Schlumberger

Company: Nighthawk Production LLC

Well: Pikes Peak Williams 4-30

Field: Wildcat

County: Lincoln State: Colorado

Platform Express

Caliper

Cement Volume

County: Lincoln
Field: Wildcat
Location: NWNW Sec 30, T13S, R55W
Well: Pikes Peak Williams 4-30
Company: Nighthawk Production LLC

Location:				
NWNW Sec 30, T13S, R55W		Elev.	K.B.	5155.00 ft
SHL: 660' FNL x 660' FWL			G.L.	5143.00 ft
Lat/Long: 38.892850/-103.605630			D.F.	5154.00 ft
Permanent Datum:	Ground Level	Elev.:		5143.00 f
Log Measured From:	Kelly Bushing	12.00 ft		above Perm.Datum
Drilling Measured From:	Kelly Bushing			

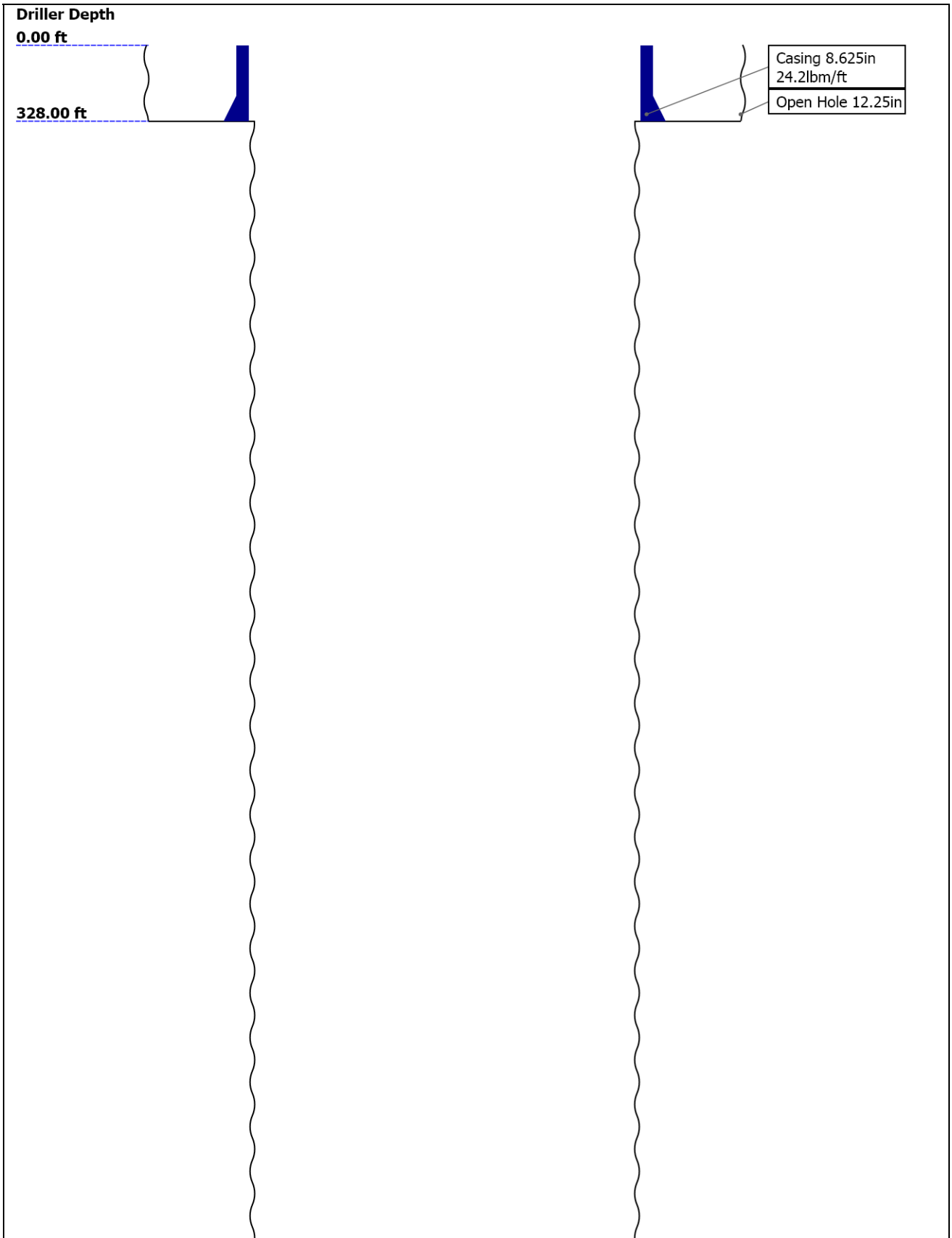
API Serial No.	Section:	Township:	Range:
05-073-06478-0000	30	13S	55W

Logging Date			26-Sep-2012			
Run Number			Run 1			
Depth Driller			7896.00 ft			
Schlumberger Depth			7884.00 ft			
Bottom Log Interval			7884.00 ft			
Top Log Interval			342.00 ft			
Casing Driller Size @ Depth			8.625 in @ 328.00 ft			
Casing Schlumberger			342 ft			
Bit Size			7.875 in			
Type Fluid In Hole			Fresh Water			
MUD	Density	Viscosity	8.4 lbm/gal	44 s		
	Fluid Loss	PH	8.4 cm3	7.6		
	Source of Sample		Flowline			
RM @ Meas Temp			1.74 ohm.m @ 64.02 degF			
RMF @ Meas Temp			1.3 ohm.m @ 75 degF			
RMC @ Meas Temp			2.17 ohm.m @ 75 degF			
Source RMF	RMC		Calculated	Calculated		
RM @ BHT	RMF @ BHT		0.72 @ 163.67	0.63 @ 163.67		
Max Recorded Temperatures			163.67 degF			
Circulation Stopped	Time		26-Sep-2012	01:30:00		
Logger on Bottom	Time		26-Sep-2012	09:25:00		
Unit Number	Location:		2135	Fort Morgan, Colora		
Recorded By			Keri Loring			
Witnessed By			Jim Weir / Andy Elgerd			

Disclaimer

Contents

Well Sketch


Driller Depth
0.00 ft
328.00 ft
Casing 8.625in
24.2lbm/ft
Open Hole 12.25in

Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	12.25	7.875				
Top Driller (ft)	0	328				
Top Logger (ft)	0	342				
Bottom Driller (ft)	328	7896				
Bottom Logger (ft)	342	7884				
Casing						
Size (in)	8.625					
Weight (lbm/ft)	24.2					
Inner Diameter (in)	8.095					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	328					
Bottom Logger (ft)	342					

Operational Run Summary

Parameter (unit)	Run 1					
Date Log Started	26-Sep-2012					
Time Log Started	08:13:59					
Date Log Finished	26-Sep-2012					
Time Log Finished	11:49:15					
Top Log Interval (ft)	342.00					
Bottom Log Interval (ft)	7884.00					
Total Depth (ft)	7884.00					
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	7.875					
Logging Unit Number	2135					
Logging Unit Location	Fort Morgan, Colorado					
Recorded By	Keri Loring					
Witnessed By	Jim Weir / Andy Elgerd					
Service Order Number	BX19-00056					

Borehole Fluids

Parameter(unit)	Run 1					
Fluid Type	Water					
Fluid Name	Fresh Water					
Max Recorded Temperatures (degF)	163.67					
Source of Sample	Flowline					
Salinity (ppm)	3601.04					
Density (lbm/gal)	8.4					
Funnel Viscosity (s)	44					
Fluid Loss (cm3)	8.4					
PH	7.6					
Date/Time Circulation Stopped	26-Sep-2012 01:30:00					
Date Logger on Bottom	26-Sep-2012					
Time Logger on Bottom	09:25:00					
Source RMF	Calculated					
RMC	Calculated					
RM @ Meas Temp (ohm.m@degF)	1.74 @ 64.02					
RMF @ Meas Temp (ohm.m@degF)	1.3 @ 75					
RMC @ Meas Temp (ohm.m@degF)	2.17 @ 75					
RM @ BHT (ohm.m@degF)	0.72 @ 163.67					
RMF @ BHT (ohm.m@degF)	0.63 @ 163.67					
RMC @ BHT (ohm.m@degF)	1.04 @ 163.67					
Total Solid (%)	2					
High Gravity Solids (%)						

Remarks and Equipment Summary

Run 1: Toolstring

Equip name	Length	MP name	Offset
LEH-QT	**66.21**		
LEH-QT			
DTC-H:9469	**63.29**		
ECH-KC:10530		**CTEM**	**62.39**
DTC-H:9469		**HV**	**0.00**
		ToolStatus	**60.29**
		TelStatus	**60.29**
HGNS-H:4779	**60.29**	**Temperatur e**	**60.26**
HGNH:3826			
NPV-N		**GR**	**59.55**
NSR-F:5168			
HGNS-H:4779			
HACCZ-H:5736			
HMCA-H			
		CNL Porosit y	**53.21**
		HMCA	**50.88**
		HGNS	**50.88**
		Accelerome ter	**0.00**
HDRS-H:4706	**50.88**		
ECH-MEB:4711			

Run 1: Remarks

Toolstring run as per toolsketch with the exception of CME-Z[2] which is on the SLS, not the DSLC.

First run in hole procedures followed.

HRCC-H:5705
HRMS-H:4706
GPV-Q
GSR-J:5240
Short Spacing:27
634
Backscatter
HRGD-H:3816
Long Spacing:28
732

HRCC 46.88

MCFL 41.45
Caliper 40.96
TLD Density 40.57

AH-184:909 38.64

DSLT-H:8339 36.64
ECH-KH:8401
DSLC-H:8339
SLS-E:165

CBL 3ft 24.17
Upper-Near 24.17

VDL 5ft 23.17
Upper-Far 23.17

Delta-T 21.79

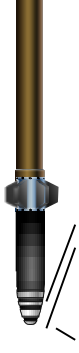
Lower-Far 20.42

Lower-Near 19.42

SLS-E 16.00

AIT-M:1270 16.00
AMIS:1270
AMRM:1270

Temperatur e 7.91
Power Supply 7.91
Induction 7.91



Lengths are in ft
Maximum Outer Diameter = 4.950 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

Depth Control Parameters	Run 1		
Conveyance Type	Wireline		
Rig Type	Land		
Depth Remark Parameters	**Run 1**		
Depth Remark 1	All Schlumberger depth procedures followed.		
Depth Remark 2	IDW used as primary depth control device.		
Depth Remark 3	Z-chart used as secondary depth control device.		
Depth Measuring Device	**Run 1**		
Type	IDW-B		
Serial Number	4938		
Calibration Date	11-Apr-2012		
Calibration Cable Type	7-46P XS		
Wheel Correction 1	-6		
Wheel Correction 2	-6		
Tension Device	**Run 1**		
Type	CMTD-B/A		
Serial Number	1919		
Calibration Date	10-Sep-2012		
Calibrator Serial Number	78135a		
Calibration Points	10		
Calibration RMS	12		
Calibration Peak Error	24		
Logging Cable	**Run 1**		
Type	7-46P-XS		
Serial Number	U711057		
Logging Cable Length (ft)	24600.00		

Run 1

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	1790.7	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	3036.35	ft3

Software Version

Acquisition System	Version

MaxWell	3.1.9755.0
Application Patch	SP-20120614-3.1.9755.1038

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.1.9755.0
DepthCorrection	DepthCorrection	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
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
Run 1	Main[4]:Up	Up	31.88 ft	7892.18 ft	26-Sep-2012 9:23:43 AM	26-Sep-2012 11:48:38 AM	6.25 ft	true

All depths are referenced to toolstring zero

Log

Run 1: Main[4]:Up

Description: Format: Log (Noble East Caliper) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 26-Sep-2012 12:26:53

Channel	Source	Sampling
CALI	HDRS-H:HRCC-H:HRCC-H	1in
BS	Borehole	6in
CALI	HDRS-H:HRCC-H:HRCC-H	1in
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR_CAL	HGNS-H:HGNS-H:HGNS-H	6in
ICV	Borehole	6in
IHV	Borehole	6in
STIT	DepthCorrection	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

IHV - Integrated Hole Volume every 100.00 (ft3)

ICV - Integrated Cement Volume every 100.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

IHV - Integrated Hole Volume every 10.00 (ft3)

ICV - Integrated Cement Volume every 10.00 (ft3)

Integrated Cement Volume (ICV) ft3

Bit Size (BS) 3 in 23

Bit Size (BS) 23 in 3

Cable Tension (TENS) 5000 lbf 0

Caliper (CALI) HDRS-H 23 in 3

Caliper (CALI) HDRS-H 3 in 23

FCD2-FCD3

Bit Size (BS) 4 in 14

Calibrated Gamma Ray (GR_CAL) HGNS-H 0 gAPI 200

Caliper (CALI) HDRS-H 4 in 14

Stuck Tool Indicator, Total (STIT) 0 ft 50

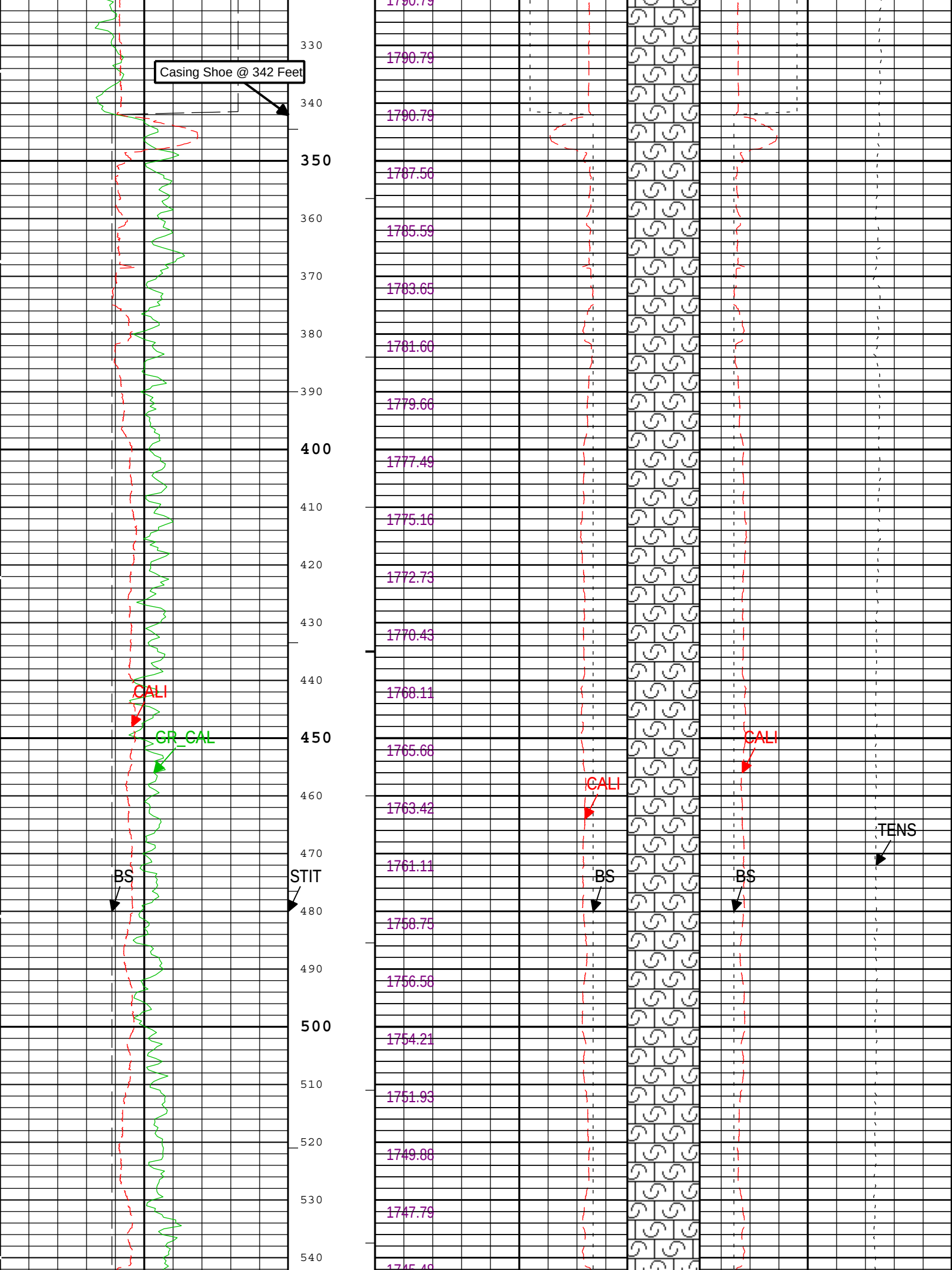
Future Casing (Outer) Diameter (FCD) -17 in 23

Future Casing (Outer) Diameter (FCD) 23 in -17

310

320

1790.79


Casing Shoe @ 342 Feet
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340
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1765.68
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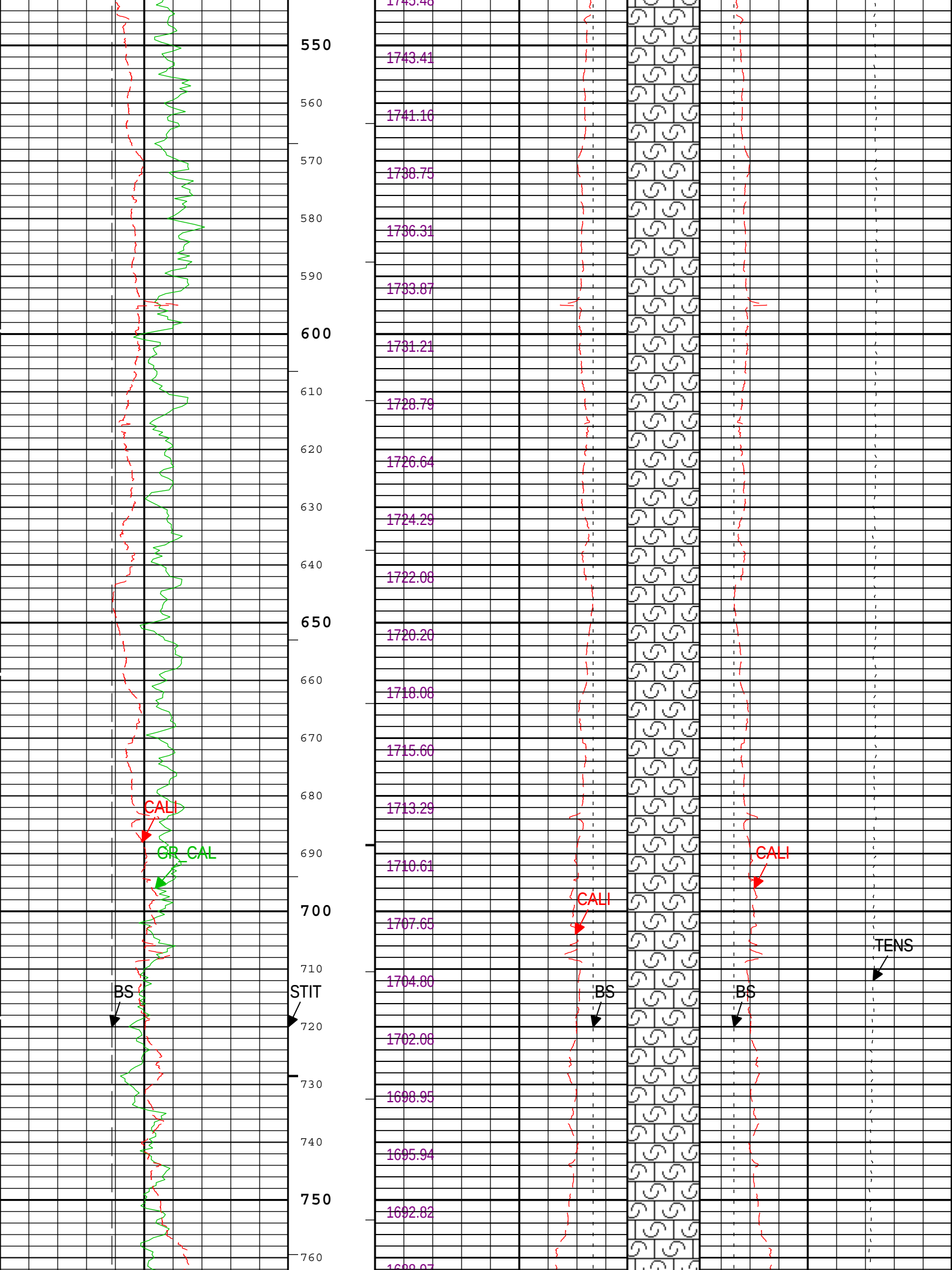
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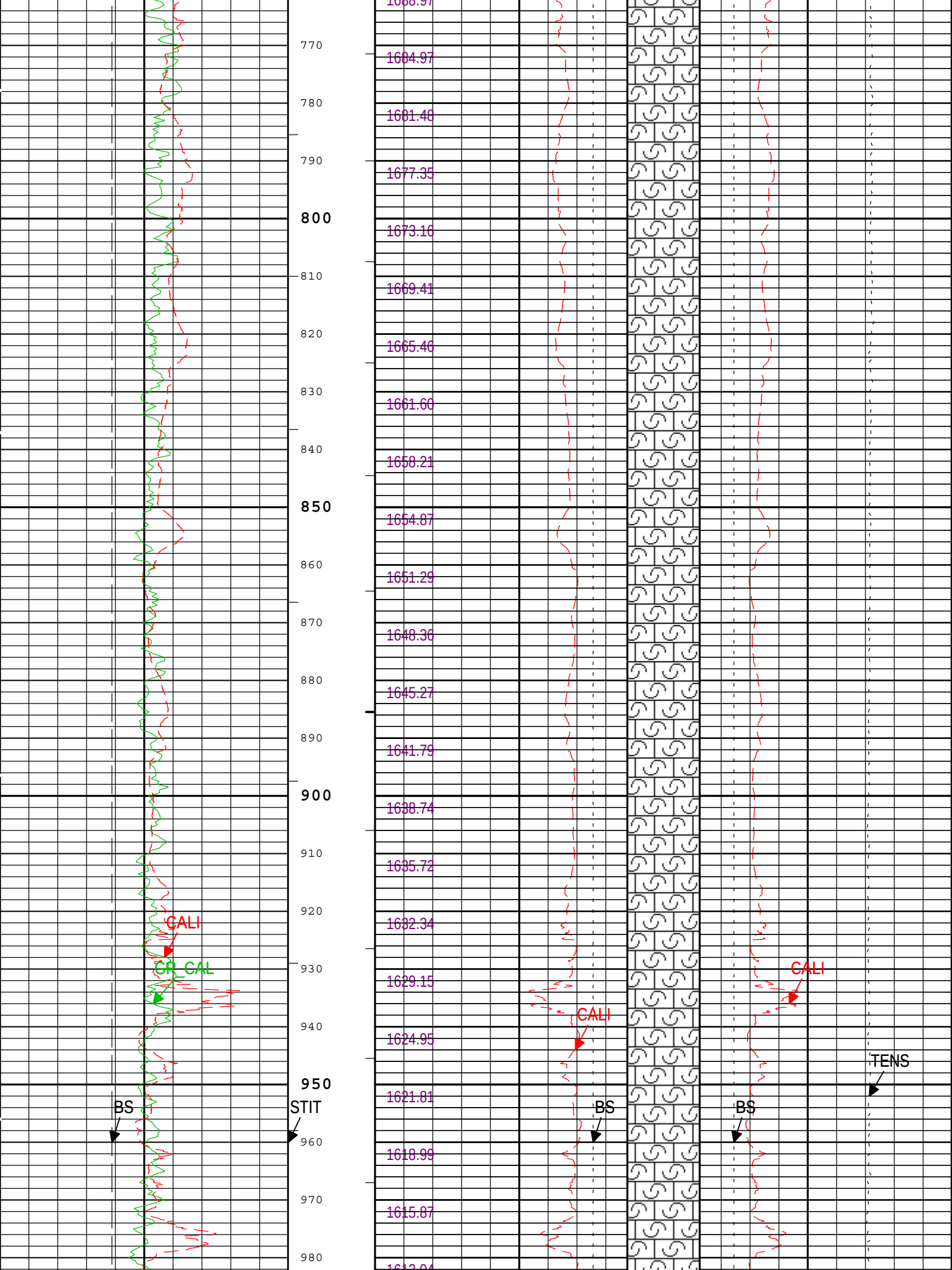
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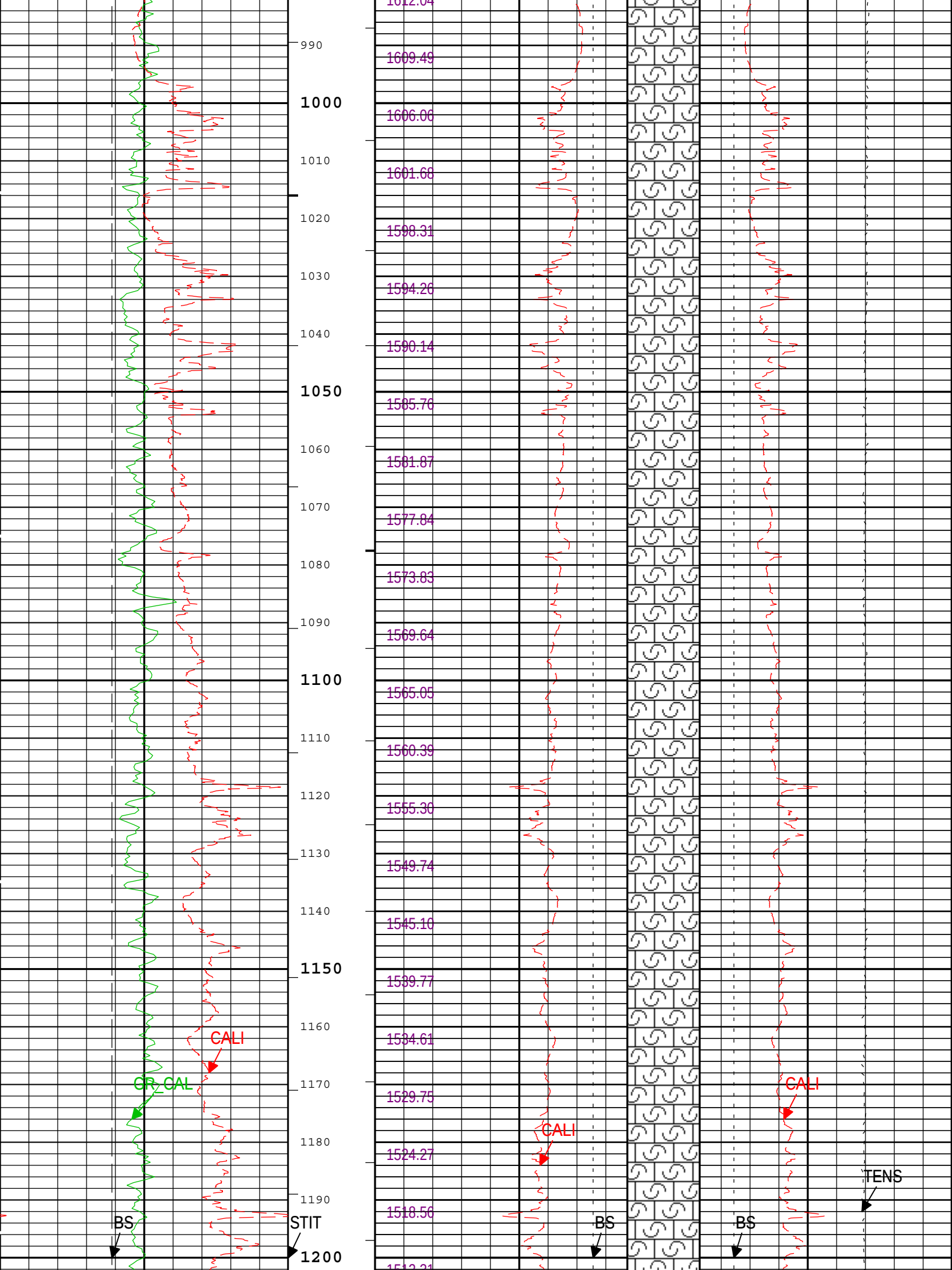
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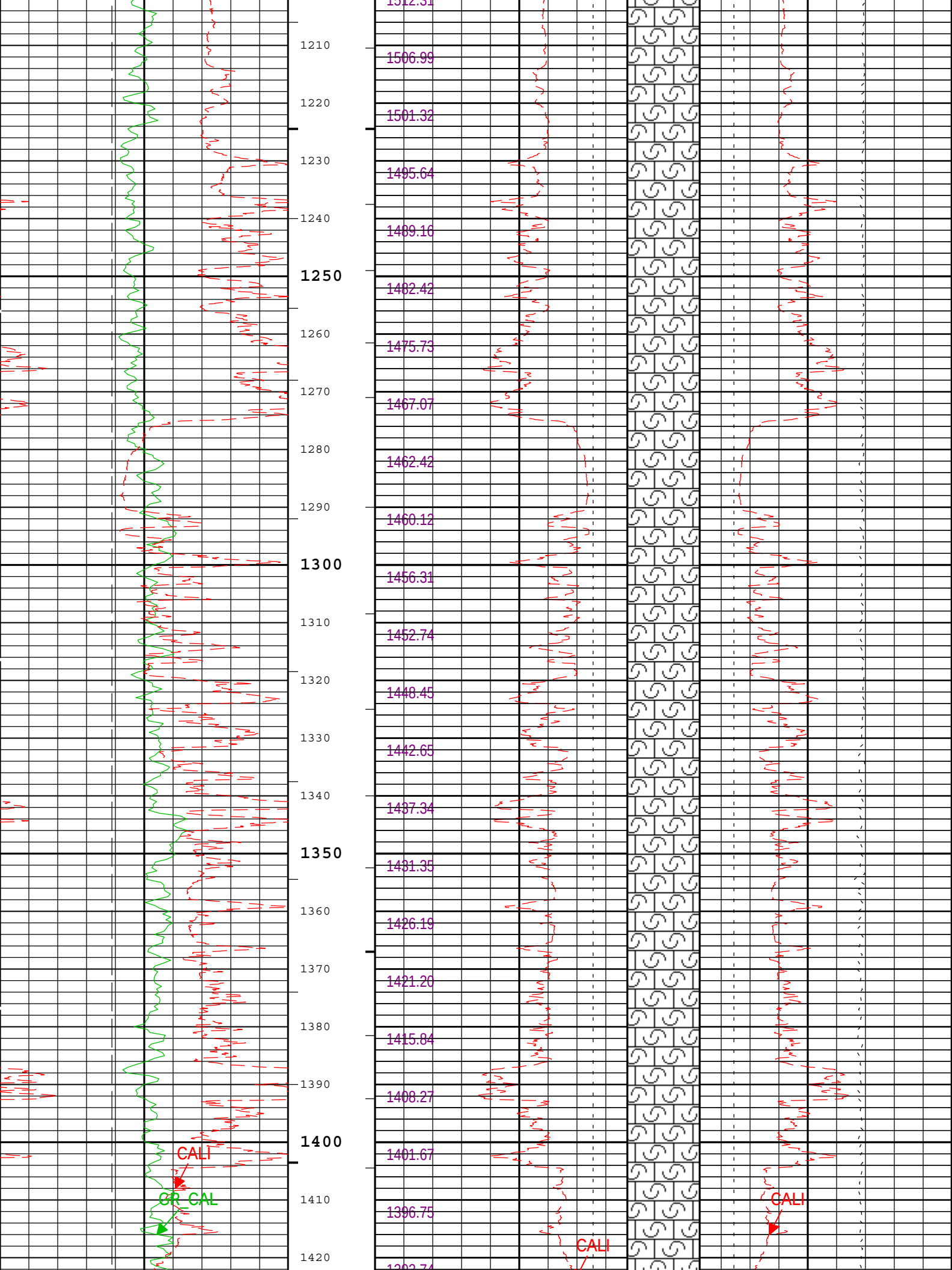
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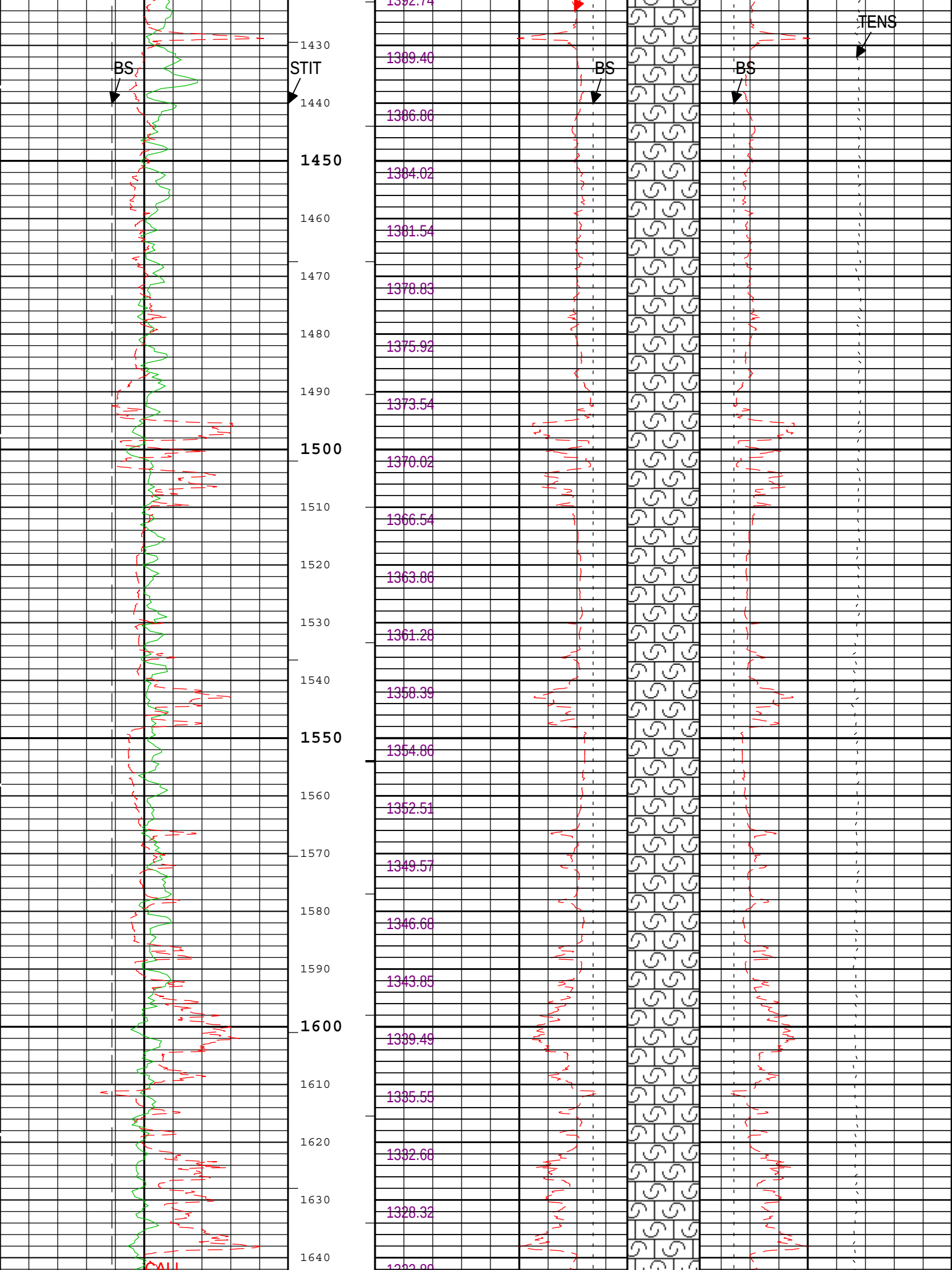
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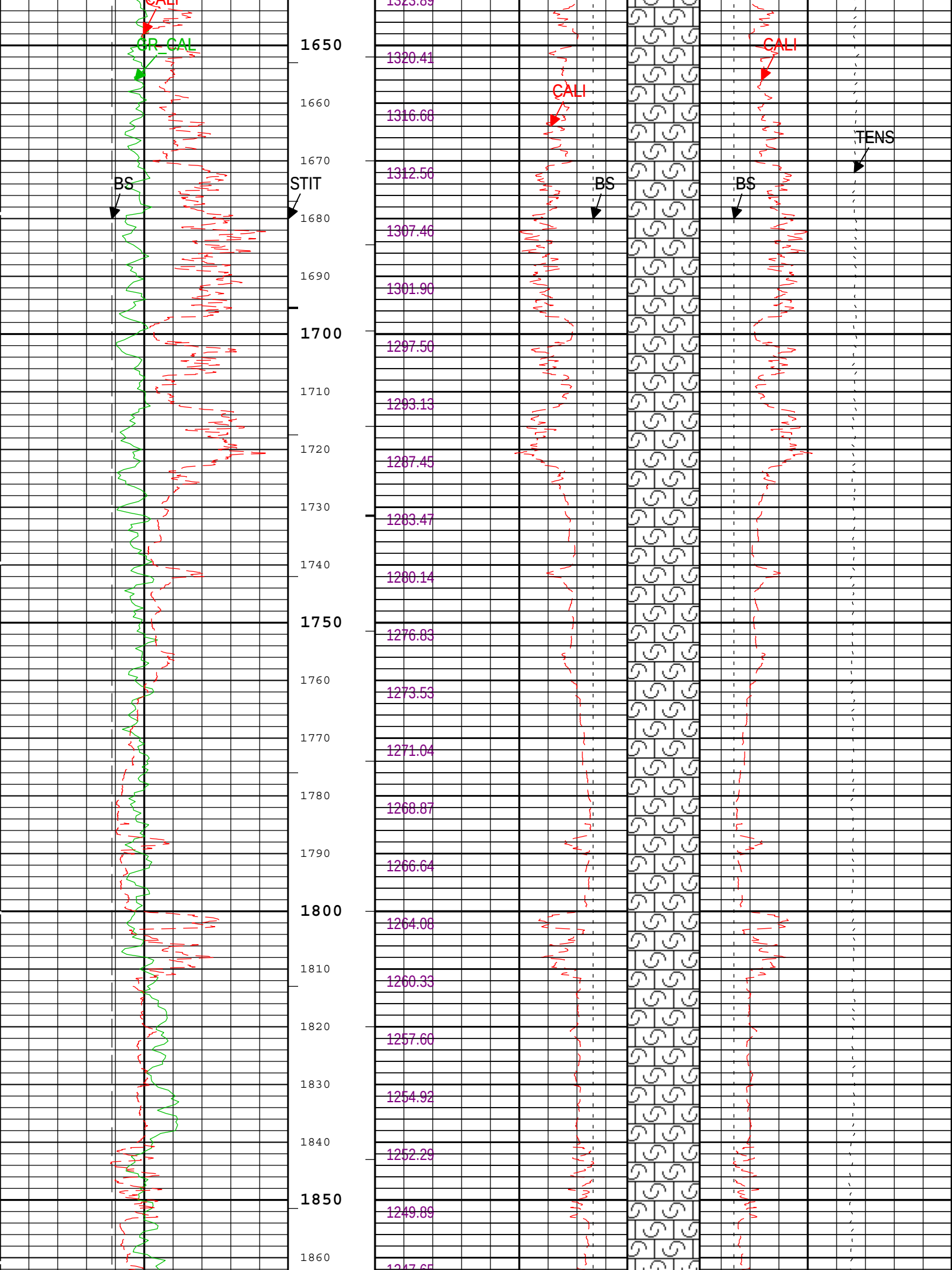
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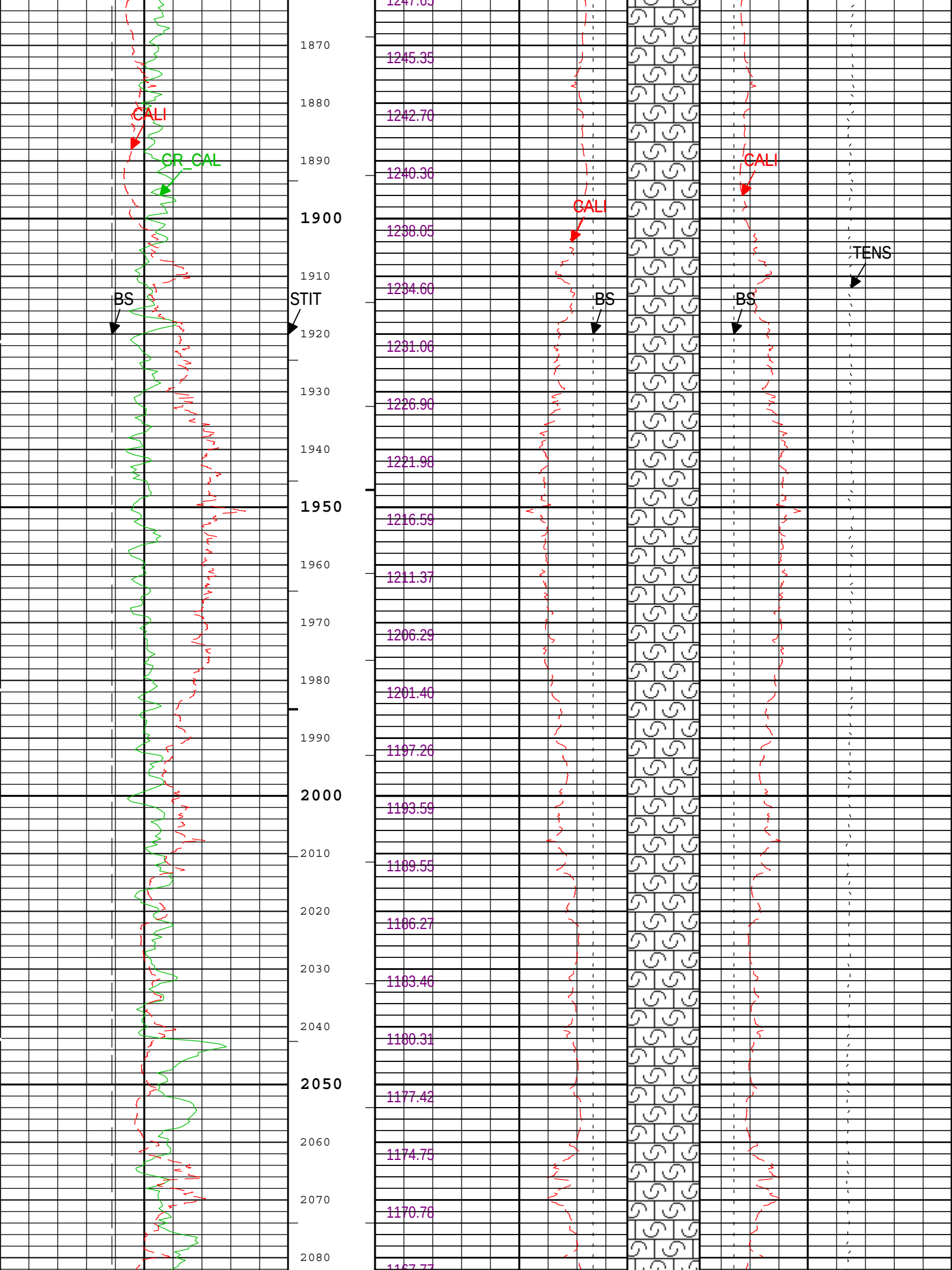
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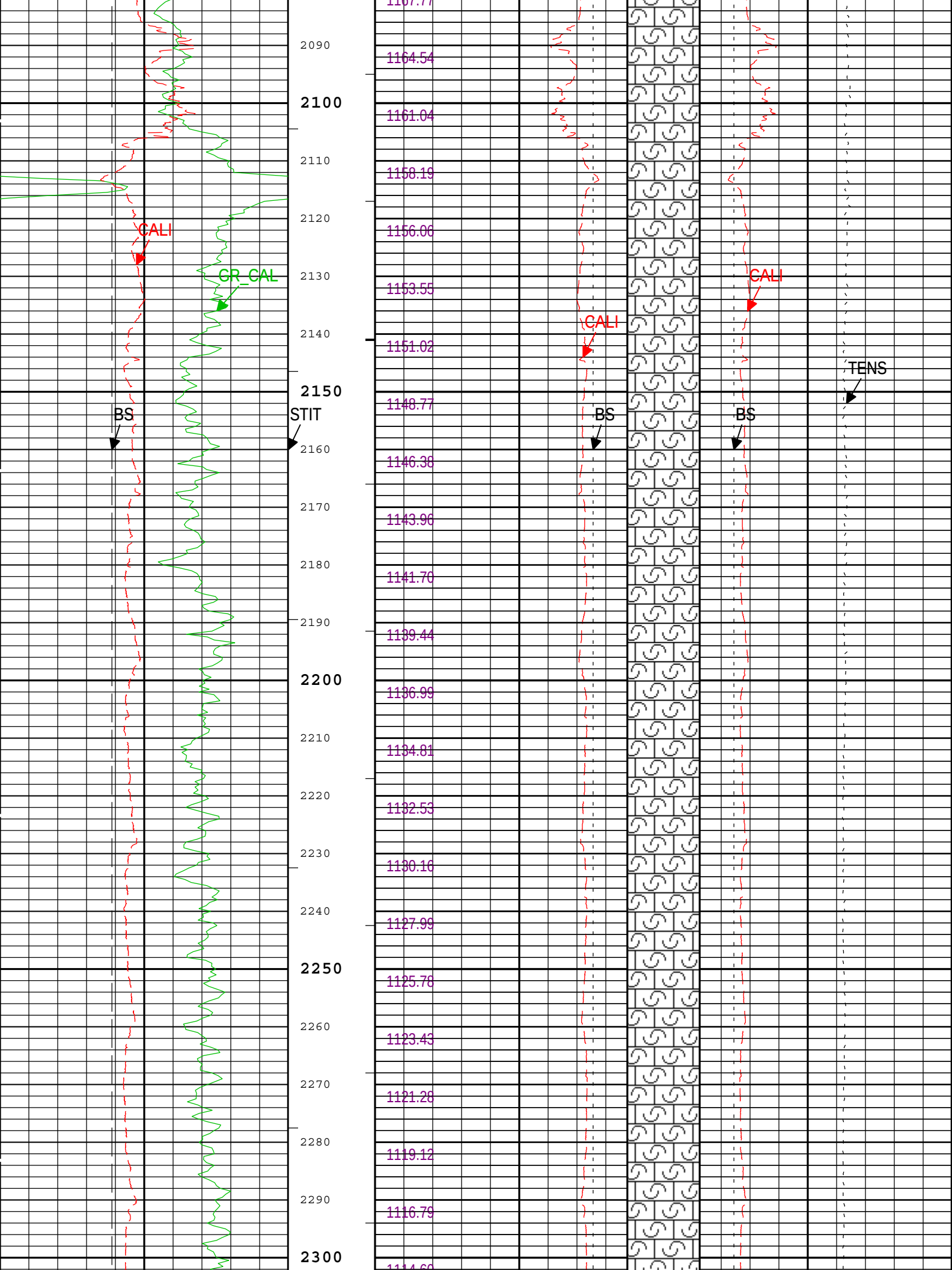
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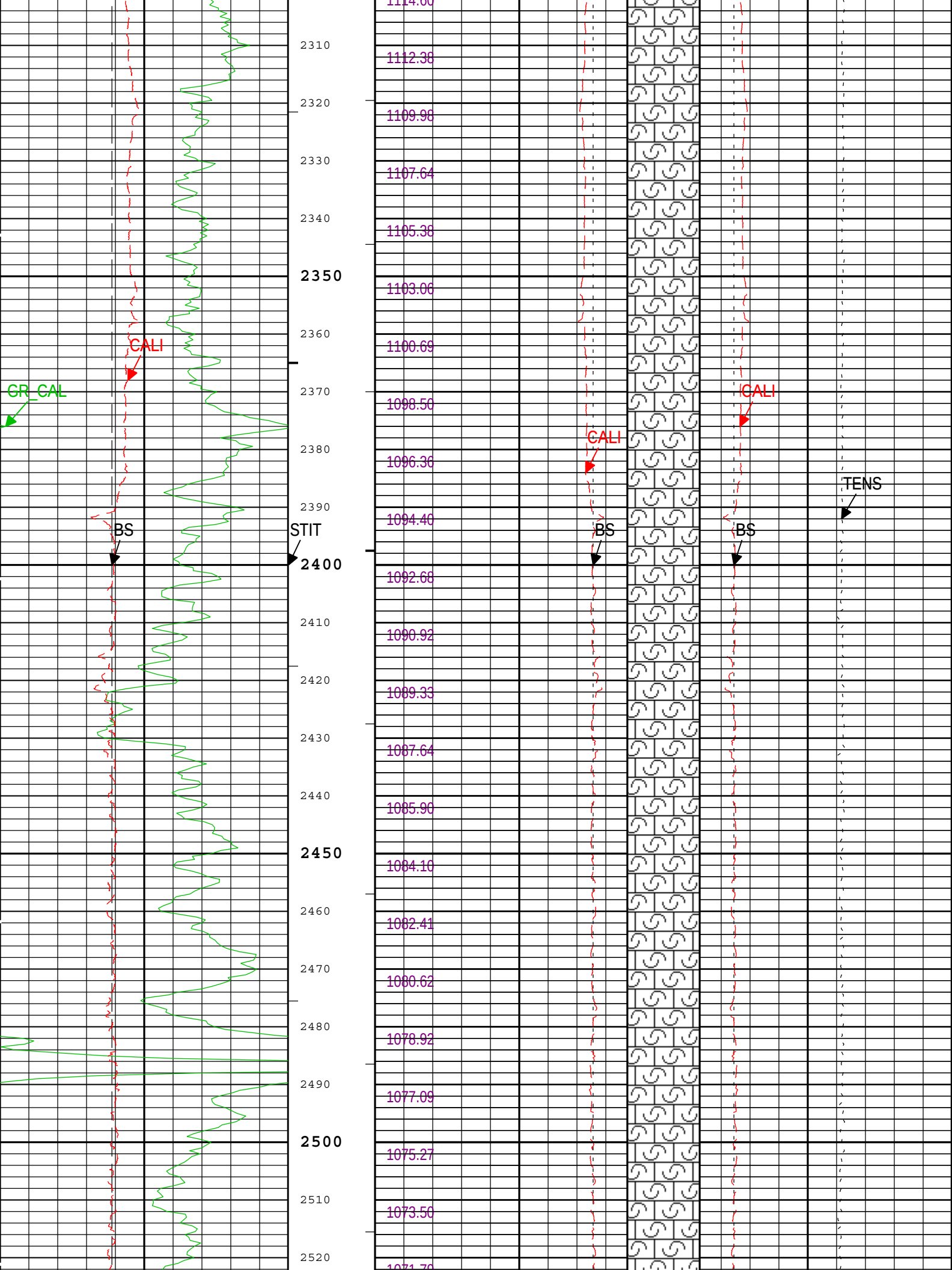
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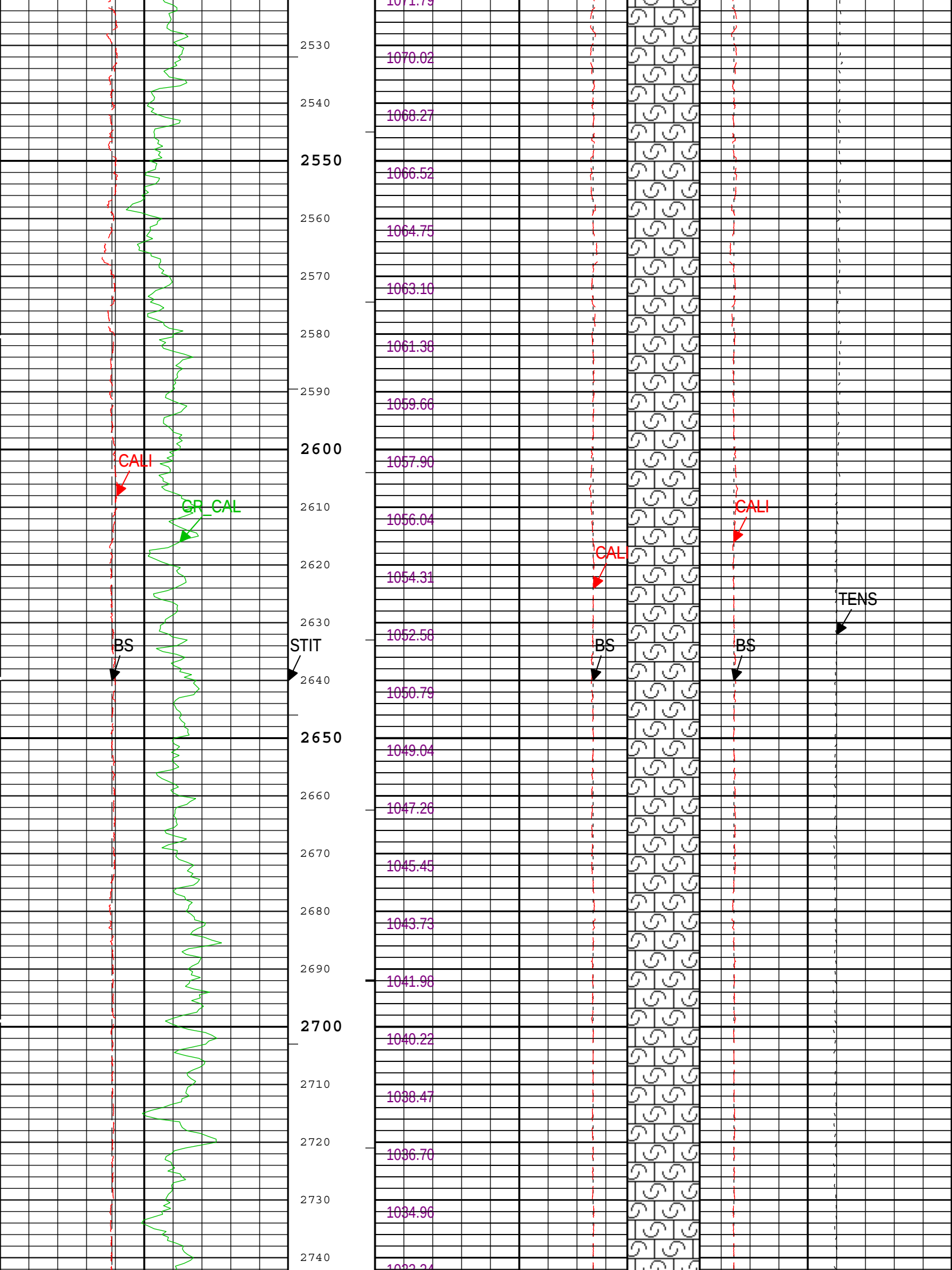
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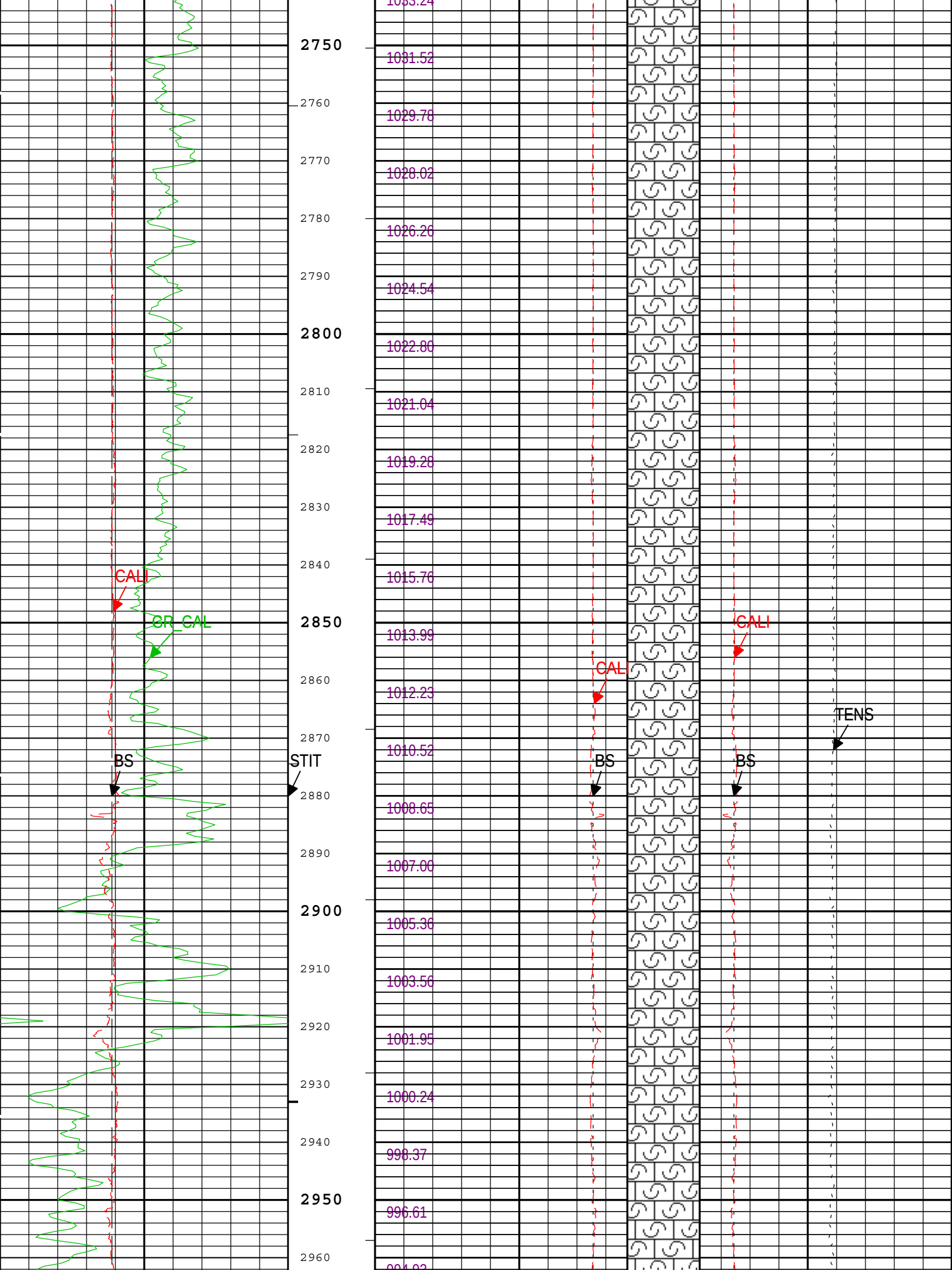
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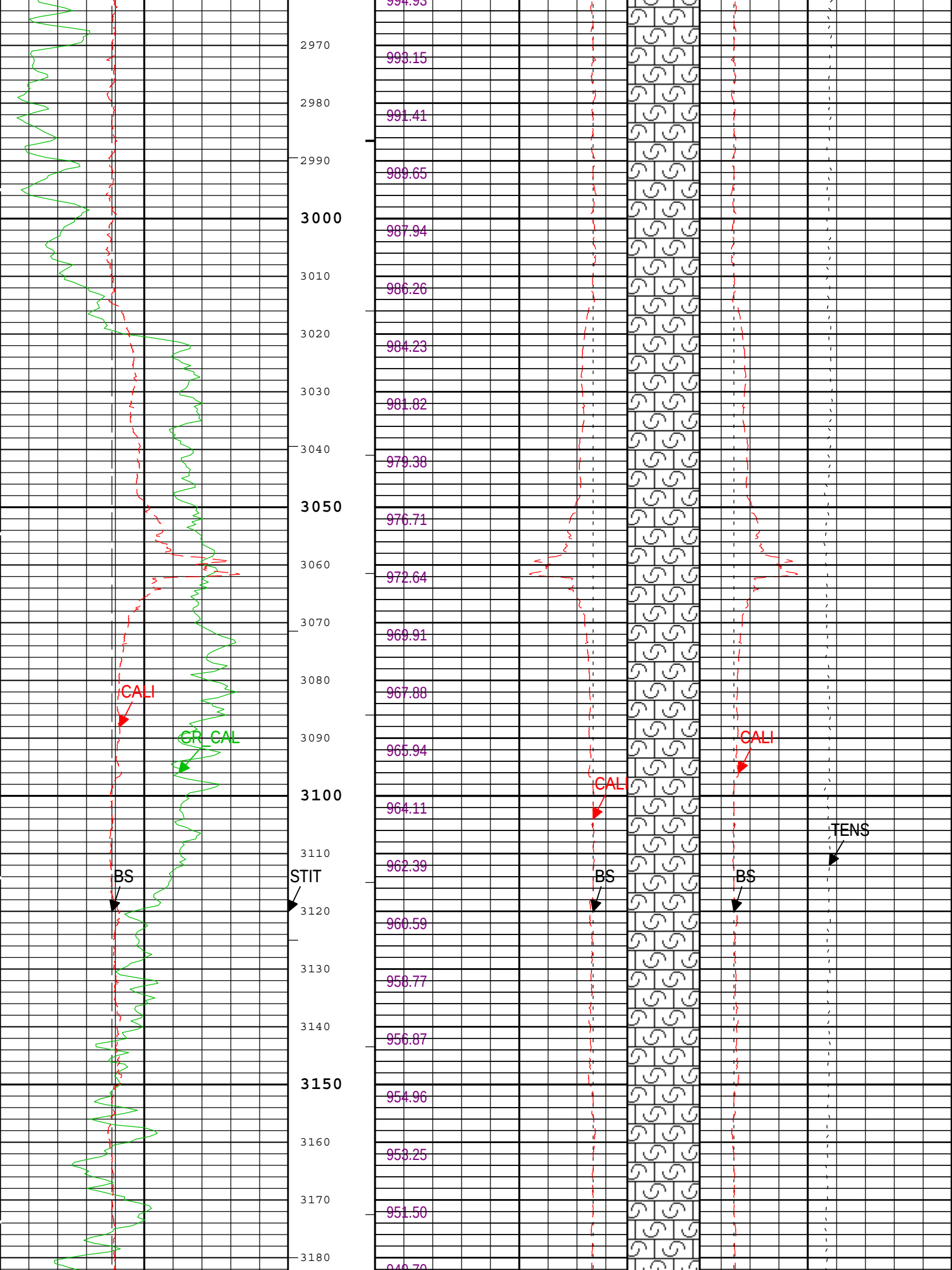
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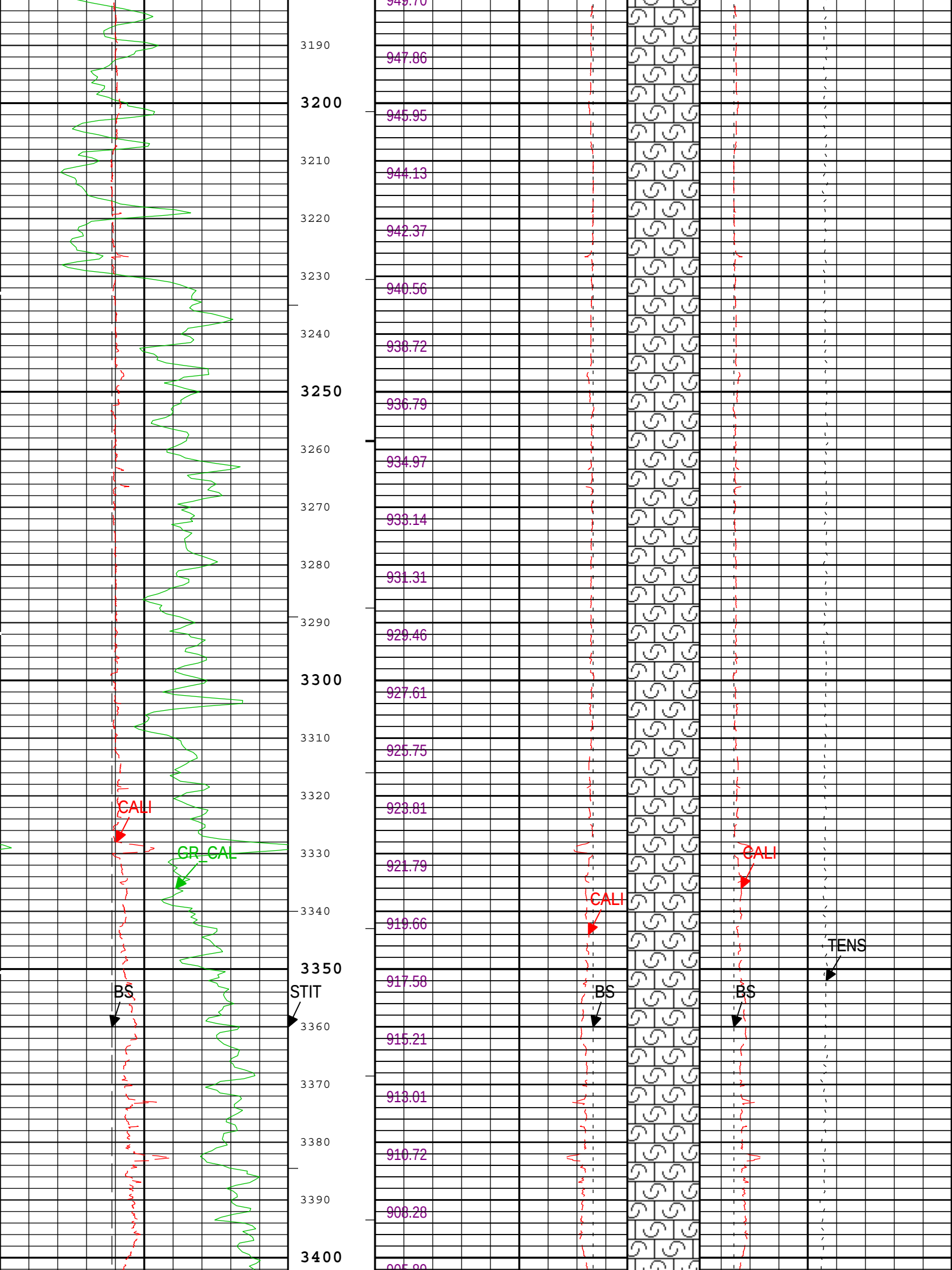
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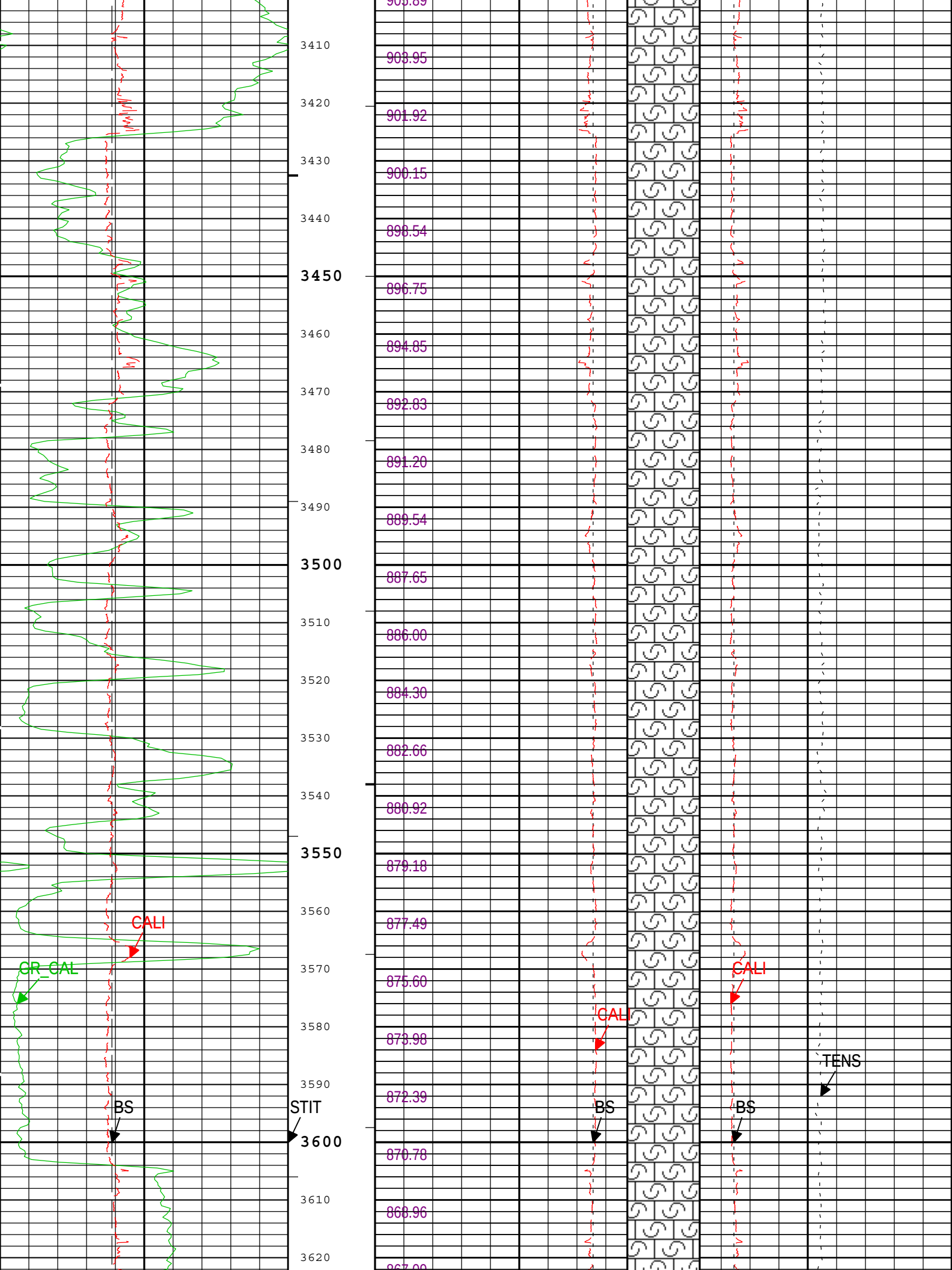
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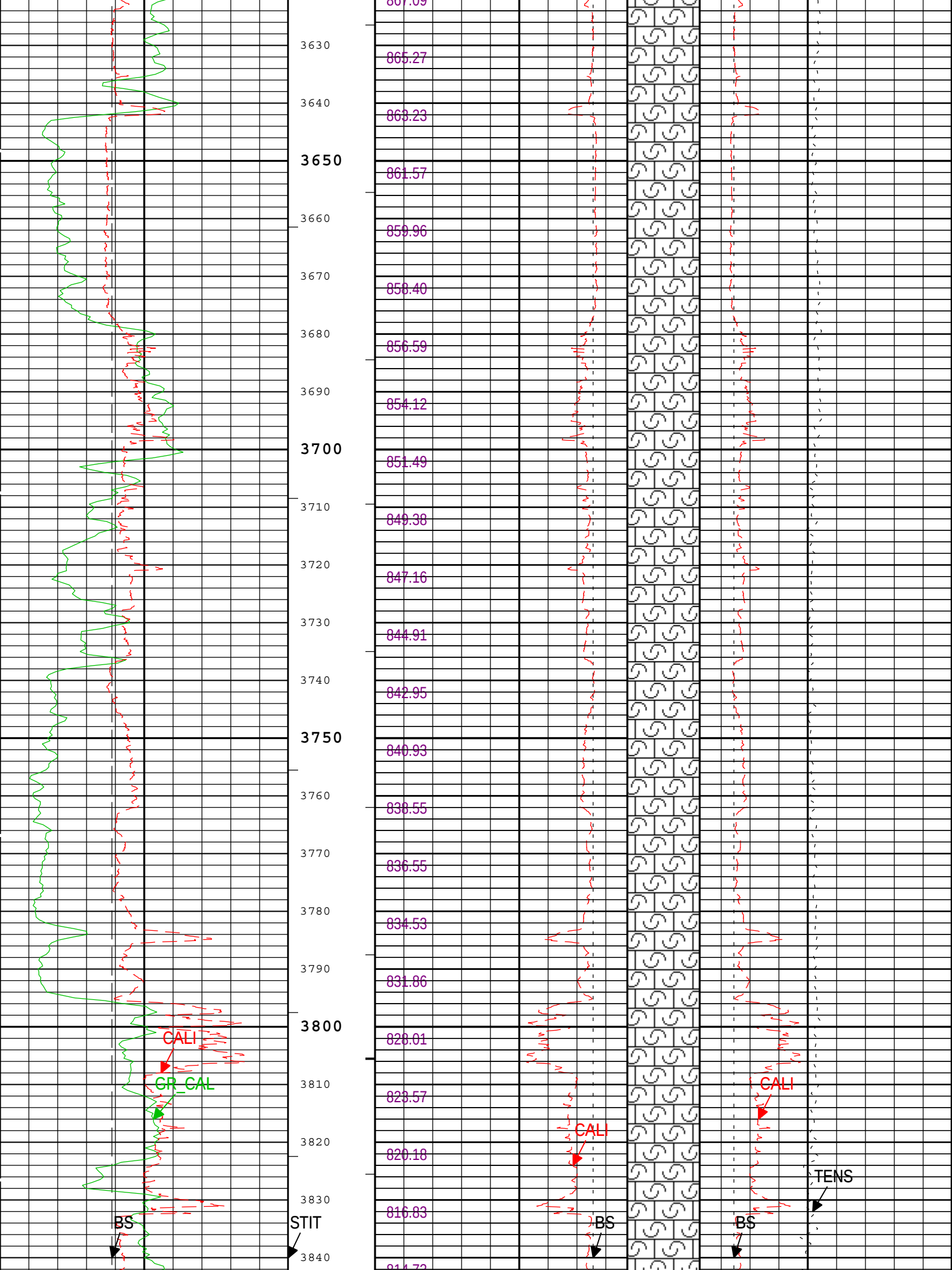
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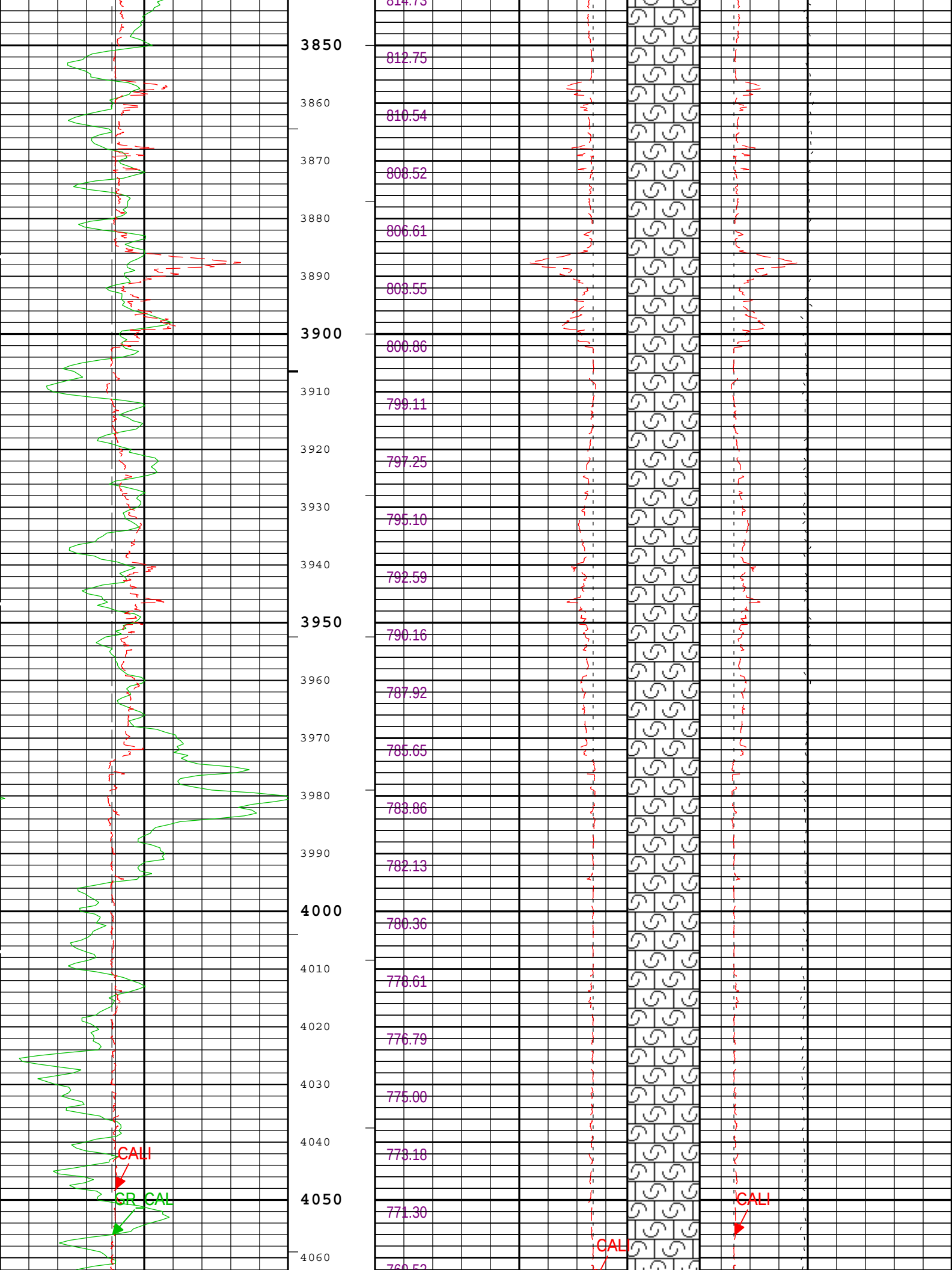
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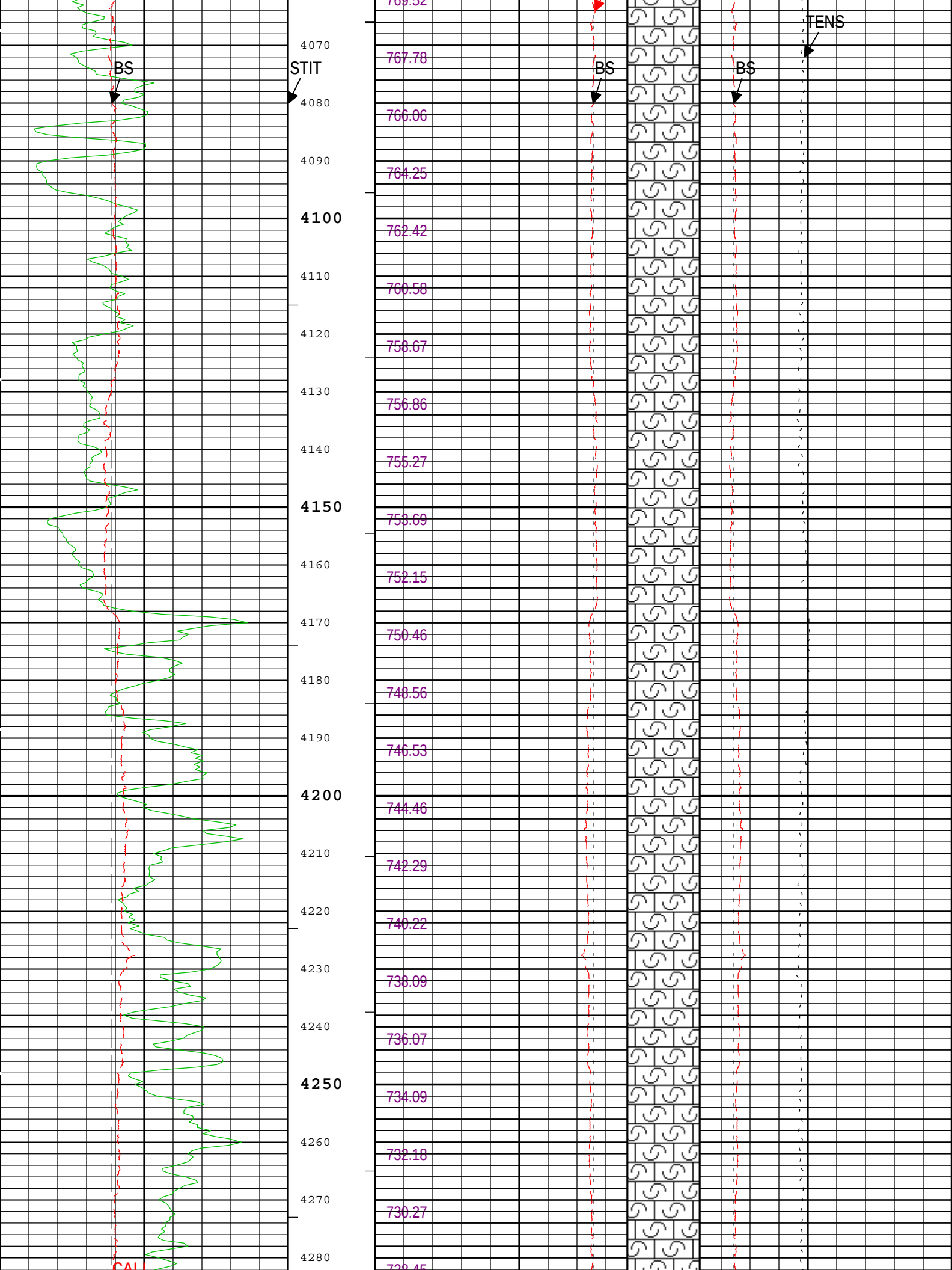
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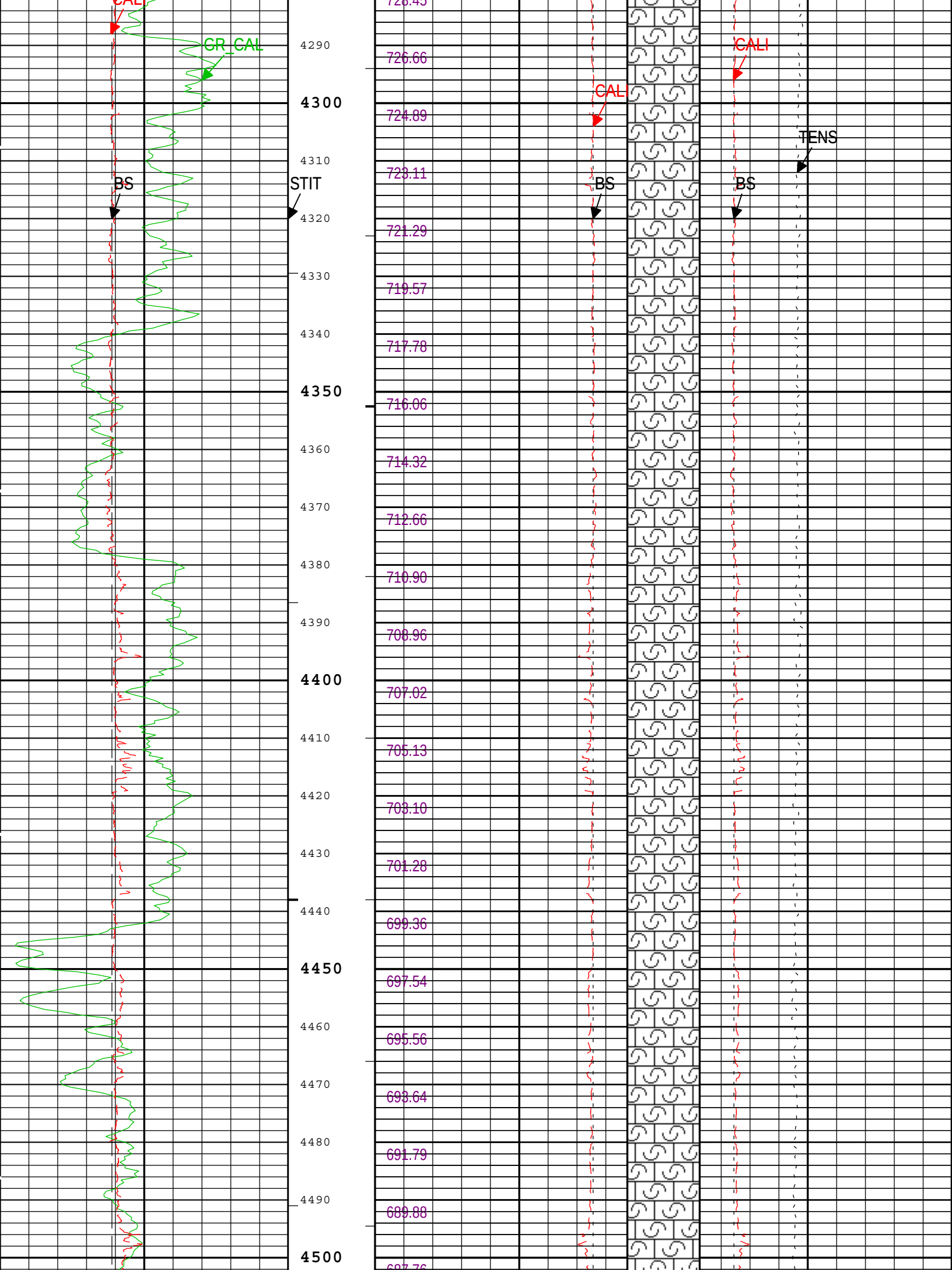
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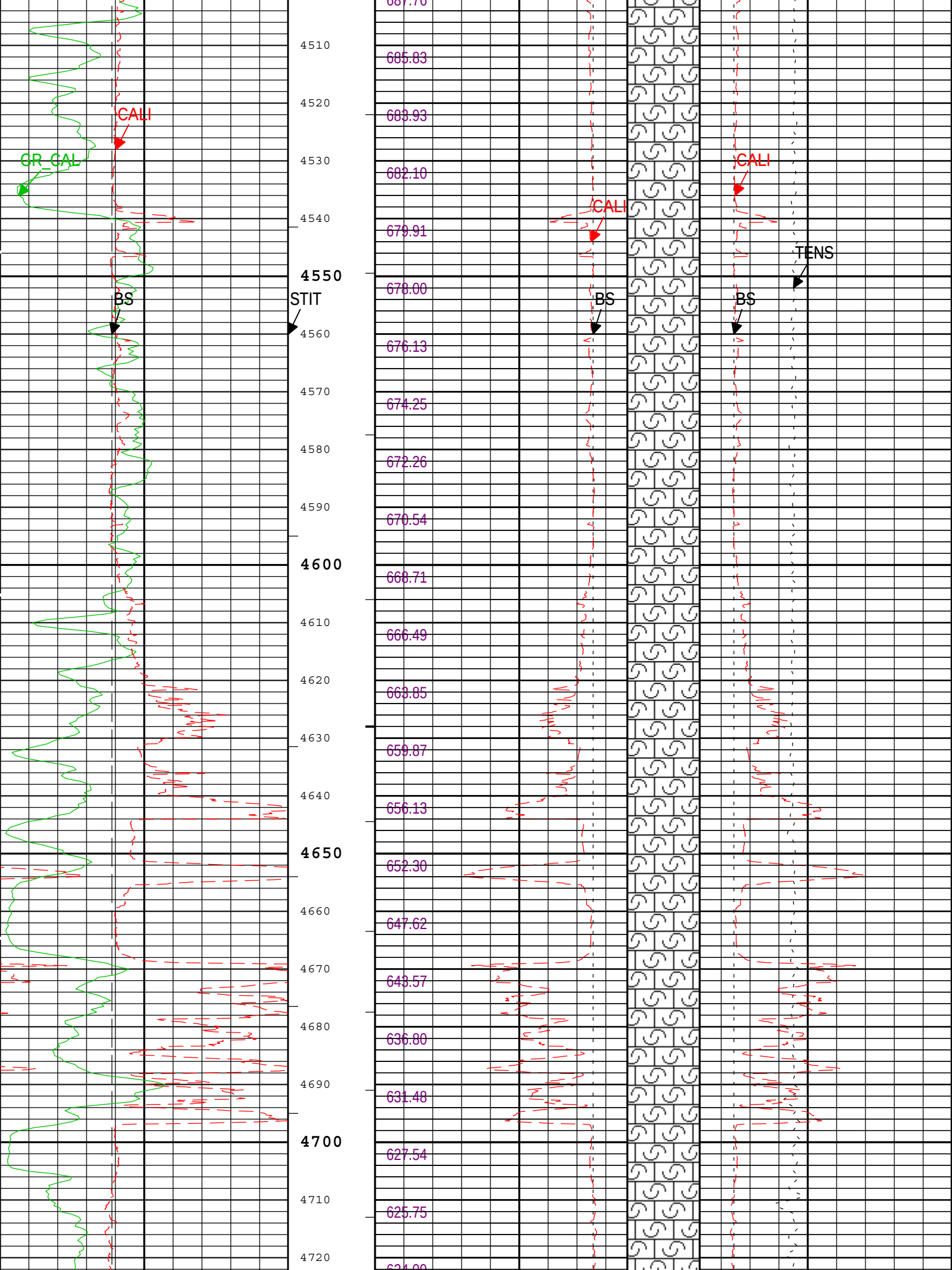
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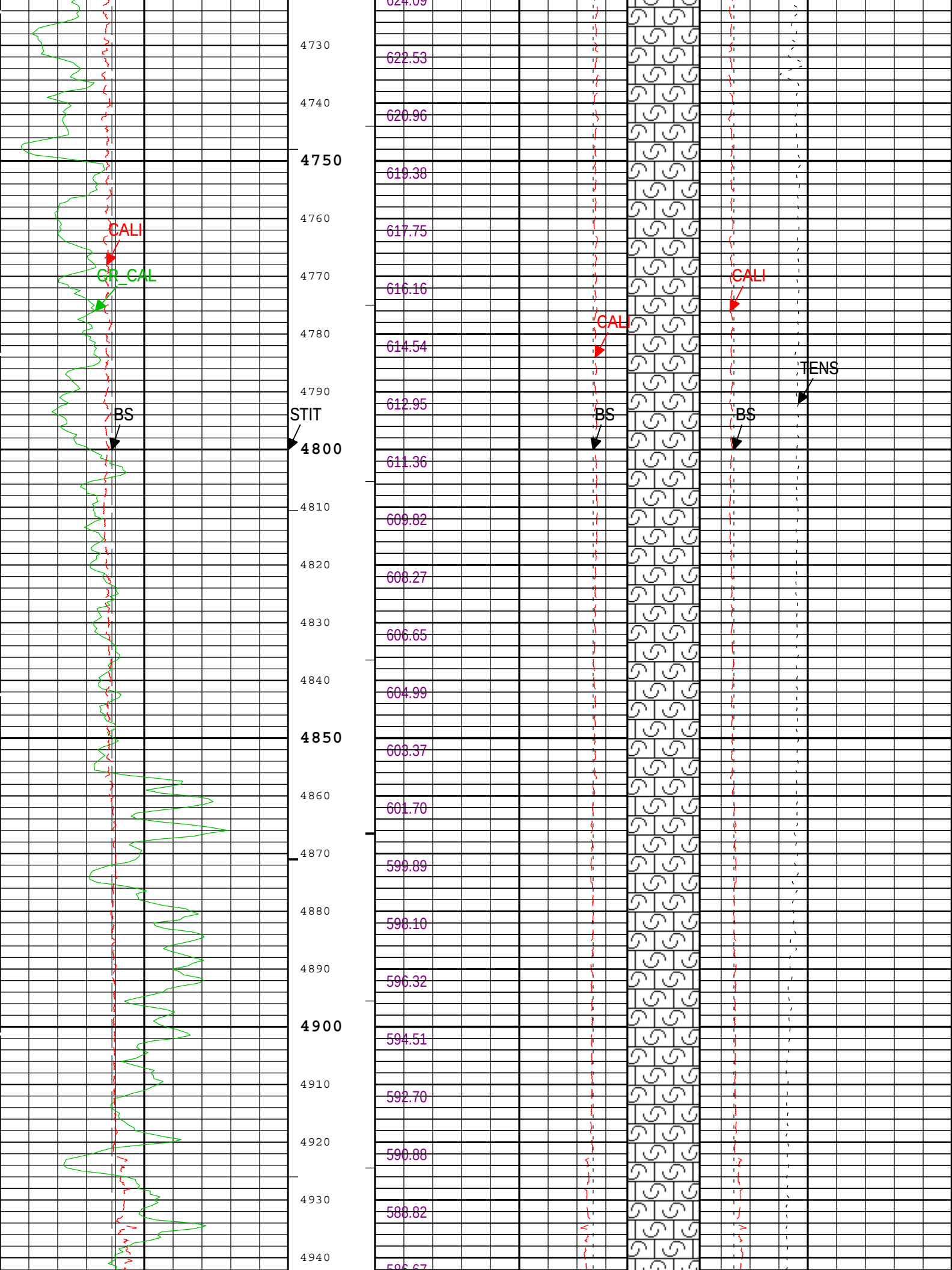
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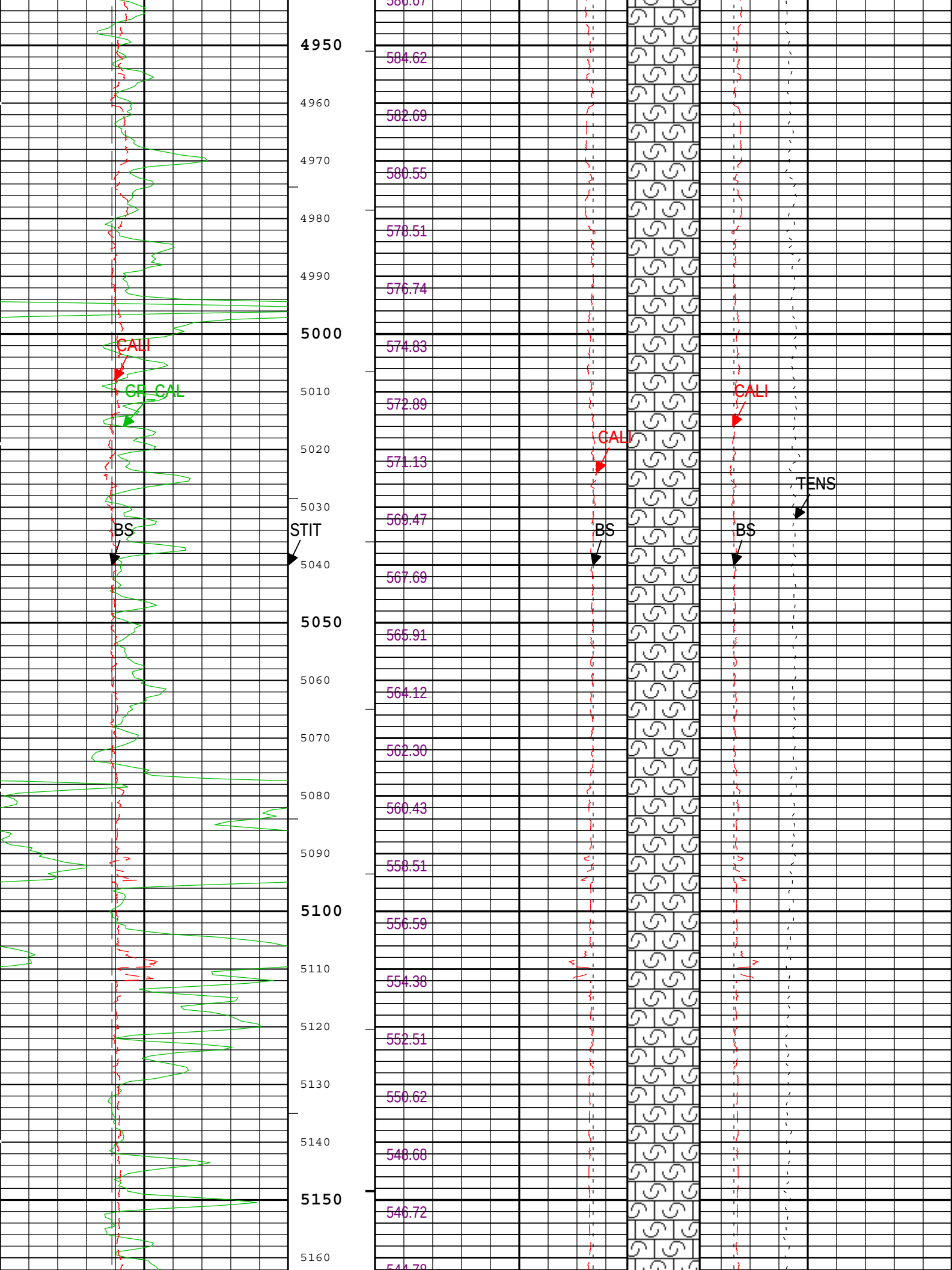
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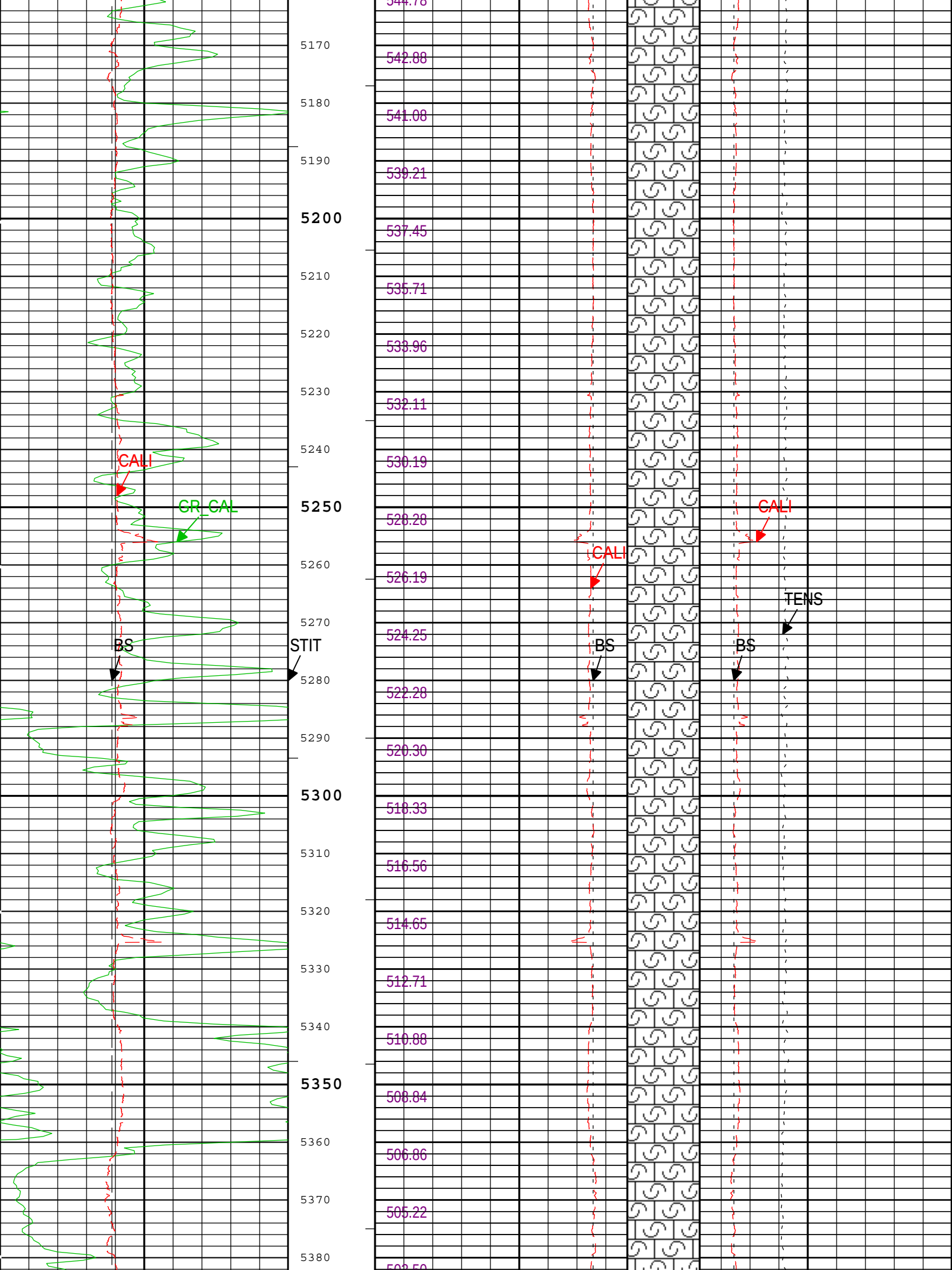
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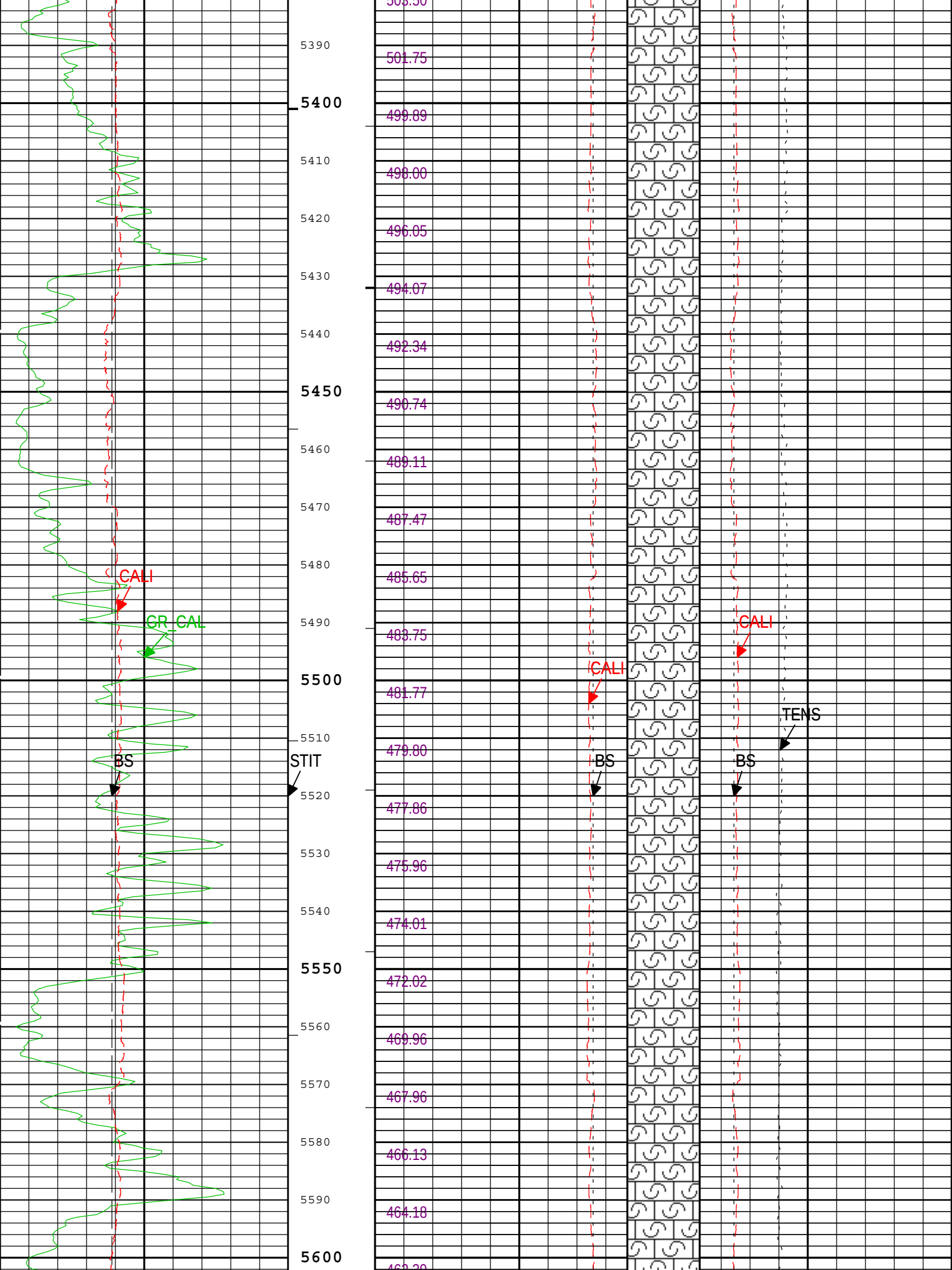
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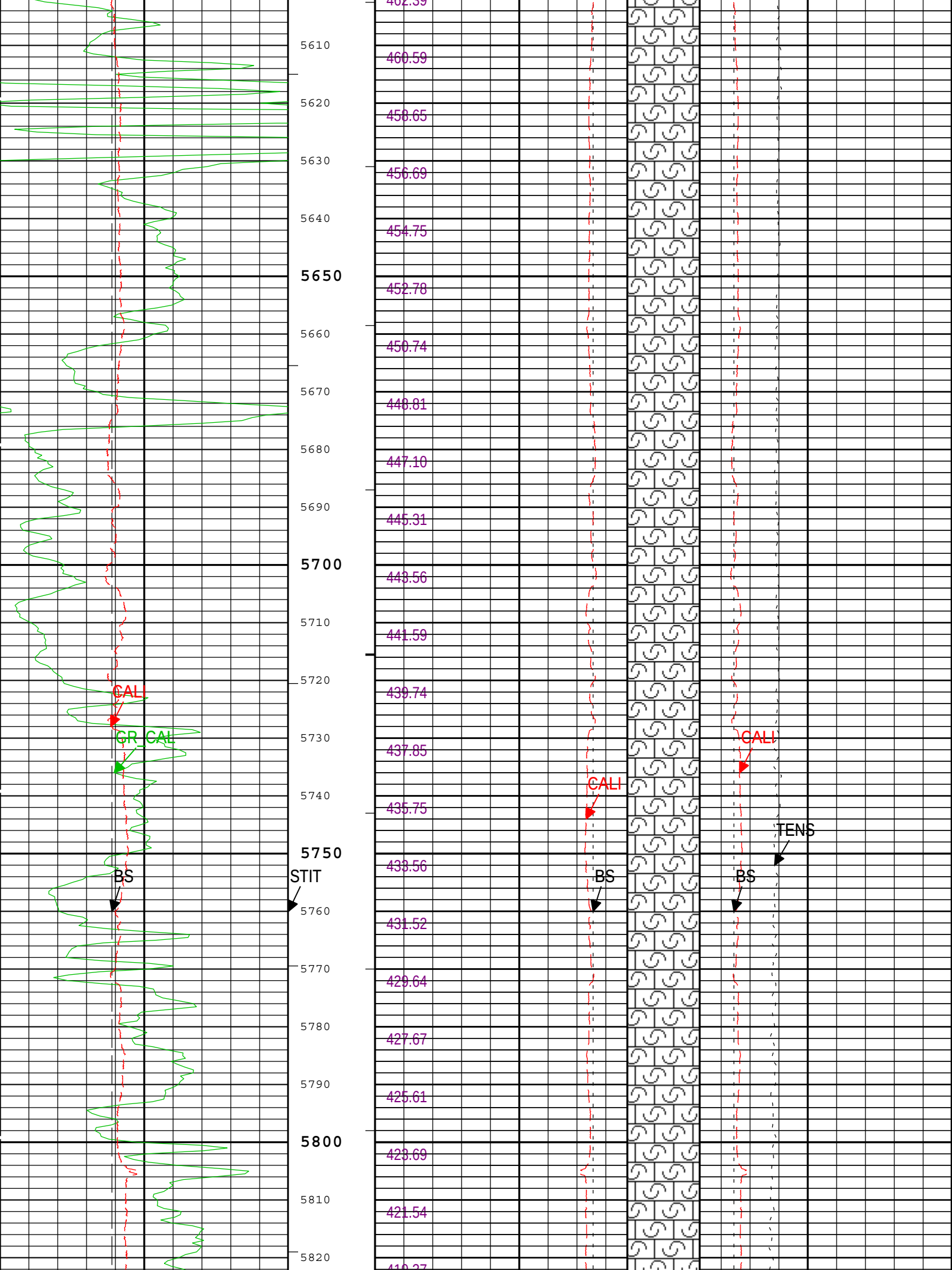
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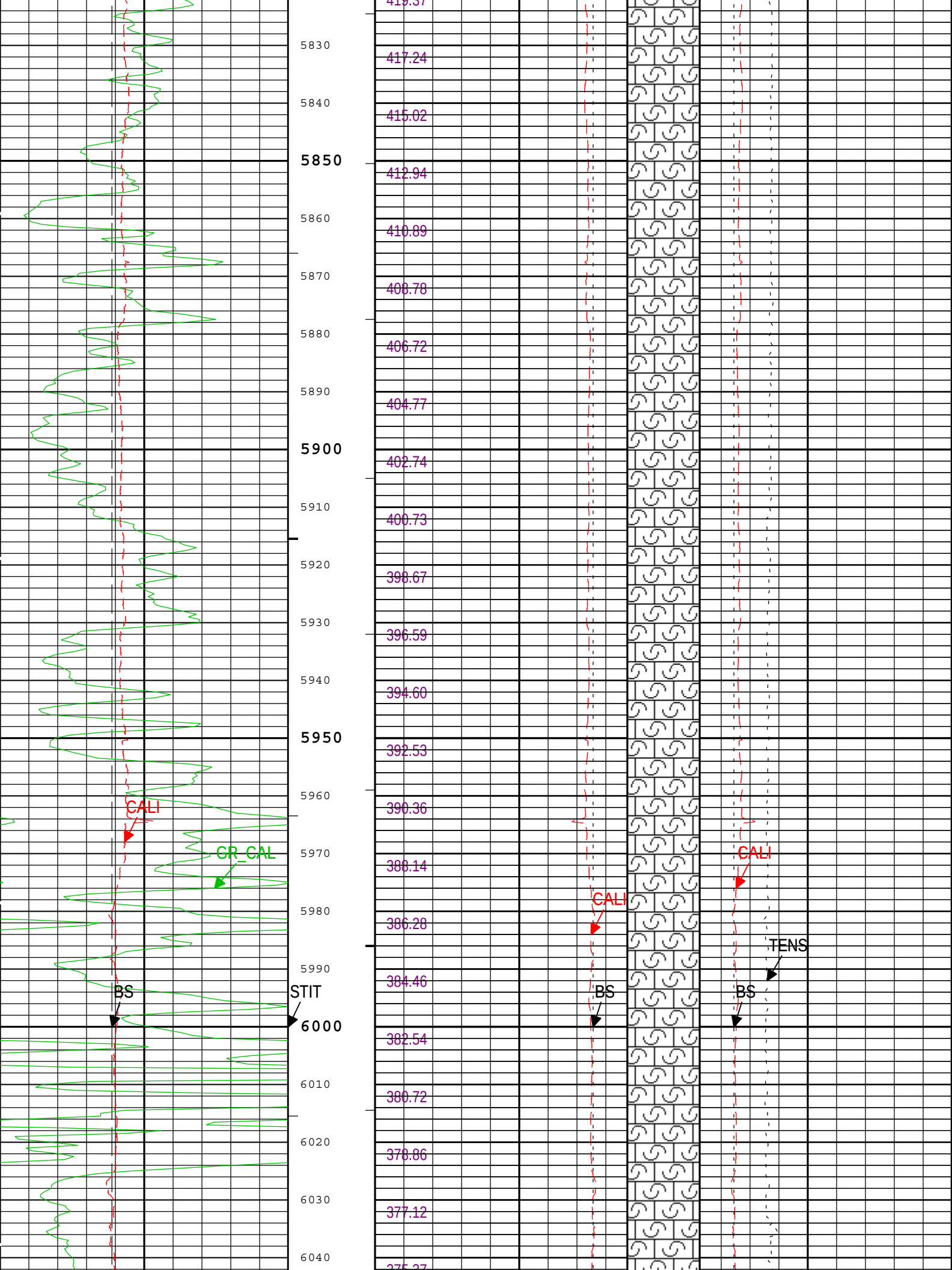
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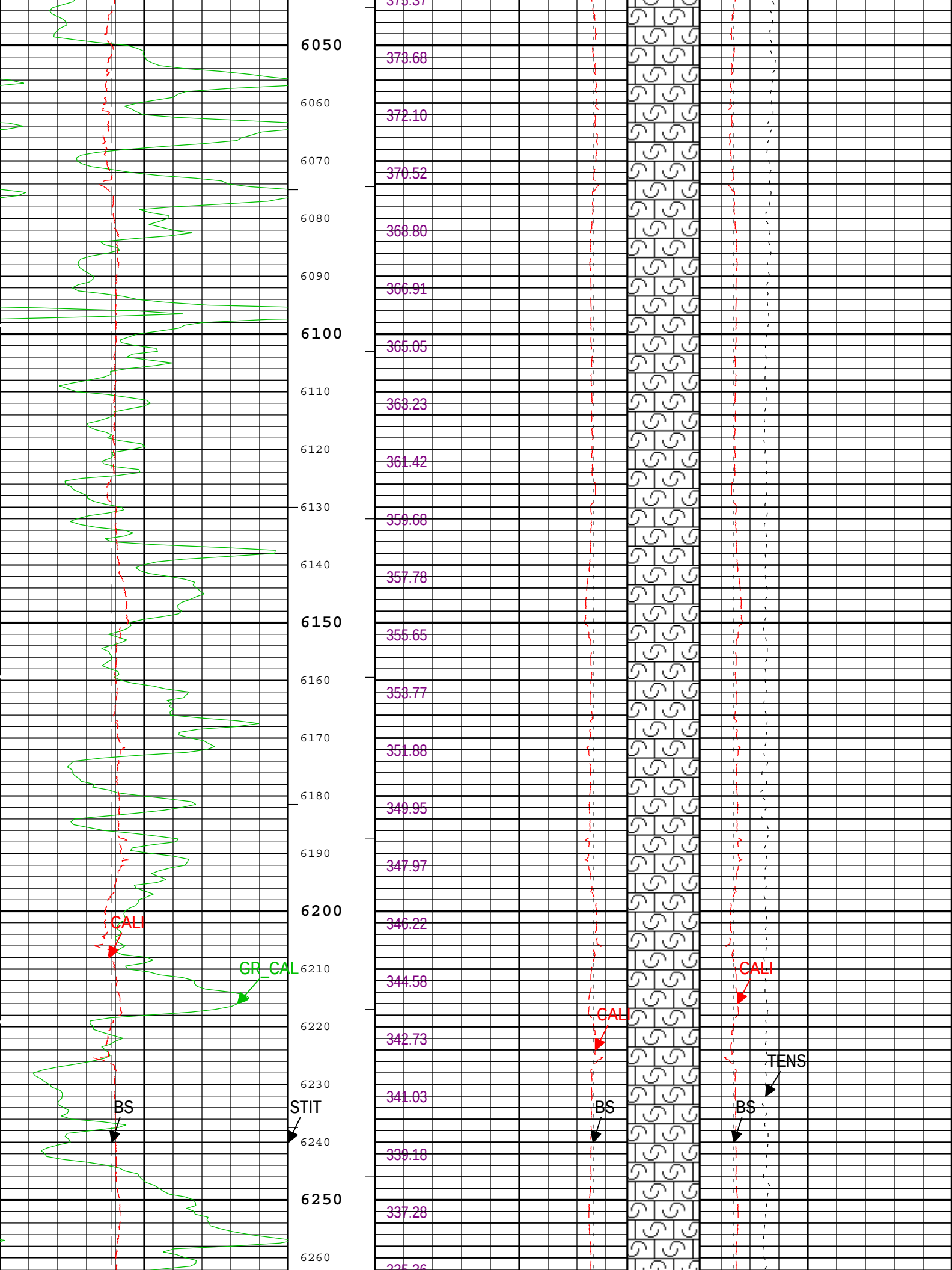
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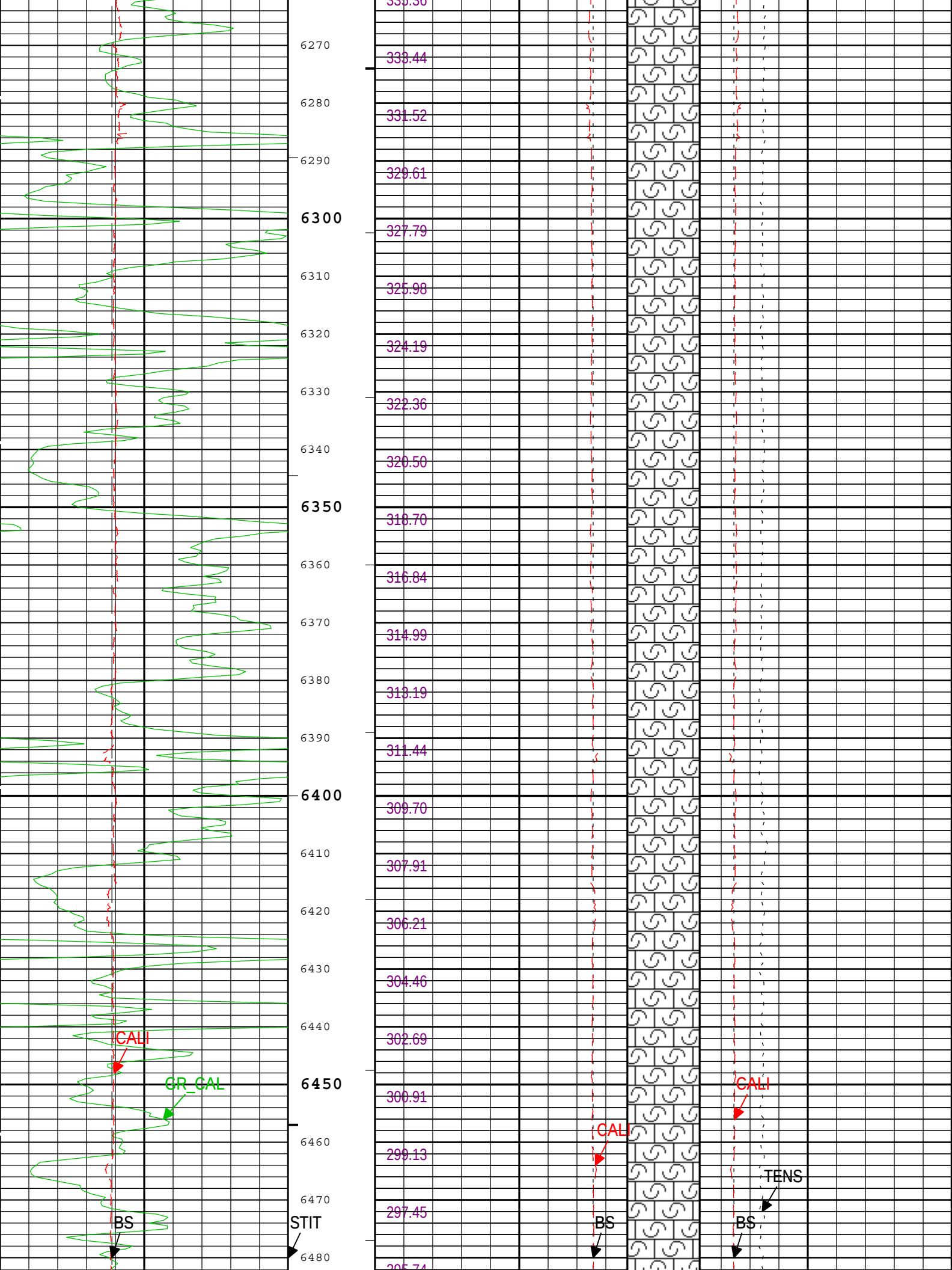
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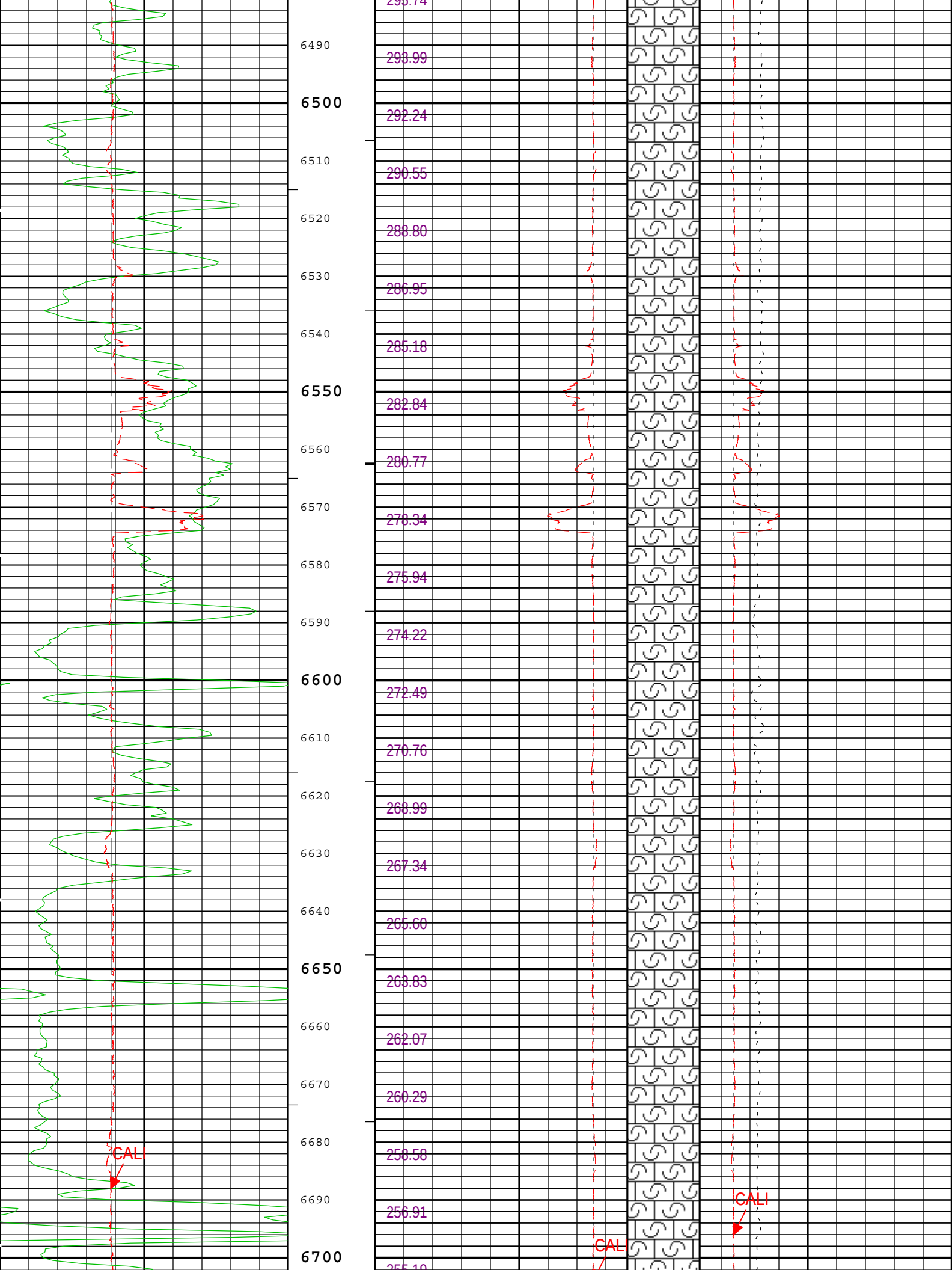
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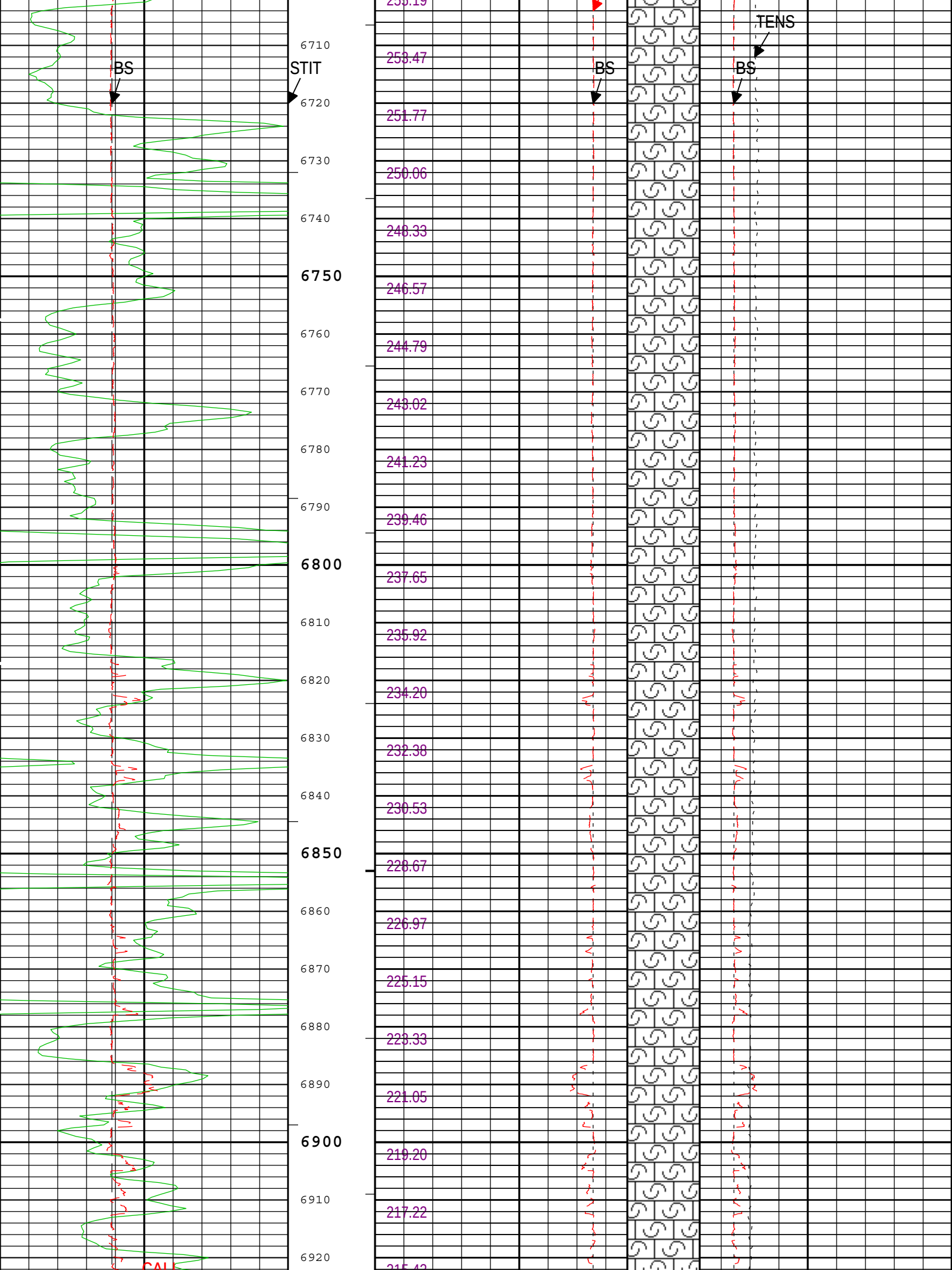
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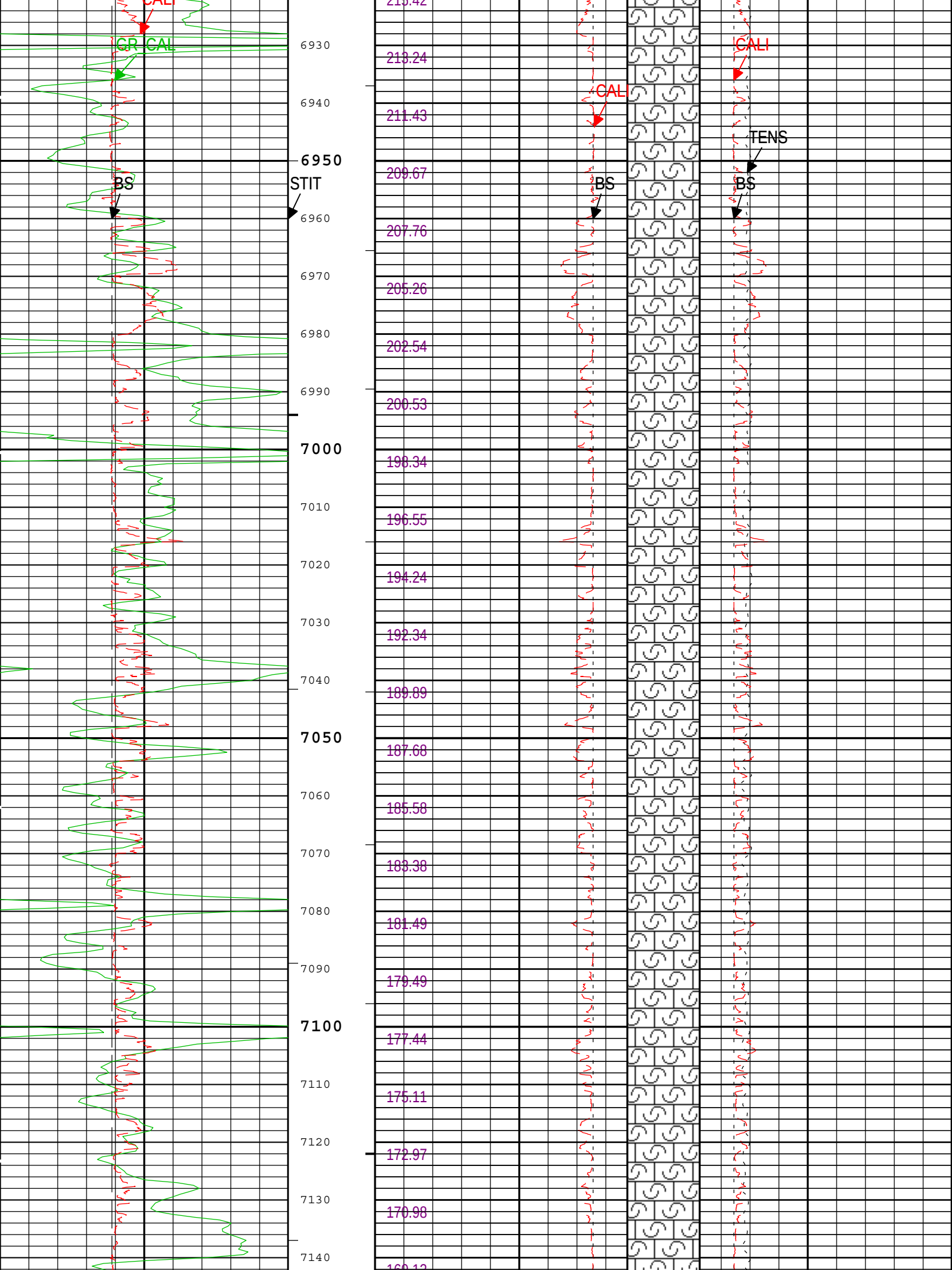
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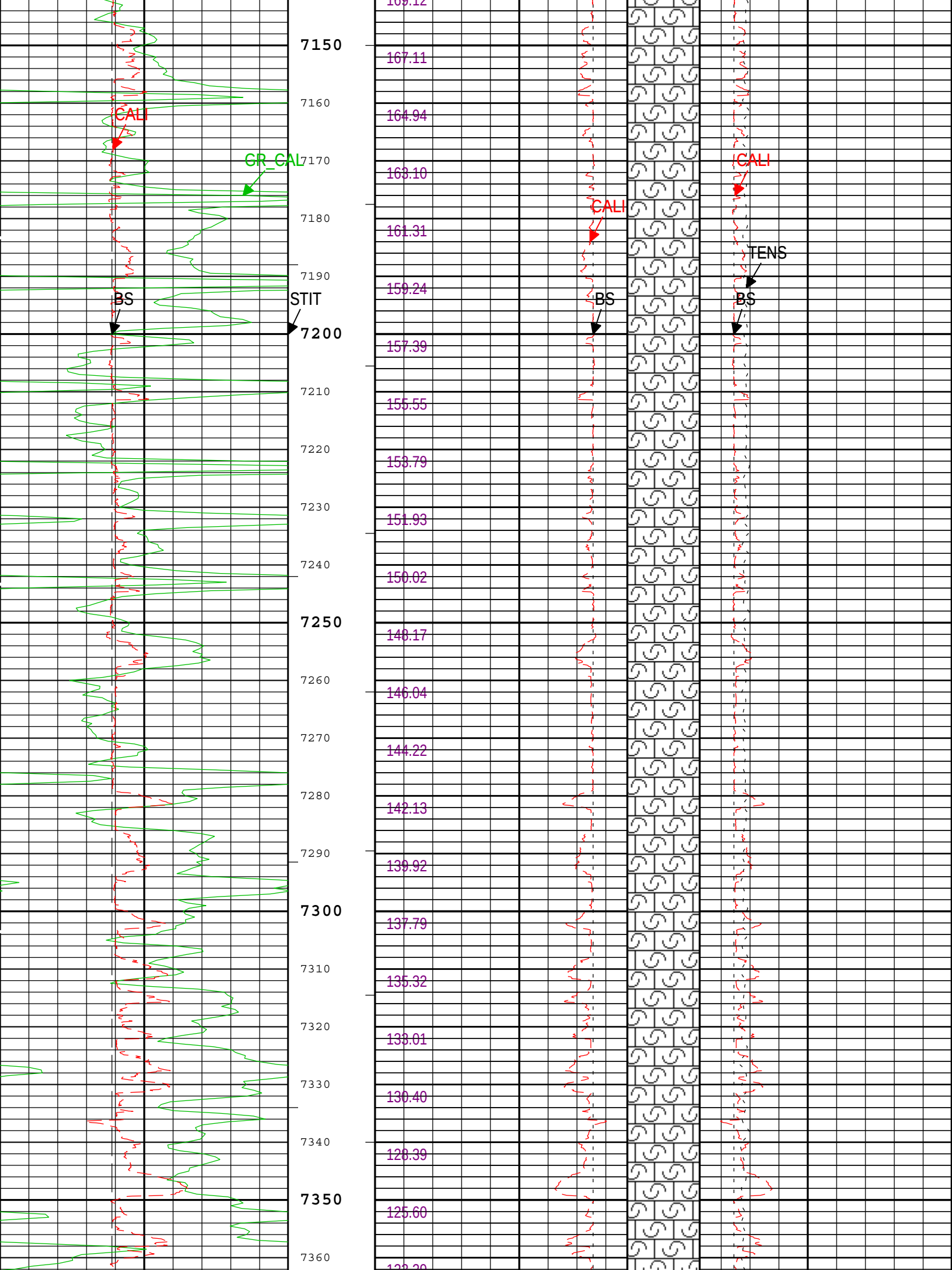
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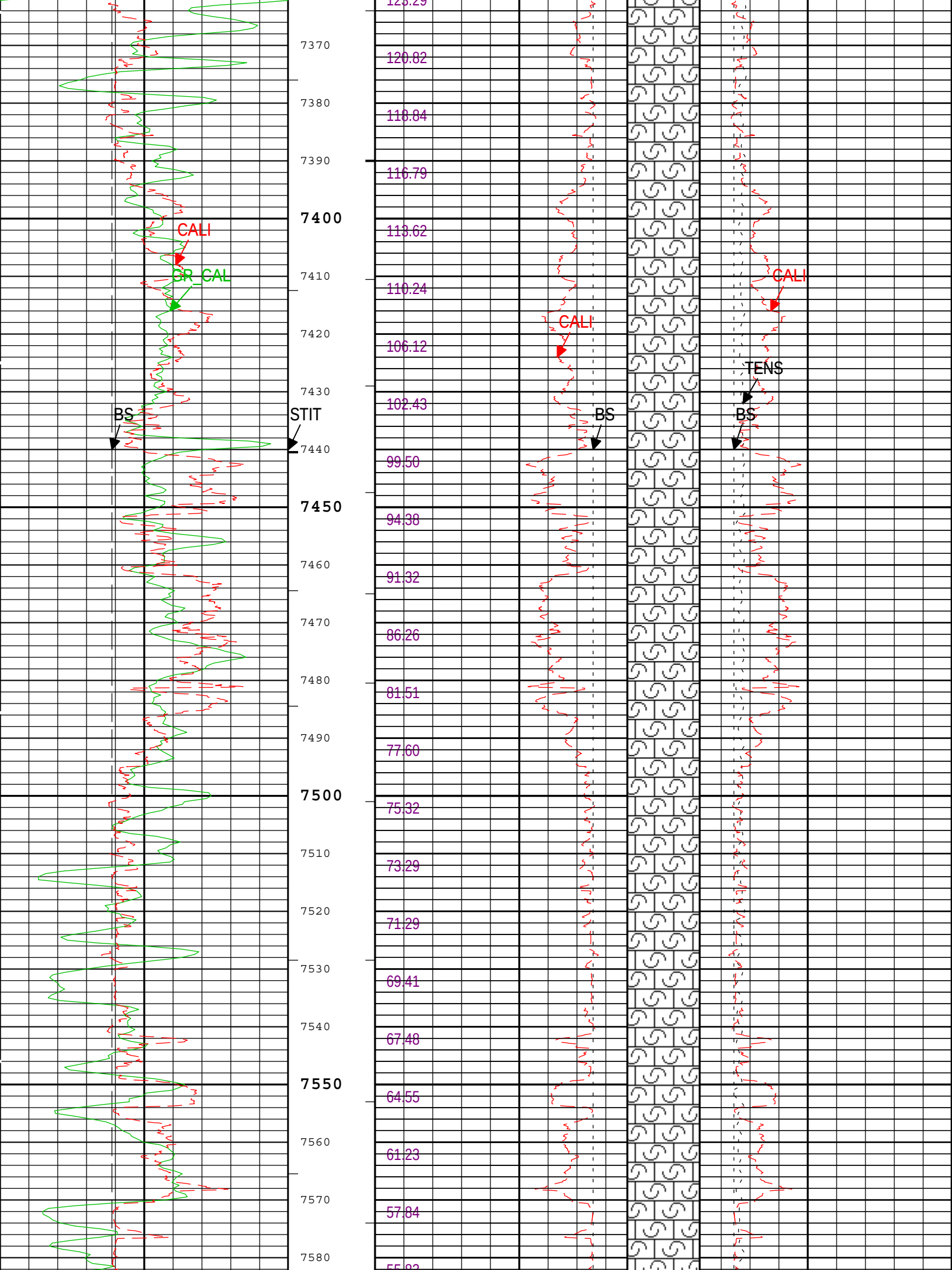
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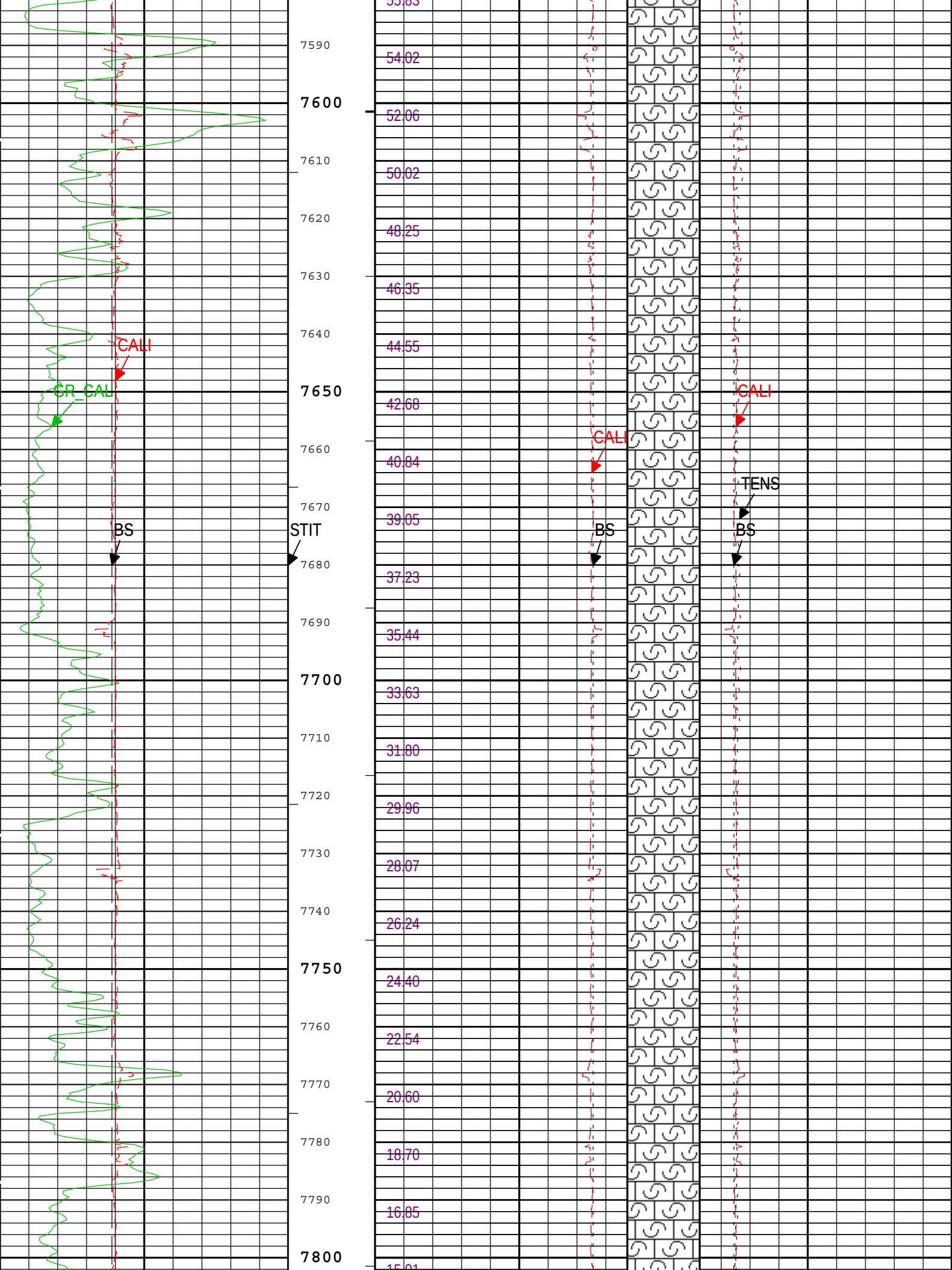
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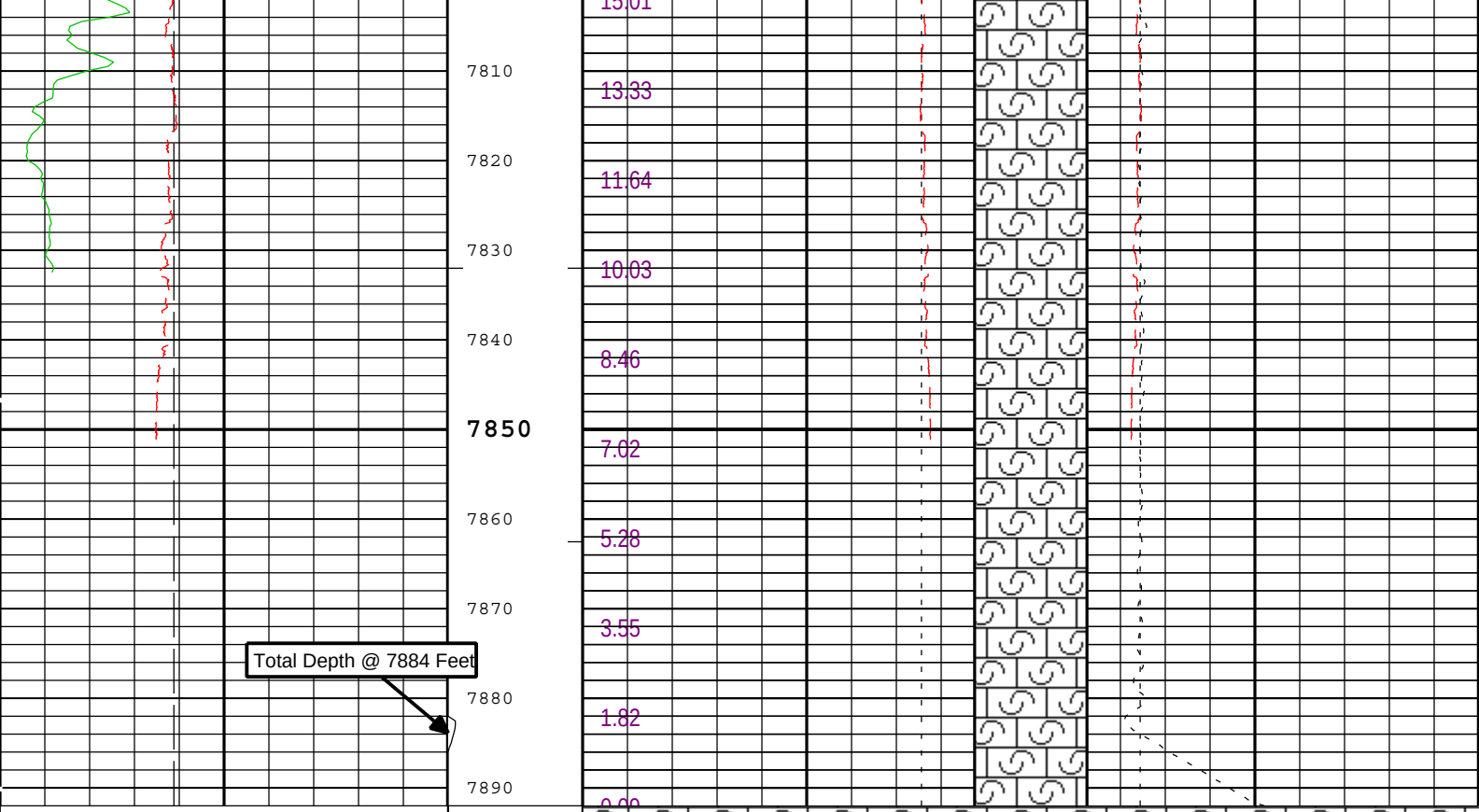

Bit Size (BS)
4 in 14

Calibrated Gamma Ray (GR_CAL) HGNS-H
0 gAPI 200

Caliper (CALI) HDRS-H
4 in 14

Stuck Tool Indicator, Total (STIT)
0 ft 50

FCD2-FCD3

Future Casing (Outer) Diameter (FCD)
-17 in 23

Future Casing (Outer) Diameter (FCD)
23 in -17

Bit Size (BS)
23 in 3

Bit Size (BS)
3 in 23

Caliper (CALI) HDRS-H
23 in 3

Cable Tension (TENS)
5000 lbf 0

Integrated Cement Volume (ICV)
ft3

Caliper (CALI) HDRS-H
3 in 23

ICV - Integrated Cement Volume every 10.00 (ft3)

IHV - Integrated Hole Volume every 10.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

ICV - Integrated Cement Volume every 100.00 (ft3)

IHV - Integrated Hole Volume every 100.00 (ft3)

Description: Format: Log (Noble East Caliper) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 26-Sep-2012 12:26:53

Channel Processing Parameters

Parameter	Description	Tool	Value	Unit
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.273	in
CBLO	Casing Bottom (Logger)	WLSESSION	342	ft
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	8.625	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	

FCD	Future Casing (Outer) Diameter	WLSESSION	5.5	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	
TD	Total Measured Depth	Borehole	7884	ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	12.25	310	342
BS	7.875	342	7892

All depth are actual.

Tool Control Parameters

Parameter	Description	Tool	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

Calibration Report

HDRS-H (HILT Density and Rxo Sonde, 150 degC) Calibration - Run 1

Primary Equipment :

HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	5705
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	3816

Auxiliary Equipment :

HRDD Backscatter Detector	Backscatter	
HRDD Long Spacing Detector	Long Spacing	28732
HRDD Short Spacing Detector	Short Spacing	27634
Cesium 137 Gamma-Ray Logging Source	GSR-J	5240
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	5705
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	4706

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): 12:01:23 25-Sep-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Small Ring	in	Before	8.00	6.00	8.83	10.00
Large Ring	in	Before	12.00	9.00	13.08	15.00

HDRS Density Calibration - Inversion Results

Master (EEPROM): 05:11:40 26-Aug-2012 Expired by 1 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Rho Aluminum	g/cm3	Master	2.596	2.586	2.597	2.606
Rho Magnesium	g/cm3	Master	1.686	1.676	1.687	1.696
Pe Aluminum		Master	2.570	2.470	2.552	2.670
Pe Magnesium		Master	2.650	2.550	2.628	2.750

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 05:11:40 26-Aug-2012 Expired by 1 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Average Deviation	%	Master	0	-0.6000	0.4613	0.6000
BS Max Deviation	%	Master	0	-1.6000	0.9746	1.6000
SS Average Deviation	%	Master	0	-1.0000	0.3374	1.0000
SS Max Deviation	%	Master	0	-2.5000	1.1245	2.5000
LS Average Deviation	%	Master	0	-1.5000	0.6985	1.5000
LS Max Deviation	%	Master	0	-3.5000	2.2980	3.5000

HDRS Density Calibration - Background Summary

Master (EEPROM): 05:11:40 26-Aug-2012 Expired by 1 days Before (Measured): 11:57:59 25-Sep-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Window Ratio		Master	1.0000		0.7499	
		Before	0.7499	0.7124	0.7499	0.7874

		Before-Master	-----	-----	0.0000	-----	
BS Window Sum	1/s	Master	1		25953		
		Before	25953	24655	26182	27251	
		Before-Master	-----	-----	229	-----	
SS Window Ratio		Master	1.0000		0.4795		
		Before	0.4795	0.4555	0.4809	0.5034	
		Before-Master	-----	-----	0.0014	-----	
SS Window Sum	1/s	Master	1		10352		
		Before	10352	9834	10328	10870	
		Before-Master	-----	-----	-24	-----	
LS Window Ratio		Master	1.0000		0.3019		
		Before	0.3019	0.2868	0.3003	0.3170	
		Before-Master	-----	-----	-0.0016	-----	
LS Window Sum	1/s	Master	1		1212		
		Before	1212	1151	1203	1272	
		Before-Master	-----	-----	-9	-----	

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 05:11:40 26-Aug-2012 Expired by 1 days Before (Measured): 11:57:59 25-Sep-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS PM High Voltage	V	Master		1000	1618	2400
		Before		1000	1632	2400
		Before-Master	-----	-100	14	100
SS PM High Voltage	V	Master		1000	1405	2400
		Before		1000	1413	2400
		Before-Master	-----	-100	8	100
LS PM High Voltage	V	Master		1000	1210	2400
		Before		1000	1223	2400
		Before-Master	-----	-100	13	100

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM): 05:11:40 26-Aug-2012 Expired by 1 days Before (Measured): 11:57:59 25-Sep-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Crystal Resolution	%	Master		5.00	11.39	25.00
		Before		5.00	11.40	25.00
		Before-Master	-----	-1.00	0.01	1.00
SS Crystal Resolution	%	Master		5.00	9.84	20.00
		Before		5.00	9.90	20.00
		Before-Master	-----	-1.00	0.06	1.00
LS Crystal Resolution	%	Master		5.00	8.07	20.00
		Before		5.00	8.15	20.00
		Before-Master	-----	-1.00	0.08	1.00

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured): 09:11:48 26-Sep-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Main Resistivity	ohm.m	Before	3875	3565	3880	4185
Deep Resistivity	ohm.m	Before	3830	3524	3810	4136
Shallow Resistivity	ohm.m	Before	3830	3524	3834	4136

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	4779

Auxiliary Equipment :

HGNS Accelerometer, 150 degC	HACCZ-H	5736
AmBe Neutron Logging Source	NSR-F	5168

Calibration Parameter :

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

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured): 08:17:00 26-Sep-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.0	32.8

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM): 00:00:00 15-Mar-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	-----	-----	8084.000	-----
Accelerometer Coefficients - 1		Master	-----	-----	-8.467	-----
Accelerometer Coefficients - 2		Master	-----	-----	0.009	-----
Accelerometer Coefficients - 3		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 4		Master	-----	-----	2.722	-----
Accelerometer Coefficients - 5		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 7		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 8		Master	-----	-----	298.700	-----
Accelerometer Coefficients - 9		Master	-----	-----	0.995	-----

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 11:55:48 10-Jul-2012 Before (Measured): 11:55:23 25-Sep-2012 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Near Zero Measurement	1/s	Master	0	5.0	25.2	40.0
		Before	0	5.0	25.2	40.0
		After	-----	-----	-----	-----
		Before-Master	-----	-3.8	0.0	3.8
		After-Before	-----	-----	-----	-----
Far Zero Measurement	1/s	Master	0	5.0	28.4	40.0
		Before	0	5.0	27.7	40.0
		After	-----	-----	-----	-----
		Before-Master	-----	-4.3	-0.7	4.3
		After-Before	-----	-----	-----	-----
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	5277.0	6900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	2204.0	2900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Near Corrected Plus Measurement - 0	1/s	Master		4700.0	5227.0	6900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Far Corrected Plus Measurement - 0	1/s	Master		1900.0	2158.0	2900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 12:01:46 25-Sep-2012 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
RGR Zero Measurement	gAPI	Before	30.0	0	82.6	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	-----	-----	-----	-----

Schlumberger

Well:	Pikes Peak Williams 4-30
Field:	Wildcat
County:	Lincoln
State:	Colorado

Platform Express

Caliper

Cement Volume