

Company: Anadarko E&P Onshore LLC

Well: Murphy 1-31 M

Field: Greenwood

County: Morton State: Kansas

County: Morton				
Field: Greenwood				
Location: 497.46' FEL & 1335.13' FSL				
Well: Murphy 1-31 M				
Company: Anadarko E&P Onshore LLC				
TRIPLE COMBO PLATFORM EXPRESS GAMMA RAY		Location:		
		497.46' FEL & 1335.13' FSL		
		SW,SE,NE,SW		
		SE/4 SEC.31, T32S-R42W		
Permanent Datum:		Mean Sea Level	Elev.:	K.B.
Log Measured From:		Ground Level	3538.19 ft	G.L.
Drilling Measured From:		Ground Level		D.F.
API Serial No.		Section:	Township:	Range:
15-129-21957		31	32S	42W
Logging Date 12-Dec-2013				

Run Number	One		
Depth Driller	5250.00 ft		
Schlumberger Depth	5255.00 ft		
Bottom Log Interval	5255.00 ft		
Top Log Interval	1494.00 ft		
Casing Driller Size @ Depth	8.625 in @ 1480.00 ft		
Casing Schlumberger	1494 ft		
Bit Size	7.875 in		
Type Fluid In Hole	Fresh Water		
Density	8.8 lbm/gal	60 s	
Fluid Loss	6.2 cm3	10.5	
Source of Sample	Active Tank		
RM @ Meas Temp	0.72 ohm.m @ 55 degF		
RMF @ Meas Temp	0.62 ohm.m @ 55 degF		
RMC @ Meas Temp	1.01 ohm.m @ 55 degF		
Source RMF	Calculated	Calculated	
RM @ BHT	0.34 @ 123.4 @ 0.29 @ 123.4		
Max Recorded Temperatures	123.4 degF 123		
Circulation Stopped	12-Dec-2013 07:15:00		
Logger on Bottom	12-Dec-2013 12:02:29		
Unit Number	Location: 2367	Elk City, OK	
Recorded By	Matt Cramer		
Witnessed By	Tom Bingel		

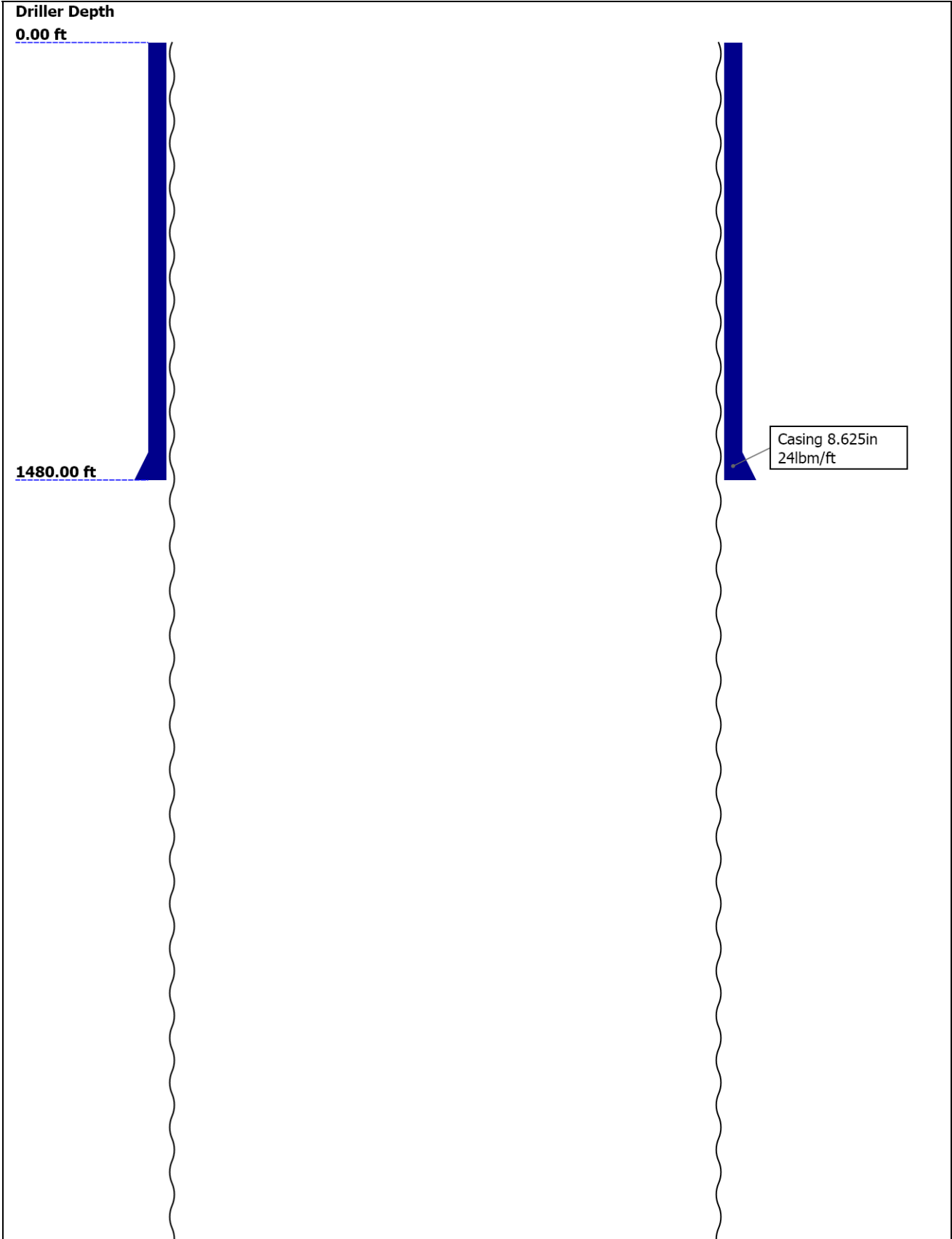
Disclaimer

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Well Sketch



5250.00 ft

One: Toolstring				One: Remarks
Equip name LEH-QT LEH-QT	Length 58.76	MP name	Offset	Thank you for choosing Schlumberger of Elk City, OK- 580-339-6535
				Tools ran as per toolsketch.
				All logs and presentations as per client's request.
EDTC-B EDTH-B EDTG-A EDTC-B	55.84			Logging measured from ground level as per client's request. Drilling measured from drill floor at 7' above ground level.
		CTEM ACCZ HV	52.34 0.00 0.00	Logged on limestone matrix (MDEN=2.56,DTM=47.6)
		Gamma Ray	50.47	Standoff correction & Hole size correction were applied.
HNGS-BA:328 HEH-K:328 HNGS-BA:328	49.34	TelStatus	49.34	Caliper check inside casing within tolerance.
				Source of maximum recorded temperature is HNGS temperature sensor.
		GR	46.35	

HNGC-B:596 41.15
HNGH-A:4077
HNGC-B:596

Tel Status 39.4

HGNS-H:3819 37.65
HGNH:2844
NSR-F:5075
NPV-N
HGNS-H:3819
HACCZ-H:5120
HMCA-H

Temperatur 37.62
GR 36.91

CNL Porosity 30.57
HMCA 28.24
HGNS 28.24
Accelerometer 0.00

HDRS-H:3966 28.24
ECH-MEB:2840
HRCC-H:3928
HRMS-H:3966
Short Spacing
Backscatter
GPV-Q
GSR-J:5398
Long Spacing
HRGD-H:3832

HRCC 24.24

MCFL 18.81
Caliper 18.33
TLD Density 17.94

AIT-M:154 16.00
AMIS:154
AMRM:154

Power Supply 7.91
Temperature 7.91
Induction 7.91

SP 0.08
Mud Resistivity 0.00
Head Tension
TOOL_ZERO

Lengths are in ft
Maximum Depth 0.000 in

Maximum Outer Diameter = 9.000 in Line: Sensor Location, Value: Gating Offset All measurements are relative to TOOL_ZERO					
Depth Summary					
Depth Control Parameters		One			
Conveyance Type		Wireline			
Log Sequence		ONE			
Depth Remark Parameters		One			
Depth Remark 1		First run in hole, All Schlumberger Depth control procedures were followed.			
Depth Remark 2		IDW used as primary depth control & Z-Chart used as secondary.			
Depth Remark 3		Main Log was correlated to the Down log.			
Depth Remark 4		Logging measured from ground level as per client's request. Drilling measured from drill floor at 7' above ground level.			
Depth Measuring Device		One			
Type		IDW-JA			
Serial Number		6650			
Calibration Date		25-Apr-2013			
Calibrator Serial Number		33			
Calibration Cable Type		7-39P-LXS			
Wheel Correction 1		-6			
Wheel Correction 2		-3			
Tension Device		One			
Type		CMTD-B/A			
Serial Number		2549			
Calibration Date		25-Sep-2013			
Calibrator Serial Number		1018			
Calibration Points		10			
Calibration RMS		12			
Calibration Peak Error		19			
Logging Cable		One			
Type		7-39P-LXS			
Serial Number		U712016			
Logging Cable Length (ft)		16100.00			
One					
Main Pass 5					
Integration Summary					
Output Channel(s)		Output Description	Input Parameter	Output Value	Unit
Software Version					
Acquisition System			Version		
MaxWell			3.1.9755.0		
Application Patch			SP-20130325-3.1.9755.1799		
Computation		Description			Version
HENVIR		Computation Ensemble for the HGNS Neutron environmental corrections			3.1.9755.0
Tool Elements		Description		Software Version	Firmware Version
HRCC-H		HILT High-Resolution Control Cartridge, 150 degC		3.1.9755.0	2.0
HRGD-H		HILT Resistivity Gamma Ray Density Device, 150 degC		3.1.9755.0	3.0

HRGD-H	HELI Resistivity Gamma-Ray Density Device, 150 degC	3.1.9755.0	3.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0
AMIS	Array Induction Sonde - M	3.1.9755.1799	1

Pass Summary								
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Log[4]:Up	Up	256.43 ft	5269.80 ft	12-Dec-2013 12:17:33 PM	12-Dec-2013 2:41:47 PM	9.93 ft	

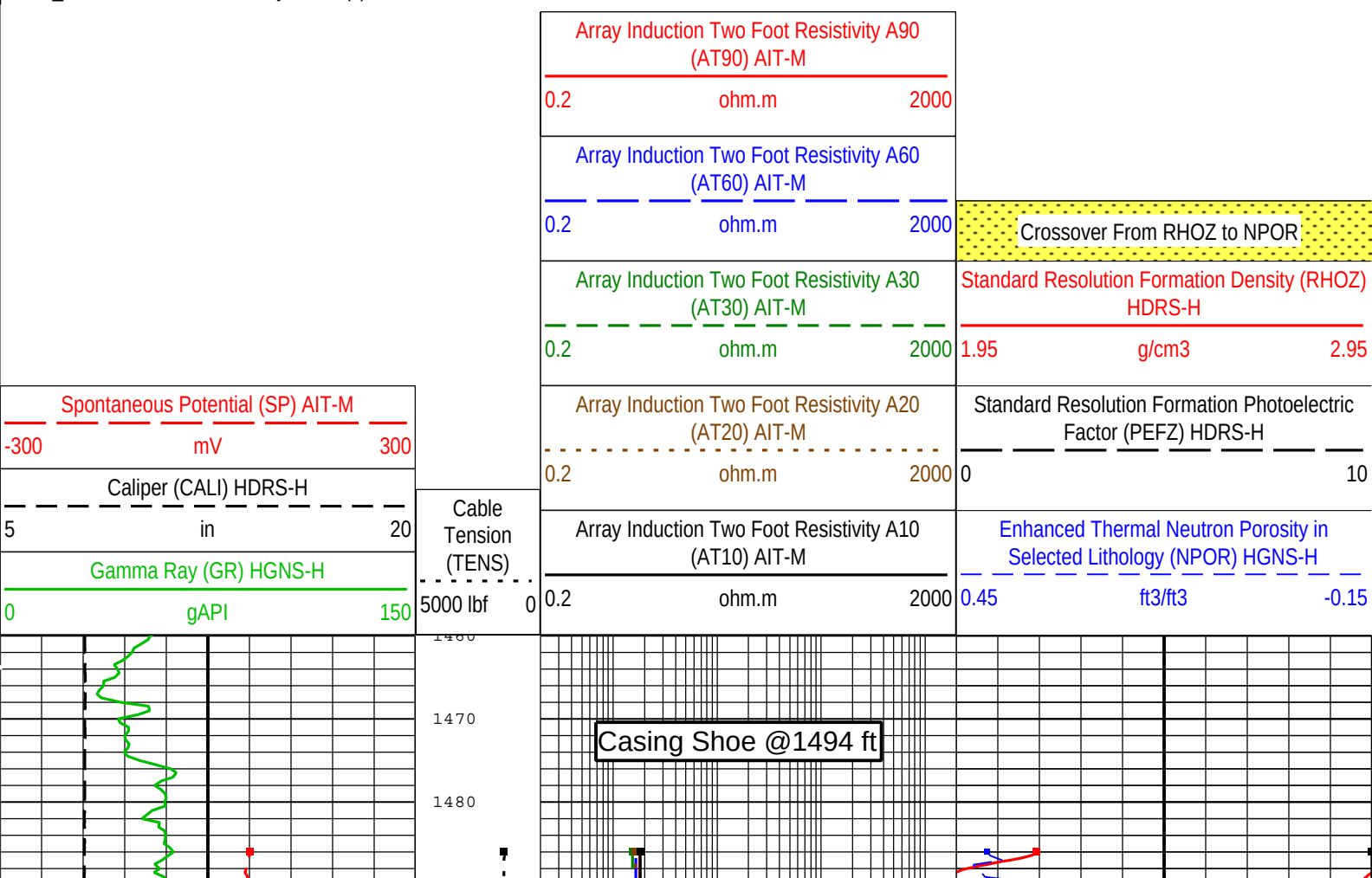
All depths are referenced to toolstring zero

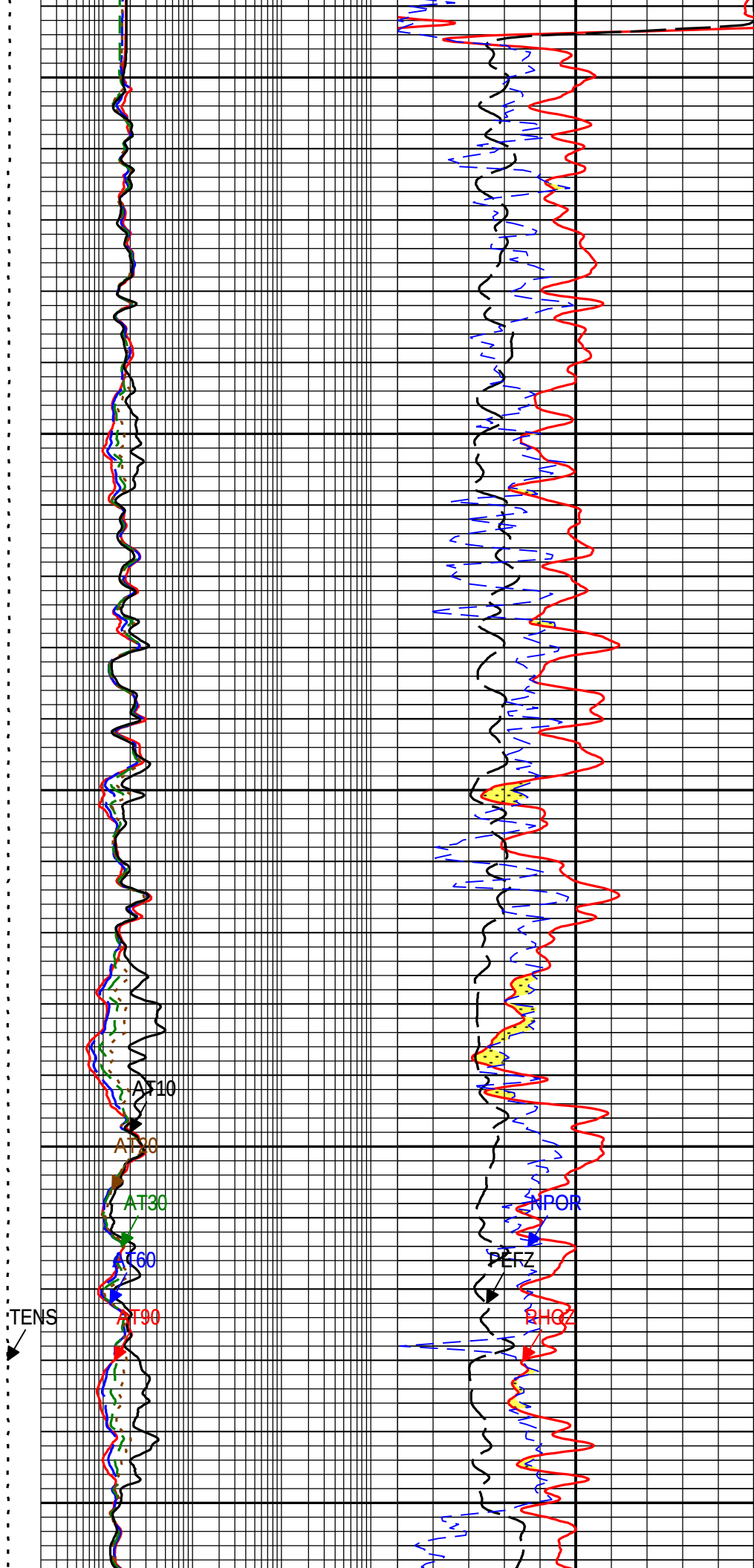
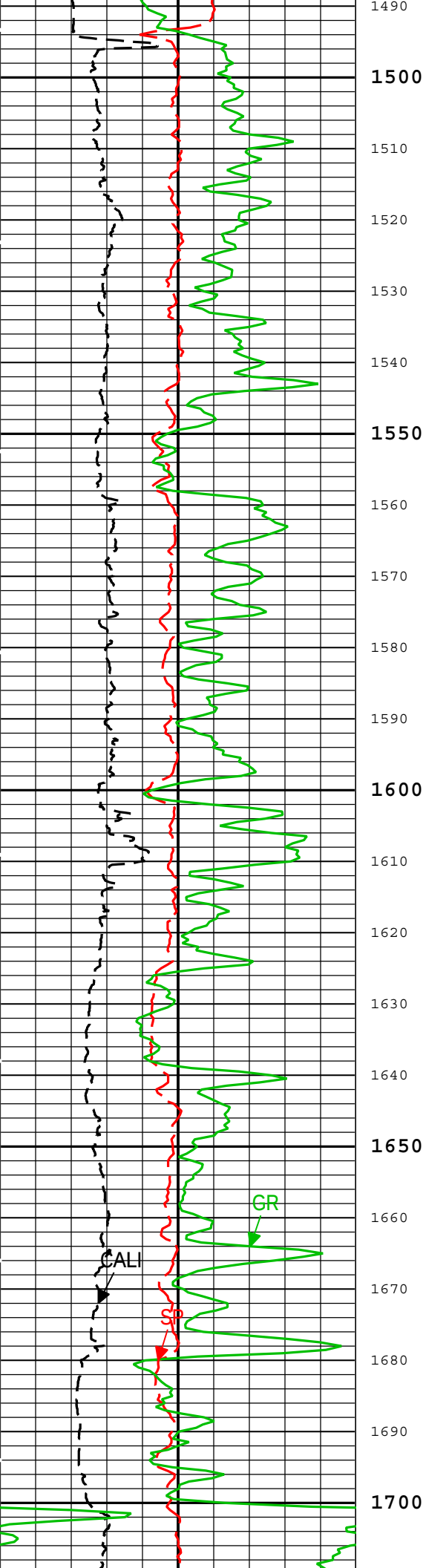
Log	One: Log[4]:Up
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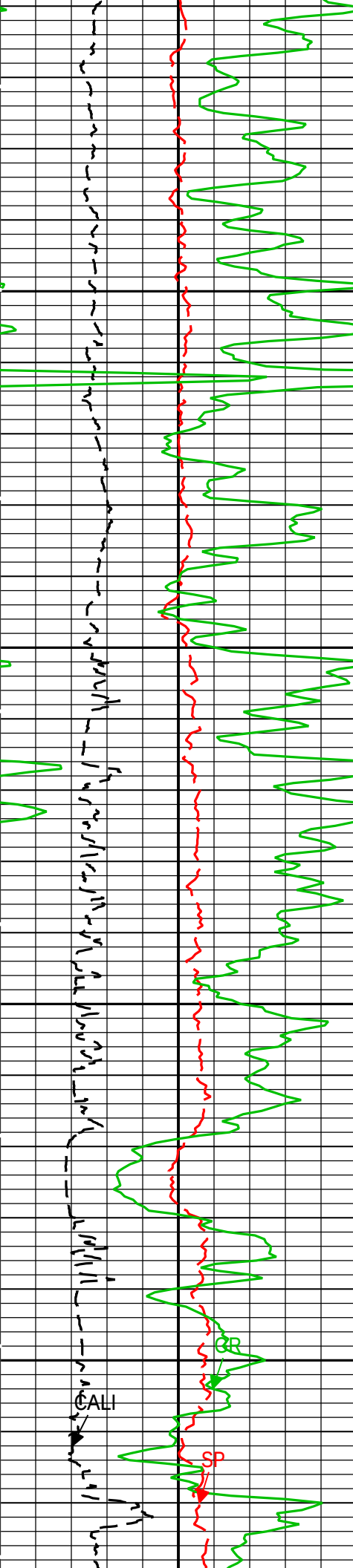
Description: AIT Basic Log Two Format: Log (Shell AIT 5) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-Dec-2013 15:42:14

Channel	Source	Sampling
AT10	AIT-M:AMIS:AMIS	3in
AT20	AIT-M:AMIS:AMIS	3in
AT30	AIT-M:AMIS:AMIS	3in
AT60	AIT-M:AMIS:AMIS	3in
AT90	AIT-M:AMIS:AMIS	3in
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	HGNS-H:HGNS-H:HGNS-H	6in
NPOR	HGNS-H:HGNS-H:HGNS-H	6in
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in
RHOZ	HDRS-H:HRMS-H:HRGD-H	2in
SP	AIT-M:AMIS:AMIS	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

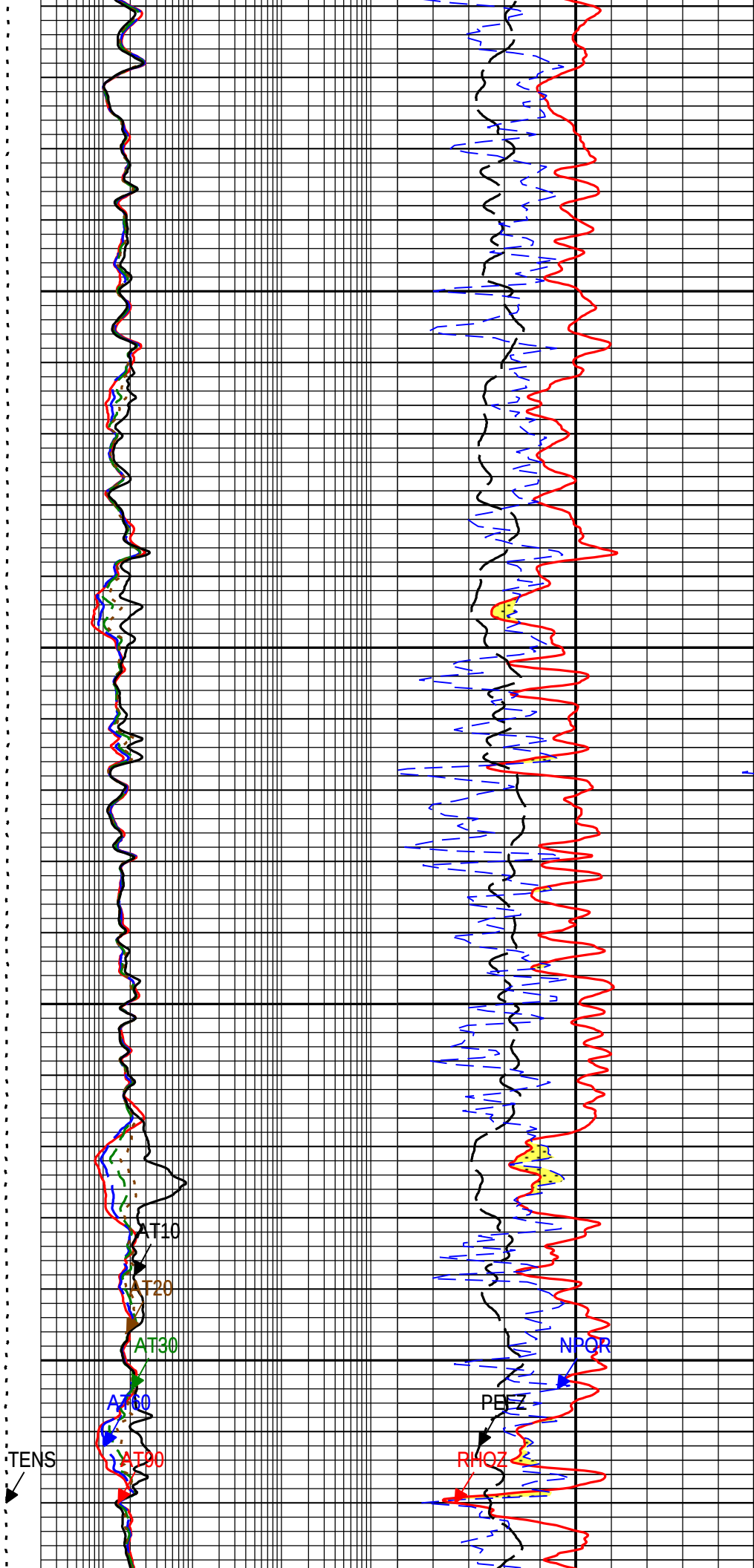
TIME_1900 - Time Marked every 60.00 (s)

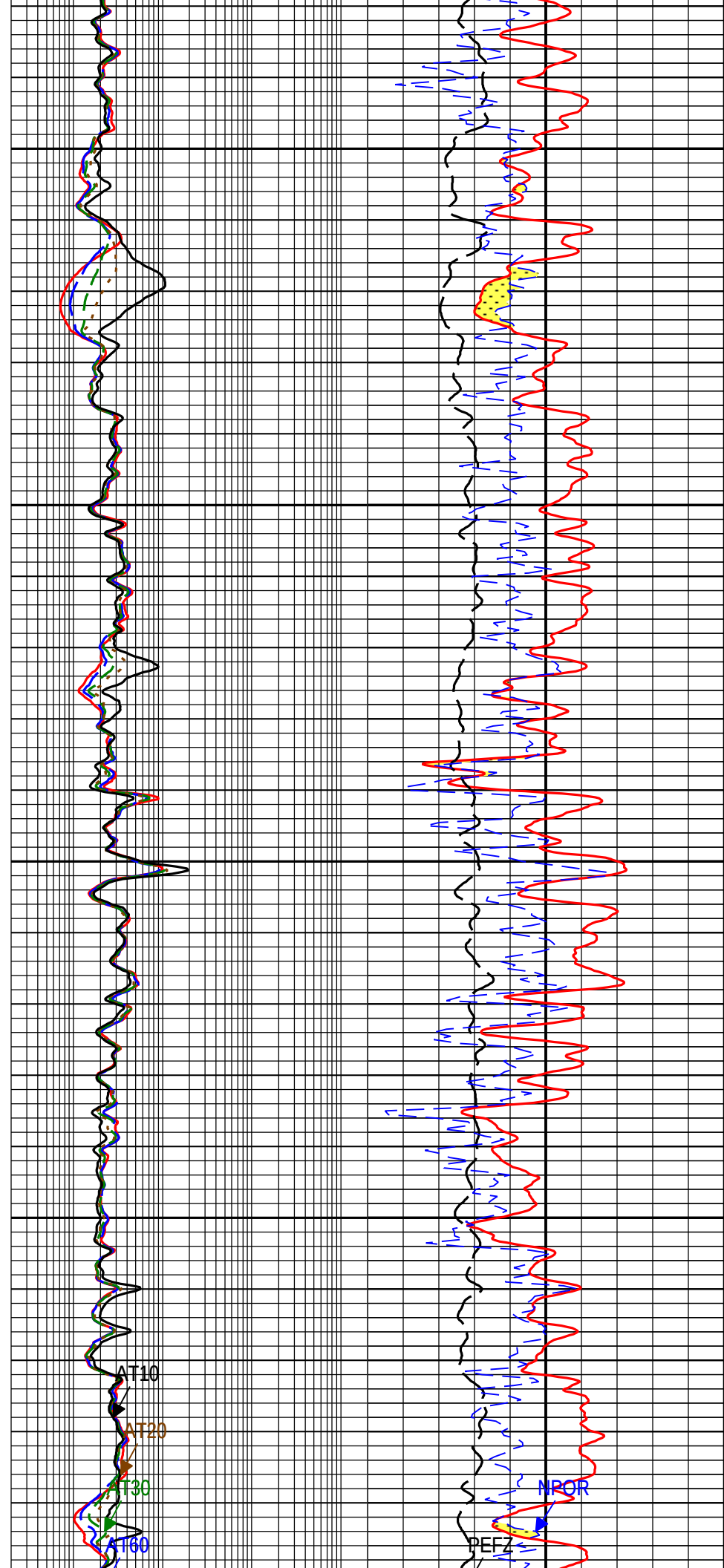
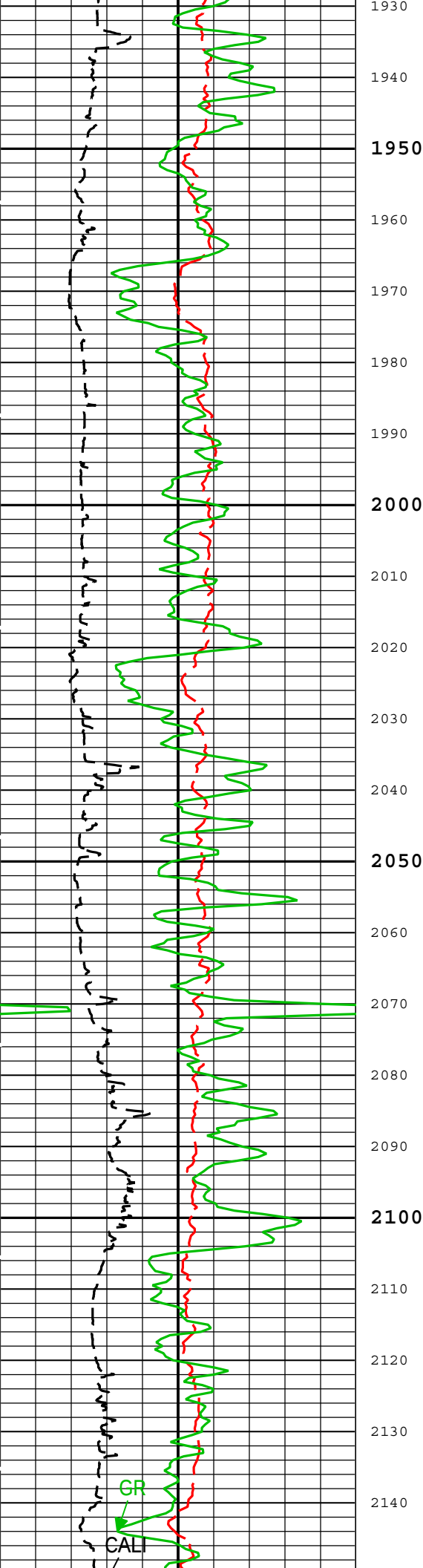


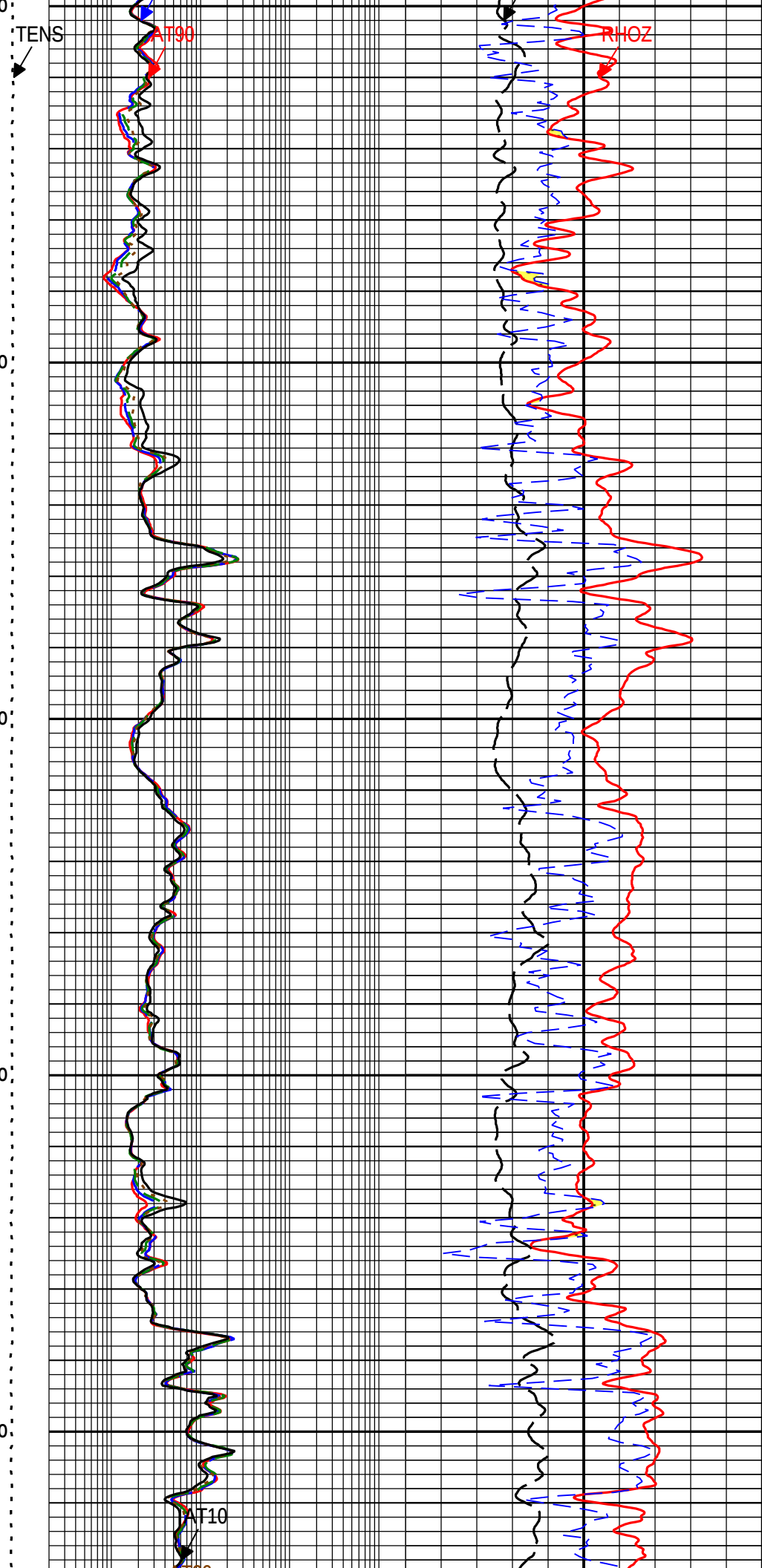
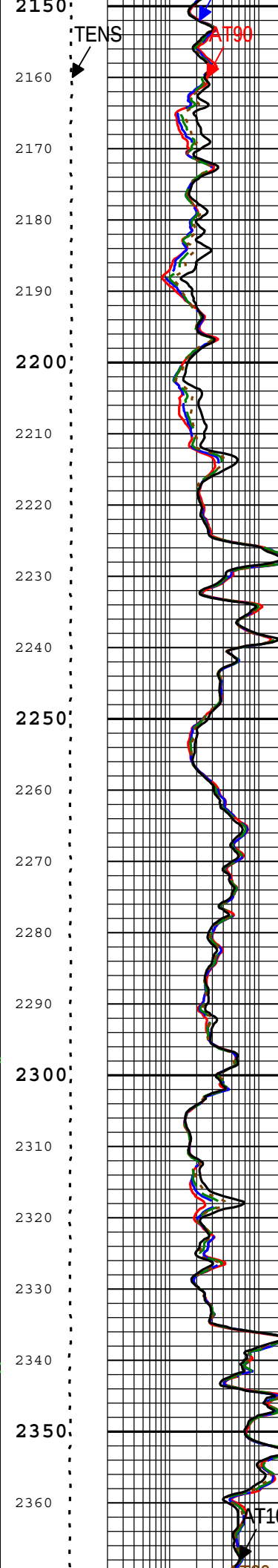
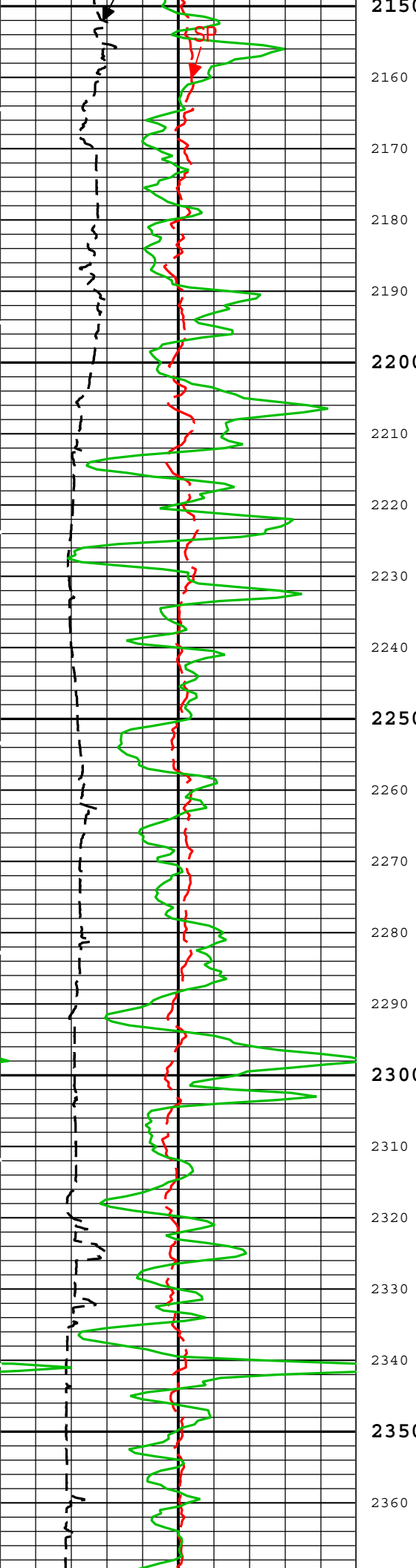


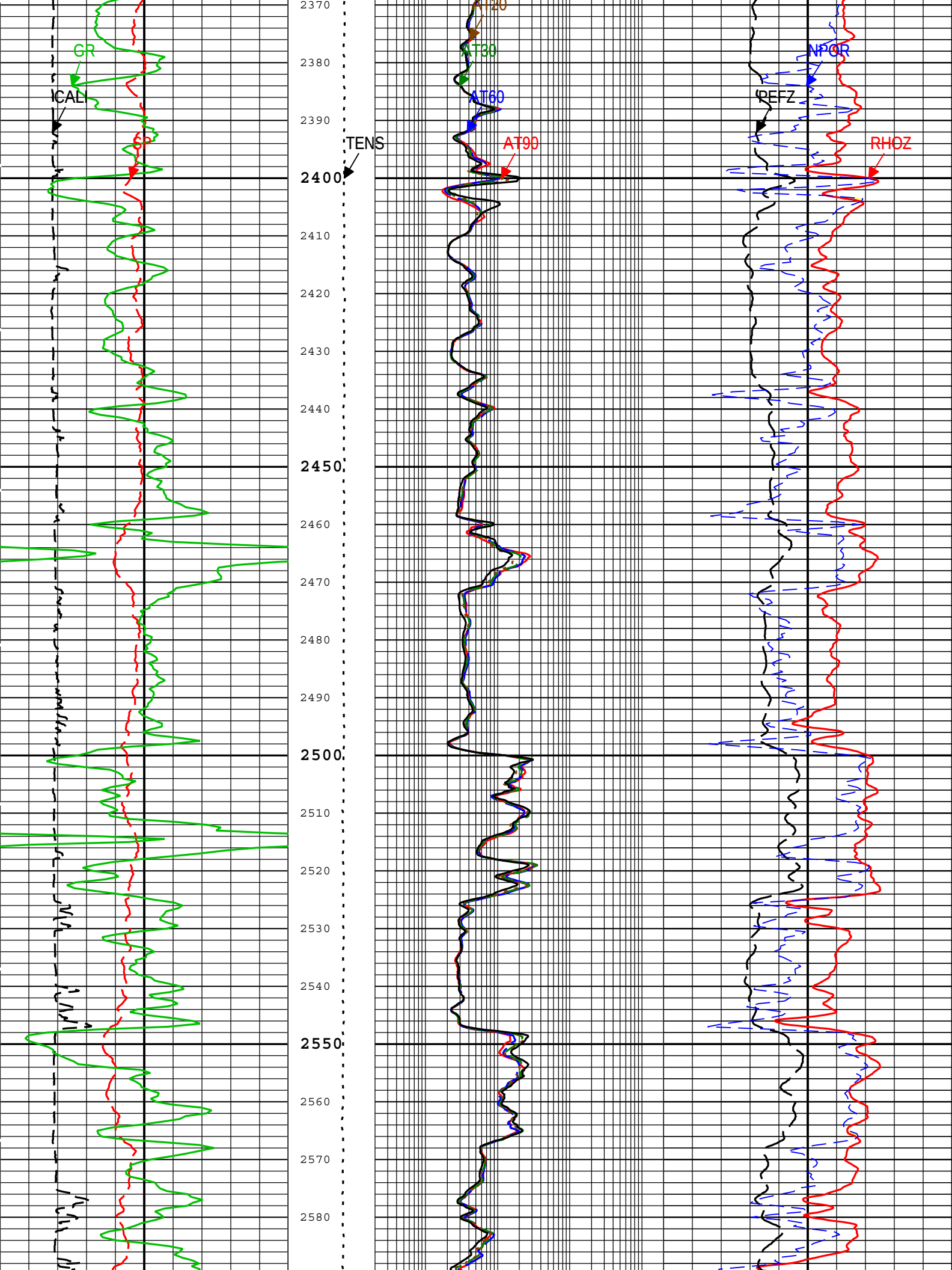


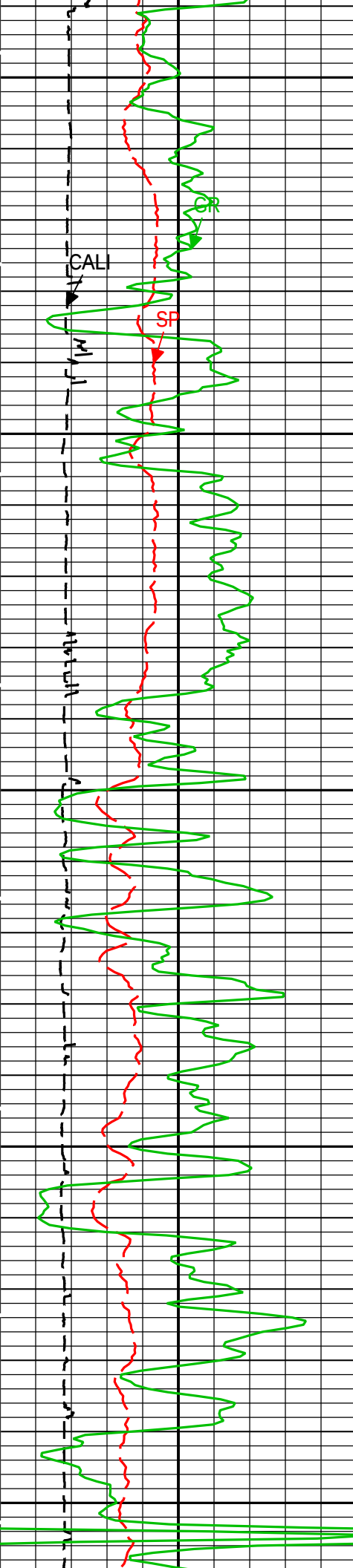
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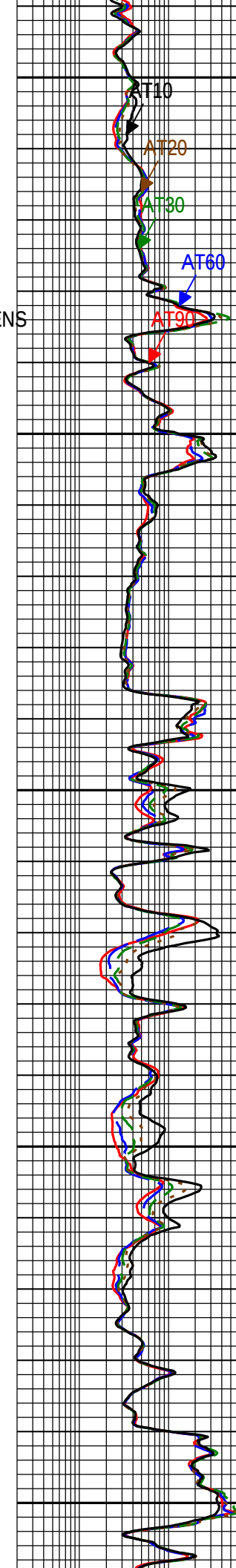




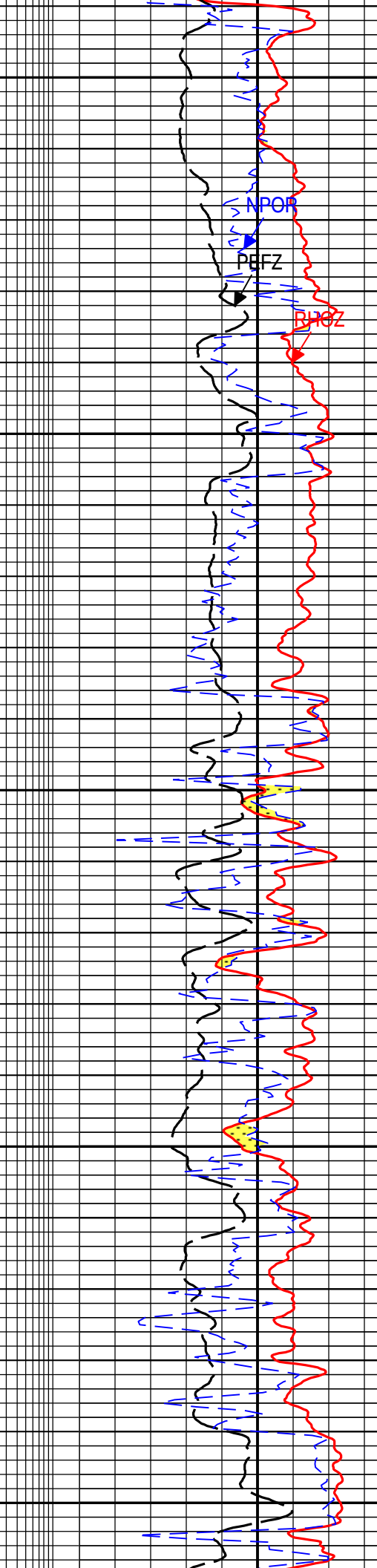


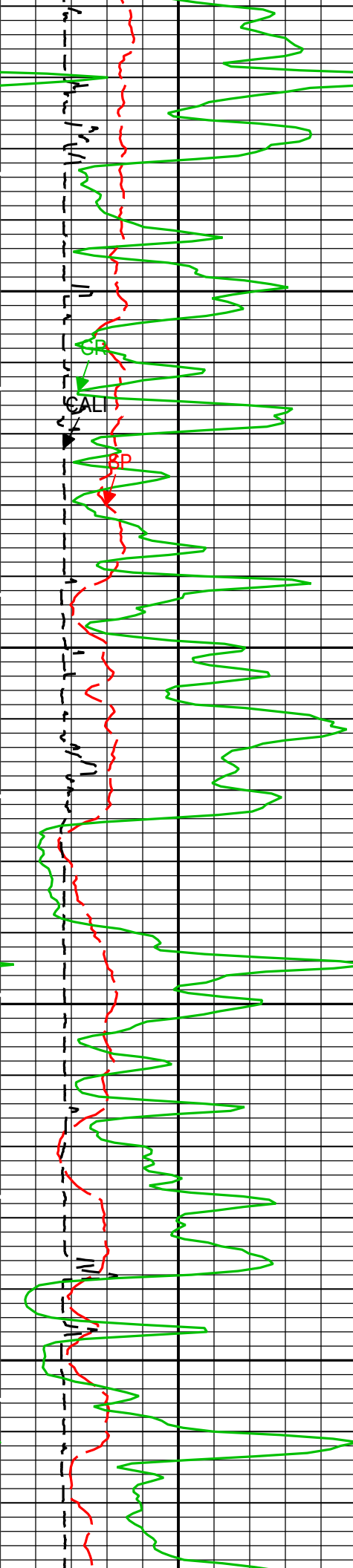
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TENS



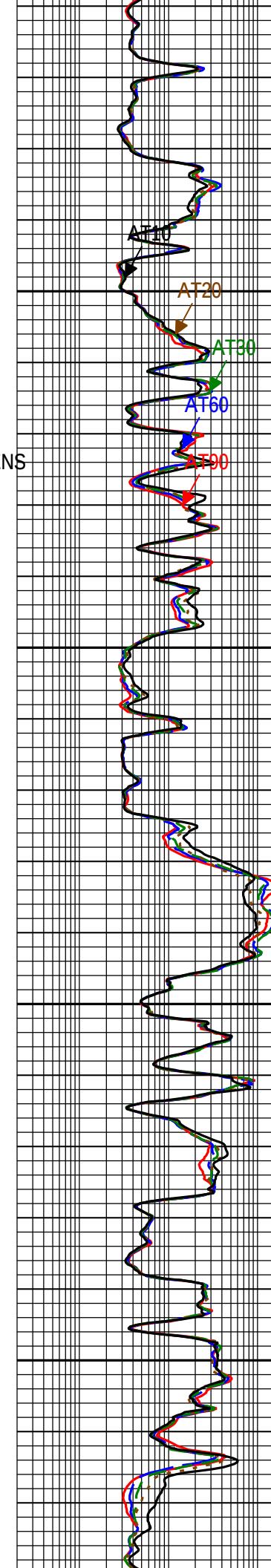
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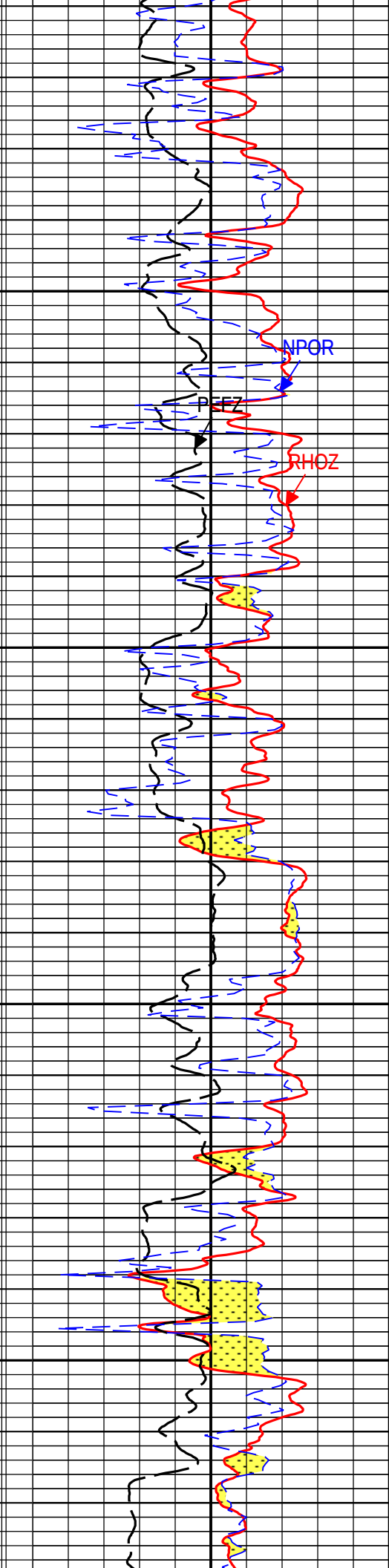


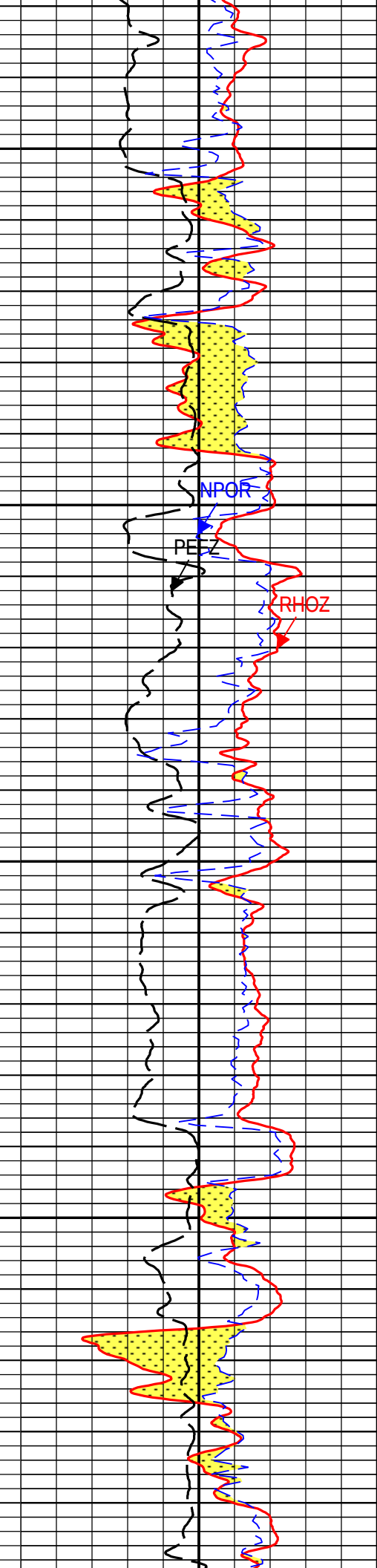
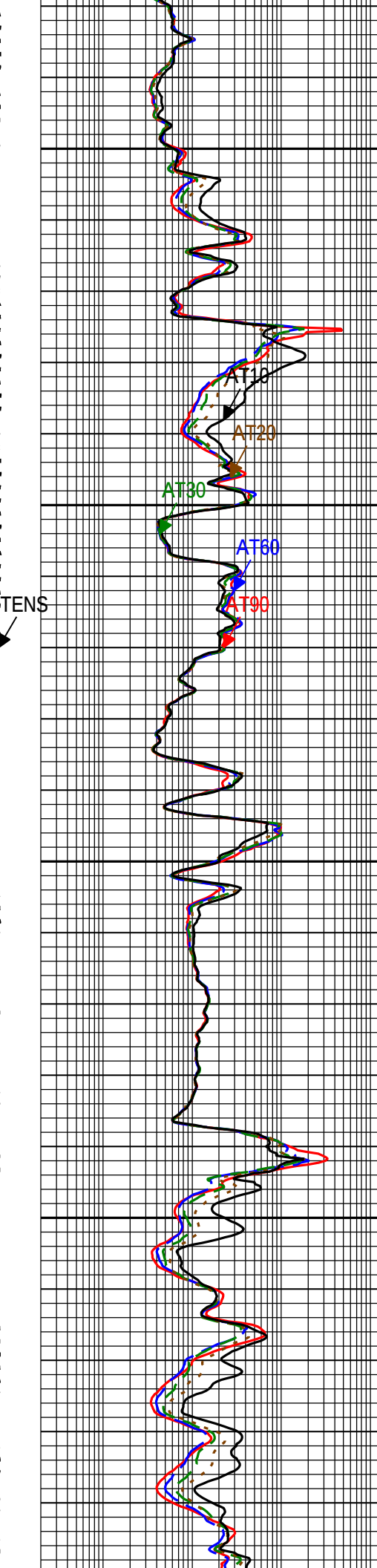
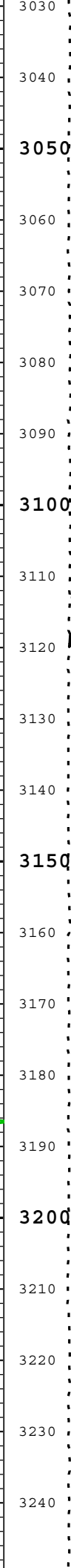
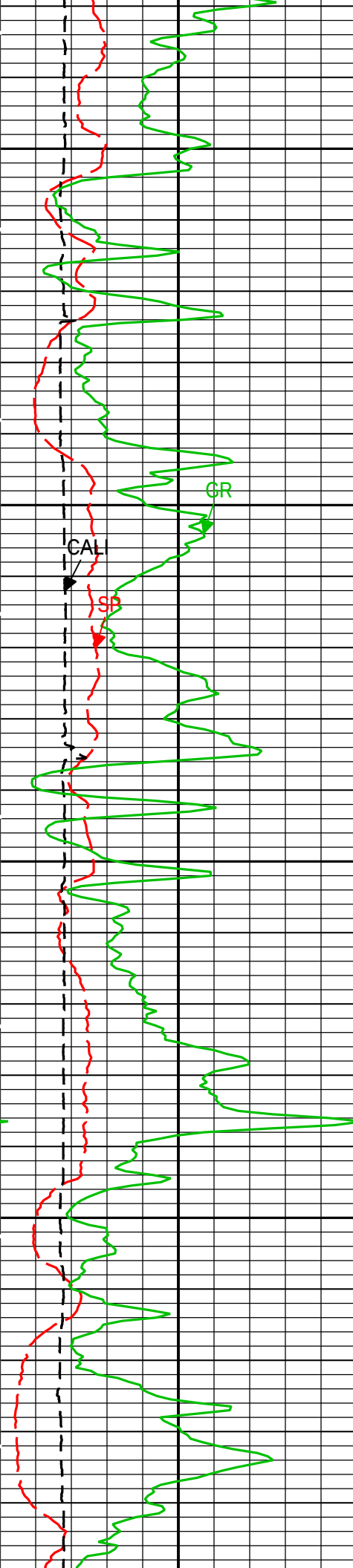
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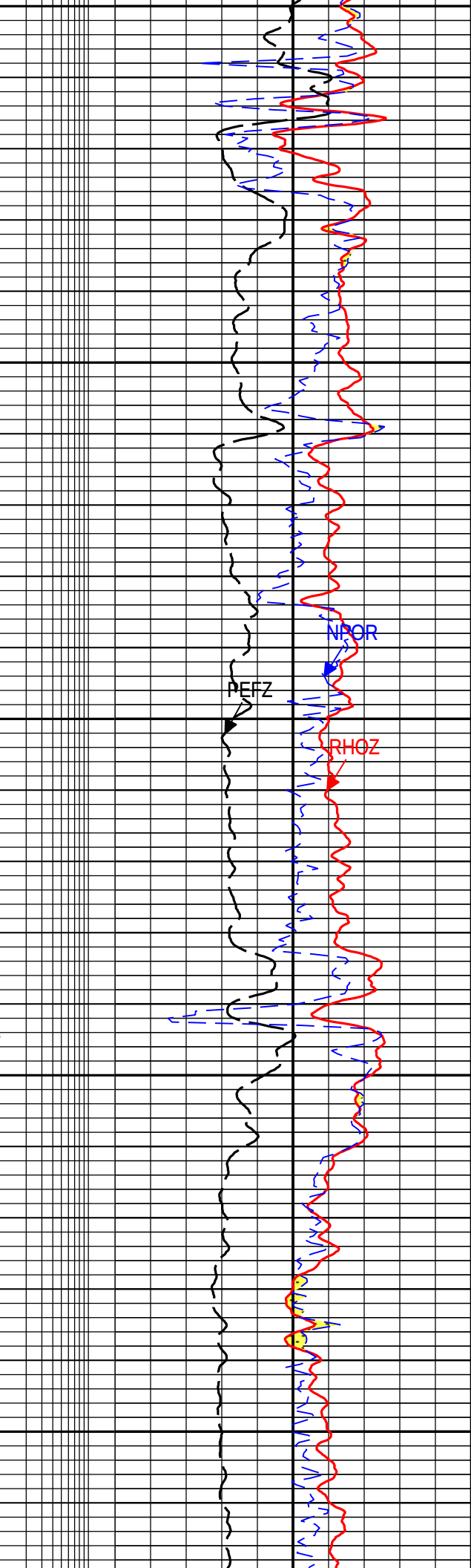
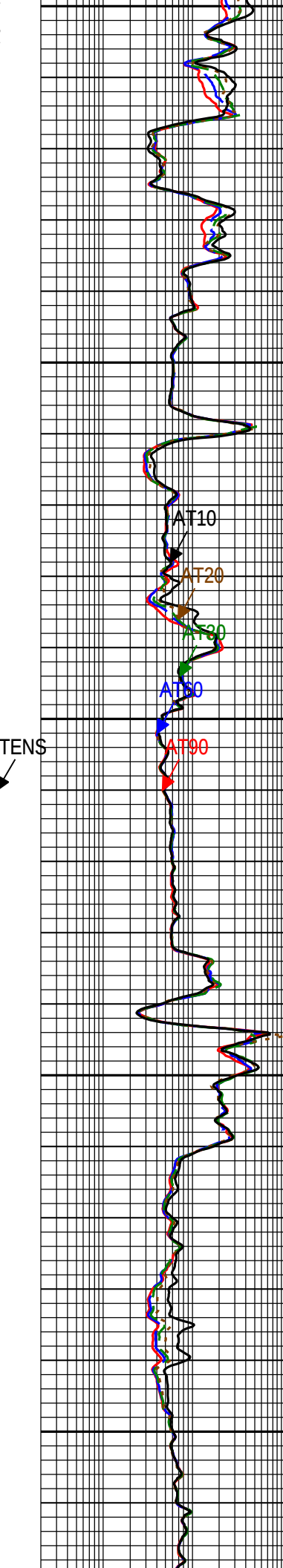
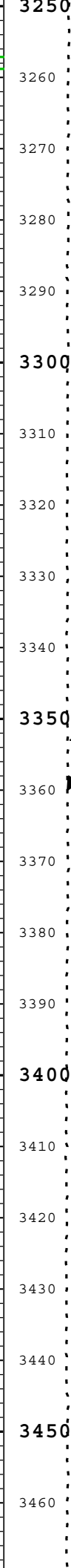
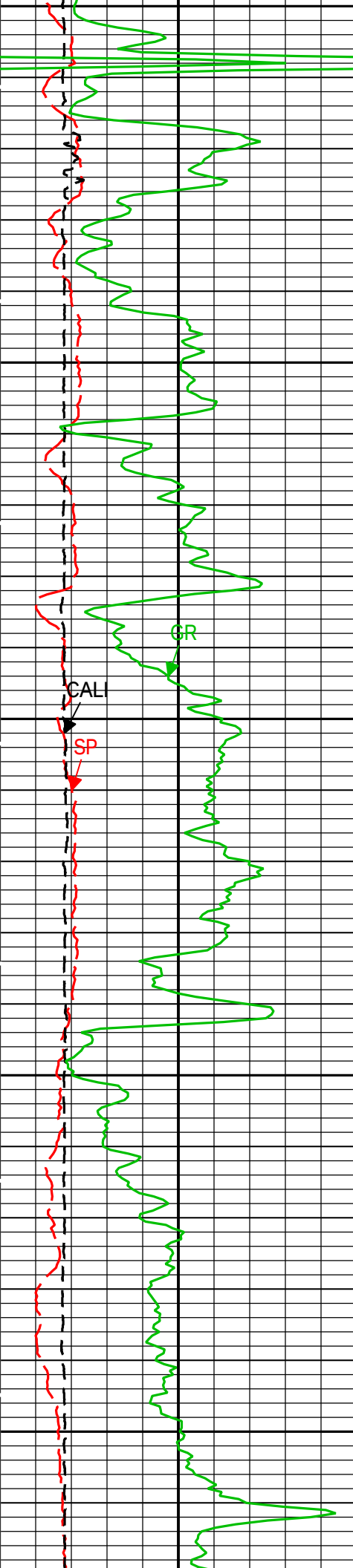
TENS

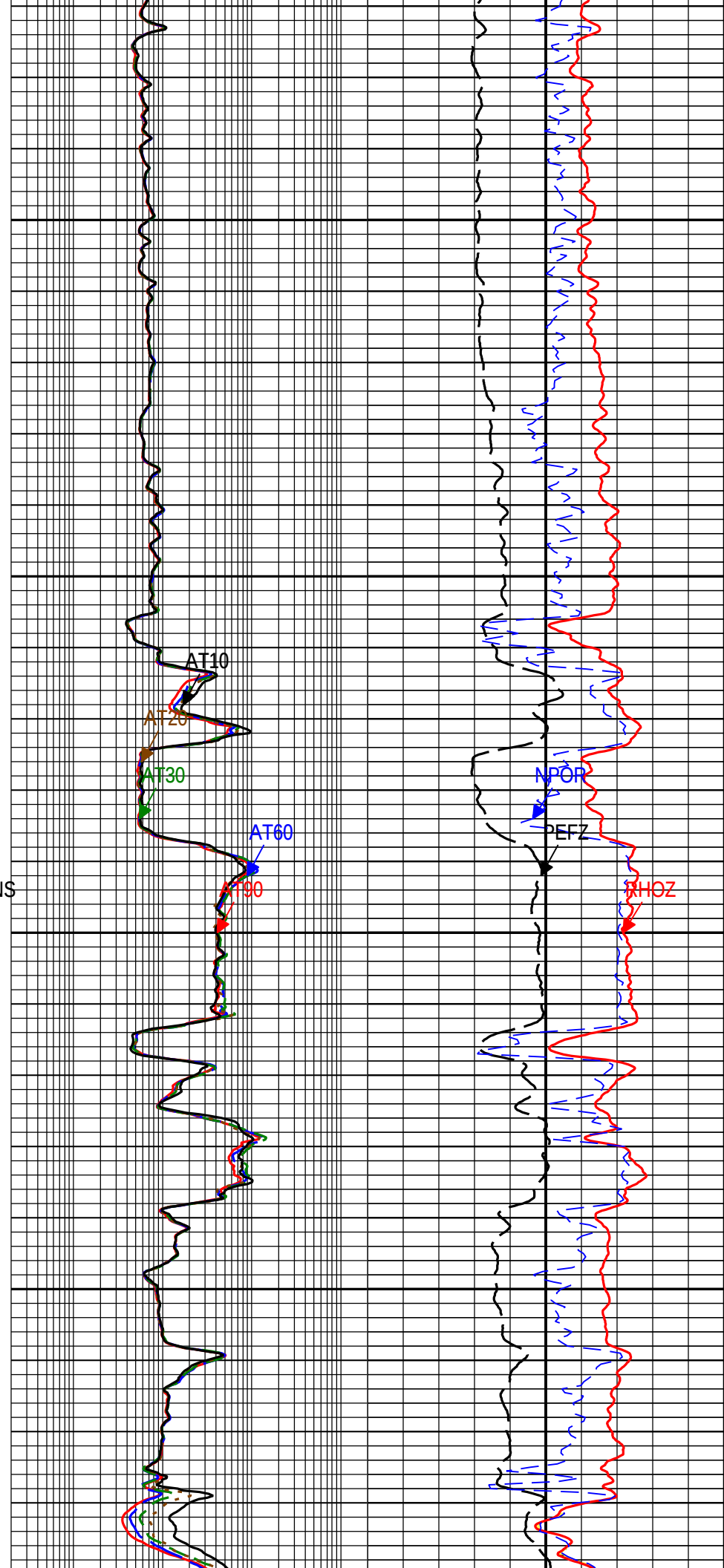
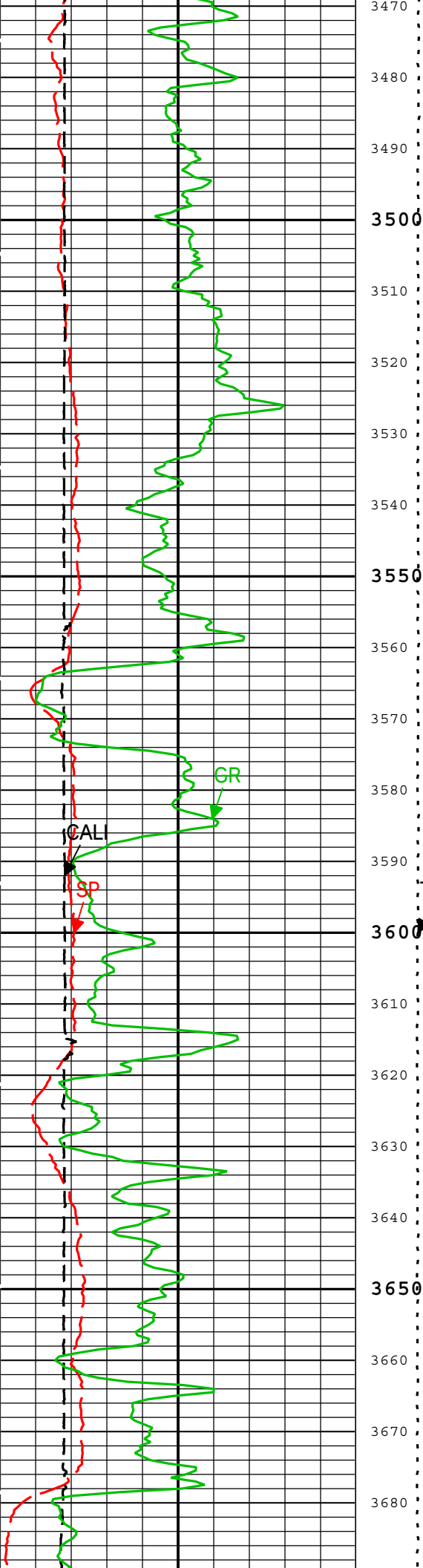


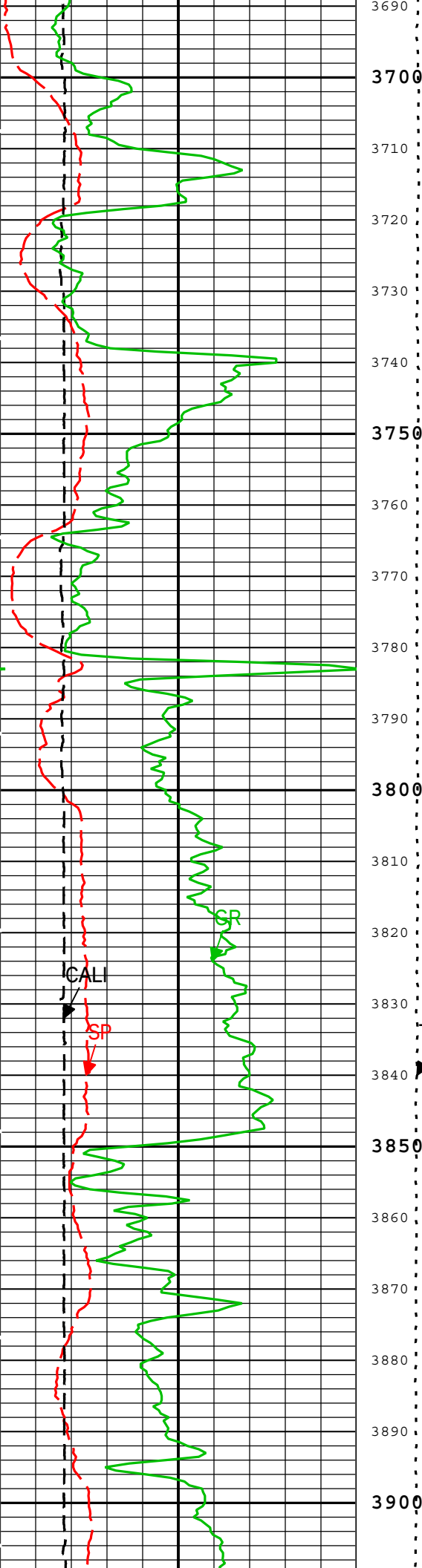
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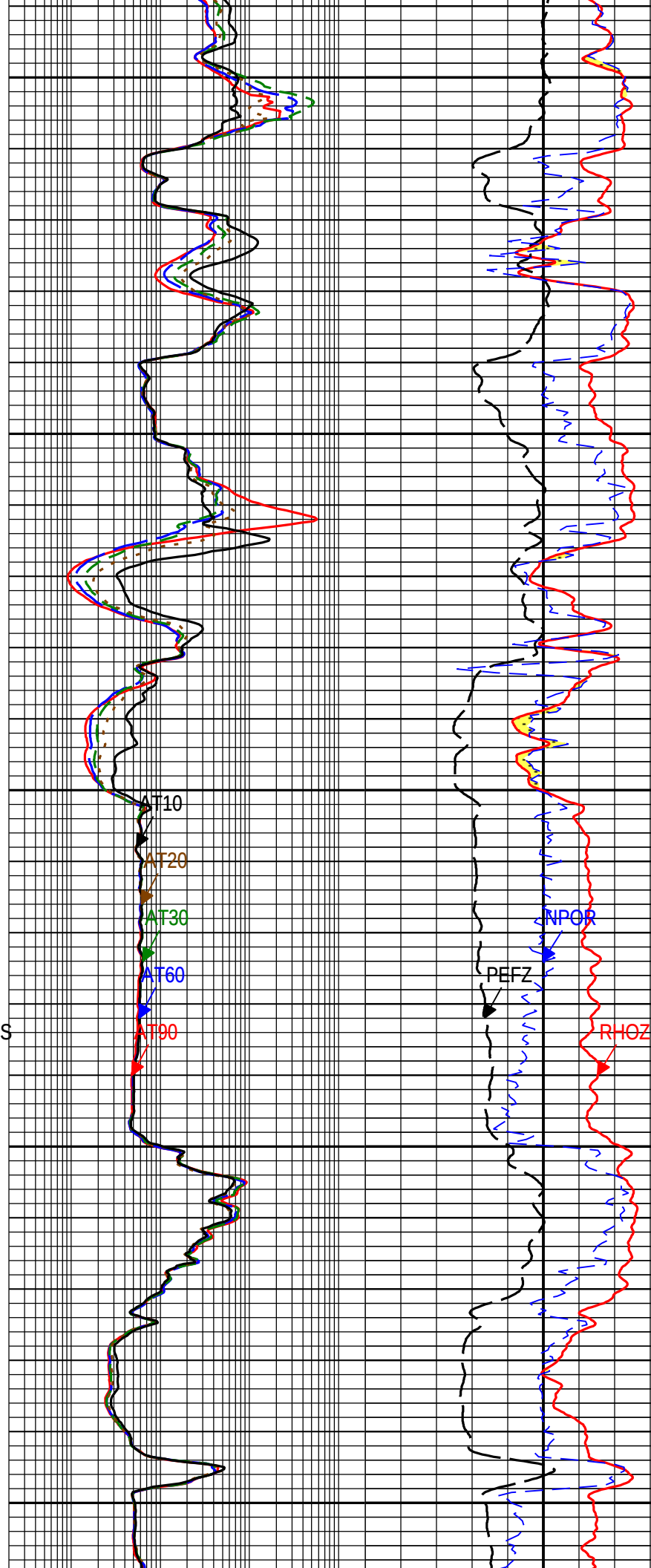


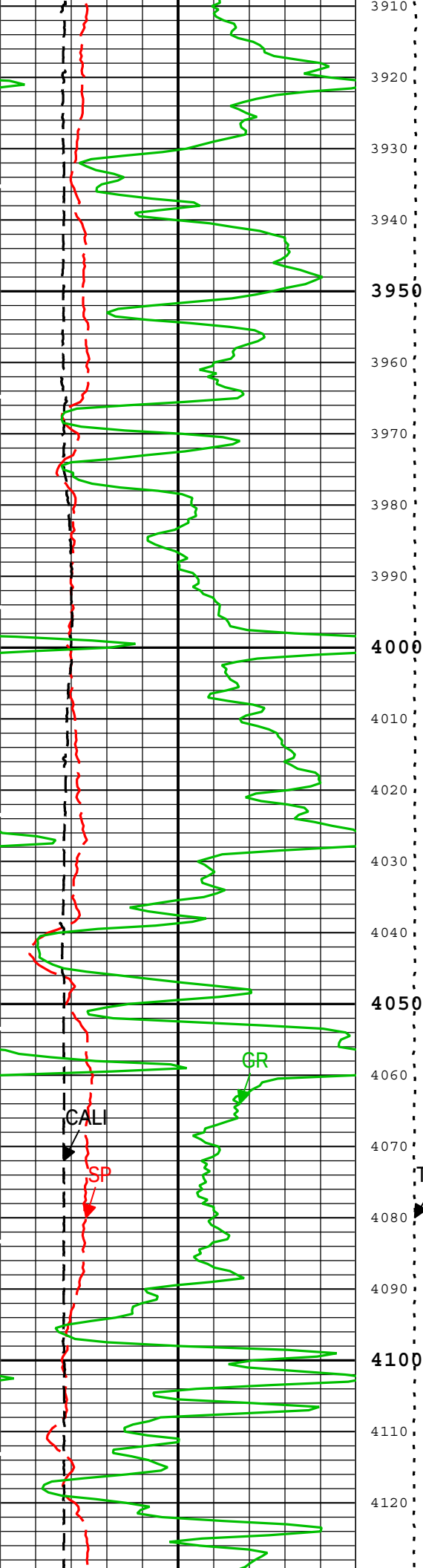




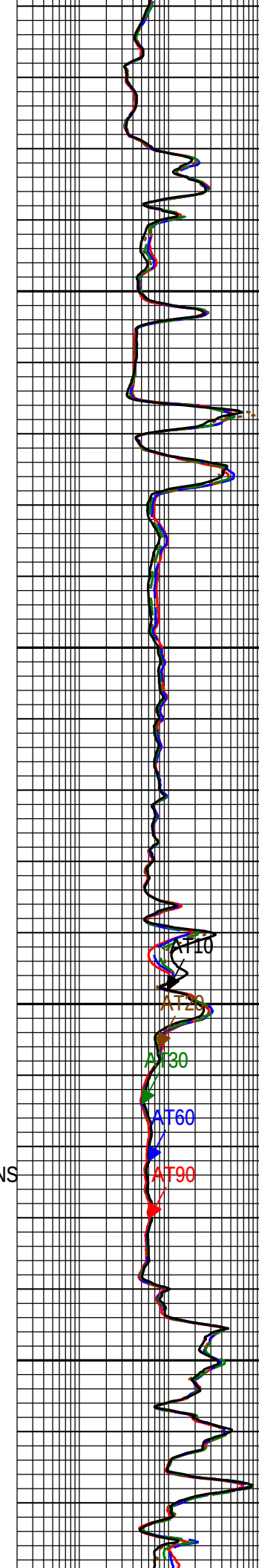
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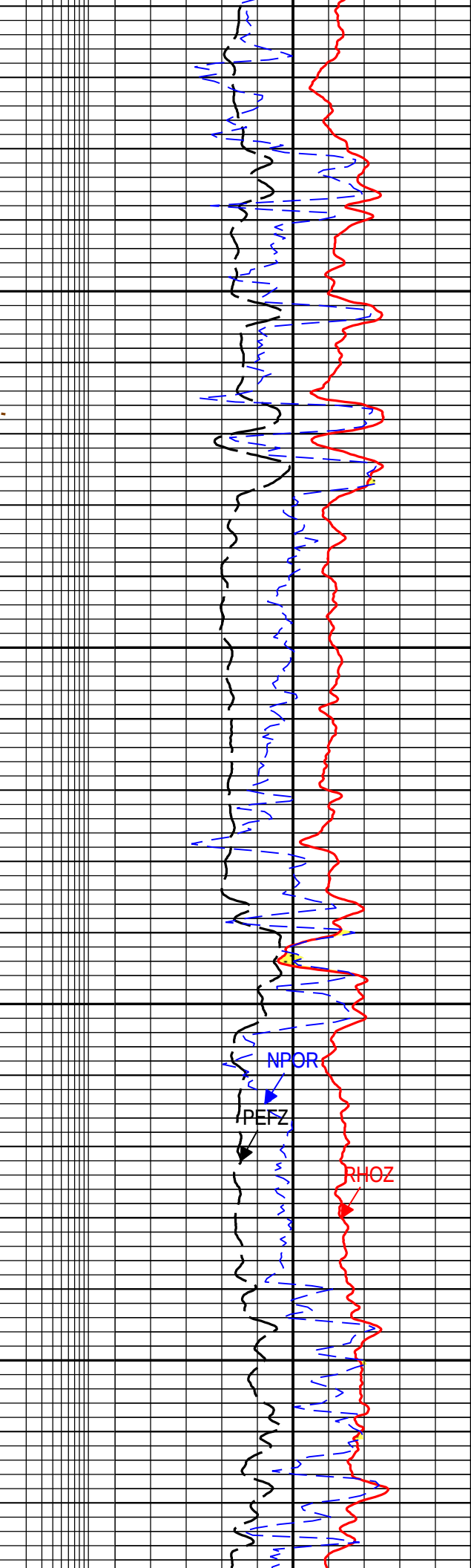




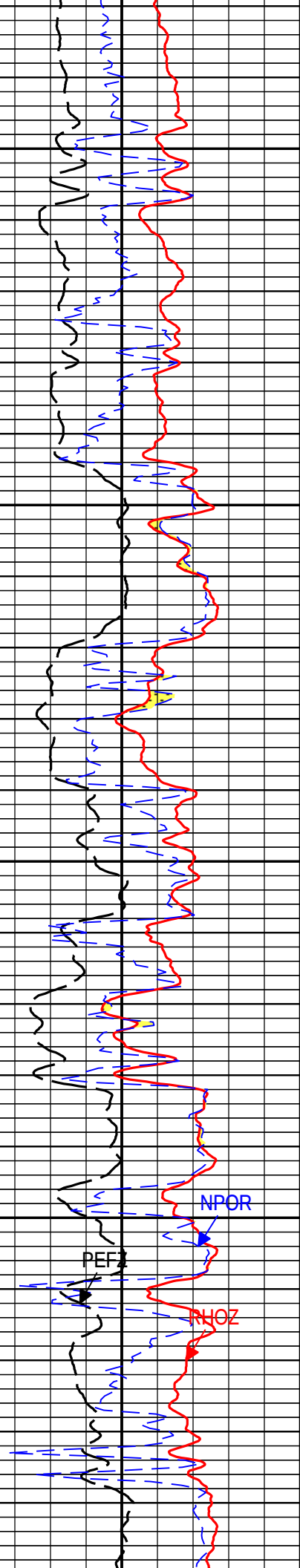
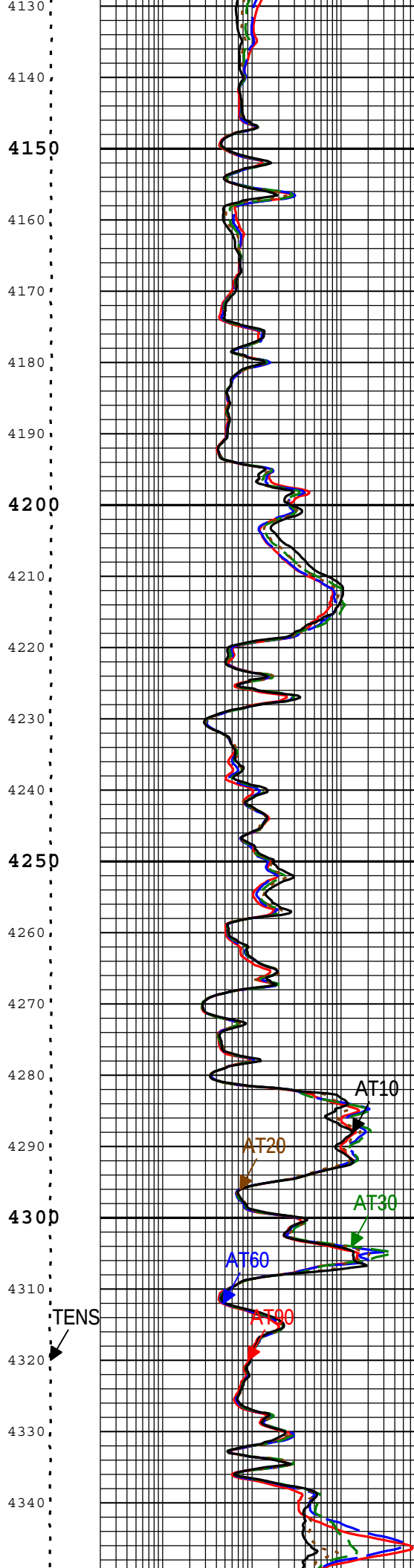
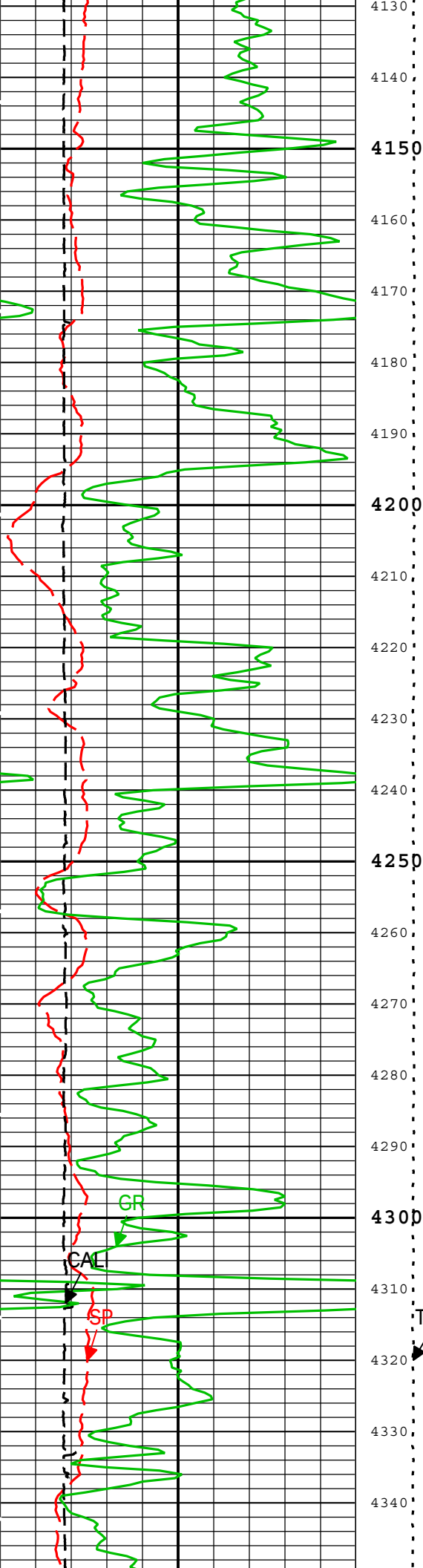
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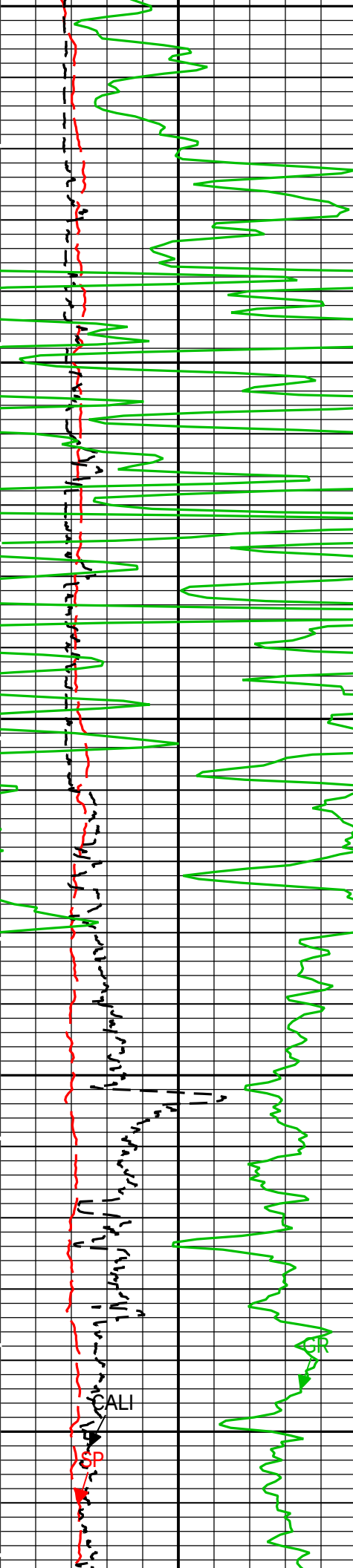


TENS



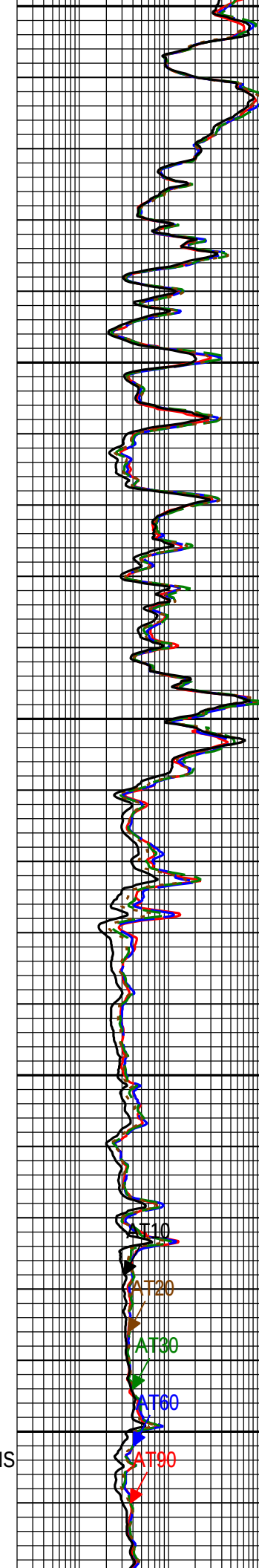
NPOR
PEFZ
RHOZ





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TENS



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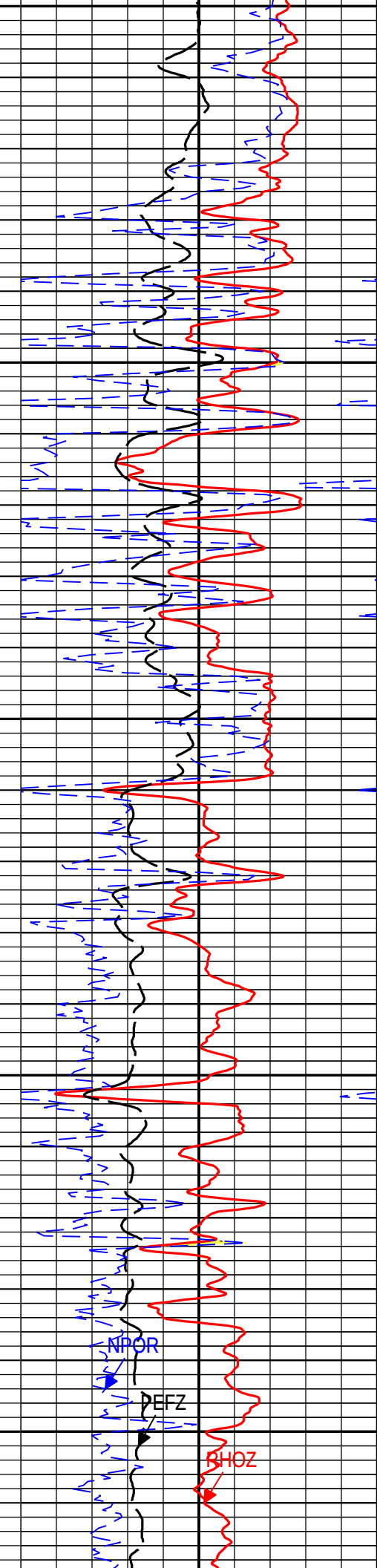
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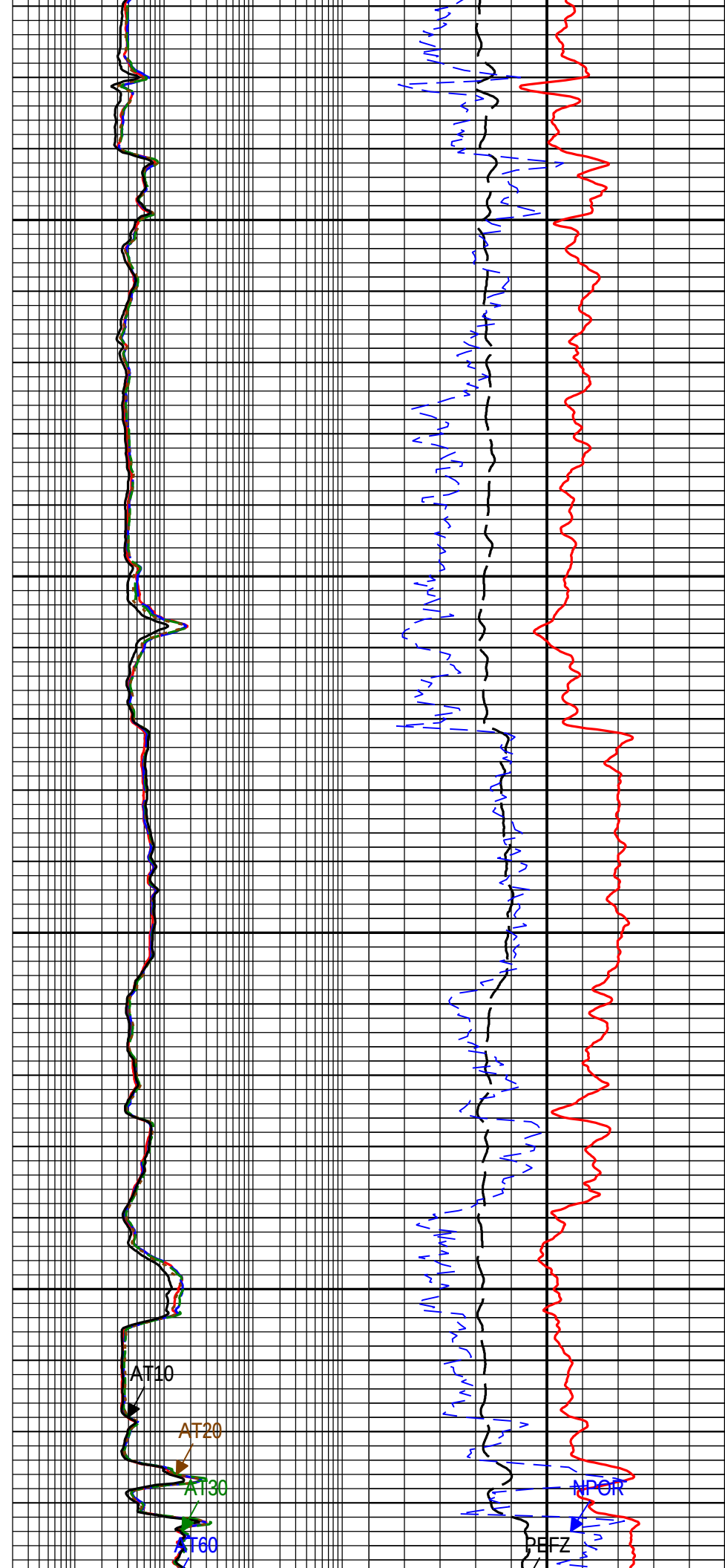
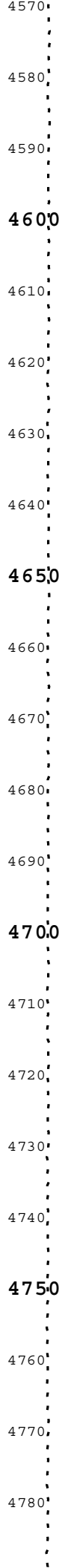
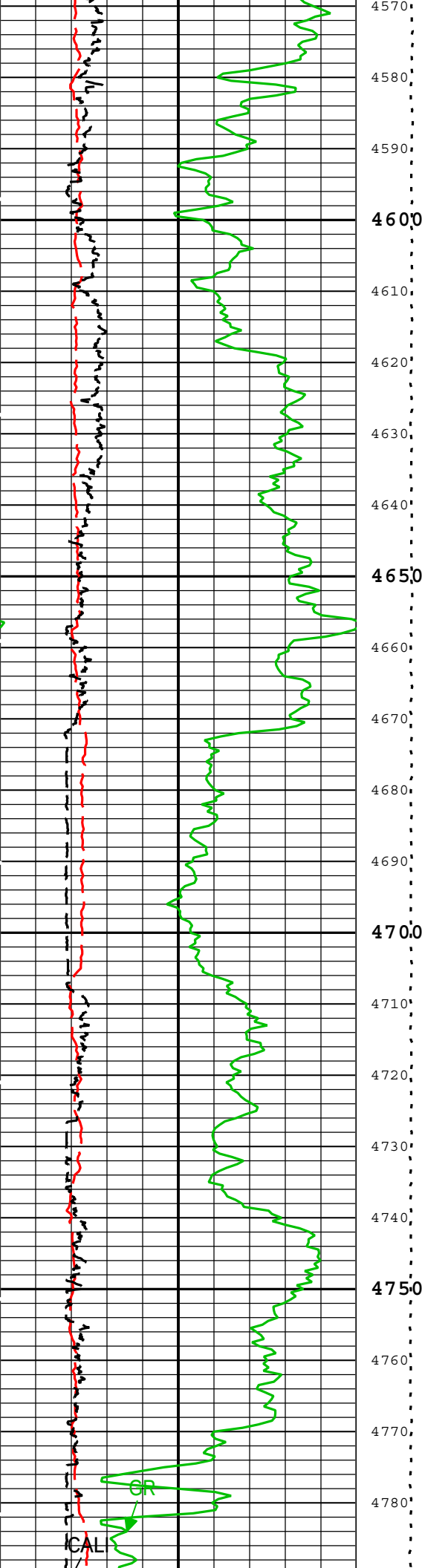
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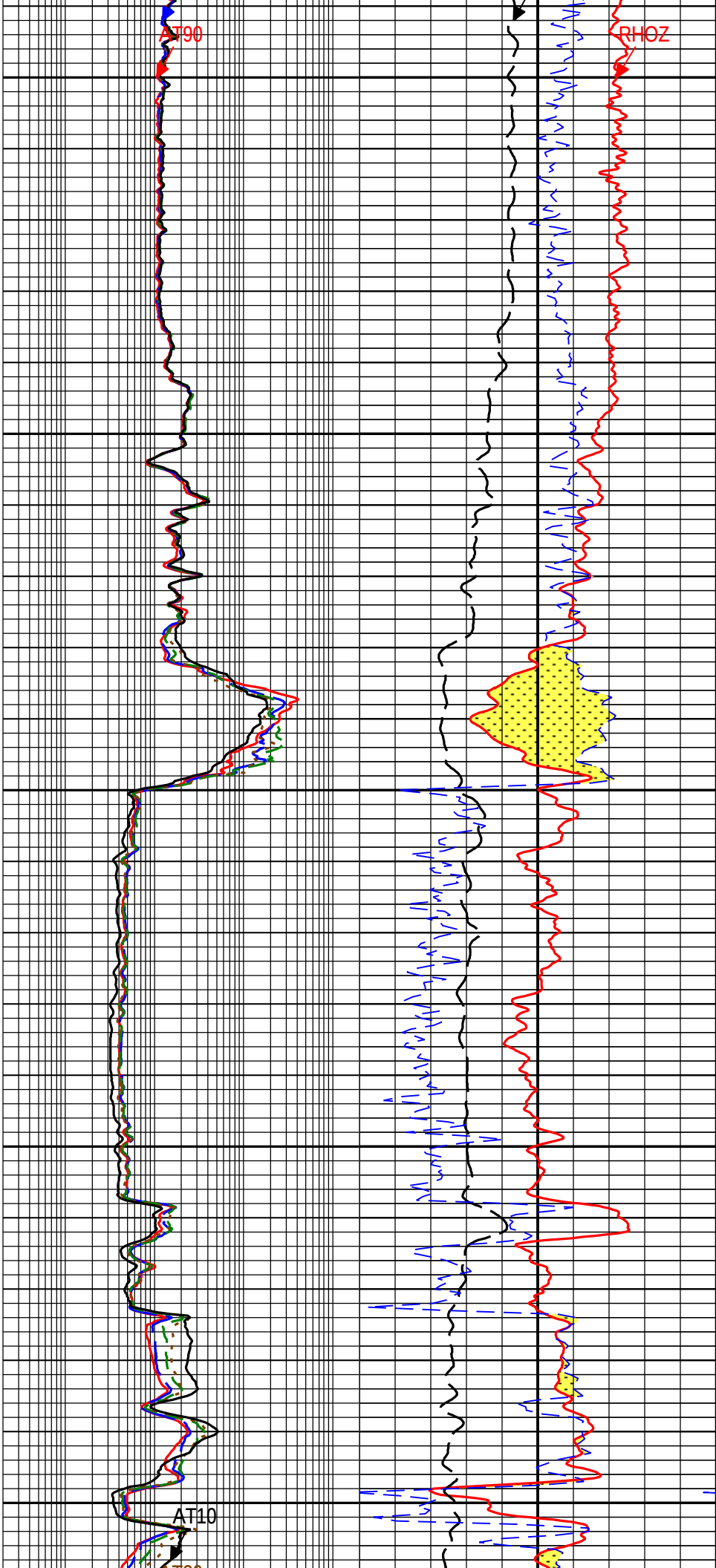
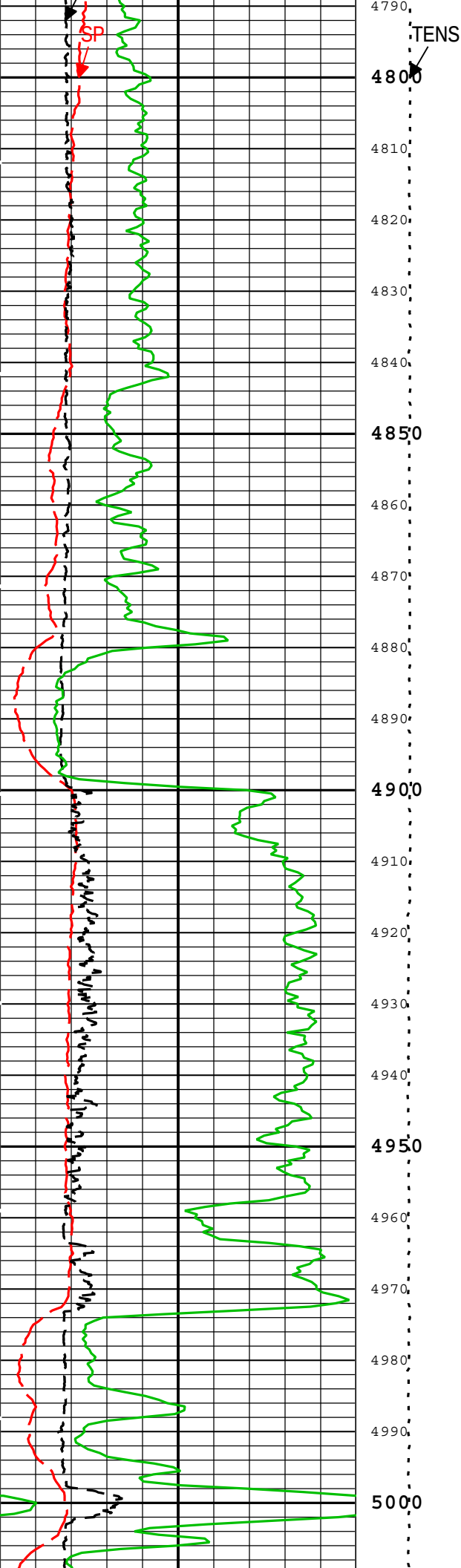


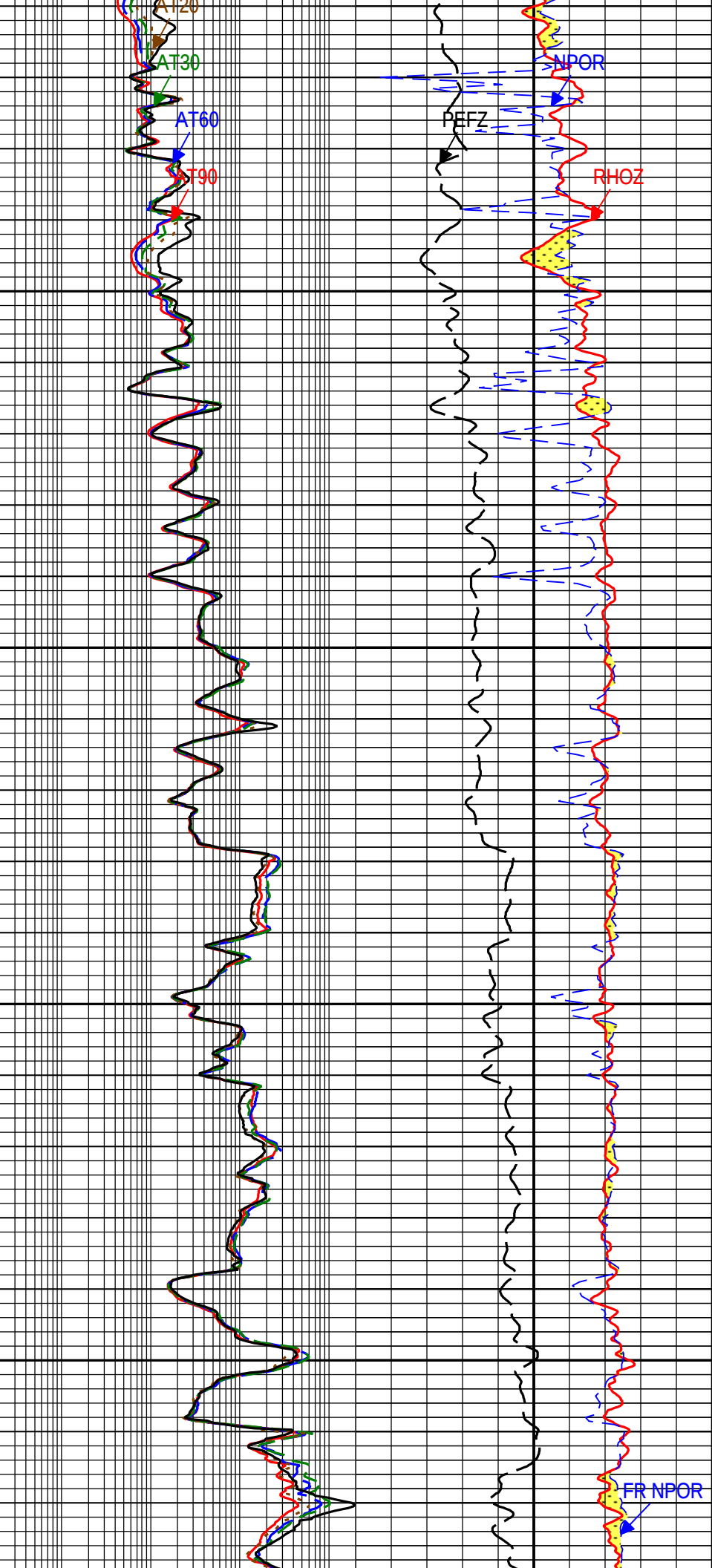
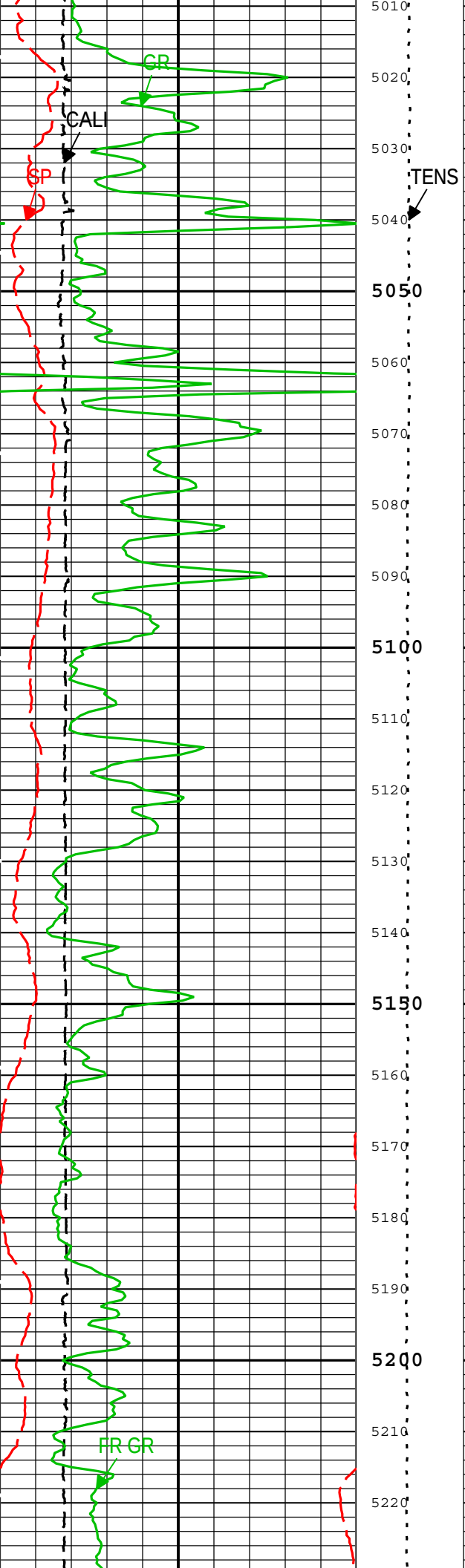
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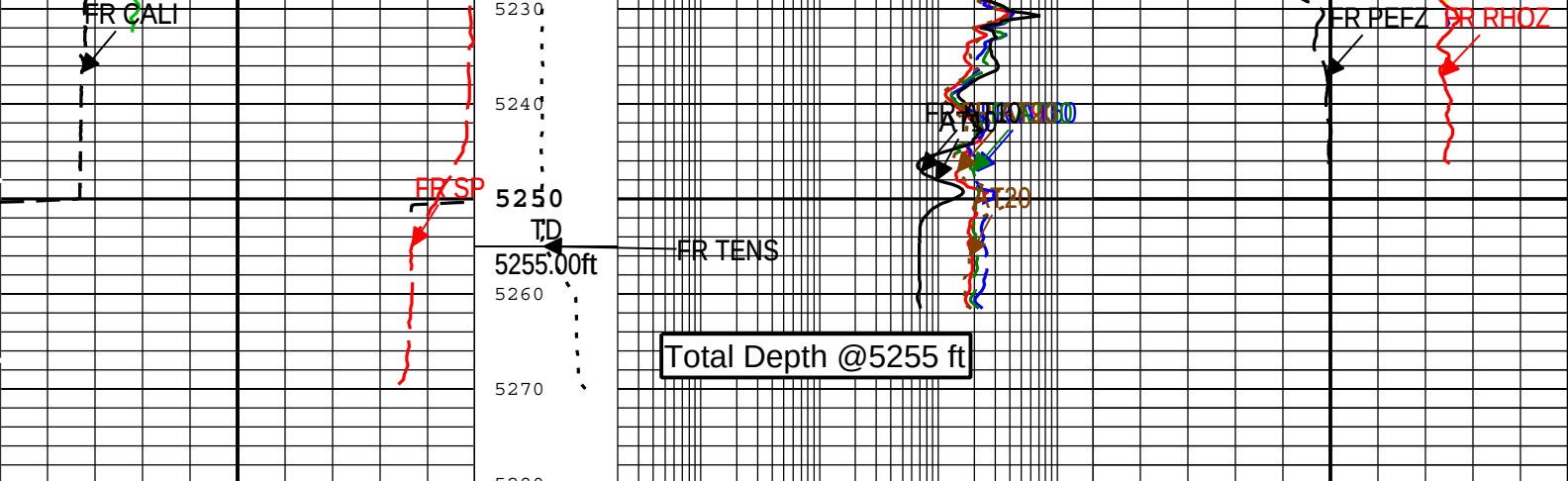
DEFZ

RHOZ







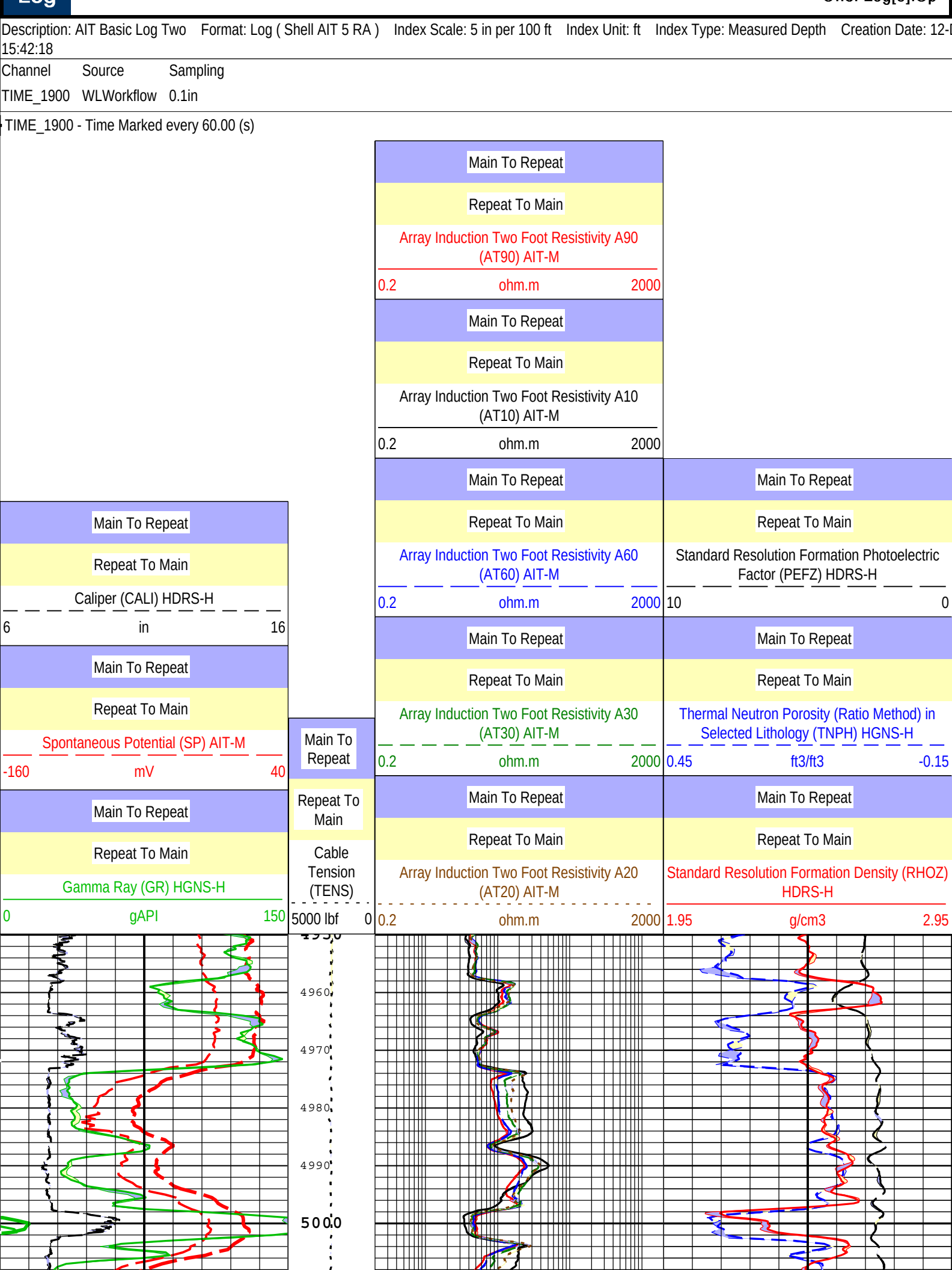


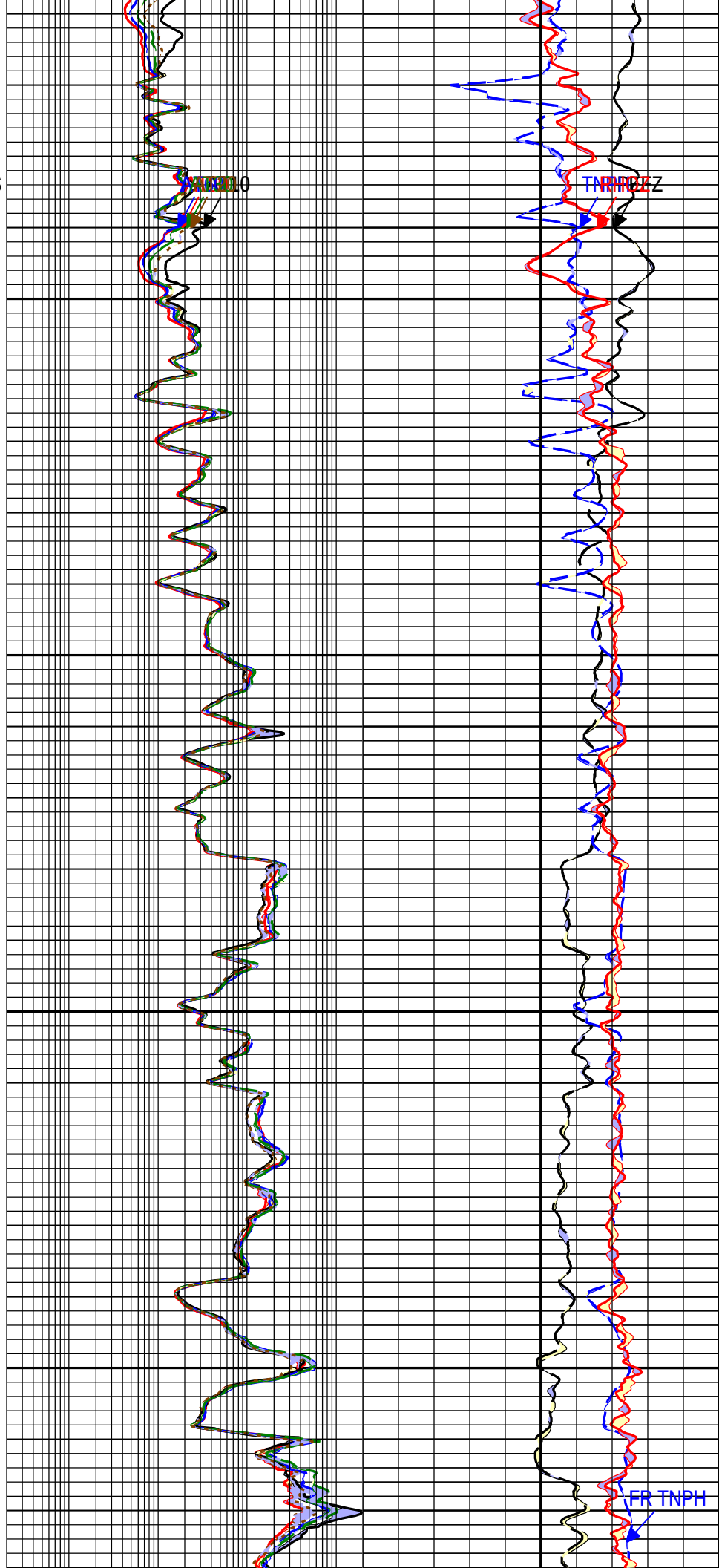
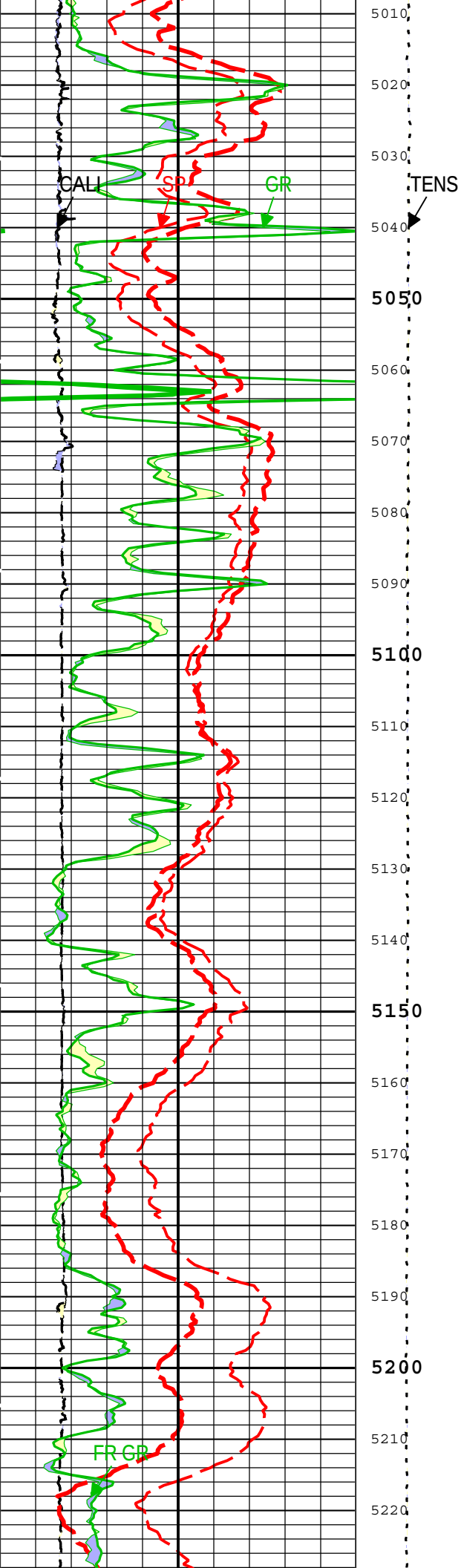
Spontaneous Potential (SP) AIT-M			Cable Tension (TENS)	Array Induction Two Foot Resistivity A90 (AT90) AIT-M			Crossover From RHOZ to NPOR				
-300	mV			300	0.2	ohm.m		2000	Standard Resolution Formation Density (RHOZ) HDRS-H		
Caliper (CALI) HDRS-H				5000 lbf	Array Induction Two Foot Resistivity A60 (AT60) AIT-M			1.95	g/cm3		2.95
5	in			20	0.2	ohm.m		2000	Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H		
Gamma Ray (GR) HGNS-H			5000 lbf	Array Induction Two Foot Resistivity A30 (AT30) AIT-M			0	10			
0	gAPI			150	0.2	ohm.m		2000	Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H		
				Array Induction Two Foot Resistivity A20 (AT20) AIT-M			0.45	ft3/ft3		-0.15	
				Array Induction Two Foot Resistivity A10 (AT10) AIT-M			0.2	ohm.m		2000	

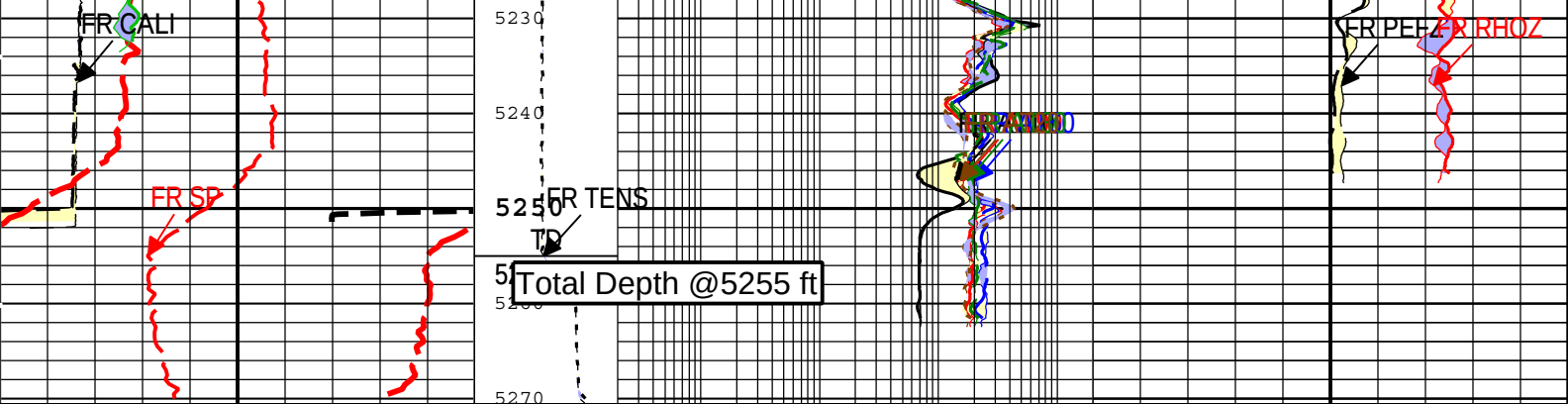
TIME_1900 - Time Marked every 60.00 (s)

Description: AIT Basic Log Two Format: Log (Shell AIT 5) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-Dec-2013 15:42:14

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
AAPL	Array Induction Answer Product Level(Depth Log/View only)	AIT-M	Radial	
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ABLM	Array Induction Basic Logs Mode	AIT-M	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M	Yes	
ACEN	Array Induction Tool Centering Flag (in Borehole)	AIT-M	Eccentered	
AMRF	Array Induction Mud Resistivity Factor	AIT-M	1	
ASTA	Array Induction Tool Standoff	AIT-M	1.625	in
ATSE	Array Induction Temperature Selection(Sonde Error Correction)	AIT-M	Internal	
AZ_ENABLE	Z-Axis Acceleration Channel Enabled for Real-Time Depth Correction	DepthCorrection	No	
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	7.875	in
BSAL	Borehole Salinity	Borehole	10443.66	ppm
BSCO	Borehole Salinity Correction Option	HGNS-H	No	
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0	in
CBLO	Casing Bottom (Logger)	WLSESSION	1494	ft







Main To Repeat	Repeat To Main	Caliper (CALI) HDRS-H 6 in 16	Main To Repeat	Repeat To Main	Array Induction Two Foot Resistivity A90 (AT90) AIT-M 0.2 ohm.m 2000	Main To Repeat	Repeat To Main	Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H 10 0
Main To Repeat	Repeat To Main	Spontaneous Potential (SP) AIT-M -160 mV 40	Main To Repeat	Repeat To Main	Array Induction Two Foot Resistivity A10 (AT10) AIT-M 0.2 ohm.m 2000	Main To Repeat	Repeat To Main	Thermal Neutron Porosity (Ratio Method) in Selected Lithology (TNPH) HGNS-H 0.45 ft3/ft3 -0.15
Main To Repeat	Repeat To Main	Gamma Ray (GR) HGNS-H 0 gAPI 150	Main To Repeat	Repeat To Main	Array Induction Two Foot Resistivity A60 (AT60) AIT-M 0.2 ohm.m 2000	Main To Repeat	Repeat To Main	Standard Resolution Formation Density (RHOZ) HDRS-H 1.95 g/cm3 2.95
Main To Repeat	Repeat To Main		Main To Repeat	Repeat To Main	Array Induction Two Foot Resistivity A30 (AT30) AIT-M 0.2 ohm.m 2000	Main To Repeat	Repeat To Main	
Main To Repeat	Repeat To Main		Main To Repeat	Repeat To Main	Array Induction Two Foot Resistivity A20 (AT20) AIT-M 0.2 ohm.m 2000	Main To Repeat	Repeat To Main	

TIME_1900 - Time Marked every 60.00 (s)

Description: AIT Basic Log Two Format: Log (Shell AIT 5 RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-15:42:18

Calibration Report

AIT-M (Array Induction Tool - M) Calibration - Run One

Primary Equipment :

Array Induction Sonde - M

AMIS

154

Auxiliary Equipment :

AITM Rm/SP Bottom Nose

AMRM

154

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM):		13:53:29 16-Oct-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Test Loop Gain - 0		Master	1.000	0.950	1.016	1.050	
Test Loop Phase - 0	deg	Master	0	-3.000	0.598	3.000	
Test Loop Gain - 1		Master	1.000	0.950	1.017	1.050	
Test Loop Phase - 1	deg	Master	0	-3.000	0.750	3.000	
Test Loop Gain - 2		Master	1.000	0.950	1.013	1.050	
Test Loop Phase - 2	deg	Master	0	-3.000	0.051	3.000	
Test Loop Gain - 3		Master	1.000	0.950	1.007	1.050	
Test Loop Phase - 3	deg	Master	0	-3.000	0.149	3.000	
Test Loop Gain - 4		Master	1.000	0.950	0.992	1.050	
Test Loop Phase - 4	deg	Master	0	-3.000	0.095	3.000	
Test Loop Gain - 5		Master	1.000	0.950	0.983	1.050	
Test Loop Phase - 5	deg	Master	0	-3.000	-0.119	3.000	
Test Loop Gain - 6		Master	1.000	0.950	0.993	1.050	
Test Loop Phase - 6	deg	Master	0	-3.000	0.290	3.000	
Test Loop Gain - 7		Master	1.000	0.950	1.008	1.050	
Test Loop Phase - 7	deg	Master	0	-3.000	-0.060	3.000	

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM):		13:53:29 16-Oct-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-102.514	119.000	
Sonde Error Correction Quad - 0		Master	-----	-2250.000	-165.193	2250.000	
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	152.862	204.000	
Sonde Error Correction Quad - 1		Master	-----	-625.000	156.352	625.000	
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	105.127	156.000	
Sonde Error Correction Quad - 2		Master	-----	-350.000	-67.600	350.000	
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	58.910	89.000	
Sonde Error Correction Quad - 3		Master	-----	-250.000	92.322	250.000	
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	24.933	35.000	
Sonde Error Correction Quad - 4		Master	-----	-63.000	47.414	63.000	
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	12.207	24.000	
Sonde Error Correction Quad - 5		Master	-----	-50.000	-25.021	50.000	
Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	9.503	15.000	
Sonde Error Correction Quad - 6		Master	-----	-30.000	0.642	30.000	
Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-1.991	5.000	
Sonde Error Correction Quad - 7		Master	-----	-30.000	-0.082	30.000	

AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM):		13:53:29 16-Oct-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Coarse Gain		Master	1.000	0.800	1.023	1.200	
Fine Gain		Master	1.000	0.800	1.023	1.200	

AIT Electronics Check - Thru Calibration Check

Master (EEPROM):		13:53:29 16-Oct-2013	Before (Measured):		21:00:04 03-Feb-2014	After:	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Thru Cal Mag - 0	V	Master	-----	0.366	0.597	0.854	
		Before	-----	0.366	0.596	0.854	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-0.001	-----	
		After-Before	-----	-----	-----	-----	
Thru Cal Phase - 0	deg	Master	-----	137.000	-170.441	-103.000	
		Before	-----	137.000	-164.390	-103.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	6.051	-----	
		After-Before	-----	-----	-----	-----	
Thru Cal Mag - 1	V	Master	-----	0.762	1.222	1.778	
		Before	-----	0.762	1.222	1.778	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	0.000	-----	
		After-Before	-----	-----	-----	-----	
Thru Cal Phase - 1	deg	Master	-----	136.000	-171.517	-104.000	
		Before	-----	136.000	-165.460	-104.000	

		After					
		Before-Master			6.057		
		After-Before					
Thru Cal Mag - 2	V	Master		0.372	0.607	0.868	
		Before		0.372	0.606	0.868	
		After					
		Before-Master			-0.001		
		After-Before					
Thru Cal Phase - 2	deg	Master		132.000	-175.054	-108.000	
		Before		132.000	-169.001	-108.000	
		After					
		Before-Master			6.053		
		After-Before					
Thru Cal Mag - 3	V	Master		0.420	0.684	0.980	
		Before		0.420	0.684	0.980	
		After					
		Before-Master			0.000		
		After-Before					
Thru Cal Phase - 3	deg	Master		131.000	-175.807	-109.000	
		Before		131.000	-169.753	-109.000	
		After					
		Before-Master			6.054		
		After-Before					
Thru Cal Mag - 4	V	Master		0.804	1.280	1.876	
		Before		0.804	1.279	1.876	
		After					
		Before-Master			-0.001		
		After-Before					
Thru Cal Phase - 4	deg	Master		125.000	178.088	-115.000	
		Before		125.000	-175.853	-115.000	
		After					
		Before-Master			-353.941		
		After-Before					
Thru Cal Mag - 5	V	Master		1.176	1.864	2.744	
		Before		1.176	1.863	2.744	
		After					
		Before-Master			-0.001		
		After-Before					
Thru Cal Phase - 5	deg	Master		122.000	176.493	-118.000	
		Before		122.000	-177.445	-118.000	
		After					
		Before-Master			-353.938		
		After-Before					
Thru Cal Mag - 6	V	Master		1.176	1.865	2.744	
		Before		1.176	1.864	2.744	
		After					
		Before-Master			-0.001		
		After-Before					
Thru Cal Phase - 6	deg	Master		121.000	176.477	-119.000	
		Before		121.000	-177.461	-119.000	
		After					
		Before-Master			-353.938		
		After-Before					
Thru Cal Mag - 7	V	Master		0.846	1.340	1.974	
		Before		0.846	1.340	1.974	
		After					
		Before-Master			0.000		
		After-Before					
Thru Cal Phase - 7	deg	Master		115.000	175.810	-125.000	
		Before		115.000	-178.098	-125.000	
		After					
		Before-Master			-353.908		
		After-Before					
SPA Zero	mV	Master		-50.000	-0.427	50.000	
		Before		-50.000	-0.421	50.000	
		After					
		Before-Master			0.006		
		After-Before					

SPA Plus	mV	Master Before After Before-Master After-Before		941.000 941.000 ----- ----- -----	991.321 991.149 ----- -0.172 -----	1040.000 1040.000 ----- ----- -----	
Temperature Zero	V	Master Before After Before-Master After-Before		-0.050 -0.050 ----- ----- -----	0.000 0.000 ----- 0.000 -----	0.050 0.050 ----- ----- -----	
Temperature Plus	V	Master Before After Before-Master After-Before		0.870 0.870 ----- ----- -----	0.918 0.918 ----- 0.000 -----	0.960 0.960 ----- ----- -----	

HDRS-H (HILT Density and Rxo Sonde, 150 degC) Calibration - Run One

Primary Equipment :		
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	3928
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	3832
Auxiliary Equipment :		
HRDD Backscatter Detector	Backscatter	
HRDD Long Spacing Detector	Long Spacing	
HRDD Short Spacing Detector	Short Spacing	
Cesium 137 Gamma-Ray Logging Source	GSR-J	5398
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	3928
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	3966
Calibration Parameter :		
Small Ring Size (Caliper Calibration Small Ring)	8.00	
Large Ring Size (Caliper Calibration Large Ring)	12.00	

HDRS Caliper Calibration - Caliper Accumulations

Before (Measured): 14:20:14 05-Dec-2013 Expired by 5 days							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Small Ring	in	Before	8.00	6.00	8.97	10.00	
Large Ring	in	Before	12.00	9.00	13.11	15.00	

HDRS Density Calibration - Inversion Results

Master (EEPROM): 11:31:16 04-Dec-2013							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Rho Aluminum	g/cm3	Master	2.596	2.586	2.596	2.606	
Rho Magnesium	g/cm3	Master	1.686	1.676	1.688	1.696	
Pe Aluminum		Master	2.570	2.470	2.528	2.670	
Pe Magnesium		Master	2.650	2.550	2.646	2.750	

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 11:31:16 04-Dec-2013							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Average Deviation	%	Master	0	-0.6000	0.2377	0.6000	
BS Max Deviation	%	Master	0	-1.6000	0.4897	1.6000	
SS Average Deviation	%	Master	0	-1.0000	0.4242	1.0000	
SS Max Deviation	%	Master	0	-2.5000	1.3410	2.5000	
LS Average Deviation	%	Master	0	-1.5000	0.7557	1.5000	
LS Max Deviation	%	Master	0	-3.5000	1.4046	3.5000	

HDRS Density Calibration - Background Summary

Master (EEPROM): 11:31:16 04-Dec-2013				Before (Measured): 11:44:43 05-Dec-2013 Expired by 5 days			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Window Ratio		Master	1.0000		0.7399		
		Before	0.7399	0.7029	0.7422	0.7769	
		Before-Master	-----	-----	0.0023	-----	
BS Window Sum	1/s	Master	1		22878		
		Before	22878	21734	22904	24022	

		Before-Master	-----	-----	26	-----	
SS Window Ratio		Master	1.0000		0.4864		
		Before	0.4864	0.4621	0.4838	0.5108	
		Before-Master	-----	-----	-0.0026	-----	
SS Window Sum	1/s	Master	1		10252		
		Before	10252	9739	10234	10764	
		Before-Master	-----	-----	-18	-----	
LS Window Ratio		Master	1.0000		0.2987		
		Before	0.2987	0.2838	0.2963	0.3137	
		Before-Master	-----	-----	-0.0024	-----	
LS Window Sum	1/s	Master	1		1154		
		Before	1154	1096	1147	1212	
		Before-Master	-----	-----	-7	-----	

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 11:31:16 04-Dec-2013		Before (Measured):		11:44:43 05-Dec-2013 Expired by 5 days			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS PM High Voltage	V	Master		1000	1374	2400	
		Before		1000	1381	2400	
		Before-Master	-----	-100	7	100	
SS PM High Voltage	V	Master		1000	1285	2400	
		Before		1000	1297	2400	
		Before-Master	-----	-100	12	100	
LS PM High Voltage	V	Master		1000	1316	2400	
		Before		1000	1324	2400	
		Before-Master	-----	-100	8	100	

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM): 11:31:16 04-Dec-2013		Before (Measured):		11:44:43 05-Dec-2013 Expired by 5 days			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Crystal Resolution	%	Master		5.00	10.38	25.00	
		Before		5.00	10.41	25.00	
		Before-Master	-----	-1.00	0.03	1.00	
SS Crystal Resolution	%	Master		5.00	8.54	20.00	
		Before		5.00	8.56	20.00	
		Before-Master	-----	-1.00	0.02	1.00	
LS Crystal Resolution	%	Master		5.00	8.98	20.00	
		Before		5.00	8.89	20.00	
		Before-Master	-----	-1.00	-0.09	1.00	

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured): 11:15:31 12-Dec-2013							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Main Resistivity	ohm.m	Before	3875	3565	3868	4185	
Deep Resistivity	ohm.m	Before	3830	3524	3799	4136	
Shallow Resistivity	ohm.m	Before	3830	3524	3816	4136	

HGNS-H (HILT Gamma-Ray and Neutron Sonde, 150 degC) Calibration - Run One

Primary Equipment :			
HILT Gamma-Ray and Neutron Sonde, 150 degC		HGNS-H	3819
Auxiliary Equipment :			
HGNS Accelerometer, 150 degC		HACCZ-H	5120
AmBe Neutron Logging Source		NSR-F	5075
Calibration Parameter :			
Water Temperature			
Housing Size			
JIG-BKG (Jig minus background reference)		165	

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured): 11:16:03 12-Dec-2013							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.1	32.8	

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM):		00:00:00 15-May-2006					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Accelerometer Manufacturer		Master			QAT_160		
Accelerometer Reference Temperature	degF	Master		30.2	77.0	122.0	
Accelerometer Coefficients - 0		Master	----	----	519.600	----	
Accelerometer Coefficients - 1		Master	----	----	33.360	----	
Accelerometer Coefficients - 2		Master	----	----	-0.009	----	
Accelerometer Coefficients - 3		Master	----	----	0.000	----	
Accelerometer Coefficients - 4		Master	----	----	2.719	----	
Accelerometer Coefficients - 5		Master	----	----	0.000	----	
Accelerometer Coefficients - 6		Master	----	----	0.000	----	
Accelerometer Coefficients - 7		Master	----	----	0.000	----	
Accelerometer Coefficients - 8		Master	----	----	298.600	----	
Accelerometer Coefficients - 9		Master	----	----	0.997	----	

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM):		11:02:48 16-Oct-2013		Before (Measured):		14:56:08 05-Dec-2013		After:	
						Expired by 5 days			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit			
Near Zero Measurement	1/s	Master	0	5.0	26.3	40.0			
		Before	0	5.0	27.7	40.0			
		After	----	----	----	----			
		Before-Master	----	-3.9	1.4	3.9			
		After-Before	----	----	----	----			
Far Zero Measurement	1/s	Master	0	5.0	29.2	40.0			
		Before	0	5.0	28.1	40.0			
		After	----	----	----	----			
		Before-Master	----	-4.4	-1.1	4.4			
		After-Before	----	----	----	----			
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	5447.0	6900.0			
		Before	----	----	----	----			
		After	----	----	----	----			
		Before-Master	----	----	----	----			
		After-Before	----	----	----	----			
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	2281.0	2900.0			
		Before	----	----	----	----			
		After	----	----	----	----			
		Before-Master	----	----	----	----			
		After-Before	----	----	----	----			
Near Corrected Plus Measurement - 0	1/s	Master		4700.0	5553.0	6900.0			
		Before	----	----	----	----			
		After	----	----	----	----			
		Before-Master	----	----	----	----			
		After-Before	----	----	----	----			
Far Corrected Plus Measurement - 0	1/s	Master		1900.0	2338.0	2900.0			
		Before	----	----	----	----			
		After	----	----	----	----			
		Before-Master	----	----	----	----			
		After-Before	----	----	----	----			

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured):		14:53:52 05-Dec-2013		Expired by 5 days		After:	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before	30.0	0	22.6	120.0	
		After	----	----	----	----	
		After-Before	----	----	----	----	
RGR Plus Measurement	gAPI	Before	185.4	157.1	176.1	206.3	
		After	----	----	NOT DONE	----	
		After-Before	----	----	----	----	
GR Calibration Gain		Before	0.89	0.80	0.94	1.05	
		After	----	----	----	----	
		After-Before	----	----	----	----	

HNGS-BA (Hostile-environment Natural Gamma-ray Sonde) Calibration - Run One

Primary Equipment :							
HNGS Sonde Element		HNGS-BA		328			

Auxiliary Equipment :			Hostile Natural Gamma Ray Cartridge		HNGC-B	596
			HNGS Housing Element		HEH-K	328
						0

HNGS Background and Na22 Set Point Determination - Detector 1 Check

Master (EEPROM): 16:37:03 16-Nov-2013		Before:			After:		
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Location - 0		Master			39.685		
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Na 511 Peak Resolution - 0	%	Master			14.671		
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
High Voltage DAC Value - 0	V	Master			0.000		
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Na 1785 Peak Location - 0		Master			142.226		
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Na 1785 Peak Resolution - 0	%	Master			8.213		
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Temperature - 0	degF	Master					
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Na Count Rate - 0	CPS	Master	45.000	10.000	24.611	100.000	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	

HNGS Background and Na22 Set Point Determination - Detector 2 Check

Master (EEPROM): 16:37:03 16-Nov-2013		Before:			After:		
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Location - 0		Master			39.668		
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Na 511 Peak Resolution - 0	%	Master			15.246		
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
High Voltage DAC Value - 0	V	Master			0.000		
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Na 1785 Peak Location - 0		Master			141.964		
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	

Na 1785 Peak Resolution - 0	%	Master Before After Before-Master After-Before	----- ----- ----- -----	----- ----- ----- -----	8.671 ----- ----- ----- -----	----- ----- ----- ----- -----	
Temperature - 0	degF	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	----- ----- ----- ----- -----	----- ----- ----- ----- -----	----- ----- ----- ----- -----	
Na Count Rate - 0	CPS	Master Before After Before-Master After-Before	45.000 ----- ----- ----- -----	10.000 ----- ----- ----- -----	24.616 ----- ----- ----- -----	100.000 ----- ----- ----- -----	

HNGS Background and Na22 Set Point Determination - Ratio of Detector 1 to Detector 2

Master (EEPROM): 16:37:03 16-Nov-2013		Before:		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Coincidence Count Rate Ratio - 0		Master			0.000		
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HNGS Background and Na22 Set Point Determination - Detector 1 Calibration

Master (EEPROM): 16:37:03 16-Nov-2013		Before:		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Th Peak Location - 0		Master	209.630	201.000	213.899	218.250	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Th Peak Resolution - 0	%	Master	7.000	5.000	6.729	9.000	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Background Count Rate - 0	CPS	Master			0.000		
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Gain Ratio - 0		Master	1.000	0.940	1.025	1.060	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HNGS Background and Na22 Set Point Determination - Detector 2 Calibration

Master (EEPROM): 16:37:03 16-Nov-2013		Before:		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Th Peak Location - 0		Master	209.630	201.000	214.368	218.250	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Th Peak Resolution - 0	%	Master	7.000	5.000	7.705	9.000	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Background Count Rate - 0	CPS	Master			0.000		
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Gain Ratio - 0		Master	1.000	0.940	1.028	1.060	
		Before	-----	-----	-----	-----	

		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HNGS Background and Na22 Set Point Determination - Detector 1 Calibration

Master (EEPROM): 16:37:03 16-Nov-2013		Before:		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Set Point - 0		Master	40.000	38.000	40.000	43.500	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HNGS Background and Na22 Set Point Determination - Detector 2 Calibration

Master (EEPROM): 16:37:03 16-Nov-2013		Before:		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Set Point - 0		Master	40.000	38.000	40.000	43.500	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

Company:	Anadarko E&P Onshore LLC	Schlumberger
Well:	Murphy 1-31 M	
Field:	Greenwood	
County:	Morton	
State:	Kansas	

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