Low Density Rural	
Rural Density Suburban	
Low Density Suburban	
Medium Density Suburban	
Urban Density	
Low Density Urban	
Medium Density Urban	
High Density Urban	
Wildland Urban Interface	
Residential	
Commercial	
Industrial	
Mixed Use	
Public	
Open Space	
Agricultural	
Water	
Vacant	
Other	
Low Density Rural	
Rural Density Suburban	
Low Density Suburban	
Medium Density Suburban	
Low Density Urban	
Medium Density Urban	
High Density Urban	
Residential	
Commercial	
Industrial	
Mixed Use	
Public	
Open Space	
Agricultural	
Water	
Vacant	
Other	
Low Density Rural	
Rural Density Suburban	
Low Density Suburban	
Medium Density Suburban	
Low Density Urban	
Medium Density Urban	
High Density Urban	
Residential	
Commercial	
Industrial	
Mixed Use	
Public	
Open Space	
Agricultural	
Water	
Vacant	
Other	

MUD

County: GARFIELD

Schlumberger

Company: **ORION ENERGY PARTNERS**

Well: **HILTON 23−1**

Field: **WILDCAT**

County: **GARFIELD** State: **COLORADO**

PLATFORM EXPRESS
ARRAY INDUCTION TOOL
GAMMA RAY − SP

Company: ORION ENERGY PARTNERS
Well: HILTON 23−1
Location: SEC. 23, T6S−R91W
Field: WILDCAT

LOCATION

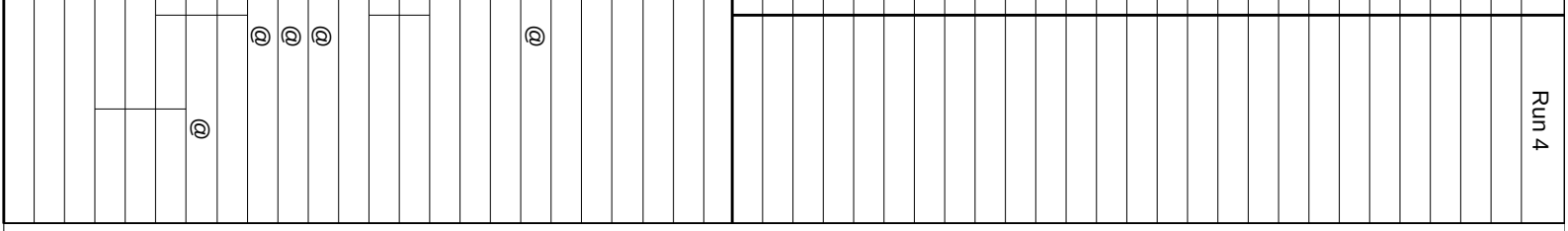
SEC. 23, T6S−R91W
SHL: SESW 793' FSL & 1875' FWL

Elev.: K.B. 6343.70 ft
G.L. 6326.70 ft
D.F. 6342.70 ft

Permanent Datum: GROUND LEVEL Elev.: 6326.70 ft
Log Measured From: KELLY BUSHING 17.00 ft above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.	Section	Township	Range
05−045−16111−0000	23	6S	91W

	Run 1	Run 2	Run 3
Logging Date	13−Aug−2008		
Run Number	1		
Depth Driller	8410 ft		
Schlumberger Depth	8411 ft		
Bottom Log Interval	8411 ft		
Top Log Interval	1036 ft		
Casing Driller Size @ Depth	8.625 in @ 1040 ft	@	
Casing Schlumberger	1036 ft		
Bit Size	7.875 in		
Type Fluid In Hole	WATER BASED MUD		
MUD Density / Viscosity	9.8 lbm/gal / 61 s		
MUD Fluid Loss / PH	6.4 cm3 / 9.2		
MUD Source Of Sample	MUD PIT		
RM @ Measured Temperature	1.980 ohm.m @ 93 degF	@	
RMF @ Measured Temperature	1.584 ohm.m @ 93 degF	@	
RMC @ Measured Temperature	2.376 ohm.m @ 93 degF	@	
Source RMF / RMC	CALCULATED / CALCULATED		
RM @ MRT / RMF @ MRT	0.955 @ 200 / 0.764 @ 200	@ / @	@ / @
Maximum Recorded Temperatures	200 degF		
Circulation Stopped Time	13−Aug−2008 4:00		
Logger On Bottom Time	13−Aug−2008 15:10		
Unit Number / Location	7060 GRAND JUNCTION, CO		
Recorded By	MIKE ARNETT		
Witnessed By	JEFF CIHAK		



DEPTH SUMMARY LISTING

Date Created: 13−AUG−2008 18:07:11

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−B/A	Type:	7−39P LXS
Serial Number:	812	Serial Number:	3040	Serial Number:	6177
Calibration Date:	8−MAY−2008	Calibration Date:	17−JUL−2008	Length:	13300 FT
Calibrator Serial Number:	1	Calibrator Serial Number:	1159		
Calibration Cable Type:	7−39P LXS	Calibration Gain:	0.97	Conveyance Method:	Wireline
Wheel Correction 1:	−1	Calibration Offset:	142.00	Rig Type:	LAND
Wheel Correction 2:	−5				

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	234.70 FT
Rig Up Length At Bottom:	234.60 FT
Rig Up Length Correction:	0.10 FT
Stretch Correction:	10.00 FT
Tool Zero Check At Surface:	1.30 FT

Depth Control Remarks

1. ALL SCHLUMBERGER DEPTH CONTROL POLICIES APPLIED
2. IDW USED AS PRIMARY DEPTH REFERENCE, Z−CHART USED AS SECONDARY DEPTH REFEREN(
3.
4.
5.
6.

OTHER SERVICES1	OTHER SERVICES2
OS1: CEMENT VOLUME	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
THIS IS THE FIRST RUN IN WELL	
TOOLSTRING RUN AS PER TOOLSKETCH	
AIT RAN WITH TWO 1" STANDOFFS	
HGNS RAN WITH TWO .125" WEAR RINGS	
NEUTRON CORRECTIONS APPLIED: HOLE SIZE & STANDOFF	
MATRIX: SANDSTONE (2.68 G/CC)	
MAXIMUM RECORDED TEMPERATURE: 200 DEGF	

RIG: PATTERSON 500

YOUR CREW: QUOC, RON, & ROB

THANK YOU FOR CHOOSING SCHLUMBERGER!

RUN 1		RUN 2	
SERVICE ORDER #:	AN27−00058	SERVICE ORDER #:	
PROGRAM VERSION:	16C0−147	PROGRAM VERSION:	
FLUID LEVEL:	5 ft	FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

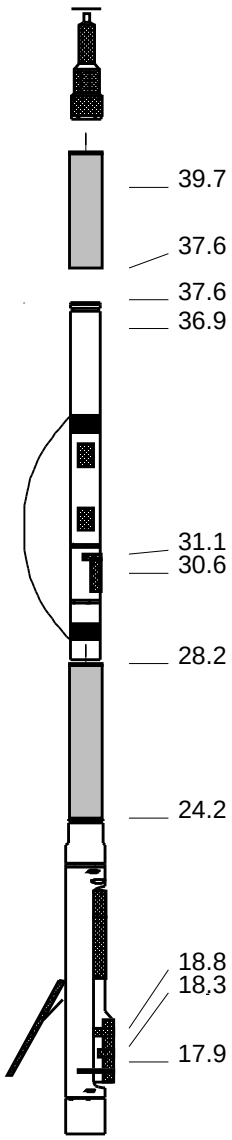
EQUIPMENT DESCRIPTION

RUN 1 RUN 2

SURFACE EQUIPMENT

GSR−U/Y
NCT−B
CNB−AB
NCS−VB
WITM (DTS)−A

DOWNHOLE EQUIPMENT

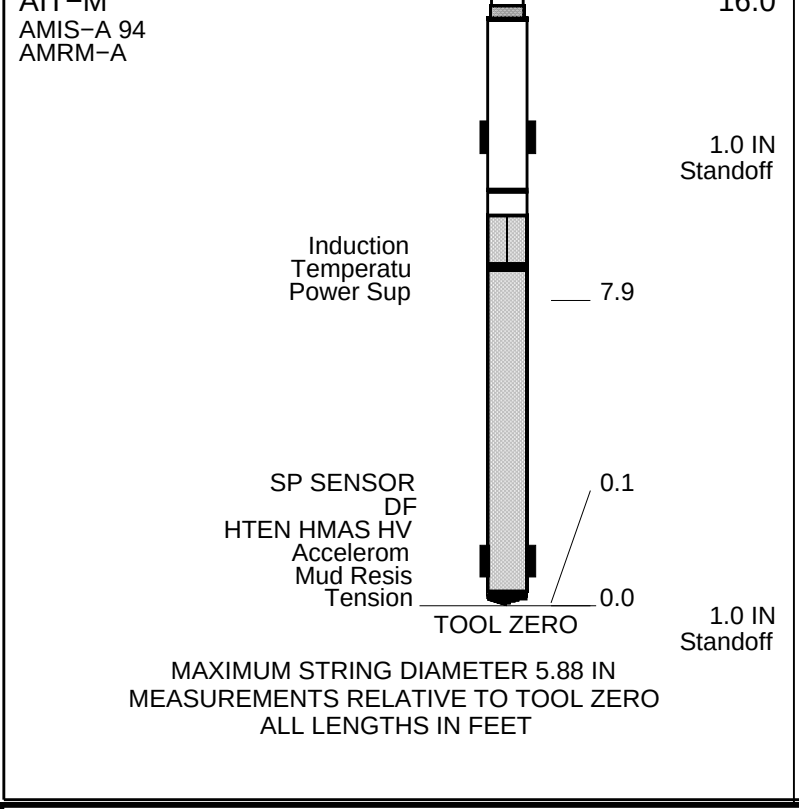


LEH−QT 43.6
LEH−QT

DTC−H 40.6
ECH−KC
DTCH0−A
DTCH1−A

HILTH−FTB 37.6
HGNSD−H
HMCA−H
HGNH
NLS−KL
NSR−F 2549
HACCZ−H 3616
HCNT−H
HGR
HRCC−H
HRMS−H
HRGD−H
GLS−VJ 5182
MCFL Device−H
HILT Nucl. LS−H 28998
HILT Nucl. SS−H 42067
HILT Nucl. BS−H 41036
BOW−SPR
NPV−N

AIT−M 16.0



Schlumberger

MAIN PASS

MAXIS Field Log

Company: ORION ENERGY PARTNERS **Well: HILTON 23−1**

Input DLIS Files

DEFAULT	**AIT_TLD_MCFL_CNL_011LUP**	**FN:10**	**PRODUCER**	**13−Aug−2008 15:10**	**8412.0 FT**	**142.0 FT**

Output DLIS Files

DEFAULT	**AIT_TLD_MCFL_CNL_014PUP**	**FN:13**	**PRODUCER**	**13−Aug−2008 18:02**	**8438.0 FT**	**168.0 FT**

Integrated Hole/Cement Volume Summary

Hole Volume = 3114.64 F3

Cement Volume = 2204.25 F3 (assuming 4.50 IN casing O.D.)

Computed from 8411.0 FT to 168.5 FT using data channel(s) HCAL

OP System Version: 16C0−147

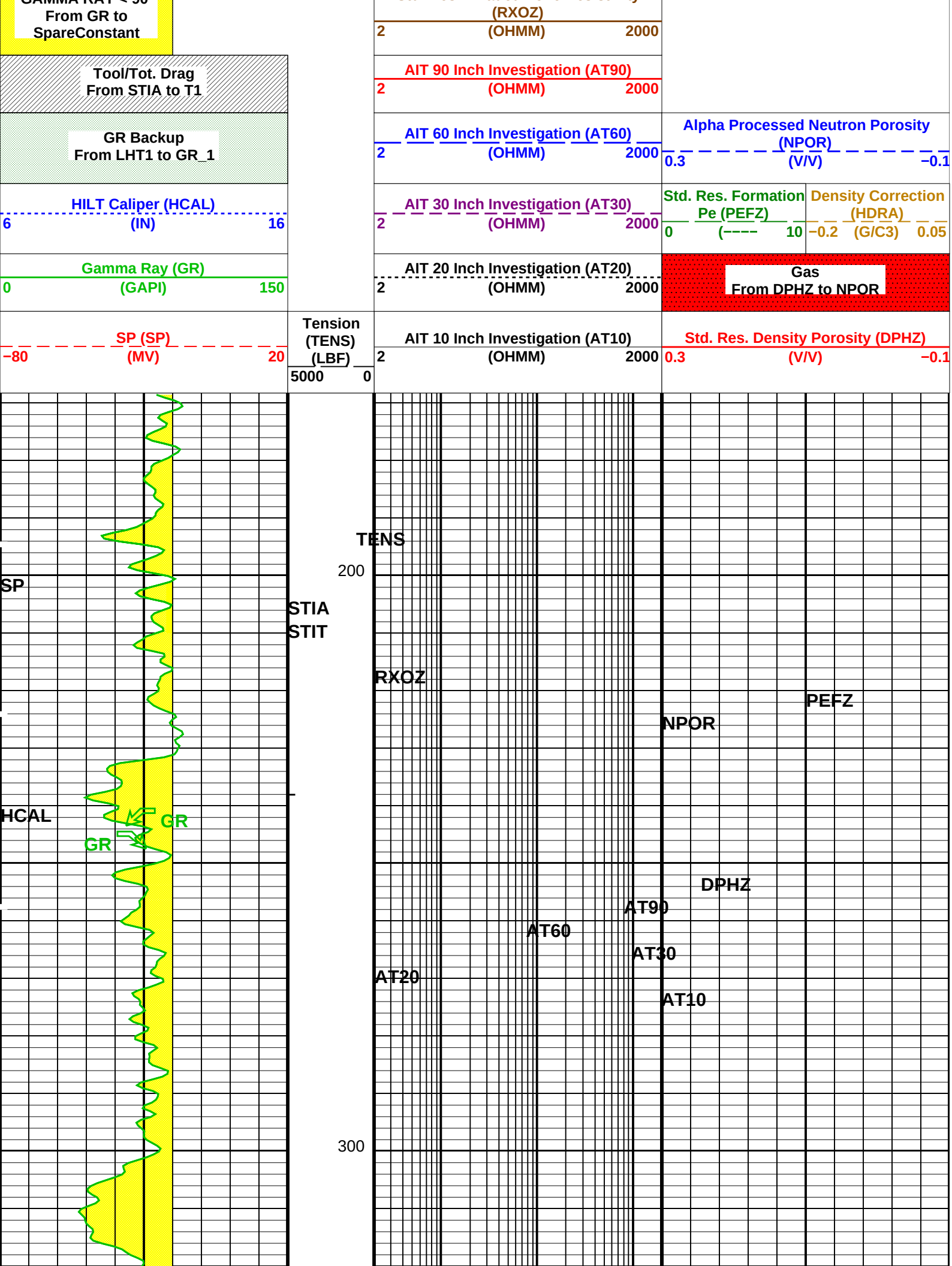
MCM

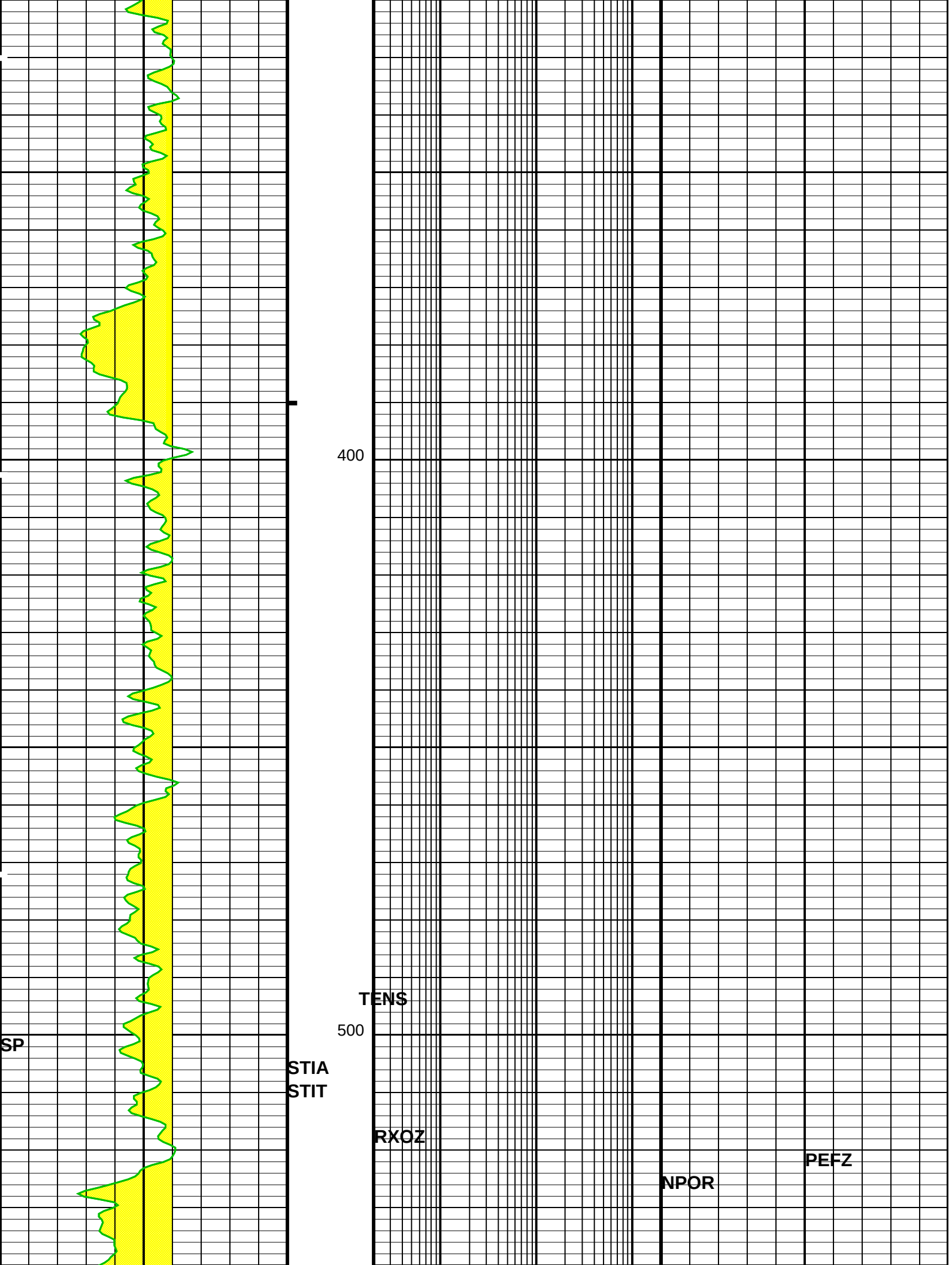
AIT−M	**SRPC−3547−Q1_2008_OP16**	**HILTH−FTB**	**SRPC−3557−FEB_2008**
DTC−H	**SRPC−3547−Q1_2008_OP16**		

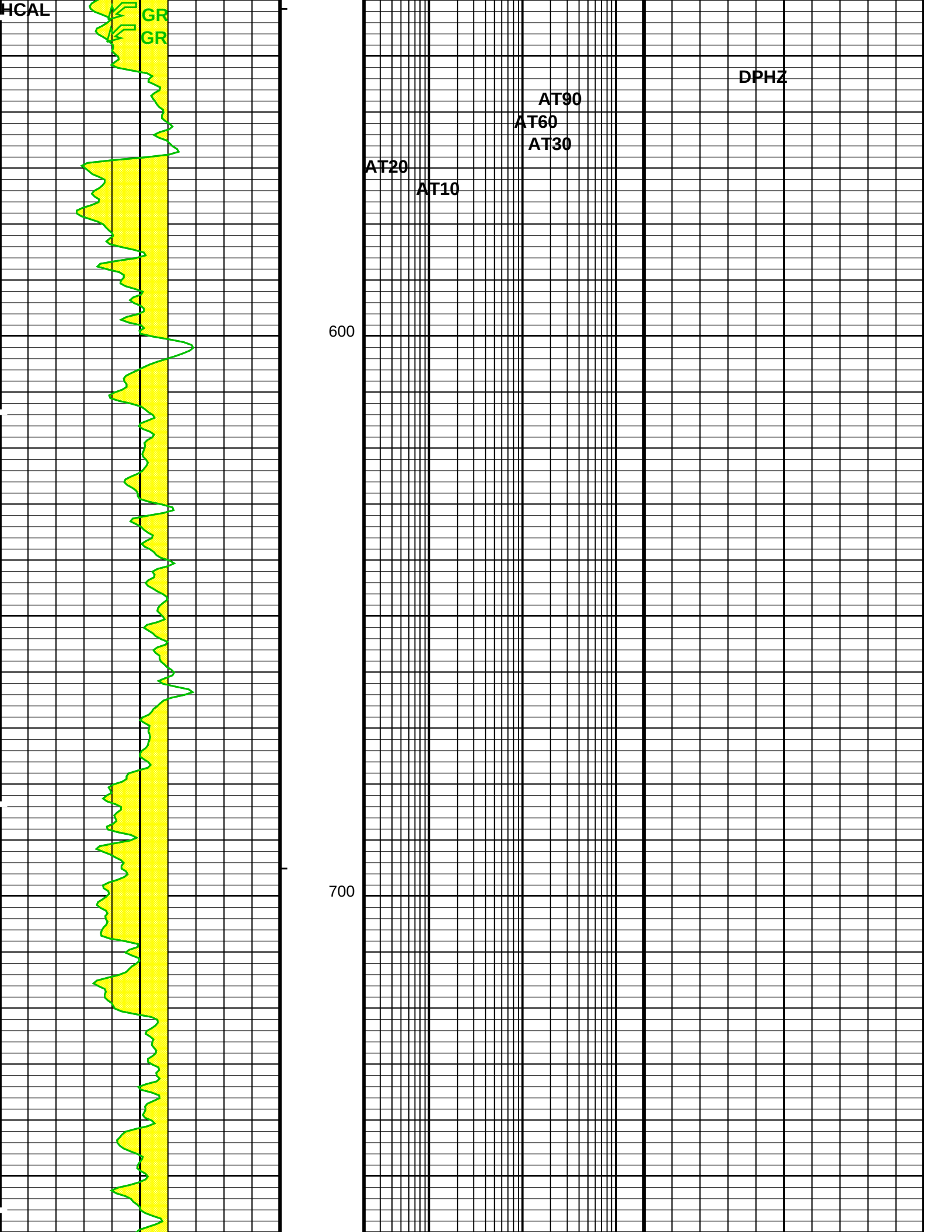
PIP SUMMARY

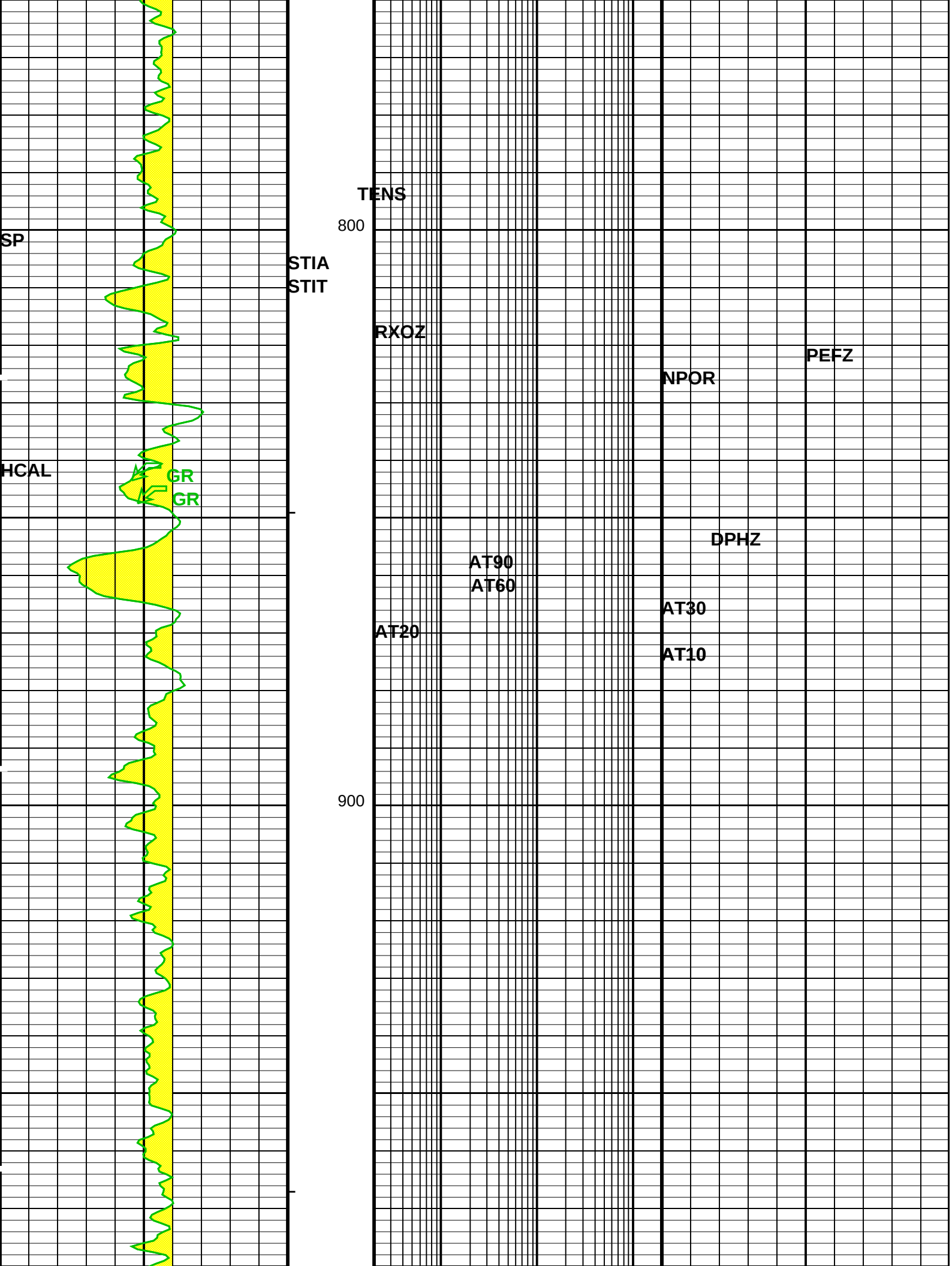
Integrated Hole Volume Minor Pip Every 10 F3
Integrated Hole Volume Major Pip Every 100 F3
Integrated Cement Volume Minor Pip Every 10 F3
Integrated Cement Volume Major Pip Every 100 F3
Time Mark Every 60 S

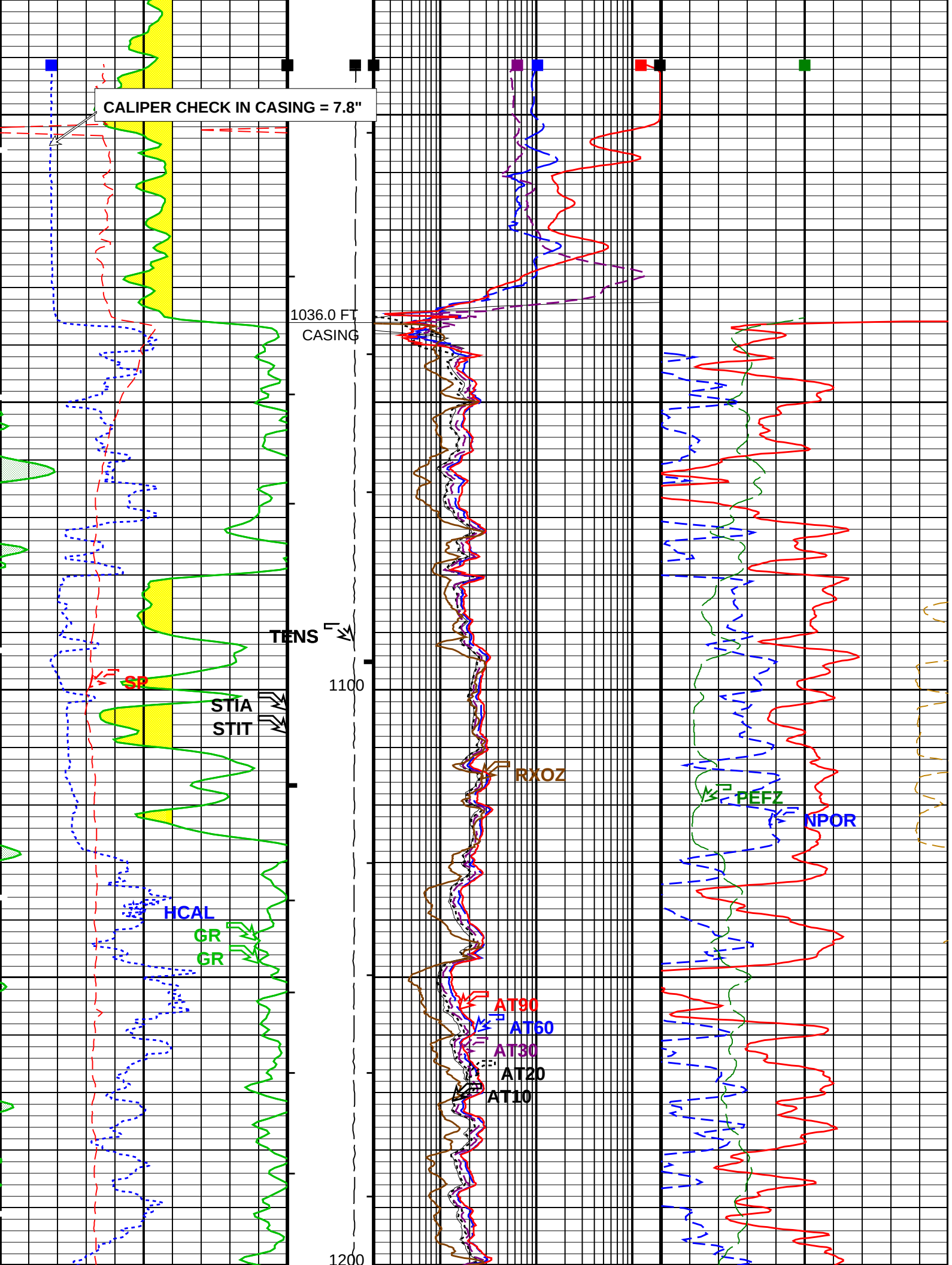
GAMMA RAY < 90 | Std. Res. Invaded Zone Resistivity

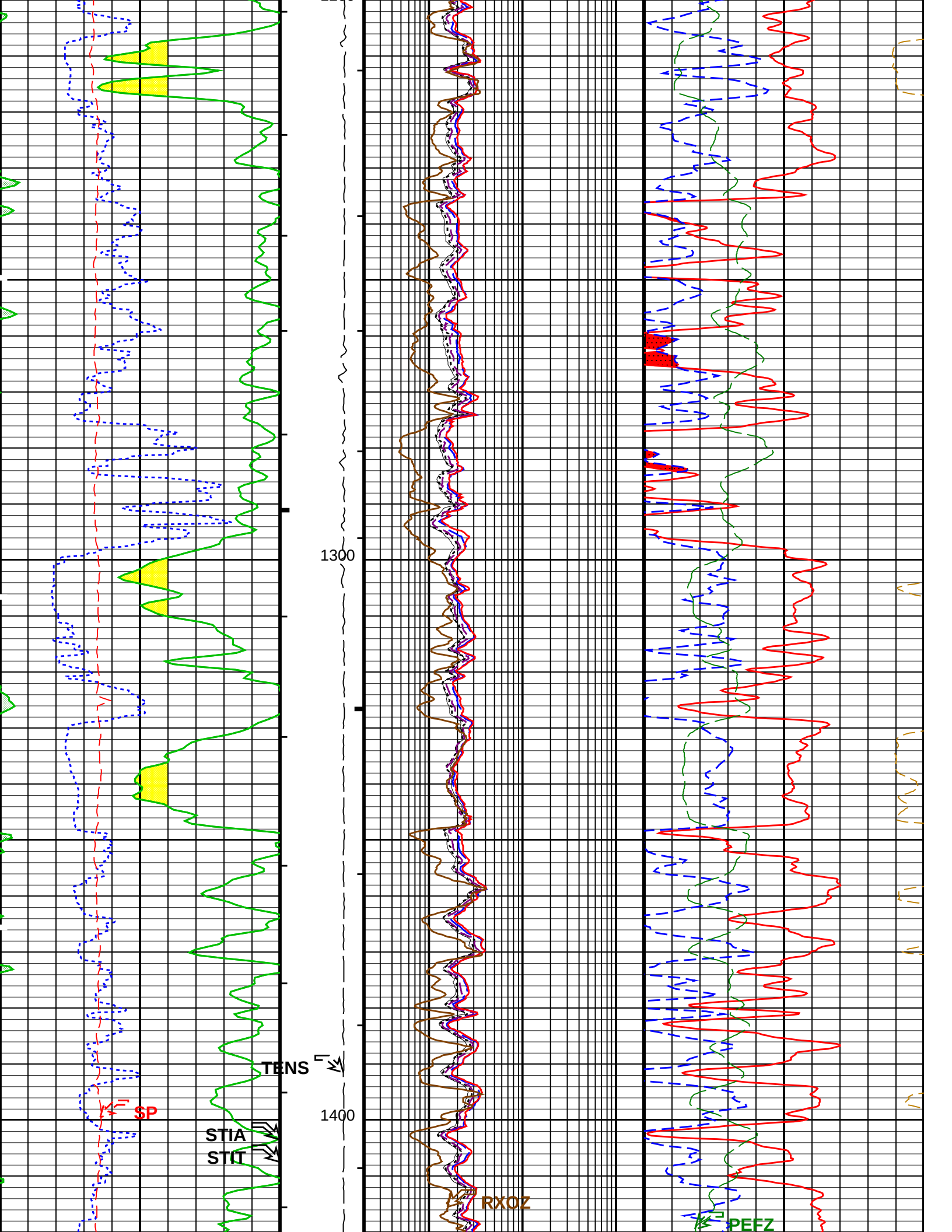

GAMMA RAY < 90
From GR to SpareConstant
Tool/Tot. Drag From STIA to T1
GR Backup From LHT1 to GR_1
HILT Caliper (HCAL)
6 (IN) 16
Gamma Ray (GR)
0 (GAPI) 150
SP (SP)
−80 (MV) 20
(RXOZ)
2 (OHMM) 2000
AIT 90 Inch Investigation (AT90)
2 (OHMM) 2000
AIT 60 Inch Investigation (AT60)
2 (OHMM) 2000
AIT 30 Inch Investigation (AT30)
2 (OHMM) 2000
AIT 20 Inch Investigation (AT20)
2 (OHMM) 2000
Tension (TENS) (LBF)
5000 0
AIT 10 Inch Investigation (AT10)
2 (OHMM) 2000
Alpha Processed Neutron Porosity (NPOR)
0.3 (V/V) −0.1
Std. Res. Formation Pe (PEFZ)
0 (---- 10
Density Correction (HDRA)
−0.2 (G/C3) 0.05
Gas From DPHZ to NPOR
Std. Res. Density Porosity (DPHZ)
0.3 (V/V) −0.1
TENS
200
SP
STIA
STIT
RXOZ
PEFZ
NPOR
HCAL
GR
GR
DPHZ
AT90
AT60
AT30
AT20
AT10
300

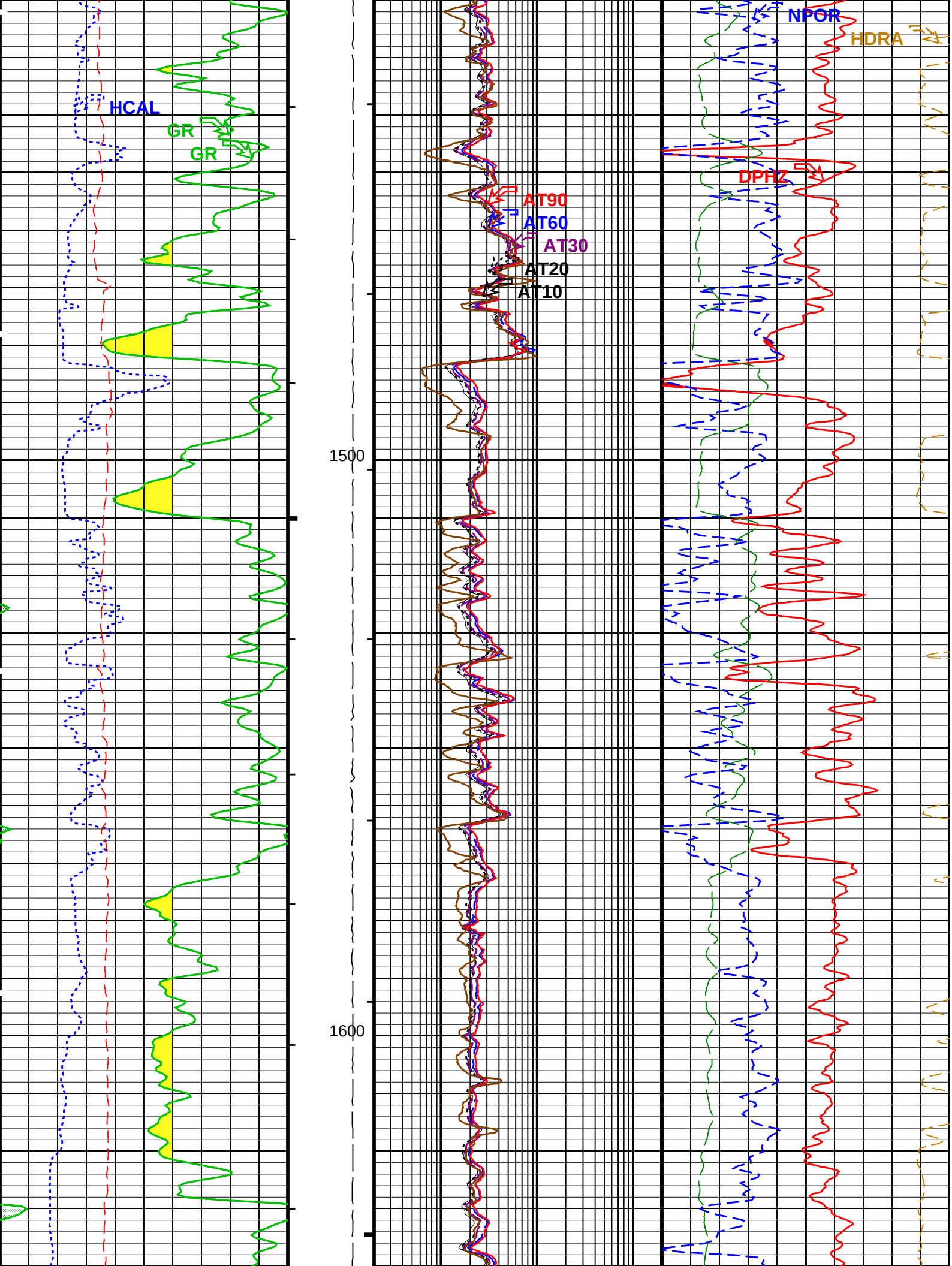

400
TENS
500
SP
STIA
STIT
RXOZ
PEFZ
NPOR

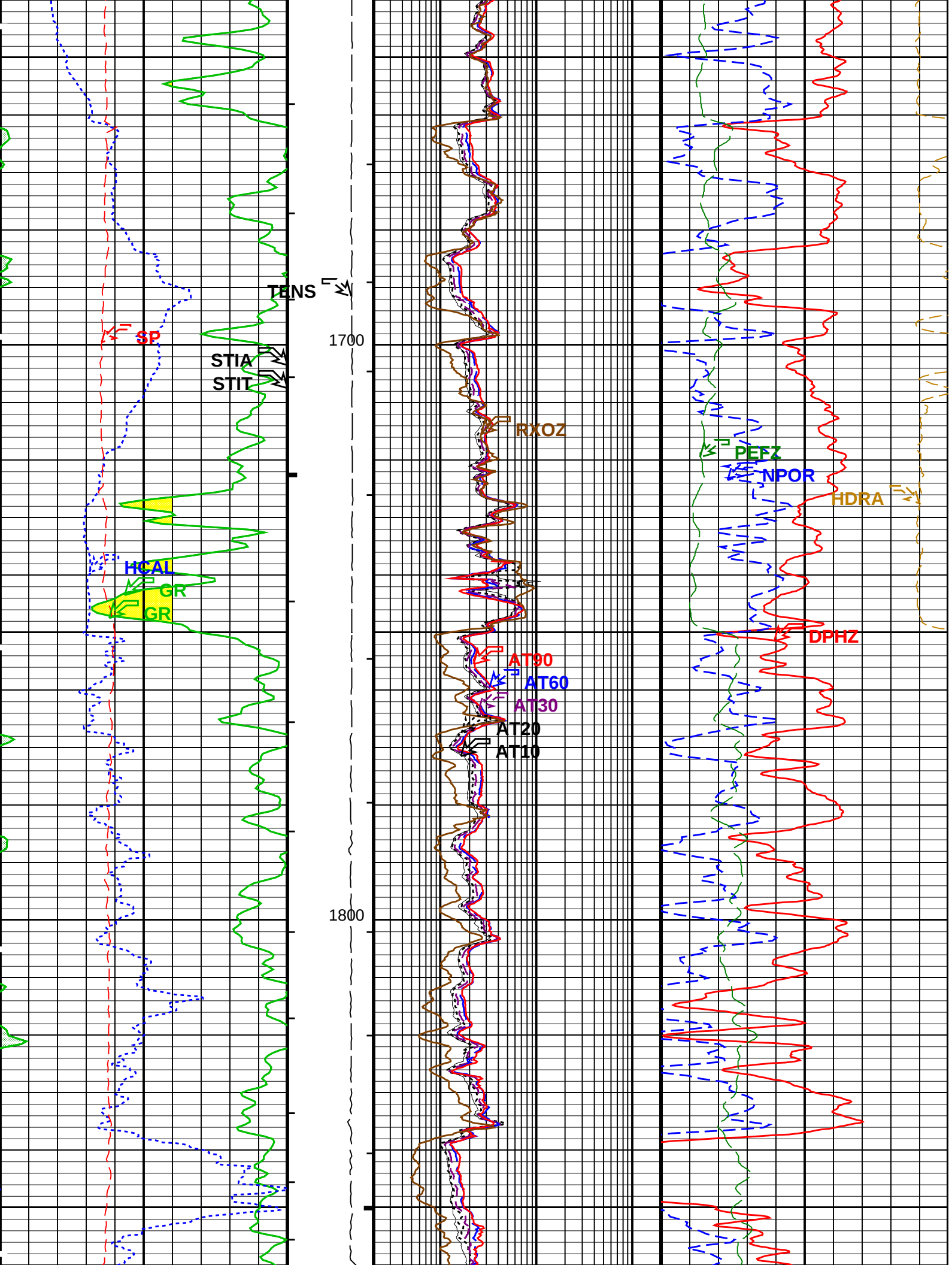

HCAL
GR
GR
DPHZ
AT90
AT60
AT30
AT20
AT10
600
700

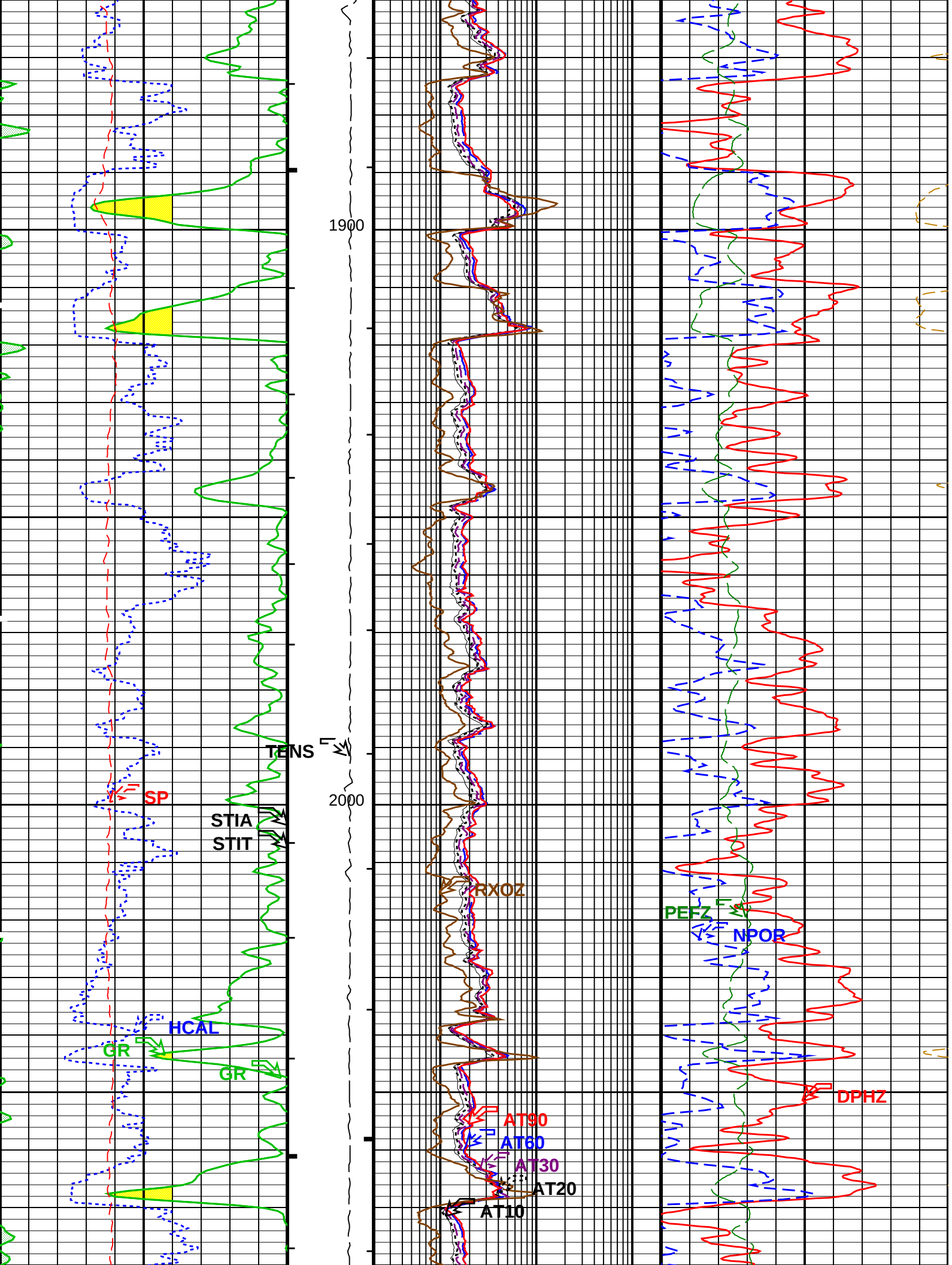

TENS
800
SP
STIA
STIT
RXOZ
PEFZ
NPOR
HCAL
GR
GR
DPHZ
AT90
AT60
AT30
AT20
AT10
900

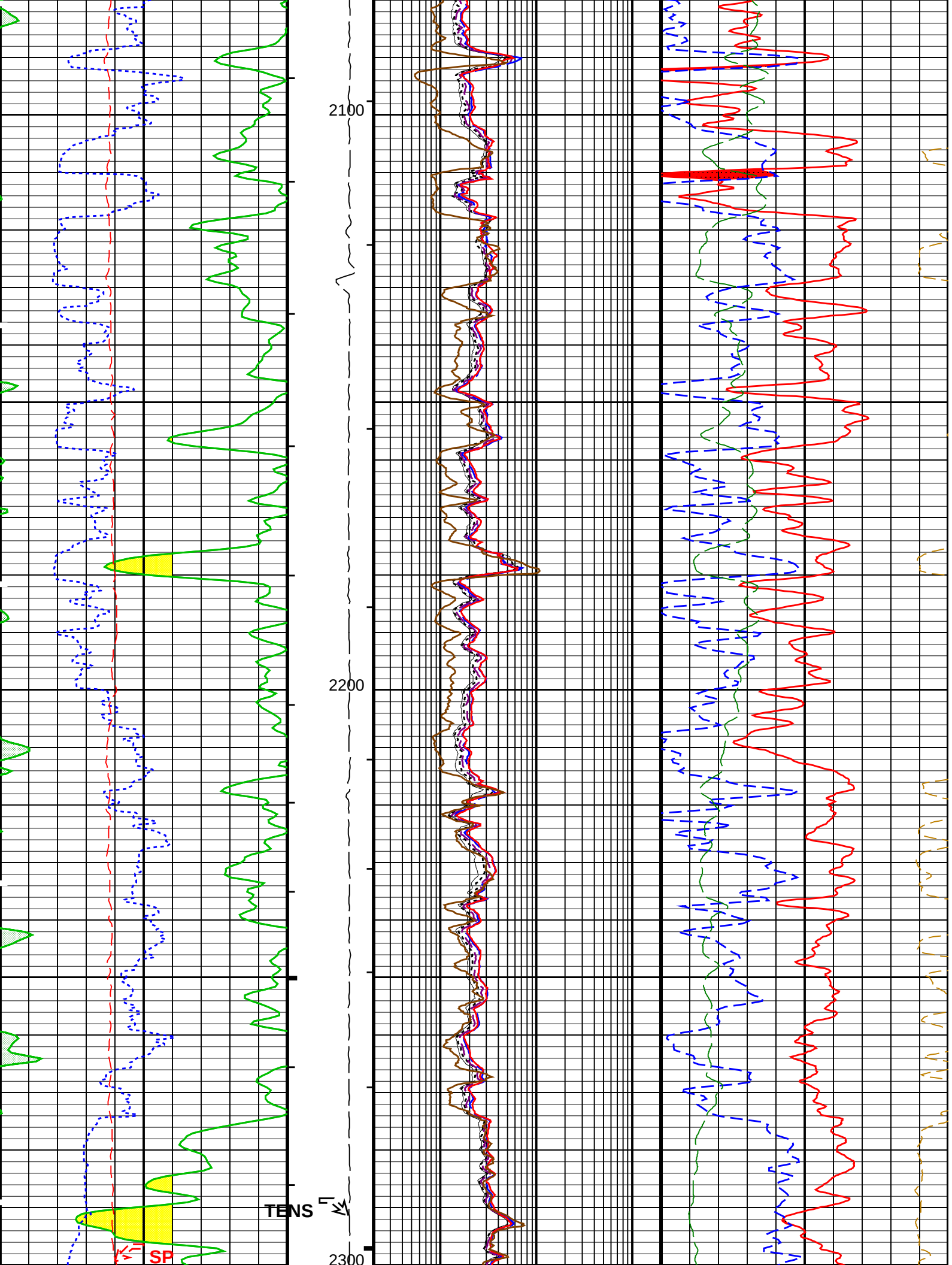

CALIPER CHECK IN CASING = 7.8"
1036.0 FT
CASING
TENS
SP
STIA
STIT
RXOZ
PEFZ
NPOR
HCAL
GR
GR
AT90
AT60
AT30
AT20
AT10
1100
1200

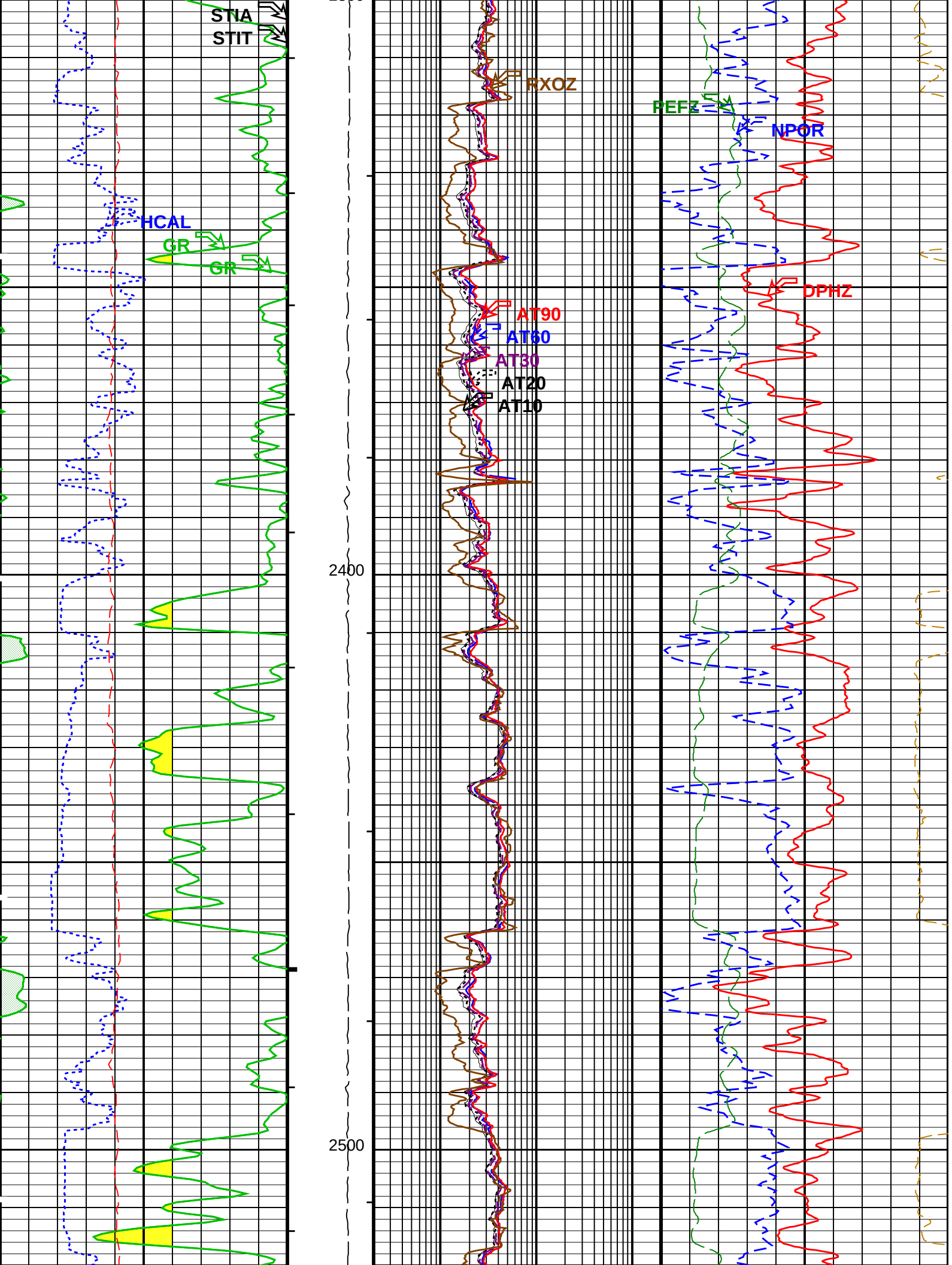

1300
1400
TENS
SP
STIA
STIT
RXOZ
PEFZ

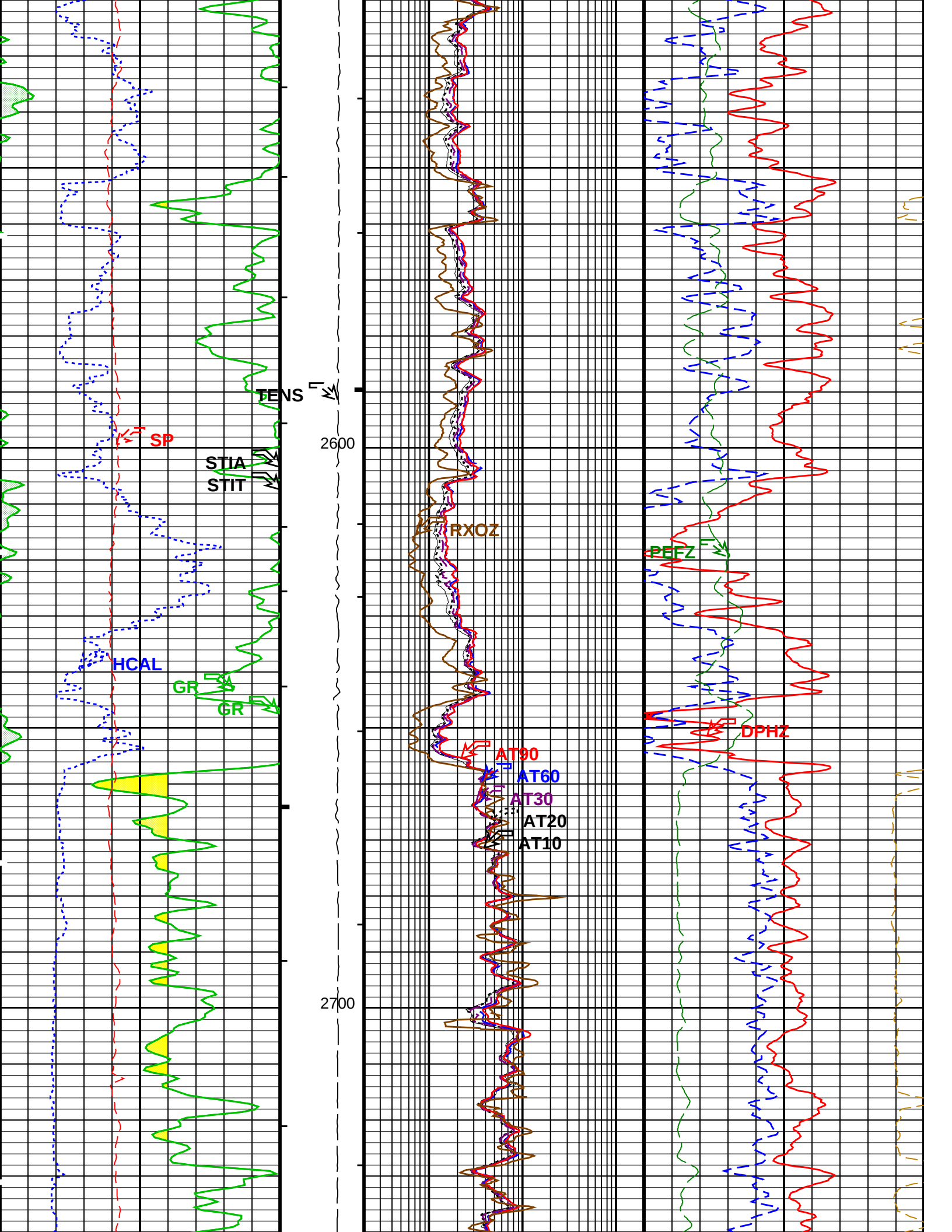

HCAL
GR
GR
AT90
AT60
AT30
AT20
AT10
NPOR
HDRA
DPHZ
1500
1600

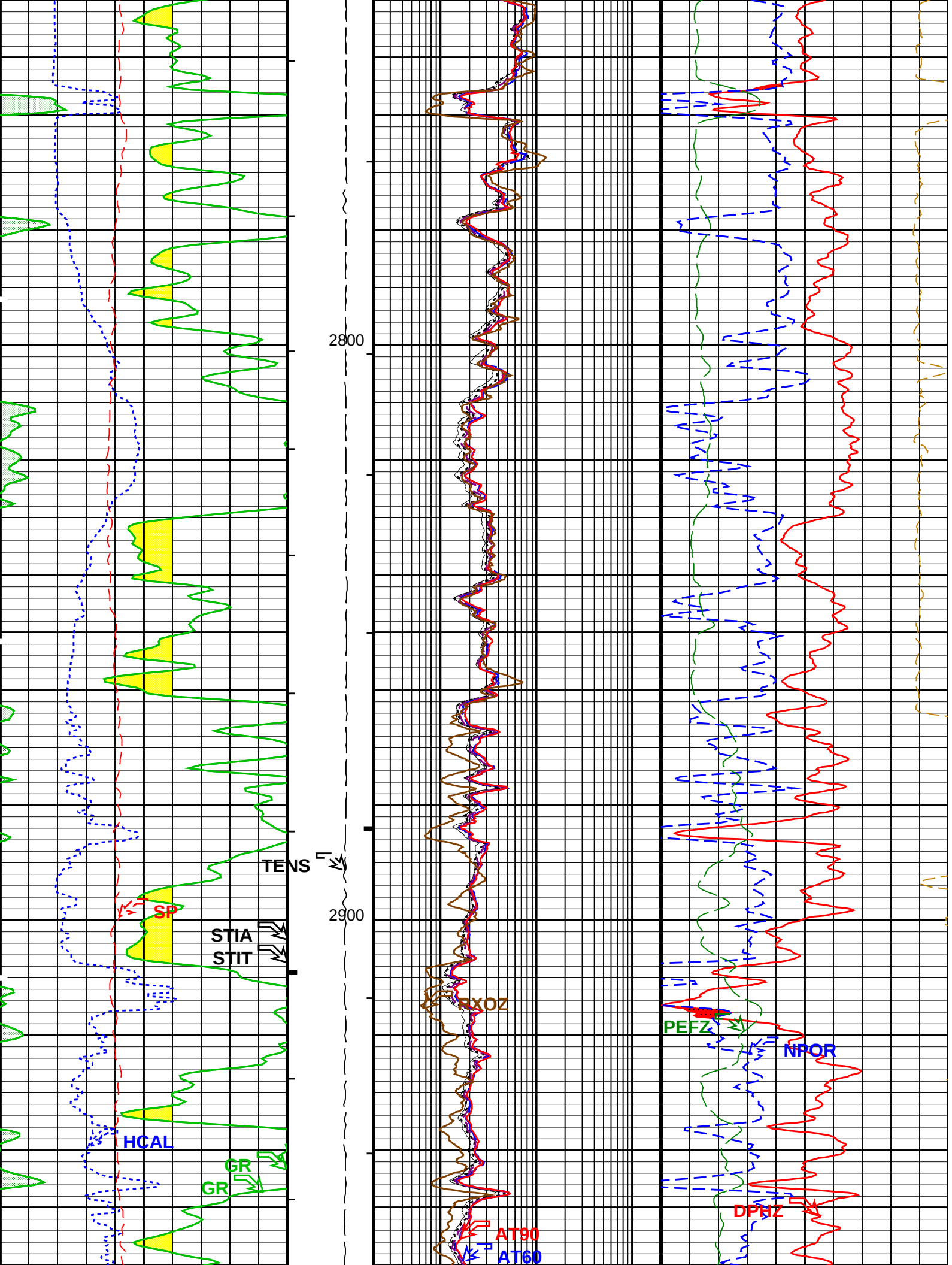

TENS
SP
STIA
STIT
1700
RXOZ
PEFZ
NPOR
HDRA
HCAL
GR
GR
DPHZ
AT90
AT60
AT30
AT20
AT10
1800

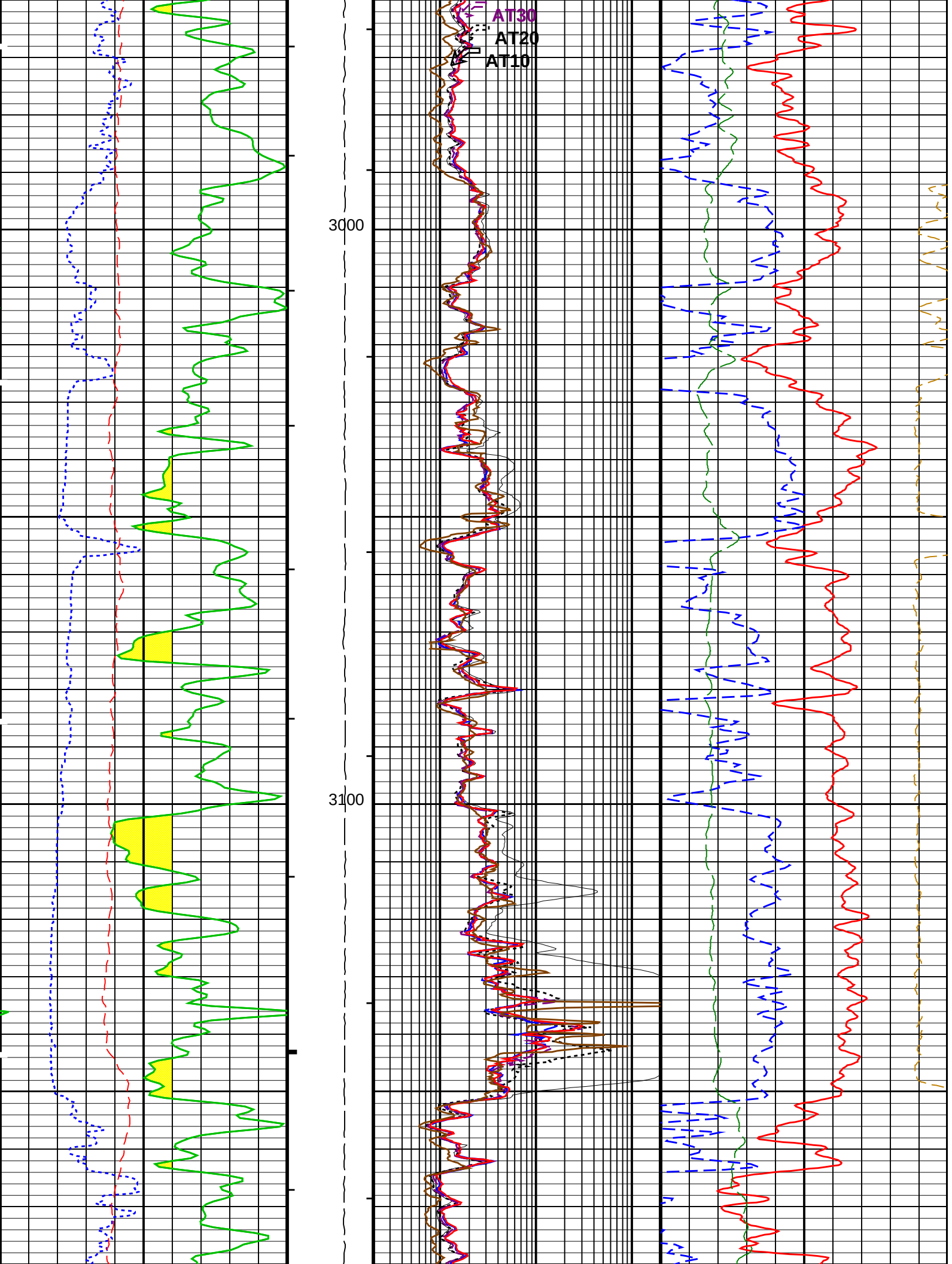

1900
2000
TENS
SP
STIA
STIT
RXOZ
PEFZ
NPOR
HCAL
GR
GR
DPHZ
AT90
AT60
AT30
AT20
AT10

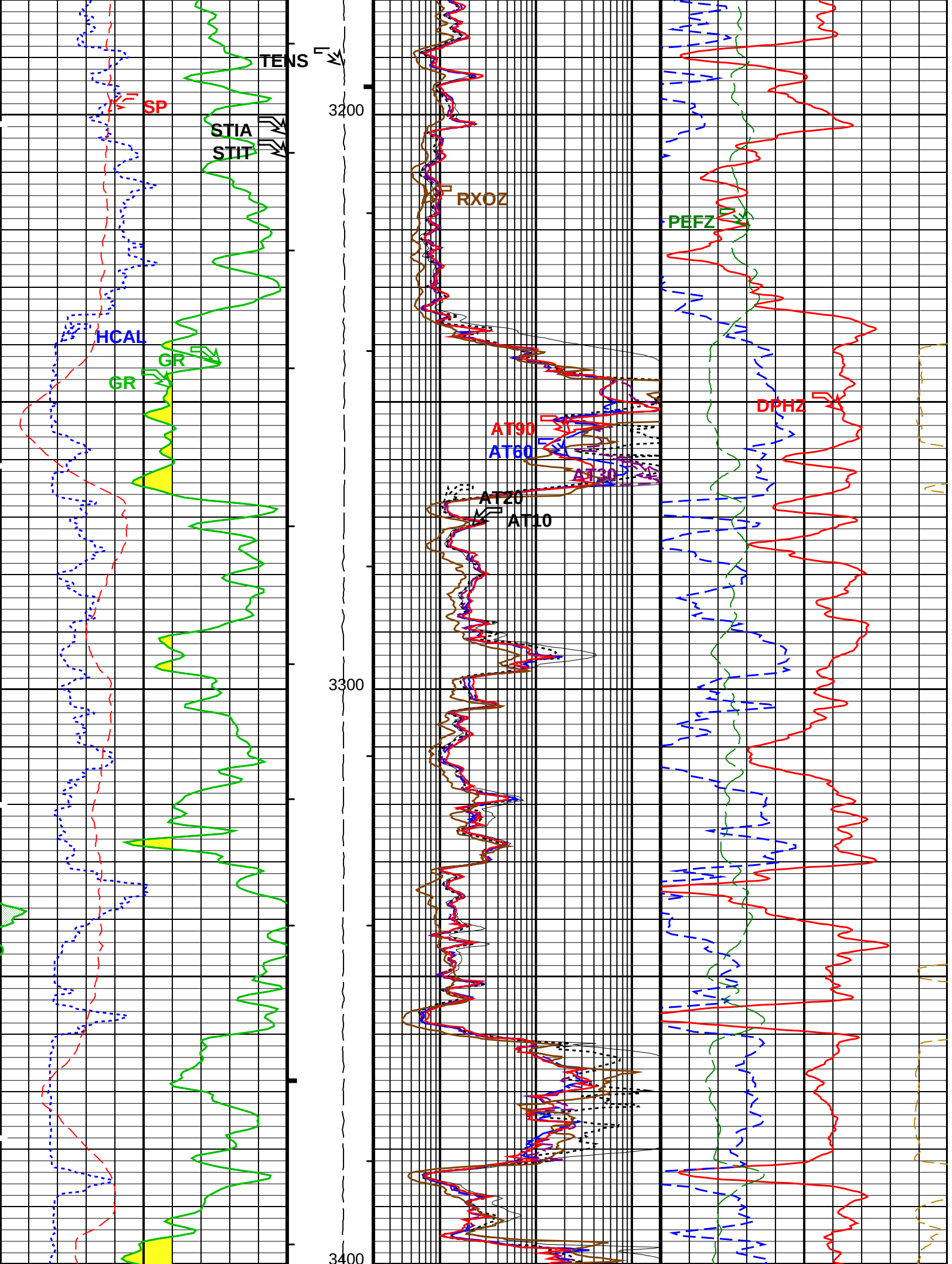

2100
2200
2300
TENS
SP

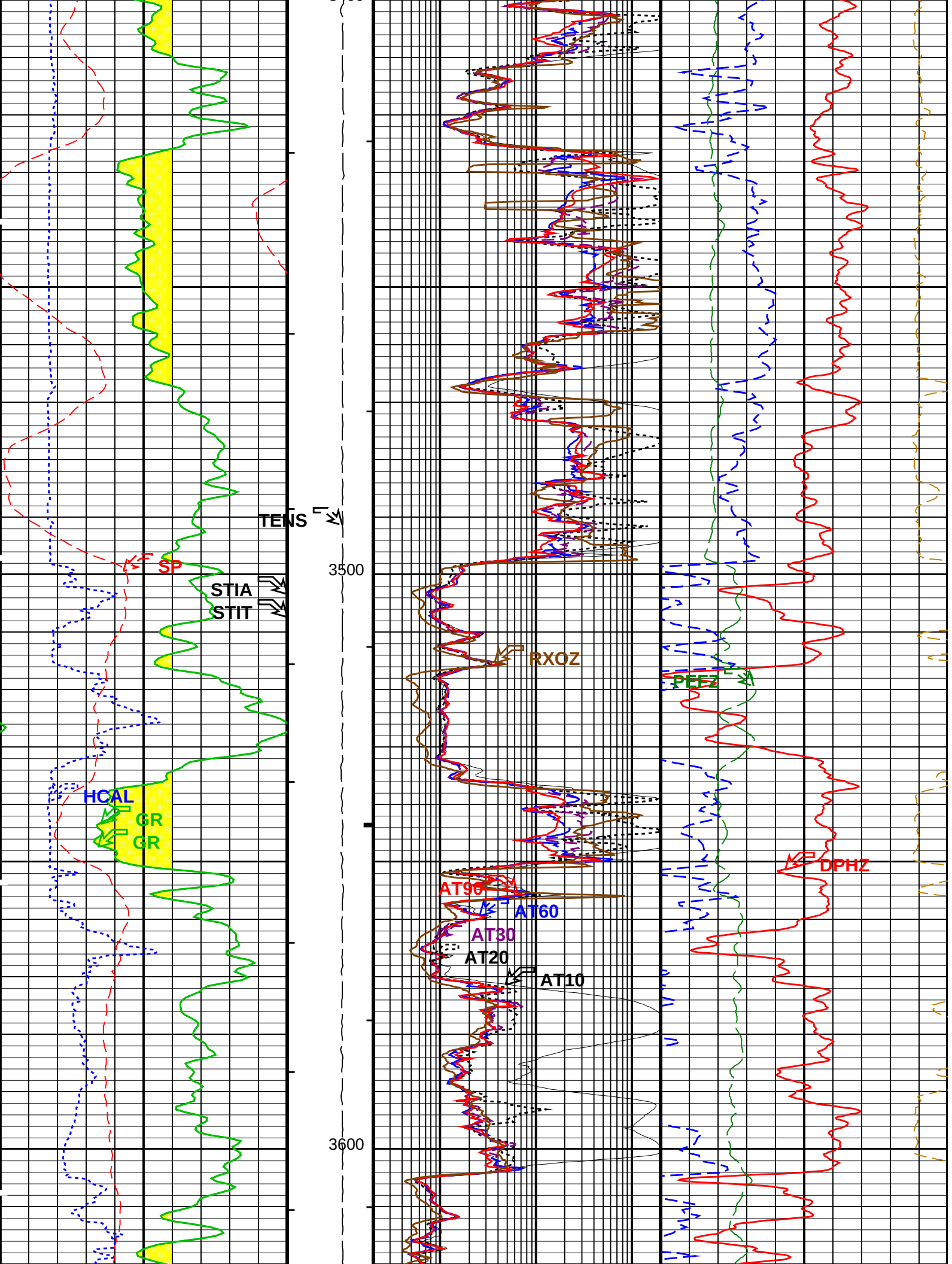

STIA
STIT
HCAL
GR
GR
RXOZ
AT90
AT60
AT30
AT20
AT10
PEFZ
NPOR
DPHZ
2400
2500

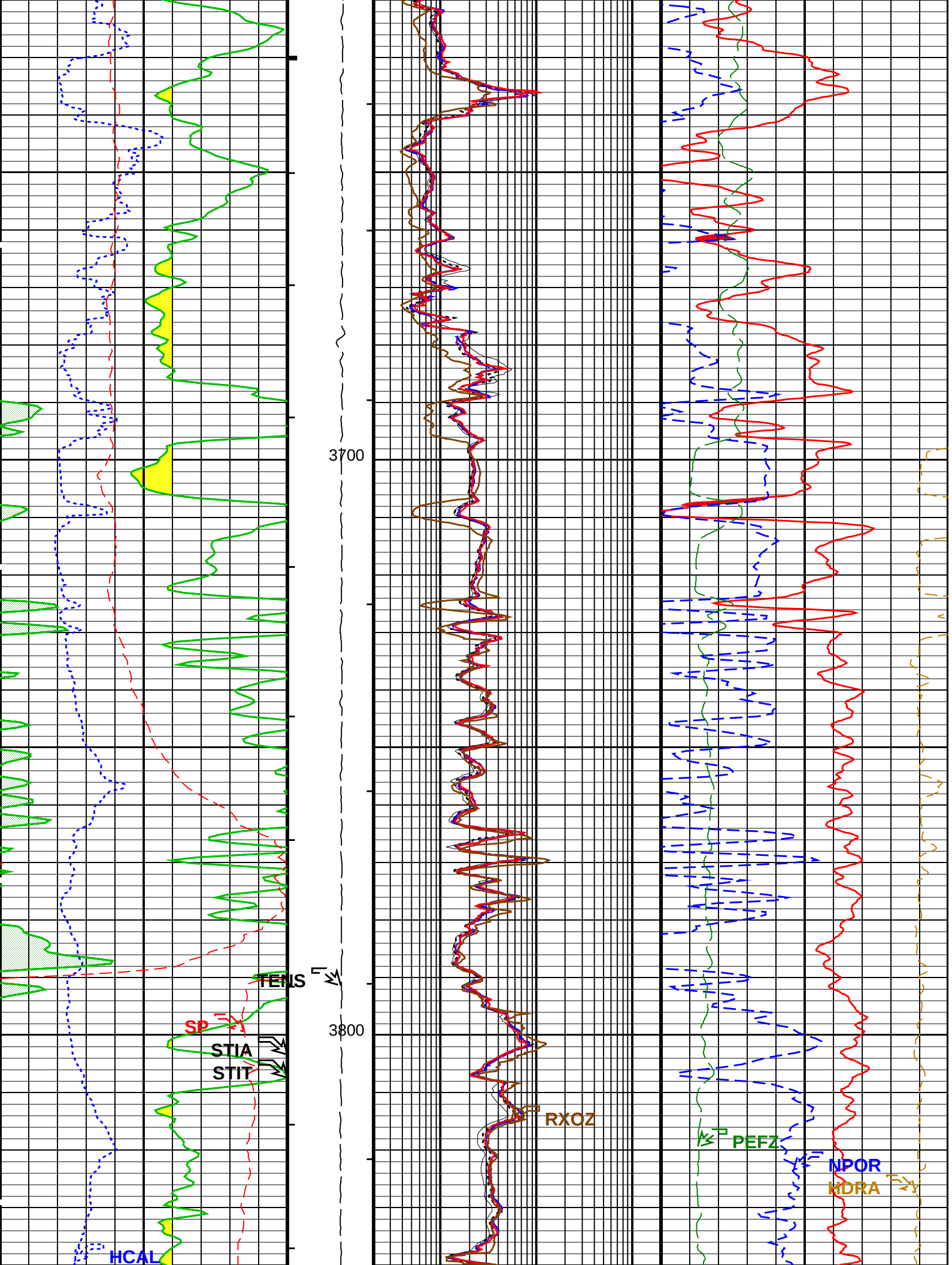

TENS
SP
STIA
STIT
HCAL
GR
GR
2600
RXOZ
PEFZ
DPHZ
AT90
AT60
AT30
AT20
AT10
2700

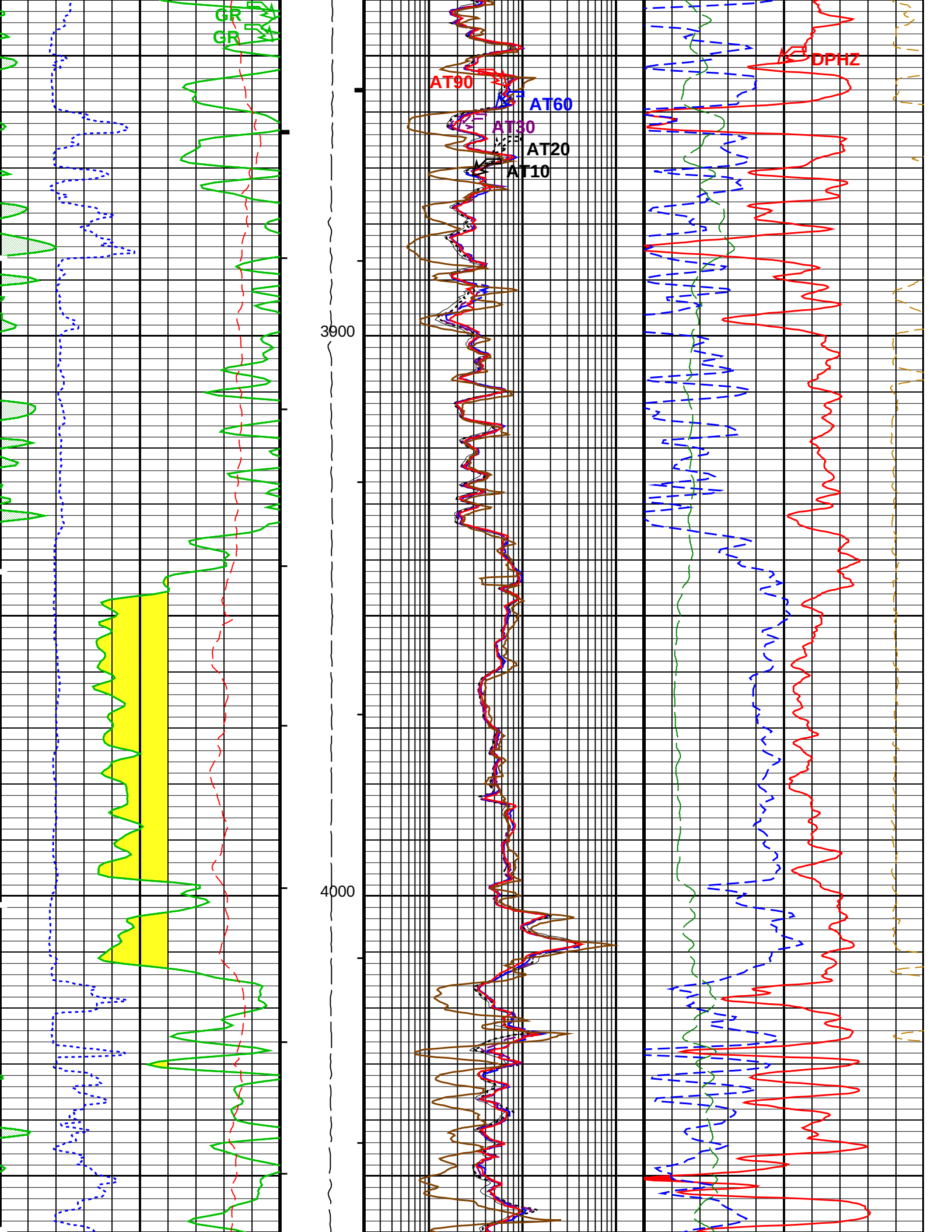

2800
2900
TENS
SP
STIA
STIT
RXOZ
PEFZ
NPOR
HCAL
GR
GR
DPHZ
AT90
AT60

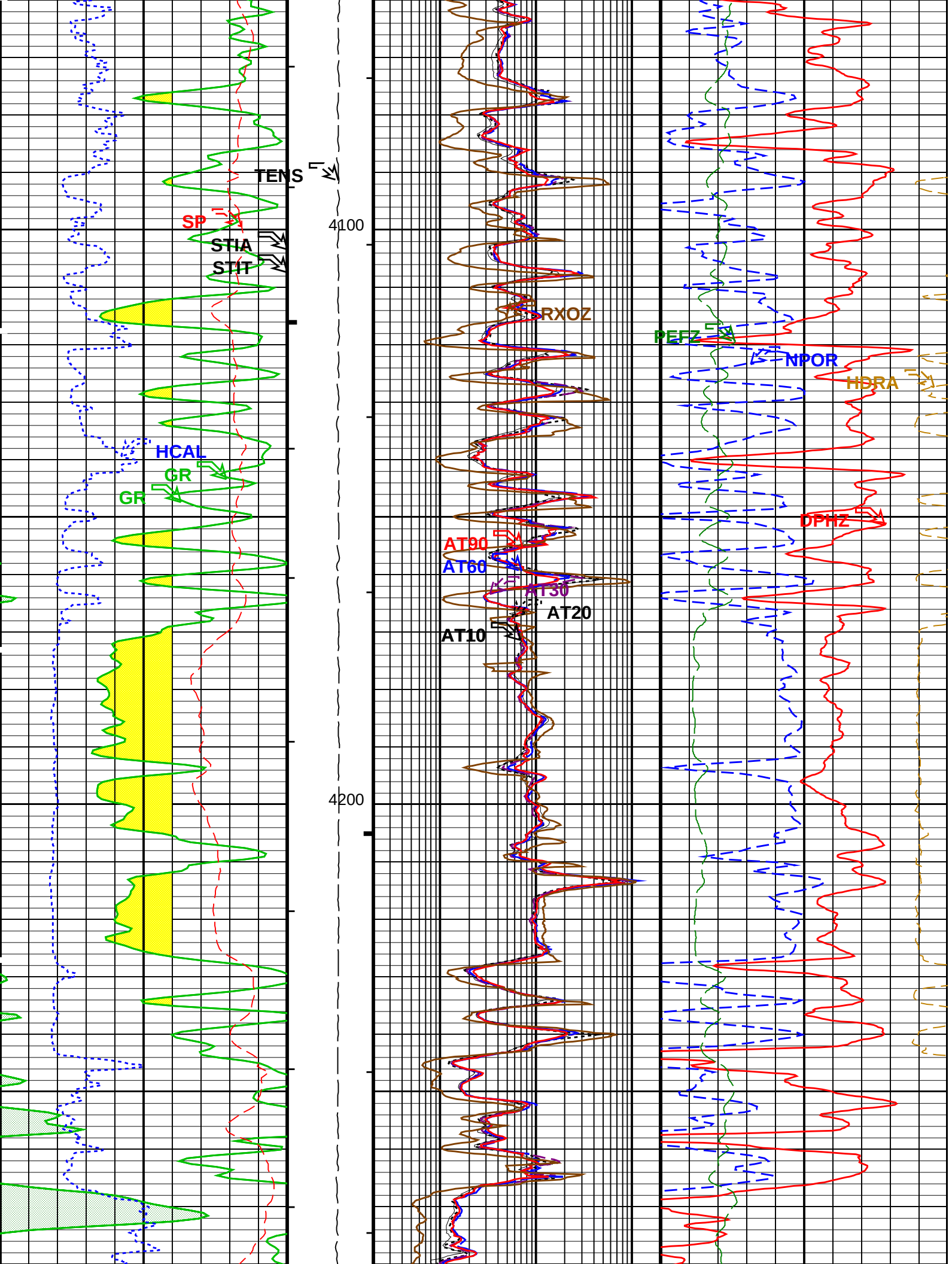

AT30
AT20
AT10
3000
3100

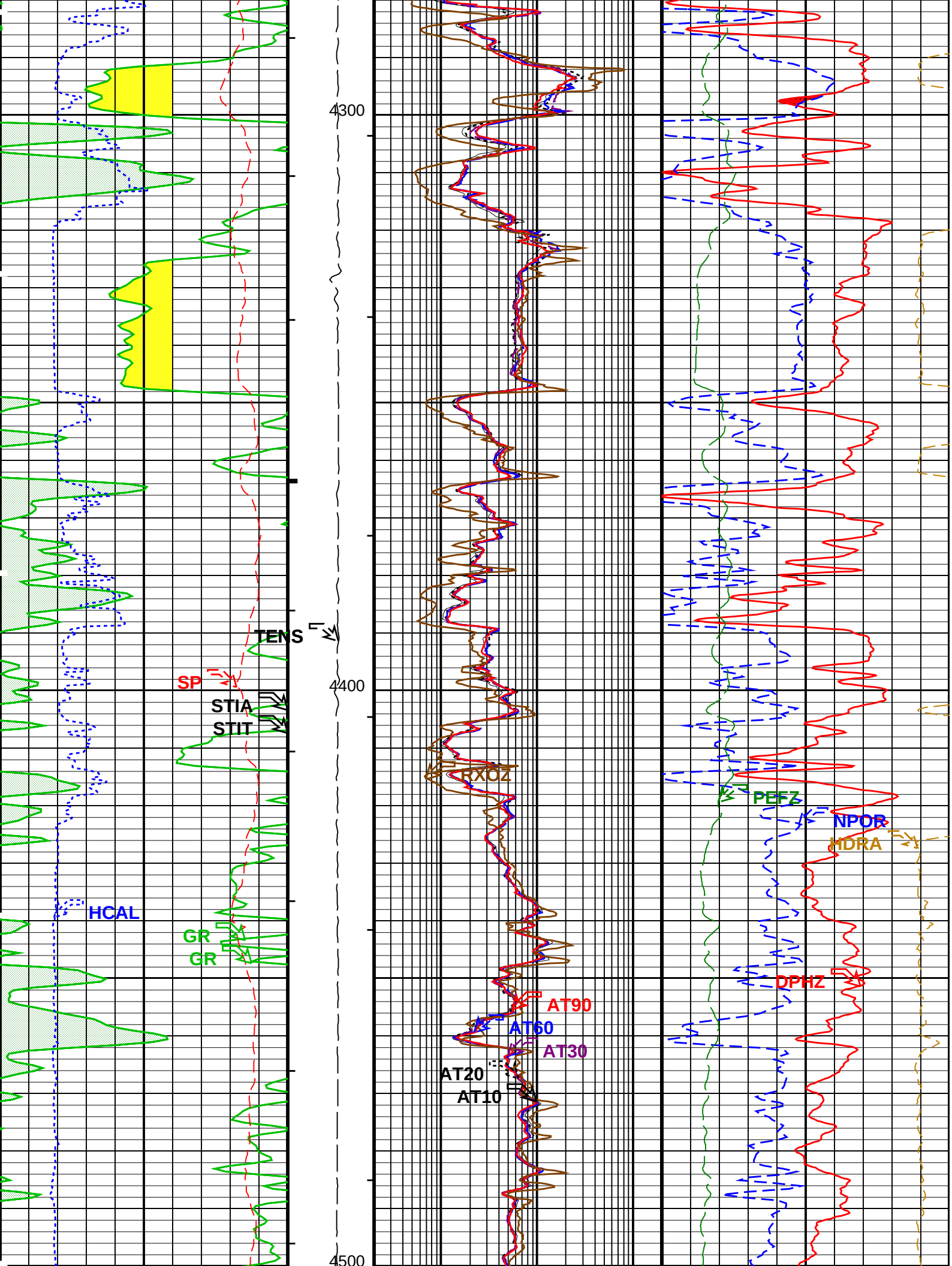

TENS
SP
STIA
STIT
RXOZ
PEFZ
HCAL
GR
GR
DPHZ
AT90
AT60
AT30
AT20
AT10
3200
3300
3400

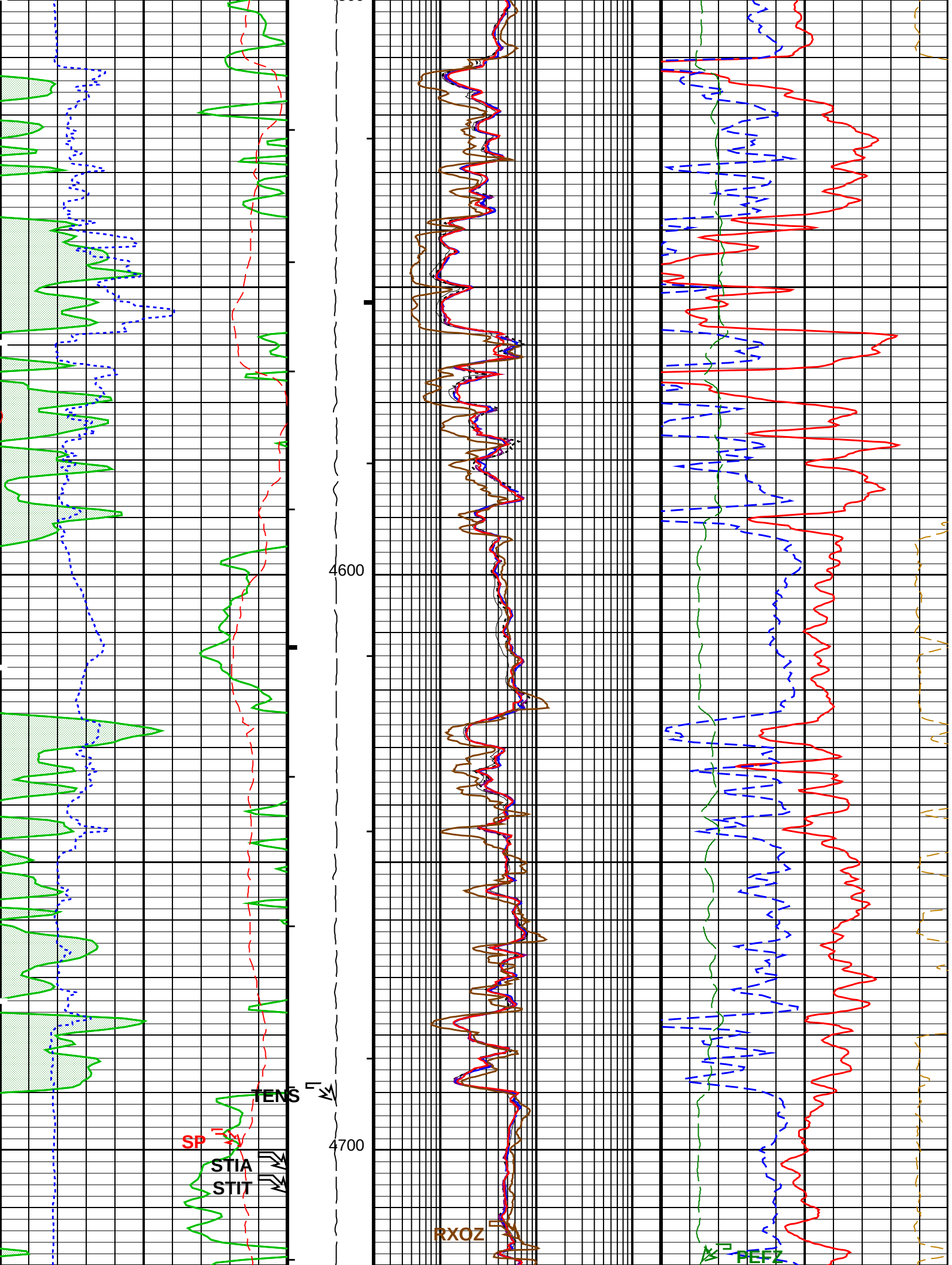

TENS
SP
STIA
STIT
HCAL
GR
GR
3500
RXOZ
PEFZ
DPHZ
AT90
AT60
AT30
AT20
AT10
3600

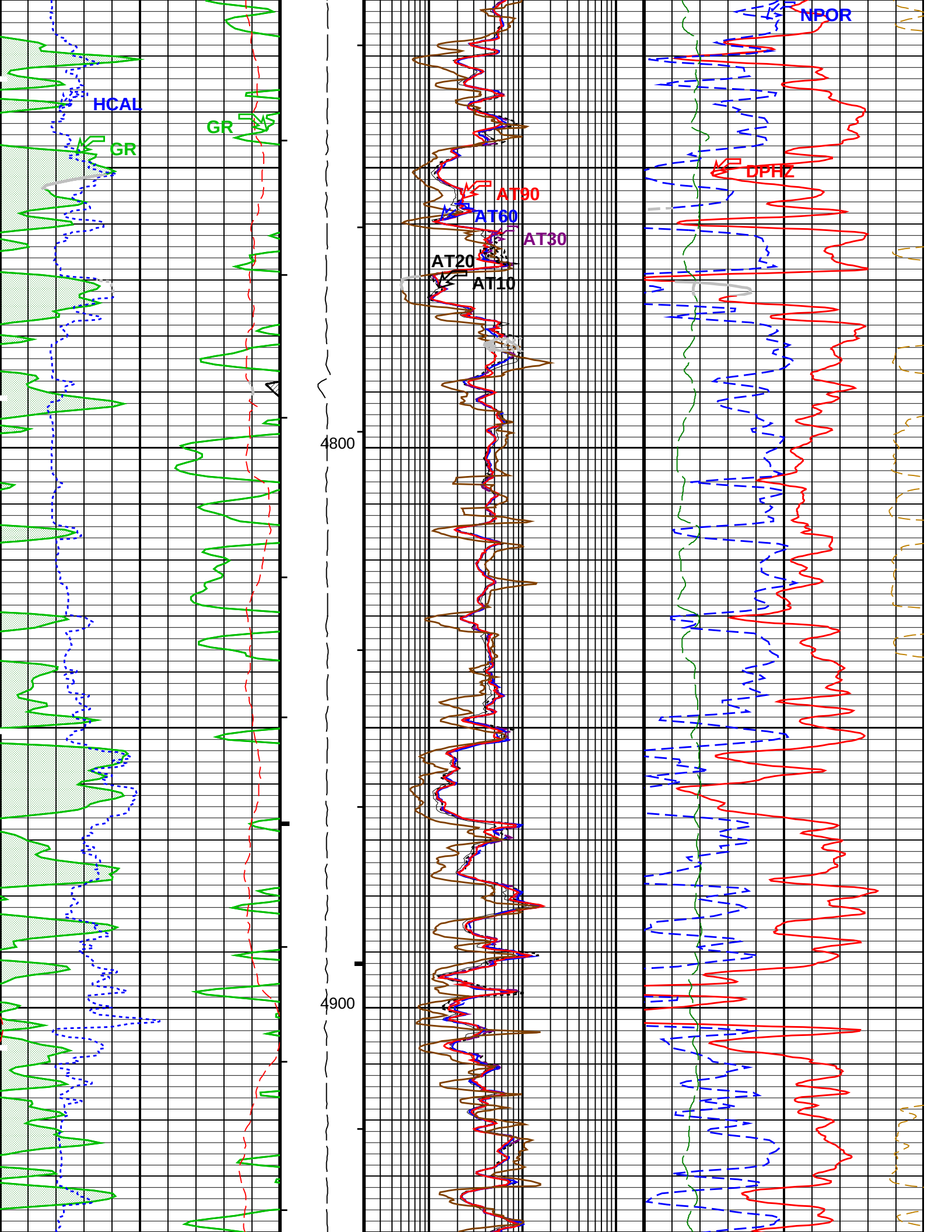

3700
3800
TENS
SP
STIA
STIT
HCAL
RXOZ
PEFZ
NPOR
HDRA

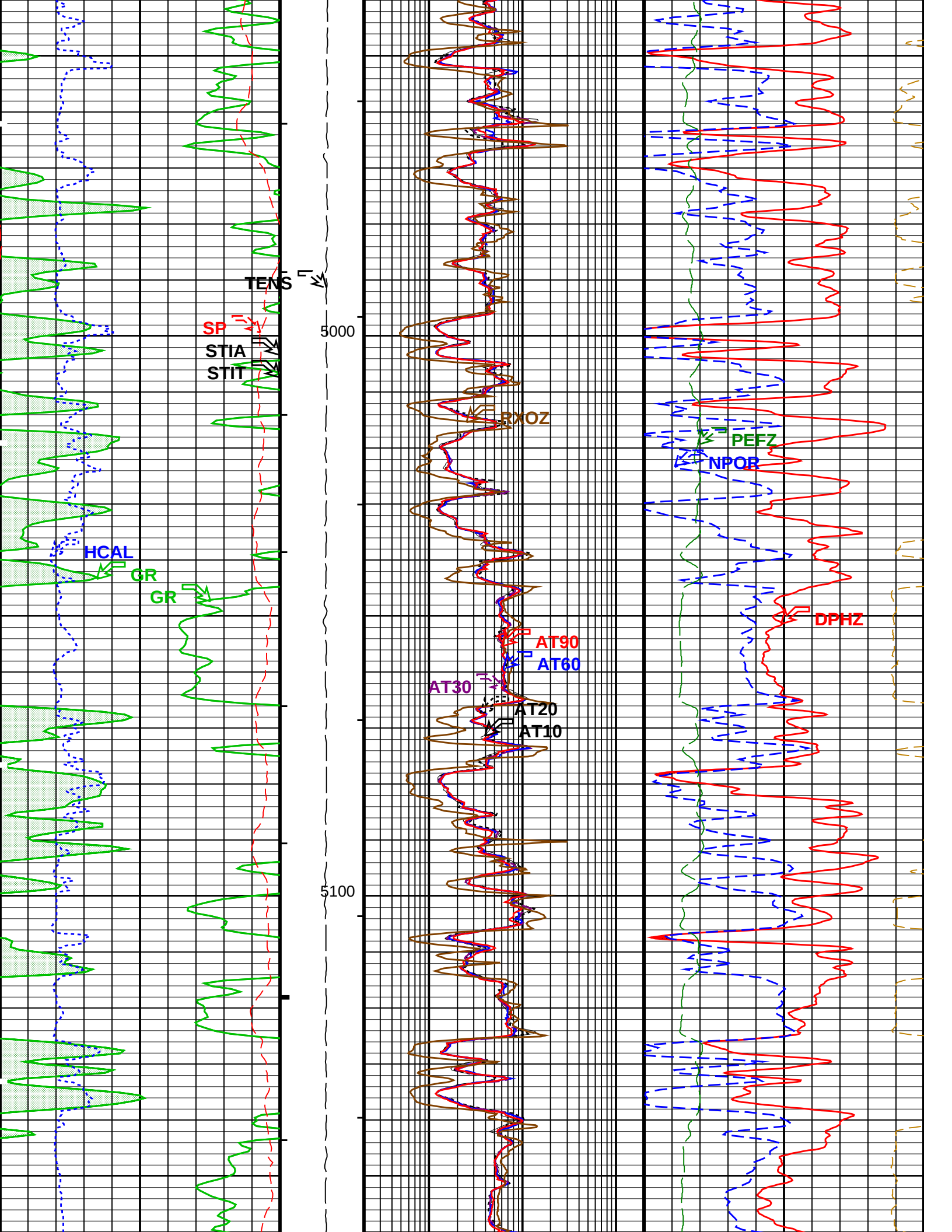

GR
GR
AT90
AT60
AT30
AT20
AT10
DPHZ
3900
4000

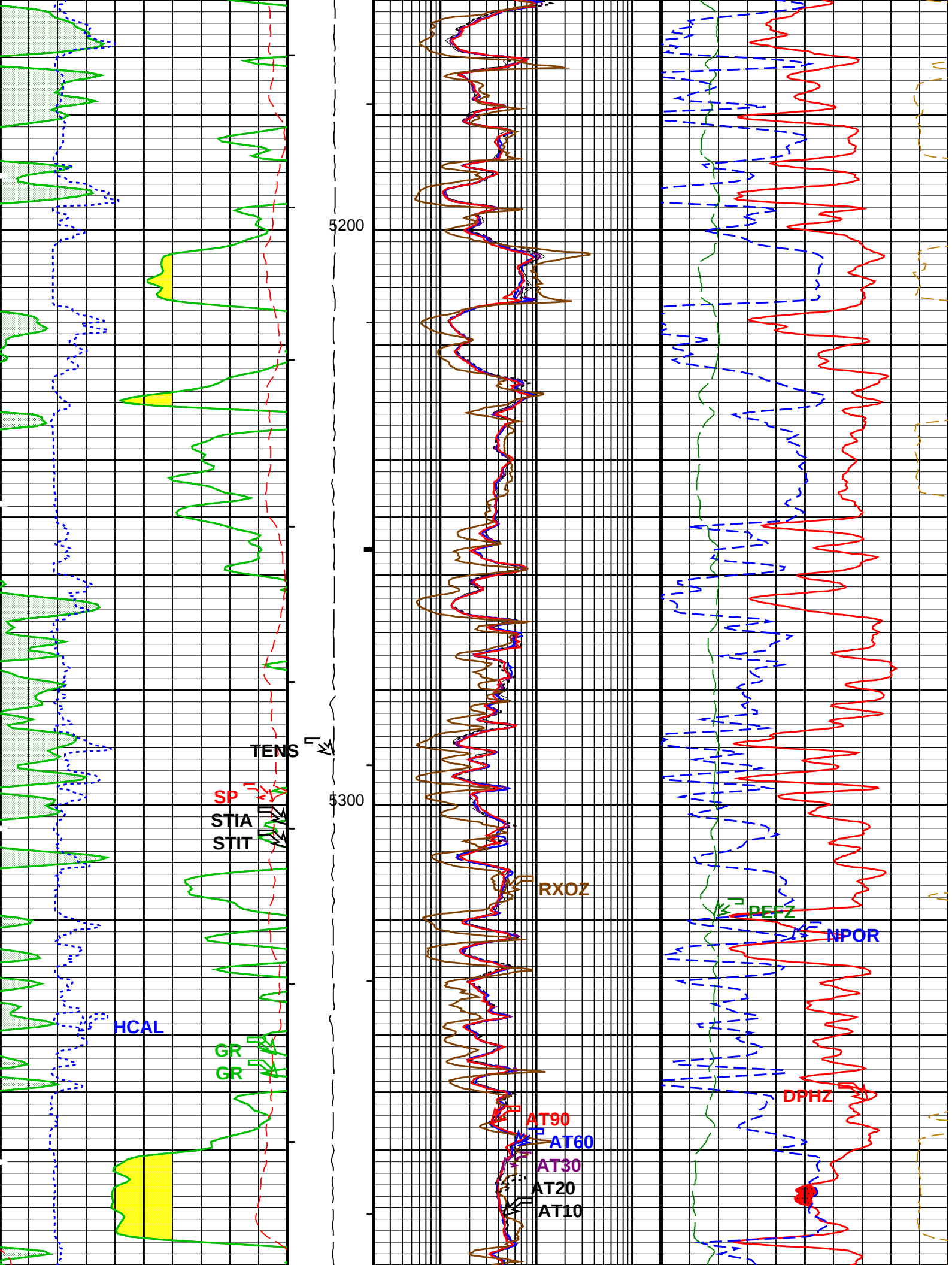

TENS
SP
STIA
STIT
HCAL
GR
GR
4100
RXOZ
PEFZ
NPOR
HDRA
DPHZ
AT90
AT60
AT30
AT20
AT10
4200

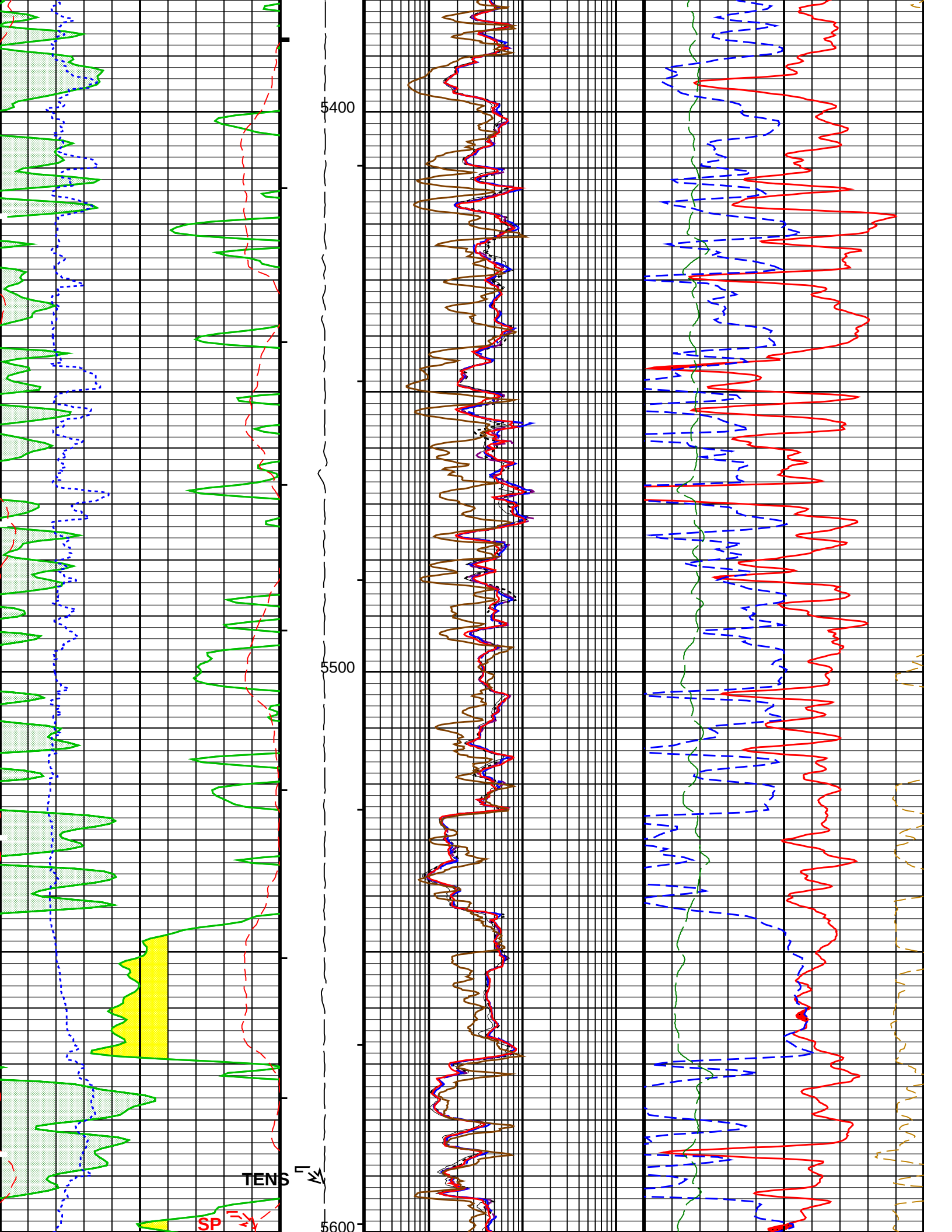

4300
4400
4500
TENS
SP
STIA
STIT
HCAL
GR
GR
RXOZ
PEFZ
NPOR
HDRA
DPHZ
AT90
AT60
AT30
AT20
AT10

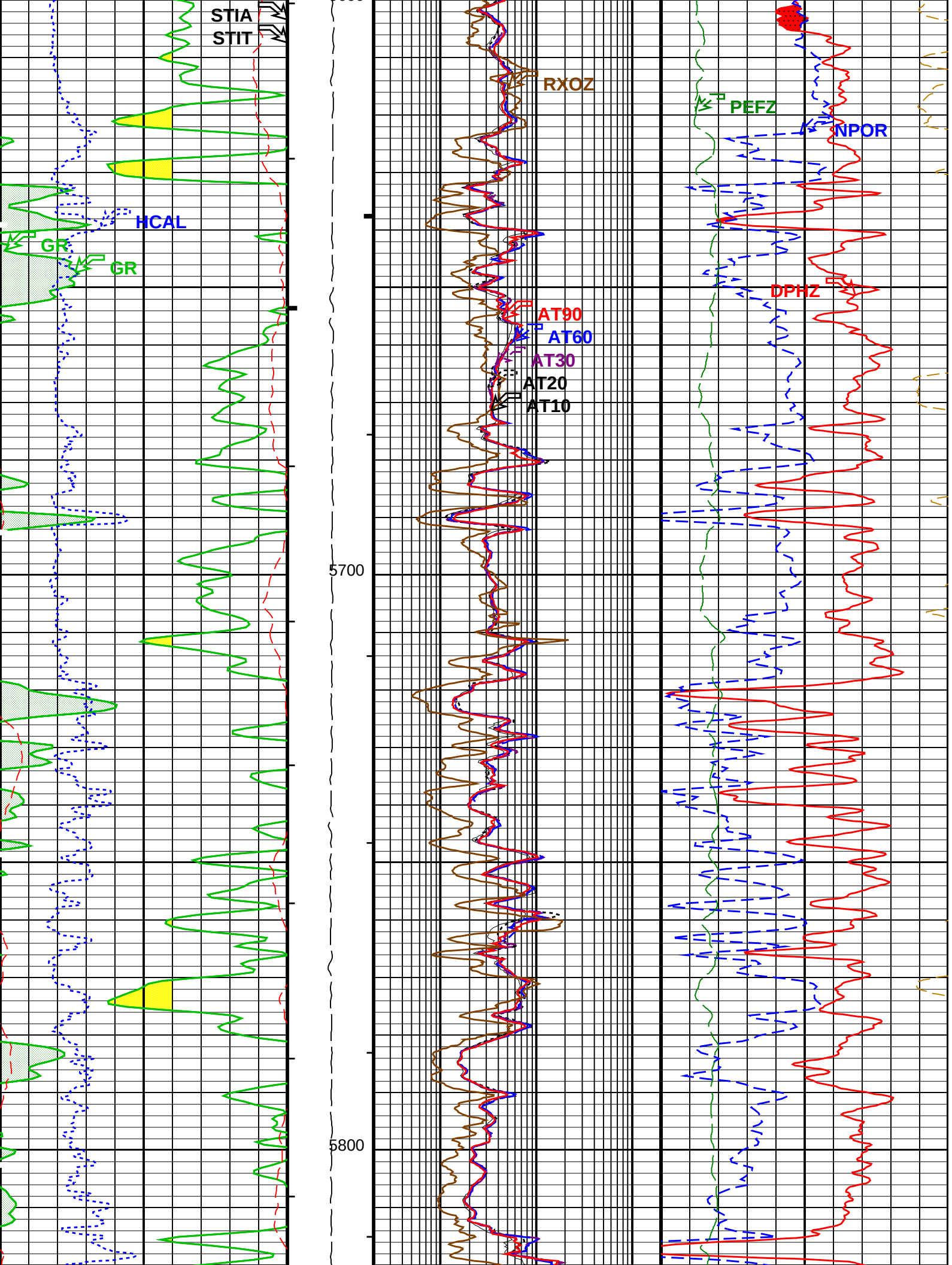

4600
4700
TENS
SP
STIA
STIT
RXOZ
PEFZ


HCAL
GR
GR
AT90
AT60
AT30
AT20
AT10
NPOR
DPHZ
4800
4900


TENS
SP
STIA
STIT
5000
RXOZ
PEFZ
NPOR
HCAL
GR
GR
DPHZ
AT90
AT60
AT30
AT20
AT10
5100


5200
5300
TENS
SP
STIA
STIT
HCAL
GR
GR
RXOZ
PEFZ
NPOR
DPHZ
AT90
AT60
AT30
AT20
AT10


5400
5500
5600
TENS
SP


STIA
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HCAL
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PEFZ
NPOR
DPHZ
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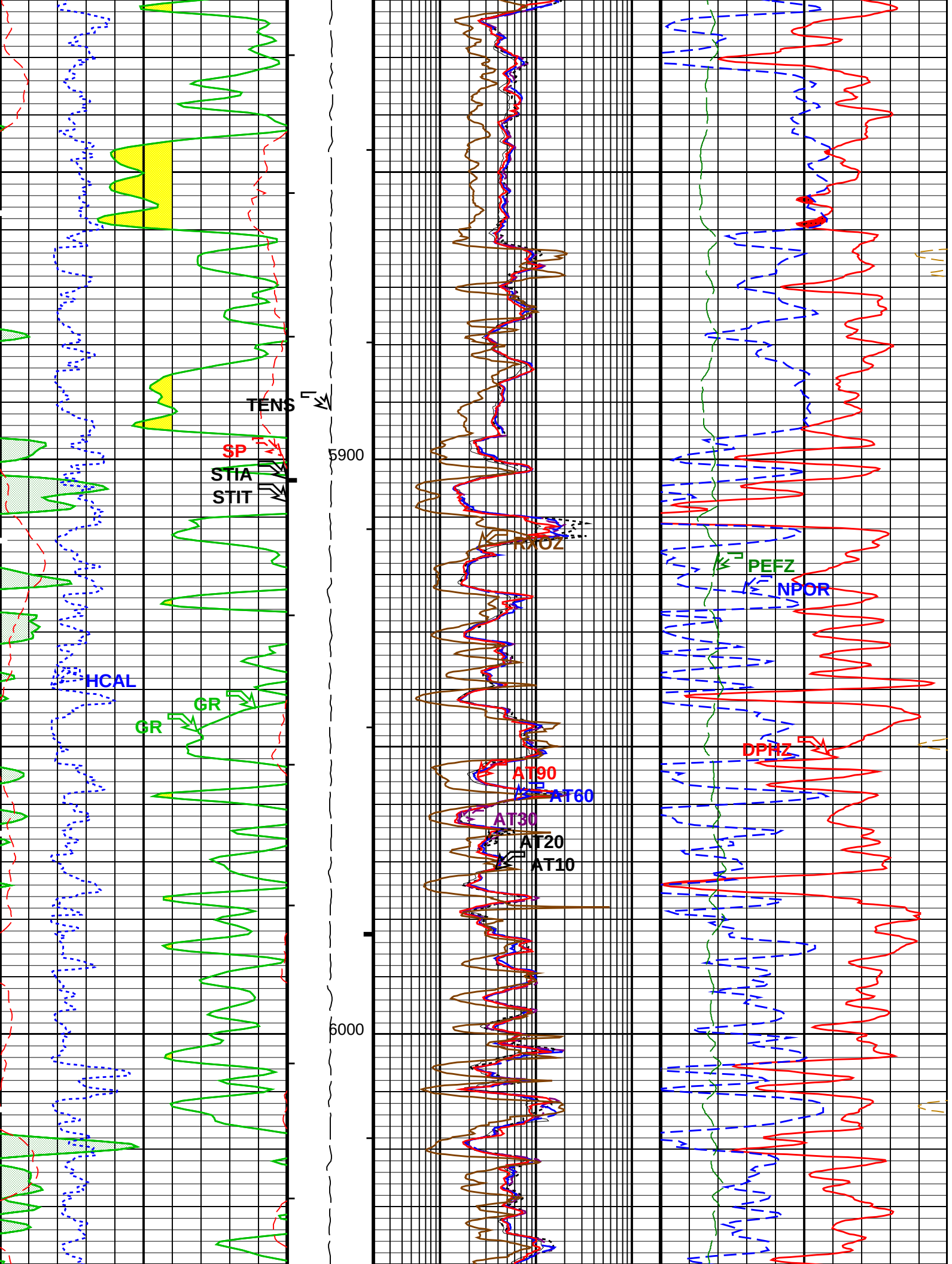
AT60
AT30
AT20
AT10
5700
5800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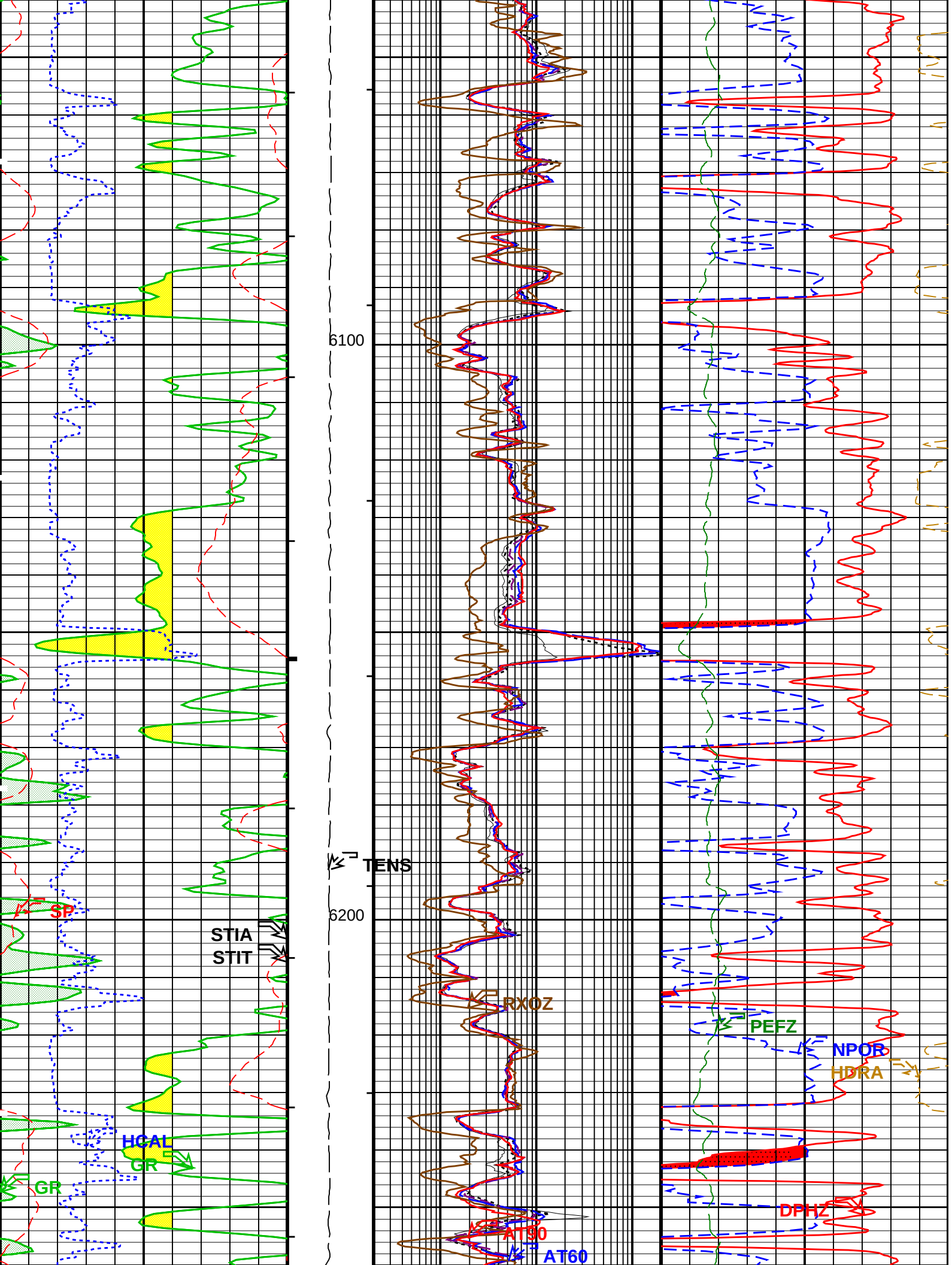
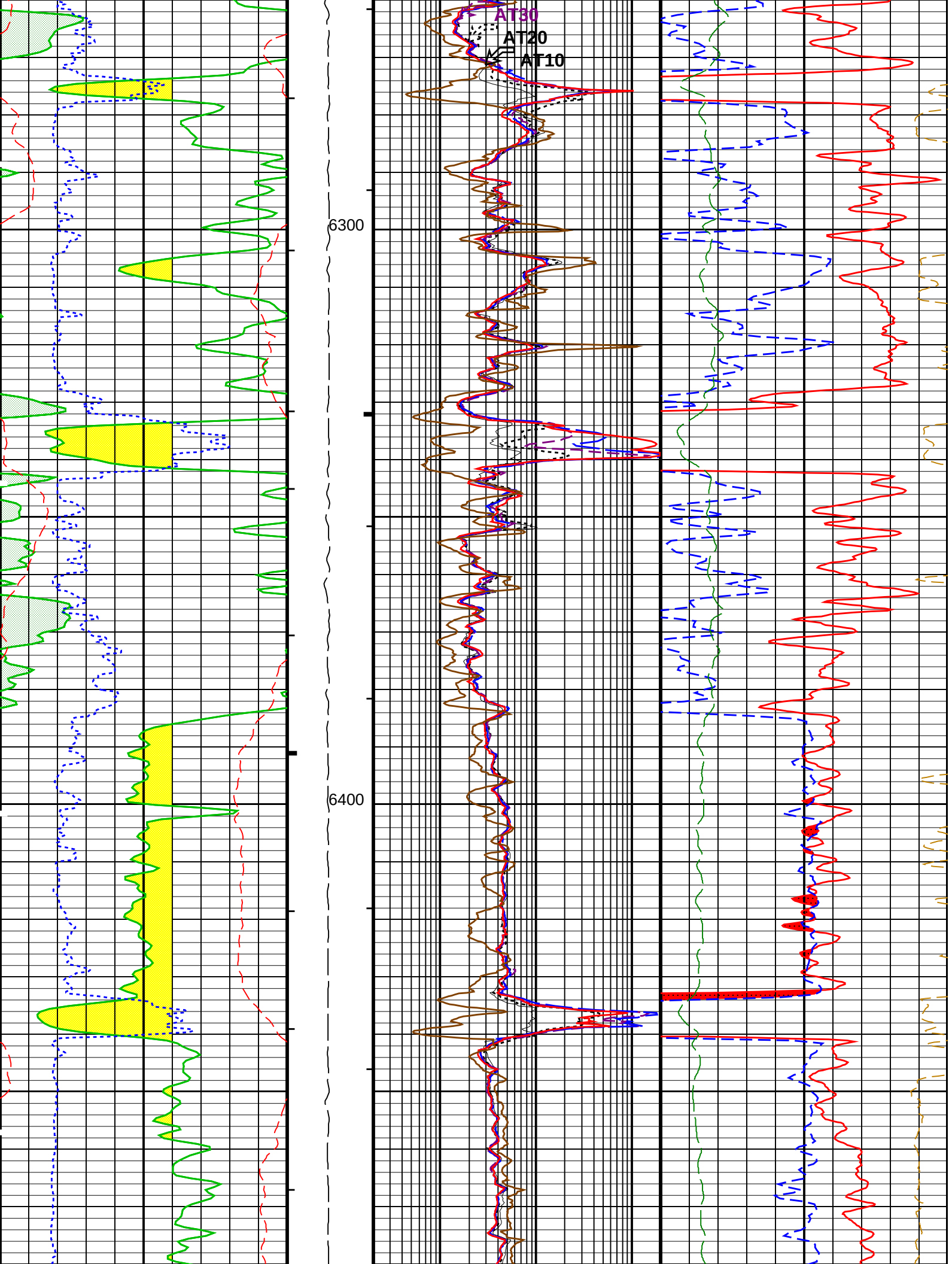
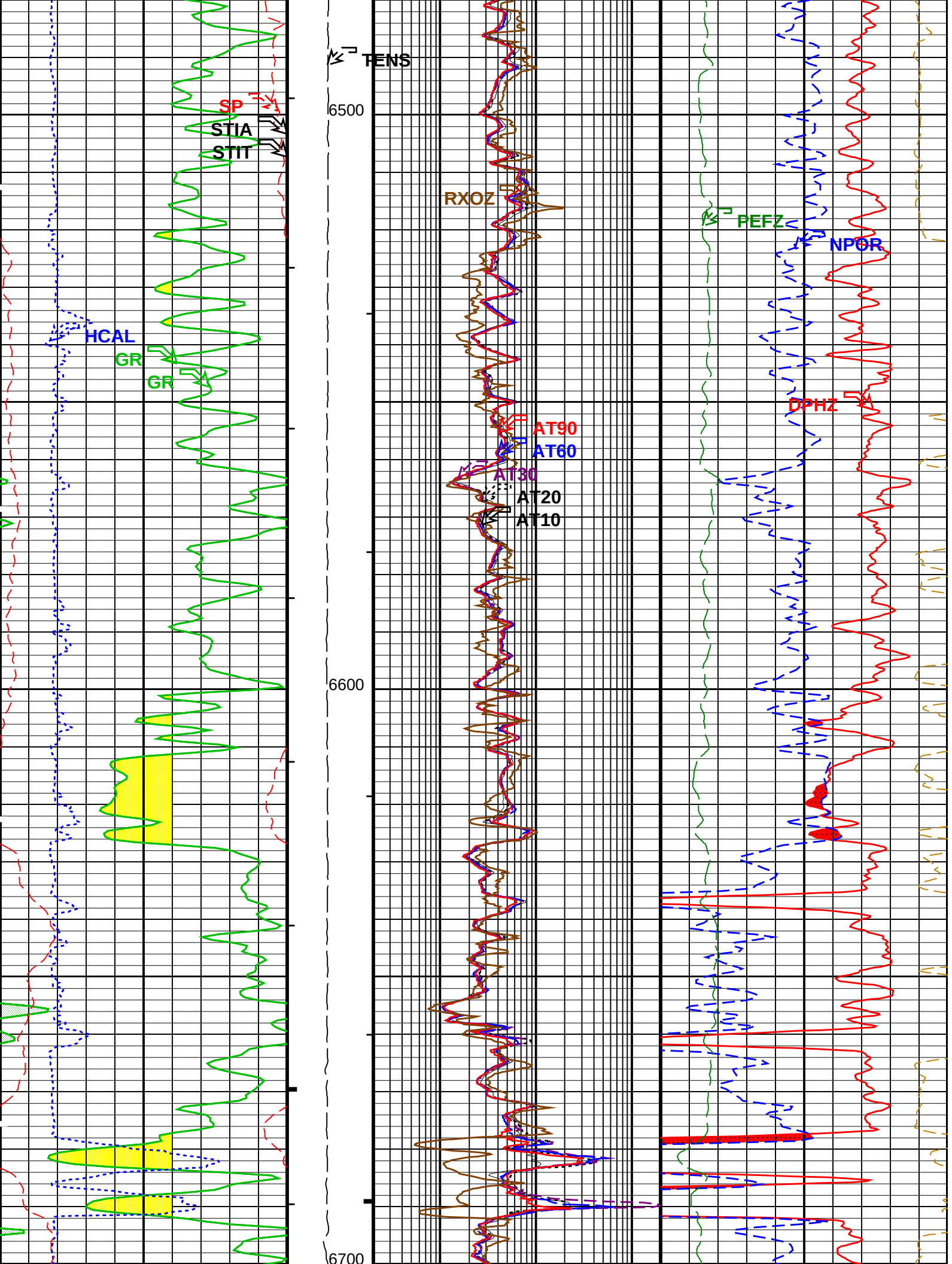
SP
STIA
STIT
5900
RXOZ
PEFZ
NPOR
HCAL
GR
GR
DPHZ
AT90
AT60
AT30
AT20
AT10
6000


6100
6200
TENS
SP
STIA
STIT
RXOZ
PEFZ
NPOR
HDRA
HCAL
GR
GR
DPHZ
AT90
AT60


AT30
AT20
AT10
6300
6400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NPOR
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AT90
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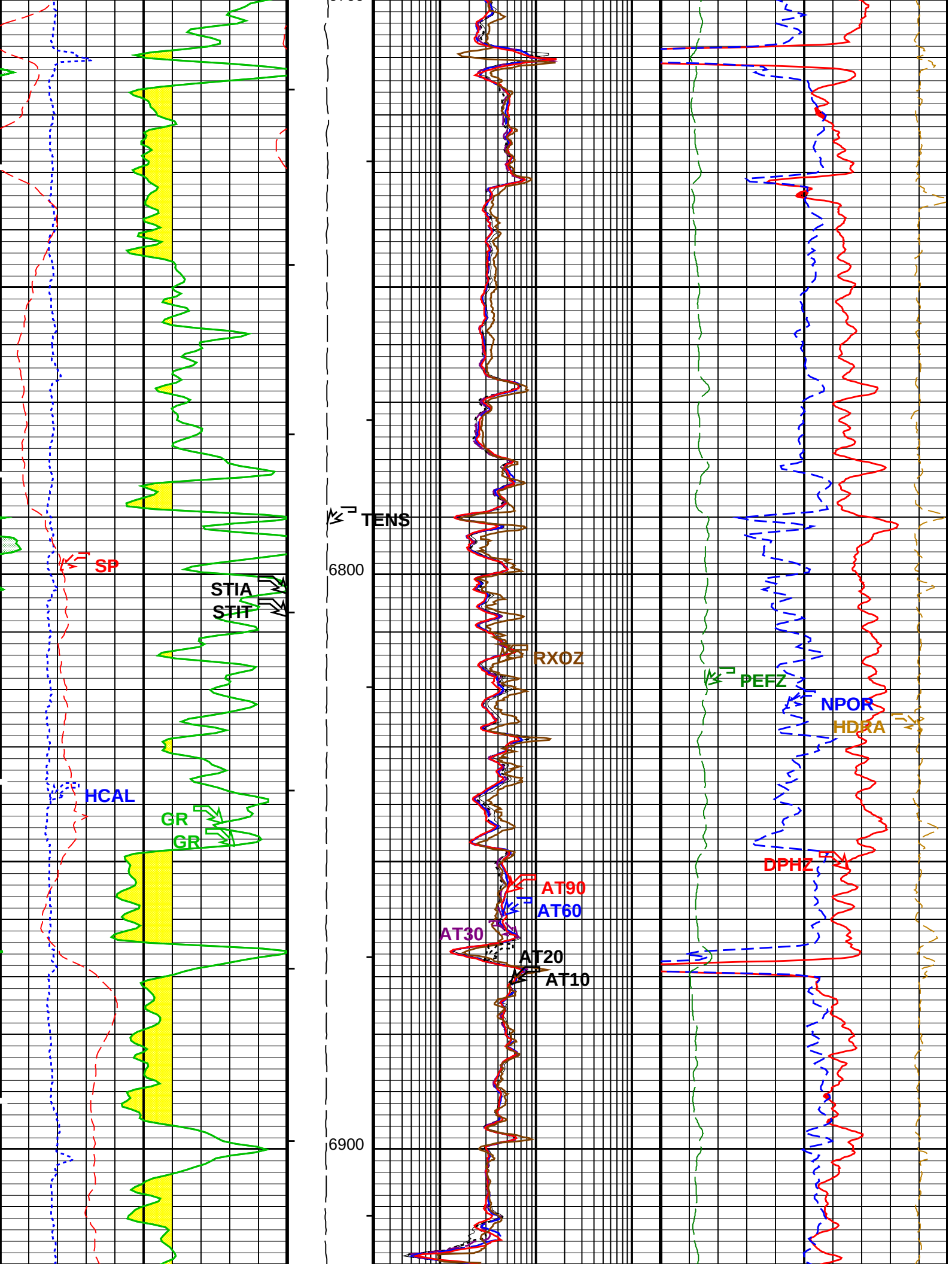
AT10
6500
6600
6700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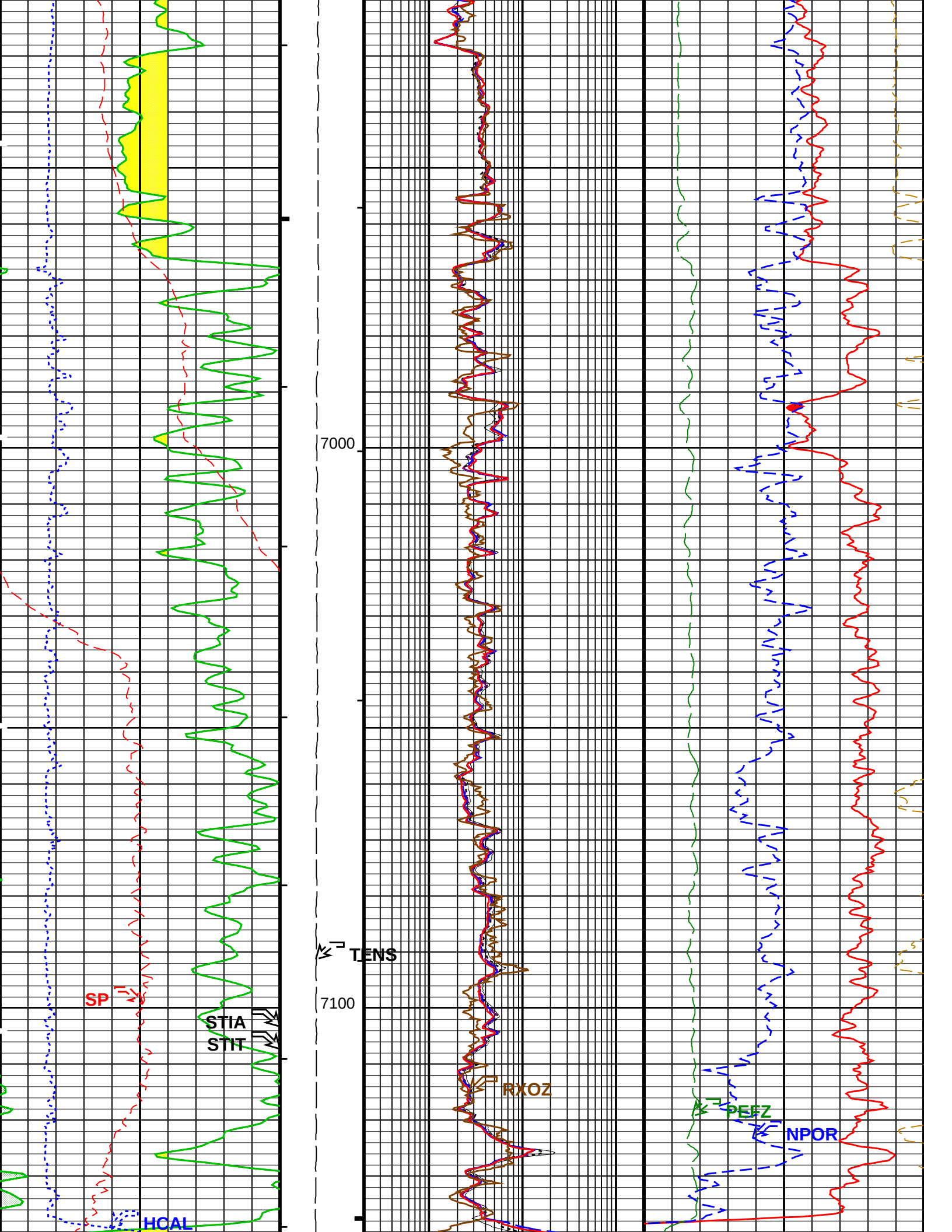
6900
SP
STIA
STIT
HCAL
GR
GR
RXOZ
PEFZ
NPOR
HDRA
DPHZ
AT90
AT60
AT30
AT20
AT10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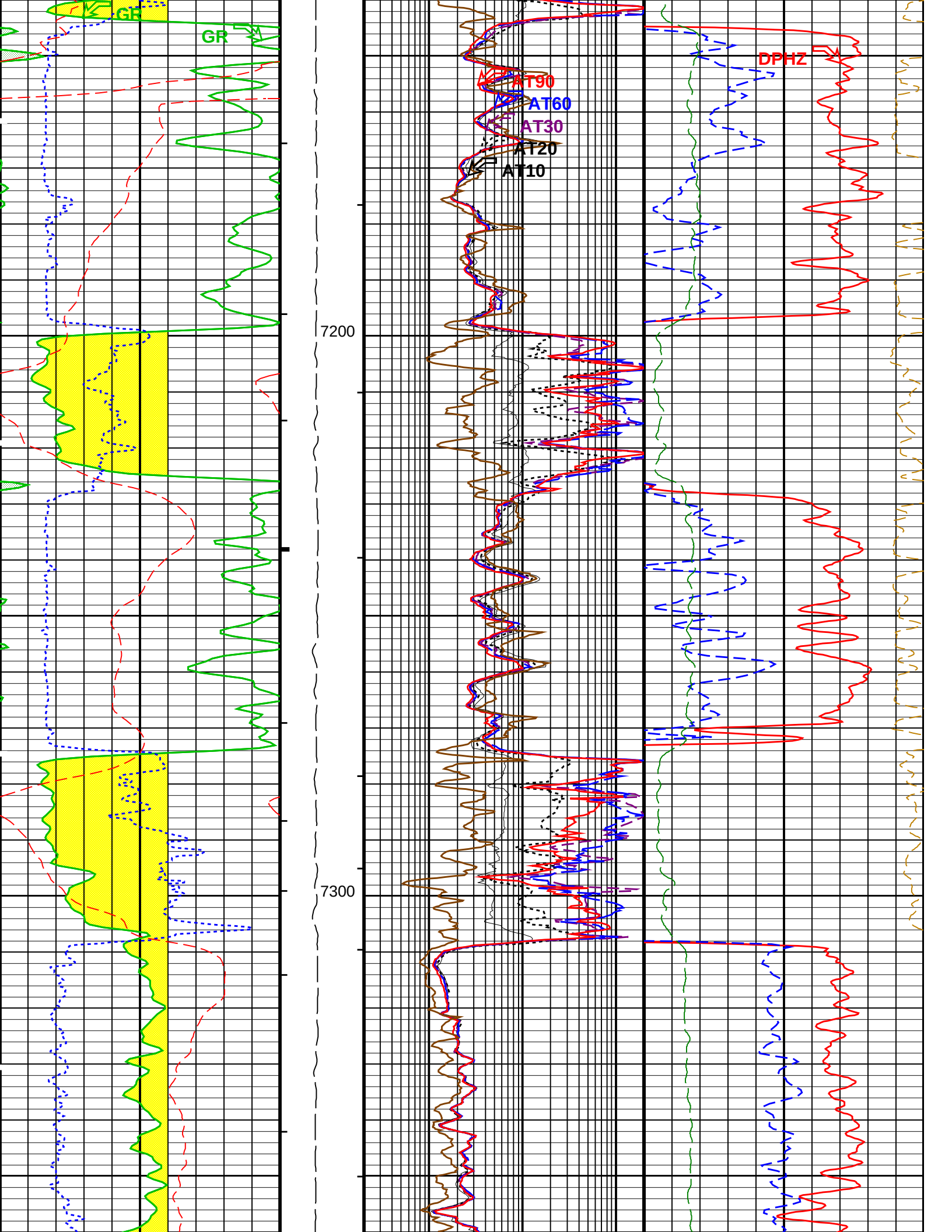
7100
TENS
SP
STIA
STIT
HCAL
RXOZ
PEFZ
NPOR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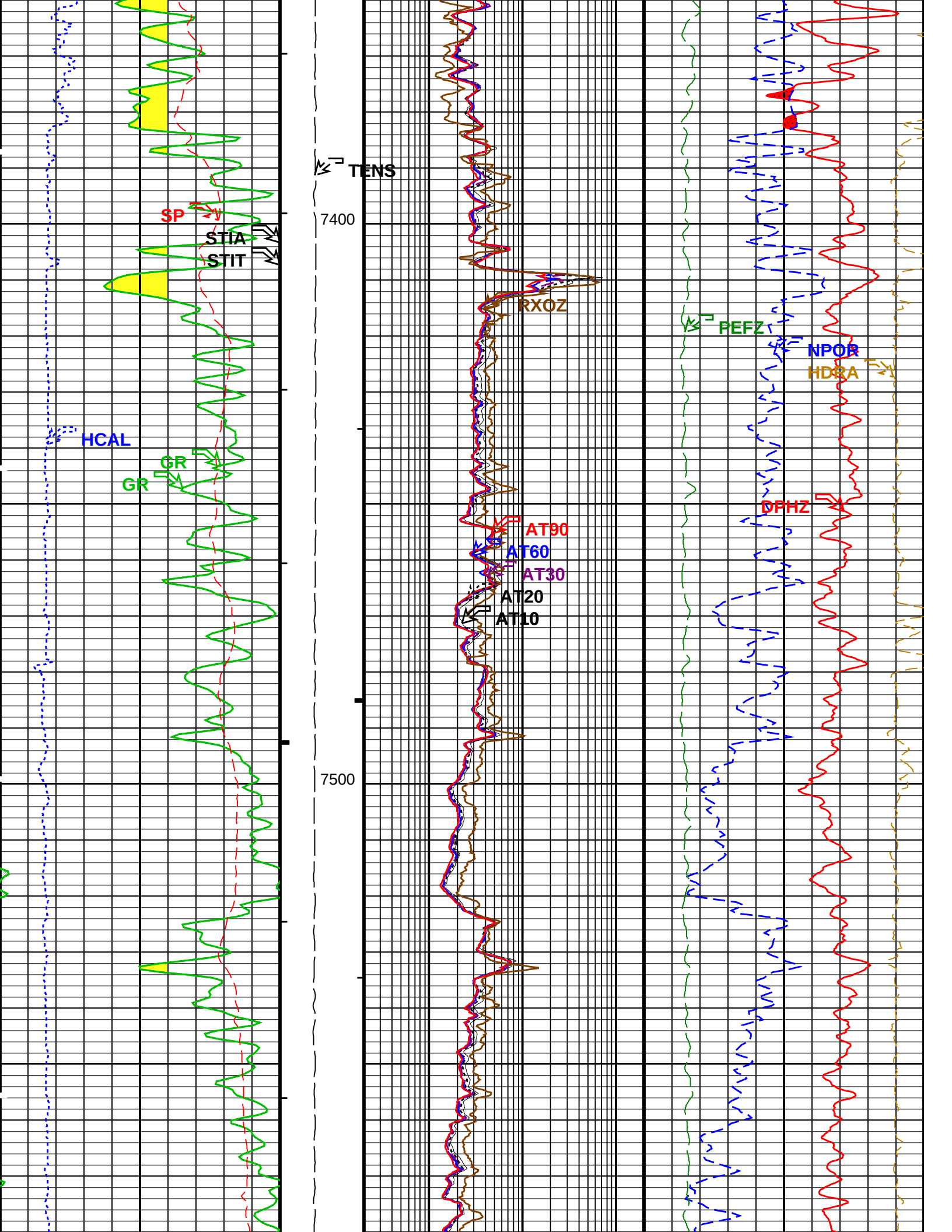
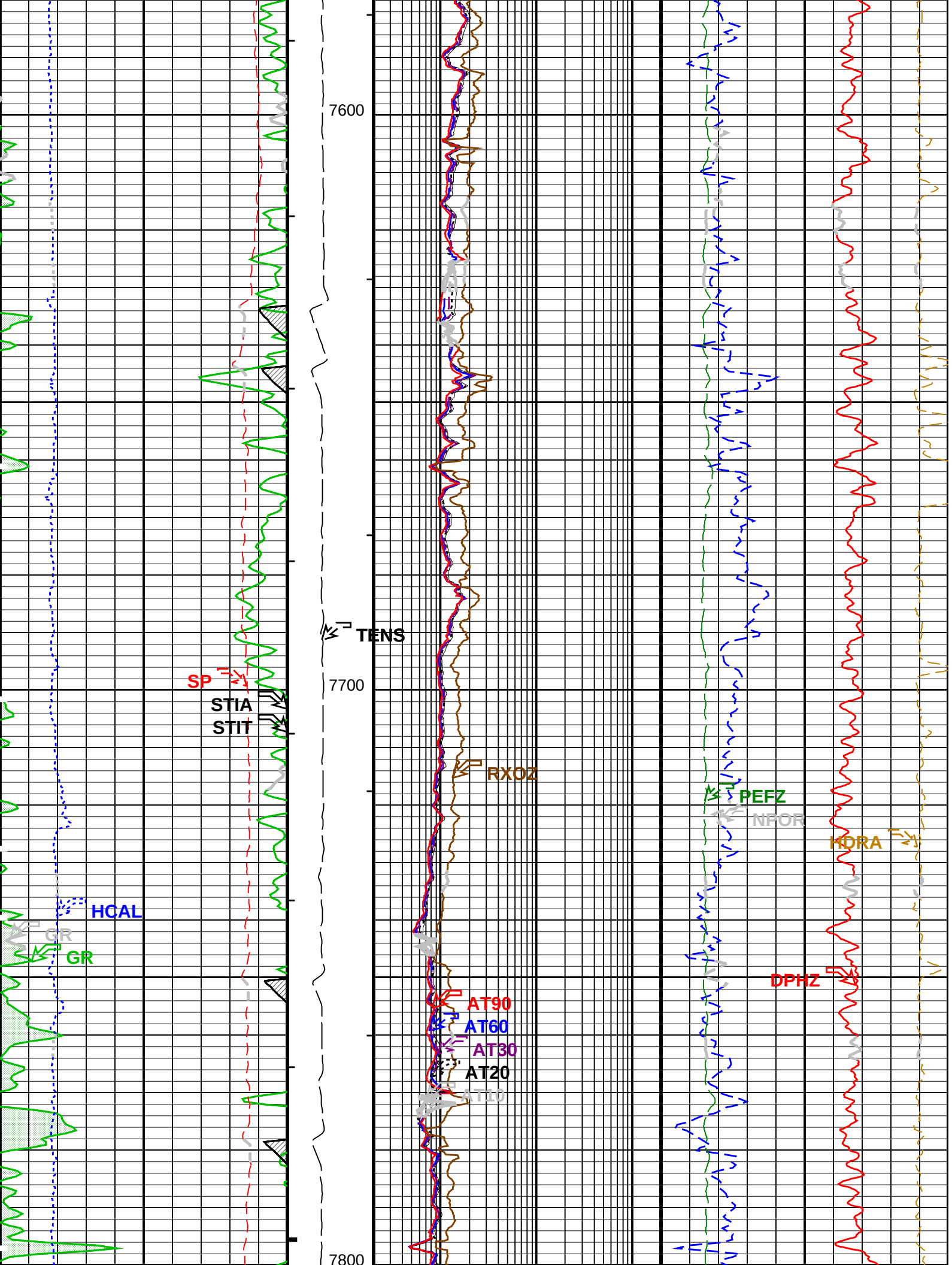
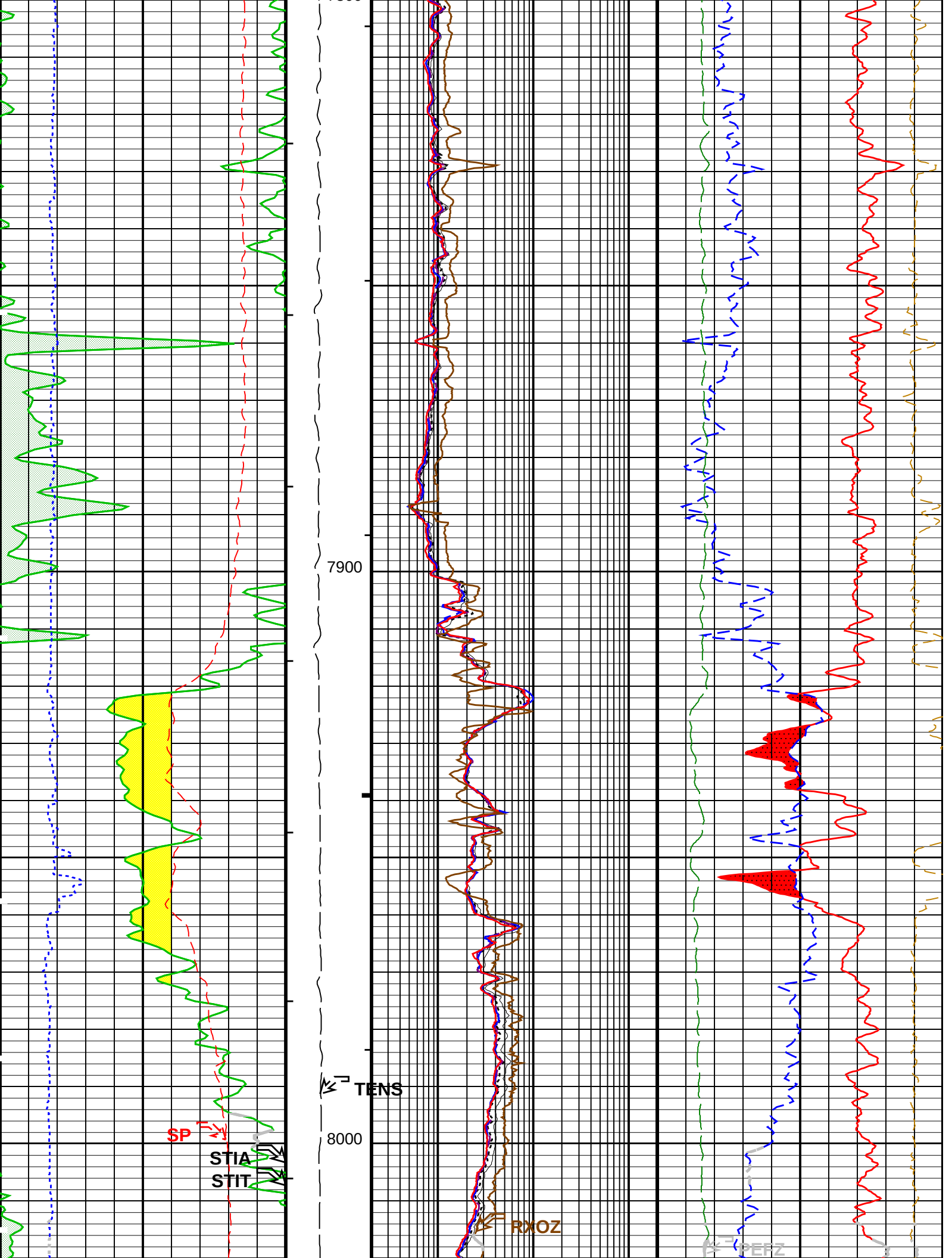
GR
AT90
AT60
AT30
AT20
AT10
DPHZ
7200
7300


TENS
SP
STIA
STIT
7400
RXOZ
PEFZ
NPOR
HDRA
HCAL
GR
GR
DPHZ
AT90
AT60
AT30
AT20
AT10
7500


7600
7700
7800
TENS
SP
STIA
STIT
RXOZ
PEFZ
NPOR
HDRA
HCAL
GR
GR
DPHZ
AT90
AT60
AT30
AT20
AT10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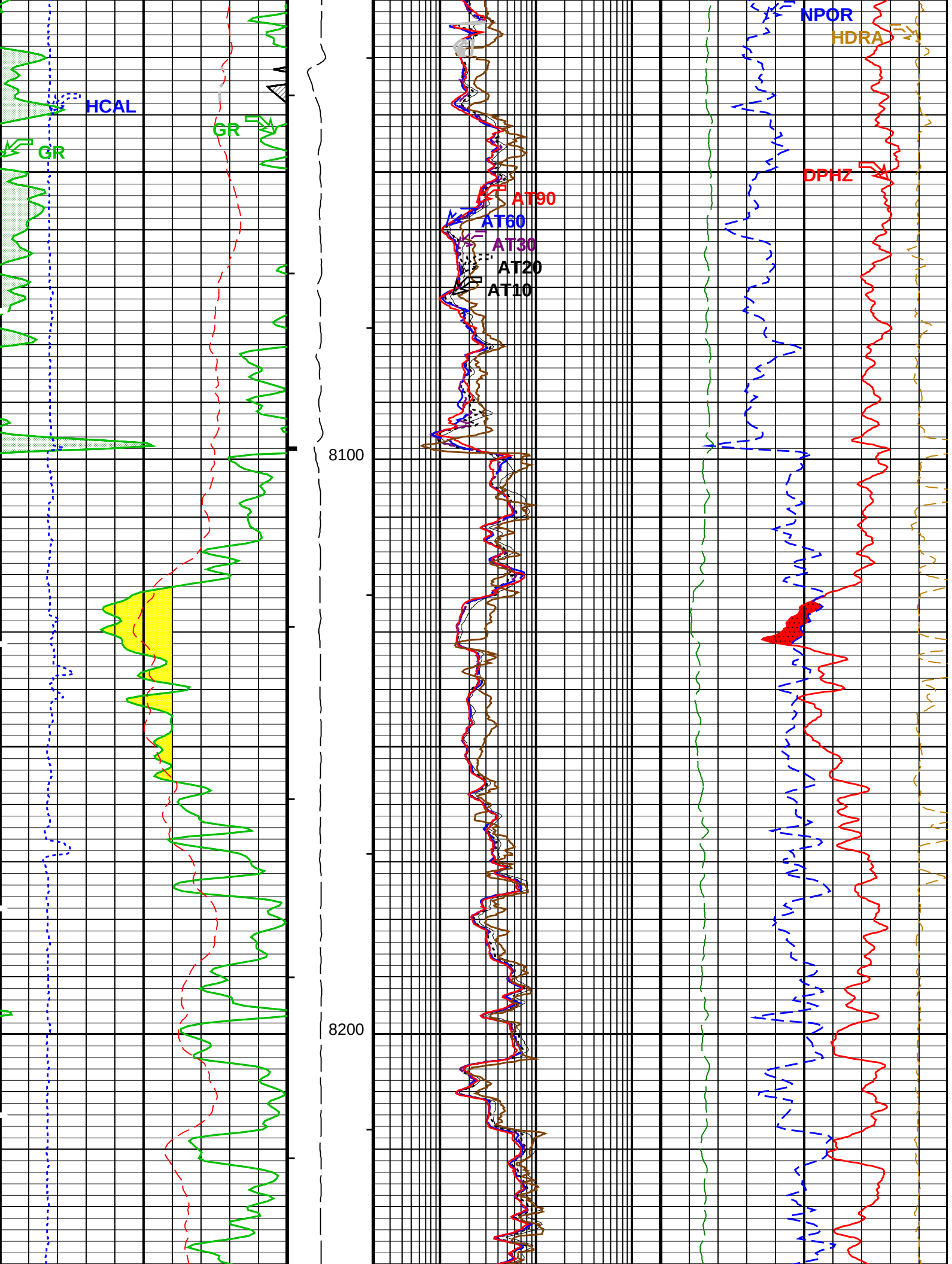
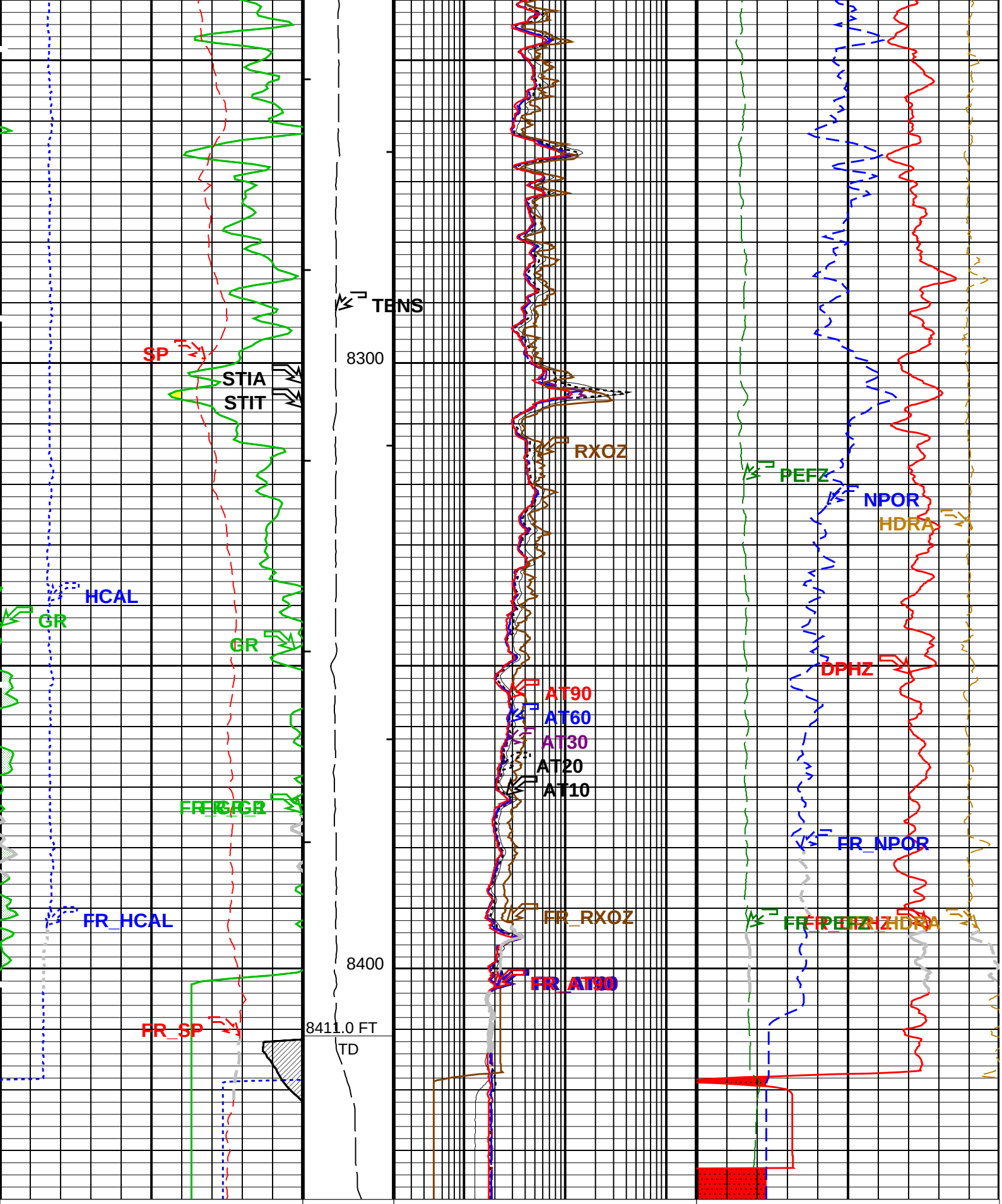
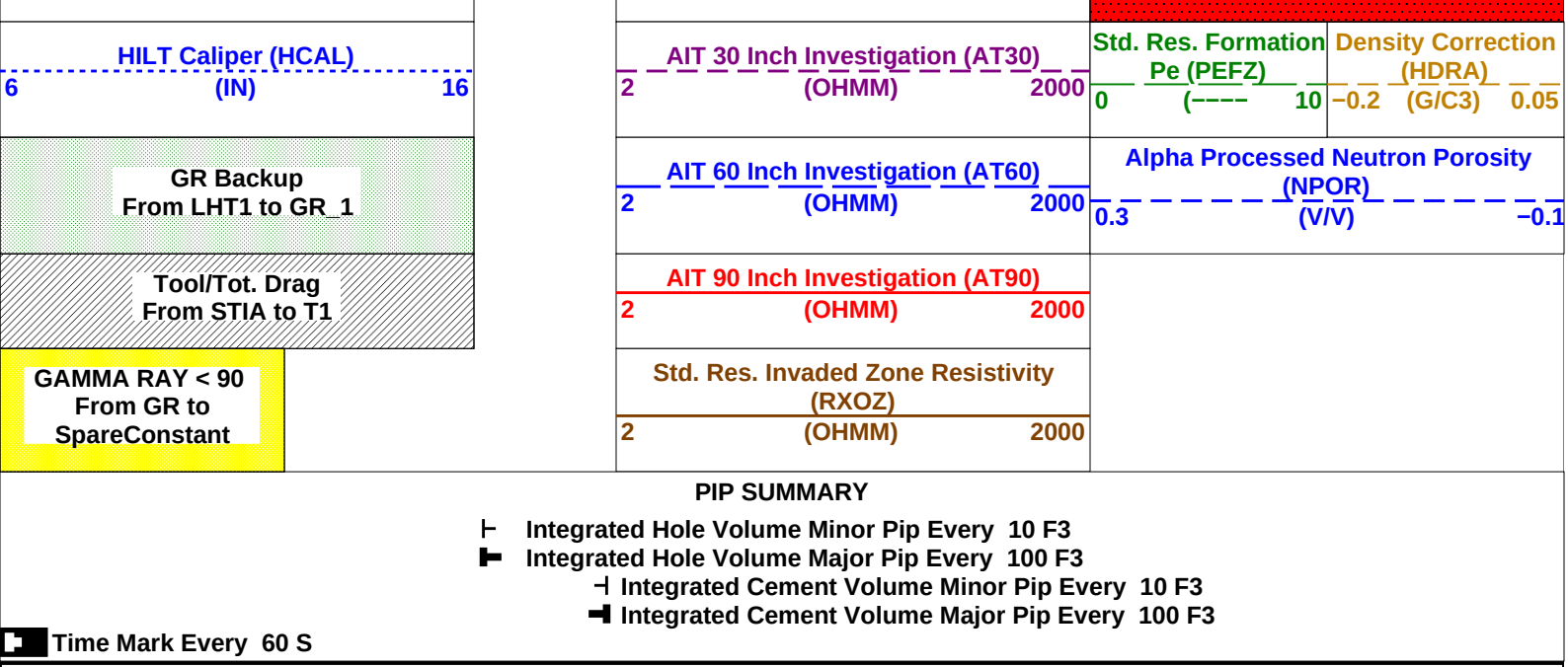
8000
TENS
SP
STIA
STIT
RXOZ
PEFZ


HCAL
GR
GR
AT90
AT60
AT30
AT20
AT10
NPOR
HDRA
DPHZ
8100
8200



SP (SP)	Tension (TENS)	AIT 10 Inch Investigation (AT10)	Std. Res. Density Porosity (DPHZ)
−80 (MV) 20	(LBF) 5000 0	2 (OHMM) 2000	0.3 (V/V) −0.1
Gamma Ray (GR)		AIT 20 Inch Investigation (AT20)	Gas From DPHZ to NPOR
0 (GAPI) 150		2 (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	
	AIT-M: Array Induction Tool - M		
ABHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
ABHV	Array Induction Borehole Correction Code Version Number	900	
ABLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
ABLV	Array Induction Basic Logs Code Version Number	223	
ACDE	Array Induction Casing Detection Enable	No	
ACEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
ACSED	Array Induction Casing Shoe Estimated Depth	-50000	FT
AETP	Array Induction Enable Sonde Error Temp&Pres Corr	Yes	
AFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AIGS	Array Induction Select Akima Interpolation Gating	On	
AMRF	Array Induction Mud Resistivity Factor	1	
AORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
ARFV	Array Induction Radial Profiling Code Version Number	701	
ARPV	Array Induction Radial Parametrization Code Version Number	232	
ASTA	Array Induction Tool Standoff	1	IN
ATRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
ATSE	Array Induction Temperature Selection(Sonde Error Correction)	Internal	
AULV	Array Induction User Level Control	Normal	
AZRSV	Array Induction Response Set Version for Z Resolution	00.10.25.00	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	197	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	LINEAR_ESTIMATE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
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)	197	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	LINEAR_ESTIMATE	
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)	197	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	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
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	2.5	FT
TDD	Total Depth − Driller	8410.00	FT
TDL	Total Depth − Logger	8411.00	FT
System and Miscellaneous			
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	600.00	PPM
CSIZ	Current Casing Size	8.625	IN
CWEI	Casing Weight	32.00	LB/F
DFD	Drilling Fluid Density	9.80	LB/G
DO	Depth Offset for Playback	26.0	FT
FLEV	Fluid Level	5.00	FT
MST	Mud Sample Temperature	93.00	DEGF
PP	Playback Processing	RECOMPUTE	
RMFS	Resistivity of Mud Filtrate Sample	1.5840	OHMM
TD	Total Depth	8411	FT

Format: TCOMBO_AIT Vertical Scale: 5" per 100’ Graphics File Created: 13−Aug−2008 18:02

OP System Version: 16C0−147

MCM

AIT−M	SRPC−3547−Q1_2008_OP16	HILTH−FTB	SRPC−3557−FEB_2008
DTC−H	SRPC−3547−Q1_2008_OP16		

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_011LUP	FN:10	PRODUCER	13−Aug−2008 15:10	8412.0 FT	142.0 FT

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_014PUP	FN:13	PRODUCER	13−Aug−2008 18:02

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REPEAT ANALYSIS

MAXIS Field Log

Company: ORION ENERGY PARTNERS Well: HILTON 23−1

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_009LUP	FN:8	PRODUCER	13−Aug−2008 14:34	8434.5 FT	8028.5 FT
DEFAULT	AIT_TLD_MCFL_CNL_014PUP	FN:13	PRODUCER	13−Aug−2008 18:02	8438.0 FT	168.0 FT

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_017PUP	FN:16	PRODUCER	13−Aug−2008 18:14	8444.5 FT	8038.5 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 119.52 F3

Cement Volume = 78.38 F3 (assuming 4.50 IN casing O.D.)

Computed from 8411.0 FT to 8039.0 FT using data channel(s) HCAL

OP System Version: 16C0−147

MCM

AIT−M	SRPC−3547−Q1_2008_OP16	HILTH−FTB	SRPC−3557−FEB_2008
DTC−H	SRPC−3547−Q1_2008_OP16		

PIP SUMMARY

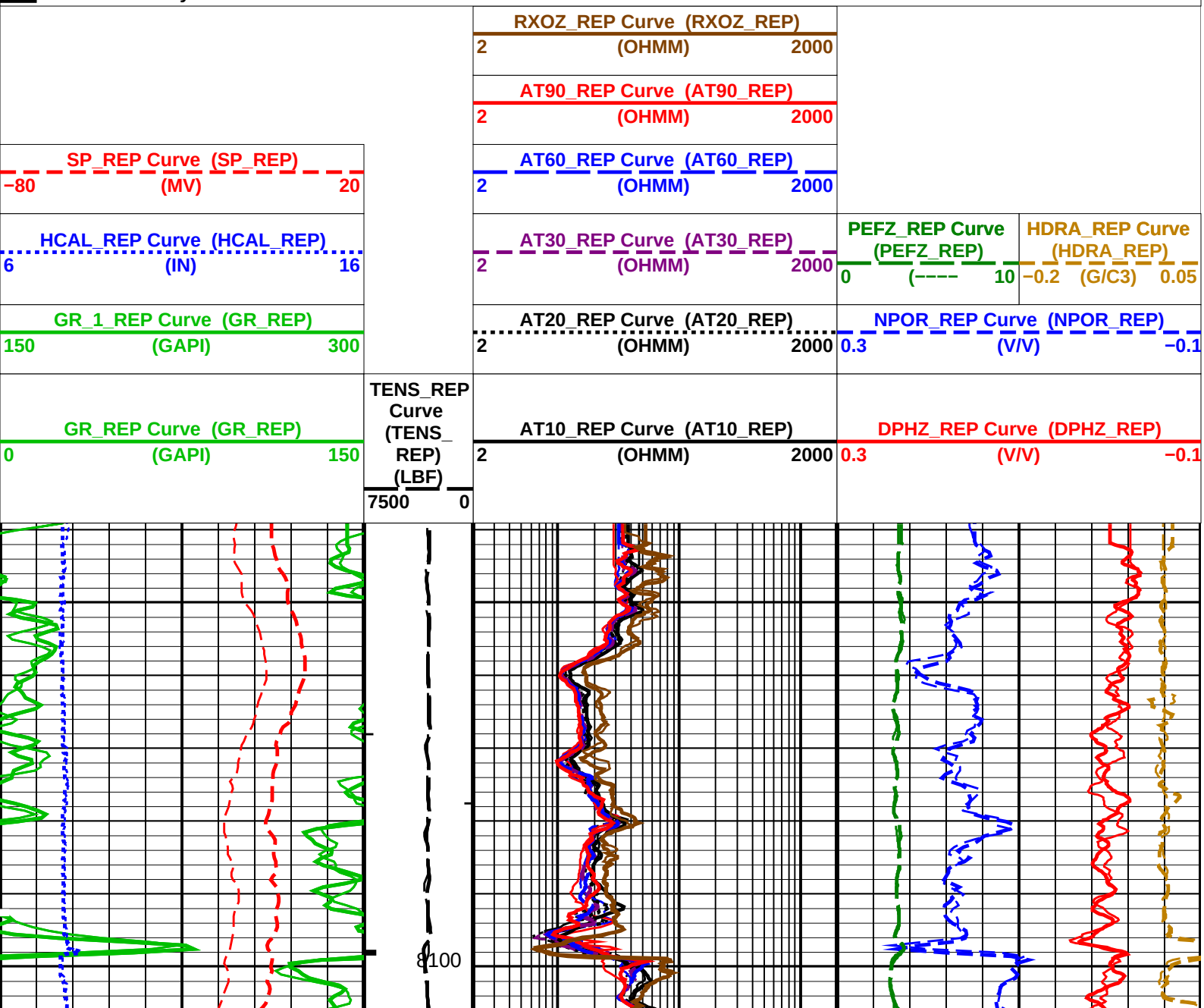
Integrated Hole Volume Minor Pip Every 10 F3

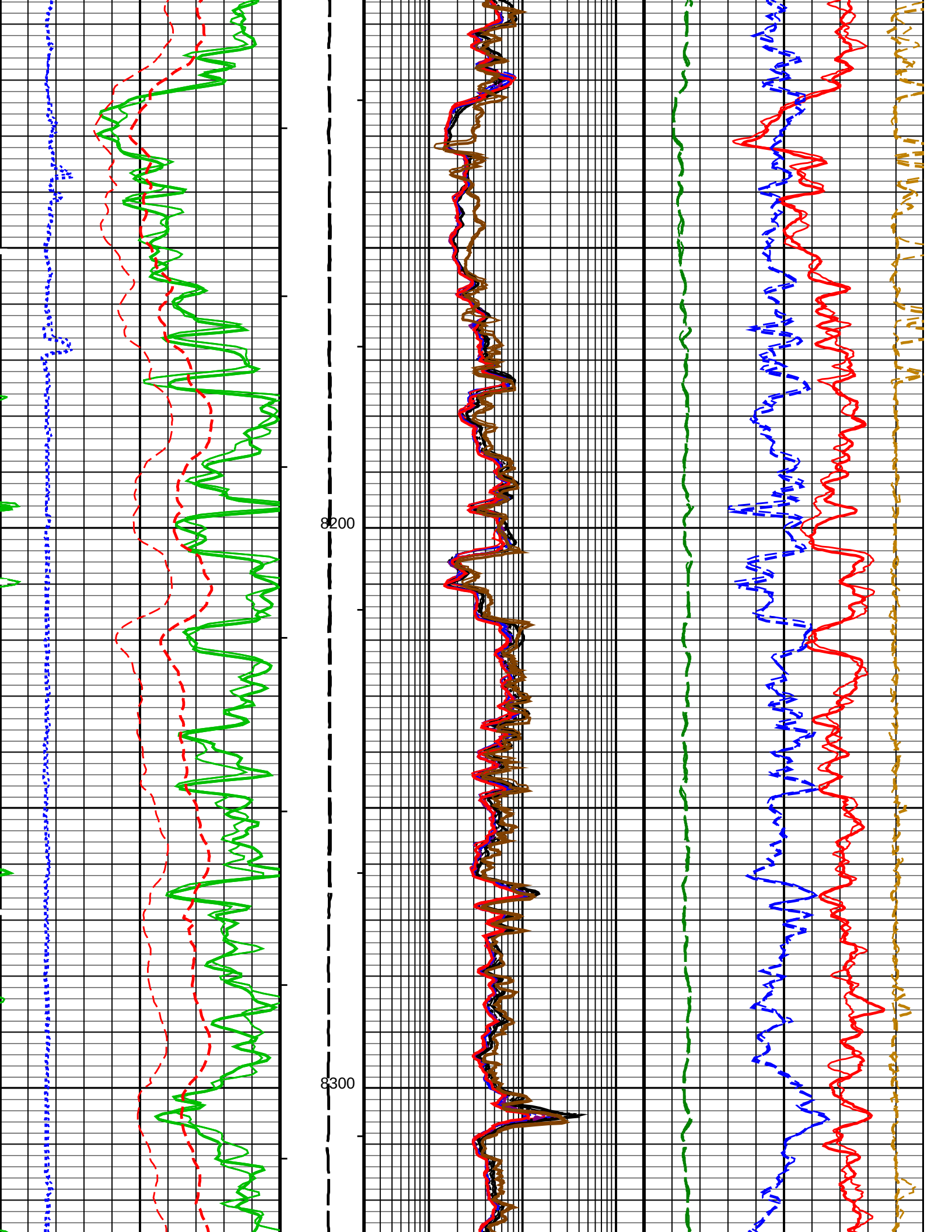
Integrated Hole Volume Major Pip Every 100 F3

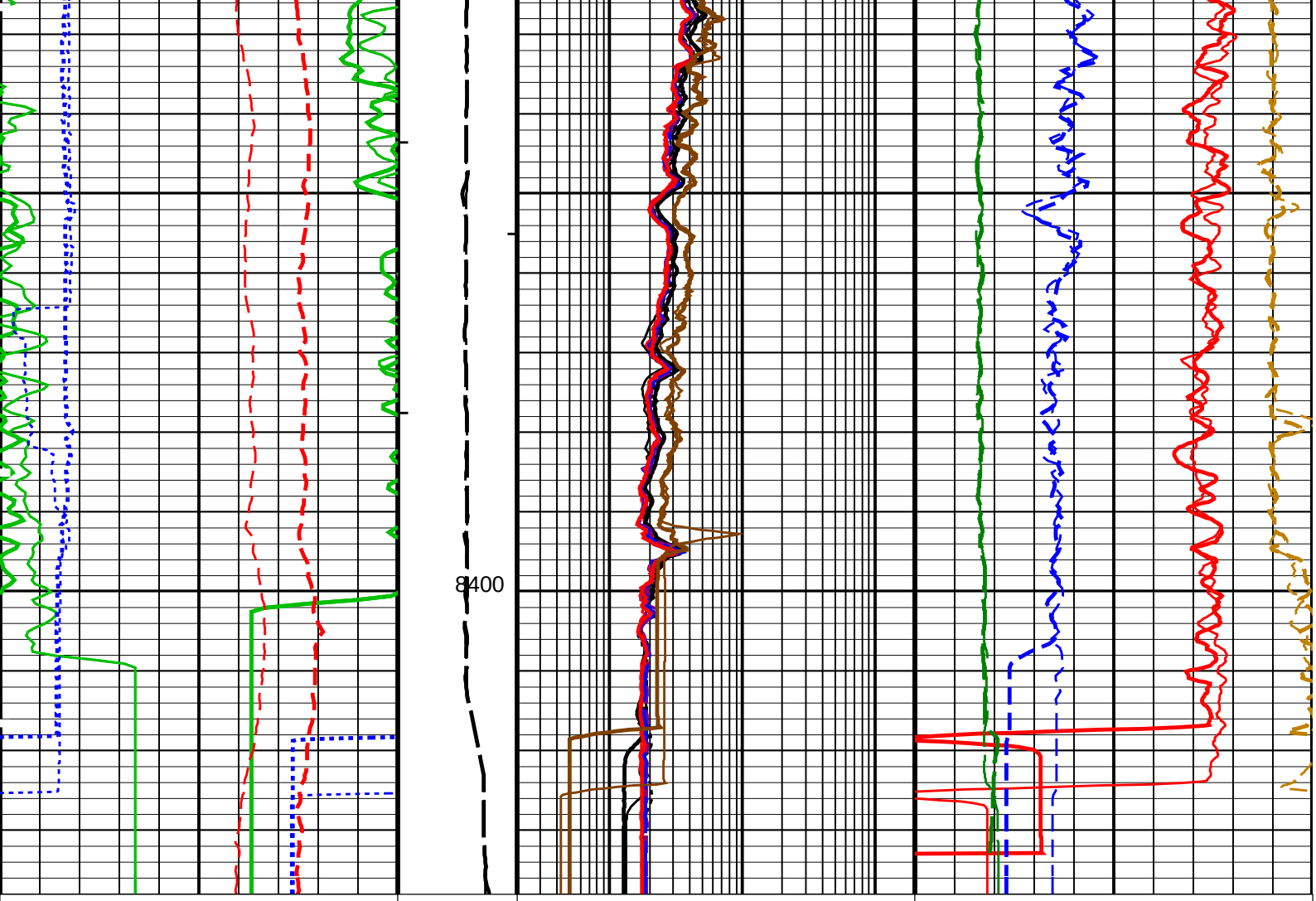
Integrated Cement Volume Minor Pip Every 10 F3

Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S




8200
8300



GR_REP Curve (GR_REP)
0 (GAPI) 150

GR_1_REP Curve (GR_REP)
150 (GAPI) 300

HCAL_REP Curve (HCAL_REP)
6 (IN) 16

SP_REP Curve (SP_REP)
−80 (MV) 20

TENS_REP Curve (TENS_REP) (LBF)
7500 0

AT10_REP Curve (AT10_REP)
2 (OHMM) 2000

AT20_REP Curve (AT20_REP)
2 (OHMM) 2000

AT30_REP Curve (AT30_REP)
2 (OHMM) 2000

AT60_REP Curve (AT60_REP)
2 (OHMM) 2000

AT90_REP Curve (AT90_REP)
2 (OHMM) 2000

RXOZ_REP Curve (RXOZ_REP)
2 (OHMM) 2000

DPHZ_REP Curve (DPHZ_REP)
0.3 (V/V) −0.1

NPOR_REP Curve (NPOR_REP)
0.3 (V/V) −0.1

PEFZ_REP Curve (PEFZ_REP)
0 (---- 10

HDRA_REP Curve (HDRA_REP)
−0.2 (G/C3) 0.05

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
	AIT−M: Array Induction Tool − M	

ABHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
ABHV	Array Induction Borehole Correction Code Version Number	900	
ABLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
ABLV	Array Induction Basic Logs Code Version Number	223	
ACDE	Array Induction Casing Detection Enable	No	
ACEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
ACSED	Array Induction Casing Shoe Estimated Depth	−50000	FT
AETP	Array Induction Enable Sonde Error Temp&Pres Corr	Yes	
AFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AIGS	Array Induction Select Akima Interpolation Gating	On	
AMRF	Array Induction Mud Resistivity Factor	1	
AORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
ARFV	Array Induction Radial Profiling Code Version Number	701	
ARPV	Array Induction Radial Parametrization Code Version Number	232	
ASTA	Array Induction Tool Standoff	1	IN
ATRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
ATSE	Array Induction Temperature Selection(Sonde Error Correction)	Internal	
AULV	Array Induction User Level Control	Normal	
AZRSV	Array Induction Response Set Version for Z Resolution	00.10.25.00	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	197	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	LINEAR_ESTIMATE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
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)	197	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	LINEAR_ESTIMATE	
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)	197	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	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
STI: Stuck Tool Indicator			
TDL	Total Depth − Logger	8411.00	FT
System and Miscellaneous			
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	600.00	PPM
CSIZ	Current Casing Size	8.625	IN
CWEI	Casing Weight	32.00	LB/F

CWEI	Casing Weight	32.00	LB/F
DFD	Drilling Fluid Density	9.80	LB/G
DO	Depth Offset for Playback	10.0	FT
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	5.00	FT
MST	Mud Sample Temperature	93.00	DEGF
PP	Playback Processing	RECOMPUTE	
RMFS	Resistivity of Mud Filtrate Sample	1.5840	OHMM
TD	Total Depth	8411	FT

Format: TCOMBO_AIT_REP **Vertical Scale: 5" per 100'** **Graphics File Created: 13−Aug−2008 18:15**

OP System Version: 16C0−147

MCM

AIT−M	SRPC−3547−Q1_2008_OP16	HILTH−FTB	SRPC−3557−FEB_2008
DTC−H	SRPC−3547−Q1_2008_OP16		

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_009LUP	FN:8	PRODUCER	13−Aug−2008 14:34	8434.5 FT	8028.5 FT
DEFAULT	AIT_TLD_MCFL_CNL_014PUP	FN:13	PRODUCER	13−Aug−2008 18:02	8438.0 FT	168.0 FT

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_017PUP	FN:16	PRODUCER	13−Aug−2008 18:14

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CALIBRATIONS

MAXIS Field Log

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
Array Induction Tool − M Wellsite Calibration − Electronics Calibration Check − Thru Cal Mag. & Phase							
Master: 2−Jun−2008 1:44 Before: 13−Aug−2008 9:17							
Thru Cal Magnitude − 0	0	0.6157	0.6157	N/A	N/A	N/A	V
Thru Cal Magnitude − 1	0	1.262	1.262	N/A	N/A	N/A	V
Thru Cal Magnitude − 2	0	0.6256	0.6257	N/A	N/A	N/A	V
Thru Cal Magnitude − 3	0	0.7070	0.7071	N/A	N/A	N/A	V
Thru Cal Magnitude − 4	0	1.324	1.324	N/A	N/A	N/A	V
Thru Cal Magnitude − 5	0	1.929	1.930	N/A	N/A	N/A	V
Thru Cal Magnitude − 6	0	1.926	1.927	N/A	N/A	N/A	V
Thru Cal Magnitude − 7	0	1.386	1.386	N/A	N/A	N/A	V
Thru Cal Phase − 0	0	198.5	201.0	N/A	N/A	N/A	DEG
Thru Cal Phase − 1	0	197.3	199.8	N/A	N/A	N/A	DEG
Thru Cal Phase − 2	0	193.7	196.2	N/A	N/A	N/A	DEG
Thru Cal Phase − 3	0	192.9	195.4	N/A	N/A	N/A	DEG
Thru Cal Phase − 4	0	186.6	189.1	N/A	N/A	N/A	DEG
Thru Cal Phase − 5	0	184.9	187.4	N/A	N/A	N/A	DEG
Thru Cal Phase − 6	0	184.9	187.4	N/A	N/A	N/A	DEG
Thru Cal Phase − 7	0	183.5	186.0	N/A	N/A	N/A	DEG
Array Induction Tool − M Wellsite Calibration − Electronics Calibration Check − Auxiliary							
Master: 2−Jun−2008 1:44 Before: 13−Aug−2008 9:17							
Array Induction SPA Plus	991.0	992.5	992.6	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	0.05604	0.1306	N/A	N/A	N/A	MV
Array Induction Temperature Pl	0.9170	0.9192	0.9192	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	0.00005357	0.00005912	N/A	N/A	N/A	V
Array Induction Tool − M Wellsite Calibration − Test Loop Gain Correction							
Master: 2−Jun−2008 1:44							
Test Loop Gain Correctio − 0	0	1.019	N/A	N/A	N/A	N/A	V

Test Loop Gain Correctio − 1	0	1.023	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 2	0	1.044	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 3	0	1.018	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 4	0	1.005	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 5	0	0.9918	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 6	0	1.004	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 7	0	1.008	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 0	0	0.5562	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 1	0	0.2840	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 2	0	0.3063	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 3	0	0.1212	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 4	0	−0.09448	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 5	0	−0.08350	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 6	0	0.2596	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 7	0	−0.03219	N/A	N/A	N/A	N/A	DEG

Array Induction Tool − M Wellsite Calibration − Sonde Error Correction
Master: 2−Jun−2008 1:44

R Sonde Error Correction − 0	0	−117.6	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 1	0	163.7	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 2	0	101.7	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 3	0	69.94	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 4	0	25.56	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 5	0	17.55	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 6	0	10.15	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 7	0	−1.363	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 0	0	−156.5	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 1	0	242.9	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 2	0	31.16	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 3	0	17.46	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 4	0	−11.53	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 5	0	17.72	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 6	0	−4.073	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 7	0	5.011	N/A	N/A	N/A	N/A	MM/M

Array Induction Tool − M Wellsite Calibration − Mud Gain Correction
Master: 2−Jun−2008 1:44

Coarse − Mag, Real, Imag − 0	0	0.8215	N/A	N/A	N/A	N/A	
Coarse − Mag, Real, Imag − 1	0	0.8215	N/A	N/A	N/A	N/A	
Coarse − Mag, Real, Imag − 2	0	0.8215	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 0	0	0.8222	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 1	0	0.8222	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 2	0	0.8222	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Stab Measurement Summary
Before: 13−Aug−2008 9:21

BS Window Ratio	0.7380	N/A	0.7377	N/A	N/A	N/A	
BS Window Sum	30960	N/A	30870	N/A	N/A	N/A	CPS
SS Window Ratio	0.4871	N/A	0.4899	N/A	N/A	N/A	
SS Window Sum	13180	N/A	13170	N/A	N/A	N/A	CPS
LS Window Ratio	0.2965	N/A	0.2947	N/A	N/A	N/A	
LS Window Sum	1517	N/A	1509	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Photo−multiplier High Voltages Calibrations
Before: 13−Aug−2008 9:21

BS PM High Voltage (Command)	1516	N/A	1512	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1631	N/A	1640	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1362	N/A	1362	N/A	N/A	N/A	V

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Crystal Quality Resolutions Calibration
Before: 13−Aug−2008 9:21

BS Crystal Resolution	11.51	N/A	11.23	N/A	N/A	N/A	%
SS Crystal Resolution	10.23	N/A	10.53	N/A	N/A	N/A	%
LS Crystal Resolution	9.348	N/A	9.002	N/A	N/A	N/A	%

High resolution Integrated Logging Tool−DTS Wellsite Calibration − MCFL Calibration
Before: 13−Aug−2008 9:22

Raw B0 Resistivity	3875	N/A	3862	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	3832	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool−DTS Wellsite Calibration − HILT Caliper Calibration
Before: 13−Aug−2008 9:17

HILT Caliper Zero Measurement	8.000	N/A	7.914	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.06	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Detector Calibration
Before: 13−Aug−2008 9:18

Gamma Ray Background	30.00	N/A	64.78	N/A	N/A	N/A	GAPI
Gamma Ray (Jig − Bkg)	150.3	N/A	150.3	N/A	N/A	13.66	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: 17−May−2008 19:24 Before: 13−Aug−2008 9:20

CNTC Background	29.97	29.97	28.81	N/A	N/A	4.496	CPS
CFTC Background	31.98	31.98	29.49	N/A	N/A	4.797	CPS

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Ratio Measurement
Master: 17−May−2008 19:24

Thermal Near Corr. (Tank)	5800	5480	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2323	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.359	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Accelerometer Calibration
Before: 13−Aug−2008 13:12

Z−Axis Acceleration	32.19	N/A	32.08	N/A	N/A	N/A	F/S2

High resolution Integrated Logging Tool−DTS Master Calibration − Inversion results
Master: 4−Aug−2008 14:20

Rho Aluminum	2.596	2.602	−−	−−	−−	−−	G/C3
Rho Magnesium	1.686	1.686	−−	−−	−−	−−	G/C3
Pe Aluminum	2.570	2.597	−−	−−	−−	−−	
Pe Magnesium	2.650	2.592	−−	−−	−−	−−	

High resolution Integrated Logging Tool−DTS Master Calibration − Deviation Summary
Master: 4−Aug−2008 14:20

BS Average Deviation	0	0.5240	−−	−−	−−	−−	%
BS Max Deviation	0	1.059	−−	−−	−−	−−	%
SS Average Deviation	0	0.2904	−−	−−	−−	−−	%
SS Max Deviation	0	1.318	−−	−−	−−	−−	%
LS Average Deviation	0	0.8832	−−	−−	−−	−−	%
LS Max Deviation	0	2.950	−−	−−	−−	−−	%

The GLS−VJ source activity is acceptable.

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

NCT−B Water Temperature 73.0 DEGF.
Thermal Housing Size 3.374 IN.
NSR−F serial number 2549

Array Induction Tool − M / Equipment Identification

Primary Equipment:

Rm/SP Bottom Nose	AMRM − A	
Array Induction Sonde	AMIS − A	94

Auxiliary Equipment:

Array Induction Tool − M Wellsite Calibration
Electronics Calibration Check − Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Thru Cal Phase DEG	Nominal
0	Master	0.6157		0.6100	198.5		197.0
	Before	0.6157			201.0		
1	Master	1.262		1.270	197.3		196.0
	Before	1.262			199.8		
2	Master	0.6256		0.6200	193.7		192.0
	Before	0.6257			196.2		
3	Master	0.7070		0.7000	192.9		191.0
	Before	0.7071			195.4		
4	Master	1.324		1.340	186.6		185.0
	Before	1.324			189.1		
5	Master	1.929		1.960	184.9		182.0
	Before	1.930			187.4		

	Before	1.930		187.4	
6	Master	1.926	1.960	184.9	181.0
	Before	1.927		187.4	
7	Master	1.386	1.410	183.5	175.0
	Before	1.386		186.0	
		60.00 % (Minimum)	140.0 % (Maximum)	Nom −60.00 (Minimum)	Nom + 60.00 (Maximum)

Master: 2−Jun−2008 1:44 Before: 13−Aug−2008 9:17

Array Induction Tool − M Wellsite Calibration

Electronics Calibration Check − Auxiliary

Phase	Array Induction SPA Plus MV	Value
Master		992.5
Before		992.6
	941.0 (Minimum) 991.0 (Nominal) 1040 (Maximum)	

Phase	Array Induction SPA Zero MV	Value
Master		0.05604
Before		0.1306
	−50.00 (Minimum) 0 (Nominal) 50.00 (Maximum)	

Phase	Array Induction Temperature Plus V	Value
Master		0.9192
Before		0.9192
	0.8710 (Minimum) 0.9170 (Nominal) 0.9630 (Maximum)	

Phase	Array Induction Temperature Zero V	Value
Master		5.357E−00
Before		5.912E−00
	−0.05000 (Minimum) 0 (Nominal) 0.05000 (Maximum)	

Master: 2−Jun−2008 1:44 Before: 13−Aug−2008 9:17

Array Induction Tool − M Wellsite Calibration

Test Loop Gain Correction

Idx	Value	Test Loop Gain Correction Magnitude V	Value	Test Loop Gain Correction Phase DEG
0	1.019	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.5562	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
1	1.023	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.2840	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
2	1.044	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.3063	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
3	1.018	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.1212	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
4	1.005	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	−0.09448	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
5	0.9918	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	−0.08350	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
6	1.004	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.2596	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
7	1.008	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	−0.03219	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)

Master: 2−Jun−2008 1:44

Array Induction Tool − M Wellsite Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M	Value	X Sonde Error Correction MM/M
0	−117.6	−231.0 (Minimum) −56.00 (Nominal) 119.0 (Maximum)	−156.5	−2250 (Minimum) 0 (Nominal) 2250 (Maximum)
1	163.7	114.0 (Minimum) 159.0 (Nominal) 204.0 (Maximum)	242.9	−625.0 (Minimum) 0 (Nominal) 625.0 (Maximum)
2	101.7	66.00 111.0 156.0	31.16	−350.0 0 350.0

		(Minimum)	(Nominal)	(Maximum)		(Minimum)	(Nominal)	(Maximum)
3	69.94				17.46			
		39.00	64.00	89.30	−250.0	0	250.0	
4	25.56				−11.53			
		15.00	25.00	35.00	−63.00	0	63.00	
5	17.55				17.72			
		4.000	14.00	24.00	−50.00	0	50.00	
6	10.15				−4.073			
		5.000	10.00	15.00	−30.00	0	30.00	
7	−1.363				5.011			
		−5.000	0	5.000	−30.00	0	30.00	

Master: 2−Jun−2008 1:44

Array Induction Tool − M Wellsite Calibration

Mud Gain Correction

Idx	Value	Coarse − Mag, Real, Imag			Value	Fine − Mag, Real, Imag		
0	0.8215				0.8222			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	
1	0.8215				0.8222			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	
2	0.8215				0.8222			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	

Master: 2−Jun−2008 1:44

Array Induction Tool − M Master Calibration

Electronics Calibration Check − Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Thru Cal Phase DEG	Nominal
0	Master	0.6157		0.6100	198.5		197.0
1	Master	1.262		1.270	197.3		196.0
2	Master	0.6256		0.6200	193.7		192.0
3	Master	0.7070		0.7000	192.9		191.0
4	Master	1.324		1.340	186.6		185.0
5	Master	1.929		1.960	184.9		182.0
6	Master	1.926		1.960	184.9		181.0
7	Master	1.386		1.410	183.5		175.0
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom −60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)	

Master: 2−Jun−2008 1:44

Array Induction Tool − M Master Calibration

Electronics Calibration Check − Auxiliary

Phase	Array Induction SPA Plus MV	Value	Phase	Array Induction SPA Zero MV	Value
Master		992.5	Master		0.05604
	941.0 (Minimum) 991.0 (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		0.9192	Master		5.357E−00
	0.8710 (Minimum) 0.9170 (Nominal) 0.9630 (Maximum)			−0.05000 (Minimum) 0 (Nominal) 0.05000 (Maximum)	

Master: 2−Jun−2008 1:44

Array Induction Tool − M Master Calibration

Test Loop Gain Correction

Idx	Value	Test Loop Gain Correction Magnitude V	Value	Test Loop Gain Correction Phase DEG

0	1.019				0.5562			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
1	1.023				0.2840			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
2	1.044				0.3063			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
3	1.018				0.1212			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
4	1.005				−0.09448			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
5	0.9918				−0.08350			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
6	1.004				0.2596			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
7	1.008				−0.03219			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	

Master: 2−Jun−2008 1:44

Array Induction Tool − M Master Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M		
0	−117.6				−156.5			
	−231.0 (Minimum)	−56.00 (Nominal)	119.0 (Maximum)		−2250 (Minimum)	0 (Nominal)	2250 (Maximum)	
1	163.7				242.9			
	114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		−625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)	
2	101.7				31.16			
	66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		−350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)	
3	69.94				17.46			
	39.00 (Minimum)	64.00 (Nominal)	89.30 (Maximum)		−250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)	
4	25.56				−11.53			
	15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		−63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)	
5	17.55				17.72			
	4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		−50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)	
6	10.15				−4.073			
	5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)	
7	−1.363				5.011			
	−5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)	

Master: 2−Jun−2008 1:44

Array Induction Tool − M Master Calibration

Mud Gain Correction

Idx	Value	Coarse − Mag, Real, Imag			Value	Fine − Mag, Real, Imag		
0	0.8215				0.8222			
	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	
1	0.8215				0.8222			
	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	
2	0.8215				0.8222			
	0.8000	1.000	1.200		0.8000	1.000	1.200	

	(Minimum)	(Nominal)	(Maximum)		(Minimum)	(Nominal)	(Maximum)

Master: 2−Jun−2008 1:44

High resolution Integrated Logging Tool−DTS / Equipment Identification

Primary Equipment:		
HILT high−Resolution Mechanical Sonde	HRMS − H	
HILT Rxo Gamma−ray Device	HRGD − H	
HILT Micro Cylindrically Focused Log Dev	MCFL − H	
GR Logging Source	GLS − VJ	5182
HILT High Res. Control Cartridge	HRCC − H	
HILT Gamma−Ray Neutron Sonde−DTS	HGNS − H	
HGNS Gamma−Ray Device	HGR −	
HGNS Neutron Detector with Alpha Source	HCNT − H	
Auxiliary Equipment:		
Neutron Calibration Tank	NCT − B	
Gamma Source Radioactive	GSR − U/Y	
HGNS Housing	HGNH −	

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				0.7377	Before				0.4899	Before				0.2947
	0.7011 (Minimum)	0.7380 (Nominal)	0.7749 (Maximum)			0.4627 (Minimum)	0.4871 (Nominal)	0.5114 (Maximum)			0.2817 (Minimum)	0.2965 (Nominal)	0.3114 (Maximum)	
Phase	BS Window Sum CPS			Value	Phase	SS Window Sum CPS			Value	Phase	LS Window Sum CPS			Value
Before				30870	Before				13170	Before				1509
	29420 (Minimum)	30960 (Nominal)	32510 (Maximum)			12530 (Minimum)	13180 (Nominal)	13840 (Maximum)			1441 (Minimum)	1517 (Nominal)	1593 (Maximum)	

Before: 13−Aug−2008 9:21

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				1512	Before				1640	Before				1362
	1416 (Minimum)	1516 (Nominal)	1616 (Maximum)			1531 (Minimum)	1631 (Nominal)	1731 (Maximum)			1262 (Minimum)	1362 (Nominal)	1462 (Maximum)	

Before: 13−Aug−2008 9:21

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				11.23	Before				10.53	Before				9.002
	10.51 (Minimum)	11.51 (Nominal)	12.51 (Maximum)			9.230 (Minimum)	10.23 (Nominal)	11.23 (Maximum)			8.348 (Minimum)	9.348 (Nominal)	10.35 (Maximum)	

Before: 13−Aug−2008 9:21

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				3862	Before				3822	Before				3832
	3565 (Minimum)	3875 (Nominal)	4185 (Maximum)			3524 (Minimum)	3830 (Nominal)	4136 (Maximum)			3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	

Before: 13−Aug−2008 9:22

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				7.914	Before				12.06
	6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)			9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)	

Before: 13−Aug−2008 9:17

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		64.78	Before		150.3	Before		165.0
	0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)			136.6 (Minimum) 150.3 (Nominal) 163.9 (Maximum)			150.0 (Minimum) 165.0 (Nominal) 180.0 (Maximum)	

Before: 13−Aug−2008 9:18

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		29.97	Master		31.98
Before		28.81	Before		29.49
	5.000 (Minimum) 29.97 (Nominal) 40.00 (Maximum)			5.000 (Minimum) 31.98 (Nominal) 40.00 (Maximum)	

Master: 17−May−2008 19:24 Before: 13−Aug−2008 9:20

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		5480	Master		2323	Master		2.359
	4700 (Minimum) 5800 (Nominal) 6900 (Maximum)			1900 (Minimum) 2400 (Nominal) 2900 (Maximum)			2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)	

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High resolution Integrated Logging Tool−DTS

Wellsite Calibration

Accelerometer Calibration

Phase	Z−Axis Acceleration F/S2	Value
Before		32.08
	31.53 (Minimum) 32.19 (Nominal) 32.84 (Maximum)	

Before: 13−Aug−2008 13:12

High resolution Integrated Logging Tool−DTS Master Calibration

Inversion results

Phase	Rho Aluminum G/C3	Value	Phase	Rho Magnesium G/C3	Value
Master		2.602	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		2.597	Master		2.592
	2.470 (Minimum) 2.570 (Nominal) 2.670 (Maximum)			2.550 (Minimum) 2.650 (Nominal) 2.750 (Maximum)	

Master: 4−Aug−2008 14:20

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		0.5240	Master		0.2904	Master		0.8832
	−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		1.059	Master		1.318	Master		2.950
	−1.600 (Minimum) 0 (Nominal) 1.600 (Maximum)			−2.500 (Minimum) 0 (Nominal) 2.500 (Maximum)			−3.500 (Minimum) 0 (Nominal) 3.500 (Maximum)	

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High resolution Integrated Logging Tool−DTS Master Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		29.97	Master		31.98
	5.000 (Minimum) 29.97 (Nominal) 40.00 (Maximum)			5.000 (Minimum) 31.98 (Nominal) 40.00 (Maximum)	

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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				5480	Master				2323	Master				2.359
	4700 (Minimum)	5800 (Nominal)	6900 (Maximum)			1900 (Minimum)	2400 (Nominal)	2900 (Maximum)			2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)	

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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

Company: **ORION ENERGY PARTNERS**

Schlumberger

Well: **HILTON 23−1**
Field: **WILDCAT**
County: **GARFIELD**
State: **COLORADO**

PLATFORM EXPRESS
ARRAY INDUCTION TOOL
GAMMA RAY − SP