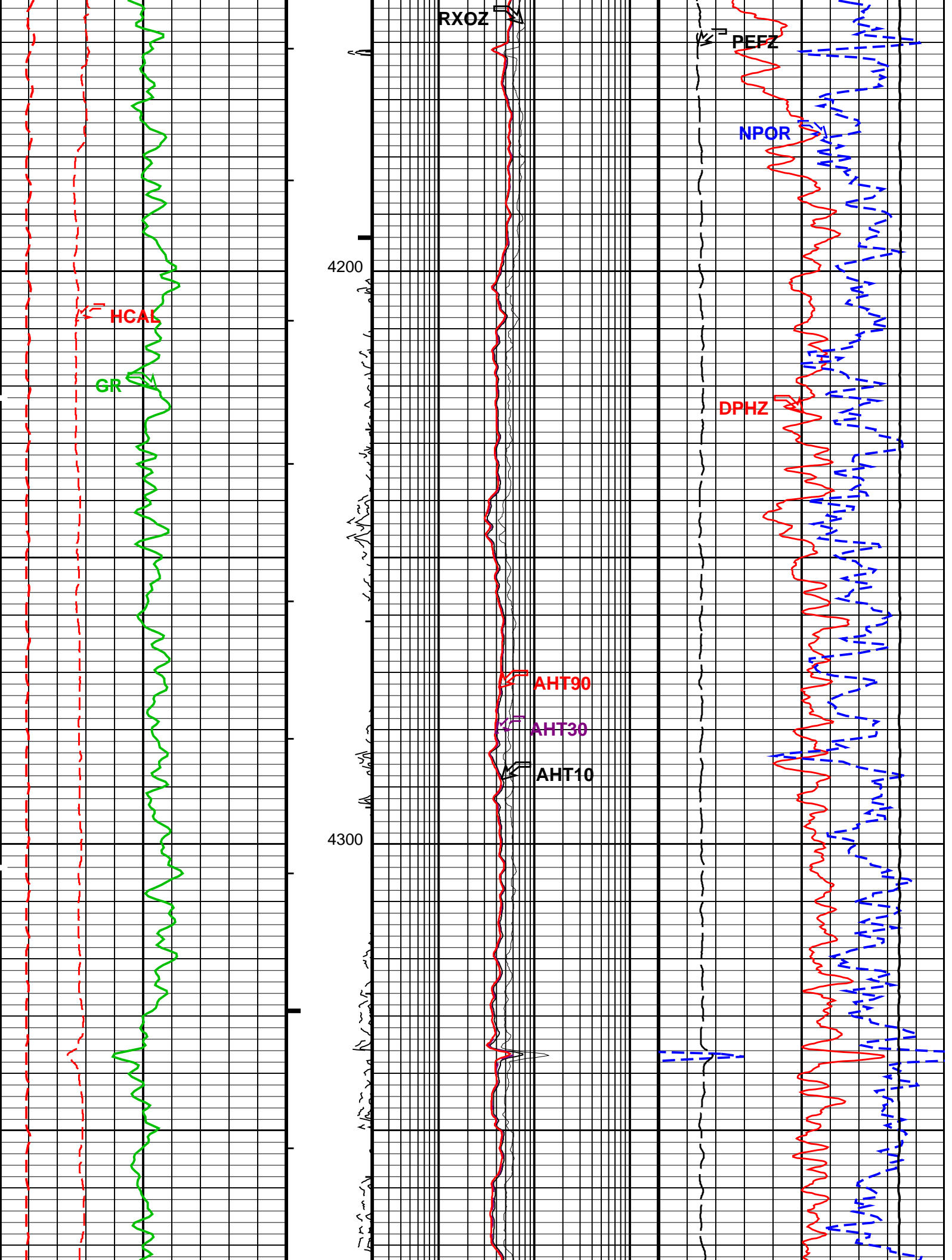


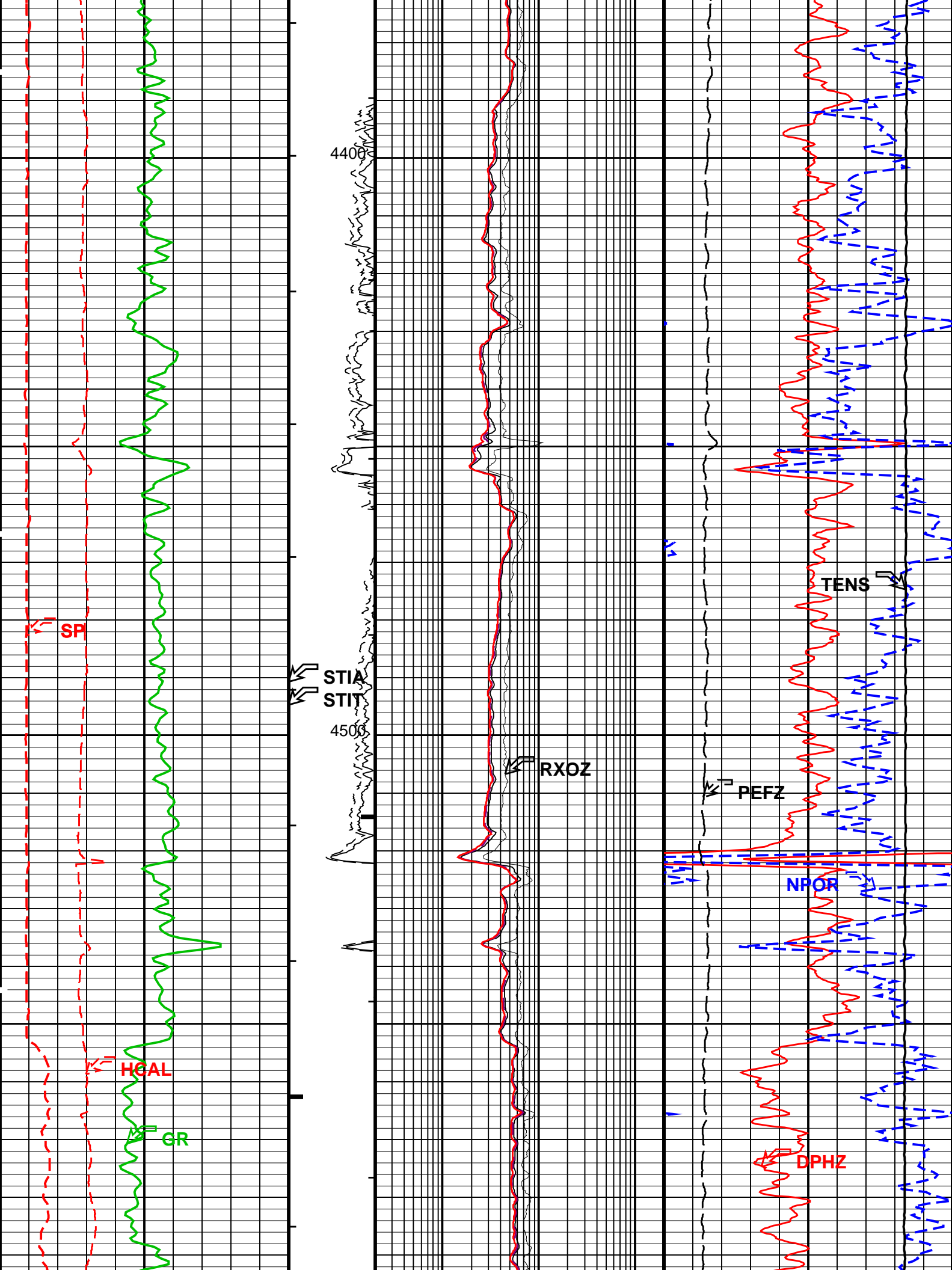


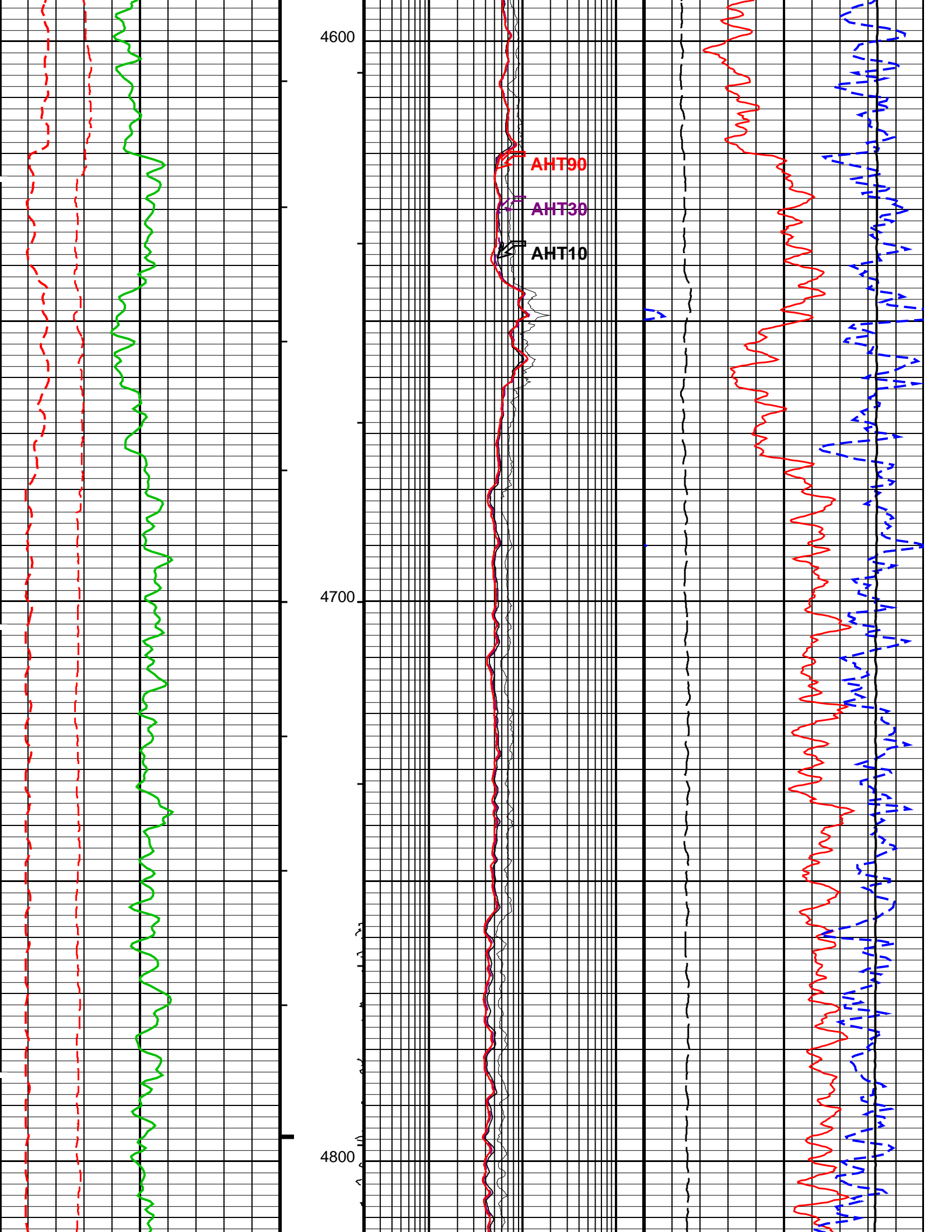


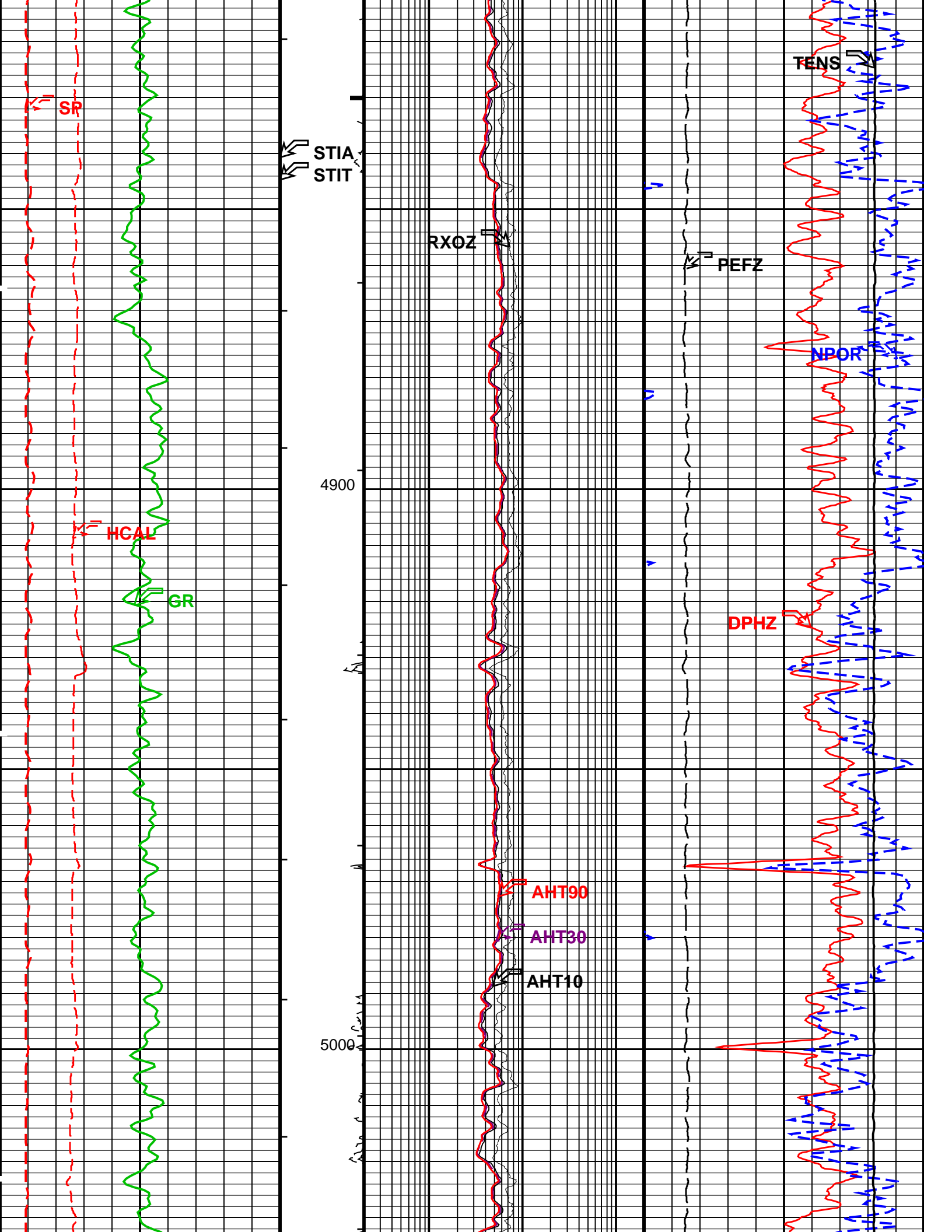


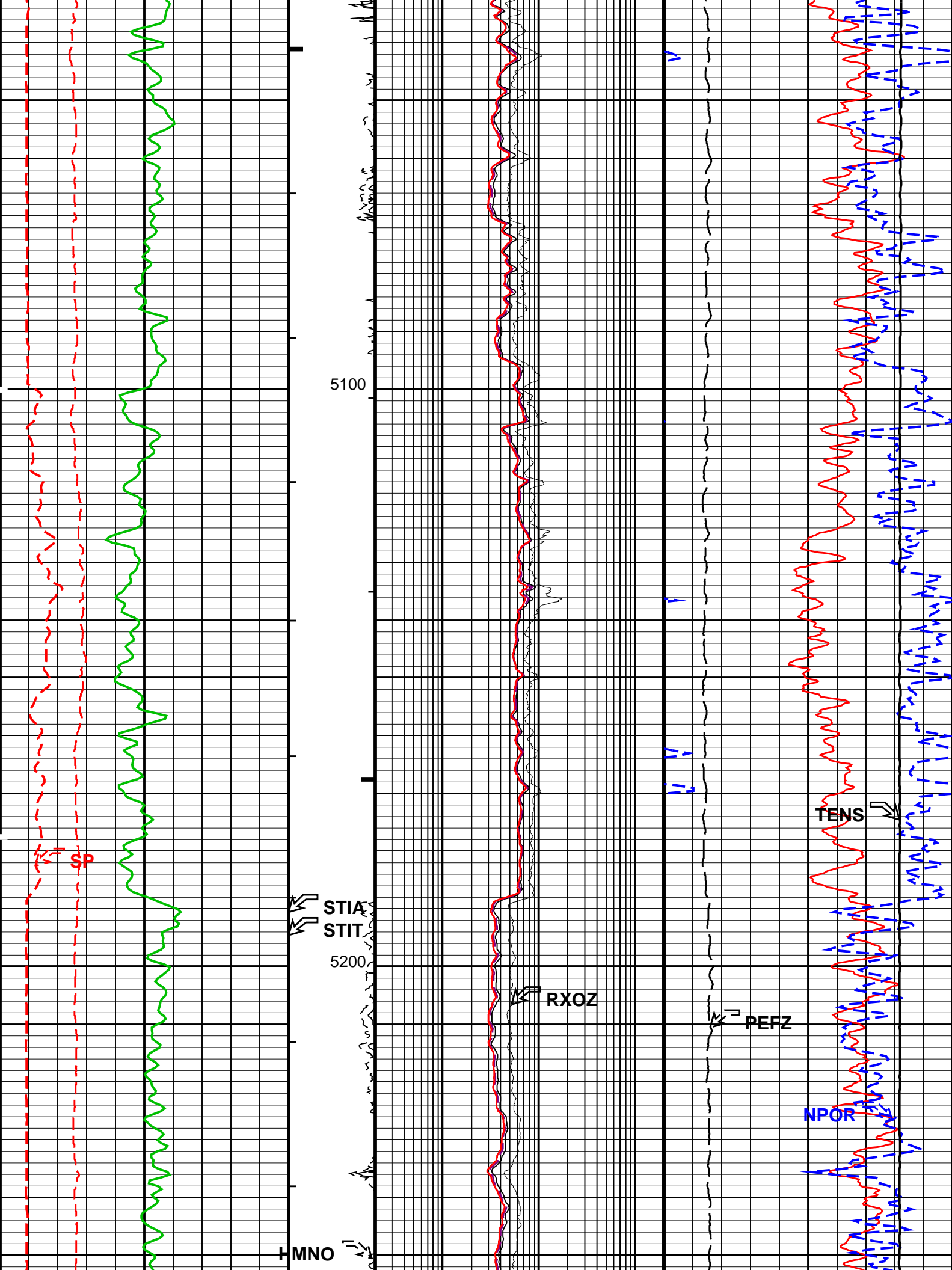


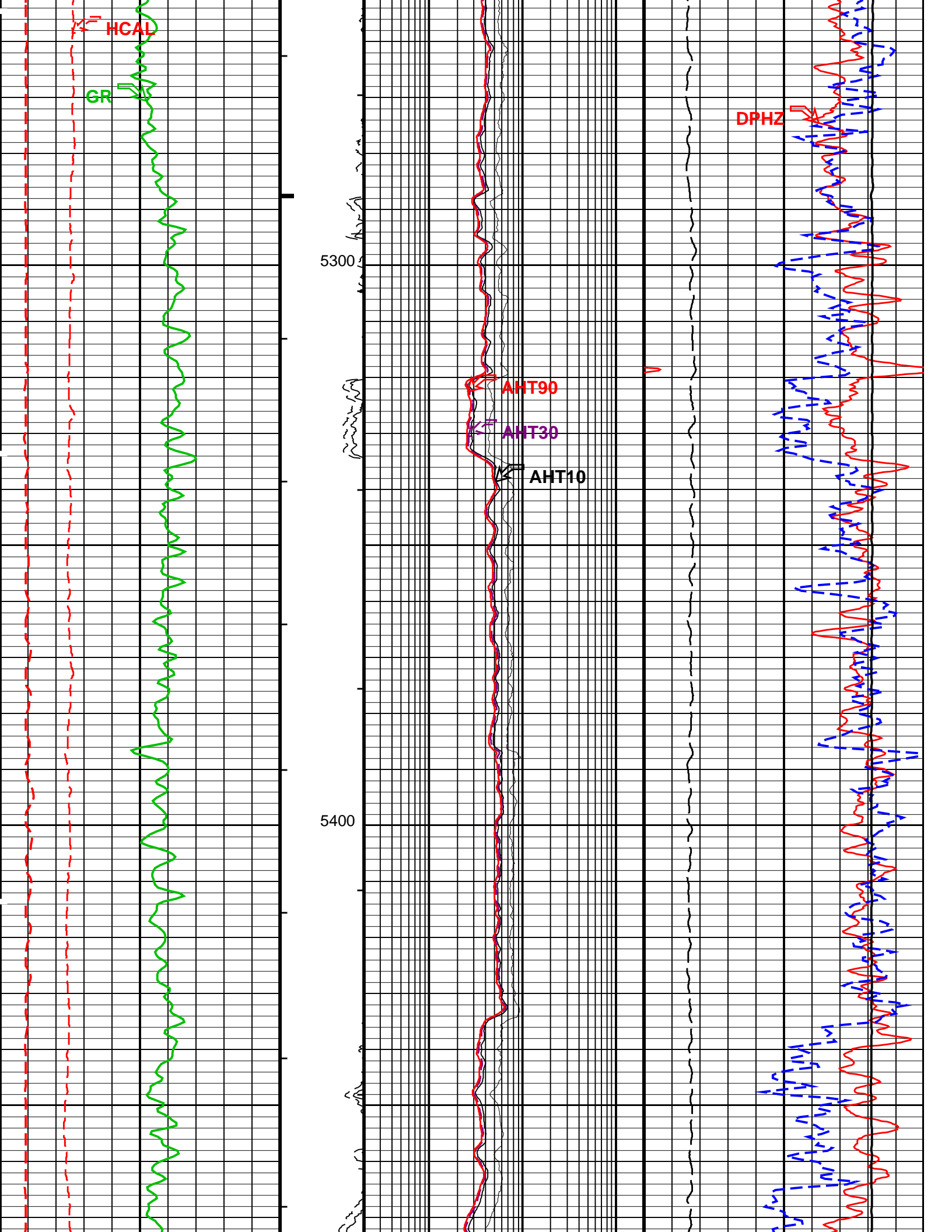


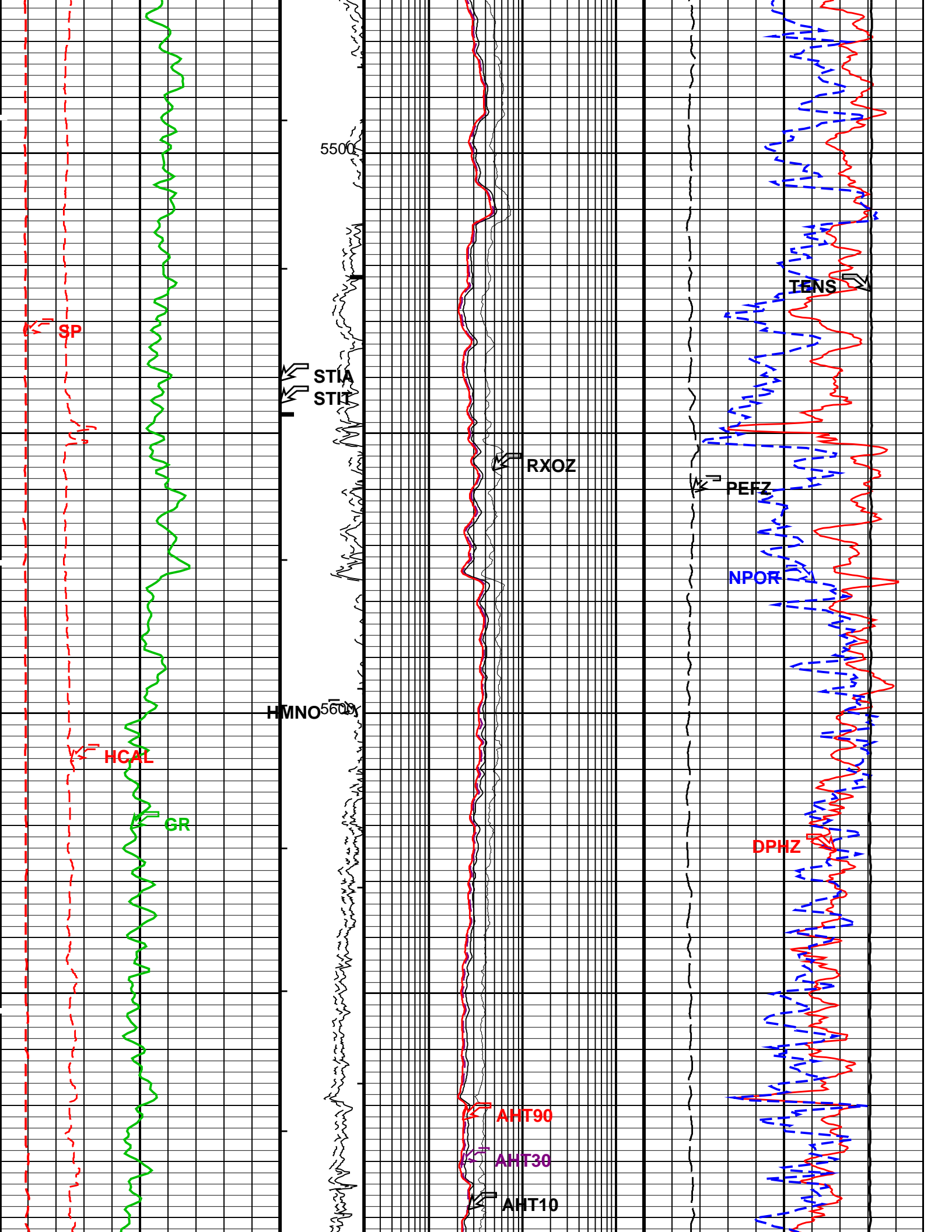


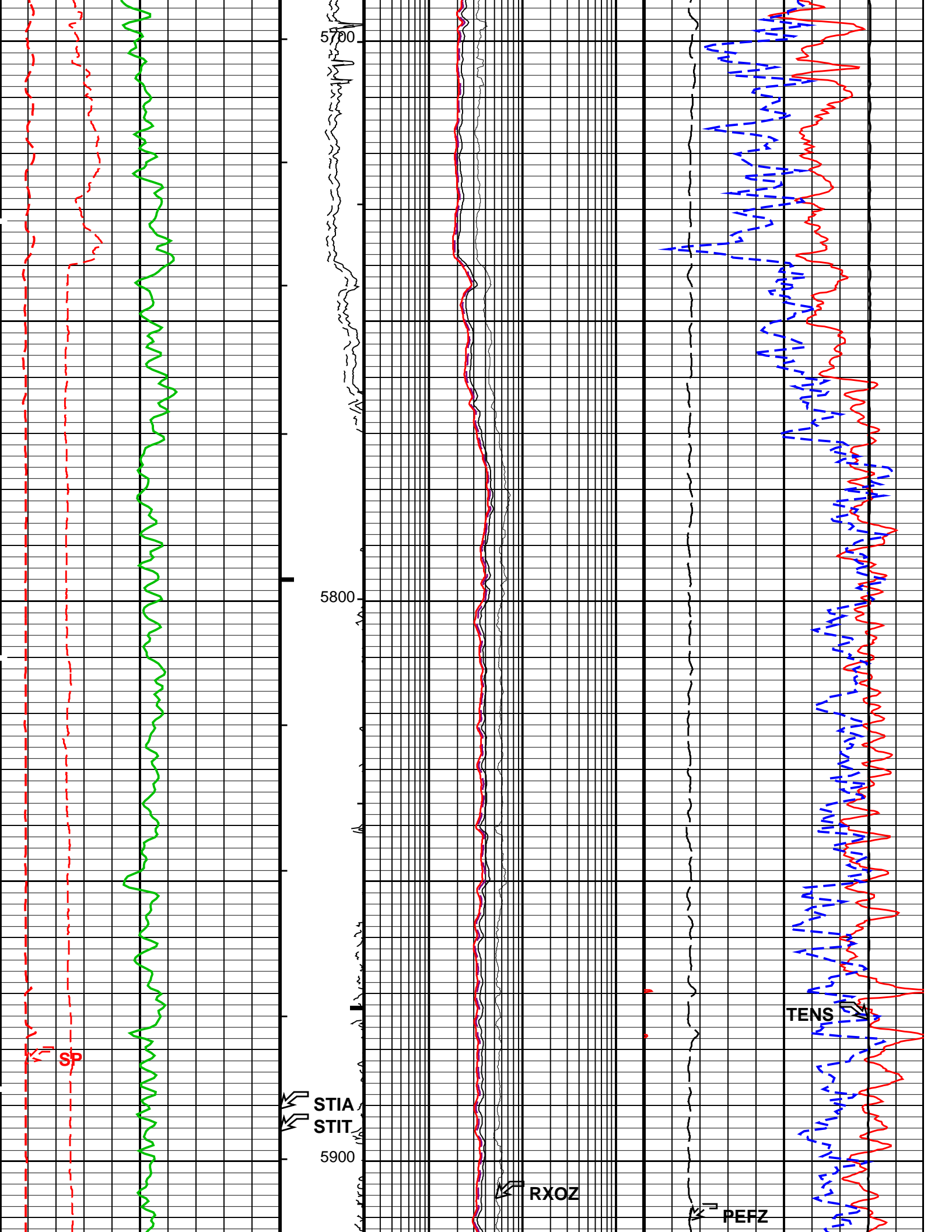


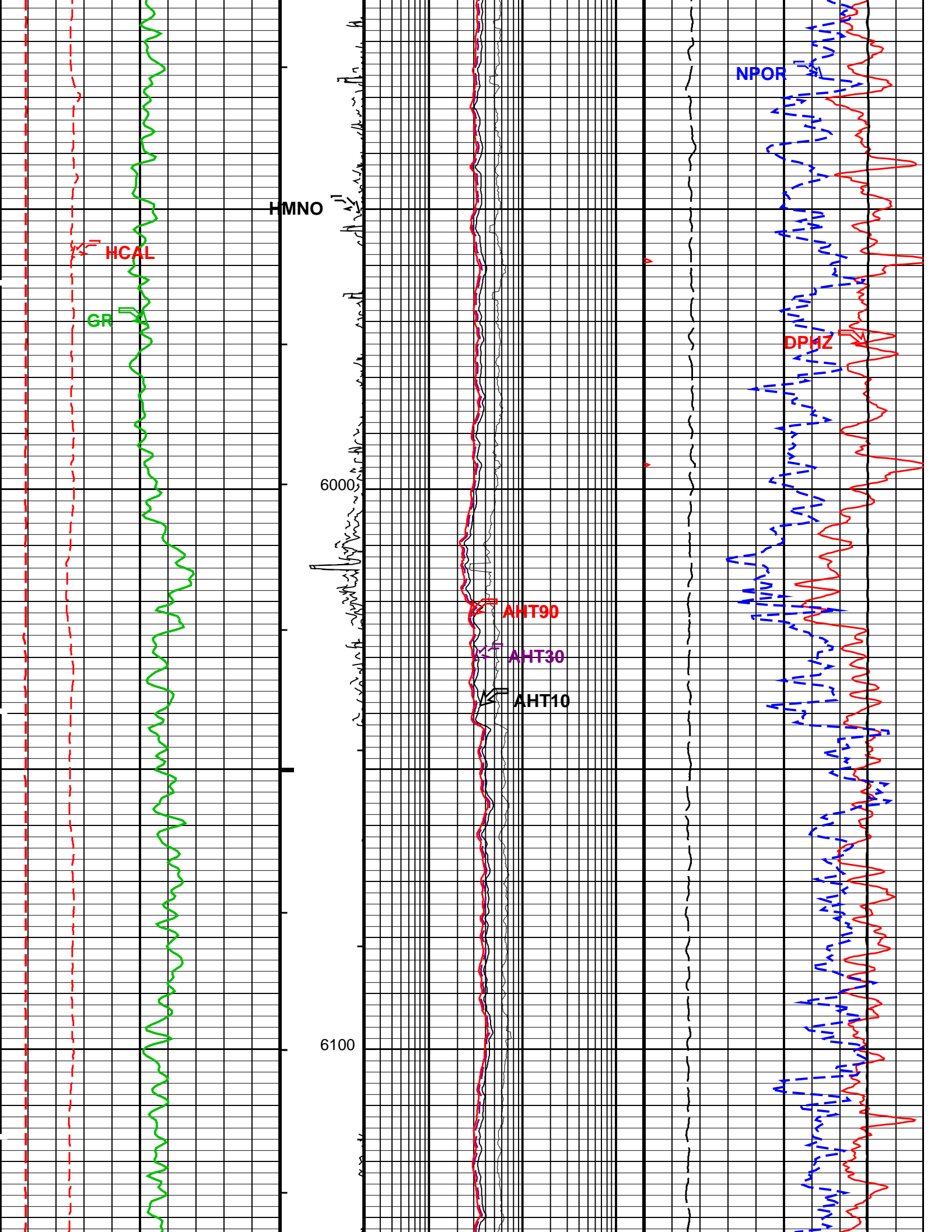


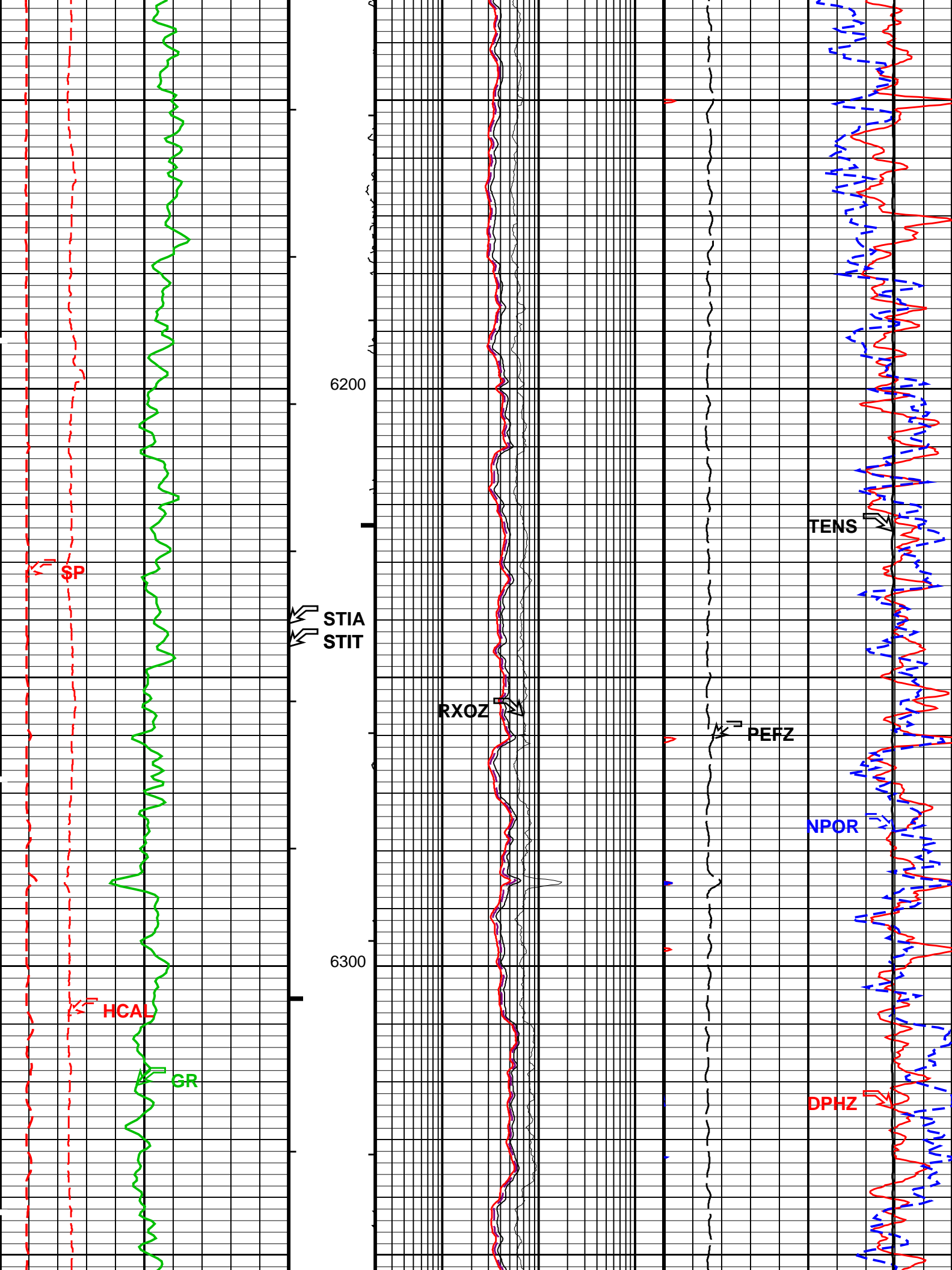


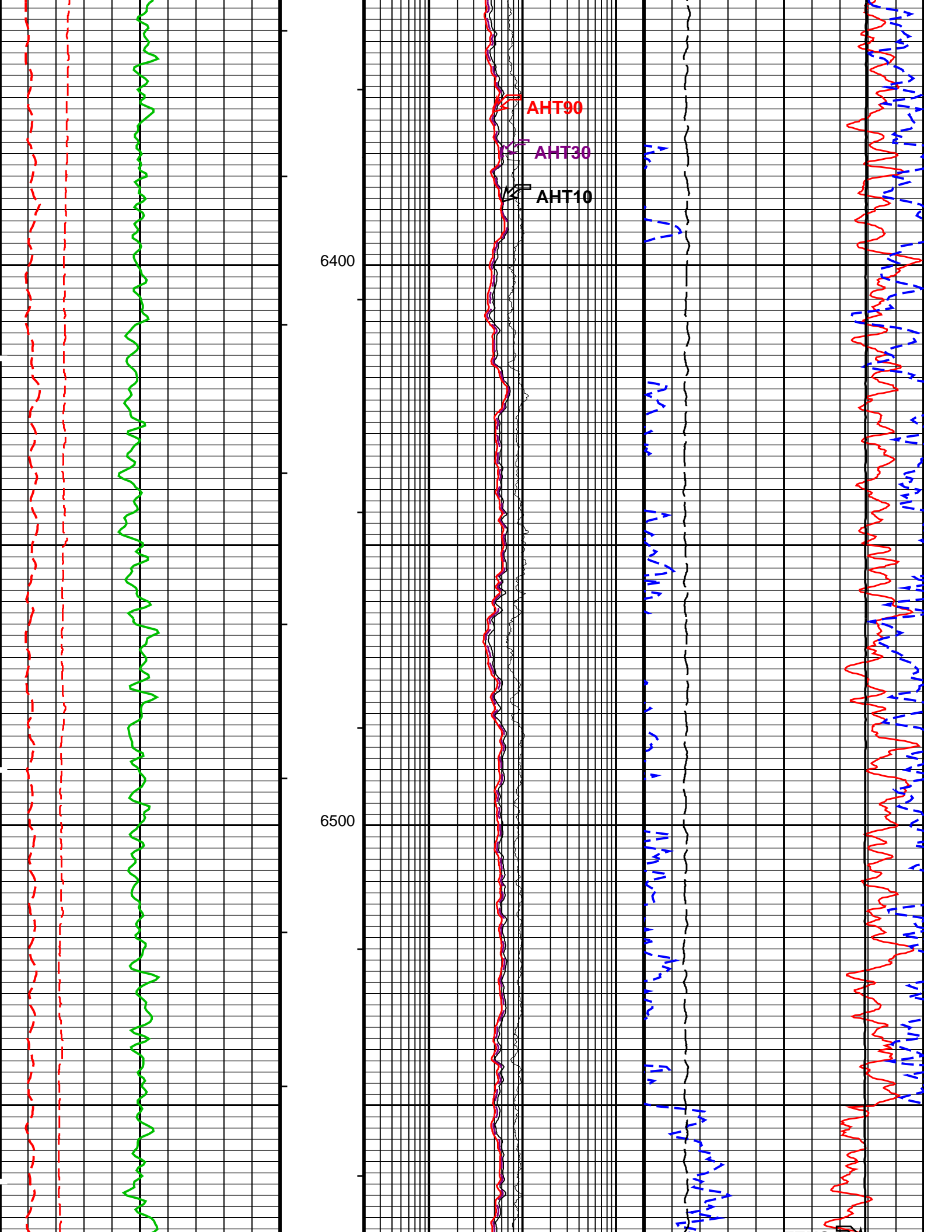


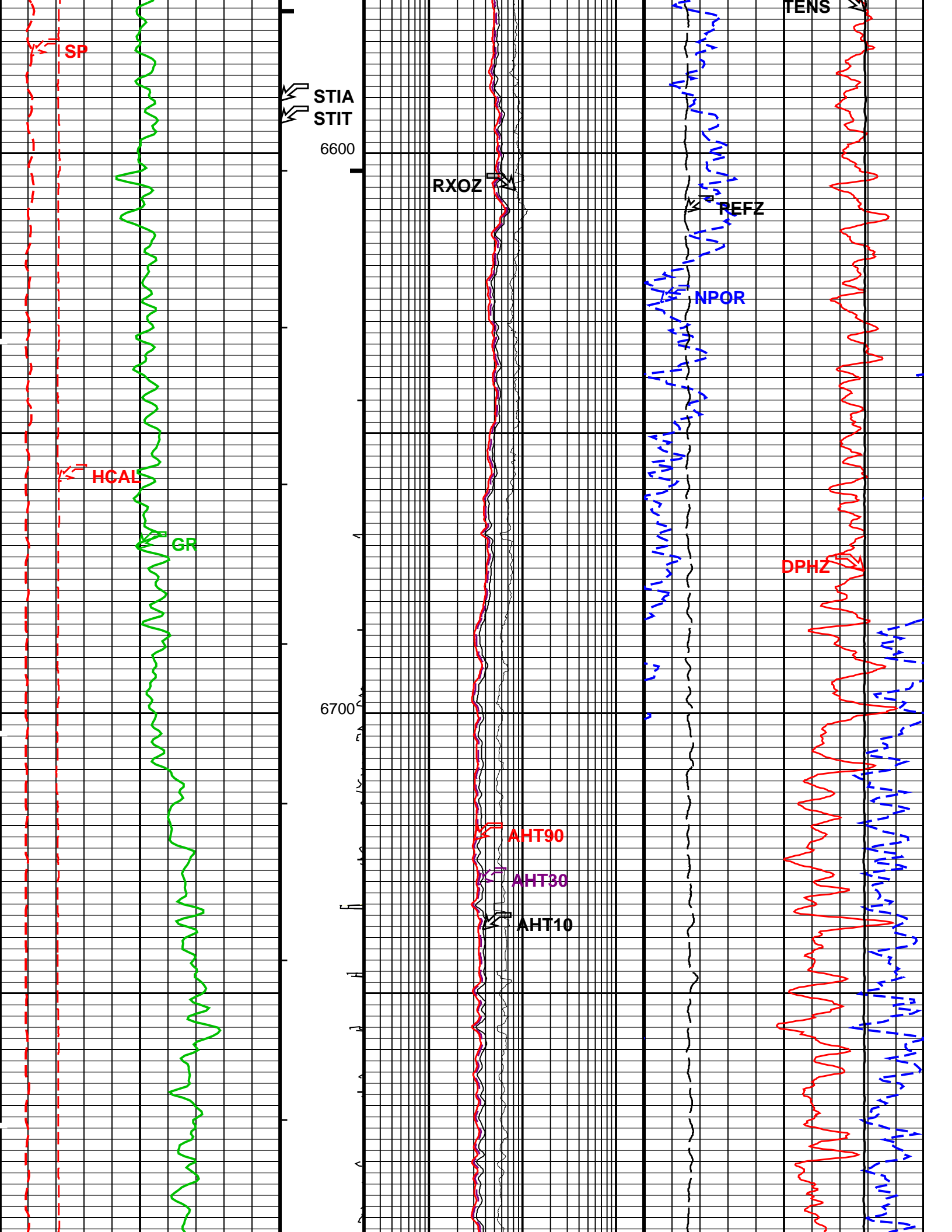


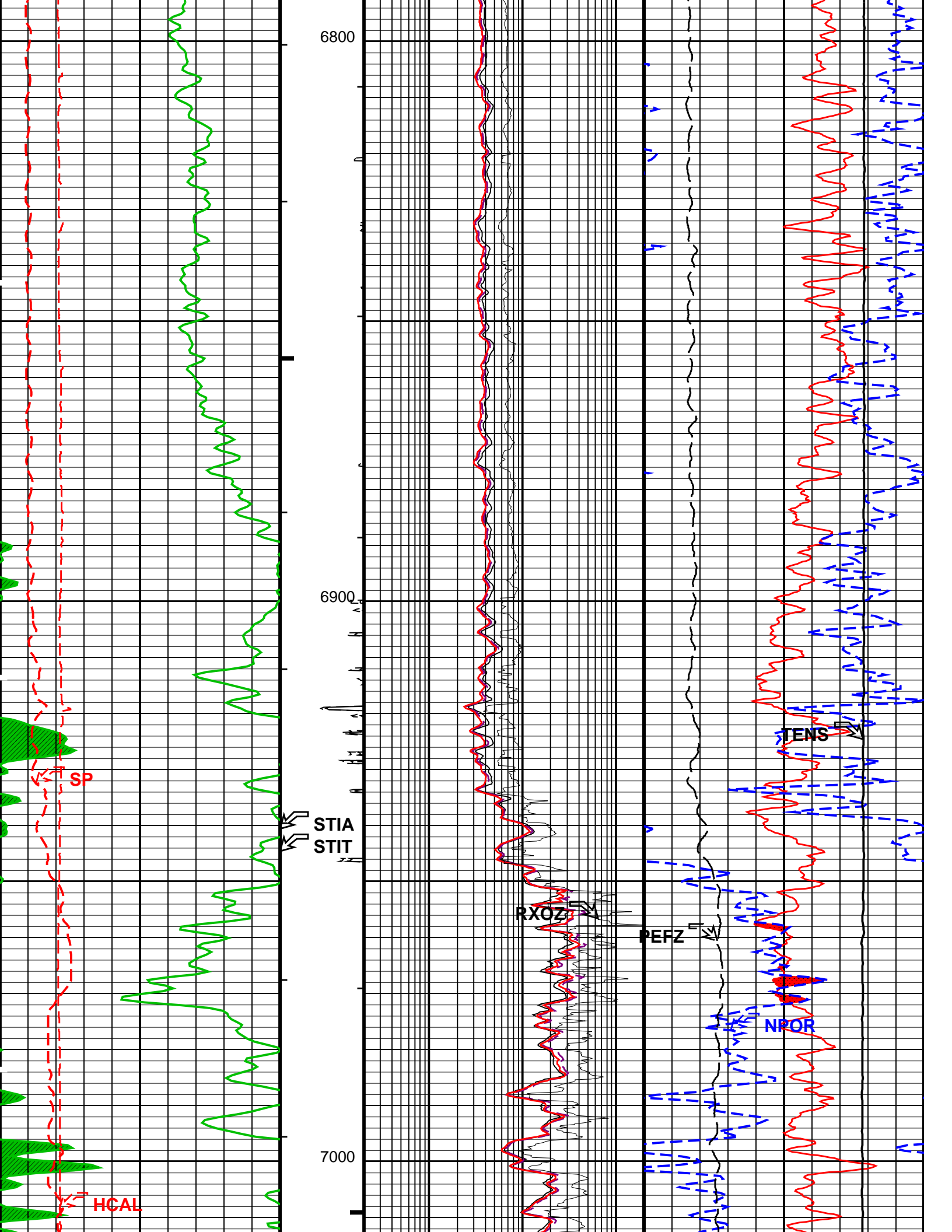


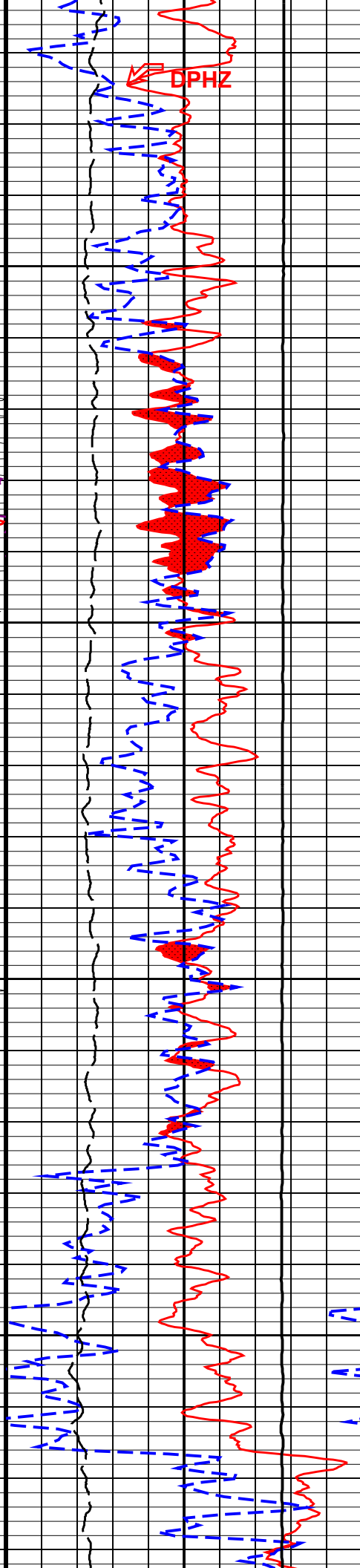
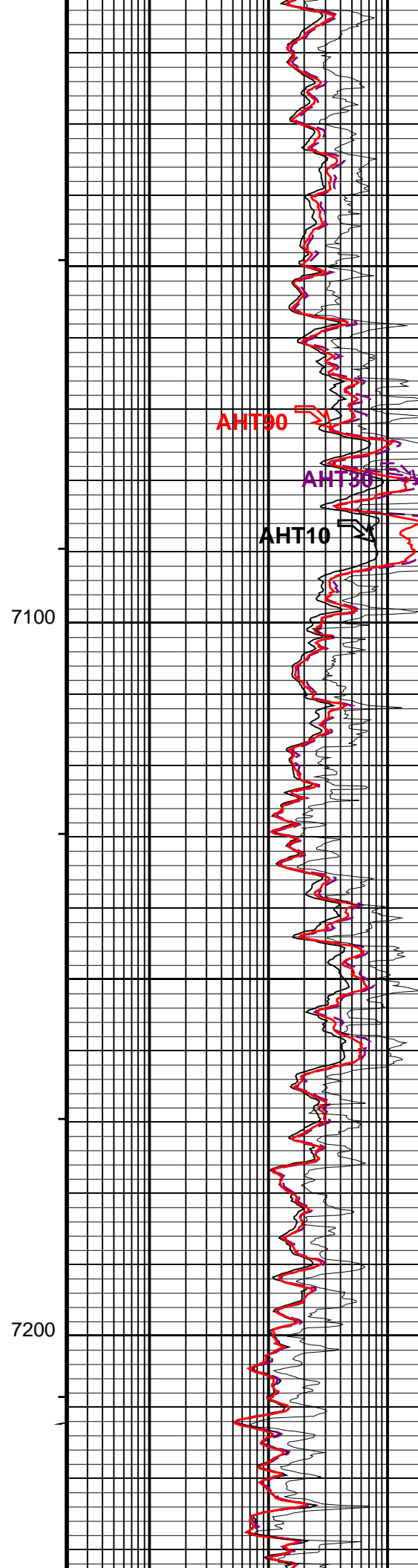
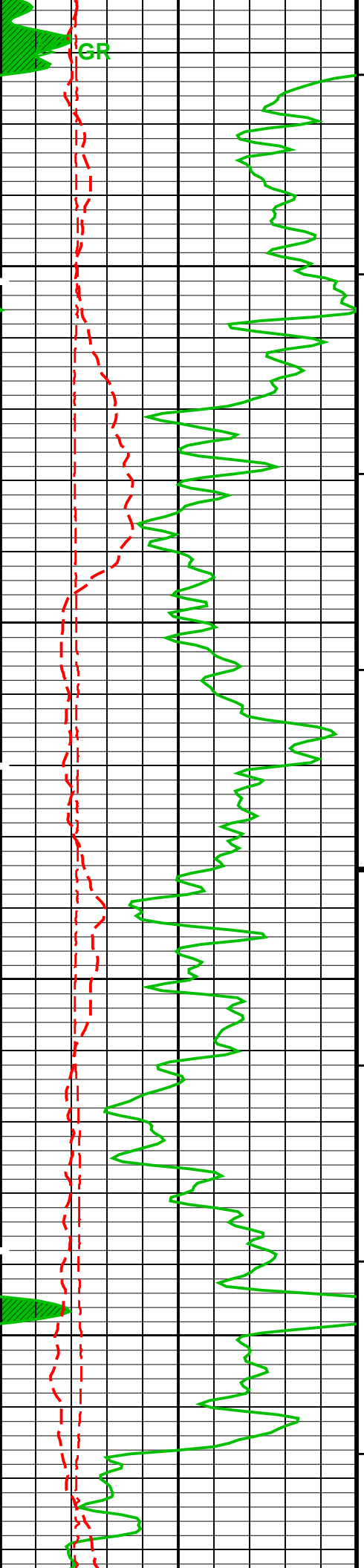


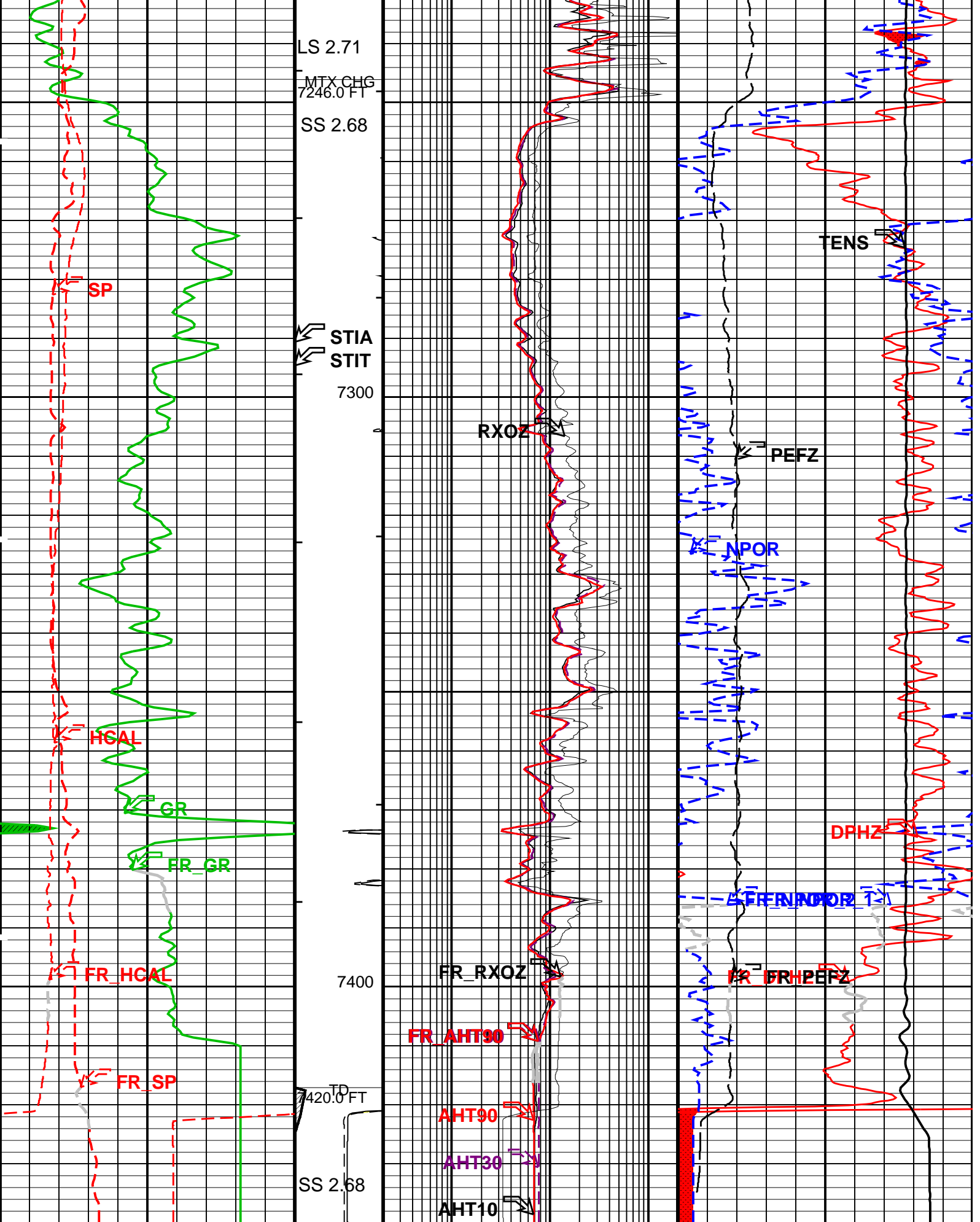












GR BACKUP

Stuck
Stretch
(STIT)

0 (F) 50

AIT-H 10 Inch Investigation (AHT10)
(OHMM)

0.2

200

Std. Res. Density Porosity (DPHZ)
(V/V)

0.2

0

<div>HILT Caliper (HCAL)</div> <div>(IN)</div> <div>616</div>	<div>Computed Micro Inverse (HMIN) (OHMM)</div> <div>04</div>	<div>AIT-H 30 Inch Investigation (AHT30)</div> <div>(OHMM)</div> <div>0.2200</div>	<div>Alpha Processed Neutron Porosity (NPOR) (V/V)</div> <div>0.20</div>
<div>Gamma Ray (GR)</div> <div>(GAPI)</div> <div>0200</div>	<div>Computed Micro Normal (HMNO) (OHMM)</div> <div>04</div>	<div>AIT-H 90 Inch Investigation (AHT90)</div> <div>(OHMM)</div> <div>0.2200</div>	<div>Std. Res. Formation Pe (PEFZ)</div> <div>010</div>
<div>SP (SP)</div> <div>(MV)</div> <div>16040</div>	<div>PERM</div>	<div>Std. Res. Invaded Zone Resistivity (RXOZ) (OHMM)</div> <div>0.2200</div>	<div>Tension (TENS)</div> <div>(LBF)</div> <div>100000</div>
			Gas Effect
			NPOR BACKUP

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	
HILTB-CTS: High resolution Integrated Logging Tool-CTS			
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
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	0.125	IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
BHFL	Borehole Fluid Type	WATER	
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	182	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	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HSCO	Hole Size Correction Option	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.71	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	

SDAT	Standoff Data Source	300N	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	YES	
SPNV	SP Next Value	0	MV
FEQL: Formation Evaluation Quick Look			
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	182	DEGF
FCD	Future Casing (Outer) Diameter	4.5	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	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	68	DEGF
PERT: Preliminary Evaluation – Real Time			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	182	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	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	68	DEGF
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth – Driller	7389.00	FT
TDL	Total Depth – Logger	7417.00	FT
System and Miscellaneous			
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	8.625	IN
CWEI	Casing Weight	24.00	LB/F
DFD	Drilling Fluid Density	9.30	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	10.00	FT
MST	Mud Sample Temperature	91.80	DEGF
RMFS	Resistivity of Mud Filtrate Sample	2.5650	OHMM
TD	Total Depth	7417	FT

Format: CZ_COMB_NUC Vertical Scale: 5" per 100' Graphics File Created: 08-Nov-2009 14:06

OP System Version: 17C0-154

HILTB-CTS 17C0-154

Output DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_007LUP FN:5 PRODUCER 08-Nov-2009 14:06

Schlumberger

REPEAT ANALYSIS

MAXIS Field Log

Input DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_006PUP FN:4 PRODUCER 08-Nov-2009 14:04 7425.0 FT 6979.0 FT

Output DLIS Files

OP System Version: 17C0-154

HILTB-CTS

17C0-154

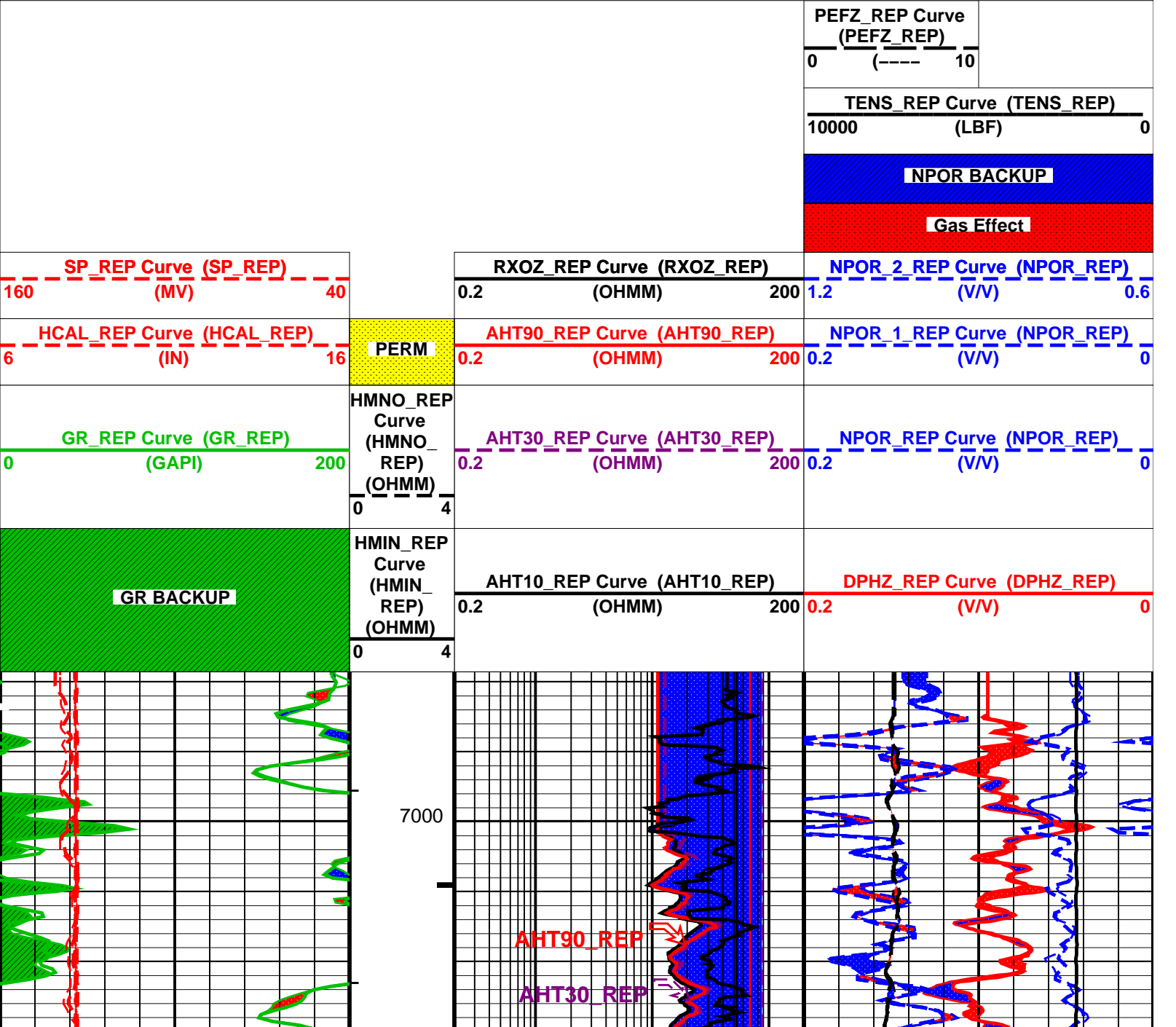
Changed Parameter Summary

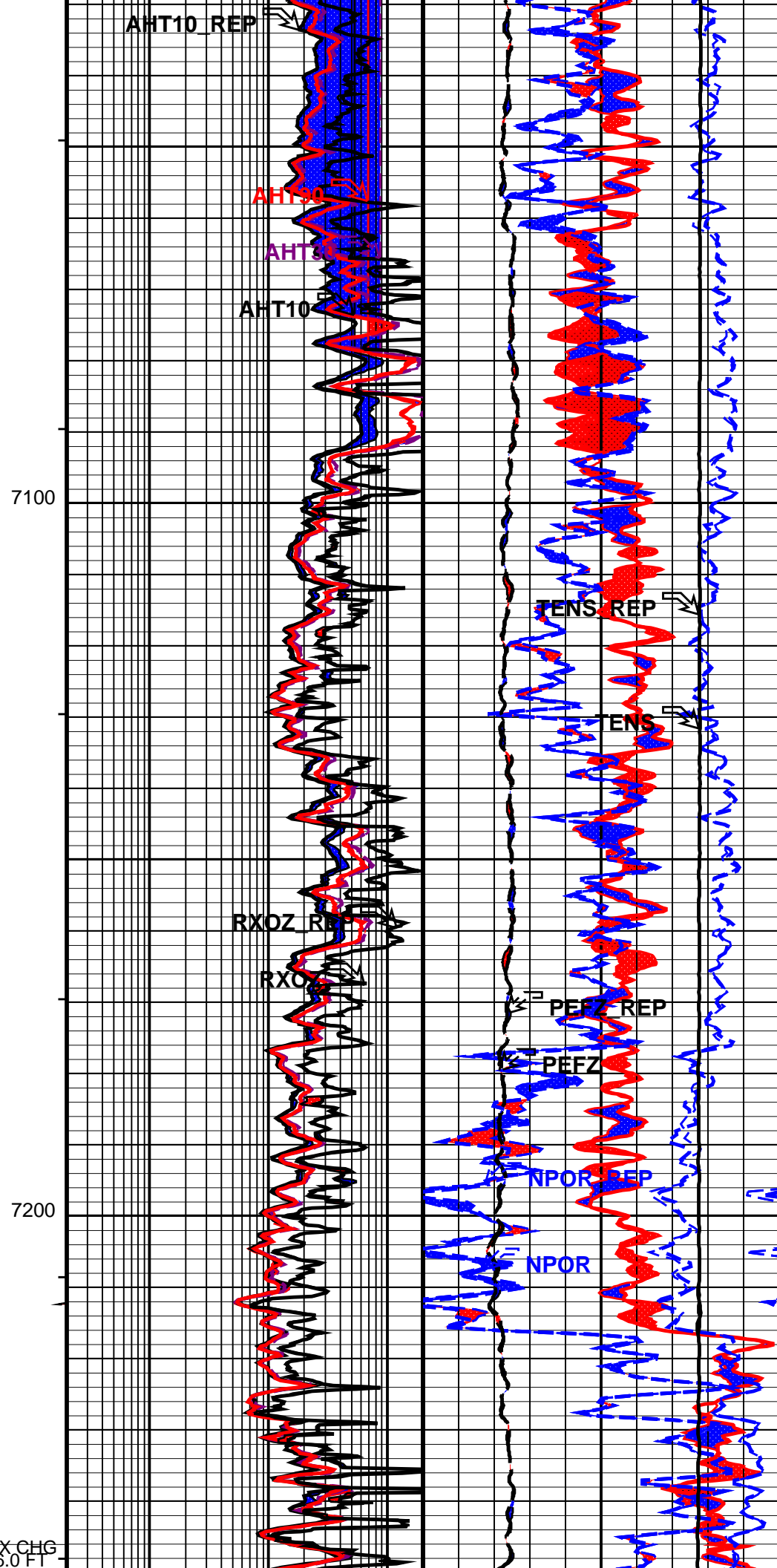
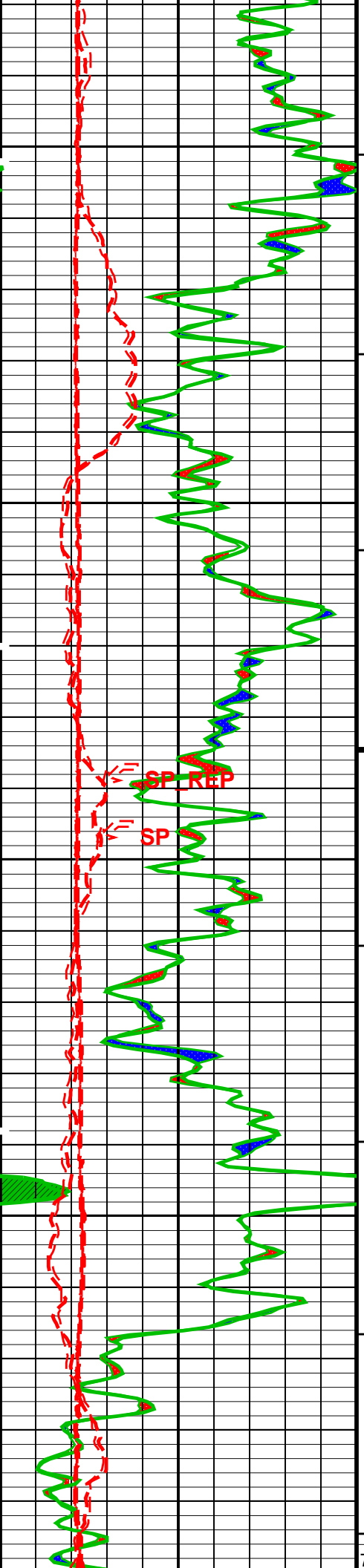
DLIS Name	New Value	Previous Value	Depth & Time
MATR	SANDSTONE	LIMESTONE	7440.0 14:06:42
	LIMESTONE	SANDSTONE	7246.0 14:09:38
MDEN	2.68 G/C3	2.71 G/C3	7440.0 14:06:42
	2.71 G/C3	2.68 G/C3	7246.0 14:09:38
TD	7420 FT	7417 FT	7095.1 14:11:50
TDL	7420.00 FT	7417.00 FT	7095.0 14:11:50

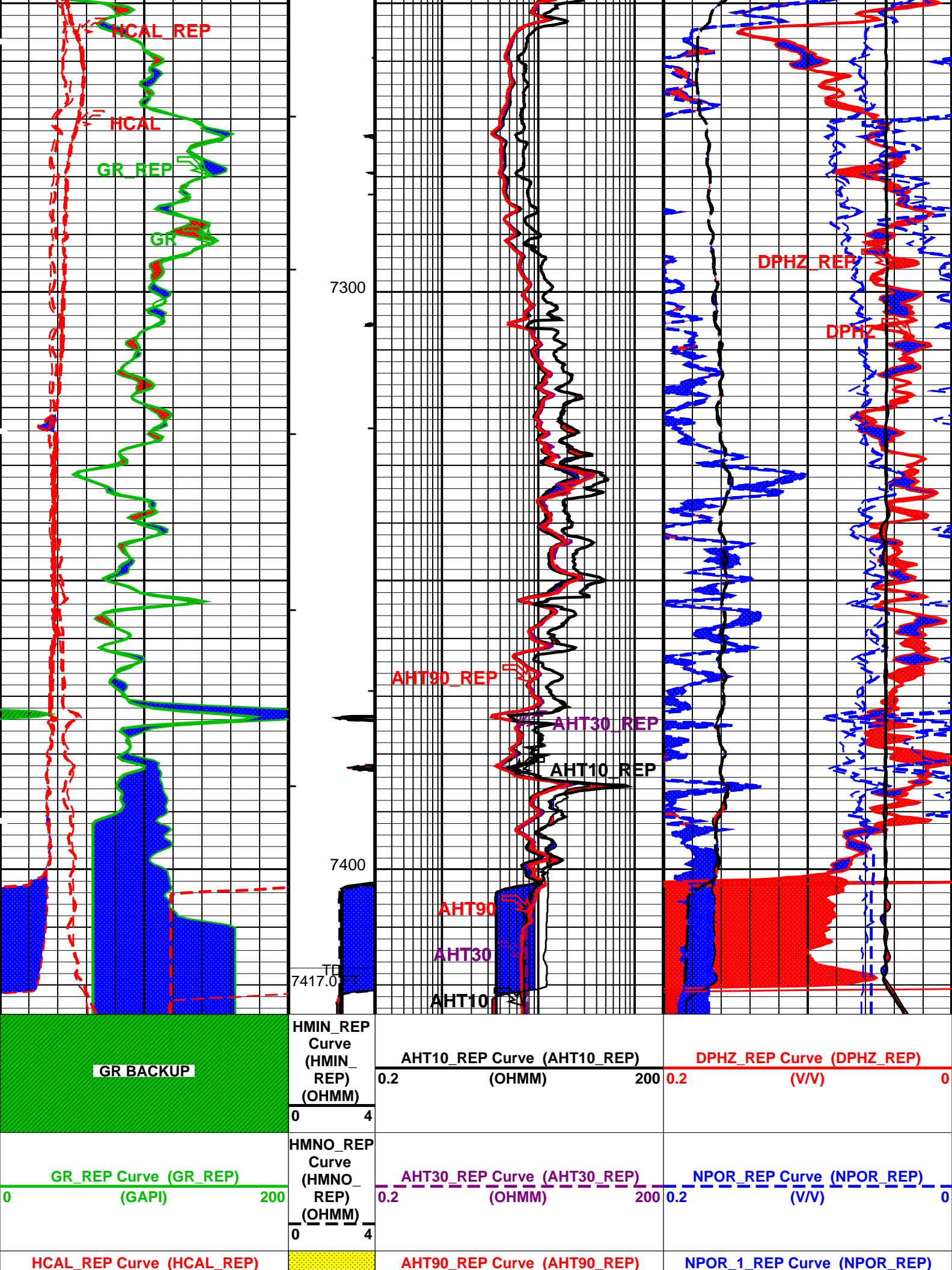
PIP SUMMARY

- └ 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







6	(IN)	16	PERM	0.2	(OHMM)	200	0.2	(V/V)	0
SP_REP Curve (SP_REP)			RXOZ_REP Curve (RXOZ_REP)			NPOR_2_REP Curve (NPOR_REP)			
160	(MV)	40	0.2	(OHMM)	200	1.2	(V/V)	0.6	
						Gas Effect			
						NPOR BACKUP			
						TENS_REP Curve (TENS_REP)			
						10000	(LBF)		0
						PEFZ_REP Curve (PEFZ_REP)			
						0	(----	10	

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	
HILTB-CTS: High resolution Integrated Logging Tool-CTS			
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
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	0.125	IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
BHFL	Borehole Fluid Type	WATER	
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	182	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
GRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HSCO	Hole Size Correction Option	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.71	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	
SPNV	SP Next Value	0	MV

FEQL: Formation Evaluation Quick Look

FEXP	Form Factor Exponent	2
FNUM	Form Factor Numerator	4

FNUM	HOLEV: Integrated Hole/Cement Volume	Form Factor Numerator	1	
BHS	Borehole Status	OPEN		
BHT	Bottom Hole Temperature (used in calculations)	182	DEGF	
FCD	Future Casing (Outer) Diameter	4.5	IN	
GCSE	Generalized Caliper Selection	HCAL		
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG	
GRGD	Geothermal Gradient	0.01	DF/F	
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST		
GTSE	Generalized Temperature Selection	HSTS_HTEM		
HVCS	Integrated Hole Volume Caliper Selection	HCAL		
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE		
SHT	Surface Hole Temperature	68	DEGF	
	PERT: Preliminary Evaluation – Real Time			
BHS	Borehole Status	OPEN		
BHT	Bottom Hole Temperature (used in calculations)	182	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	
GRGD	Geothermal Gradient	0.01	DF/F	
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST		
GTSE	Generalized Temperature Selection	HSTS_HTEM		
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE		
SHT	Surface Hole Temperature	68	DEGF	
	STI: Stuck Tool Indicator			
TDL	Total Depth – Logger	7417.00	FT	
	System and Miscellaneous			
BS	Bit Size	7.875	IN	
BSAL	Borehole Salinity	-50000.00	PPM	
CSIZ	Current Casing Size	8.625	IN	
CWEI	Casing Weight	24.00	LB/F	
DFD	Drilling Fluid Density	9.30	LB/G	
DORL	Depth Offset for Repeat Analysis	0.0	FT	
FLEV	Fluid Level	10.00	FT	
MST	Mud Sample Temperature	91.80	DEGF	
RMFS	Resistivity of Mud Filtrate Sample	2.5650	OHMM	
TD	Total Depth	7417	FT	

Format: CZ_COMB_NUC_REP Vertical Scale: 5" per 100' Graphics File Created: 08-Nov-2009 14:06

OP System Version: 17C0-154

HILTB-CTS 17C0-154

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006PUP	FN:4	PRODUCER	08-Nov-2009 14:04	7425.0 FT	6979.0 FT
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Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_007LUP	FN:5	PRODUCER	08-Nov-2009 14:06
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Schlumberger

BEFORE CALIBRATIONS

MAXIS Field Log

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool-CTS Wellsite Calibration – Electronics Calibration Check – Thru Cal Mag. & Phase							
Master: 14-Oct-2009 15:45 Before: 8-Nov-2009 9:35							
Thru Cal Magnitude – 0	0	0.6190	0.6182	N/A	N/A	N/A	V
Thru Cal Magnitude – 1	0	1.271	1.269	N/A	N/A	N/A	V

Thru Cal Magnitude – 2	0	0.6288	0.6279	N/A	N/A	N/A	V
Thru Cal Magnitude – 3	0	0.7114	0.7104	N/A	N/A	N/A	V
Thru Cal Magnitude – 4	0	1.330	1.328	N/A	N/A	N/A	V
Thru Cal Magnitude – 5	0	1.924	1.921	N/A	N/A	N/A	V
Thru Cal Magnitude – 6	0	1.927	1.924	N/A	N/A	N/A	V
Thru Cal Magnitude – 7	0	1.354	1.353	N/A	N/A	N/A	V
Phase – 0	0	68.83	69.18	N/A	N/A	N/A	DEG
Phase – 1	0	67.84	68.19	N/A	N/A	N/A	DEG
Phase – 2	0	63.79	64.14	N/A	N/A	N/A	DEG
Phase – 3	0	62.93	63.27	N/A	N/A	N/A	DEG
Phase – 4	0	56.21	56.55	N/A	N/A	N/A	DEG
Phase – 5	0	54.09	54.44	N/A	N/A	N/A	DEG
Phase – 6	0	54.06	54.40	N/A	N/A	N/A	DEG
Phase – 7	0	48.77	49.12	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool–CTS Wellsite Calibration – Electronics Calibration Check – Auxilliary

Master: 14–Oct–2009 15:45 Before: 8–Nov–2009 9:35

Array Induction SPA Plus	990.5	992.3	991.9	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	–0.2045	–0.2111	N/A	N/A	N/A	MV
Array Induction Temperature PI	0.9150	0.9190	0.9188	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	–0.0002136	–0.0002099	N/A	N/A	N/A	V

High resolution Integrated Logging Tool–CTS Wellsite Calibration – Test Loop Gain Correction

Master: 14–Oct–2009 15:45

Test Loop Gain Magnitude – 0	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 1	0	1.014	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 2	0	1.016	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 3	0	1.012	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 4	0	0.9954	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 5	0	0.9892	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 6	0	0.9939	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 7	0	1.007	N/A	N/A	N/A	N/A	V
Phase – 0	0	0.5554	N/A	N/A	N/A	N/A	DEG
Phase – 1	0	0.5768	N/A	N/A	N/A	N/A	DEG
Phase – 2	0	0.1243	N/A	N/A	N/A	N/A	DEG
Phase – 3	0	0.1020	N/A	N/A	N/A	N/A	DEG
Phase – 4	0	0.02281	N/A	N/A	N/A	N/A	DEG
Phase – 5	0	–0.1240	N/A	N/A	N/A	N/A	DEG
Phase – 6	0	0.1826	N/A	N/A	N/A	N/A	DEG
Phase – 7	0	–0.2352	N/A	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool–CTS Wellsite Calibration – Sonde Error Correction

Master: 14–Oct–2009 15:45

R Sonde Error Correction – 0	0	–64.99	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 1	0	167.6	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	60.33	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 4	0	23.94	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 5	0	14.15	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 6	0	9.818	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 7	0	–1.274	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 0	0	–173.0	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 1	0	158.1	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 2	0	–30.91	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 3	0	–37.92	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 4	0	2.373	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 5	0	17.73	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 6	0	–6.201	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 7	0	–0.1515	N/A	N/A	N/A	N/A	MM/M

High resolution Integrated Logging Tool–CTS Wellsite Calibration – Mud Gain Correction

Master: 14–Oct–2009 15:45

Coarse – Mag, Real, Imag – 0	0	0.8334	N/A	N/A	N/A	N/A
Coarse – Mag, Real, Imag – 1	0	0.8334	N/A	N/A	N/A	N/A
Coarse – Mag, Real, Imag – 2	0	0.8334	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 0	0	0.8350	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 1	0	0.8350	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 2	0	0.8350	N/A	N/A	N/A	N/A

High resolution Integrated Logging Tool–CTS Wellsite Calibration – Stab Measurement Summary

Before: 8–Nov–2009 9:38

BS Window Ratio	0.7614	N/A	0.7594	N/A	N/A	N/A
BS Window Sum	10460	N/A	10450	N/A	N/A	N/A
SS Window Ratio	0.4987	N/A	0.4973	N/A	N/A	N/A
SS Window Sum	9899	N/A	9881	N/A	N/A	N/A
LS Window Ratio	0.2957	N/A	0.2904	N/A	N/A	N/A
LS Window Sum	1040	N/A	1030	N/A	N/A	N/A

High resolution Integrated Logging Tool–CTS Wellsite Calibration – Photo–multiplier High Voltages Calibrations

Before: 8–Nov–2009 9:38

BS PM High Voltage (Command)	1366	N/A	1376	N/A	N/A	N/A	V
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SS PM High Voltage (Command)	1394	N/A	1402	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1529	N/A	1538	N/A	N/A	N/A	V
High resolution Integrated Logging Tool–CTS Wellsite Calibration – Crystal Quality Resolutions Calibration							
Before: 8–Nov–2009 9:38							
BS Crystal Resolution	10.66	N/A	10.70	N/A	N/A	N/A	%
SS Crystal Resolution	9.116	N/A	9.303	N/A	N/A	N/A	%
LS Crystal Resolution	10.07	N/A	9.962	N/A	N/A	N/A	%
High resolution Integrated Logging Tool–CTS Wellsite Calibration – MCFL Calibration							
Before: 8–Nov–2009 9:34							
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	3824	N/A	N/A	N/A	OHMM
High resolution Integrated Logging Tool–CTS Wellsite Calibration – HILT Caliper Calibration							
Before: 8–Nov–2009 9:30							
HILT Caliper Zero Measurement	8.000	N/A	9.833	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	13.93	N/A	N/A	N/A	IN
High resolution Integrated Logging Tool–CTS Wellsite Calibration – Detector Calibration							
Before: 8–Nov–2009 9:30							
Gamma Ray Background	30.00	N/A	79.75	N/A	N/A	N/A	GAPI
Gamma Ray (Jig – Bkg)	179.7	N/A	179.7	N/A	N/A	16.34	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI
High resolution Integrated Logging Tool–CTS Wellsite Calibration – Zero Measurement							
Master: 8–Oct–2009 15:46 Before: 8–Nov–2009 9:32							
CNTC Background	26.41	26.41	26.99	N/A	N/A	3.962	CPS
CFTC Background	28.63	28.63	28.35	N/A	N/A	4.294	CPS
High resolution Integrated Logging Tool–CTS Wellsite Calibration – Ratio Measurement							
Master: 8–Oct–2009 15:46							
Thermal Near Corr. (Tank)	5800	4974	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2024	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.458	N/A	N/A	N/A	N/A	
High resolution Integrated Logging Tool–CTS Wellsite Calibration – Accelerometer Calibration							
Before: 8–Nov–2009 13:12							
Z–Axis Acceleration	32.19	N/A	32.18	N/A	N/A	N/A	F/S2
High resolution Integrated Logging Tool–CTS Master Calibration – Inversion results							
Master: 4–Nov–2009 15:07							
Rho Aluminum	2.596	2.600	--	--	--	--	G/C3
Rho Magnesium	1.686	1.686	--	--	--	--	G/C3
Pe Aluminum	2.570	2.574	--	--	--	--	
Pe Magnesium	2.650	2.619	--	--	--	--	
High resolution Integrated Logging Tool–CTS Master Calibration – Deviation Summary							
Master: 4–Nov–2009 15:07							
BS Average Deviation	0	0.4168	--	--	--	--	%
BS Max Deviation	0	0.7784	--	--	--	--	%
SS Average Deviation	0	0.2279	--	--	--	--	%
SS Max Deviation	0	1.050	--	--	--	--	%
LS Average Deviation	0	0.8168	--	--	--	--	%
LS Max Deviation	0	2.124	--	--	--	--	%
The GLS–VJ source activity is acceptable.							
The HGNS Neutron Master Calibration was done with the following parameters :							
NCT–B Water Temperature	59.8	DEGF.					
Thermal Housing Size	3.332	IN.					
NSR–F serial number	5168						

High resolution Integrated Logging Tool–CTS / Equipment Identification			
Primary Equipment:			
Array Induction Tool – H	AIT – H	397	
Rm/SP Bottom Nose	AHRM – A		
Array Induction Sonde	AHIS – BA	397	
HILT high–Resolution Mechanical Sonde	HRMS – B		
HILT Rxo Gamma–ray Device	HRGD – B	898	
HILT Micro Cylindrically Focused Log Dev	MCFL –		

















Auxiliary Equipment:

High resolution Integrated Logging Tool-CTS Wellsite Calibration							
Electronics Calibration Check - Thru Cal Mag. & Phase							
Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6190		0.6050	68.83		71.00
	Before	0.6182			69.18		
1	Master	1.271		1.270	67.84		70.00
	Before	1.269			68.19		
2	Master	0.6288		0.6230	63.79		66.00
	Before	0.6279			64.14		
3	Master	0.7114		0.7040	62.93		65.00
	Before	0.7104			63.27		
4	Master	1.330		1.337	56.21		59.00
	Before	1.328			56.55		
5	Master	1.924		1.955	54.09		57.00
	Before	1.921			54.44		
6	Master	1.927		1.955	54.06		57.00
	Before	1.924			54.40		
7	Master	1.354		1.415	48.77		53.00
	Before	1.353			49.12		
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom -60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)
Master: 14-Oct-2009 15:45				Before: 8-Nov-2009 9:35			

High resolution Integrated Logging Tool-CTS Wellsite Calibration							
Electronics Calibration Check - Auxiliary							
Phase	Array Induction SPA Plus MV		Value	Phase	Array Induction SPA Zero MV		Value
Master			992.3	Master			-0.2045
Before			991.9	Before			-0.2111
	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			0.9190	Master			-0.0002136
Before			0.9188	Before			-0.0002099
	0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)		-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)
Master: 14-Oct-2009 15:45				Before: 8-Nov-2009 9:35			

High resolution Integrated Logging Tool–CTS Wellsite Calibration						
Test Loop Gain Correction						
Idx	Value	Test Loop Gain Magnitude V			Value	Phase DEG
0	1.015				0.5554	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
1	1.014				0.5768	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
2	1.016				0.1243	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
3	1.012				0.1020	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)

4	0.9954		0.02281			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	0.9892		-0.1240			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	0.9939		0.1826			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.007		-0.2352			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
Master: 14-Oct-2009 15:45						




High resolution Integrated Logging Tool-CTS Wellsite Calibration							
Sonde Error Correction							
Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M	
0	-64.99				-173.0		
		-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)		-2250 (Minimum)	0 (Nominal)
1	167.6				158.1		
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		-625.0 (Minimum)	0 (Nominal)
2	109.7				-30.91		
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		-350.0 (Minimum)	0 (Nominal)
3	60.33				-37.92		
		39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)		-250.0 (Minimum)	0 (Nominal)
4	23.94				2.373		
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		-63.00 (Minimum)	0 (Nominal)
5	14.15				17.73		
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		-50.00 (Minimum)	0 (Nominal)
6	9.818				-6.201		
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		-30.00 (Minimum)	0 (Nominal)
7	-1.274				-0.1515		
		-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		-30.00 (Minimum)	0 (Nominal)
Master: 14-Oct-2009 15:45							

High resolution Integrated Logging Tool-CTS Wellsite Calibration							
Mud Gain Correction							
Idx	Value	Coarse – Mag, Real, Imag			Value	Fine – Mag, Real, Imag	
0	0.8334				0.8350		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)
1	0.8334				0.8350		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)
2	0.8334				0.8350		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)
Master: 14-Oct-2009 15:45							




High resolution Integrated Logging Tool-CTS Wellsite Calibration									
Stab Measurement Summary									
Phase	BS Window Ratio			Value	Phase	SS Window Ratio			Value
Before				0.7594	Before				0.4973
	0.7234 (Minimum)	0.7614 (Nominal)	0.7995 (Maximum)			0.4738 (Minimum)	0.4987 (Nominal)	0.5236 (Maximum)	
Phase	BS Window Sum CPS			Value	Phase	SS Window Sum CPS			Value
Before				10450	Before				9881
	10000 (Minimum)	10450 (Nominal)	11000 (Maximum)			9500 (Minimum)	9881 (Nominal)	10200 (Maximum)	
Phase	LS Window Ratio			Value	Phase	LS Window Sum CPS			Value
Before				0.2904	Before				1030
	0.2809 (Minimum)	0.2957 (Nominal)	0.3105 (Maximum)			1000 (Minimum)	1030 (Nominal)	1060 (Maximum)	

9932 (Minimum)	10460 (Nominal)	10980 (Maximum)	9404 (Minimum)	9899 (Nominal)	10390 (Maximum)	988.2 (Minimum)	1040 (Nominal)	1092 (Maximum)
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Before: 8–Nov–2009 9:38

High resolution Integrated Logging Tool–CTS 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				1376	Before				1402	Before				1538
	1266 (Minimum)	1366 (Nominal)	1466 (Maximum)		1294 (Minimum)	1394 (Nominal)	1494 (Maximum)		1429 (Minimum)	1529 (Nominal)	1629 (Maximum)			
Before: 8–Nov–2009 9:38														

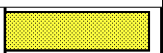
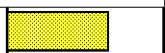
Before: 8–Nov–2009 9:38

High resolution Integrated Logging Tool–CTS Wellsite Calibration											
Crystal Quality Resolutions Calibration											
Phase	BS Crystal Resolution %		Value	Phase	SS Crystal Resolution %		Value	Phase	LS Crystal Resolution %		Value
Before			10.70	Before			9.303	Before			9.962
	9.659 (Minimum)	10.66 (Nominal)	11.66 (Maximum)		8.116 (Minimum)	9.116 (Nominal)	10.12 (Maximum)		9.069 (Minimum)	10.07 (Nominal)	11.07 (Maximum)
Before: 8-Nov-2009 9:38											

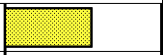
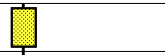
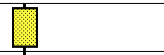
Before: 8–Nov–2009 9:38

High resolution Integrated Logging Tool–CTS 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				3824
	3565 (Minimum)	3875 (Nominal)	4185 (Maximum)		3524 (Minimum)	3830 (Nominal)	4136 (Maximum)			3524 (Minimum)	3830 (Nominal)	4136 (Maximum)		
Before: 8–Nov–2009 9:34														





Before: 8–Nov–2009 9:34

High resolution Integrated Logging Tool–CTS Wellsite Calibration							
HILT Caliper Calibration							
Phase	HILT Caliper Zero Measurement IN		Value	Phase	HILT Caliper Plus Measurement IN		Value
Before			9.833	Before			13.93
	6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)		9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)
Before: 8–Nov–2009 9:30							

Before: 8–Nov–2009 9:30

High resolution Integrated Logging Tool–CTS Wellsite Calibration														
Detector Calibration														
Phase	Gamma Ray Background GAPI			Value	Phase	Gamma Ray (Jig – Bkg) GAPI			Value	Phase	Gamma Ray (Calibrated) GAPI			Value
Before				79.75	Before				179.7	Before				165.0
	0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)		163.4 (Minimum)	179.7 (Nominal)	196.1 (Maximum)			150.0 (Minimum)	165.0 (Nominal)	180.0 (Maximum)		
Before: 8–Nov–2009 9:30														

Before: 8–Nov–2009 9:30


High resolution Integrated Logging Tool–CTS Wellsite Calibration							
Zero Measurement							
Phase	CNTC Background CPS		Value	Phase	CFTC Background CPS		Value
Master			26.41	Master			28.63
Before			26.99	Before			28.35
5.000 (Minimum)			26.41 (Nominal)	40.00 (Maximum)			
Master: 8–Oct–2009 15:46				Before: 8–Nov–2009 9:32			


Master: 8–Oct–2009 15:46

















Before: 8–Nov–2009 9:32





High resolution Integrated Logging Tool–CTS Wellsite Calibration														
Ratio 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>			4974	Master	<div><div></div></div>			2024	Master	<div><div></div></div>			2.458
	4700 (Minimum)	5800 (Nominal)	6900 (Maximum)		1900 (Minimum)	2400 (Nominal)	2900 (Maximum)			2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)		
Master: 8–Oct–2009 15:46														

















Master: 8–Oct–2009 15:46

High resolution Integrated Logging Tool–CTS Wellsite Calibration		
Accelerometer Calibration		
Phase	Z–Axis Acceleration F/S2	Value
		

















Before		32.18
31.53 (Minimum)	32.19 (Nominal)	32.84 (Maximum)
Before: 8-Nov-2009 13:12		

High resolution Integrated Logging Tool-CTS Master Calibration							
Electronics Calibration Check – Thru Cal Mag. & Phase							
Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6190		0.6050	68.83		71.00
1	Master	1.271		1.270	67.84		70.00
2	Master	0.6288		0.6230	63.79		66.00
3	Master	0.7114		0.7040	62.93		65.00
4	Master	1.330		1.337	56.21		59.00
5	Master	1.924		1.955	54.09		57.00
6	Master	1.927		1.955	54.06		57.00
7	Master	1.354		1.415	48.77		53.00
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom -60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)
Master: 14-Oct-2009 15:45							

High resolution Integrated Logging Tool-CTS Master Calibration							
Electronics Calibration Check – Auxilliary							
Phase	Array Induction SPA Plus MV		Value	Phase	Array Induction SPA Zero MV		Value
Master			992.3	Master			-0.2045
	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			0.9190	Master			-0.0002136
	0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)		-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)
Master: 14-Oct-2009 15:45							







High resolution Integrated Logging Tool-CTS Master Calibration							
Test Loop Gain Correction							
Idx	Value	Test Loop Gain Magnitude V			Value	Phase DEG	
0	1.015				0.5554		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.014				0.5768		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
2	1.016				0.1243		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.012				0.1020		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
4	0.9954				0.02281		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	0.9892				-0.1240		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	0.9939				0.1826		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.007				-0.2352		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
Master: 14-Oct-2009 15:45							

High resolution Integrated Logging Tool-CTS Master Calibration					
Sonde Error Correction					





Sonde Error Correction							
Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M	
0	-64.99				-173.0		
		-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)		-2250 (Minimum)	0 (Nominal) 2250 (Maximum)
1	167.6				158.1		
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		-625.0 (Minimum)	0 (Nominal) 625.0 (Maximum)
2	109.7				-30.91		
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		-350.0 (Minimum)	0 (Nominal) 350.0 (Maximum)
3	60.33				-37.92		
		39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)		-250.0 (Minimum)	0 (Nominal) 250.0 (Maximum)
4	23.94				2.373		
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		-63.00 (Minimum)	0 (Nominal) 63.00 (Maximum)
5	14.15				17.73		
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		-50.00 (Minimum)	0 (Nominal) 50.00 (Maximum)
6	9.818				-6.201		
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		-30.00 (Minimum)	0 (Nominal) 30.00 (Maximum)
7	-1.274				-0.1515		
		-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		-30.00 (Minimum)	0 (Nominal) 30.00 (Maximum)

Master: 14-Oct-2009 15:45

Master: 14-Oct-2009 15:45

High resolution Integrated Logging Tool-CTS Master Calibration								
Mud Gain Correction								
Idx	Value	Coarse – Mag, Real, Imag			Value	Fine – Mag, Real, Imag		
0	0.8334				0.8350			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	0.8334				0.8350			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	0.8334				0.8350			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
Master: 14-Oct-2009 15:45								



Master: 14-Oct-2009 15:45

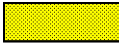
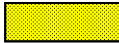
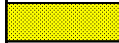
High resolution Integrated Logging Tool-CTS Master Calibration									
Inversion results									
Phase	Rho Aluminum G/C3			Value	Phase	Rho Magnesium G/C3			Value
Master				2.600	Master				1.686
	2.586 (Minimum)	2.596 (Nominal)	2.606 (Maximum)			1.676 (Minimum)	1.686 (Nominal)	1.696 (Maximum)	
Phase	Pe Aluminum			Value	Phase	Pe Magnesium			Value
Master				2.574	Master				2.619
	2.470 (Minimum)	2.570 (Nominal)	2.670 (Maximum)			2.550 (Minimum)	2.650 (Nominal)	2.750 (Maximum)	
Master: 4-Nov-2009 15:07									

Master: 4-Nov-2009 15:07

High resolution Integrated Logging Tool-CTS Master Calibration														
Deviation Summary														
Phase	BS Average Deviation %			Value	Phase	SS Average Deviation %			Value	Phase	LS Average Deviation %			Value
Master	<div><div></div></div>			0.4168	Master	<div><div></div></div>			0.2279	Master	<div><div></div></div>			0.8168
	-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>			0.7784	Master	<div><div></div></div>			1.050	Master	<div><div></div></div>			2.124
	-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-Nov-2009 15:07														

Master: 4-Nov-2009 15:07

High resolution Integrated Logging Tool–CTS Master Calibration									
Zero Measurement									
Phase	CNTC Background CPS			Value	Phase	CFTC Background CPS			Value
Master				26.41	Master				28.63
	5.000 (Minimum)	26.41 (Nominal)	40.00 (Maximum)			5.000 (Minimum)	28.63 (Nominal)	40.00 (Maximum)	
Master: 8–Oct–2009 15:46									

High resolution Integrated Logging Tool–CTS Master Calibration														
Tank Measurement														
Phase	Thermal Near Corr. (Tank) CPS			Value	Phase	Thermal Far Corr. (Tank) CPS			Value	Phase	CNTC/CFTC (Tank)			Value
Master				4974	Master				2024	Master				2.458
	4700 (Minimum)	5800 (Nominal)	6900 (Maximum)		1900 (Minimum)	2400 (Nominal)	2900 (Maximum)			2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)		
Master: 8–Oct–2009 15:46														

Company:

Orr Energy LLC

Well:

Spencer 21–14

Field:

Wattenberg

County:

Weld

State:

Colorado

Schlumberger

Platform Express

Triple Combo