

Company: AXIA ENERGY, LLC

Well: BULLDOG 20-12H-892

Field: LAY CREEK

County: MOFFAT State: COLORADO

Platform Express - Field Print

Compensated Neutron - Lithodensity

Array Induction - Gamma

County: MOFFAT  
 Field: LAY CREEK  
 Location: SHL: 1641' FNL & 712' FWL  
 Well: BULLDOG 20-12H-892  
 Company: AXIA ENERGY, LLC

Location:		SHL: 1641' FNL & 712' FWL	Elev.:	K.B. 6877.00 ft
		BHL: 1920' FSL & 600' FWL	G.L. 6845.00 ft	
			D.F. 6877.00 ft	
Permanent Datum:	Ground Level		6845.00 f	
Log Measured From:	Kelly Bushing	32.00 ft	above Perm. Datum	
Drilling Measured From:	Kelly Bushing			
API Serial No. 05-081-07729	Section: 20	Township: 8N	Range: 92W	

Logging Date	05-Aug-2012
Run Number	1
Depth Driller	12332.00 ft
Schlumberger Depth	12332.00 ft
Bottom Log Interval	12335.00 ft
Top Log Interval	200.00 ft
Casing Driller Size @ Depth	7.625 in @ 9335.00 ft
Casing Schlumberger	9335 ft
Bit Size	6.75 in
Type Fluid In Hole	Crude or Produced Oil
Density	10 lbm/gal
Fluid Loss	PH
Source of Sample	N/A
RM @ Meas Temp	N/A
RMF @ Meas Temp	N/A
RMC @ Meas Temp	N/A
Source RMF	N/A
RM @ BHT	N/A
RMF @ BHT	N/A
Max Recorded Temperatures	280 degF
Circulation Stopped	Time
Logger on Bottom	Time
Unit Number	Location:
Recorded By	
Witnessed By	

## Disclaimer

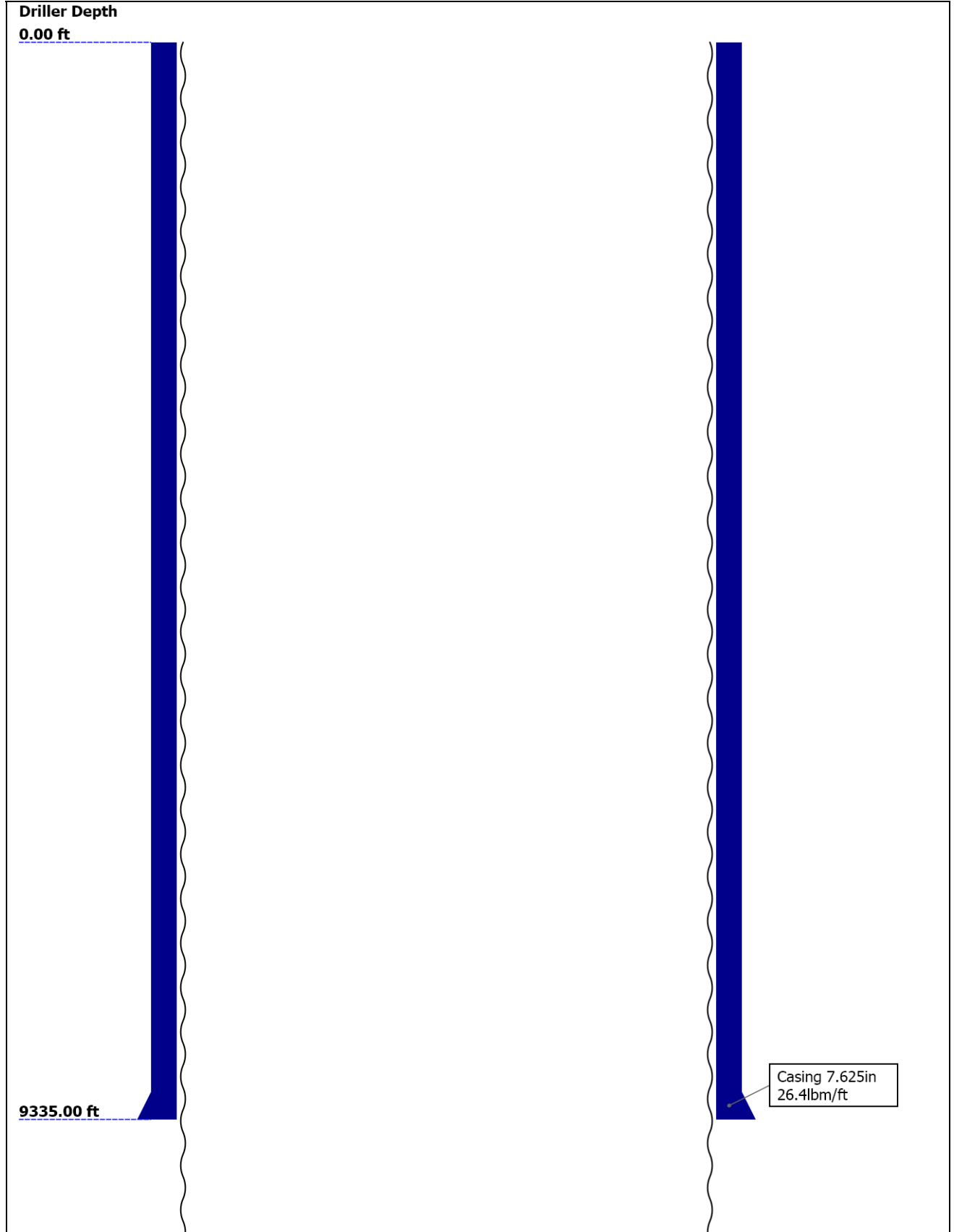
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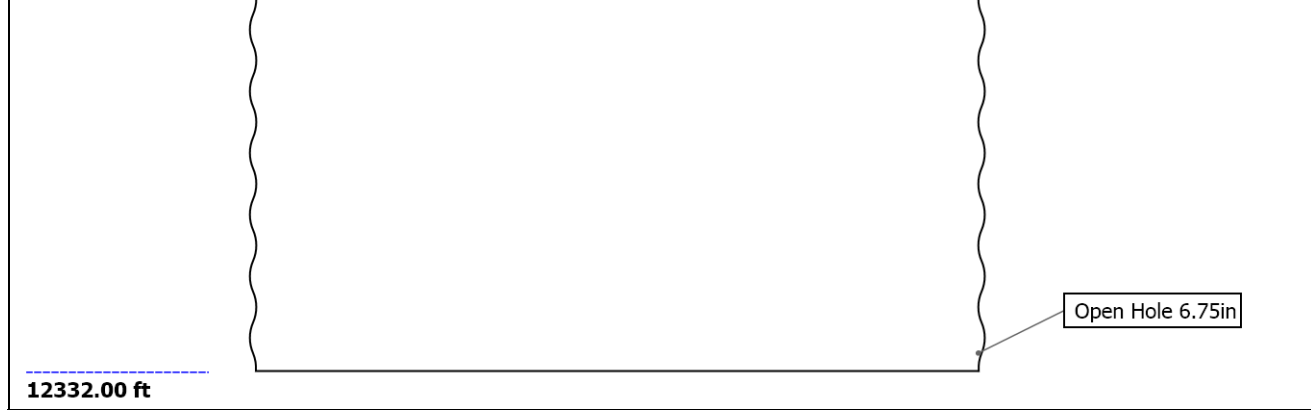
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  - 12.2 Log ( TCOM\_AIT\_MAIN\_5 RA )

## Well Sketch





## Borehole Size/Casing/Tubing Record

Bit						
Bit Size ( in )	6.75					
Top Driller ( ft )	0					
Top Logger ( ft )	0					
Bottom Driller ( ft )	12332					
Bottom Logger ( ft )	12332					
Casing						
Size ( in )	7.625					
Weight ( lbm/ft )	26.4					
Inner Diameter ( in )	6.962					
Grade	P110					
Top Driller ( ft )	0					
Top Logger ( ft )	0					
Bottom Driller ( ft )	9335					
Bottom Logger ( ft )	9335					

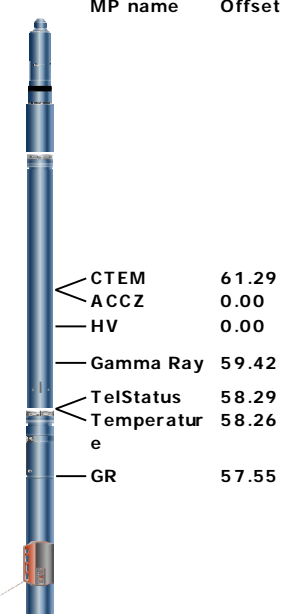
## Operational Run Summary

Parameter ( unit )	1					
Date Log Started	05-Aug-2012					
Time Log Started	02:37:17					
Date Log Finished	05-Aug-2012					
Time Log Finished	07:06:54					
Top Log Interval ( ft )	200.00					
Bottom Log Interval ( ft )	12335.00					
Total Depth ( ft )	12335.00					
Max Hole Deviation ( deg )	11.00					
Azimuth of Max Deviation ( deg )	NaN					
Bit Size ( in )	6.750					
Logging Unit Number	2379					
Logging Unit Location	VERNAL					
Recorded By	FOLAKE OGUNBANWO					
Witnessed By	OB SANCHEZ					

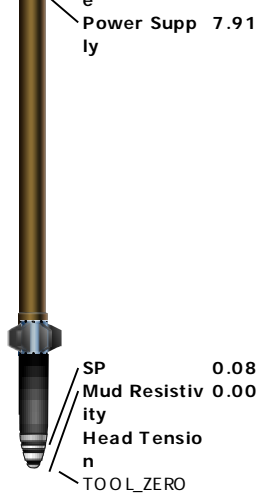
Service Order Number	BXV3-00050				
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Borehole Fluids						
Parameter( unit )	1					
Fluid Type	Oil					
Fluid Name	Crude or Produced Oil					
Max Recorded Temperatures ( degF )	280					
Source of Sample	Active Tank					
Salinity ( ppm )	0					
Density ( lbm/gal )	10					
Funnel Viscosity ( s )	48					
Fluid Loss ( cm3 )						
PH						
Date/Time Circulation Stopped	NaN					
Date Logger on Bottom	05-Aug-2012					
Time Logger on Bottom	04:47:19					
Source RMF						
RMC	Pressed					
RM @ Meas Temp ( ohm.m@degF )	N/A					
RMF @ Meas Temp ( ohm.m@degF )	N/A					
RMC @ Meas Temp ( ohm.m@degF )	N/A					
RM @ BHT ( ohm.m@degF )	N/A					
RMF @ BHT ( ohm.m@degF )	N/A					
RMC @ BHT ( ohm.m@degF )	N/A					
Electricity Stability ( V )						
Oil/Water						
Total Solid ( % )						
High Gravity Solids ( % )						

## Remarks and Equipment Summary

1: Toolstring				1: Remarks	
<b>Equip name</b> <b>Length</b> <b>MP name</b> <b>Offset</b> LEH-QT    67.71 LEH-QT  EDTC-B:8188    64.79 EDTH-B:8187 EDTG-A EDTC-B:8188  HGNS-H:3799    58.29 HGNS-H:3799 NPV-N NSR-F:5138 HGNS-H:3799 HACCZ-H:1614 HMCA-H  				Toolstring run as per tool sketch. HGNS and HDRS run to provide eccentralization. Cement hole volume calculated assuming a future casing diameter of 4.5" Caliper check in casing = 6.97 +/- 0.1" Casing shoe found @ 9320' Crew: Ogunbanwo, Yoder	





Lengths are in ft  
 Maximum Outer Diameter = 9.000 in  
 Line: Sensor Location, Value: Gating Offset  
 All measurements are relative to TOOL\_ZERO

## Depth Summary

<b>Depth Control Parameters</b>	<b>1</b>		
Conveyance Type	Wireline		
Log Sequence	Subsequent trip in the hole.		
Reference Log Date	31-Jul-2012		
Reference Log Name	HALLIBURTON GAMMA RAY LOG		
Reference Log Run Number	1		
Rig Type	LAND		
<b>Depth Remark Parameters</b>	<b>1</b>		
Depth Remark 1	All depth control procedures followed as per Schlumberger Depth Control Standard dated April, 2010.		
Depth Remark 2	IDW used as primary depth control. Z-chart used as secondary depth control device.		
Depth Remark 3	Stretch calculated by comparing the down-log to the up-log		
Depth Remark 4	Log correlated to reference log over the interval of 4000' - 7800'		
<b>Depth Measuring Device</b>	<b>1</b>		
Type	IDW-B		
Serial Number	5980		
Calibration Date	10-APR-2012		
Calibration Cable Type	7-46 ZVXS		
Wheel Correction 1	-7		
Wheel Correction 2	-6		
<b>Tension Device</b>	<b>1</b>		
Type	CMTD-B/A		
Serial Number	8093		
Calibration Date	06-JUL-2012		
Calibrator Serial Number	100518A		
Calibration Points	10		
Calibration RMS	20		
Calibration Peak Error	37		
<b>Logging Cable</b>	<b>1</b>		
Type	7-46A-XS		
Serial Number	U711172		
Logging Cable Length ( ft )	24250.00		

## Main Pass 2"/100'

### Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	404.41	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	736.65	ft3

### Software Version

Acquisition System	Version
MaxWell	3.1.9755.0

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.1.9755.0

Tool Elements	Description	Software Version	Firmware Version
HRCC-H	HILT High-Resolution Control Cartridge, 150 degC	3.1.9755.0	
AMIS	Array Induction Sonde - M	3.1.9755.0	
EDTC-B	Enhanced Digital Telemetry Cartridge - B	3.1.9755.0	

### Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
1	Log[3]:Up	Up	37.65 ft	12350.07 ft	05-Aug-2012 4:47:29 AM	05-Aug-2012 7:06:38 AM	-9.00 ft	false

All depths are referenced to toolstring zero

### Log

1: Log[3]:Up

Description: AIT Log Format: Log (AIT\_MAIN\_2) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 09-Aug-2012 12:50:59

Channel	Source	Sampling
AF10	AIT-M:AMIS:AMIS	3in
AF20	AIT-M:AMIS:AMIS	3in
AF30	AIT-M:AMIS:AMIS	3in
AF60	AIT-M:AMIS:AMIS	3in
AF90	AIT-M:AMIS:AMIS	3in
AMF	AIT-M:AMIS:AMIS	12in
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	EDTC-B:EDTC-B:EDTC-B	6in
ICV	Borehole	6in
IHV	Borehole	6in
TENS	WLWorkflow	1in
TIME_1900	WLWorkflow	0.1in

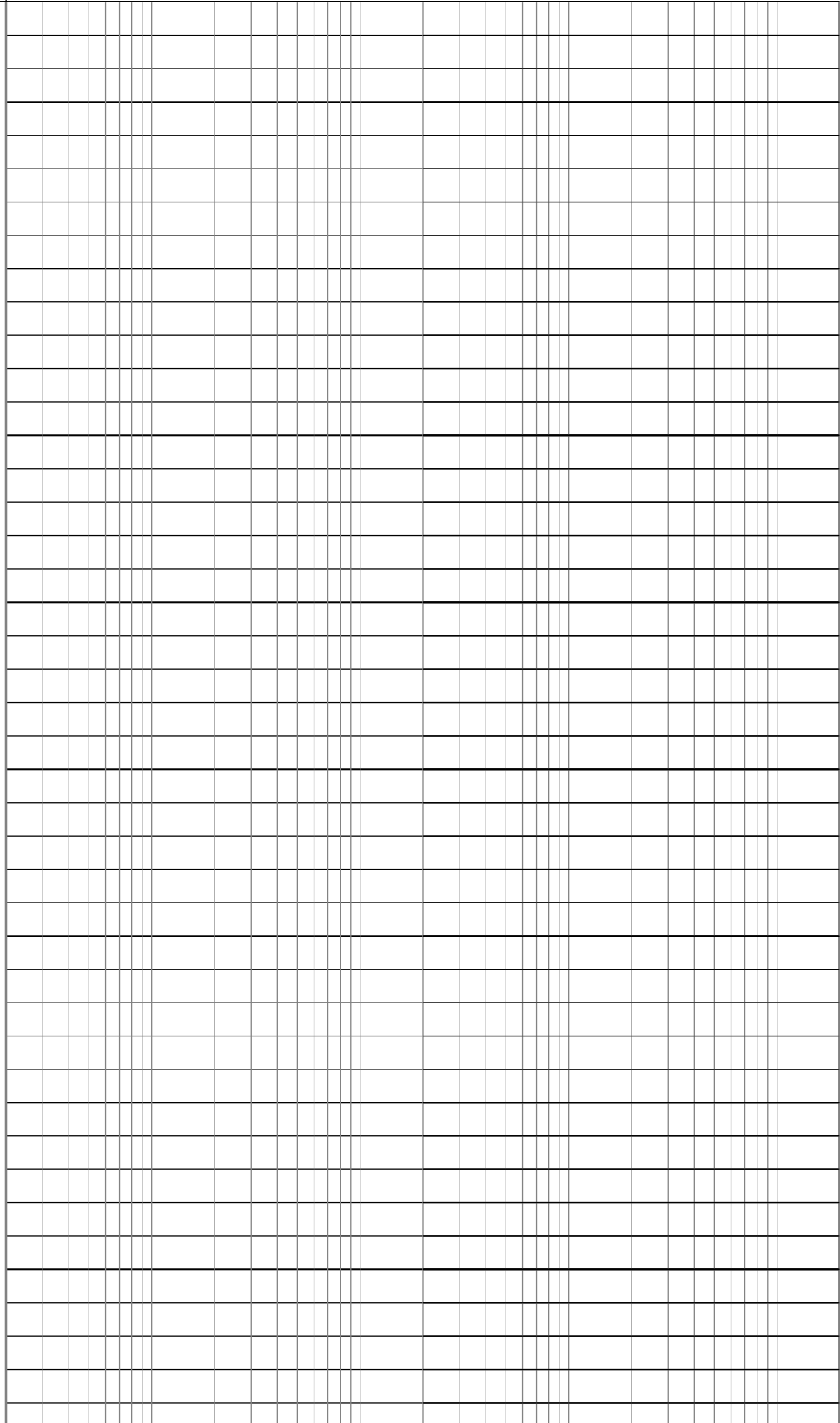
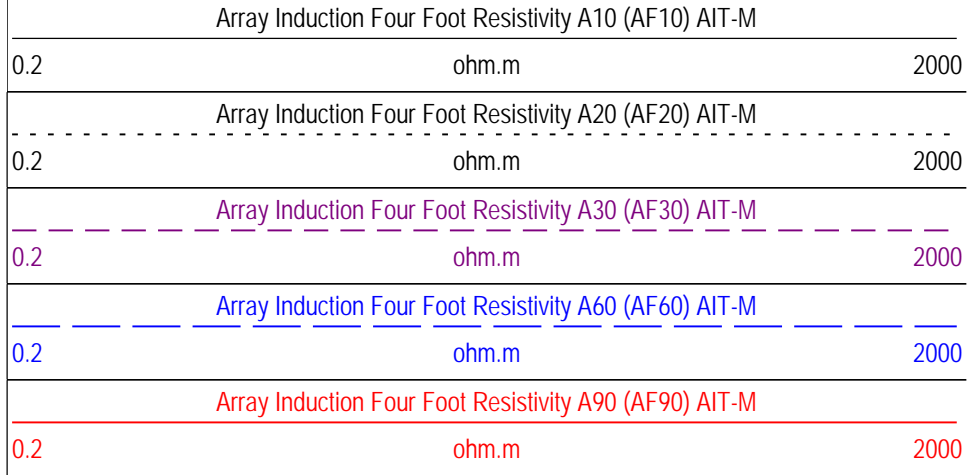
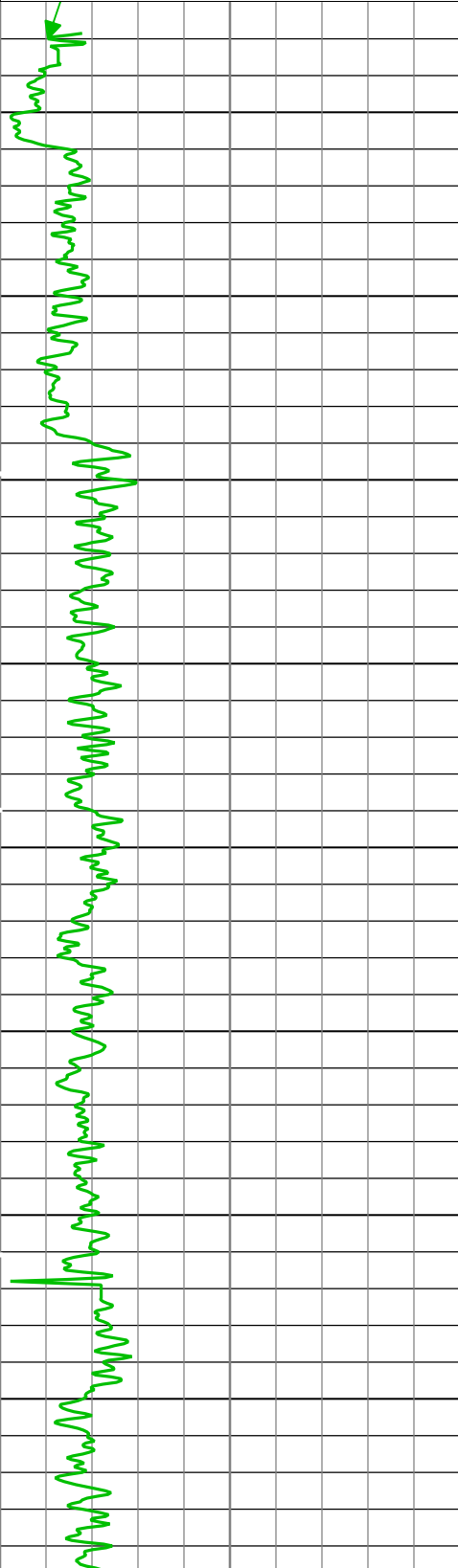
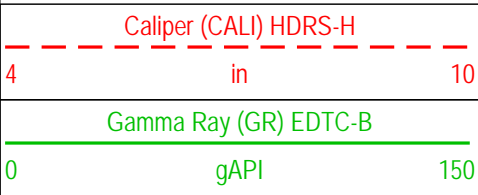
—|IHV - Integrated Hole Volume every 10.00 (ft3)  
 —|IHV - Integrated Hole Volume every 100.00 (ft3)

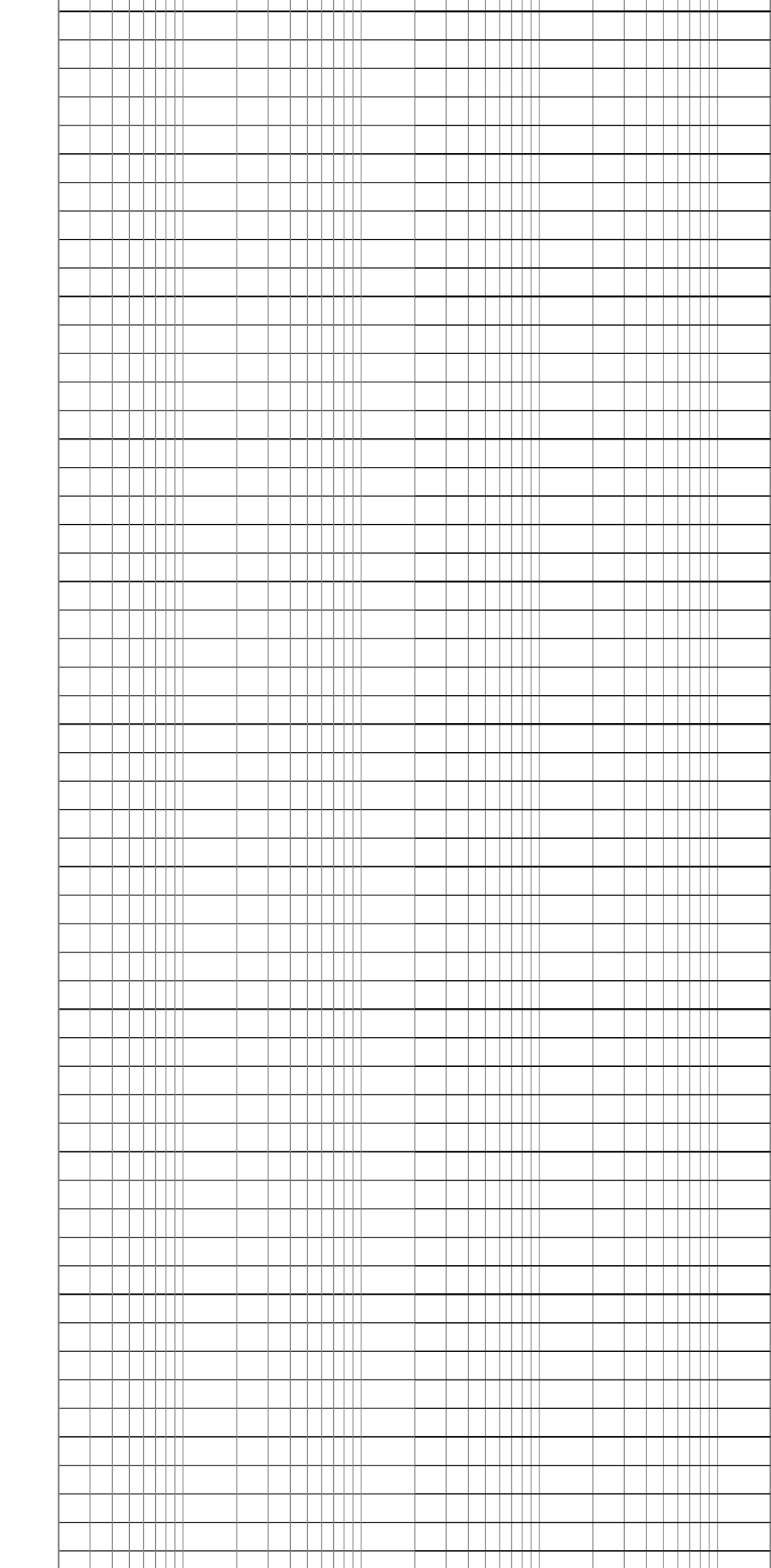
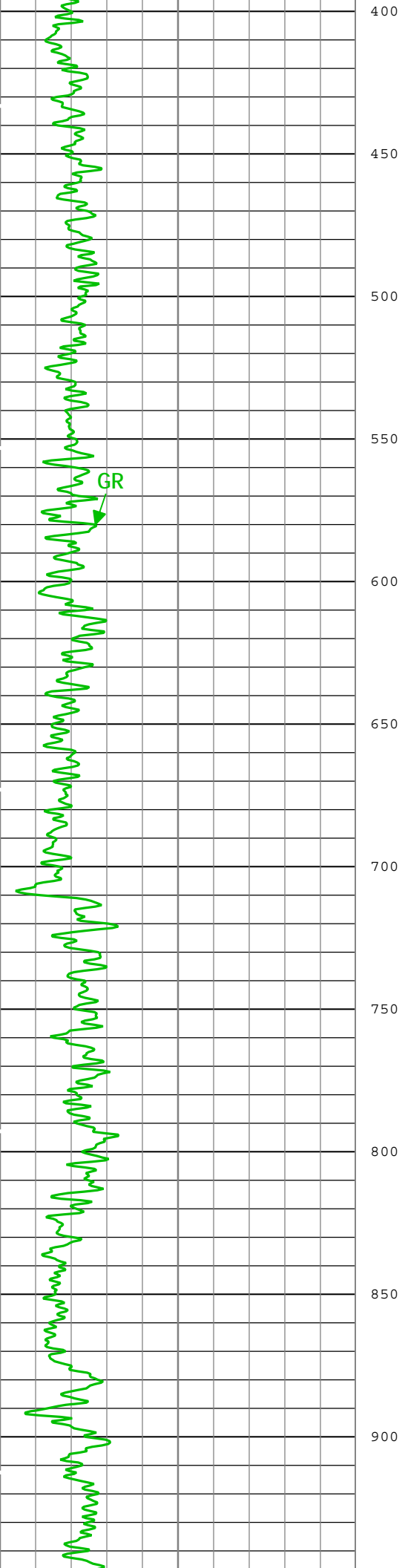
TIME\_1900 - Time Marked every 60.00 (s)

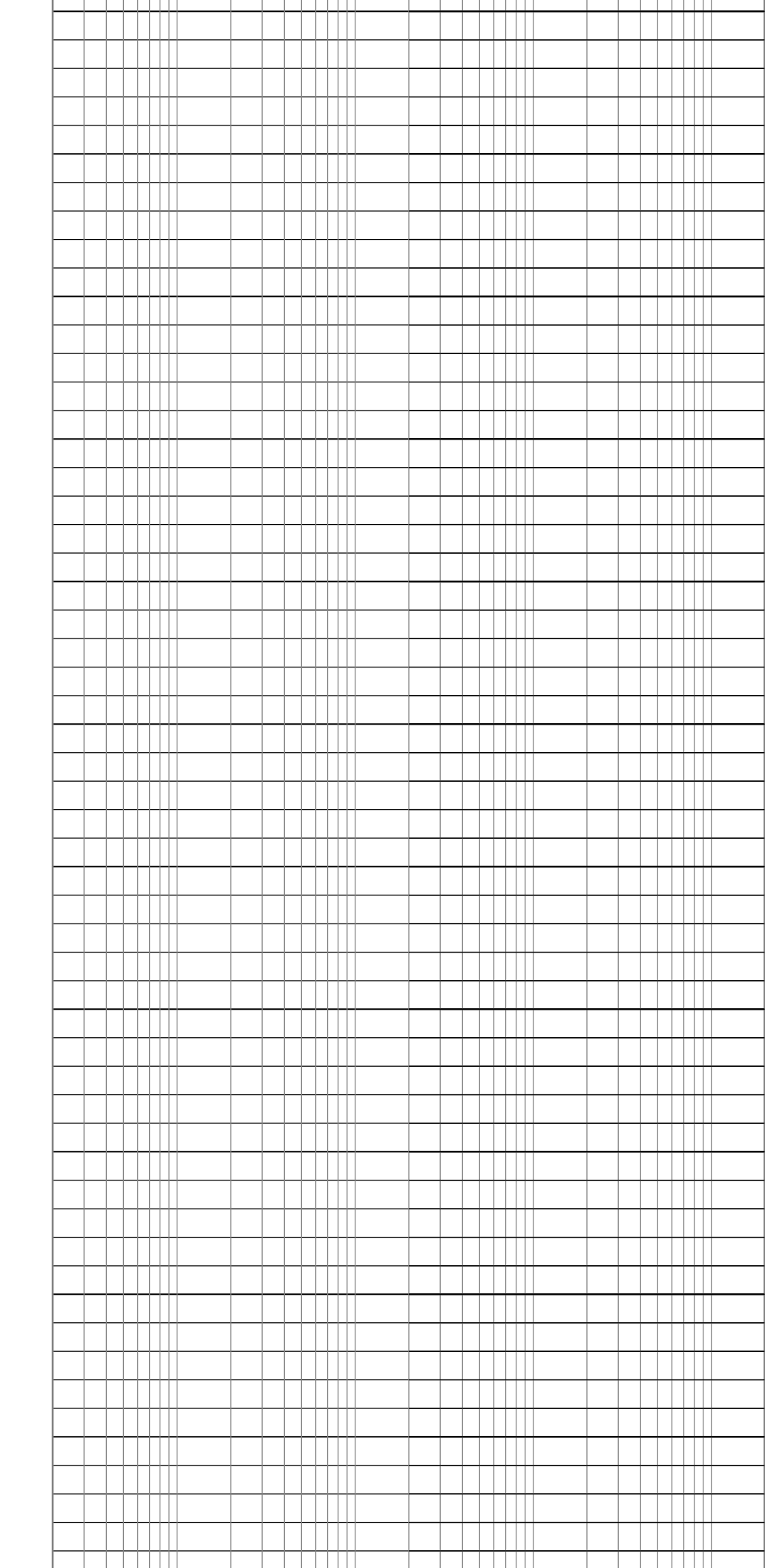
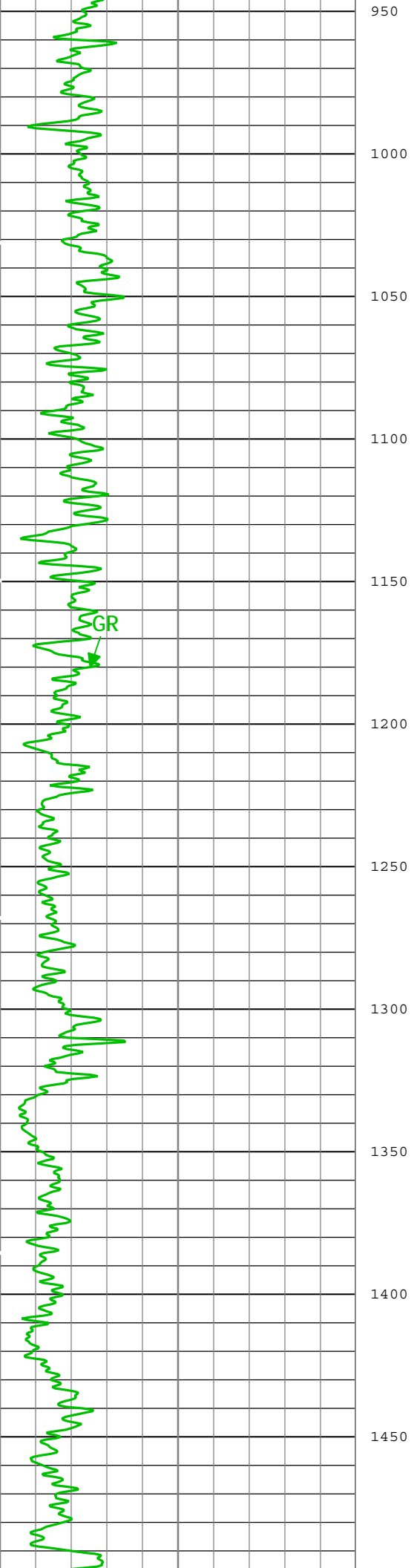
—|ICV - Integrated Cement Volume every 10.00 (ft3)  
 —|ICV - Integrated Cement Volume every 100.00 (ft3)

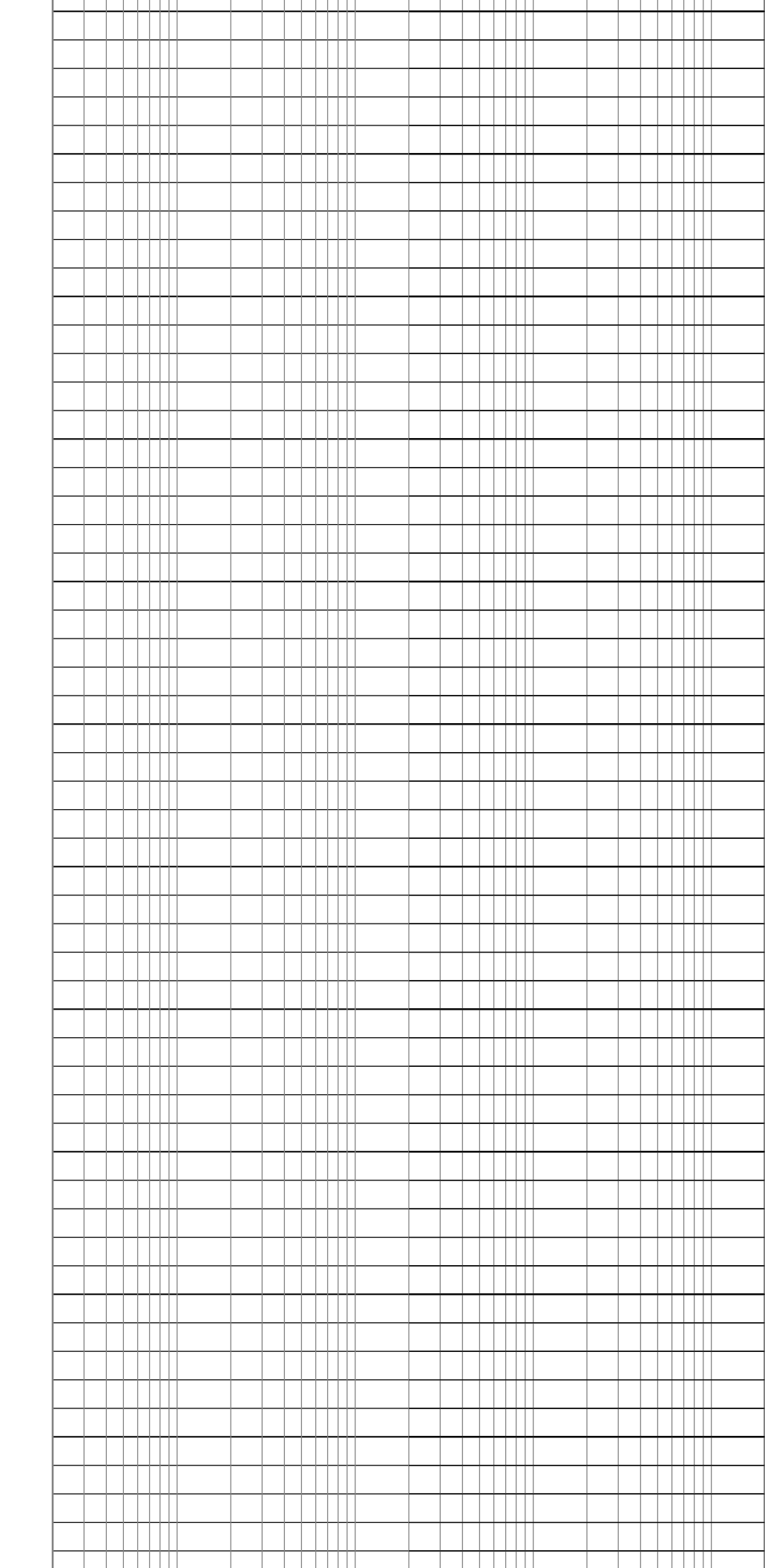
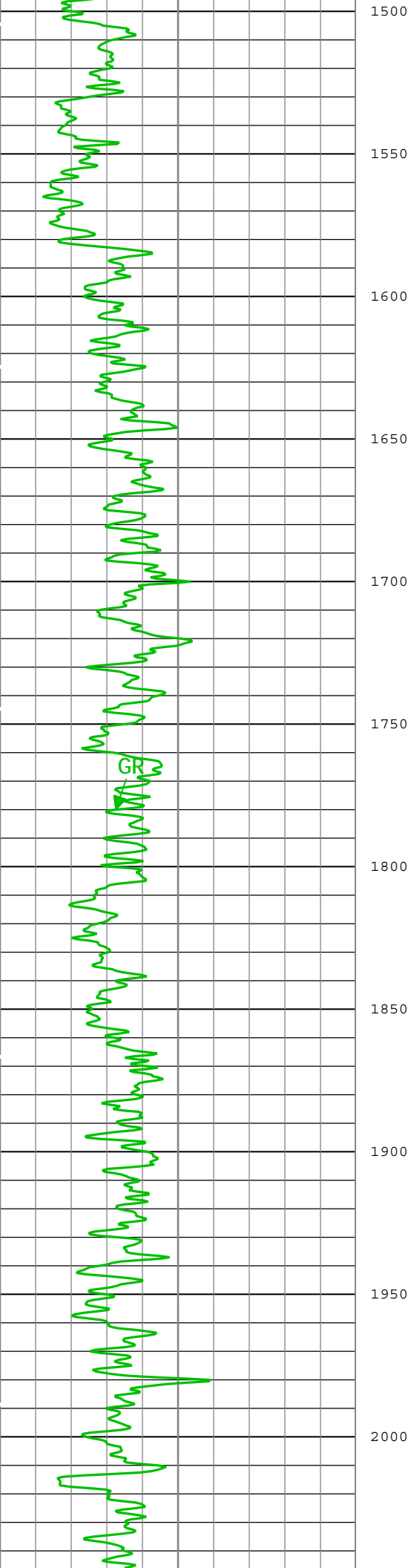
Cable Tension (TENS)	
10000	0
lb	

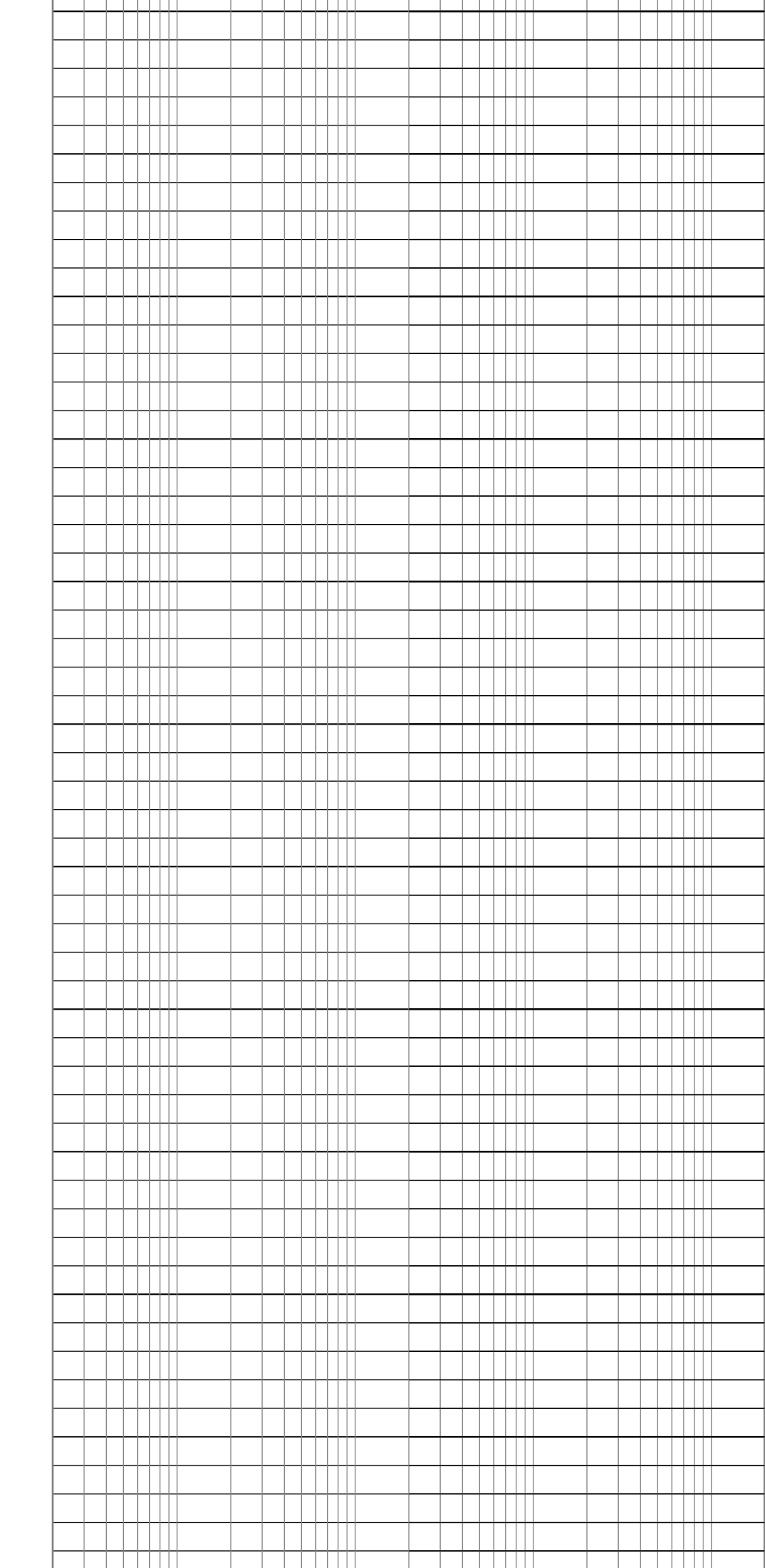
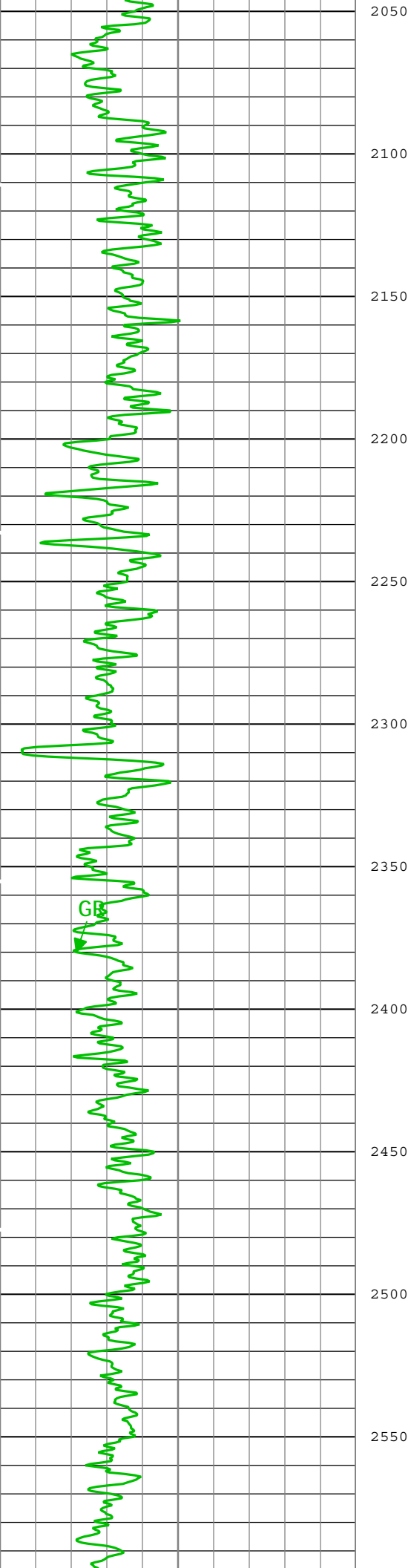
Array Induction Mud Resistivity Fully Calibrated (AMF) AIT-M	
0.02	200
ohm.m	

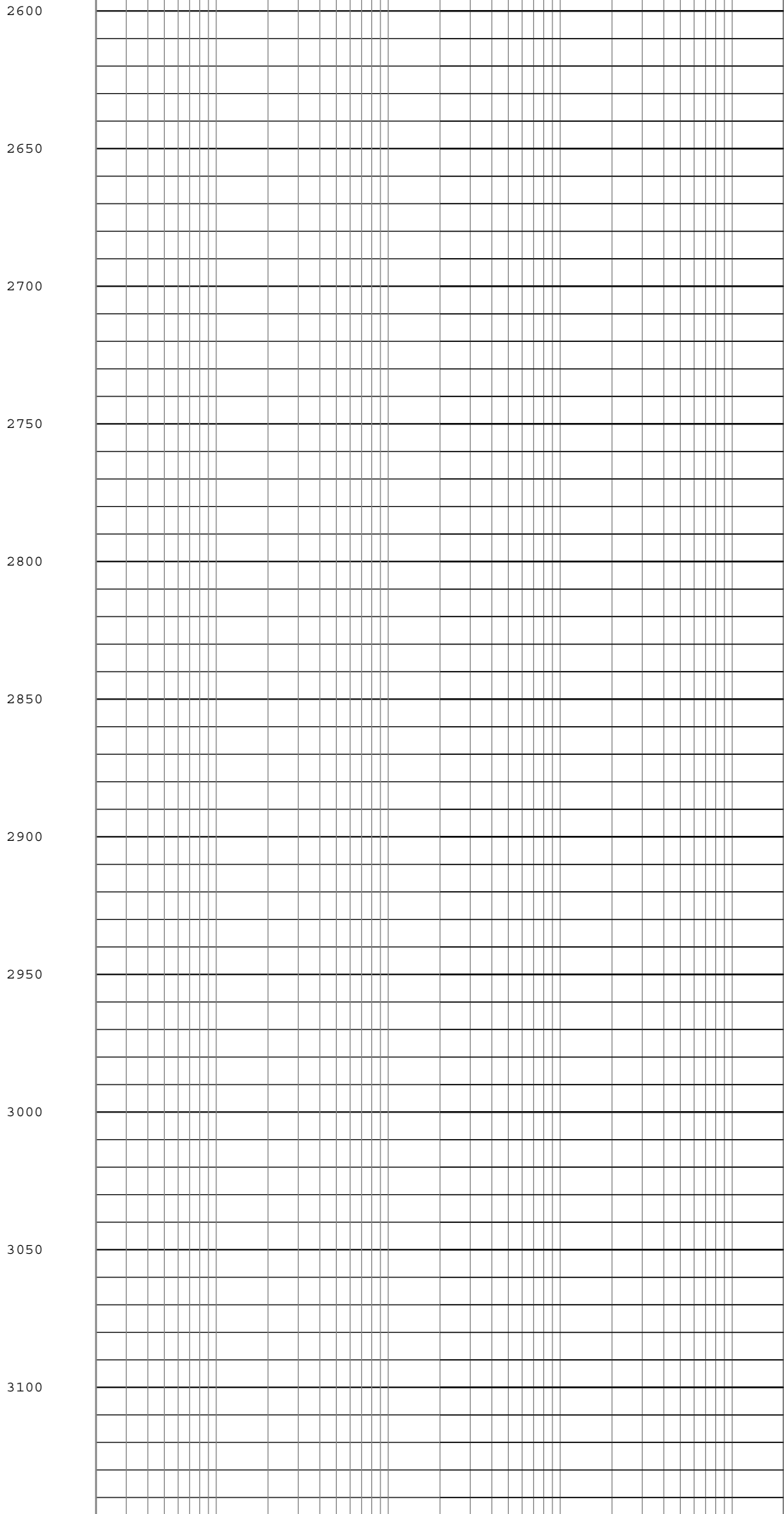
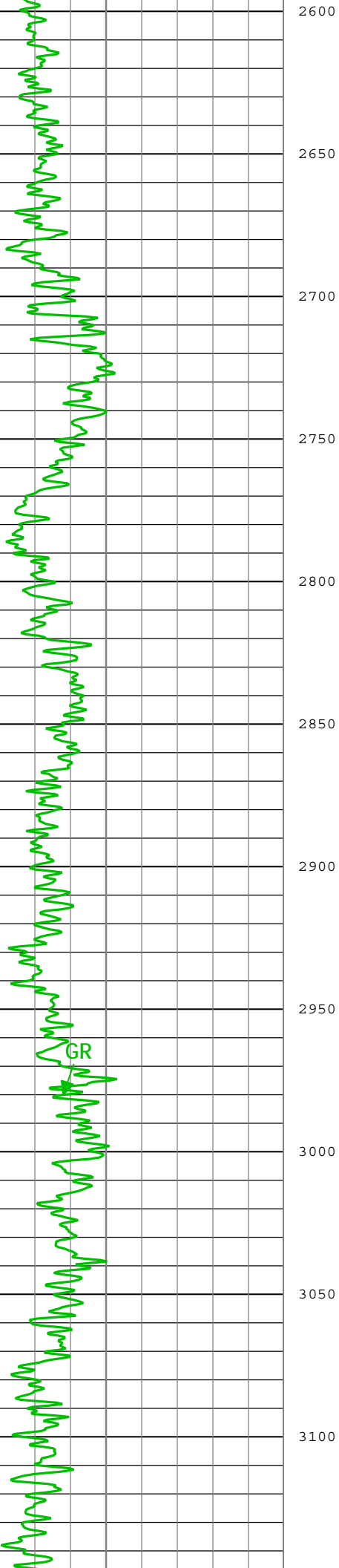


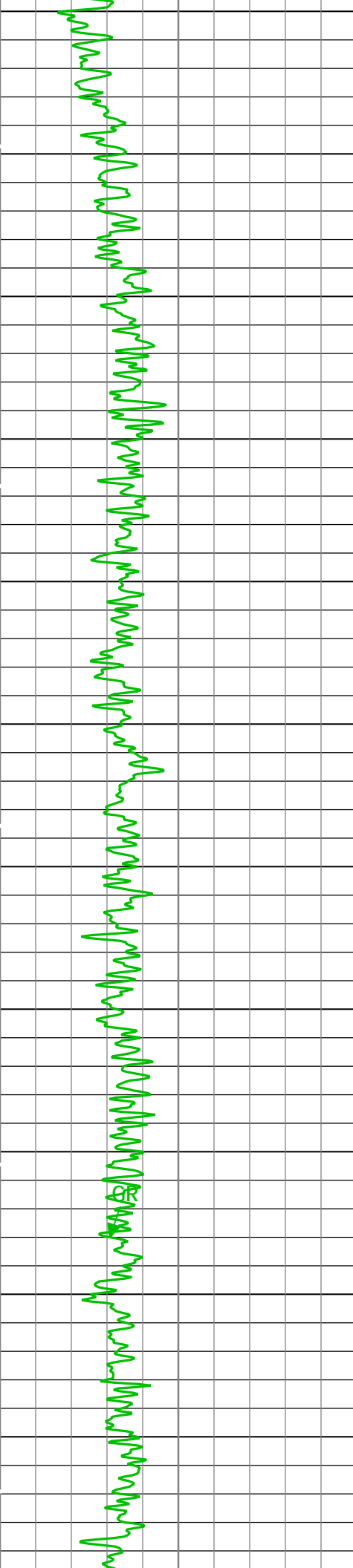




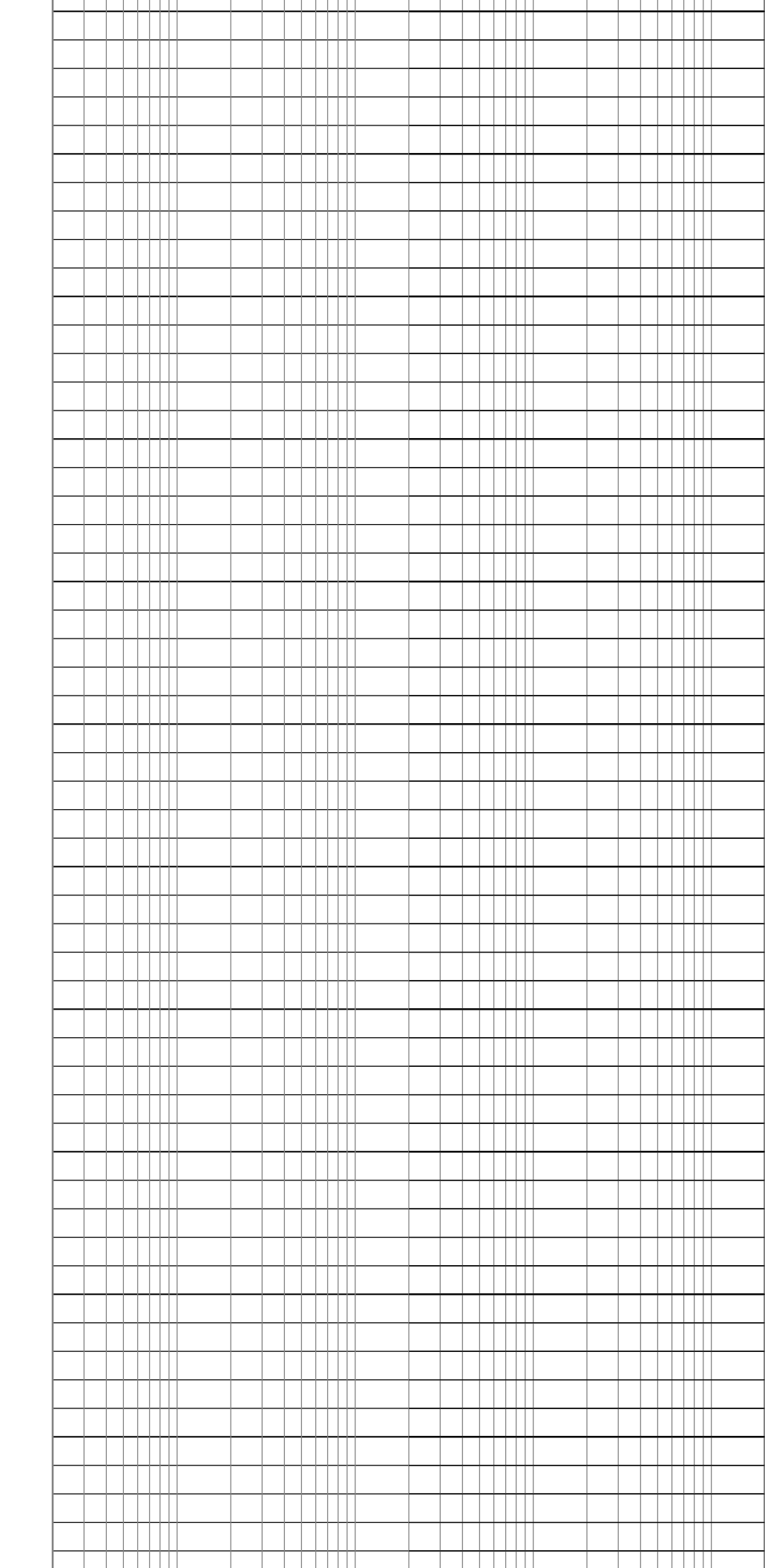
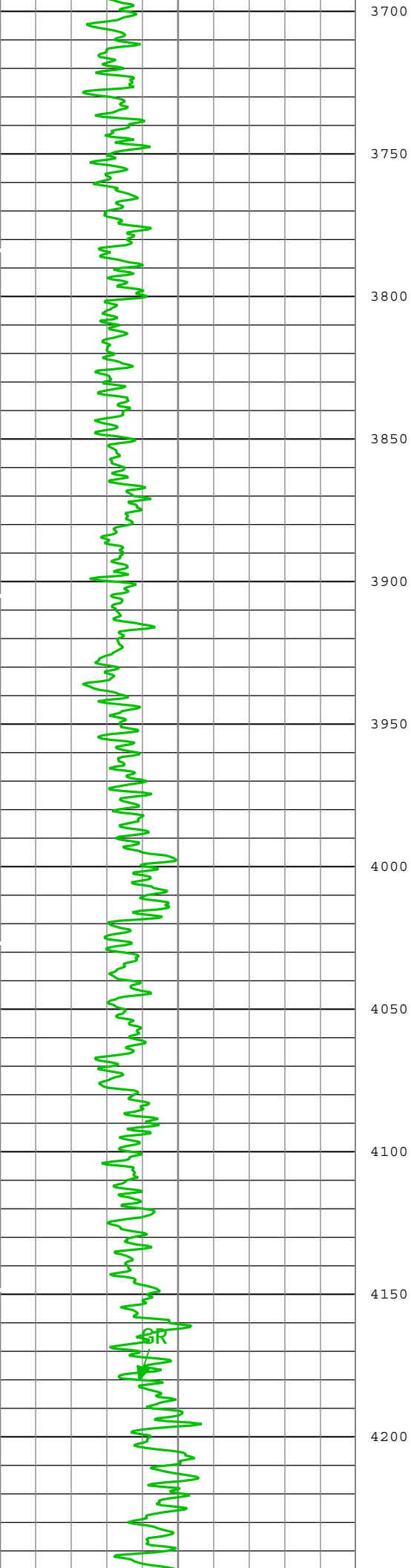


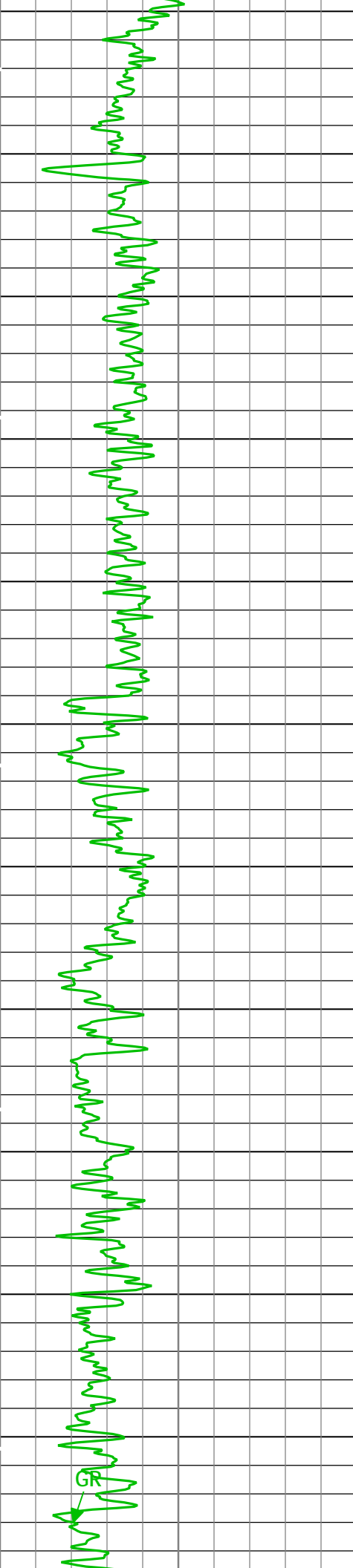




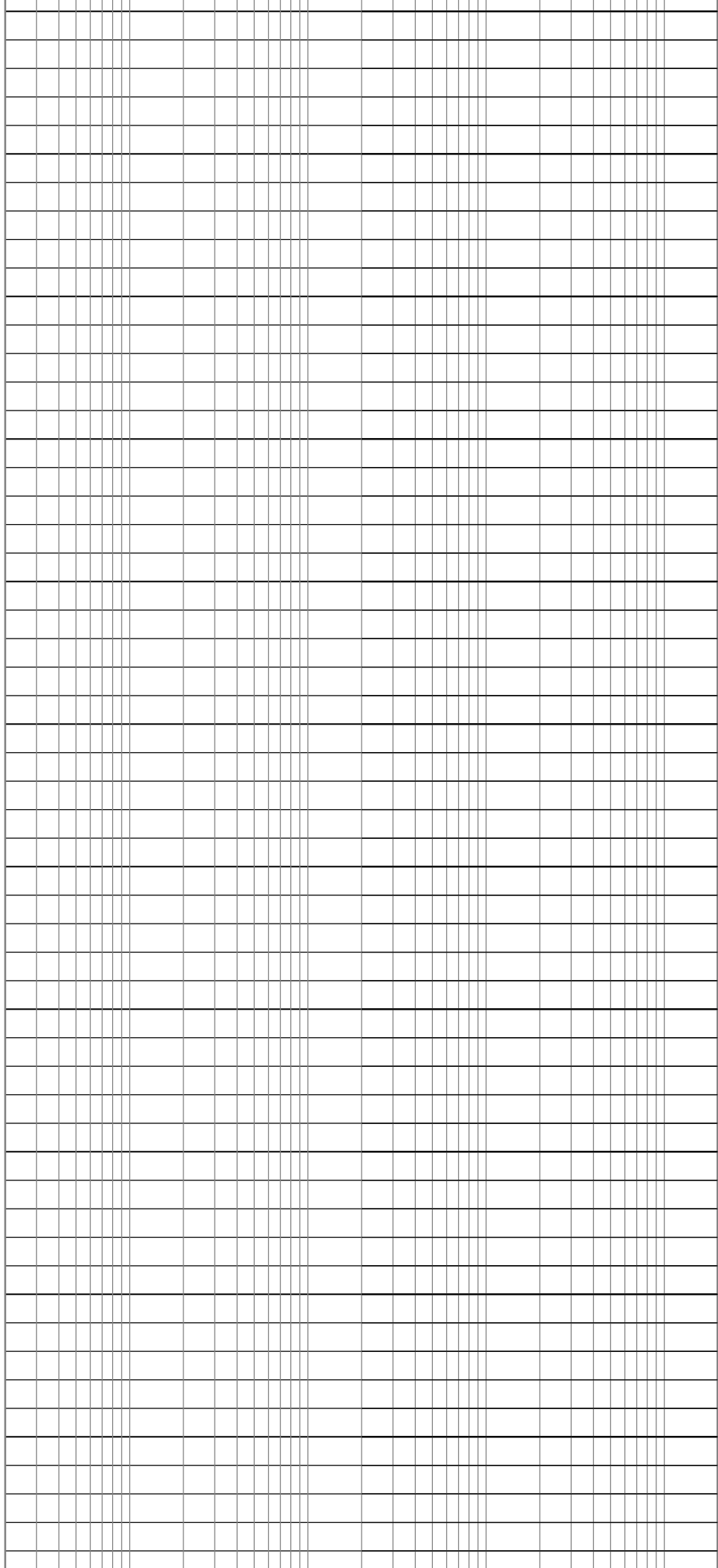


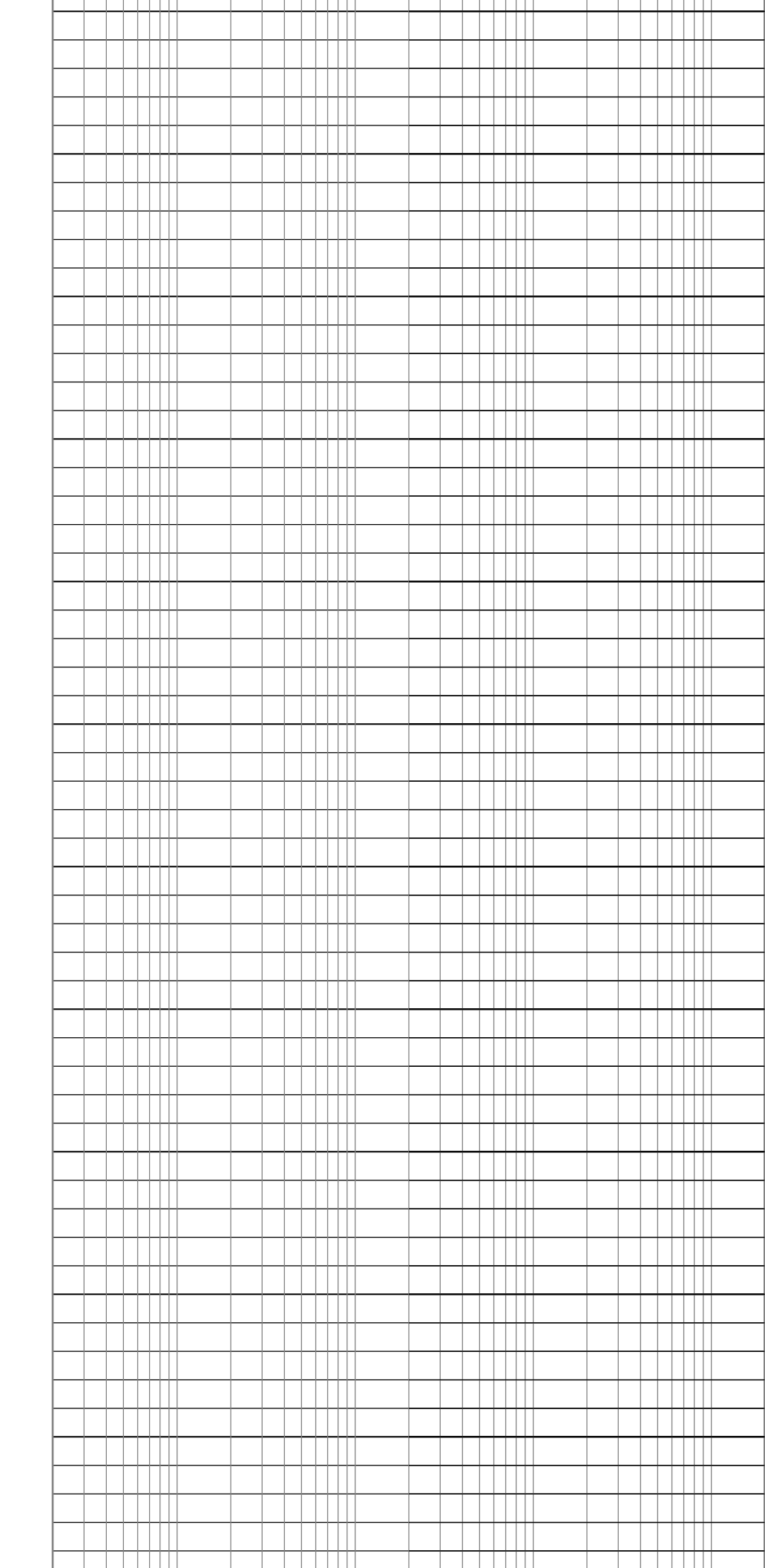
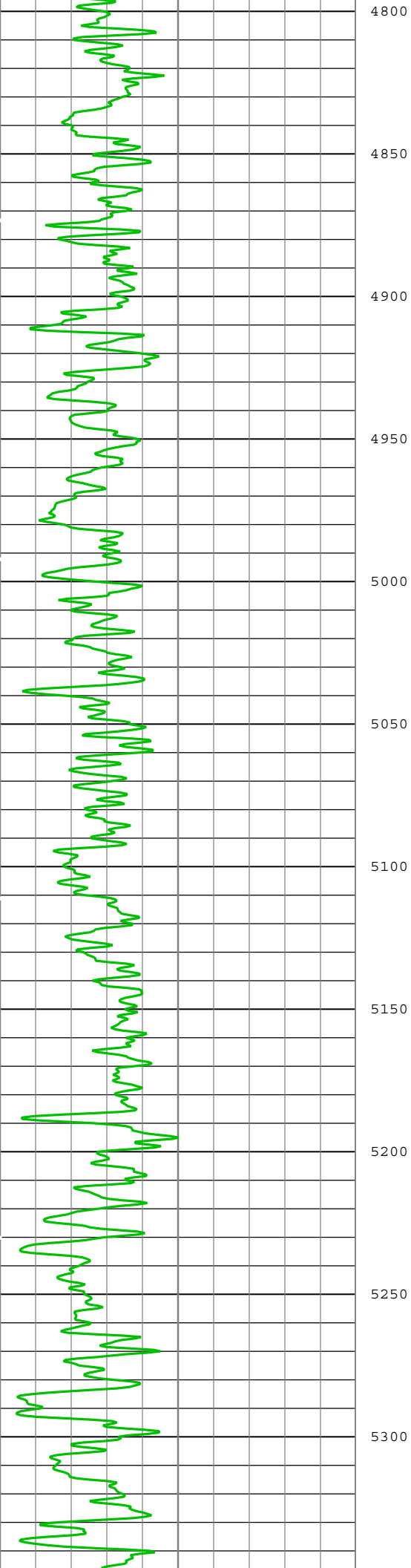
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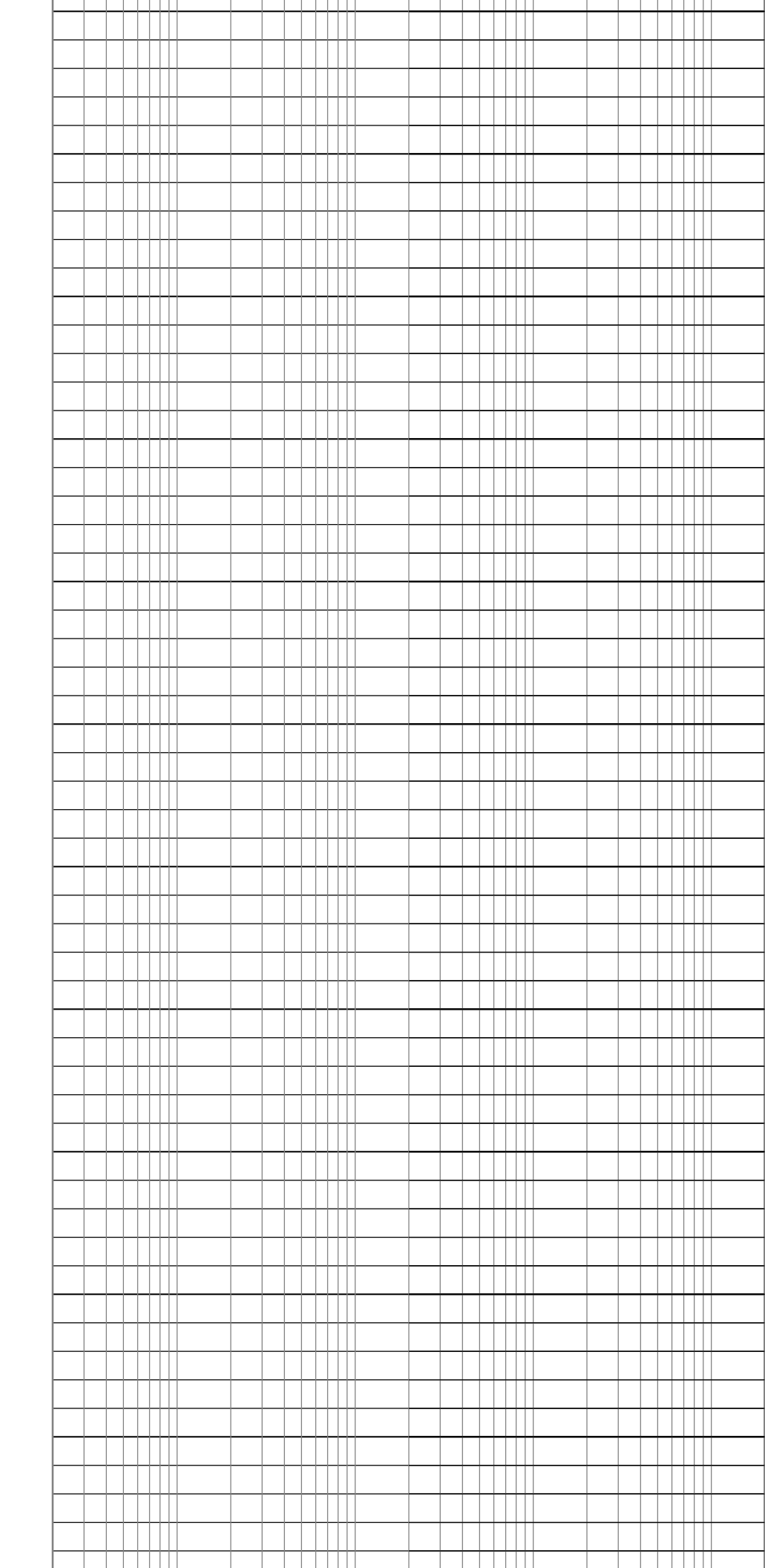
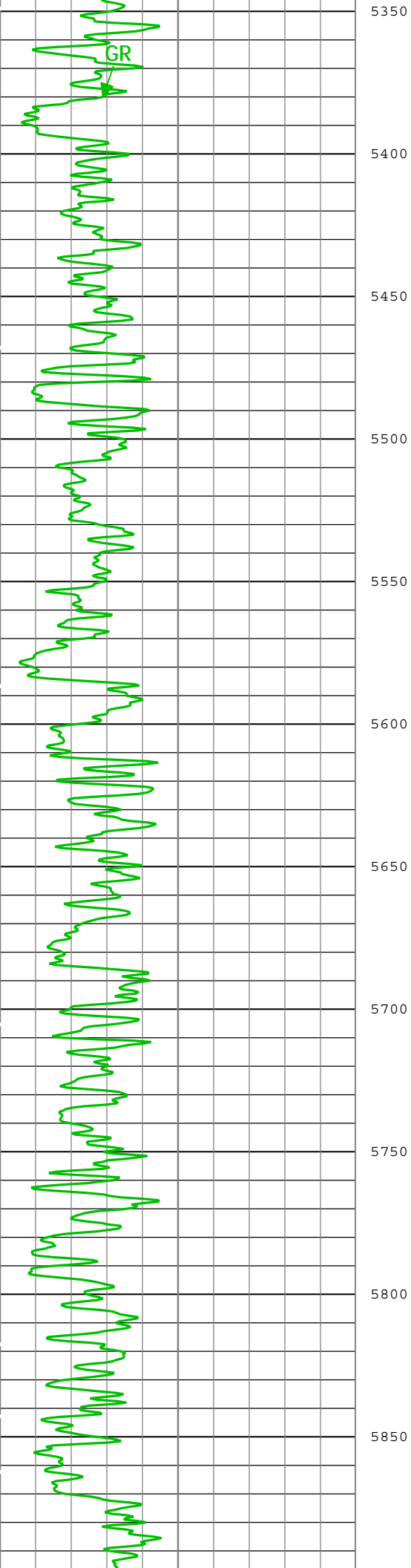


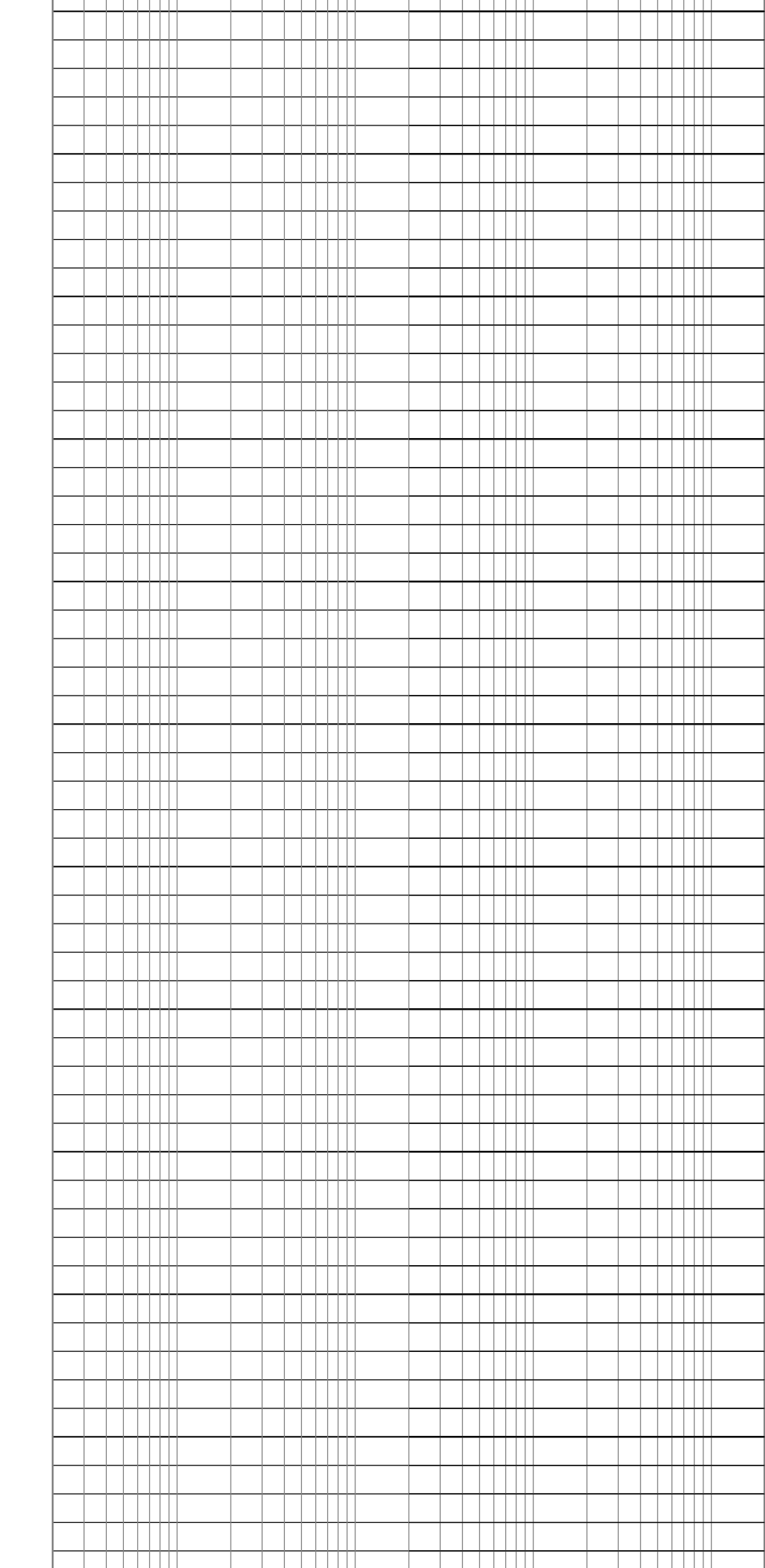
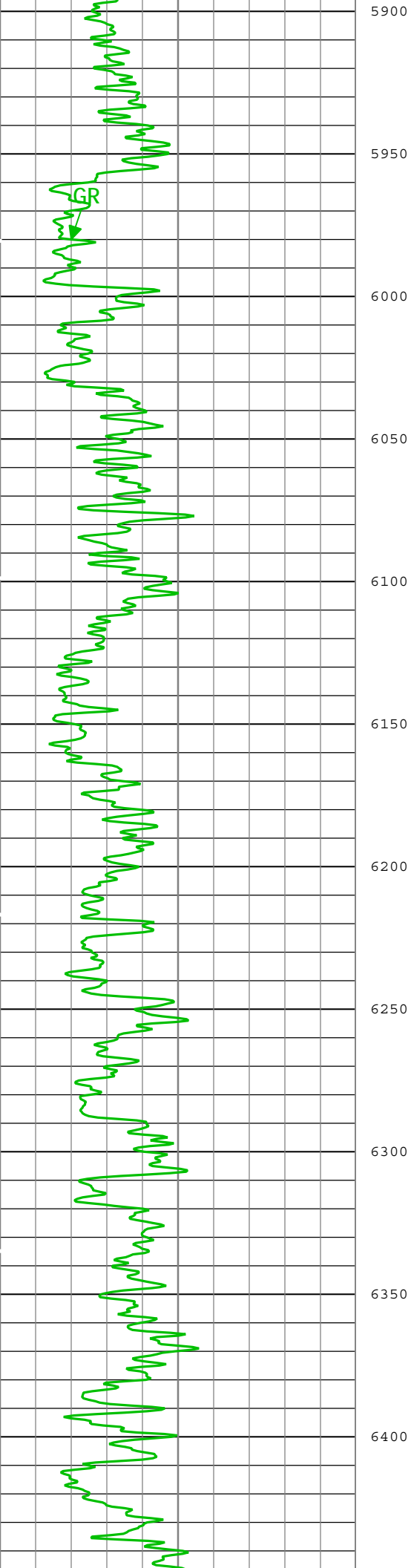


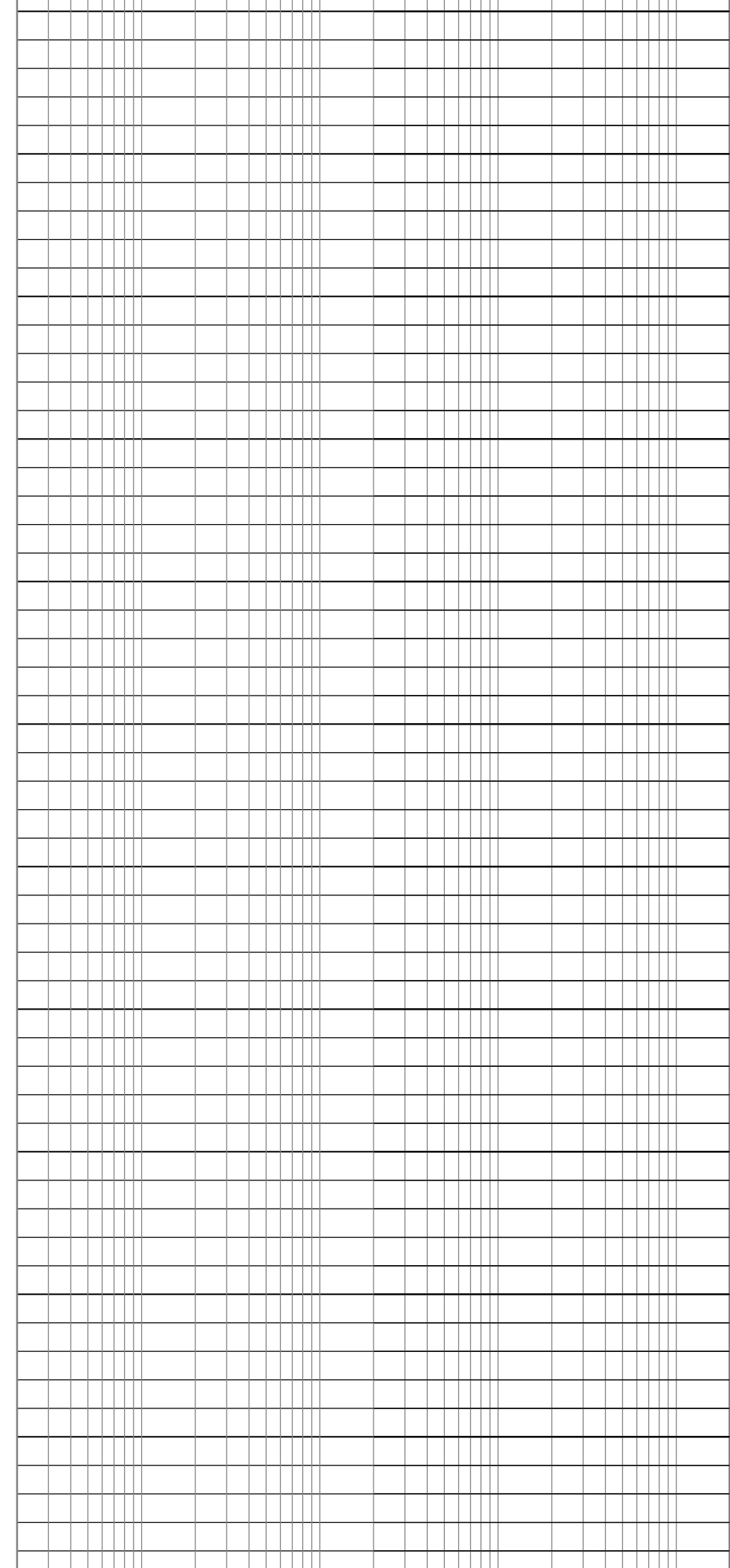
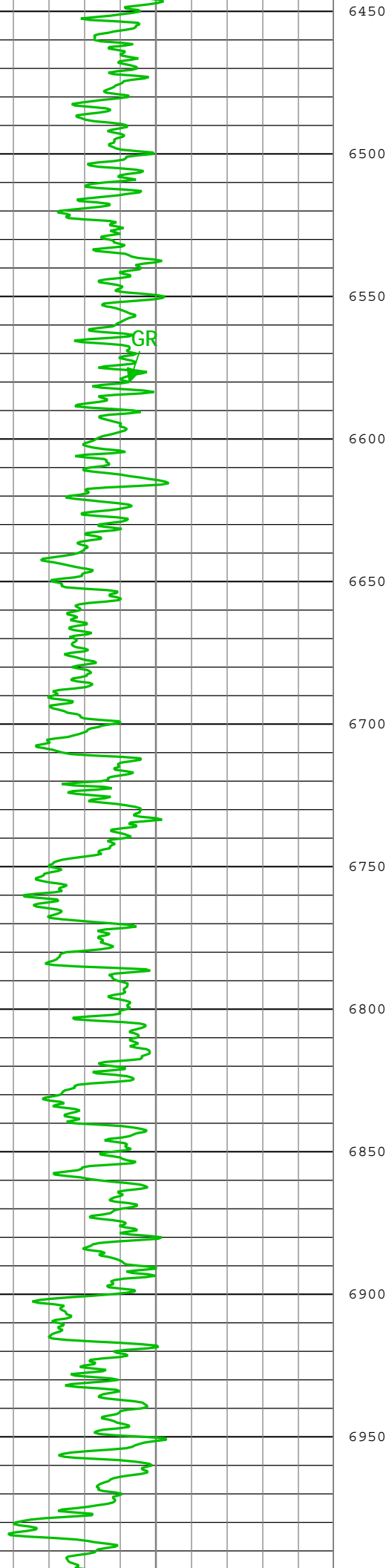
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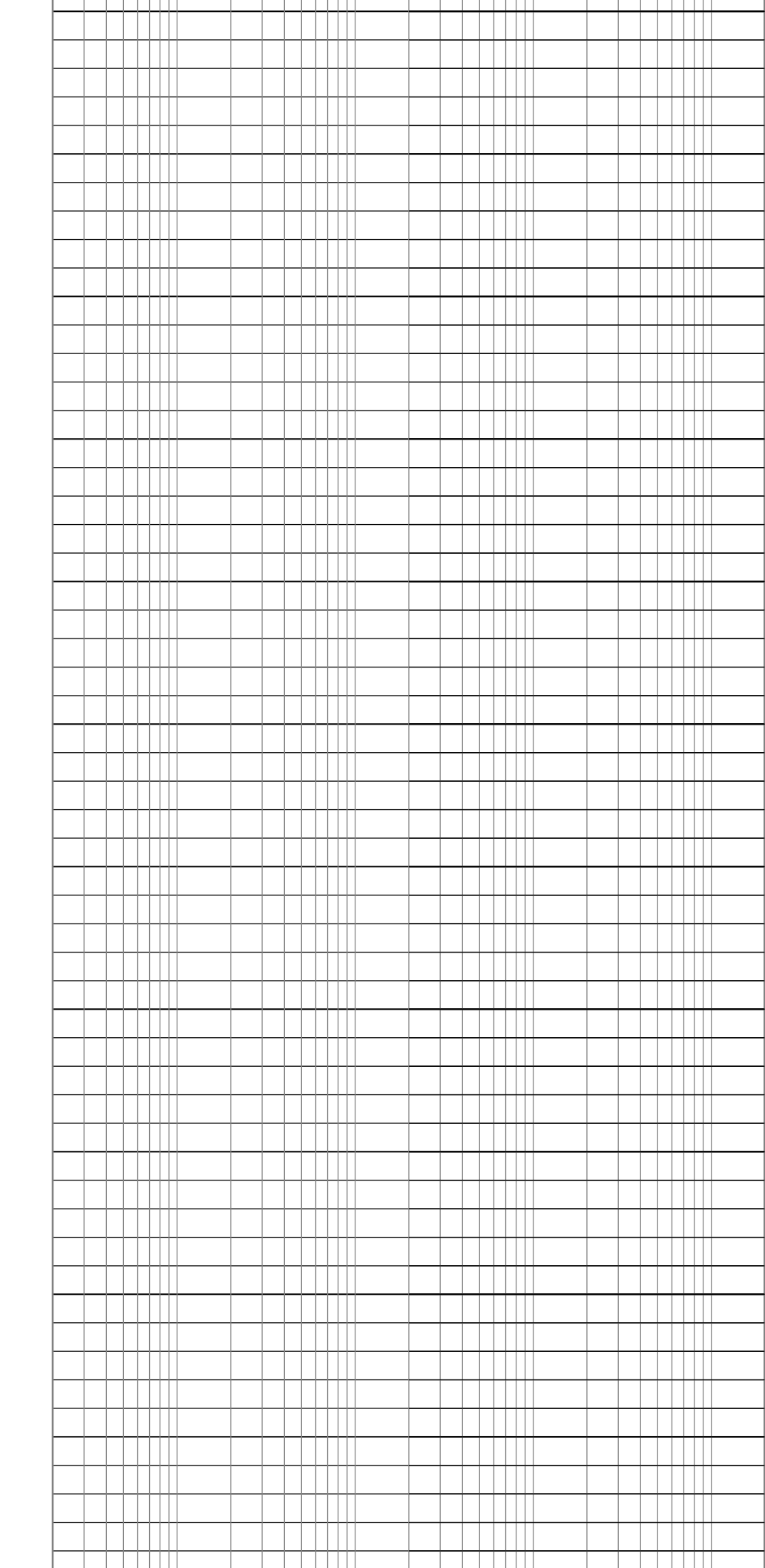
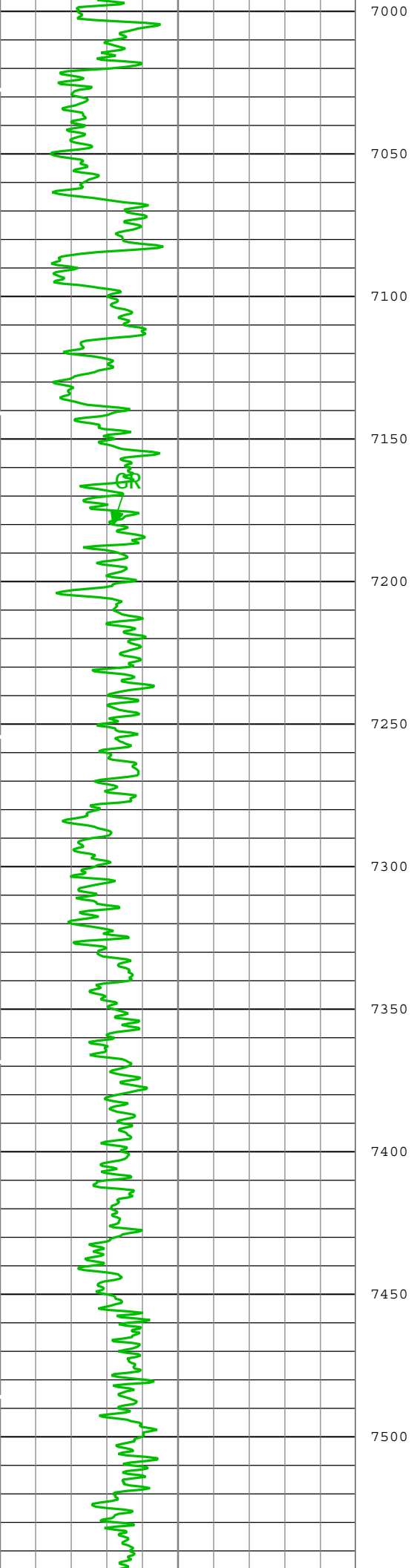


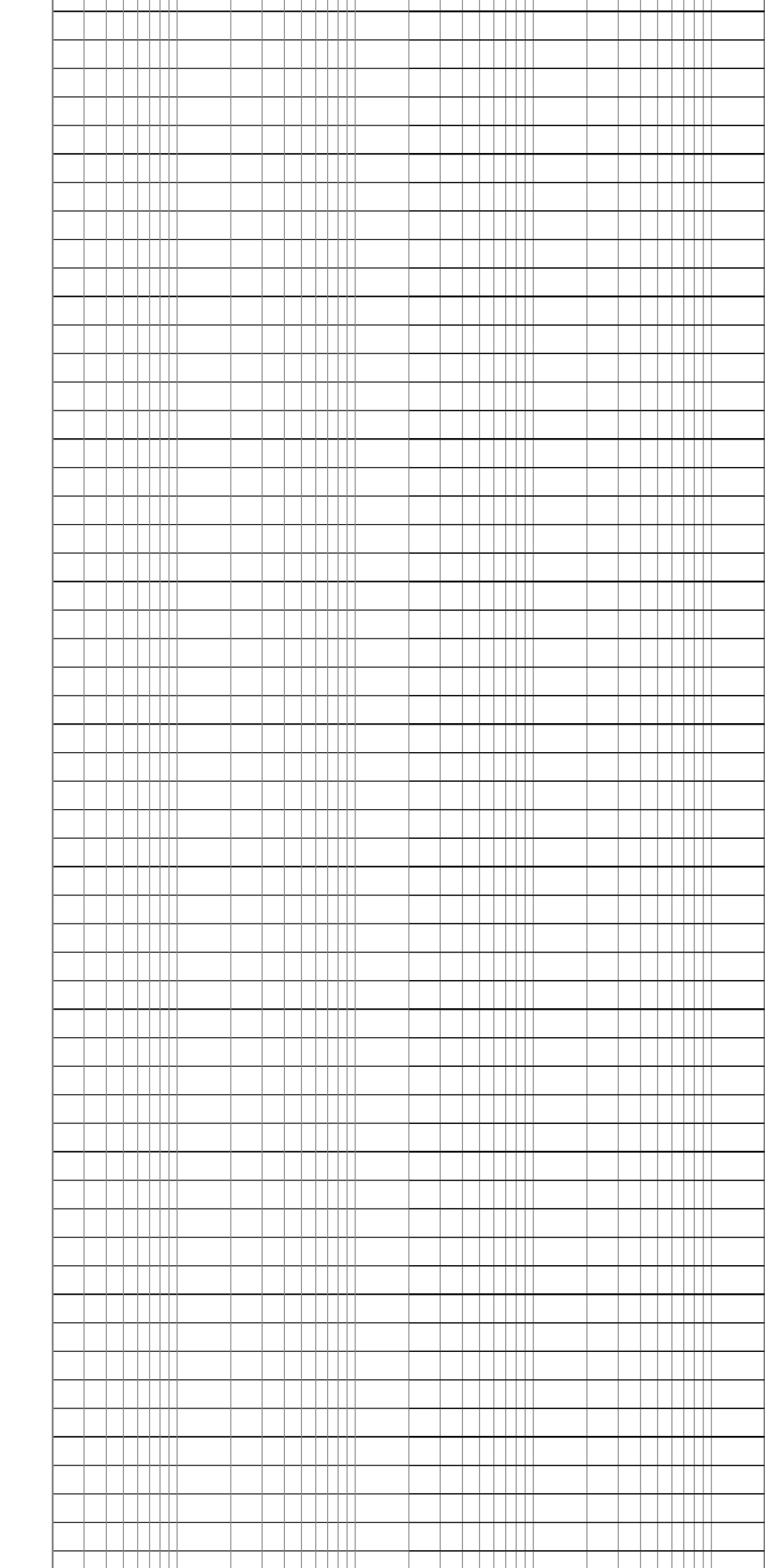
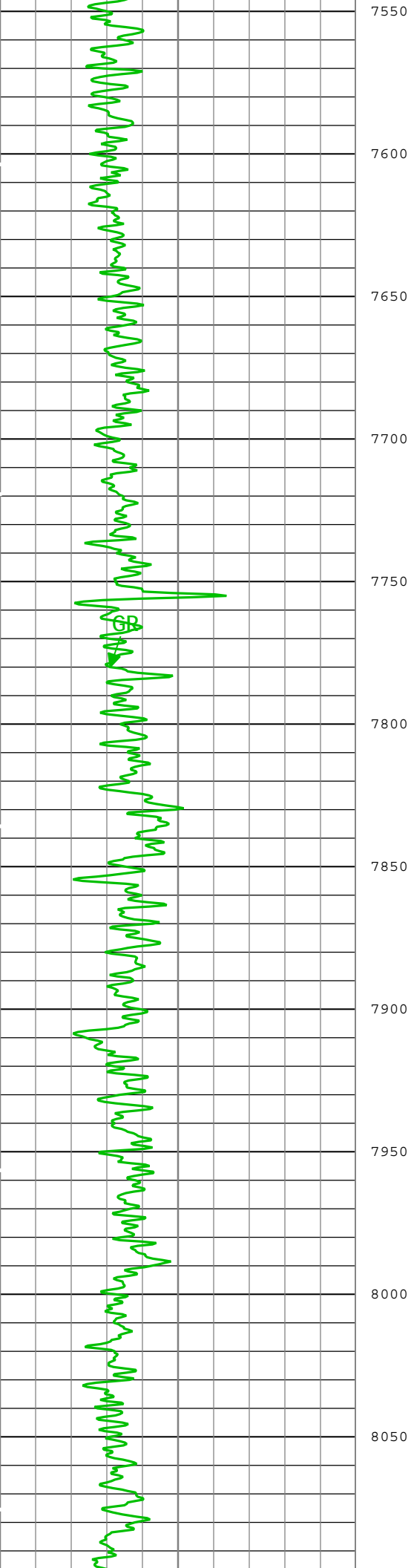


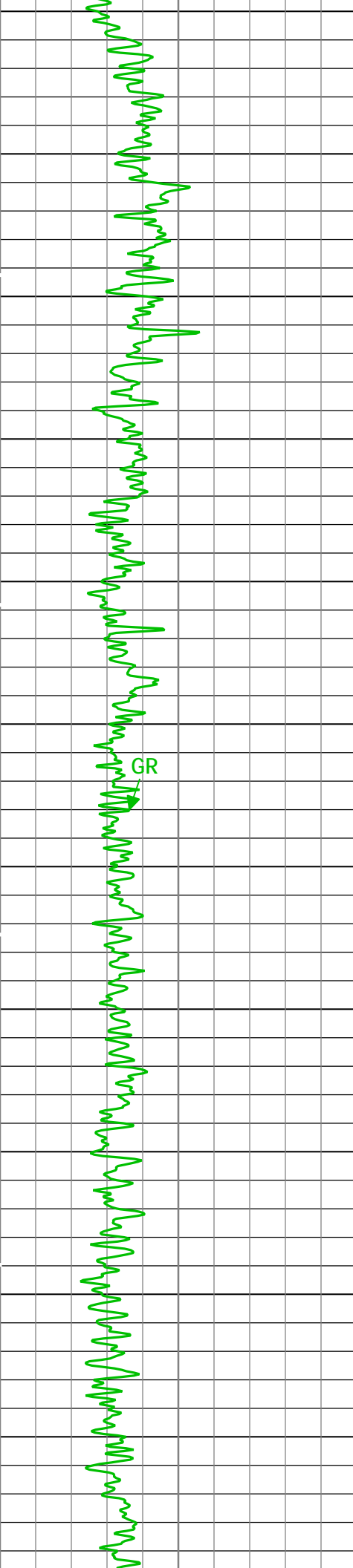




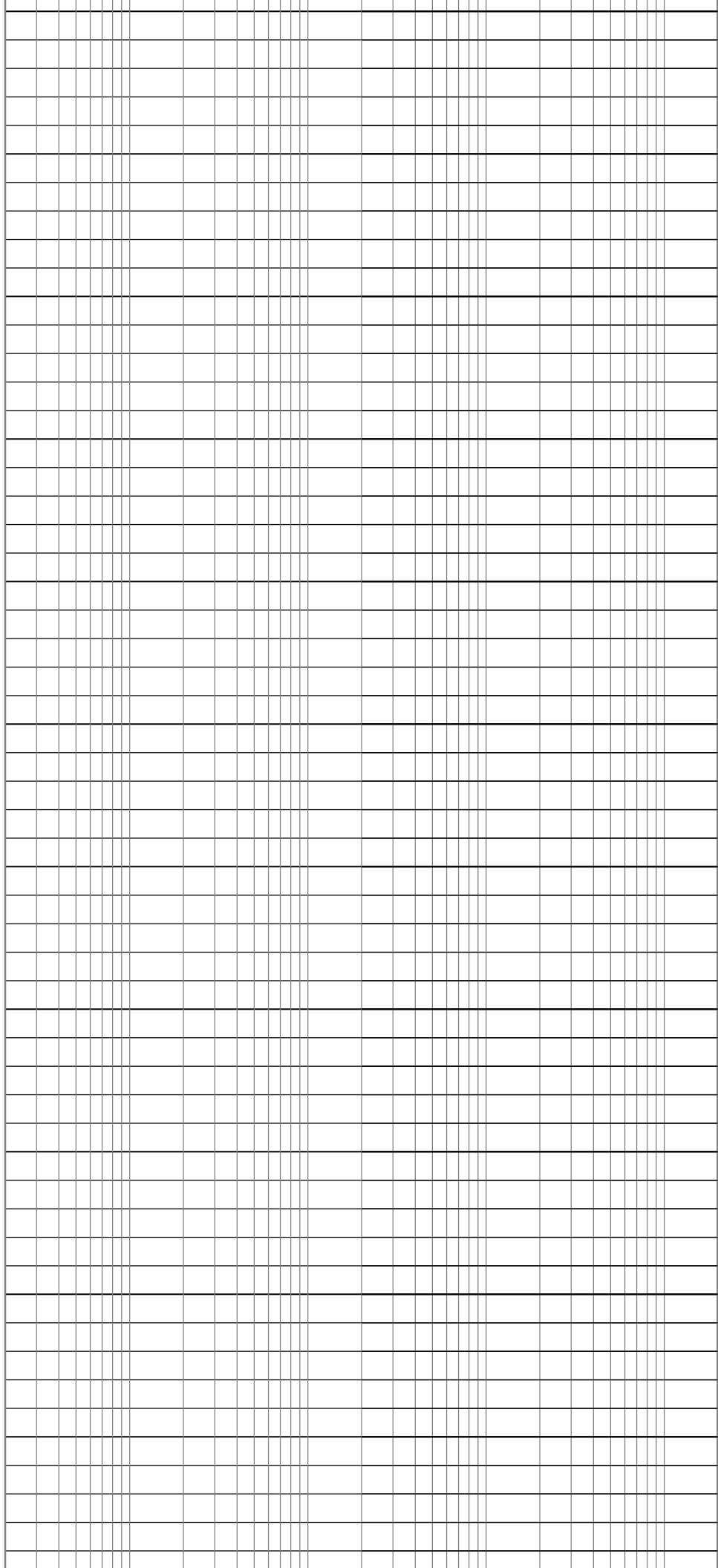


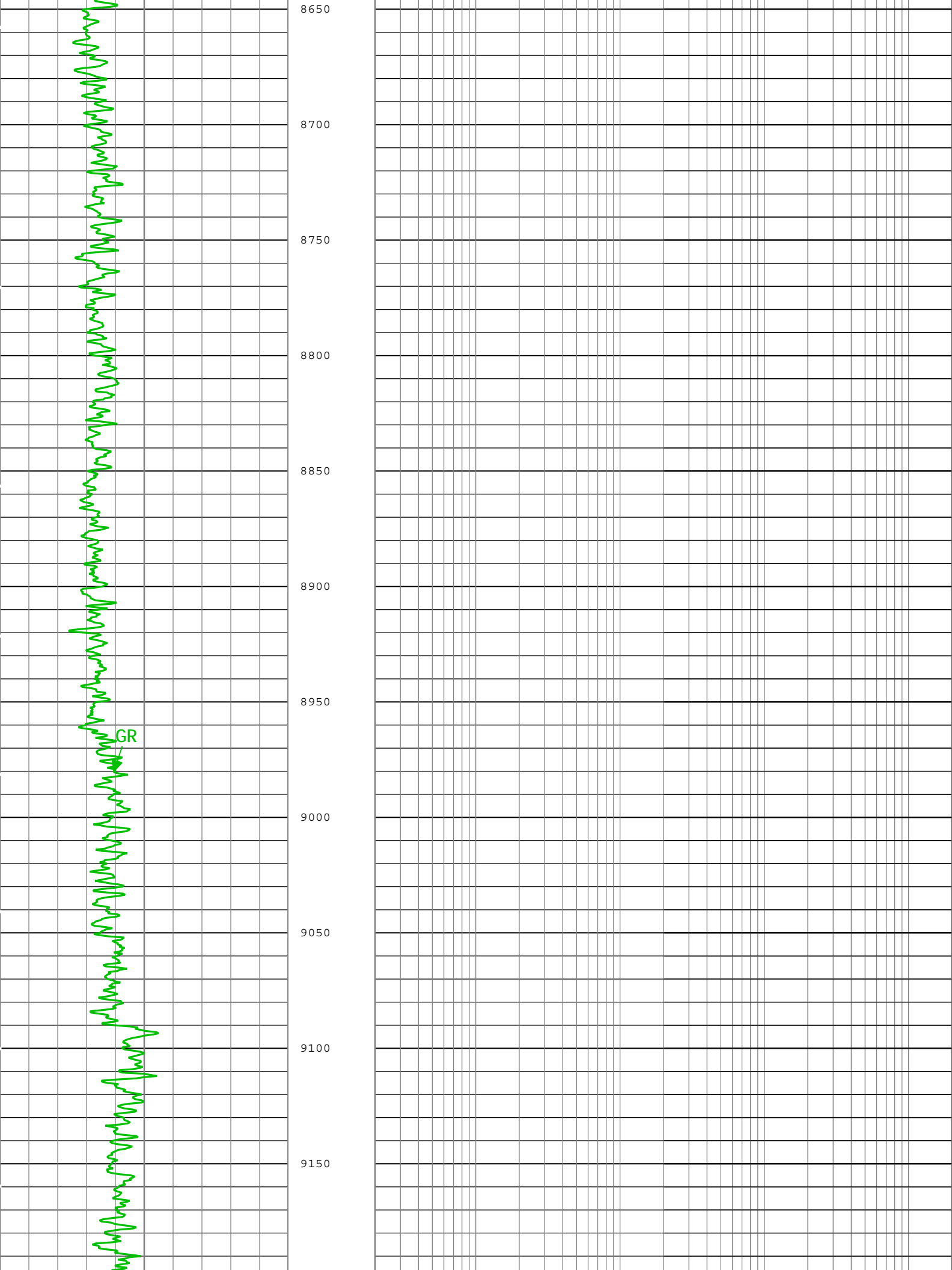


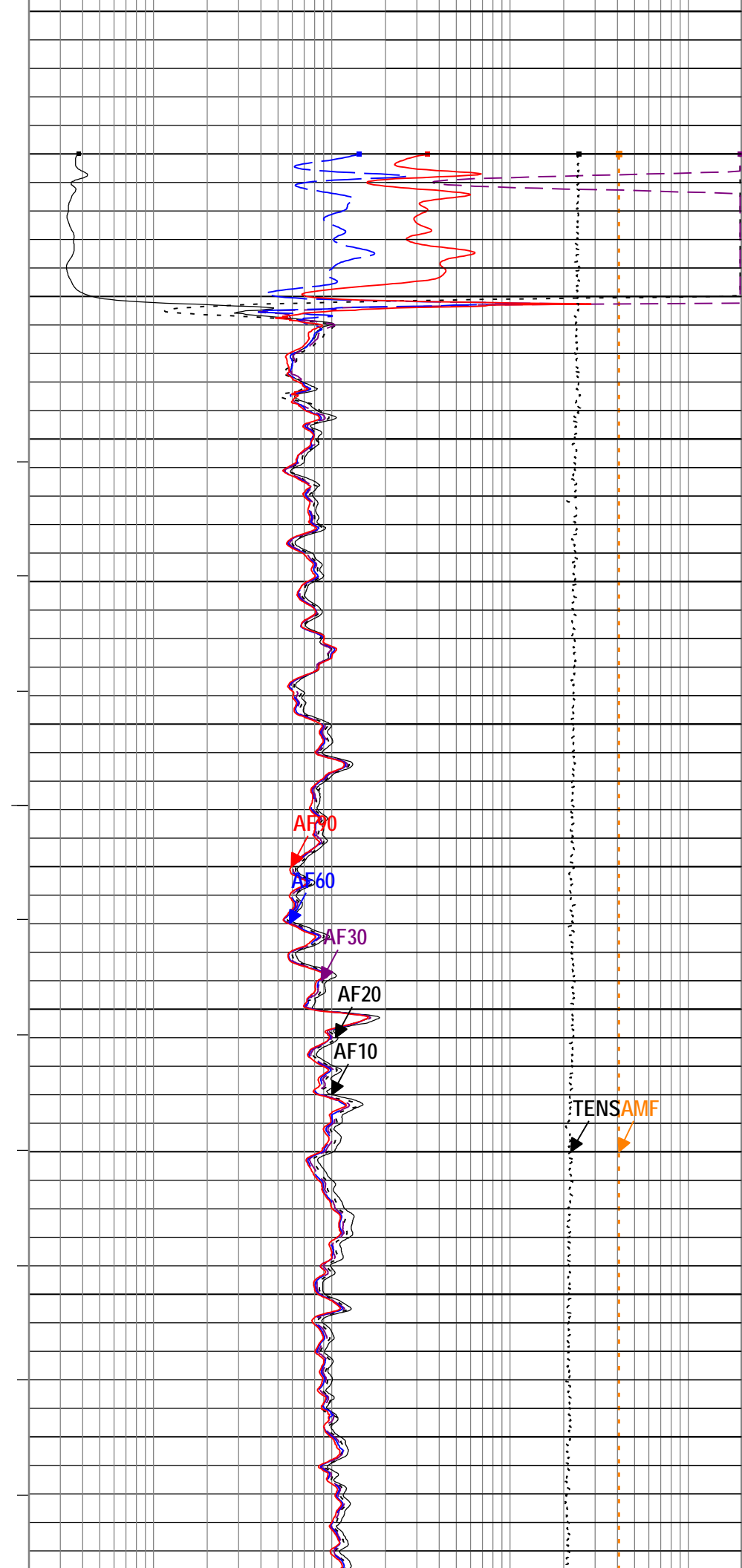
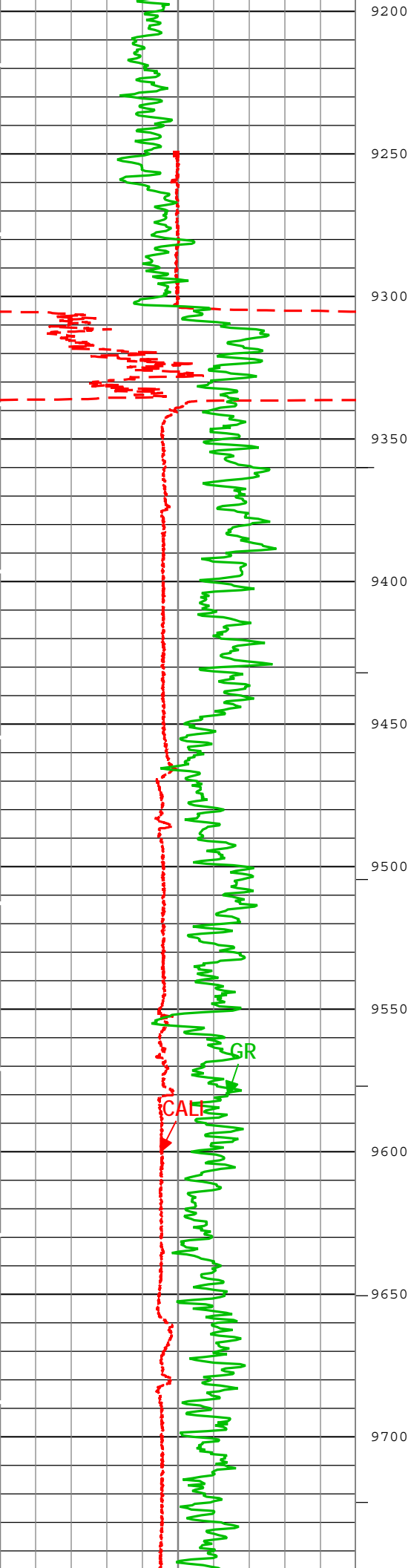


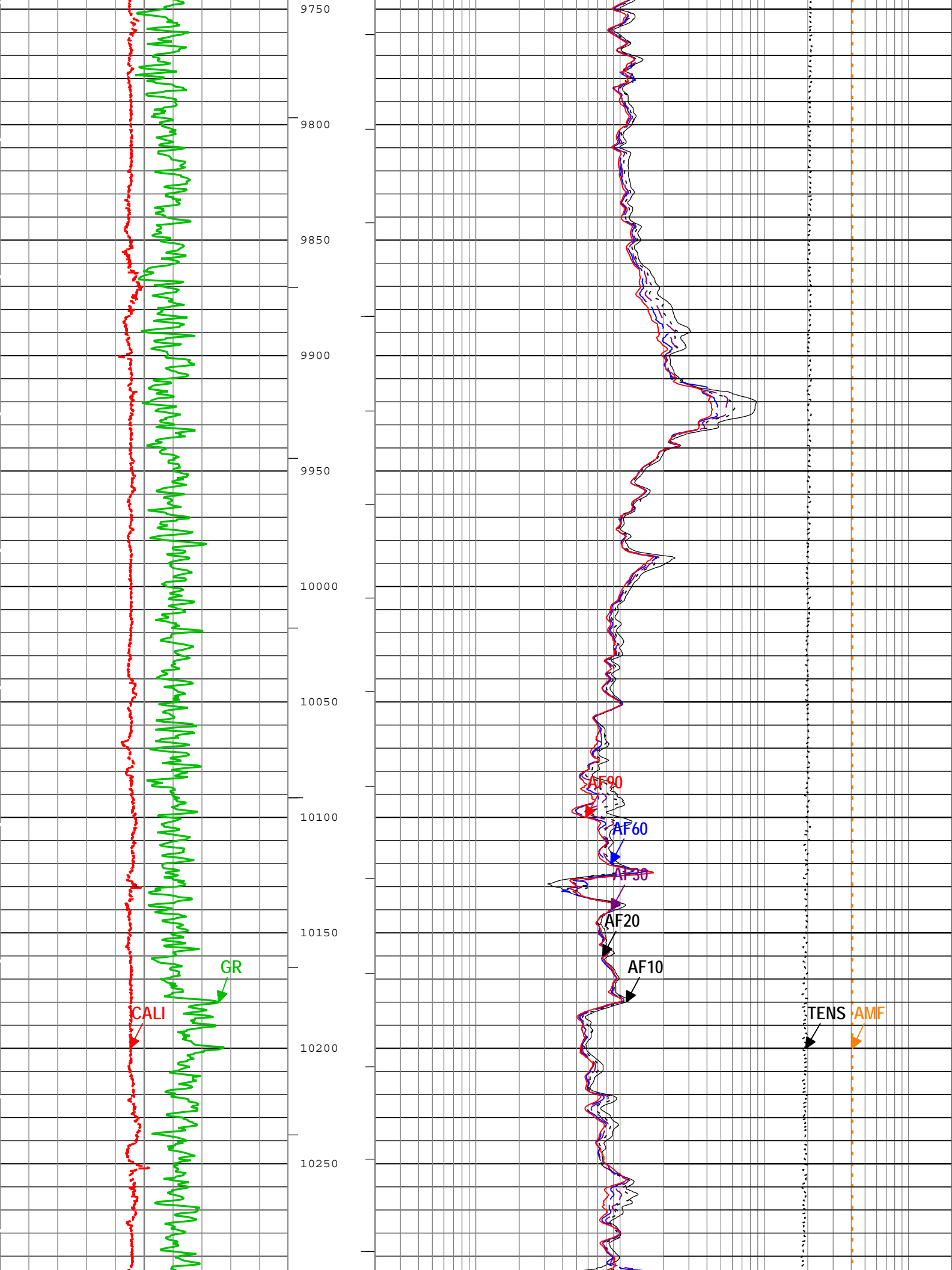


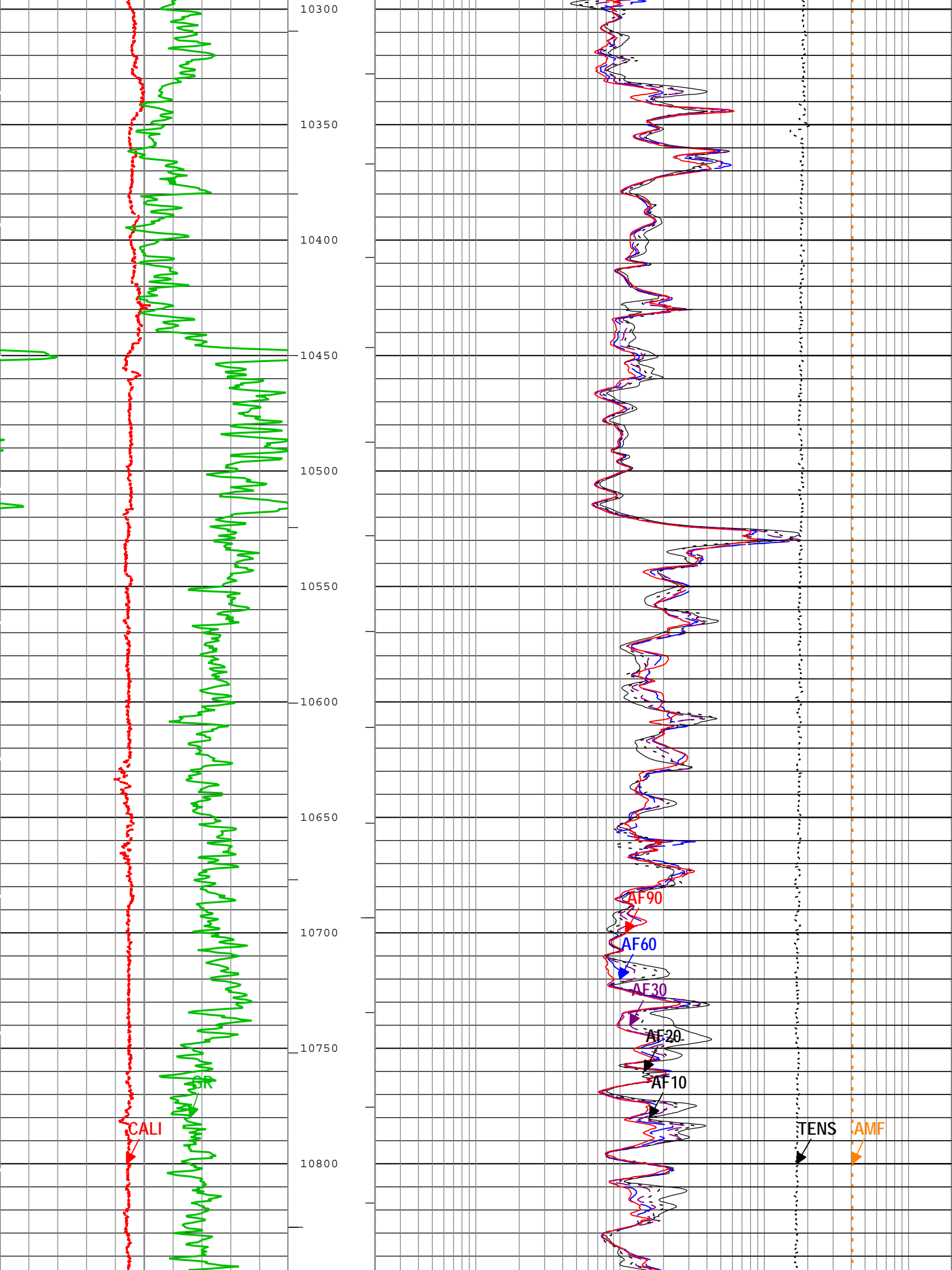
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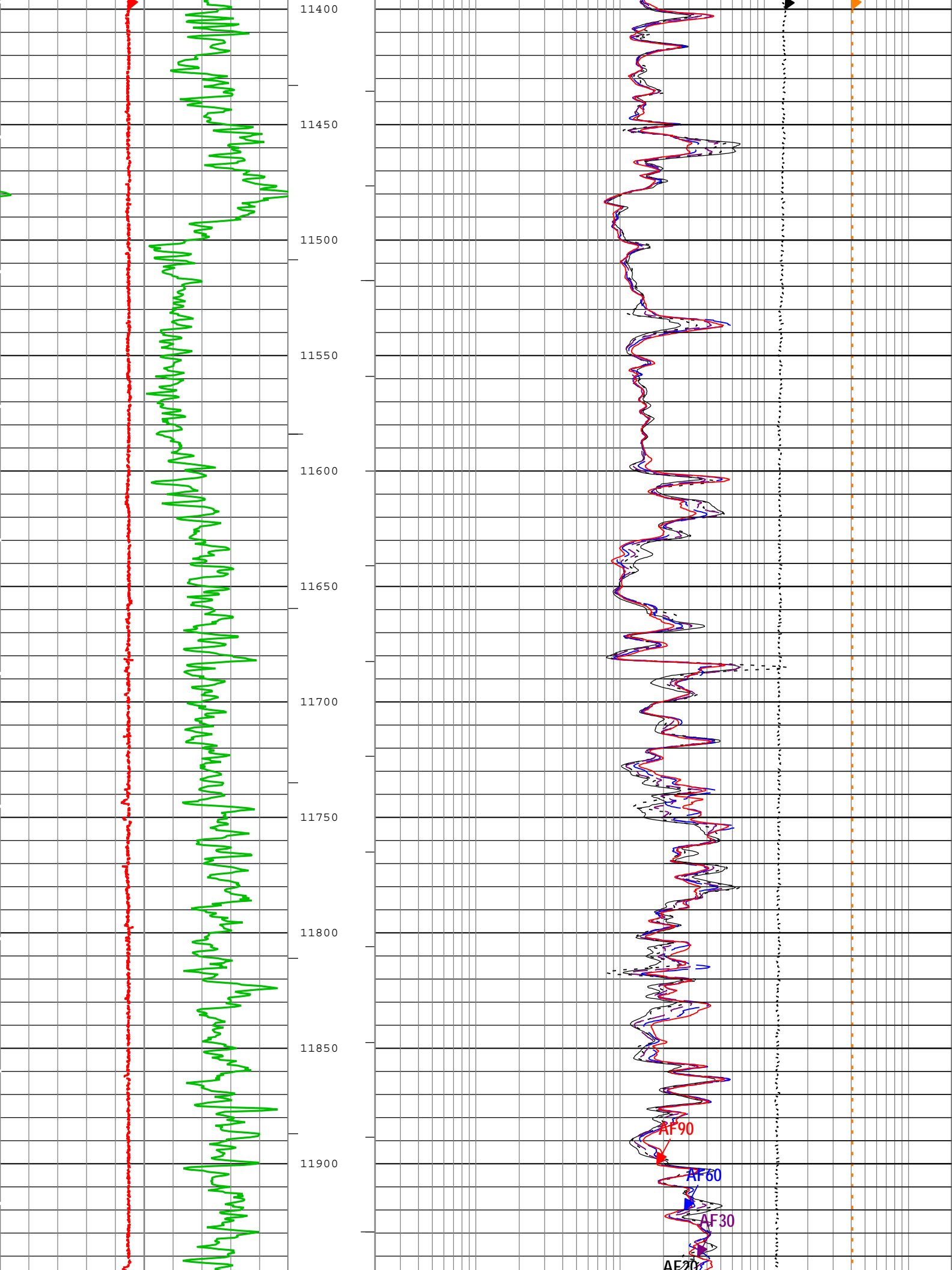


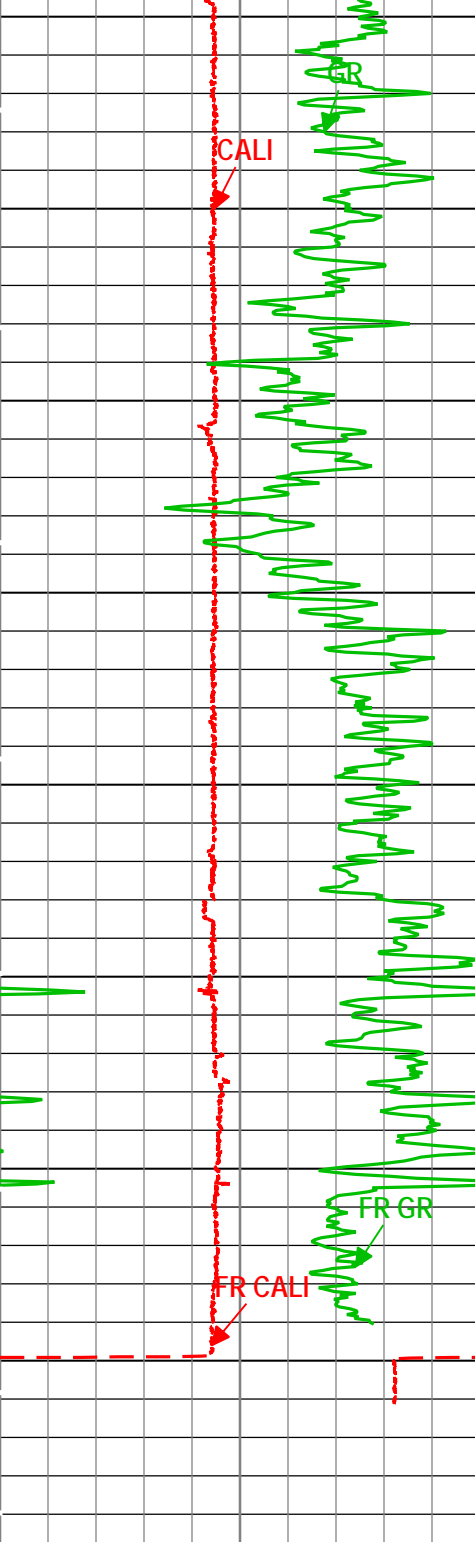




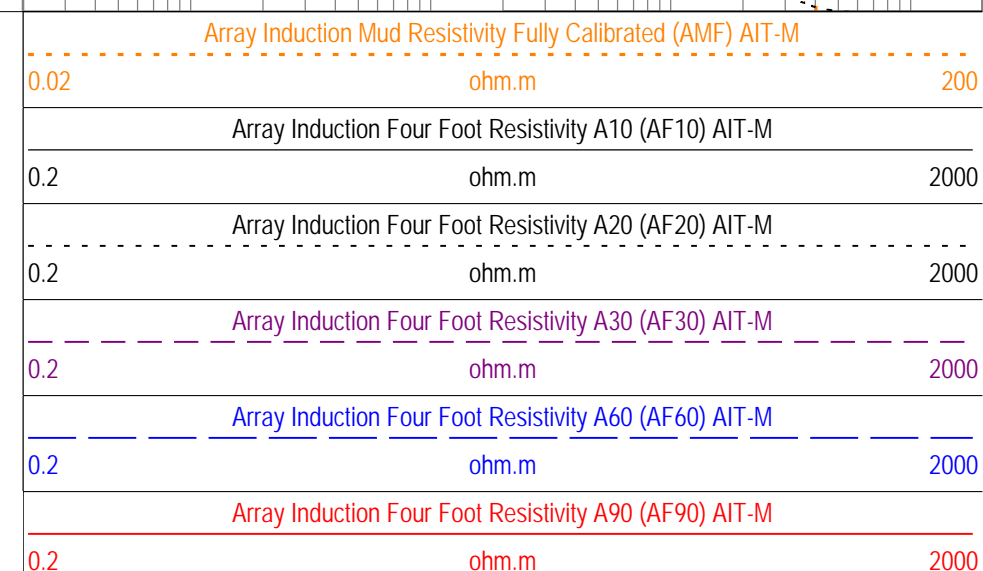
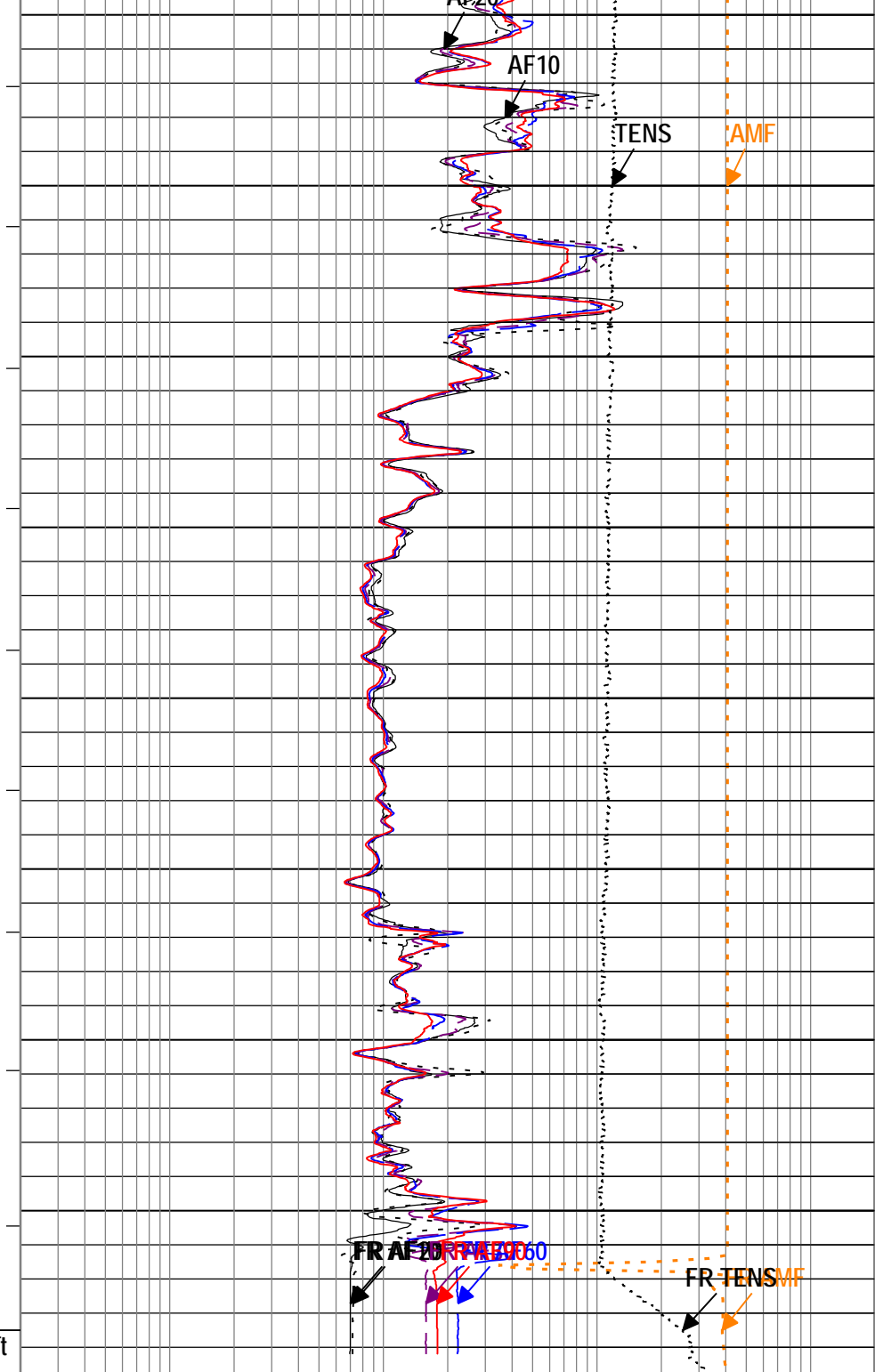
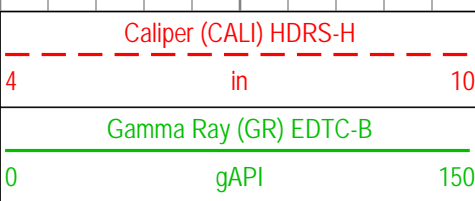








TD  
12335.00ft  
12350



└─ ICV - Integrated Cement Volume every 100.00 (ft3)

└─ ICV - Integrated Cement Volume every 10.00 (ft3)

TIME\_1900 - Time Marked every 60.00 (s)

└─ IHV - Integrated Hole Volume every 100.00 (ft3)

└─ IHV - Integrated Hole Volume every 10.00 (ft3)

Description: AIT Log Format: Log (AIT\_MAIN\_2) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 09-Aug-2012 12:50:59

## Channel Processing Parameters

Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Mud Resistivity	
ABLM	Array Induction Basic Logs Mode	AIT-M	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M	No	
ASTA	Array Induction Tool Standoff	AIT-M	1	in
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	6.75	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	-0.749	in
CBLO	Casing Bottom (Logger)	WLSESSION	9335	ft
CDEN	Cement Density	EDTC-B	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	7.625	in
DFD	Drilling Fluid Density	Borehole	10	lbm/gal
FCD	Future Casing (Outer) Diameter	WLSESSION	4.5	in
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	REMS	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	CTEM	

## Tool Control Parameters

Parameter	Description	Tool	Value	Unit
HMCA_BRD_TYPE	HMCA Board Type	HGNS-H	1	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

1

## Main Pass 5"/100'

## Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	404.41	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	736.65	ft3

## Software Version

Acquisition System	Version	
MaxWell	3.1.9755.0	
Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.1.9755.0
HENVIR	Computation Ensemble for the HGNS Neutron environmental corrections	3.1.9755.0
PEQL	Platform Express Quicklook	3.1.9755.0

Tool Elements	Description	Software Version	Firmware Version
HRCC-H	HILT High-Resolution Control Cartridge, 150 degC	3.1.9755.0	
HRGD-H	HILT Resistivity Gamma-Ray Density Device, 150 degC	3.1.9755.0	
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	
AMIS	Array Induction Sonde - M	3.1.9755.0	
EDTC-B	Enhanced Digital Telemetry Cartridge - B	3.1.9755.0	

## Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
1	Log[3]:Up	Up	37.65 ft	12350.07 ft	05-Aug-2012 4:47:29 AM	05-Aug-2012 7:06:38 AM	-9.00 ft	false

All depths are referenced to toolstring zero

## Log

1: Log[3]:Up

Description: AIT Basic Log Two Format: Log ( TCOM\_AIT\_MAIN\_5 ) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 09-Aug-2012 12:51:10

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
BS	Borehole	6in
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	EDTC-B:EDTC-B:EDTC-B	6in
ICV	Borehole	6in
IHV	Borehole	6in
NPOR	HGNS-H:HGNS-H:HGNS-H	6in
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in
PXND	PEQL	6in
RHOZ	HDRS-H:HRMS-H:HRGD-H	2in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

- |IHV - Integrated Hole Volume every 10.00 (ft3)
- |IHV - Integrated Hole Volume every 100.00 (ft3)
- |—ICV - Integrated Cement Volume every 10.00 (ft3)
- |—ICV - Integrated Cement Volume every 100.00 (ft3)

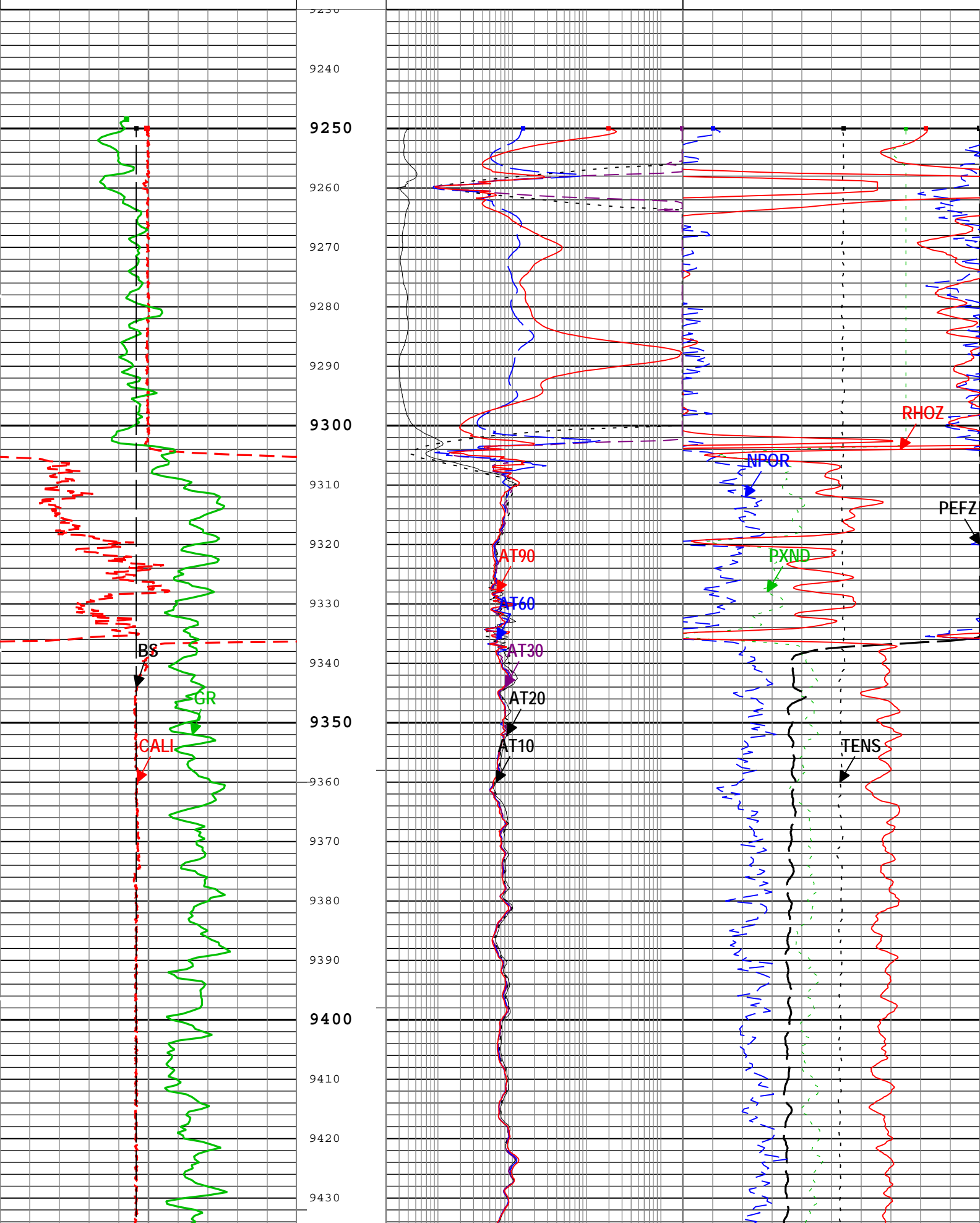
TIME\_1900 - Time Marked every 60.00 (s)

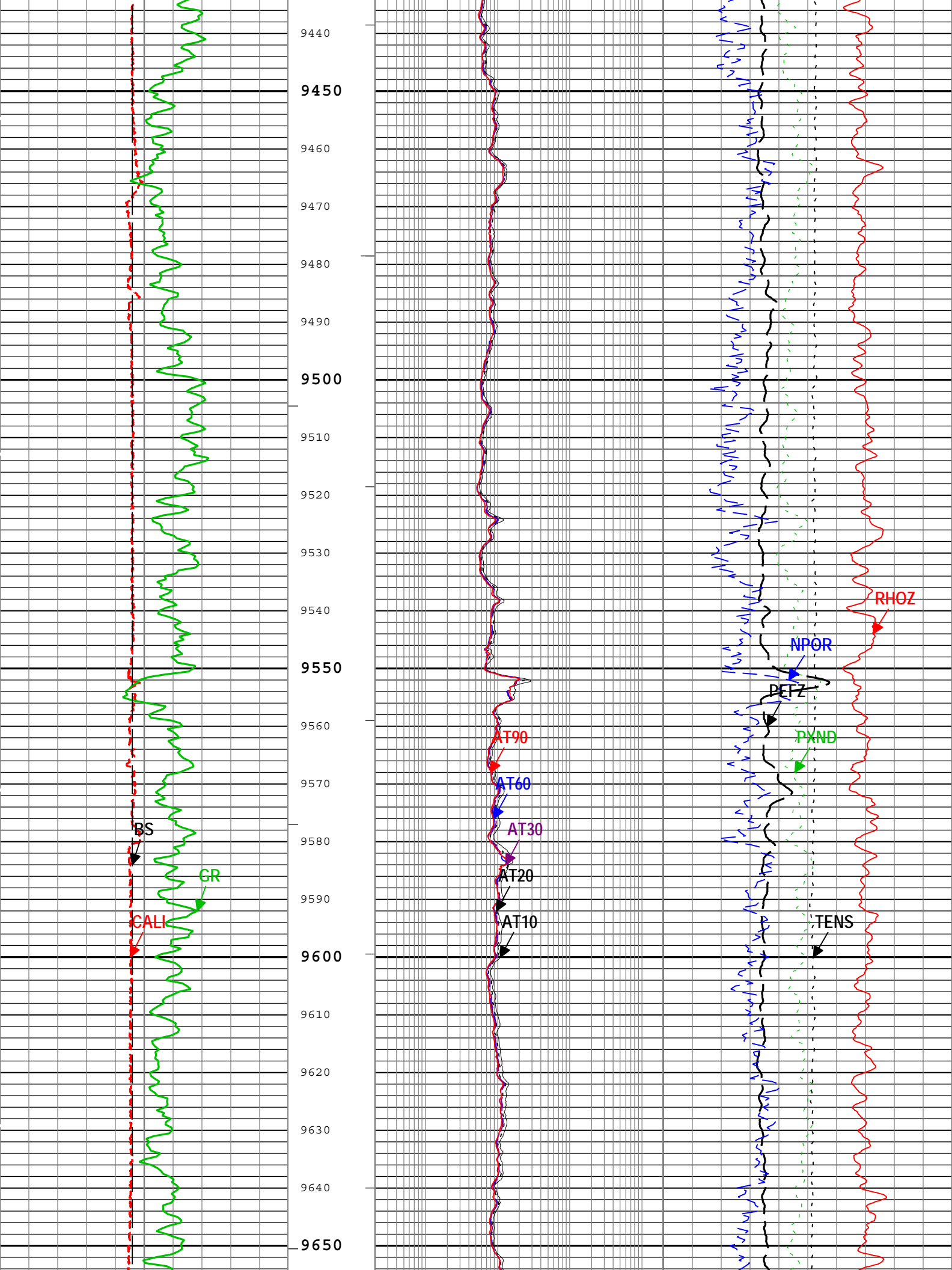
<p style="text-align: center;">Array Induction Two Foot Resistivity A10 (AT10) AIT-M</p> <p>0.2 ohm.m 2000</p>		<p style="text-align: center;">Cable Tension (TENS)</p> <p>10000 lbf 0</p>	
<p style="text-align: center;">Array Induction Two Foot Resistivity A20 (AT20) AIT-M</p> <p>0.2 ohm.m 2000</p>		<p style="text-align: center;">Crossplot Porosity for Neutron-Density (PXND)</p> <p>0.3 ft3/ft3 -0.1</p>	
<p style="text-align: center;">Array Induction Two Foot Resistivity A30 (AT30) AIT-M</p> <p>0.2 ohm.m 2000</p>		<p style="text-align: center;">Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H</p> <p>0 10</p>	
<p style="text-align: center;">Caliper (CALI) HDRS-H</p> <p>4 in 10</p>		<p style="text-align: center;">Array Induction Two Foot Resistivity A60 (AT60) AIT-M</p> <p>0.2 ohm.m 2000</p>	
<p style="text-align: center;">Gamma Ray (GR) EDTC-B</p>		<p style="text-align: center;">Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H</p> <p>0.3 ft3/ft3 -0.1</p>	

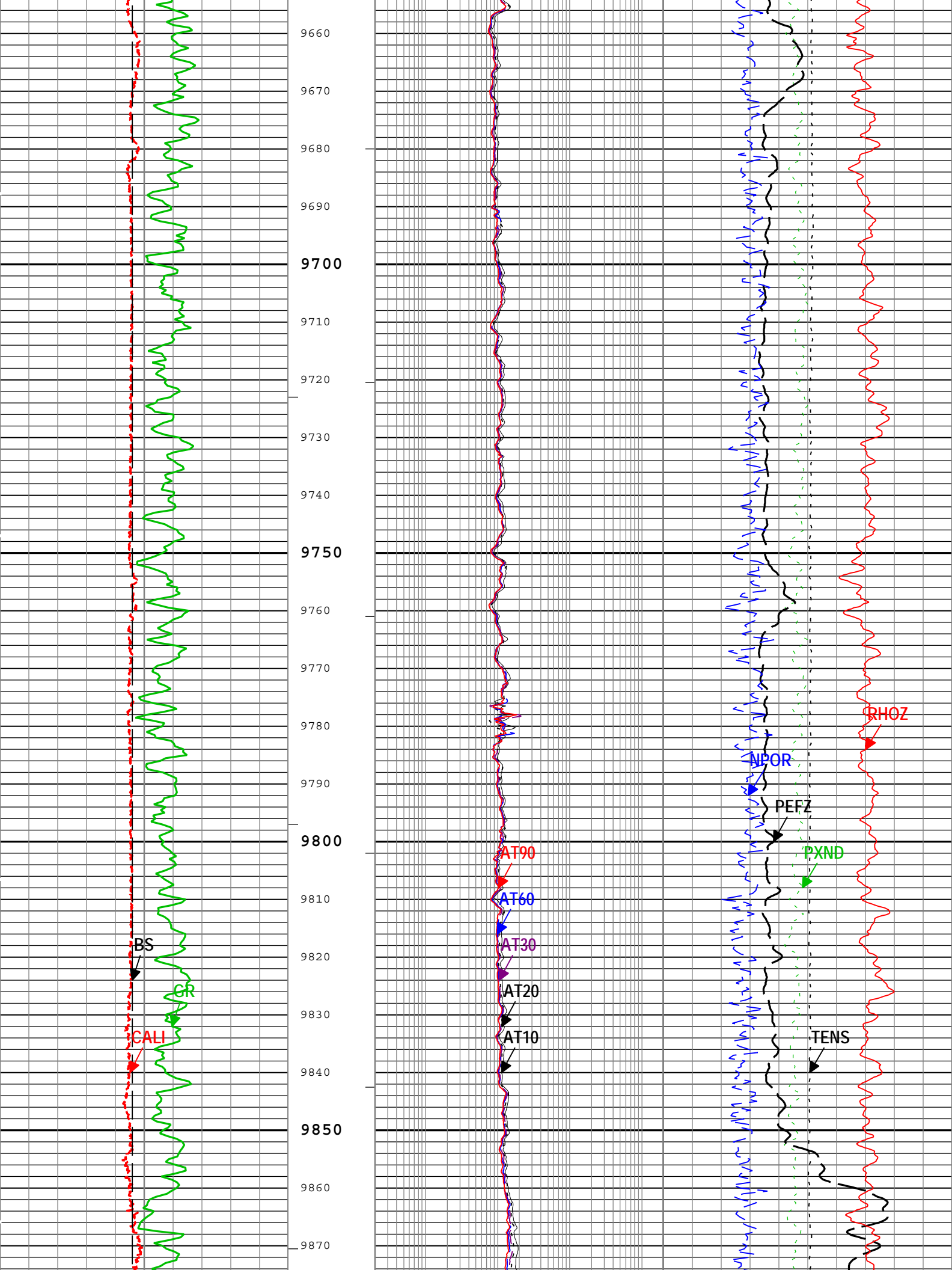
0 gAPI 150  
 Bit Size (BS) in 10

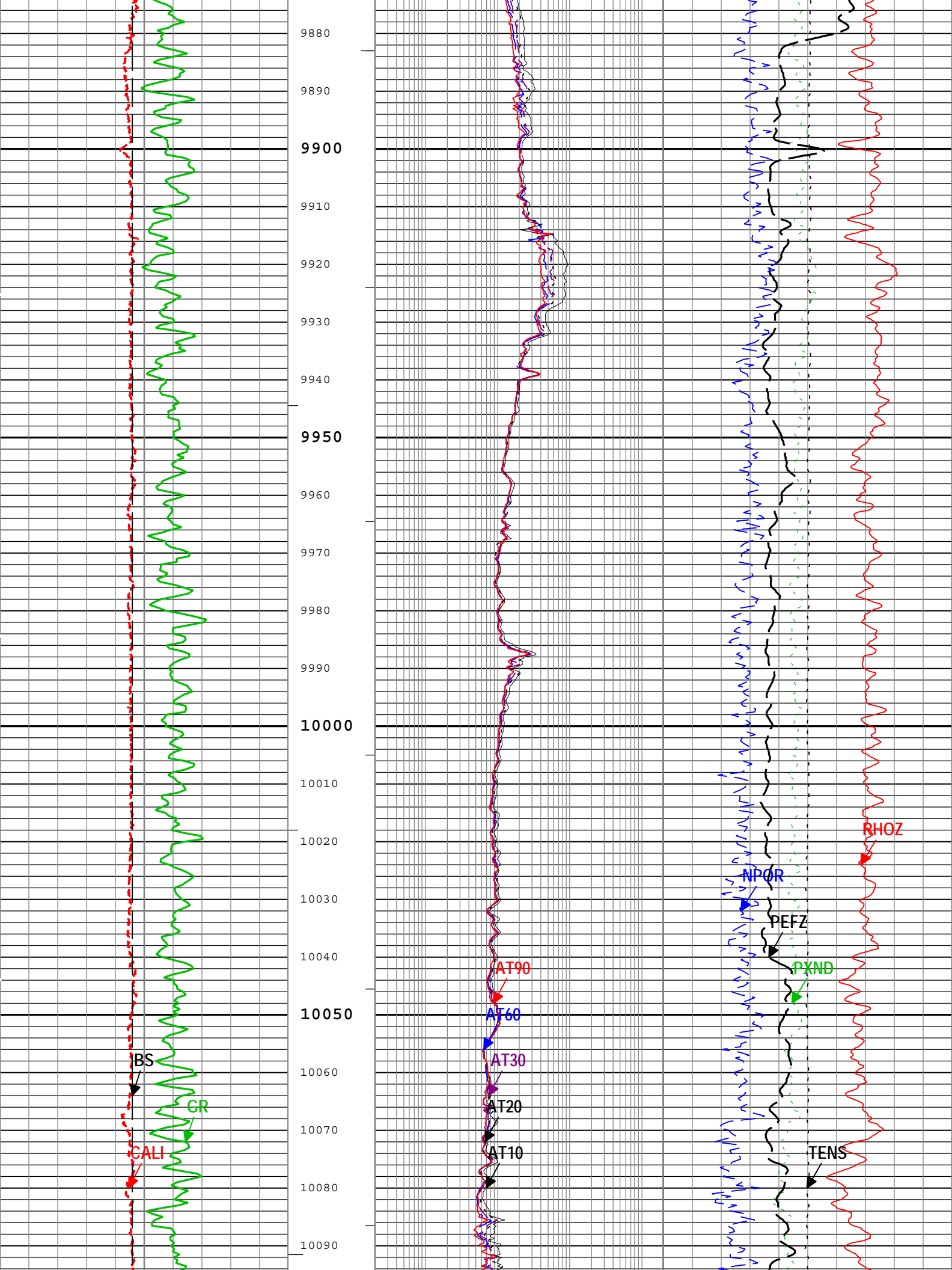
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 (AT90) AIT-M  
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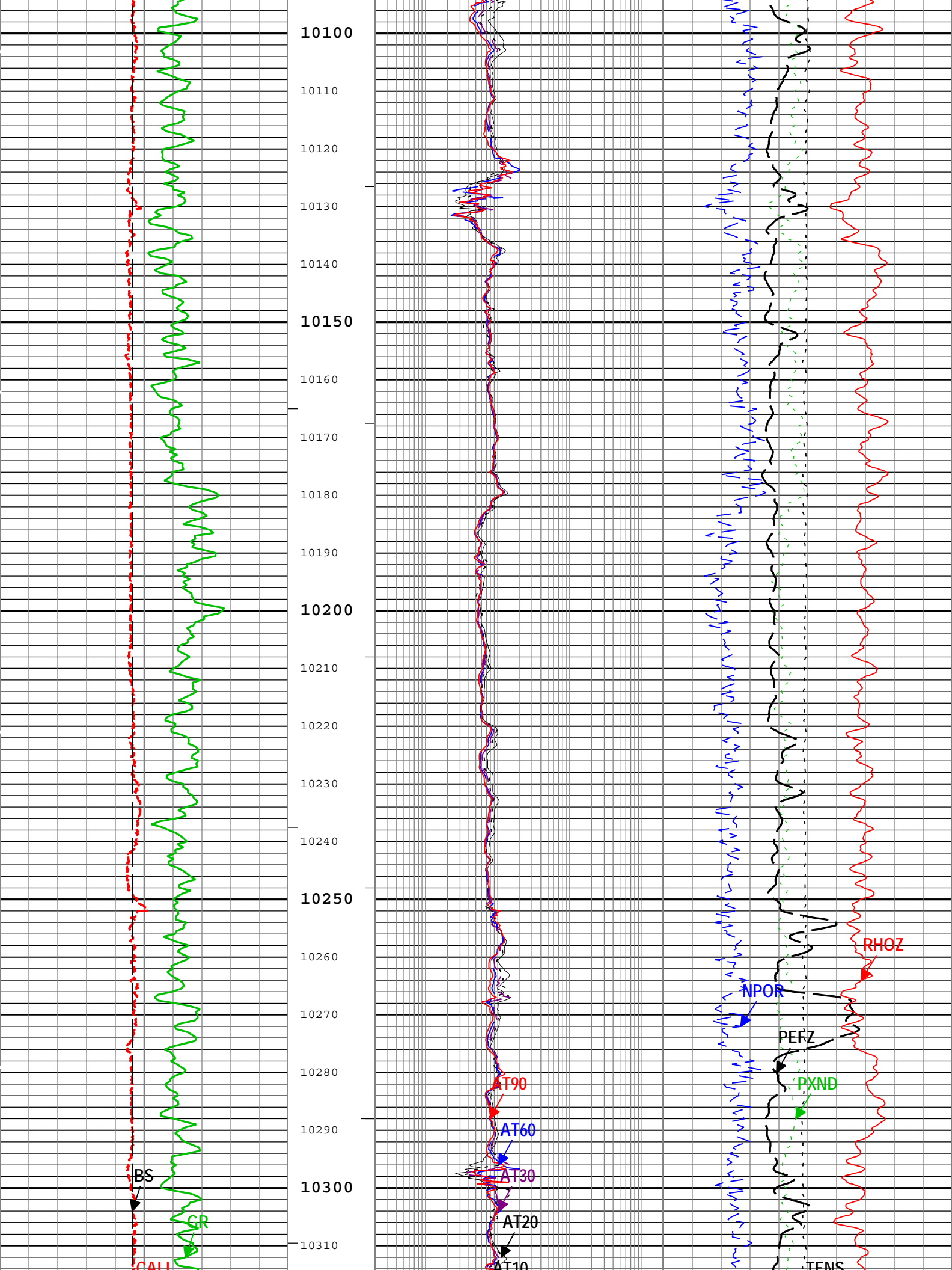
Standard Resolution Formation Density (RHOZ)  
 HDRS-H  
 2.18 g/cm3 2.85

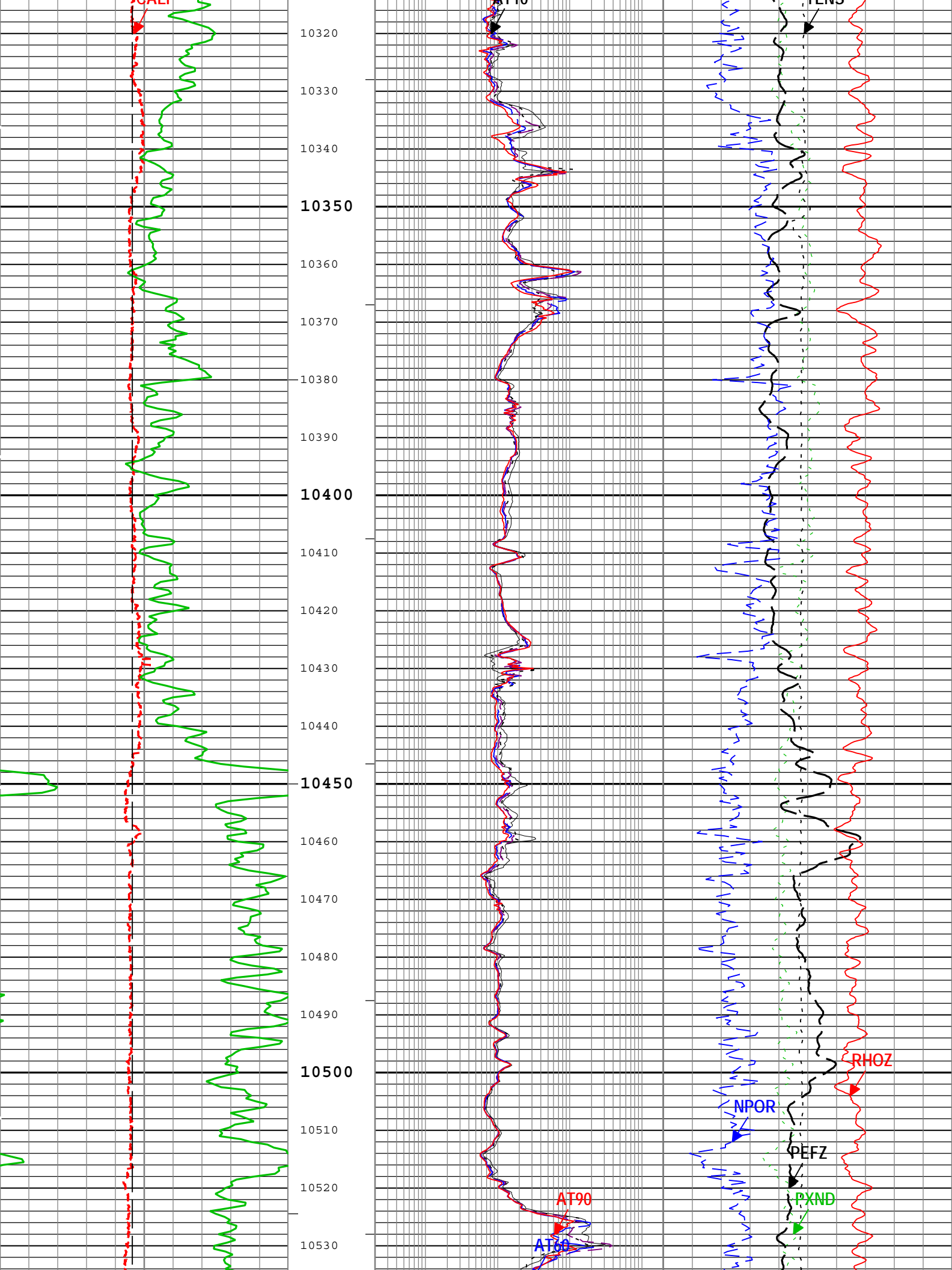


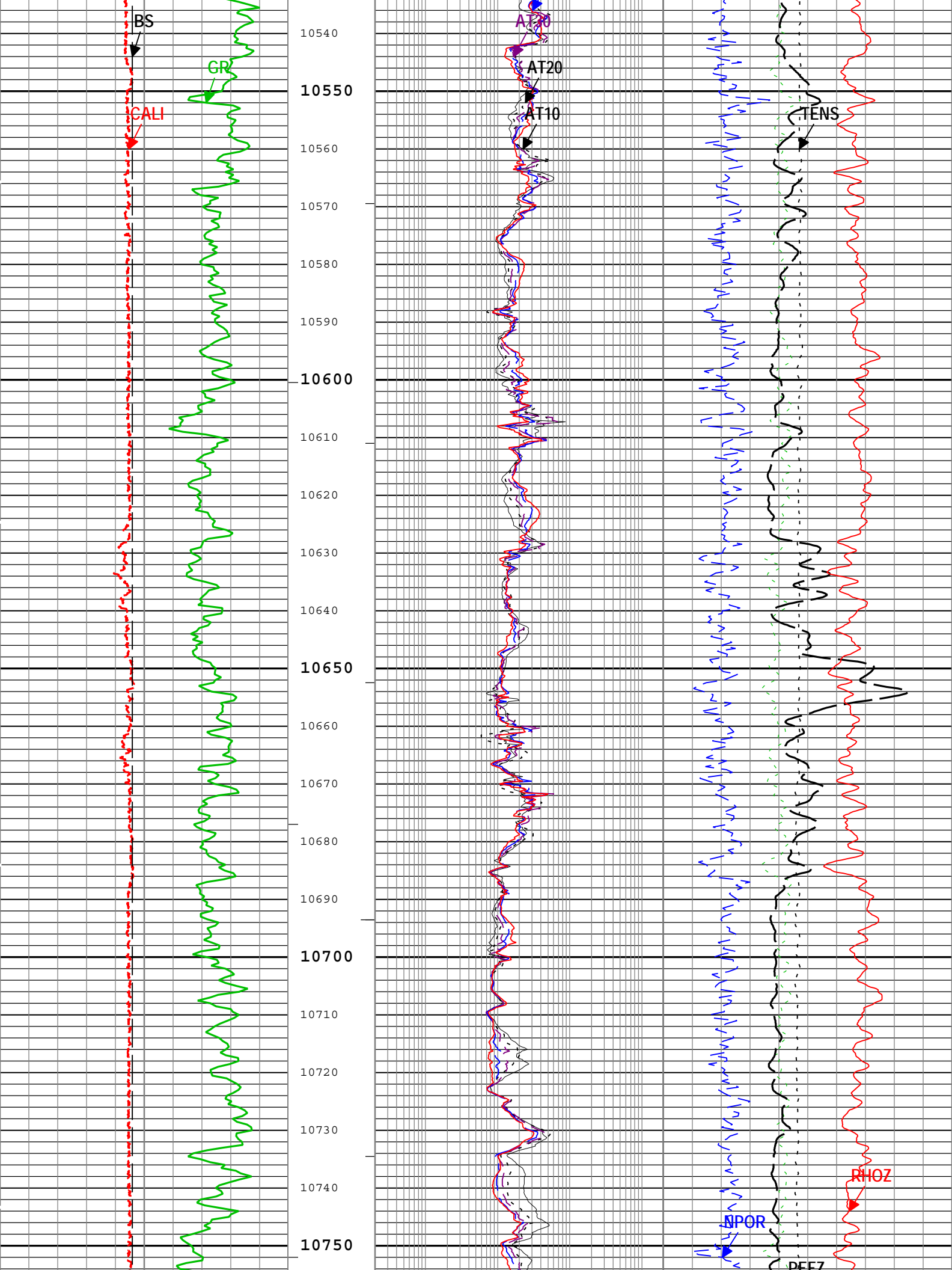


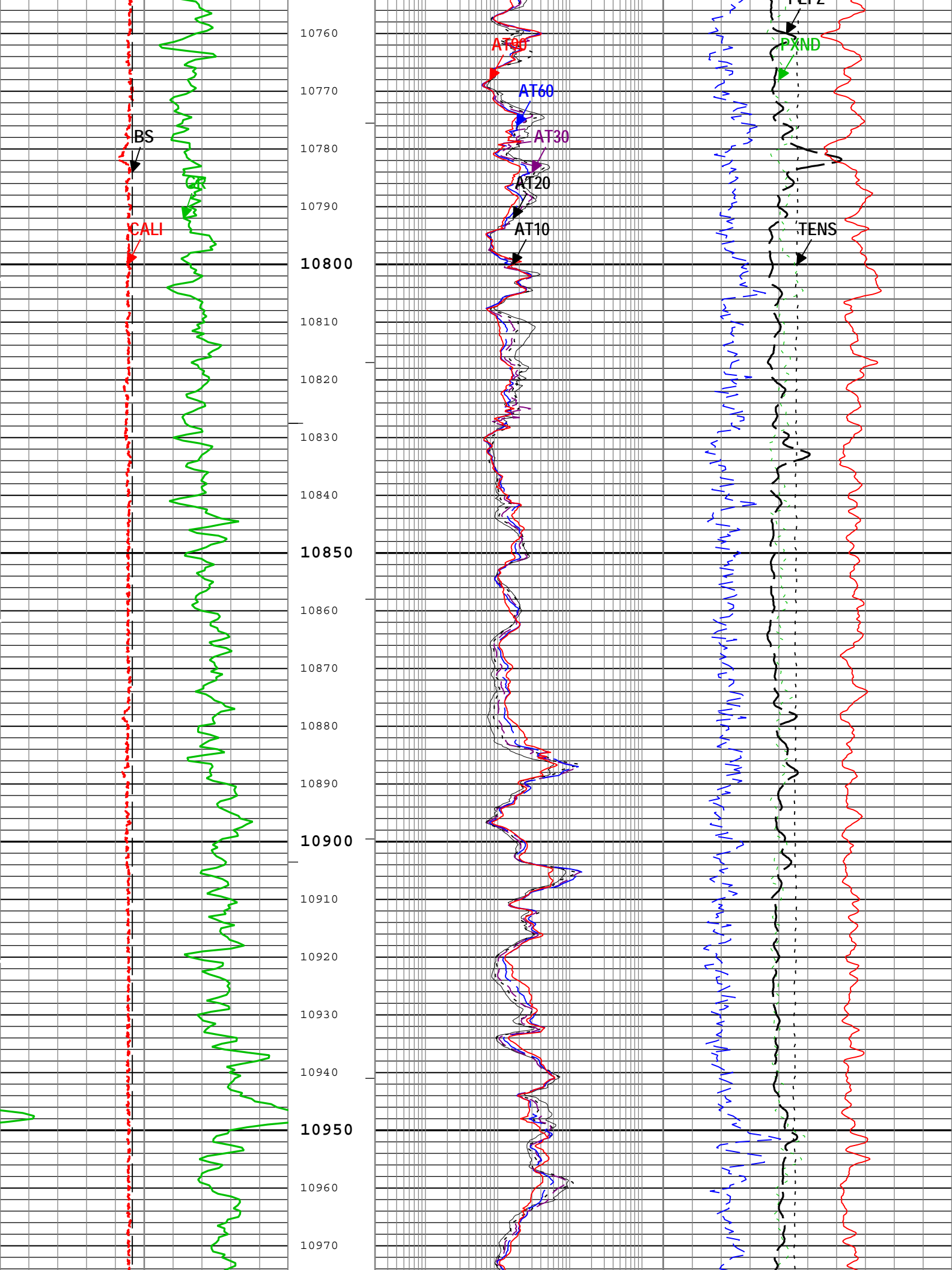


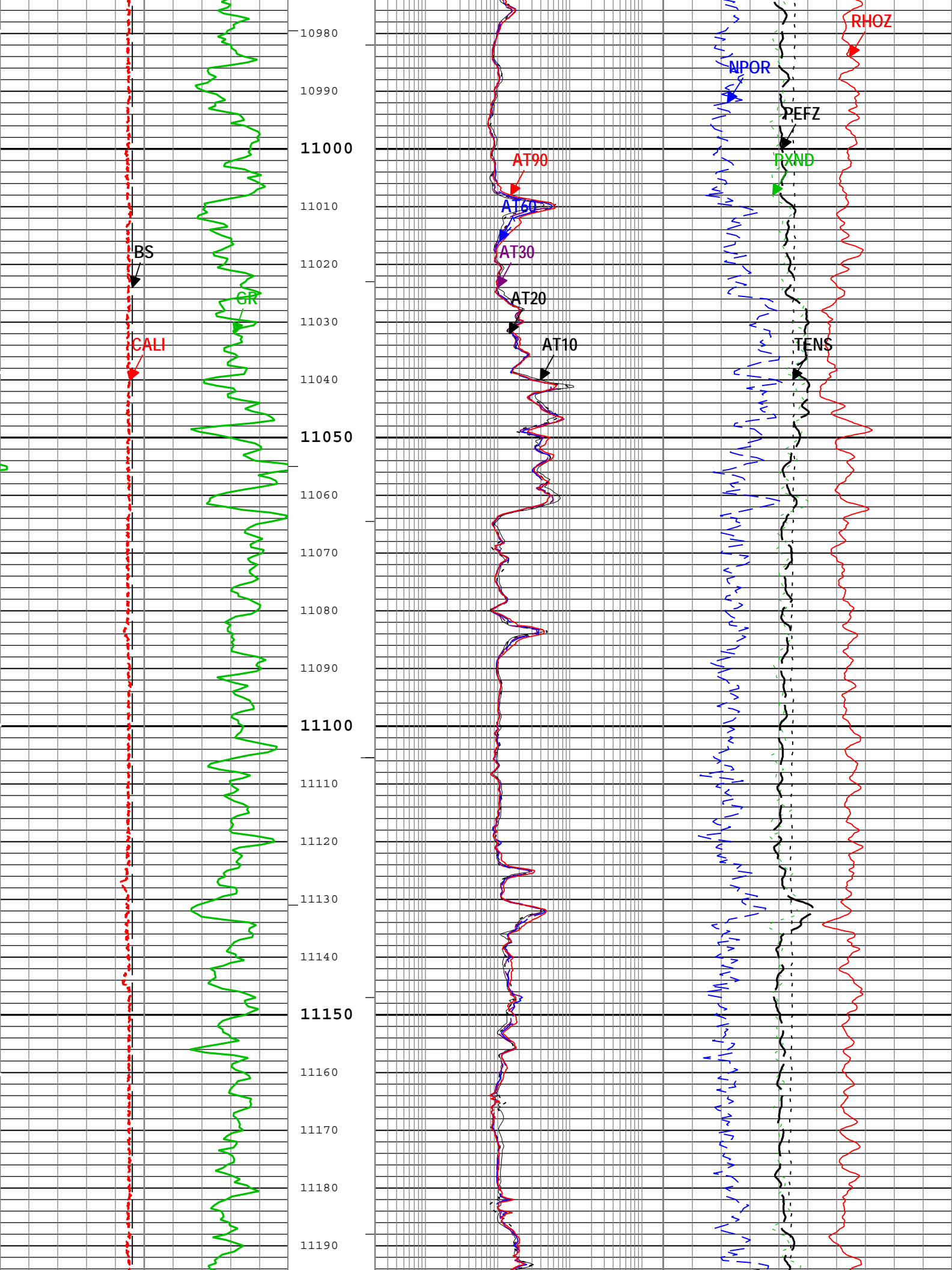


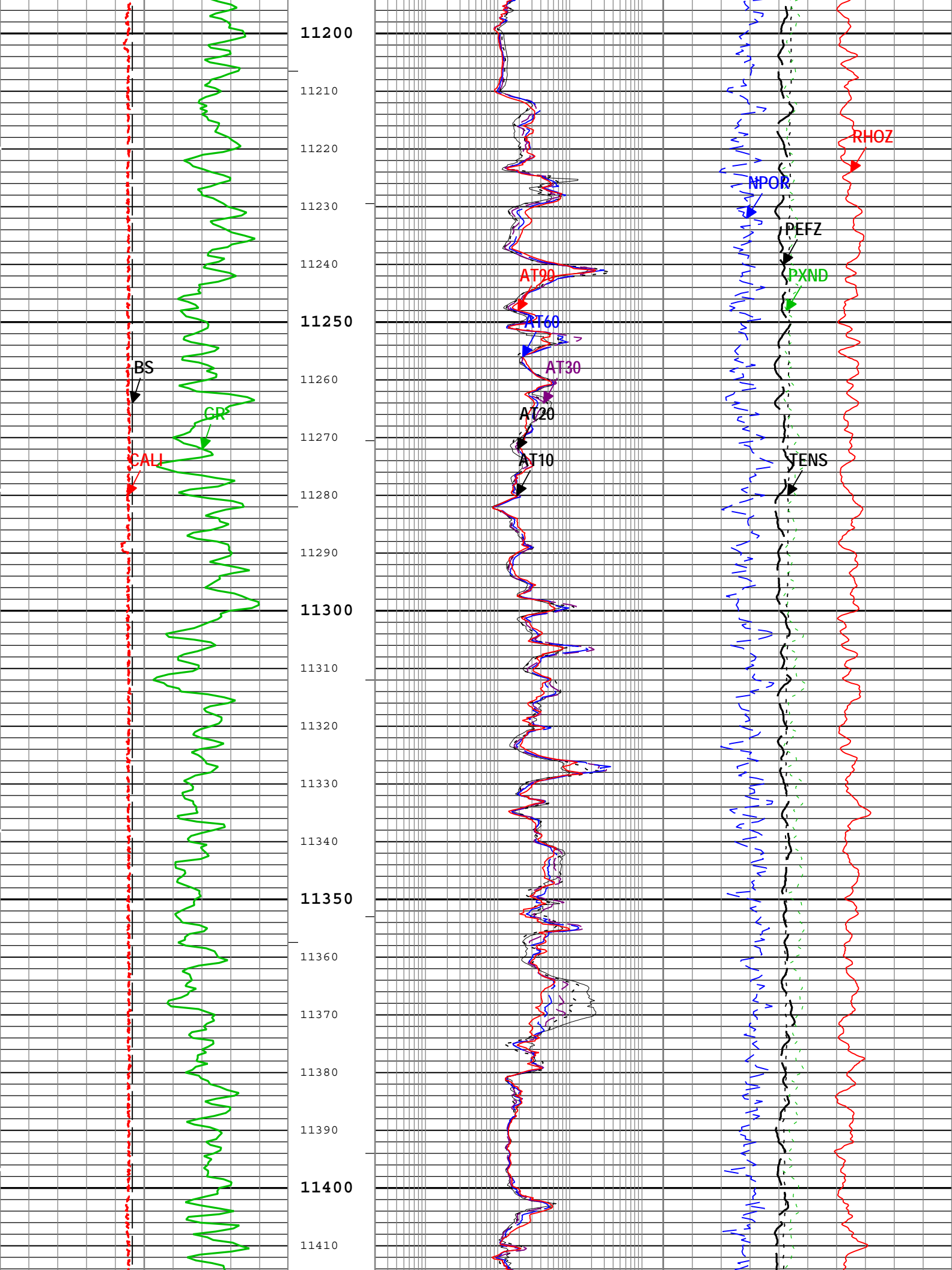


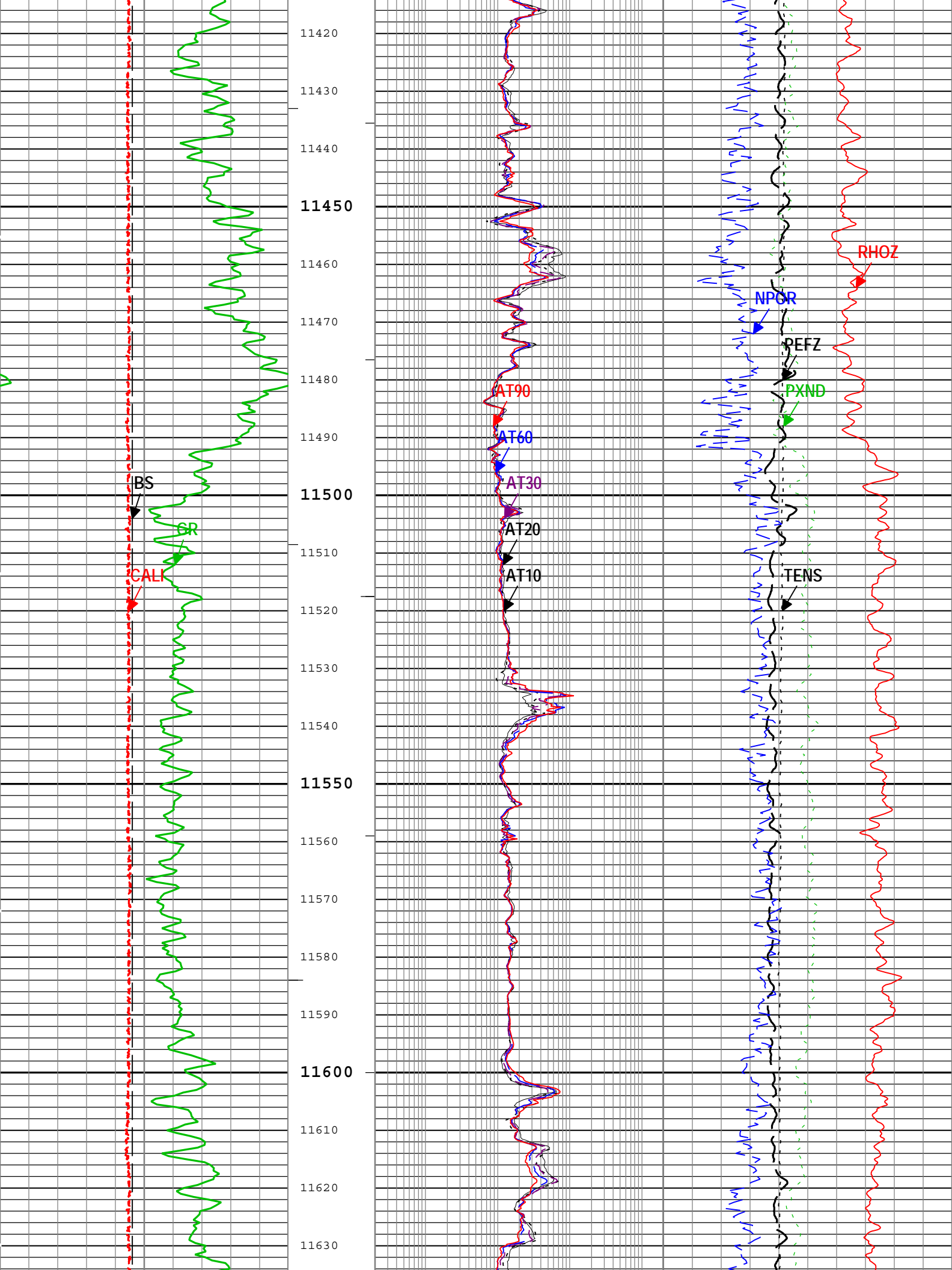


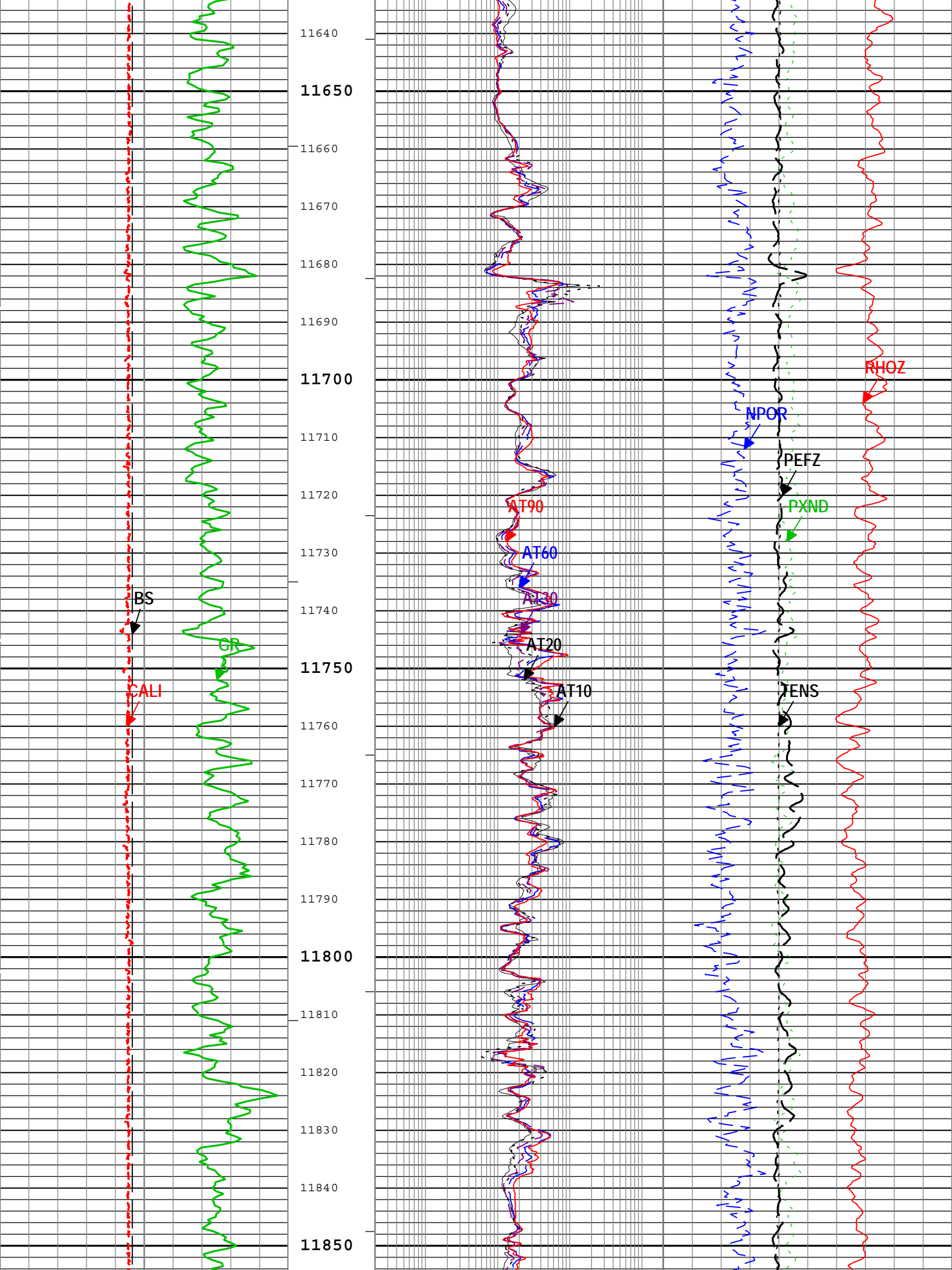


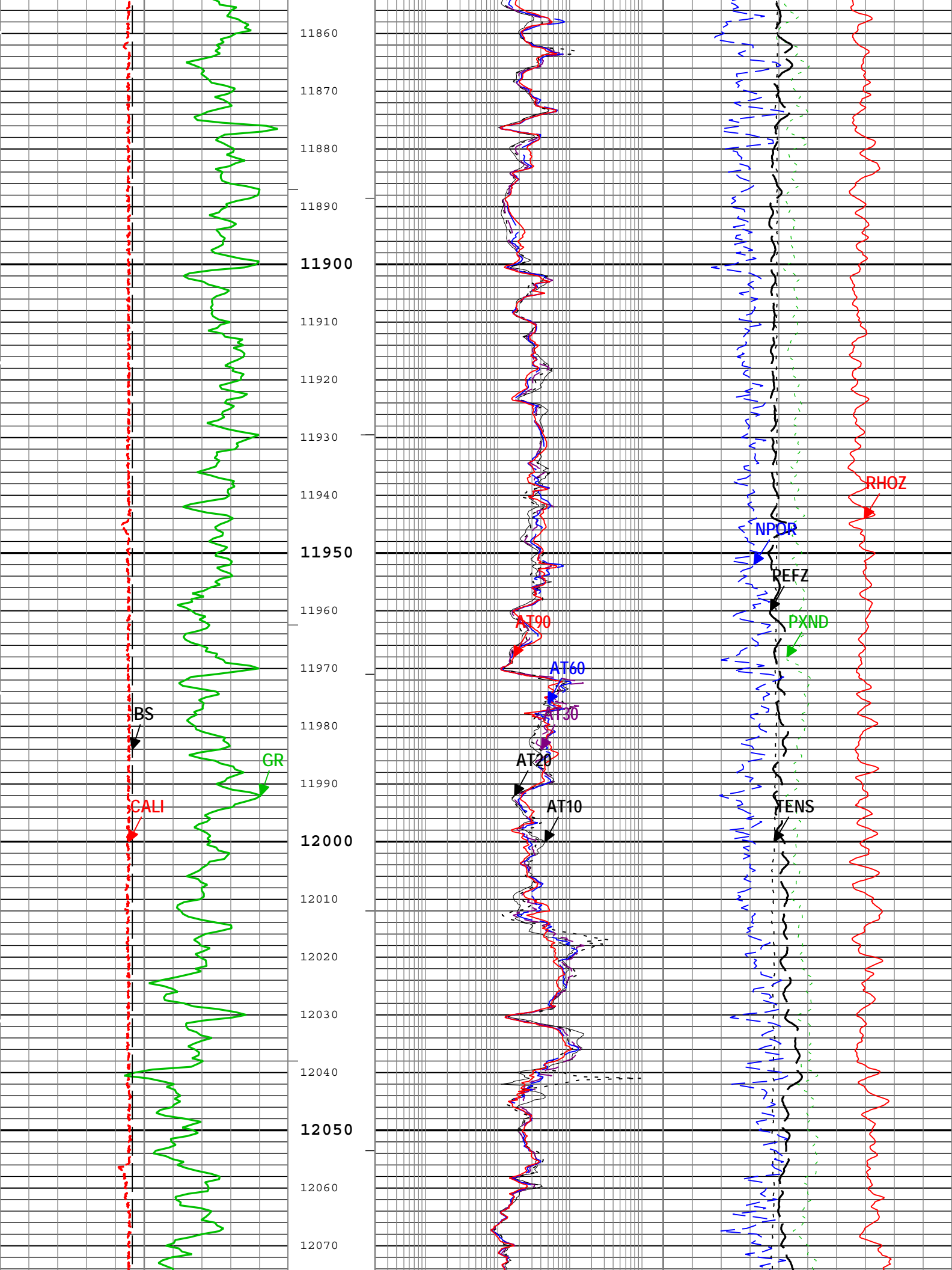


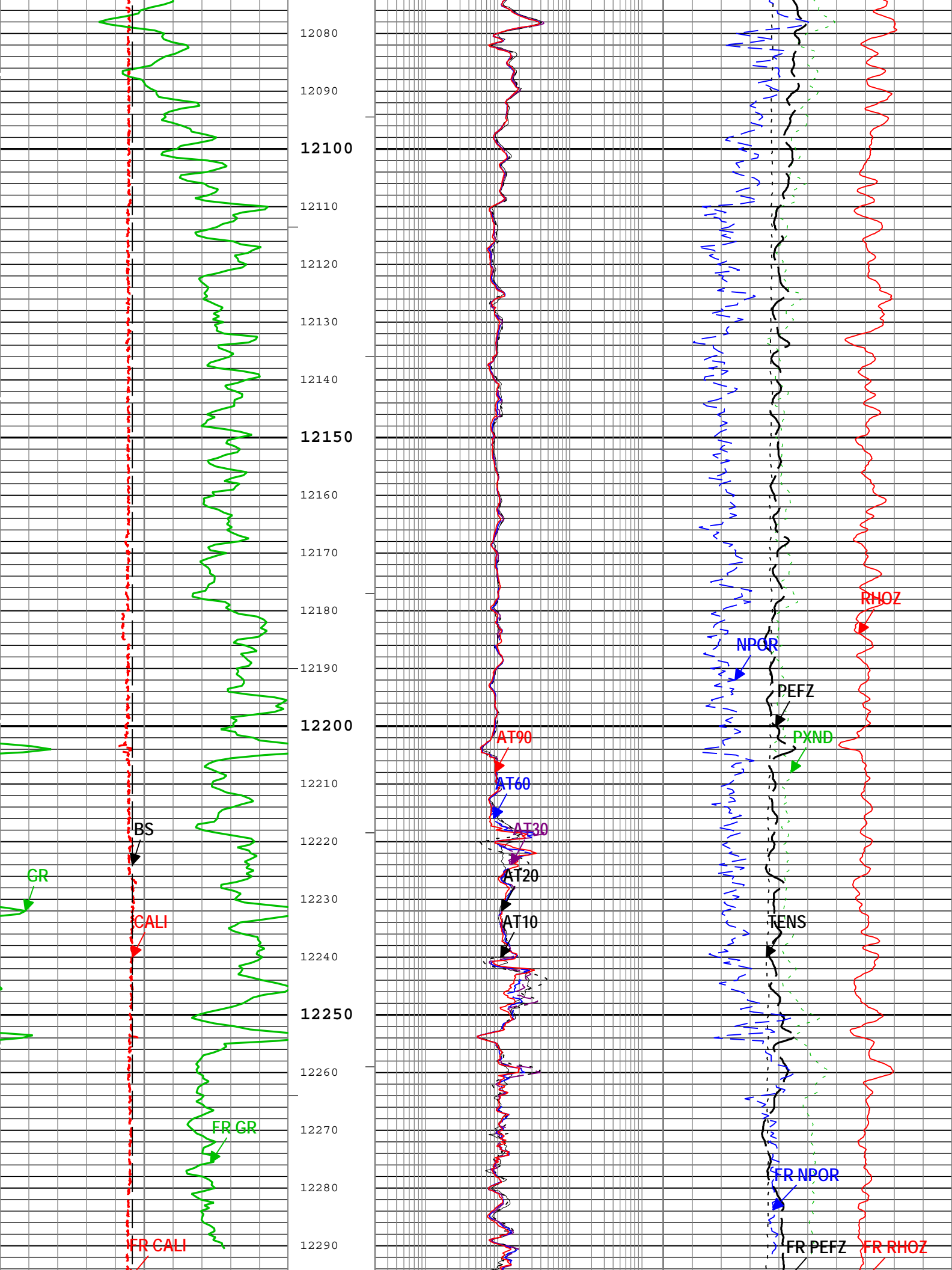


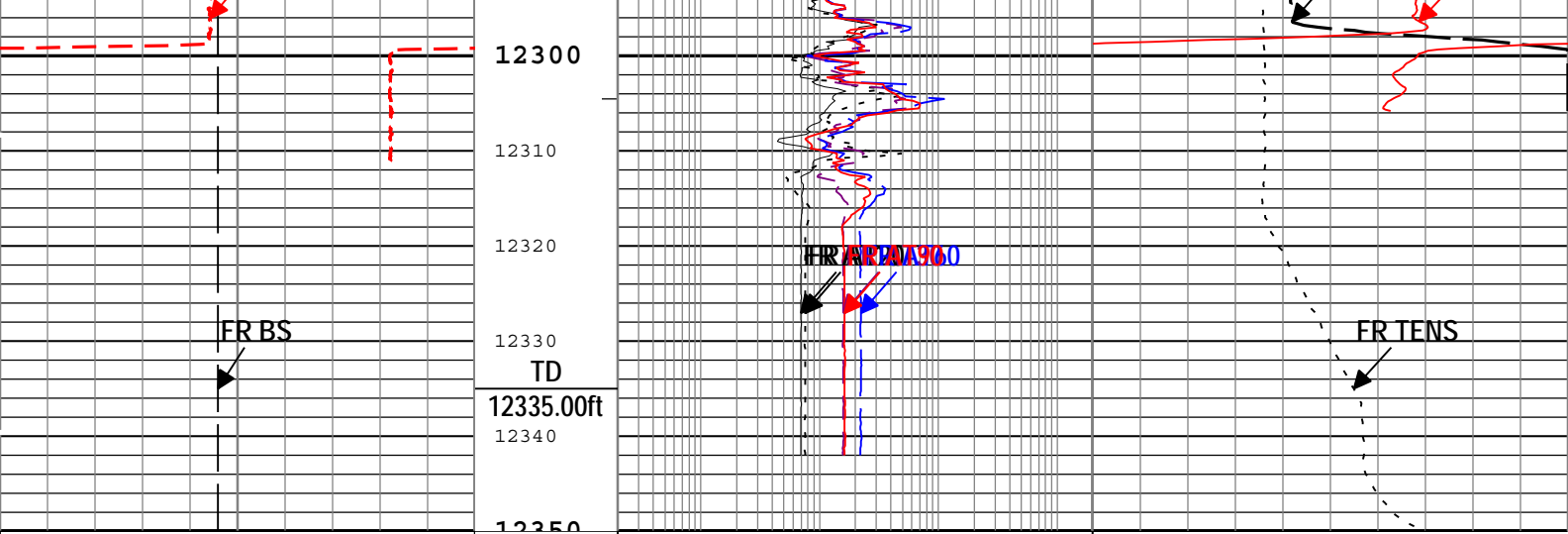












Caliper (CALI) HDRS-H		
4	in	10
Gamma Ray (GR) EDTC-B		
0	gAPI	150
Bit Size (BS)		
4	in	10

Array Induction Two Foot Resistivity A10 (AT10) AIT-M	0.2	ohm.m	2000
Array Induction Two Foot Resistivity A20 (AT20) AIT-M	0.2	ohm.m	2000
Array Induction Two Foot Resistivity A30 (AT30) AIT-M	0.2	ohm.m	2000
Array Induction Two Foot Resistivity A60 (AT60) AIT-M	0.2	ohm.m	2000
Array Induction Two Foot Resistivity A90 (AT90) AIT-M	0.2	ohm.m	2000

Cable Tension (TENS)		
10000	lbf	0
Crossplot Porosity for Neutron-Density (PXND)		
0.3	ft3/ft3	-0.1
Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H		
0		10
Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H		
0.3	ft3/ft3	-0.1
Standard Resolution Formation Density (RHOZ) HDRS-H		
2.18	g/cm3	2.85

TIME\_1900 - Time Marked every 60.00 (s)

- |— ICV - Integrated Cement Volume every 100.00 (ft3)
- |— ICV - Integrated Cement Volume every 10.00 (ft3)
- | IHV - Integrated Hole Volume every 100.00 (ft3)
- | IHV - Integrated Hole Volume every 10.00 (ft3)

Description: AIT Basic Log Two Format: Log ( TCOM\_AIT\_MAIN\_5 ) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 09-Aug-2012 12:51:10

### Channel Processing Parameters

Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Mud Resistivity	
ABLM	Array Induction Basic Logs Mode	AIT-M	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M	No	
ASTA	Array Induction Tool Standoff	AIT-M	1	in
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	6.75	in
BSAL	Borehole Salinity	Borehole	0	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	-0.749	in
CBLO	Casing Bottom (Logger)	WLSESSION	9335	ft
CDEN	Cement Density	EDTC-B	2	g/cm3

CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	7.625	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	10	lbm/gal
DFT	Drilling Fluid Type	Borehole	Oil	
DHC	Density Hole Correction	HDRS-H	Bit Size	
FCD	Future Casing (Outer) Diameter	WLSESSION	4.5	in
FSAL	Formation Salinity	Borehole	0	ppm
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	REMS	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	CTEM	
HSCO	Hole Size Correction Option	HGNS-H	Yes	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	SANDSTONE	

## Tool Control Parameters

Parameter	Description	Tool	Value	Unit
HMCA_BRD_TYPE	HMCA Board Type	HGNS-H	1	
HRGD_BRD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

1

## Repeat Analysis

## Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
1	Log[2]:Up	Up	11012.34 ft	12336.88 ft	05-Aug-2012 4:13:52 AM	05-Aug-2012 4:37:29 AM	-11.61 ft	false
1	Log[3]:Up	Up	37.65 ft	12350.07 ft	05-Aug-2012 4:47:29 AM	05-Aug-2012 7:06:38 AM	-9.00 ft	false

All depths are referenced to toolstring zero

## Log

1: Log[3]:Up

Description: AIT Basic Log Two Format: Log ( TCOM\_AIT\_MAIN\_5 RA ) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth  
 Creation Date: 09-Aug-2012 12:51:17

Channel	Source	Sampling
ICV	Borehole	6in
IHV	Borehole	6in
TIME_1900	WLWorkflow	0.1in

— IHV - Integrated Hole Volume every 10.00 (ft3)

— IHV - Integrated Hole Volume every 100.00 (ft3)

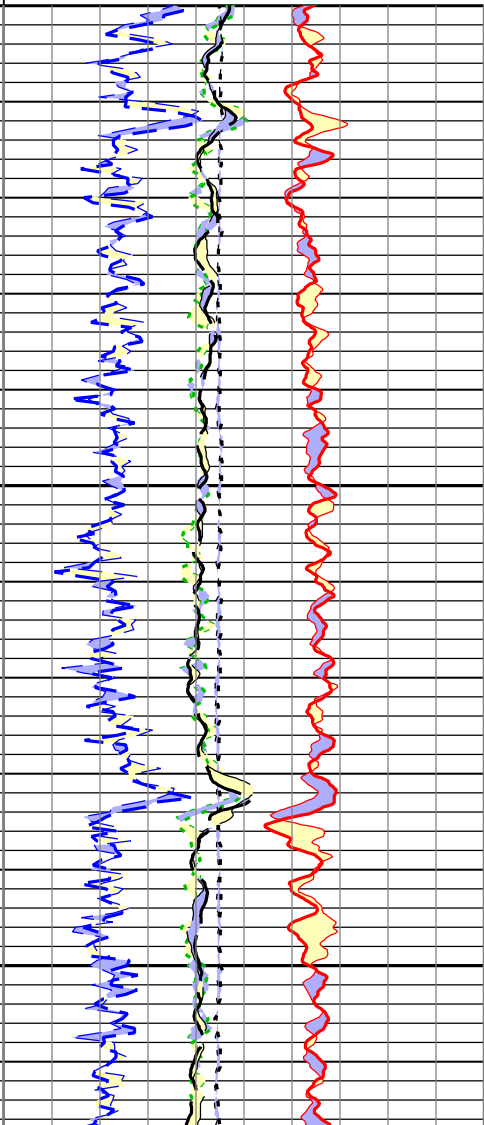
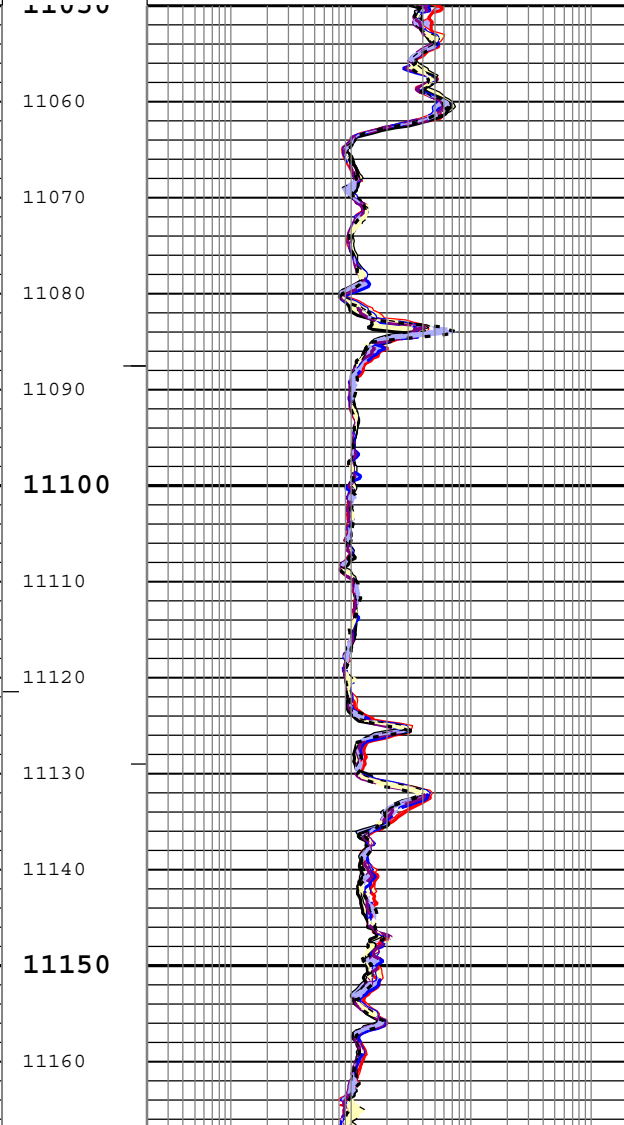
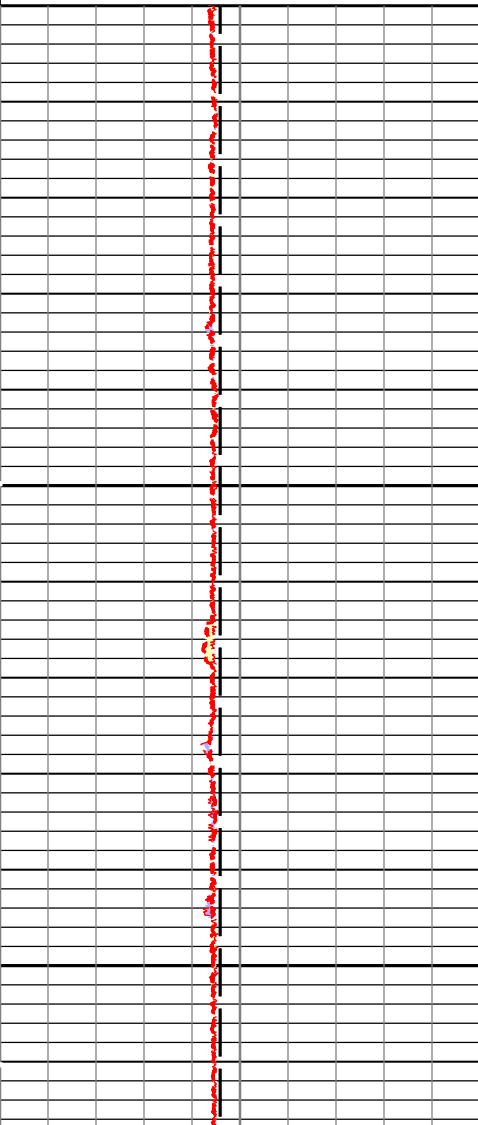
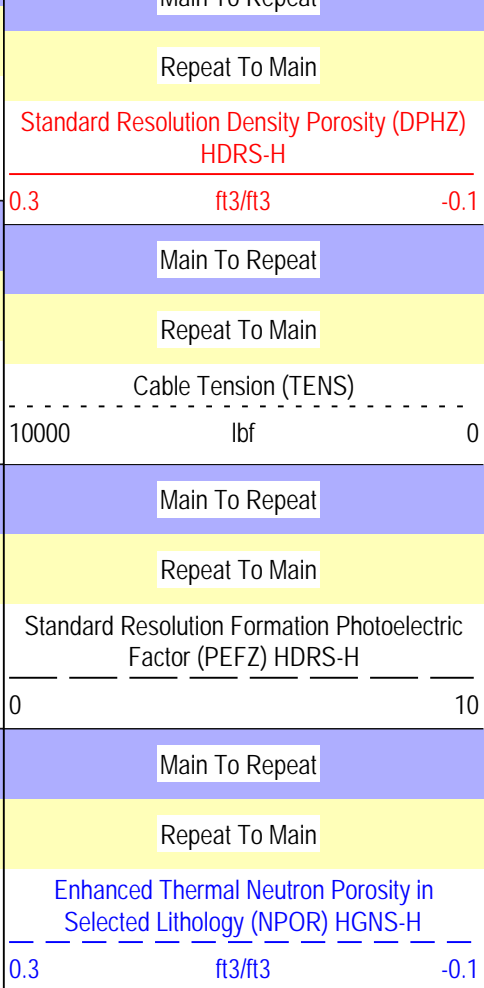
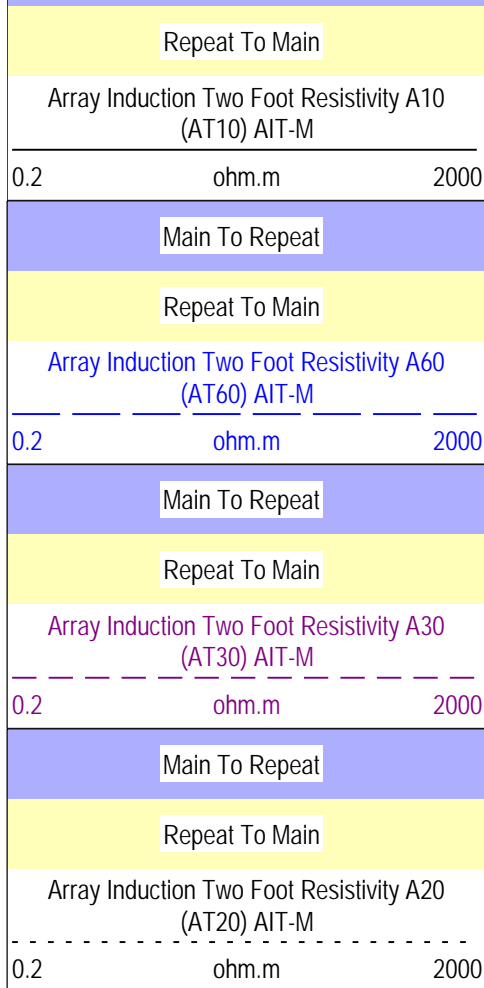
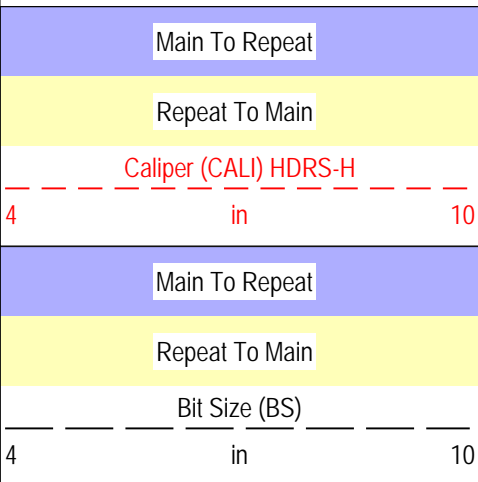
— ICV - Integrated Cement Volume every 10.00 (ft3)

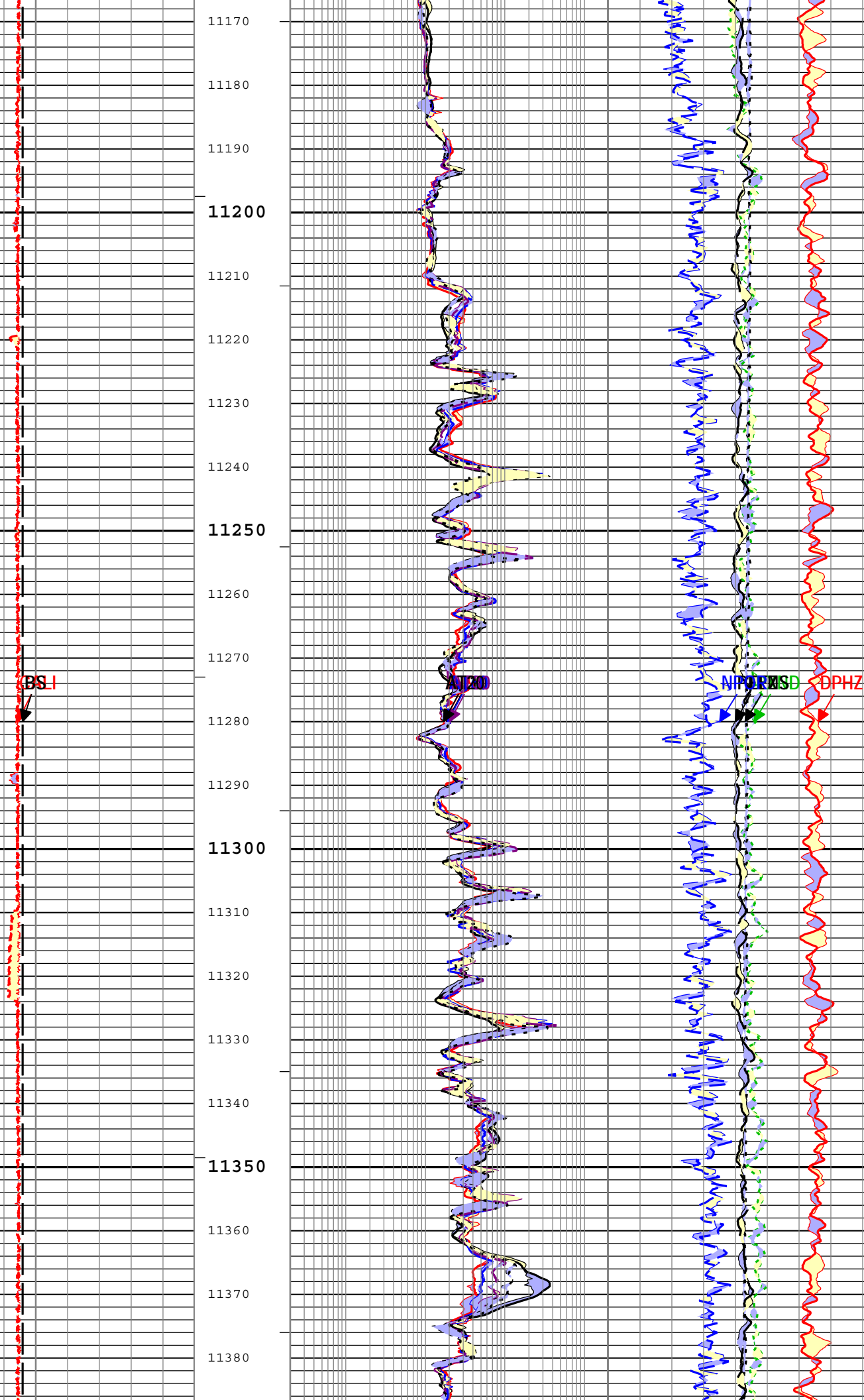
— ICV - Integrated Cement Volume every 100.00 (ft3)

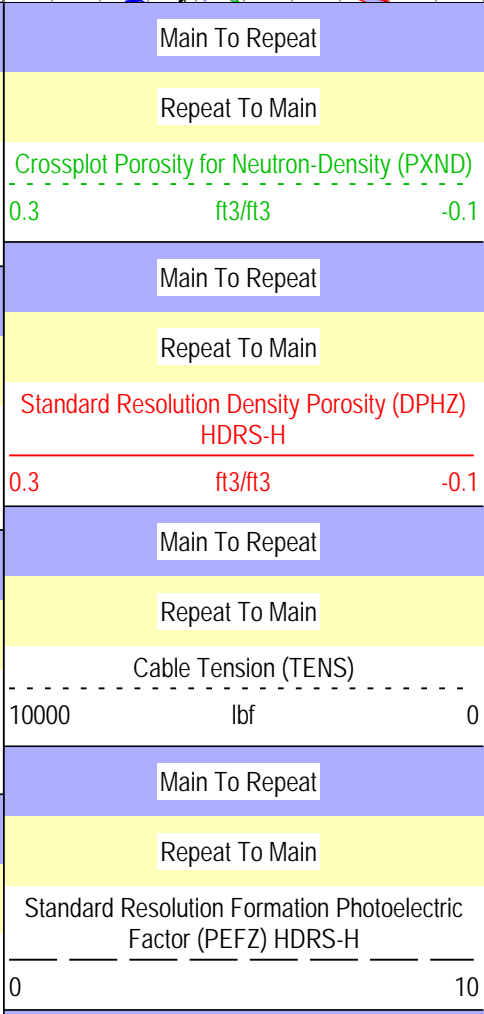
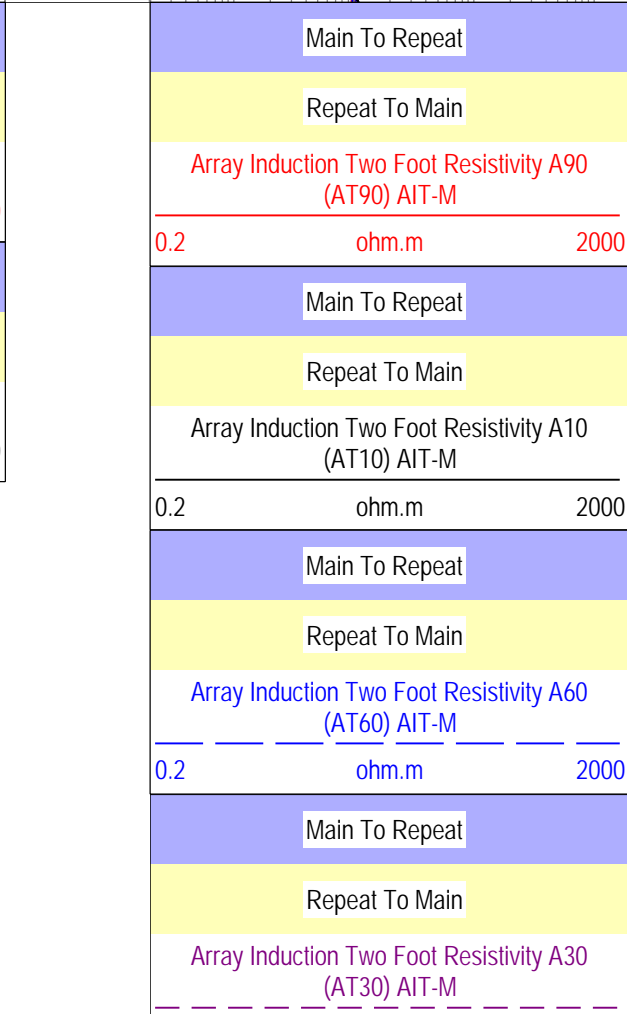
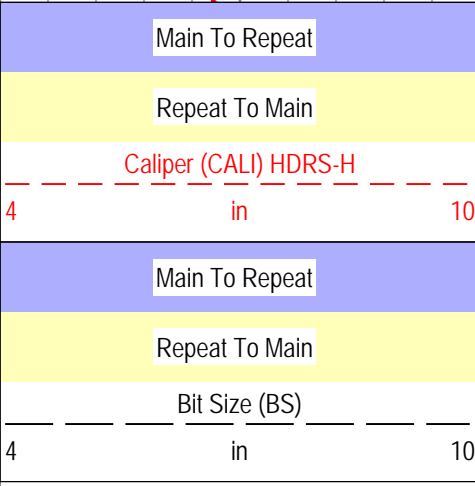
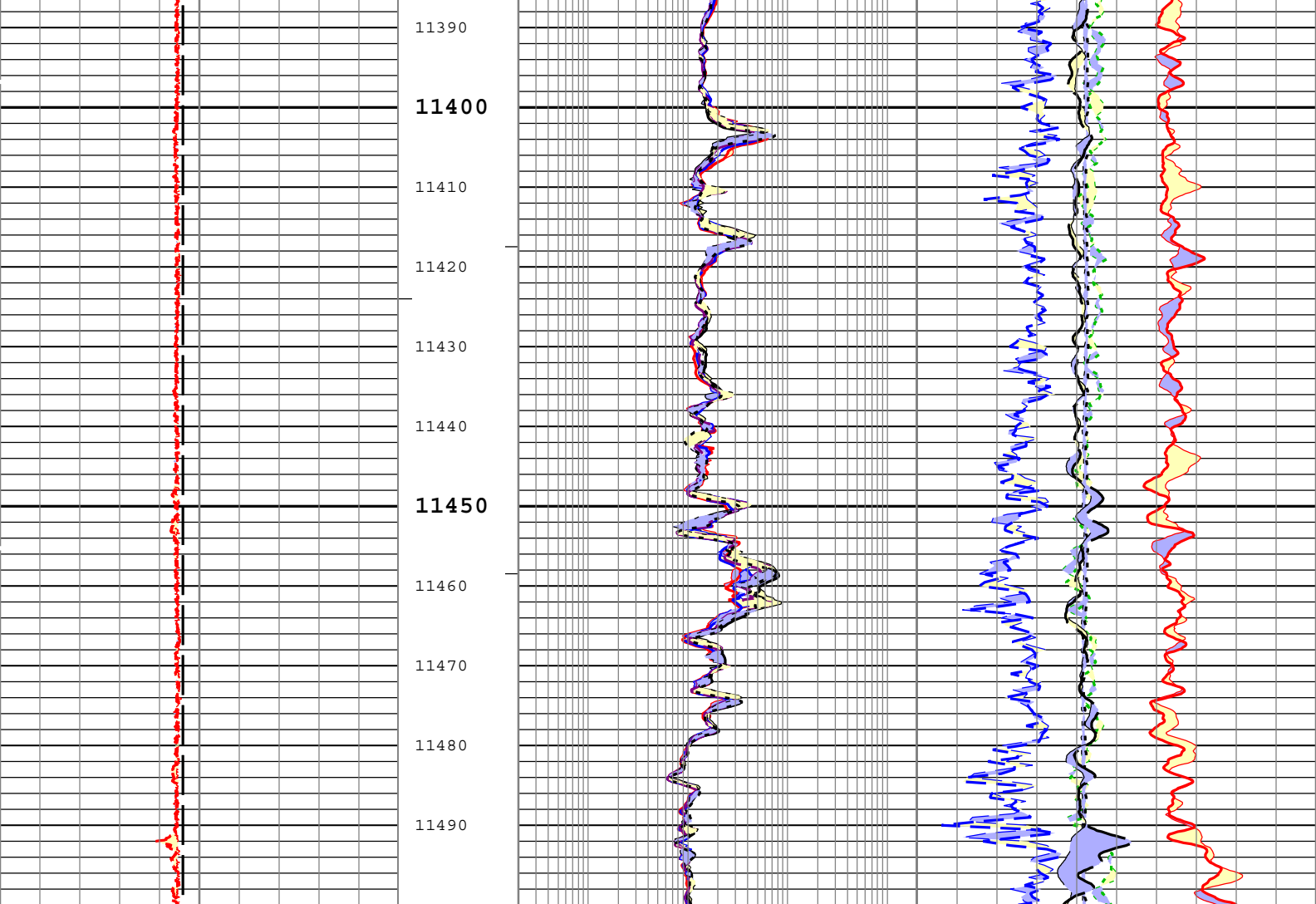
TIME\_1900 - Time Marked every 60.00 (s)

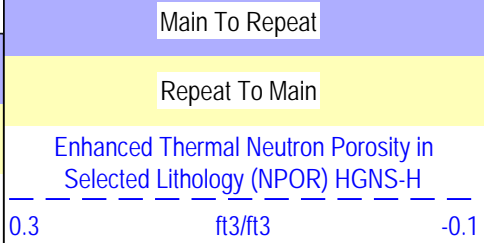
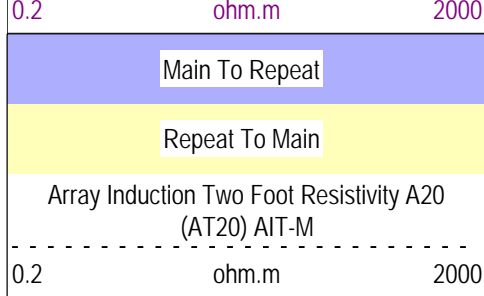
Main To Repeat		
Repeat To Main		
Array Induction Two Foot Resistivity A90 (AT90) AIT-M		
0.2	ohm.m	2000
Main To Repeat		

Main To Repeat		
Repeat To Main		
Crossplot Porosity for Neutron-Density (PXND)		
0.3	ft3/ft3	-0.1
Main To Repeat		









TIME\_1900 - Time Marked every 60.00 (s)

- └─ ICV - Integrated Cement Volume every 100.00 (ft3)
- └─ ICV - Integrated Cement Volume every 10.00 (ft3)
- └─ IHV - Integrated Hole Volume every 100.00 (ft3)
- └─ IHV - Integrated Hole Volume every 10.00 (ft3)

Description: AIT Basic Log Two Format: Log ( TCOM\_AIT\_MAIN\_5 RA ) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth  
 Creation Date: 09-Aug-2012 12:51:17

## Calibration Report

### AIT-M (Array Induction Tool - M) Calibration - Run 1

<b>Primary Equipment :</b>		
Array Induction Sonde - M	AMIS	266
<b>Auxiliary Equipment :</b>		
AITM Rm/SP Bottom Nose	AMRM	266

### AIT Sonde Calibration - Test Loop Gain

Master (EEPROM): 17:46:03 19-Jun-2012

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	0.523	3.000	
Test Loop Gain - 1		Master	1.000	0.950	1.014	1.050	
Test Loop Phase - 1	deg	Master	0	-3.000	0.723	3.000	
Test Loop Gain - 2		Master	1.000	0.950	1.019	1.050	
Test Loop Phase - 2	deg	Master	0	-3.000	0.034	3.000	
Test Loop Gain - 3		Master	1.000	0.950	1.012	1.050	
Test Loop Phase - 3	deg	Master	0	-3.000	0.069	3.000	
Test Loop Gain - 4		Master	1.000	0.950	0.996	1.050	
Test Loop Phase - 4	deg	Master	0	-3.000	0.067	3.000	
Test Loop Gain - 5		Master	1.000	0.950	0.998	1.050	
Test Loop Phase - 5	deg	Master	0	-3.000	-0.216	3.000	
Test Loop Gain - 6		Master	1.000	0.950	1.009	1.050	
Test Loop Phase - 6	deg	Master	0	-3.000	0.064	3.000	
Test Loop Gain - 7		Master	1.000	0.950	1.020	1.050	
Test Loop Phase - 7	deg	Master	0	-3.000	-0.237	3.000	

### AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM): 17:46:03 19-Jun-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-130.932	119.000	
Sonde Error Correction Quad - 0		Master	-----	-2250.000	132.133	2250.000	
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	160.655	204.000	
Sonde Error Correction Quad - 1		Master	-----	-625.000	-197.035	625.000	
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	101.660	156.000	
Sonde Error Correction Quad - 2		Master	-----	-350.000	-193.915	350.000	
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	61.047	89.000	
Sonde Error Correction Quad - 3		Master	-----	-250.000	-28.500	250.000	
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	24.673	35.000	
Sonde Error Correction Quad - 4		Master	-----	-63.000	-19.958	63.000	
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	13.700	24.000	
Sonde Error Correction Quad - 5		Master	-----	-50.000	8.817	50.000	
Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	9.311	15.000	
Sonde Error Correction Quad - 6		Master	-----	-30.000	7.266	30.000	
Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-1.934	5.000	

Sonde Error Correction Quad - 7		Master	----	-30.000	6.181	30.000	
<b>AIT Mud Calibration - Mud Calibration Gain</b>							
Master (EEPROM):		17:46:03 19-Jun-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Coarse Gain		Master	1.000	0.800	1.010	1.200	
Fine Gain		Master	1.000	0.800	1.010	1.200	
<b>AIT Electronics Check - Thru Calibration Check</b>							
Master (EEPROM):		17:46:03 19-Jun-2012	Before (Measured):	02:41:25 05-Aug-2012	After:		
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Thru Cal Mag - 0	V	Master	----	0.366	0.619	0.854	
		Before	----	0.366	0.619	0.854	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
After-Before	----	----	----	----			
Thru Cal Phase - 0	deg	Master	----	137.000	176.579	-103.000	
		Before	----	137.000	177.936	-103.000	
		After	----	----	----	----	
		Before-Master	----	----	1.357	----	
After-Before	----	----	----	----			
Thru Cal Mag - 1	V	Master	----	0.762	1.268	1.778	
		Before	----	0.762	1.269	1.778	
		After	----	----	----	----	
		Before-Master	----	----	0.001	----	
After-Before	----	----	----	----			
Thru Cal Phase - 1	deg	Master	----	136.000	175.502	-104.000	
		Before	----	136.000	176.857	-104.000	
		After	----	----	----	----	
		Before-Master	----	----	1.355	----	
After-Before	----	----	----	----			
Thru Cal Mag - 2	V	Master	----	0.372	0.629	0.868	
		Before	----	0.372	0.629	0.868	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
After-Before	----	----	----	----			
Thru Cal Phase - 2	deg	Master	----	132.000	172.019	-108.000	
		Before	----	132.000	173.372	-108.000	
		After	----	----	----	----	
		Before-Master	----	----	1.353	----	
After-Before	----	----	----	----			
Thru Cal Mag - 3	V	Master	----	0.420	0.711	0.980	
		Before	----	0.420	0.711	0.980	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
After-Before	----	----	----	----			
Thru Cal Phase - 3	deg	Master	----	131.000	171.260	-109.000	
		Before	----	131.000	172.612	-109.000	
		After	----	----	----	----	
		Before-Master	----	----	1.352	----	
After-Before	----	----	----	----			
Thru Cal Mag - 4	V	Master	----	0.804	1.337	1.876	
		Before	----	0.804	1.338	1.876	
		After	----	----	----	----	
		Before-Master	----	----	0.001	----	
After-Before	----	----	----	----			
Thru Cal Phase - 4	deg	Master	----	125.000	165.149	-115.000	
		Before	----	125.000	166.496	-115.000	
		After	----	----	----	----	
		Before-Master	----	----	1.347	----	
After-Before	----	----	----	----			
Thru Cal Mag - 5	V	Master	----	1.176	1.952	2.744	
		Before	----	1.176	1.952	2.744	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
After-Before	----	----	----	----			
Thru Cal Phase - 5	deg	Master	----	122.000	163.511	-118.000	
		Before	----	122.000	164.851	-118.000	

		After	----	----	1.340	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 6	V	Master	----	1.176	1.947	2.744	
		Before	----	1.176	1.948	2.744	
		After	----	----	----	----	
		Before-Master	----	----	0.001	----	
		After-Before	----	----	----	----	
Thru Cal Phase - 6	deg	Master	----	121.000	163.557	-119.000	
		Before	----	121.000	164.898	-119.000	
		After	----	----	----	----	
		Before-Master	----	----	1.341	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 7	V	Master	----	0.846	1.429	1.974	
		Before	----	0.846	1.429	1.974	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
		After-Before	----	----	----	----	
Thru Cal Phase - 7	deg	Master	----	115.000	162.664	-125.000	
		Before	----	115.000	163.964	-125.000	
		After	----	----	----	----	
		Before-Master	----	----	1.300	----	
		After-Before	----	----	----	----	
SPA Zero	mV	Master		-50.000	0.362	50.000	
		Before		-50.000	0.369	50.000	
		After	----	----	----	----	
		Before-Master	----	----	0.007	----	
		After-Before	----	----	----	----	
SPA Plus	mV	Master		941.000	991.178	1040.000	
		Before		941.000	991.196	1040.000	
		After	----	----	----	----	
		Before-Master	----	----	0.018	----	
		After-Before	----	----	----	----	
Temperature Zero	V	Master		-0.050	0.000	0.050	
		Before		-0.050	0.000	0.050	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
		After-Before	----	----	----	----	
Temperature Plus	V	Master		0.870	0.918	0.960	
		Before		0.870	0.918	0.960	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
		After-Before	----	----	----	----	

## DSLT-H (Digitizing Sonic Logging Tool - H) Calibration - Run 1

Primary Equipment :  
Sonic Logging Sonde E supports 3'-5'BHC DT and CBL/VDL SLS-E

### CBL Normalization - CBL Accumulations

Master:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Upper Far Amplitude - 0		Master	----	----	----	----	
Upper Near Raw Amplitude - 0	mV	Master	----	----	----	----	
Lower Far Amplitude - 0		Master	----	----	----	----	
Lower Near Raw Amplitude - 0	mV	Master	----	----	----	----	

### CBL Normalization - CBL/VDL Coefficients

Master:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CBL Correction Factor for UT		Master	3.500	2.700	NOT DONE	4.300	
CBL Correction Factor for LT		Master	2.500	1.700	NOT DONE	4.300	
VDL Ratio between UT and LT for CBLB Mode		Master	1.000		NOT DONE		

### CBL Free Pipe Adjustment - Free Pipe Measurement

Before:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CBL Amplitude - 0	mV	Before	----	----	----	----	

CBL Reference Amplitude (CBRA) - 0	mV	Before	-----	-----	-----	-----	
Measurement Depth - 0	ft	Before	-----	-----	-----	-----	

### CBL Free Pipe Adjustment - CBL Amplitude Coefficient

Before:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CBL Adjustment Factor		Before	1.000	0.200	NOT DONE	5.000	
Depth of Before Calibration	ft	Before			NOT DONE		

### HGNS-H (HILT Gamma-Ray and Neutron Sonde, 150 degC) Calibration - Run 1

Primary Equipment :

HILT Gamma-Ray and Neutron Sonde, 150 degC	HGNS-H	3799
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Auxiliary Equipment :

HGNS Accelerometer, 150 degC	HACCZ-H	1614
AmBe Neutron Logging Source	NSR-F	5138

Calibration Parameter :

Water Temperature	
Housing Size	
JIG-BKG (Jig minus background reference)	165

### HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured): 02:39:19 05-Aug-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.3	32.8	

### HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM): 18:00:00 14-May-2002

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	-----	-----	-3195.000	-----	
Accelerometer Coefficients - 1		Master	-----	-----	3.177	-----	
Accelerometer Coefficients - 2		Master	-----	-----	0.012	-----	
Accelerometer Coefficients - 3		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 4		Master	-----	-----	2.708	-----	
Accelerometer Coefficients - 5		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 7		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 8		Master	-----	-----	298.500	-----	
Accelerometer Coefficients - 9		Master	-----	-----	1.005	-----	

### HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 11:21:16 24-May-2012      Before (Measured): 16:20:56 03-Aug-2012      After: Expired by 1 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Zero Measurement	1/s	Master	0	5.0	27.4	40.0	
		Before	0	5.0	27.8	40.0	
		After	-----	-----	-----	-----	
		Before-Master	-----	-4.1	0.4	4.1	
		After-Before	-----	-----	-----	-----	
Far Zero Measurement	1/s	Master	0	5.0	29.1	40.0	
		Before	0	5.0	29.3	40.0	
		After	-----	-----	-----	-----	
		Before-Master	-----	-4.4	0.2	4.4	
		After-Before	-----	-----	-----	-----	
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	5518.0	6900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	2279.0	2900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	

		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Near Corrected Plus Measurement - 0	1/s	Master		4700.0	5535.0	6900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Far Corrected Plus Measurement - 0	1/s	Master		1900.0	2278.0	2900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	

### HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 16:41:32 03-Aug-2012 Expired by 1 days After:							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before	30.0	0	84.3	120.0	
		After	----	----	----	----	
		After-Before	----	----	----	----	
RGR Plus Measurement	gAPI	Before	185.4	157.1	168.1	206.3	
		After	----	----	NOT DONE	----	
		After-Before	----	----	----	----	
GR Calibration Gain		Before	0.89	0.80	0.98	1.05	
		After	----	----	----	----	
		After-Before	----	----	----	----	

Company: AXIA ENERGY, LLC



Well: BULLDOG 20-12H-892

Field: LAY CREEK

County: MOFFAT

State: COLORADO

Platform Express - Field Print

Compensated Neutron - Lithodensity

Array Induction - Gamma