

Company: Whiting Oil and Gas Corporation

Well: Wolf 12L-0103

Field: Wildcat

County: Weld State: Colorado

Platform Express

Compensated Neutron Log

LithoDensity

County: Weld
Field: Wildcat
Location: SWNW, Sec. 12, T10N, R59W
Well: Wolf 12L-0103
Company: Whiting Oil and Gas Corporation

Location:
SWNW, Sec. 12, T10N, R59W
SHL: 2558' FNL x 619' FWL
Lat/Long: 40.852931/-103.934714
Elev.: K.B. 4971.50 ft
G.L. 4953.00 ft
D.F. 4970.50 ft

Permanent Datum: Ground Level Elev.: 4953.00 f
Log Measured From: Kelly Bushing 18.50 ft above Perm.Datum
Drilling Measured From: Kelly Bushing

API Serial No. Section: 12 Township: 10N Range: 59W
05-123-39421-0000

Logging Date 30-Aug-2014

Run Number One

Depth Driller 6700.00 ft

Schlumberger Depth 6624.00 ft

Bottom Log Interval 6614.00 ft

Top Log Interval 18.00 ft

Casing Driller Size @ Depth 9.625 in @ 1792.00 ft

Casing Schlumberger 1794 ft

Bit Size 8.75 in

Type Fluid In Hole Polymer

Density 9.3 lbm/gal 44 s

Fluid Loss PH 6.8 cm3 8.5

Source of Sample Shale Shakers

RM @ Meas Temp 1.21 ohm.m @ 75.4 degF

RMF @ Meas Temp 0.91 ohm.m @ 75.4 degF

RMC @ Meas Temp 1.51 ohm.m @ 75.4 degF

Source RMF RMC Calculated Calculated

RM @ BHT RMC @ BHT 0.51 @ 190 0.38 @ 190

Max Recorded Temperatures 190 degF

Circulation Stopped 30-Aug-2014 15:00:00

Logger on Bottom 30-Aug-2014 18:00:47

Unit Number 9108 Location: Fort Morgan, CO

Recorded By Elizabeth Wilson

Witnessed By BJ Honeycutt / Matt Taylor

Disclaimer

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Well Sketch

Driller Depth

0.00 ft

1792.00 ft

Casing 9.625in
36lbm/ft

Open Hole 12.25in



Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	12.25	8.75				
Top Driller (ft)	0	1792				
Top Logger (ft)	0	1792				
Bottom Driller (ft)	1792	6700				
Bottom Logger (ft)	1792	6624				
Casing						
Size (in)	9.625					
Weight (lbm/ft)	36					
Inner Diameter (in)	8.921					
Grade	N/A					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	1792					
Bottom Logger (ft)	1794					

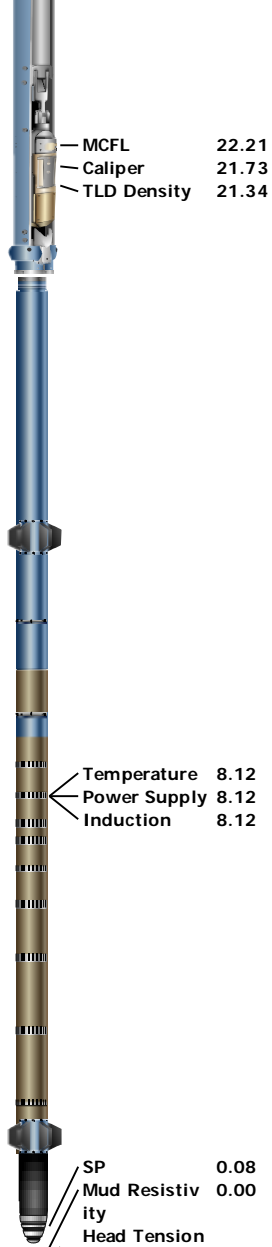
Borehole Fluids

Parameter(unit)	One					
Fluid Type	Water					
Fluid Name	Polymer					
Max Recorded Temperatures (degF)	190					
Source of Sample	Shale Shakers					
Salinity (ppm)	1000					
Density (lbm/gal)	9.3					
Funnel Viscosity (s)	44					
Fluid Loss (cm3)	6.8					
PH	8.5					
Date/Time Circulation Stopped	30-Aug-2014 15:00:00					
Date Logger on Bottom	30-Aug-2014					
Time Logger on Bottom	18:00:47					
Source RMF	Calculated					
RMC	Calculated					
RM @ Meas Temp (ohm.m@degF)	1.21 @ 75.4					
RMF @ Meas Temp (ohm.m@degF)	0.91 @ 75.4					

RMC @ Meas Temp (ohm.m@degF)	1.51 @ 75.4					
RM @ BHT (ohm.m@degF)	0.51 @ 190					
RMF @ BHT (ohm.m@degF)	0.38 @ 190					
RMC @ BHT (ohm.m@degF)	0.63 @ 190					
Total Solid (%)	5					
High Gravity Solids (%)						

Remarks and Equipment Summary

One: Toolstring				One: Remarks
Equip name LEH-QT:2552 LEH-QT:2552	Length 62.47	MP name	Offset	Toolstring ran as per tool sketch
				TLD caliper calibrated to casing ID of 8.921"
				Crew: Alonzo Carrera, David Marquez
				Thank you for choosing Schlumberger Wireline Services
EDTC-B:9296 EDTH-B:9347 EDTG-B:79498 EDTC-B:9296	59.55			
		CTEM	56.05	
		ACCZ	0.00	
		HV	0.00	
		Gamma Ray	54.18	
		TelStatus	53.05	
Weight[2]	53.05	3808		
GPIT-F:2953 GPIH-B DHRU-F:2953 GPIC-F:2953	49.05			
		GPIT-F Inclino	47.63	
		meter		
Weight[1]	45.05	GPIT	0.00	
		3808		
HGNS-H:4810 HGNH:3912 NPV-N NSR-F:5069 HMCA-H HGNS-H:4810 HACCZ-H:6305	41.05	Temperature	41.02	
		GR	40.31	
		CNL Porosity	33.98	
		HGNS	31.64	
		HMCA	31.64	
		Accelerometer	0.00	
HDRS-H:3911 ECH-MEB:3949 HRCC-H:4923 HRMS-H:3911 Long Spacing:287 36 Short Spacing:287 36 GPV-Q Backscatter:2873 6 GSR-J:5094 HRGD-H:3933	31.64			
		HRCC	27.64	



ZAIT-E:99 19.4
AZIS:99
AZRM:99

Lengths are in ft
Maximum Outer Diameter = 7.000 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

One

Depth Measuring Device

Type	IDW-JA		
Serial Number	5916		
Calibration Date	24-Mar-2014		
Calibrator Serial Number			
Calibration Cable Type	7-46 PXS		
Wheel Correction 1	-6		
Wheel Correction 2	-3		

Tension Device

Type	CMTD-B/A		
Serial Number	1919		
Calibration Date	28-Jul-2014		
Calibrator Serial Number	78135A		
Number of Calibration Points	10		
Calibration Root Mean Square Error	17		
Calibration Peak Error	26		

Logging Cable

Logging Cable

Type	7-46A-XS		
Serial Number	U711142		
Length	21000.00 ft		
Conveyance Type	Wireline		
Rig Type	Land		
One:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	All Schlumberger depth policies and procedures followed	
Rig Up Length At Surface		IDW used as primary depth reference	
Rig Up Length At Bottom		Z-chart used as secondary depth reference	
Rig Up Length Correction			
Stretch Correction	7.00 ft		
Tool Zero Check At Surface			

Survey Record

Survey Calculation			
Method :	Minimum Radius of Curvature	DLS Method :	Lubinski
North Reference :	True North	Total Correction Formula :	Magnetic Dec

Rig Location			
Latitude :	40.873983 degrees	Longitude :	-103.93184 degrees
Tie In Point			
Measured Depth:	0.00 ft	Inclination:	0.00 deg
True Vertical Depth:	0.00 ft	North Displacement:	0.00 ft
		Azimuth:	0.00 deg
		East Displacement:	0.00 ft

Survey Quality Index	
9 : Manual	28 : Tie-In Point

Survey Correction Index	
0 : No correction	

Survey Description Index	
0 : Not Flagged Survey	

Seq	MD (ft)	Incl (deg)	Azim (deg)	Course (ft)	TVD (ft)	V Sec (ft)	N/ -S (ft)	E/ -W (ft)	Closure (ft)	at Azim (deg)	DLS deg/100ft	Tool Type	QI	CI	DI
1	0.00	0.00	0.00	- - - -	0.00	0.00	0.00	0.00	0.00	90.00	0.00	TIP	28	0	0
2	500.00	0.60	129.60	500.00	499.99	-1.67	-1.67	2.02	2.62	129.60	0.12	Other	9	0	0
3	972.00	0.80	146.60	472.00	971.96	-5.99	-5.99	5.74	8.30	136.27	0.06	Other	9	0	0
4	1530.00	1.10	176.70	558.00	1529.88	-14.59	-14.59	8.19	16.73	150.71	0.10	Other	9	0	0
5	1760.00	1.40	176.80	230.00	1759.83	-19.60	-19.60	8.47	21.36	156.63	0.13	Other	9	0	0
6	1811.00	1.30	168.40	51.00	1810.81	-20.79	-20.79	8.62	22.51	157.48	0.43	Other	9	0	0
7	1905.00	3.40	131.90	94.00	1904.73	-23.70	-23.70	10.91	26.08	155.28	2.64	Other	9	0	0
8	1999.00	5.30	125.30	94.00	1998.46	-28.07	-28.07	16.53	32.58	149.51	2.09	Other	9	0	0
9	2093.00	8.40	132.30	94.00	2091.78	-35.20	-35.20	25.15	43.27	144.45	3.41	Other	9	0	0
10	2187.00	10.90	123.80	94.00	2184.44	-44.77	-44.77	37.62	58.46	139.96	3.05	Other	9	0	0
11	2280.00	14.10	118.00	93.00	2275.23	-54.98	-54.98	54.93	77.72	135.02	3.69	Other	9	0	0
12	2374.00	13.30	118.70	94.00	2366.56	-65.55	-65.55	74.53	99.25	131.33	0.87	Other	9	0	0
13	2469.00	12.10	114.80	95.00	2459.23	-74.97	-74.97	93.15	119.59	128.83	1.55	Other	9	0	0
14	2563.00	14.50	119.30	94.00	2550.71	-84.87	-84.87	112.36	140.81	127.06	2.78	Other	9	0	0
15	2658.00	13.90	118.60	95.00	2642.80	-96.15	-96.15	132.75	163.91	125.91	0.66	Other	9	0	0
16	2753.00	13.50	117.30	95.00	2735.10	-106.70	-106.70	152.63	186.22	124.96	0.53	Other	9	0	0
17	2847.00	14.30	123.80	94.00	2826.35	-118.19	-118.19	172.02	208.73	124.49	1.87	Other	9	0	0
18	2942.00	14.00	125.30	95.00	2918.47	-131.36	-131.36	191.15	231.92	124.50	0.50	Other	9	0	0
19	3035.00	14.10	124.40	93.00	3008.69	-144.26	-144.26	209.68	254.49	124.53	0.26	Other	9	0	0
20	3130.00	14.10	122.60	95.00	3100.83	-157.03	-157.03	228.98	277.66	124.44	0.46	Other	9	0	0
21	3223.00	13.70	120.60	93.00	3191.10	-168.74	-168.74	248.00	299.97	124.23	0.67	Other	9	0	0
22	3317.00	14.70	131.10	94.00	3282.25	-182.25	-182.25	266.57	322.90	124.36	2.93	Other	9	0	0
23	3410.00	14.30	130.60	93.00	3372.28	-197.48	-197.48	284.18	346.06	124.80	0.45	Other	9	0	0
24	3503.00	14.10	131.10	93.00	3462.44	-212.40	-212.40	301.44	368.77	125.17	0.25	Other	9	0	0
25	3596.00	14.10	128.70	93.00	3552.64	-226.93	-226.93	318.82	391.34	125.44	0.63	Other	9	0	0

26	3690.00	14.90	126.60	94.00	3643.65	-241.29	-241.29	337.46	414.86	125.57	1.02	Other	9	0	0
27	3783.00	15.60	125.20	93.00	3733.37	-255.63	-255.63	357.27	439.30	125.58	0.85	Other	9	0	0
28	3875.00	16.60	125.00	92.00	3821.76	-270.30	-270.30	378.15	464.83	125.56	1.09	Other	9	0	0
29	3968.00	17.40	123.80	93.00	3910.70	-285.66	-285.66	400.59	491.99	125.49	0.94	Other	9	0	0
30	4062.00	17.50	123.00	94.00	4000.37	-301.17	-301.17	424.12	520.18	125.38	0.28	Other	9	0	0
31	4155.00	16.30	122.30	93.00	4089.35	-315.76	-315.76	446.88	547.18	125.24	1.31	Other	9	0	0
32	4250.00	16.10	121.70	95.00	4180.58	-329.81	-329.81	469.35	573.65	125.10	0.27	Other	9	0	0
33	4343.00	16.10	120.90	93.00	4269.94	-343.21	-343.21	491.39	599.38	124.93	0.24	Other	9	0	0
34	4437.00	16.00	120.20	94.00	4360.27	-356.42	-356.42	513.77	625.30	124.75	0.23	Other	9	0	0
35	4531.00	16.10	117.30	94.00	4450.61	-368.91	-368.91	536.55	651.15	124.51	0.86	Other	9	0	0
36	4623.00	15.90	113.20	92.00	4539.05	-379.73	-379.73	559.47	676.15	124.17	1.25	Other	9	0	0
37	4716.00	13.40	110.40	93.00	4629.02	-388.50	-388.50	581.28	699.15	123.76	2.79	Other	9	0	0
38	4809.00	12.20	112.80	93.00	4719.71	-396.07	-396.07	600.44	719.29	123.41	1.41	Other	9	0	0
39	4902.00	10.70	111.70	93.00	4810.85	-403.07	-403.07	617.52	737.43	123.13	1.63	Other	9	0	0
40	4996.00	10.40	112.00	94.00	4903.26	-409.47	-409.47	633.50	754.30	122.88	0.32	Other	9	0	0
41	5089.00	7.80	111.70	93.00	4995.09	-414.95	-414.95	647.15	768.77	122.67	2.80	Other	9	0	0
42	5182.00	7.40	91.40	93.00	5087.28	-417.43	-417.43	659.00	780.09	122.35	2.90	Other	9	0	0
43	5276.00	5.50	75.10	94.00	5180.69	-416.42	-416.42	669.41	788.35	121.88	2.79	Other	9	0	0
44	5369.00	4.10	59.50	93.00	5273.37	-413.59	-413.59	676.58	792.98	121.44	2.05	Other	9	0	0
45	5462.00	1.20	45.10	93.00	5366.26	-411.21	-411.21	680.13	794.78	121.16	3.18	Other	9	0	0
46	5555.00	1.20	20.40	93.00	5459.24	-409.61	-409.61	681.16	794.85	121.02	0.55	Other	9	0	0
47	5649.00	1.20	26.20	94.00	5553.22	-407.81	-407.81	681.94	794.59	120.88	0.13	Other	9	0	0
48	5742.00	1.80	39.30	93.00	5646.19	-405.80	-405.80	683.30	794.72	120.71	0.74	Other	9	0	0
49	5835.00	1.60	7.00	93.00	5739.15	-403.38	-403.38	684.38	794.42	120.52	1.04	Other	9	0	0
50	5928.00	1.60	352.00	93.00	5832.11	-400.81	-400.81	684.36	793.08	120.36	0.45	Other	9	0	0
51	5966.00	1.60	349.30	38.00	5870.10	-399.76	-399.76	684.18	792.42	120.30	0.20	Other	9	0	0
52	5984.00	1.50	351.10	18.00	5888.09	-399.28	-399.28	684.10	792.09	120.27	0.62	Other	9	0	0

One															

Software Version															
Acquisition System									Version						
MaxWell									4.0.9163.3000						
Application Patch									Patch-SP-10767_18214-4.0.9163.3001						
									Patch-NPD_CMRTF_SP2-22354-4.0.9434.3002						

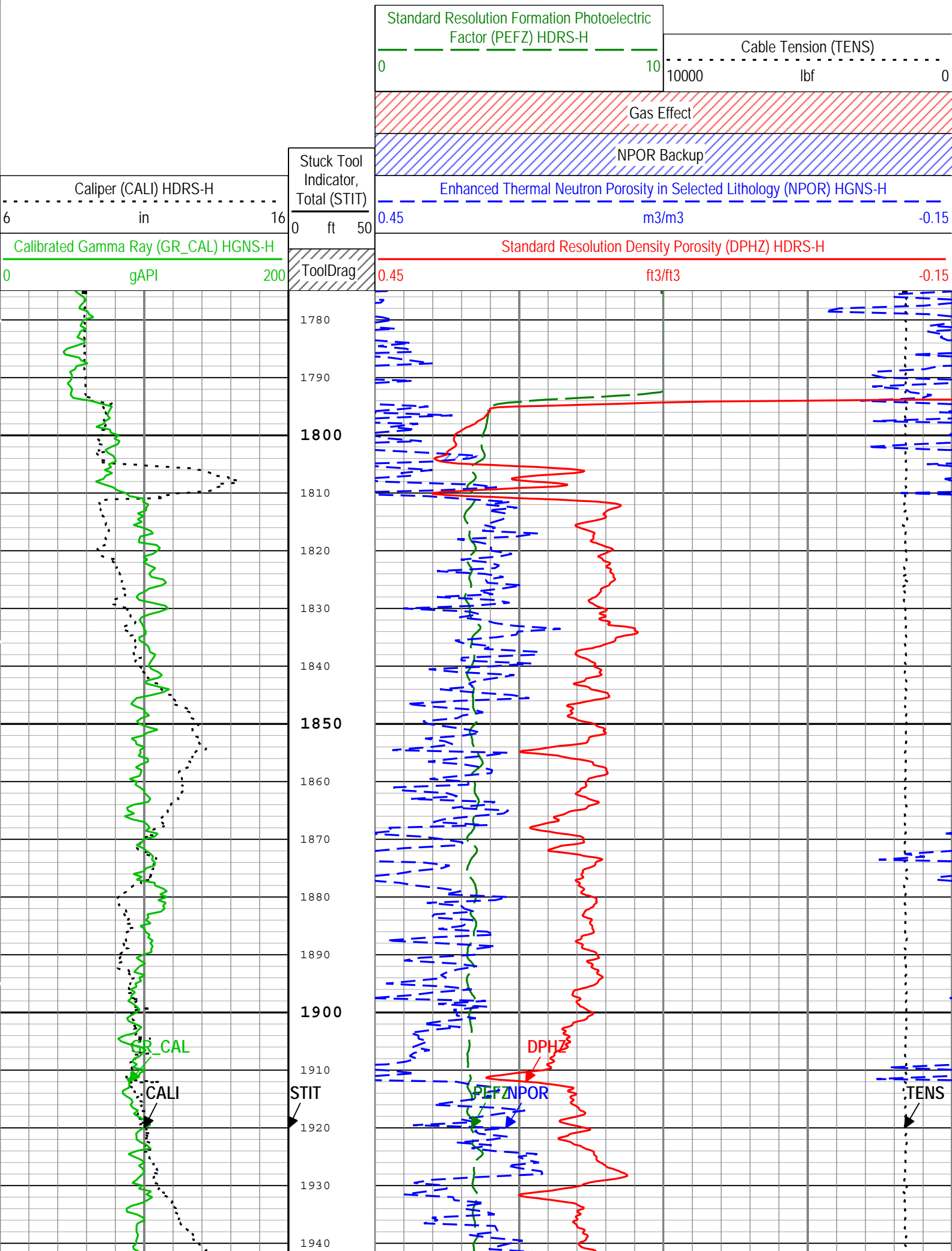
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HENVIR		Computation Ensemble for the HGNS Neutron environmental corrections									4.0.9360.3000				
DepthCorrection		DepthCorrection									4.0.9433.3000				
Tool Elements		Description							Software Version			Firmware Version			
HRCC-H		HILT High-Resolution Control Cartridge, 150 degC							4.0.9385.3000			2.0			
HRGD-H		HILT Resistivity Gamma-Ray Density Device, 150 degC							4.0.9385.3000			3.0			
HGNS-H		HILT Gamma-Ray and Neutron Sonde, 150 degC							4.0.9385.3000			2.0			

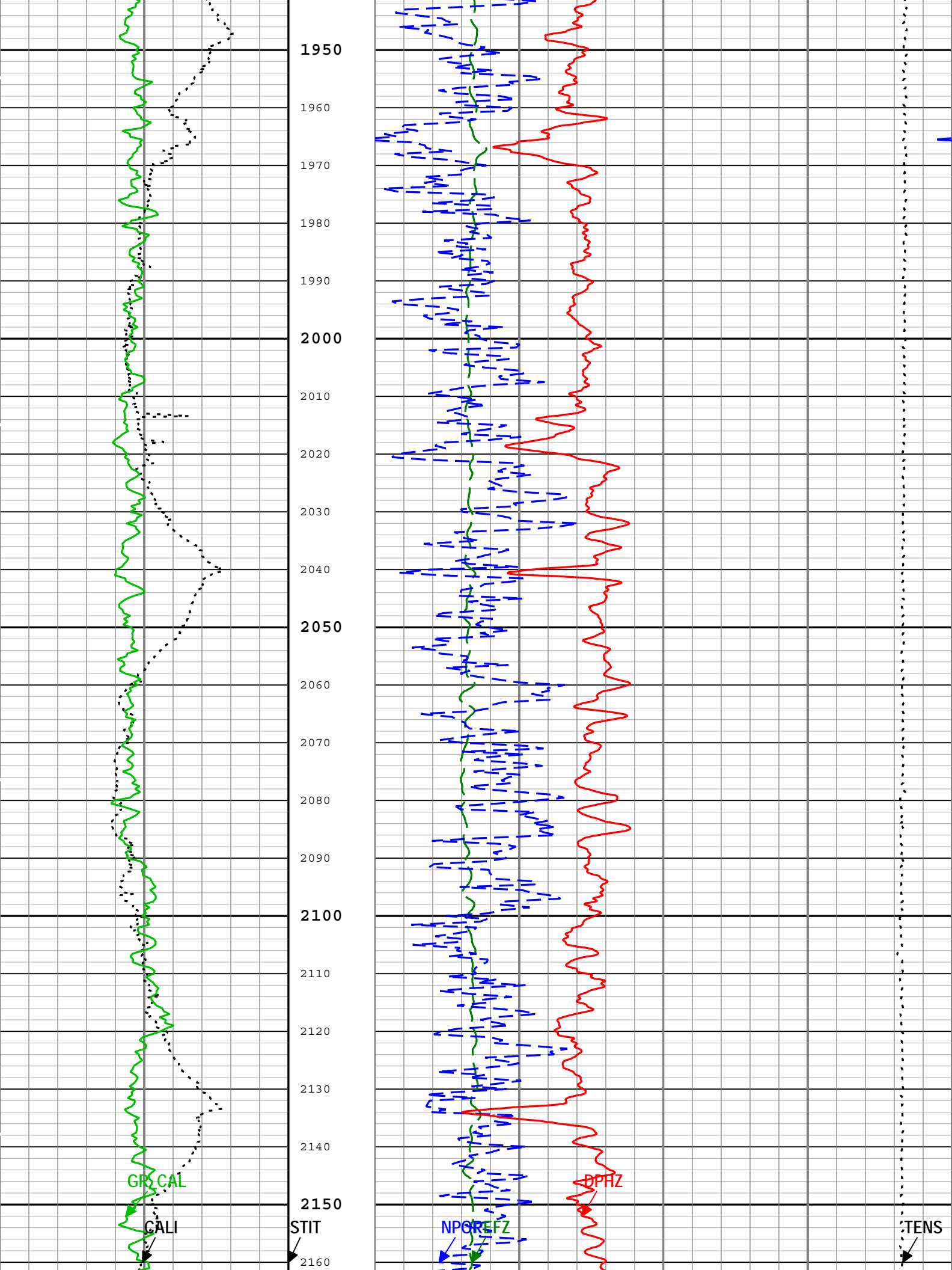
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[3]:Up	Up	59.61 ft	6641.24 ft	30-Aug-2014 6:23:41 PM	30-Aug-2014 8:11:43 PM	ON	6.77 ft	No
All depths are referenced to toolstring zero									

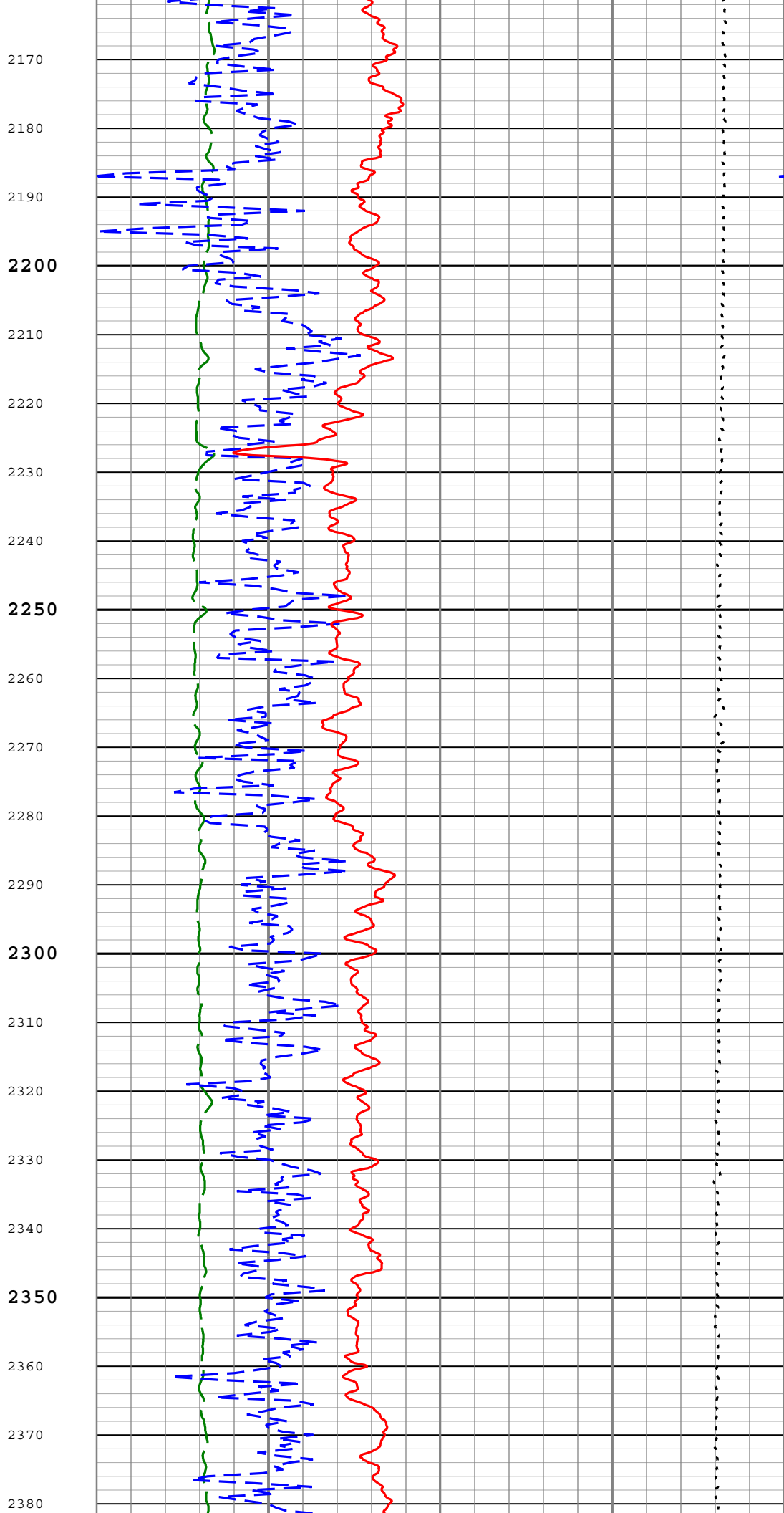
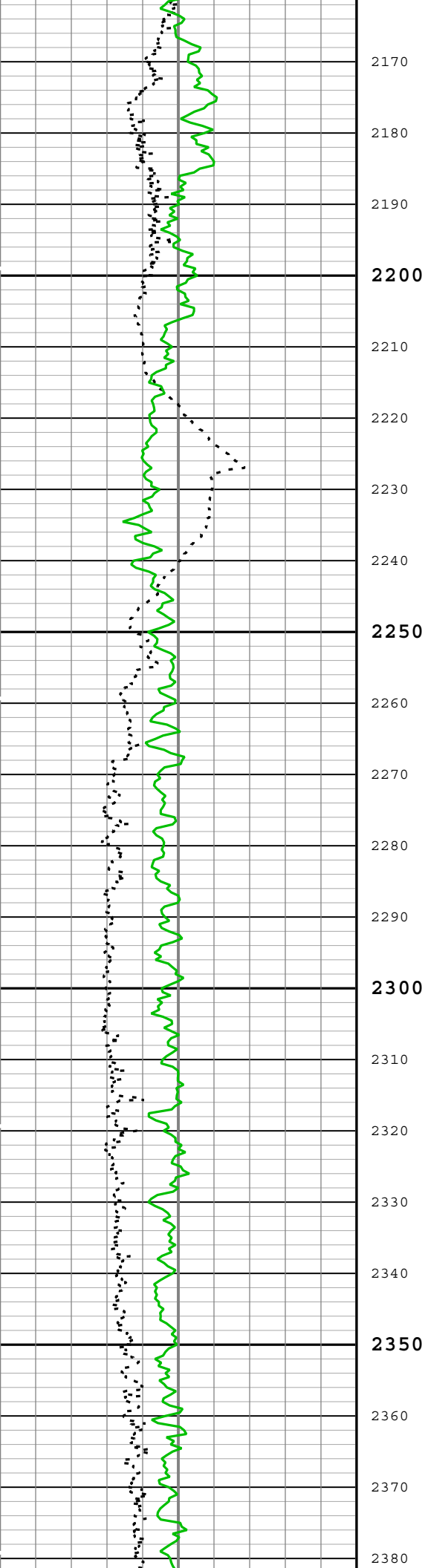
Log	Company:Whiting Oil and Gas Corporation	Well:Wolf 12L-0103
	One: Log[3]:Up:S010	

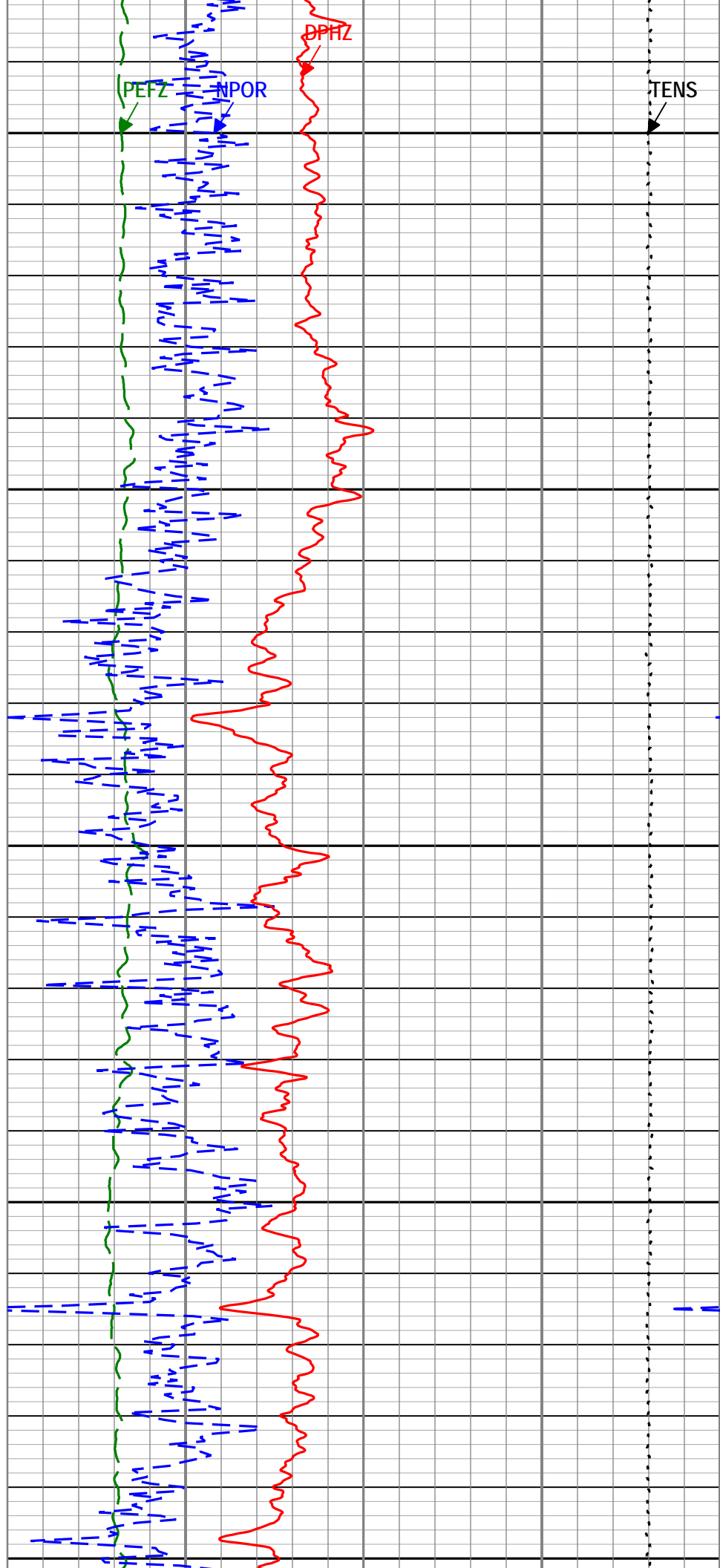
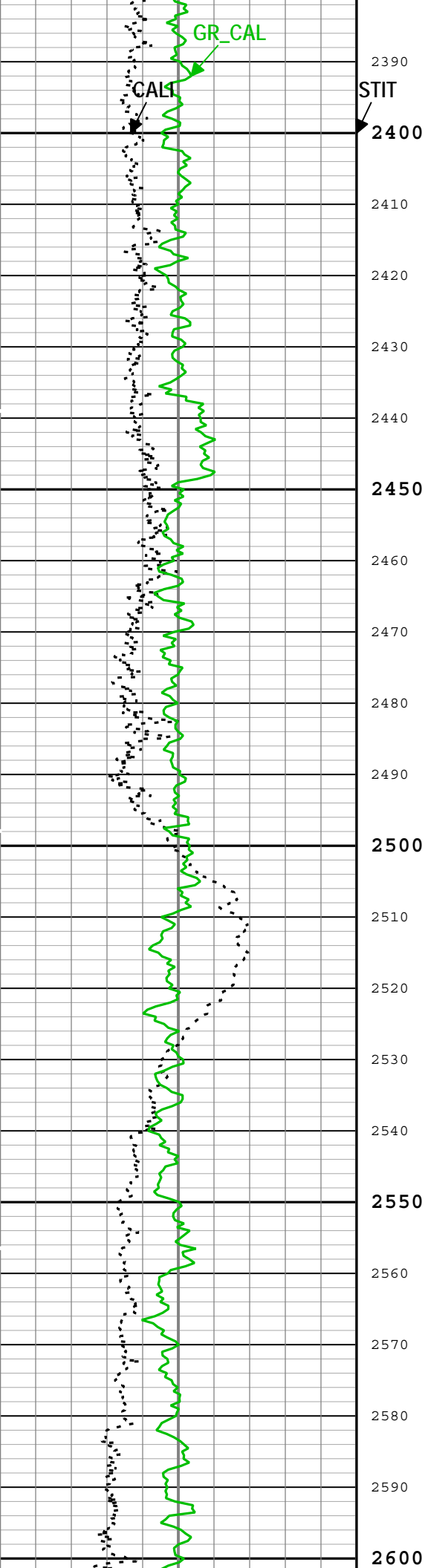
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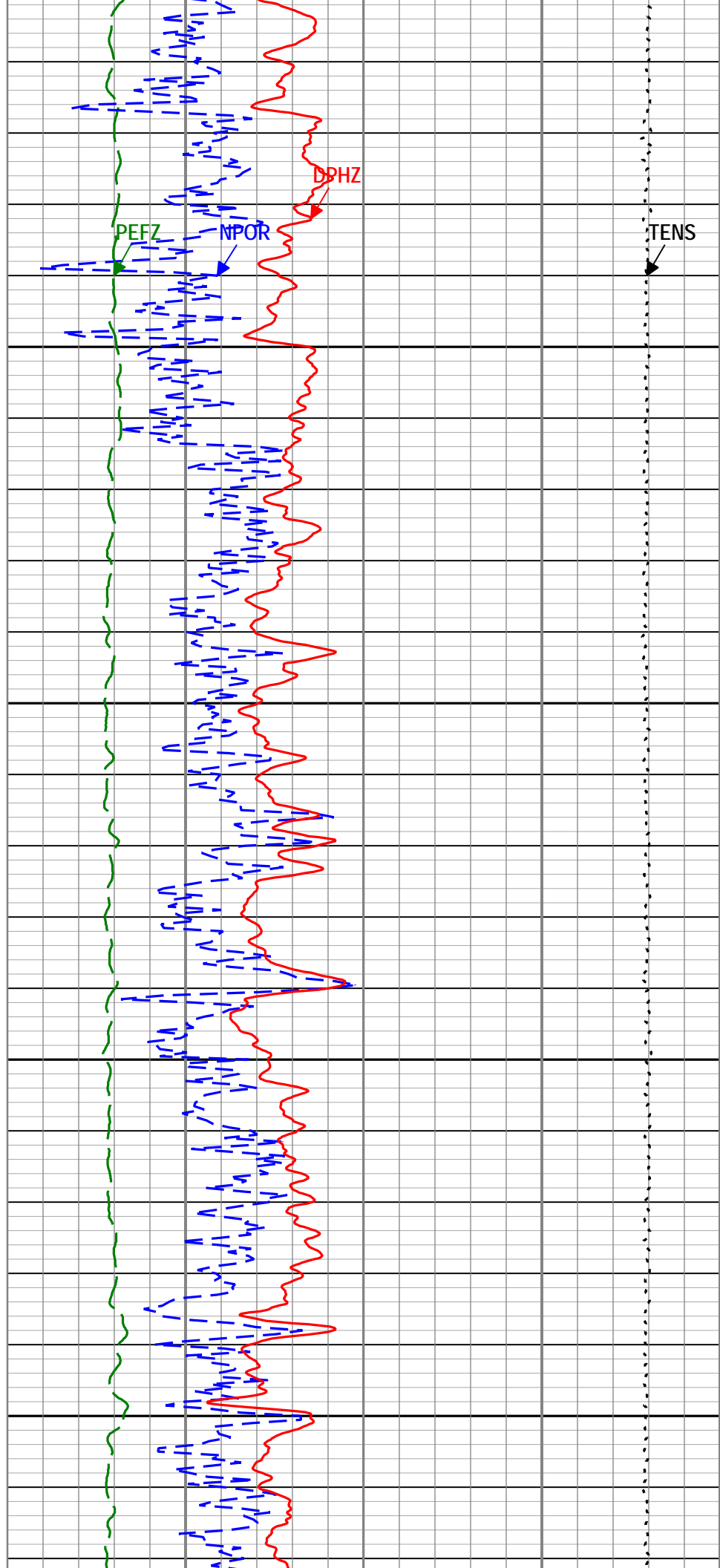
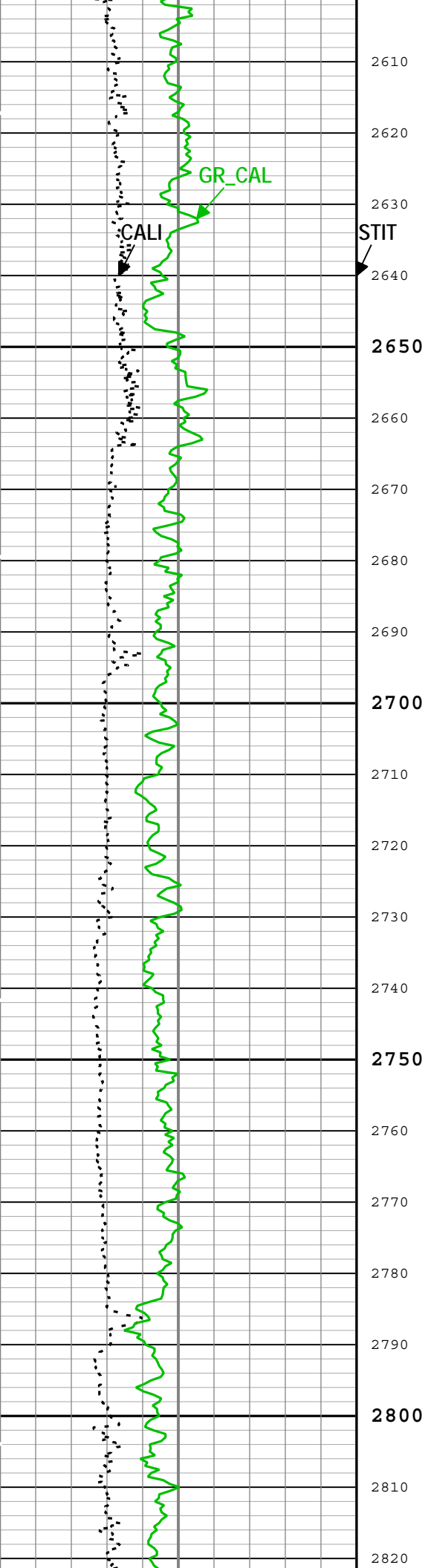
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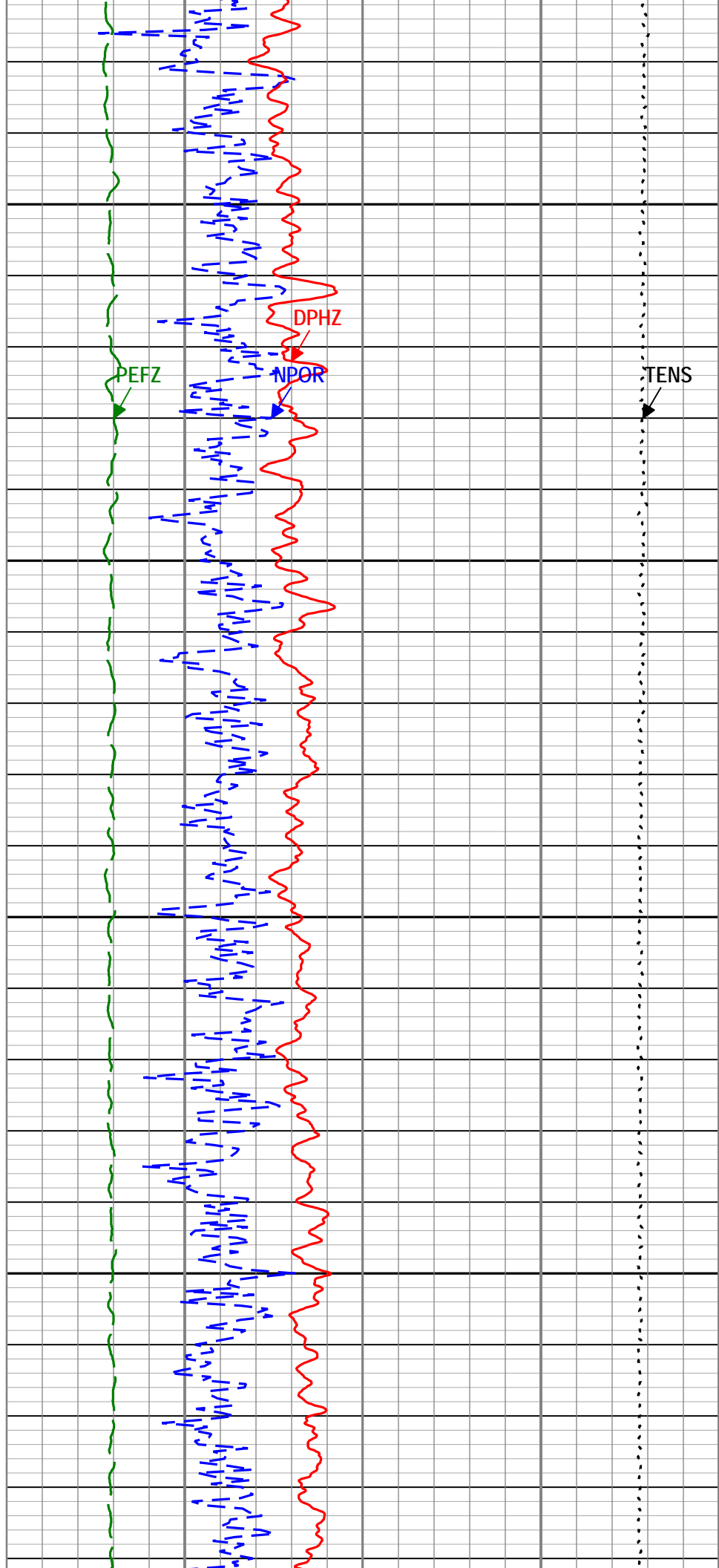
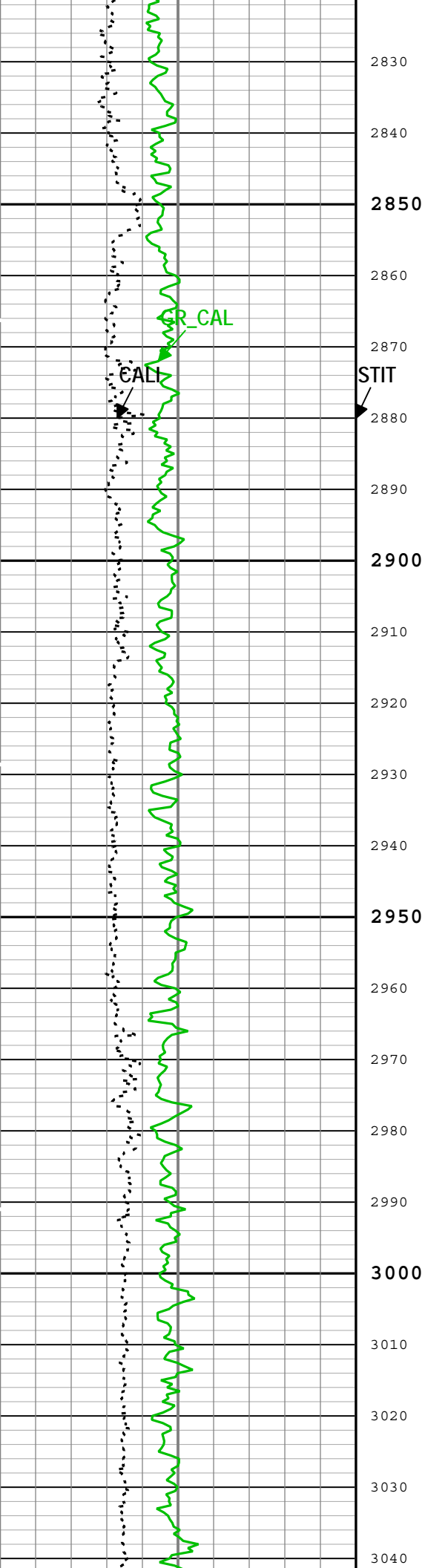


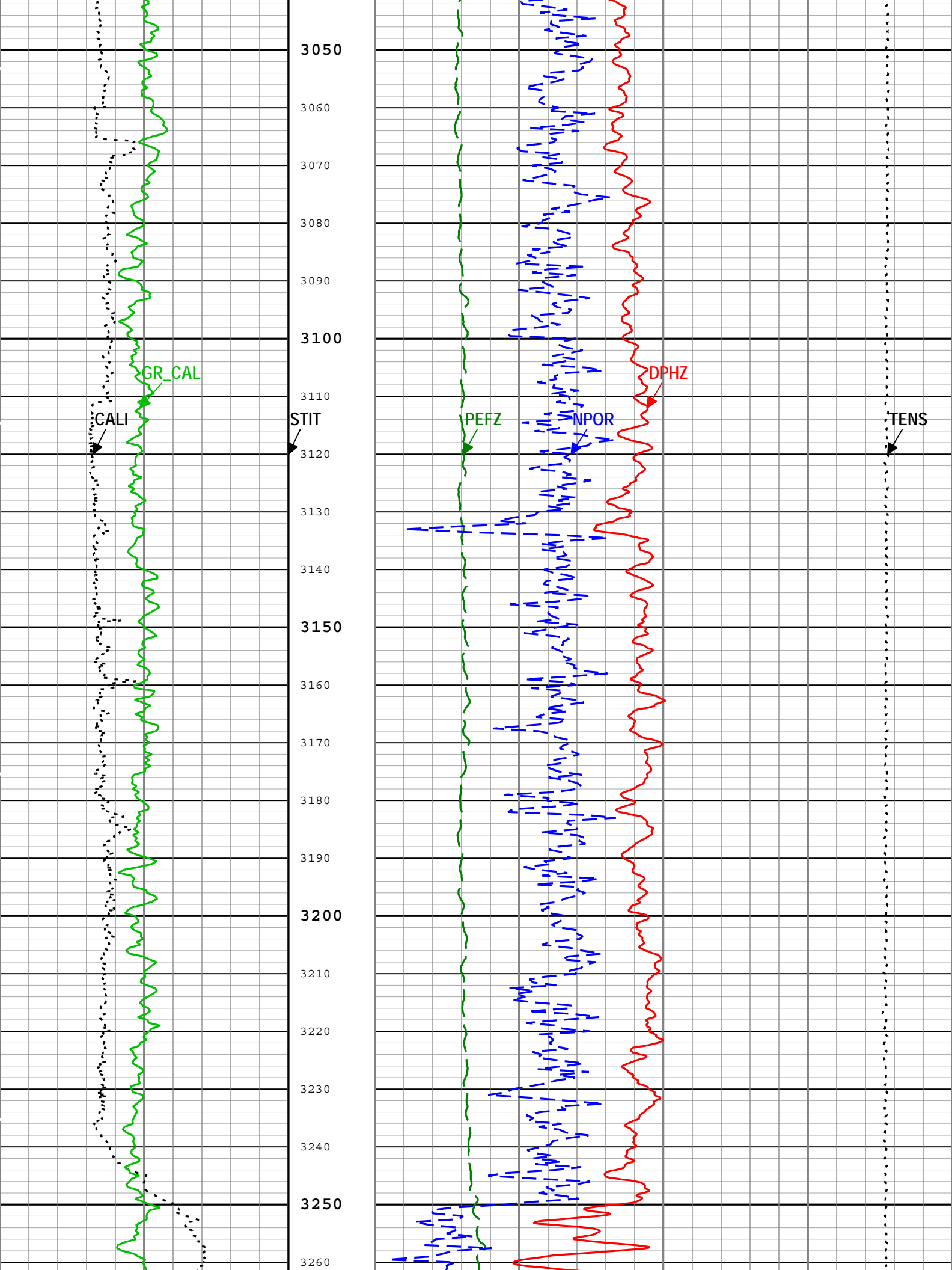


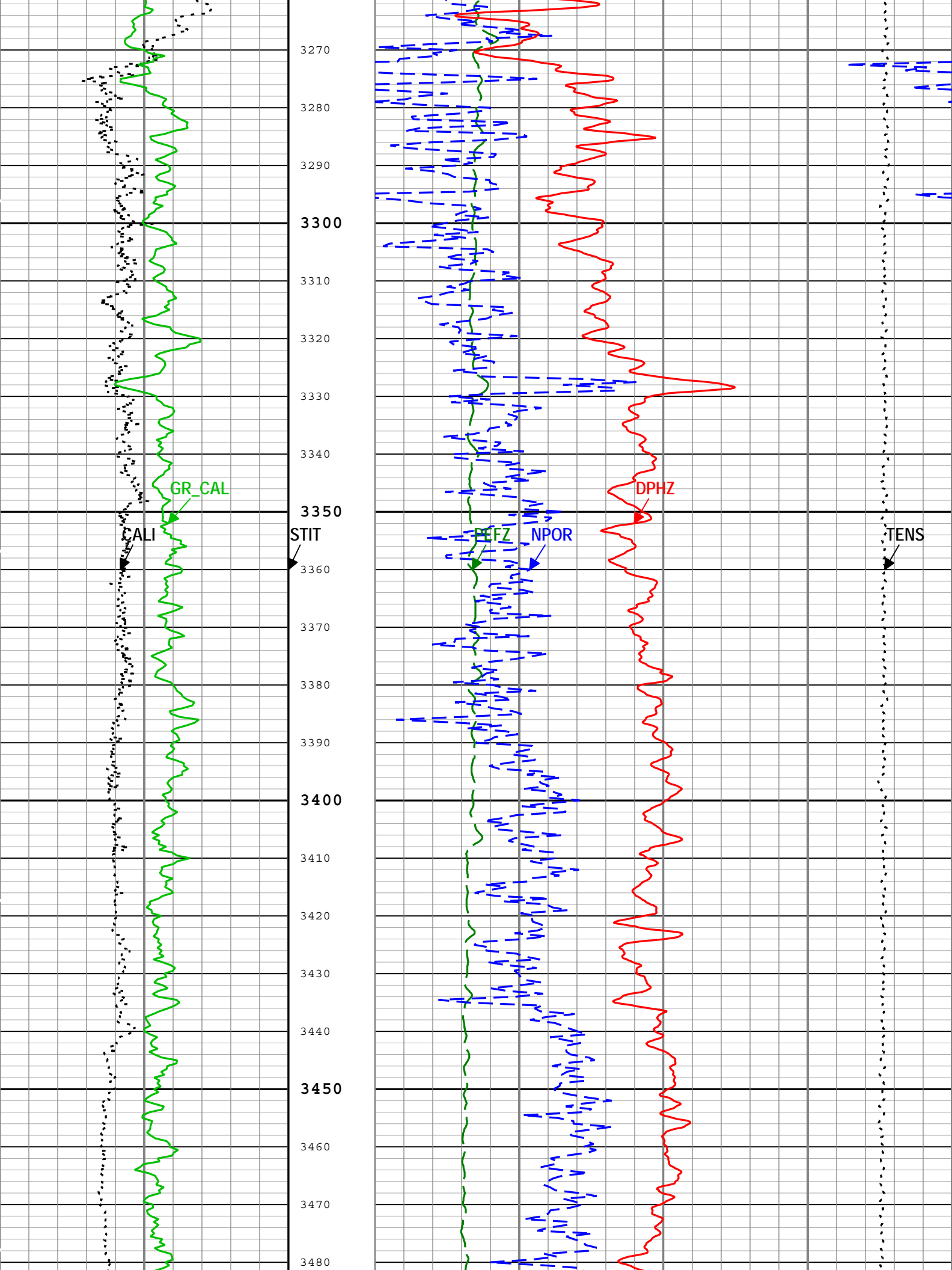


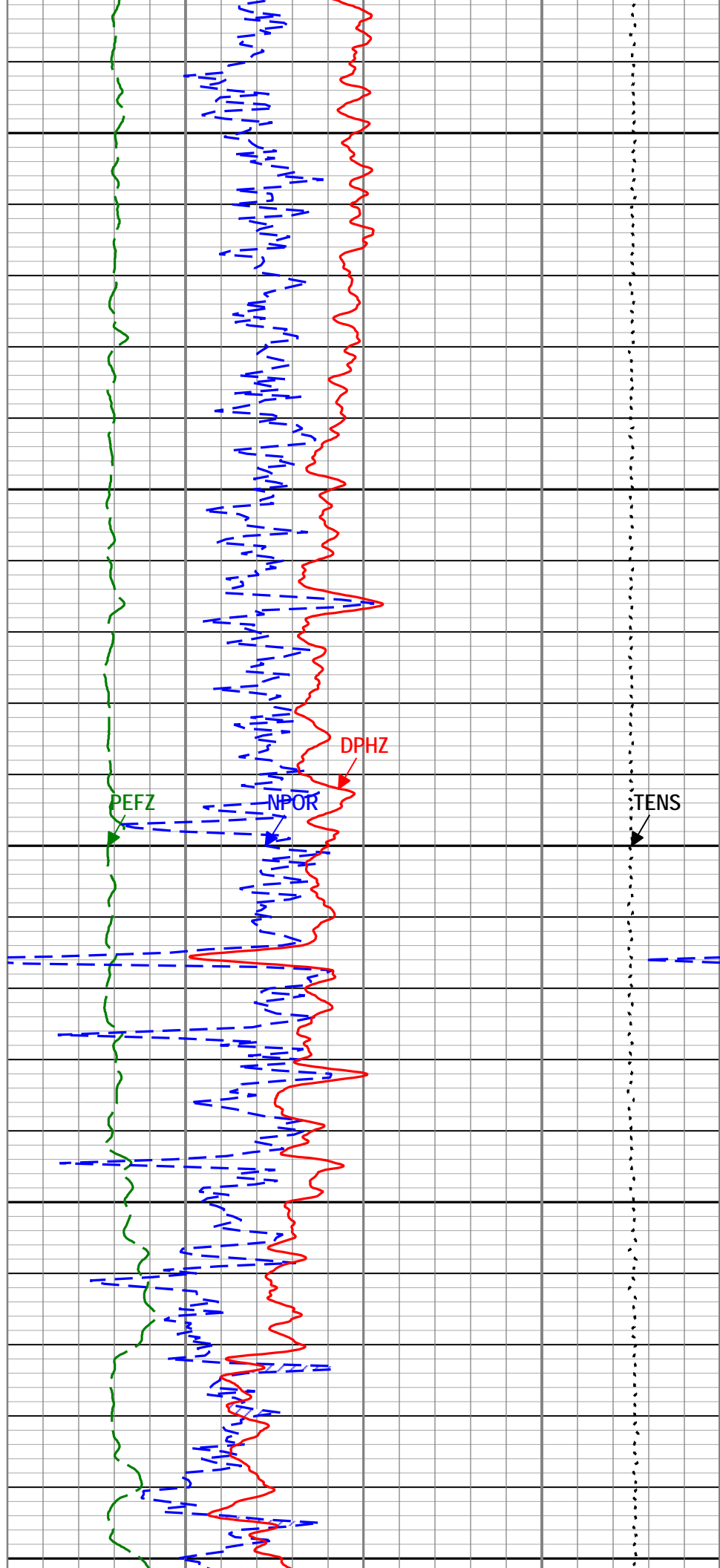
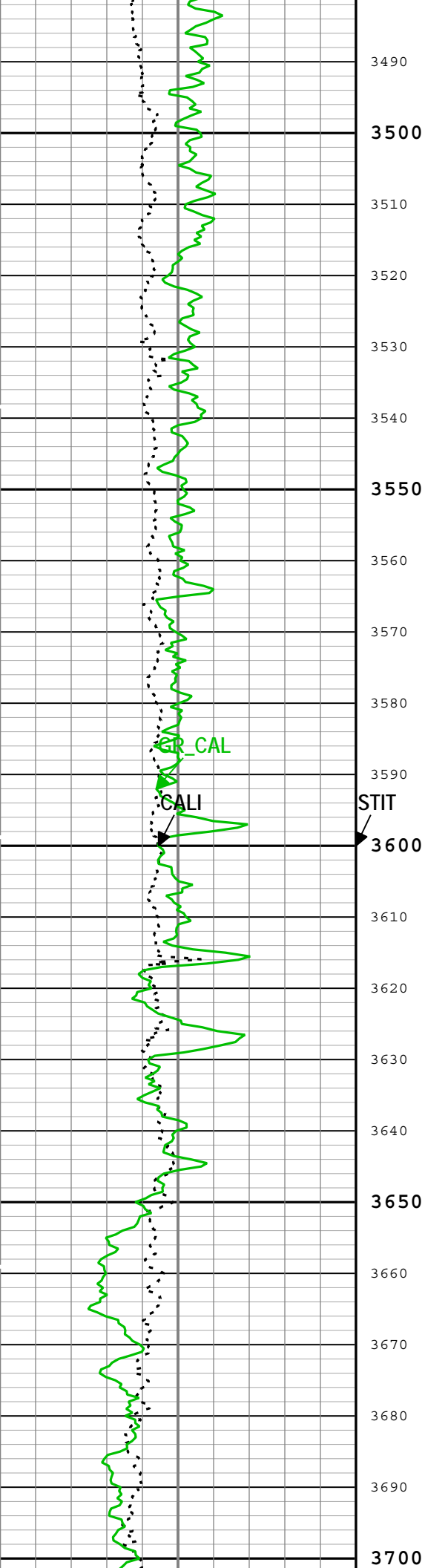


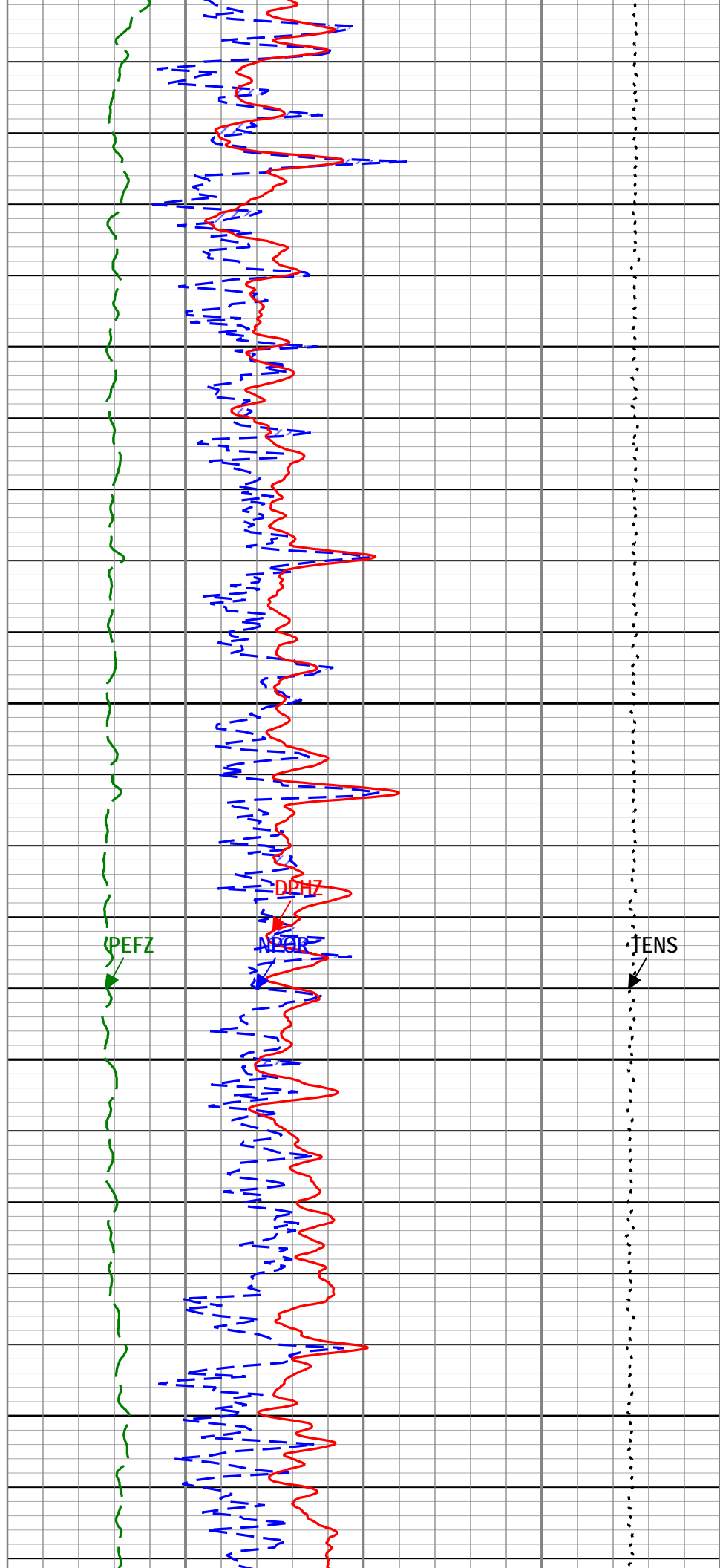
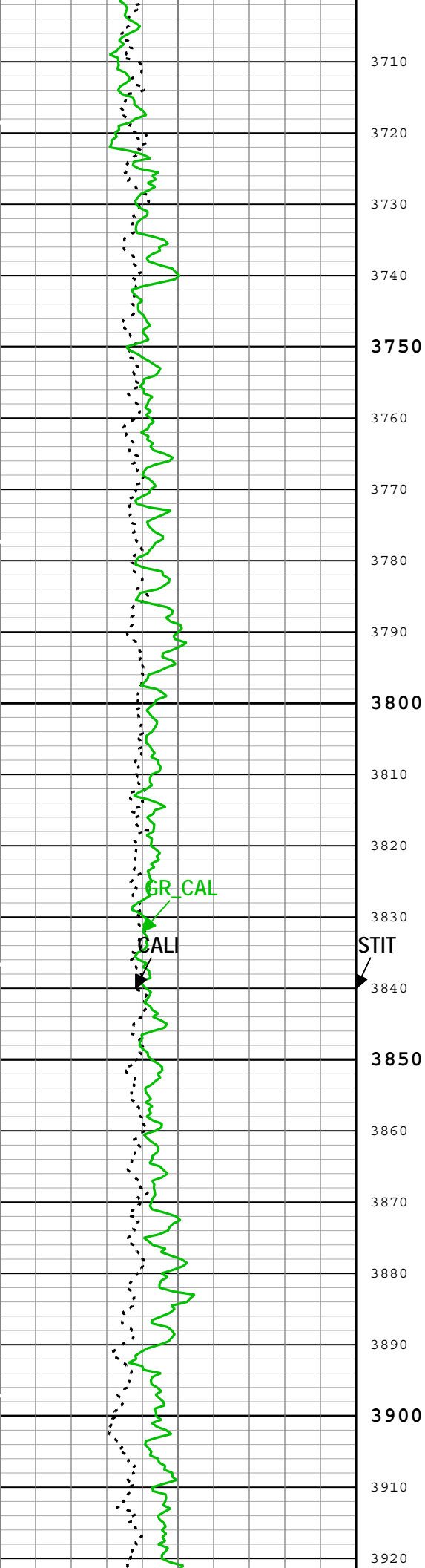


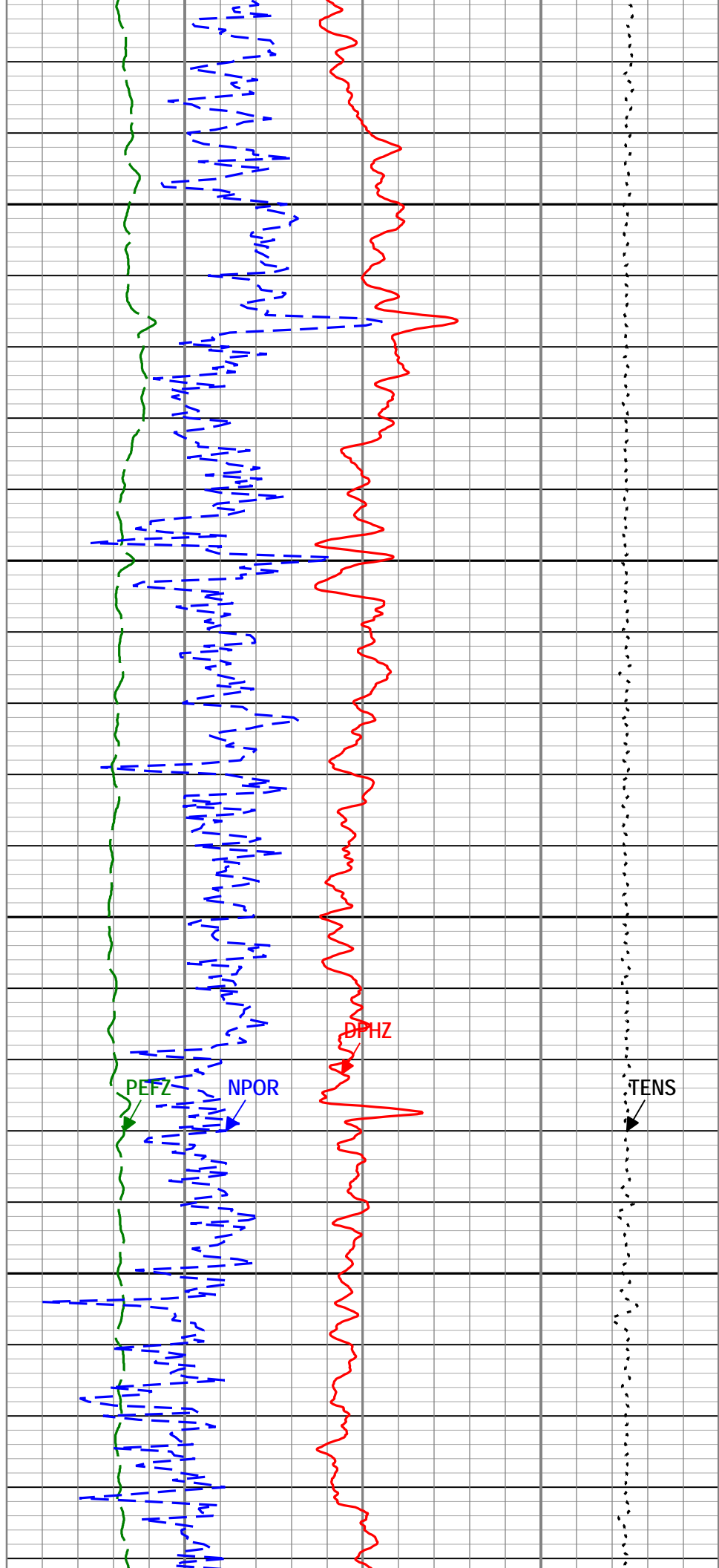
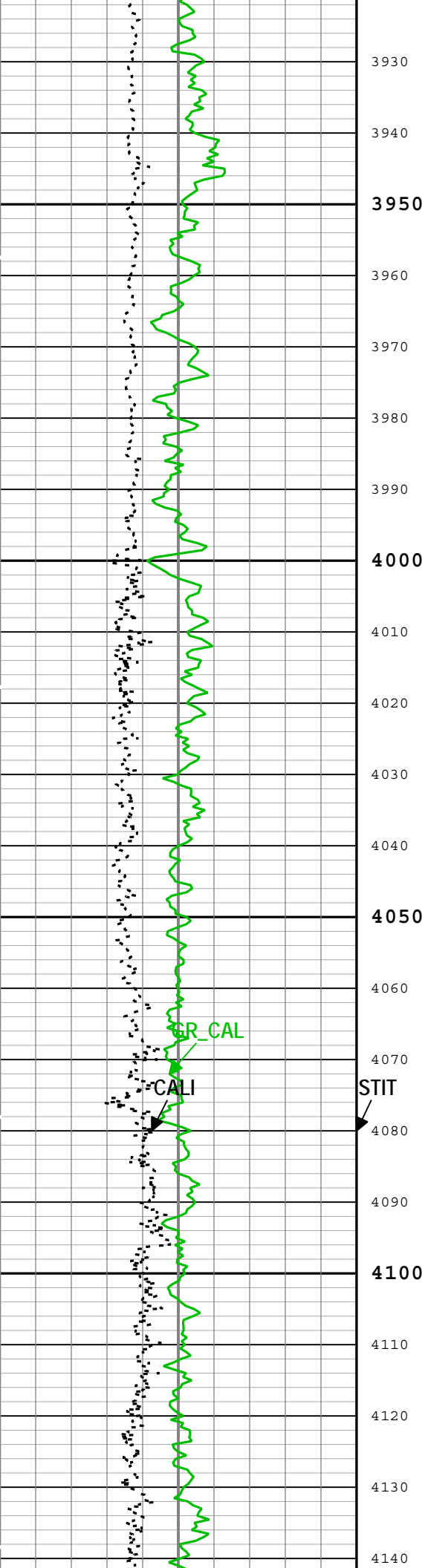


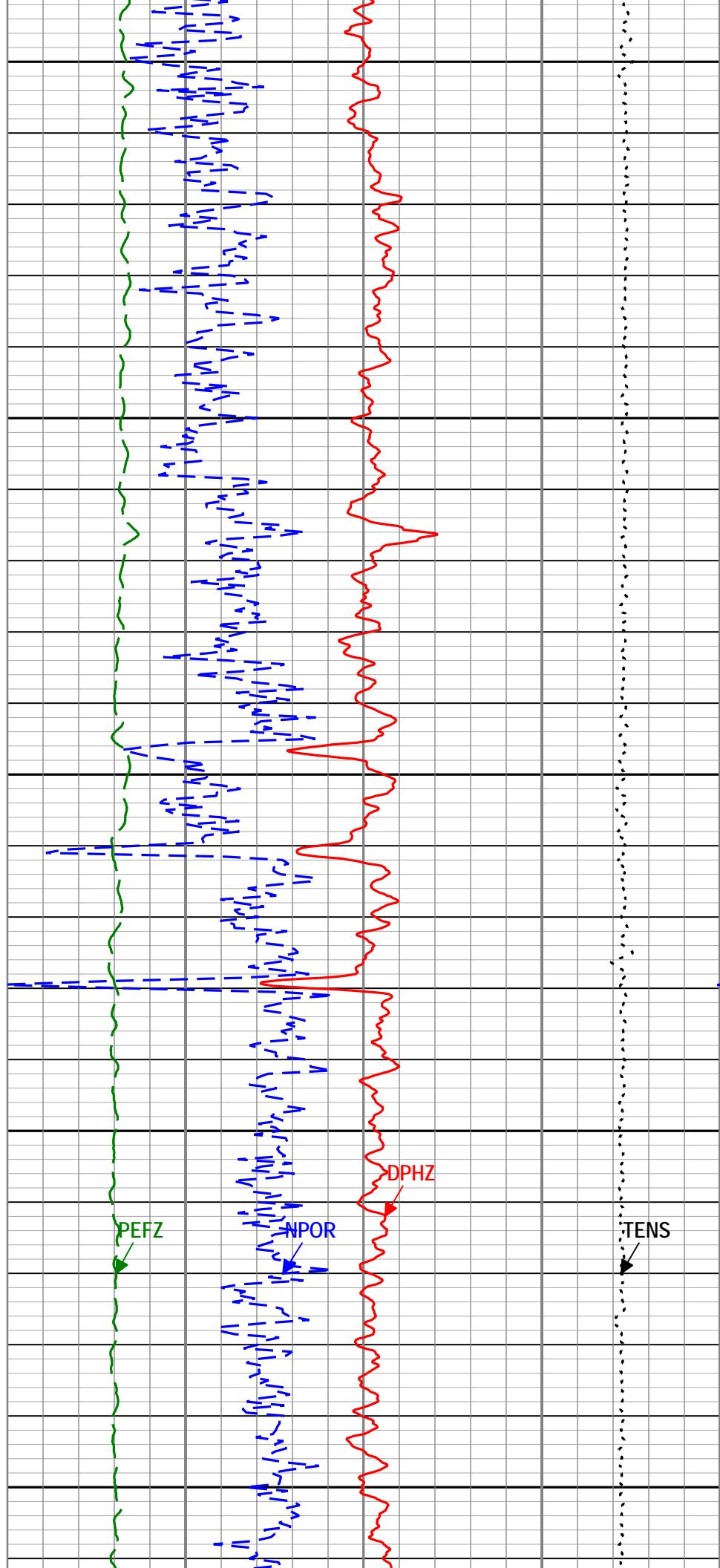
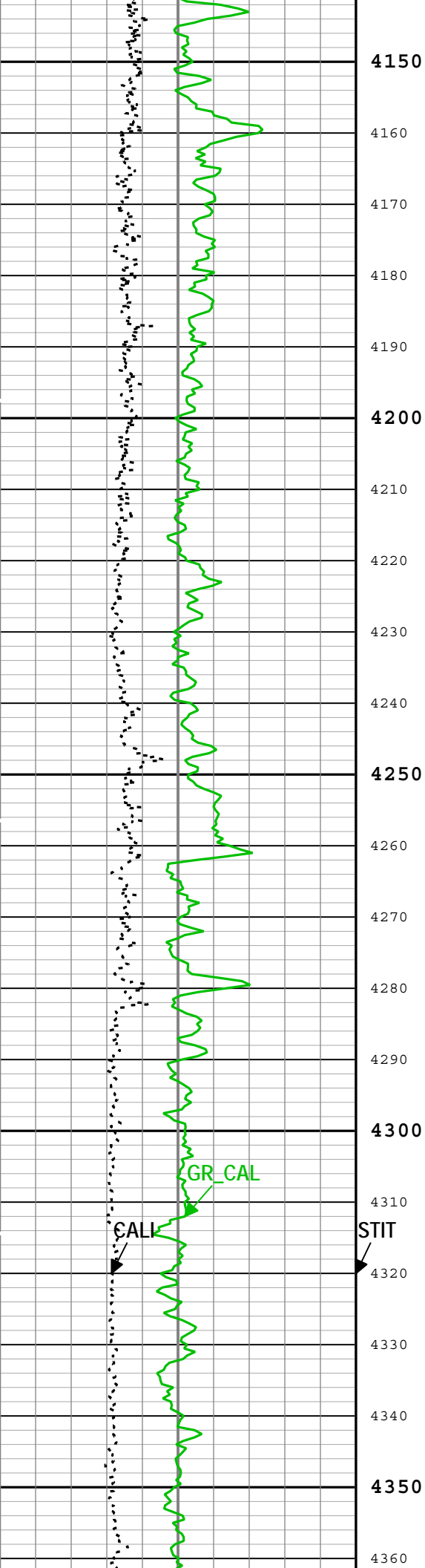


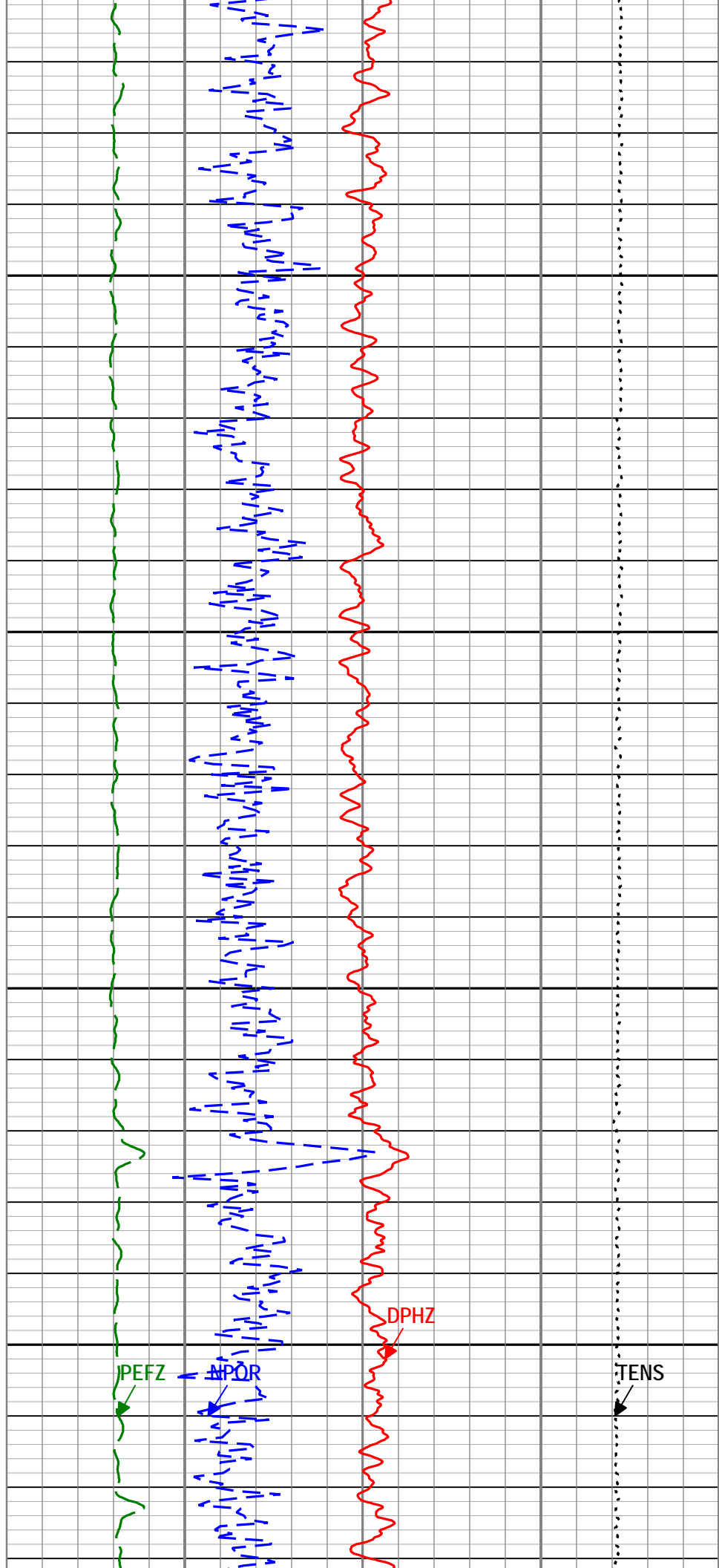
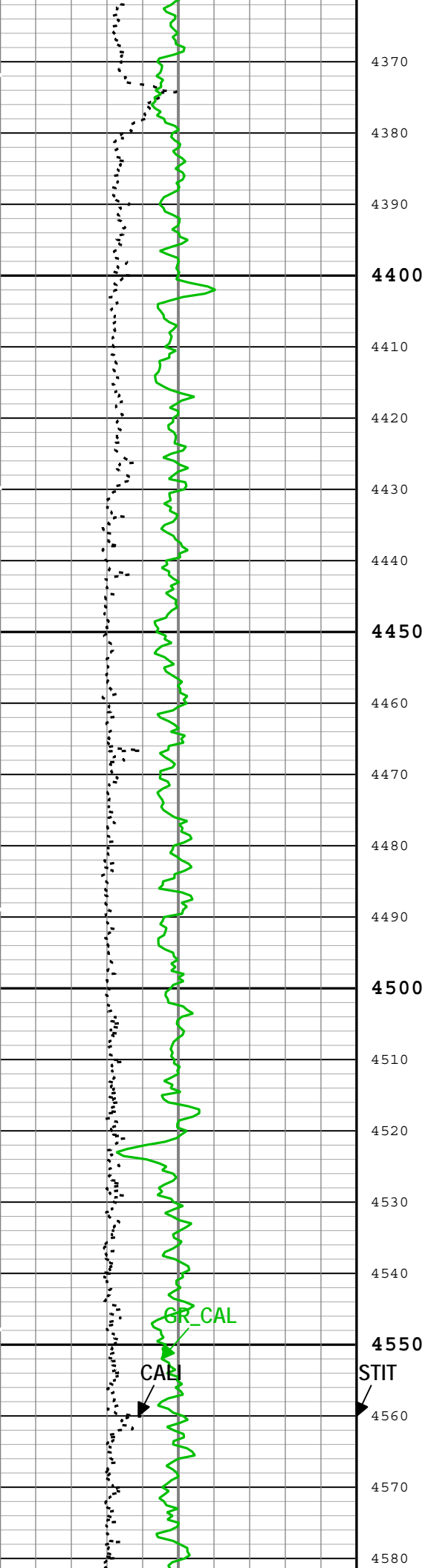


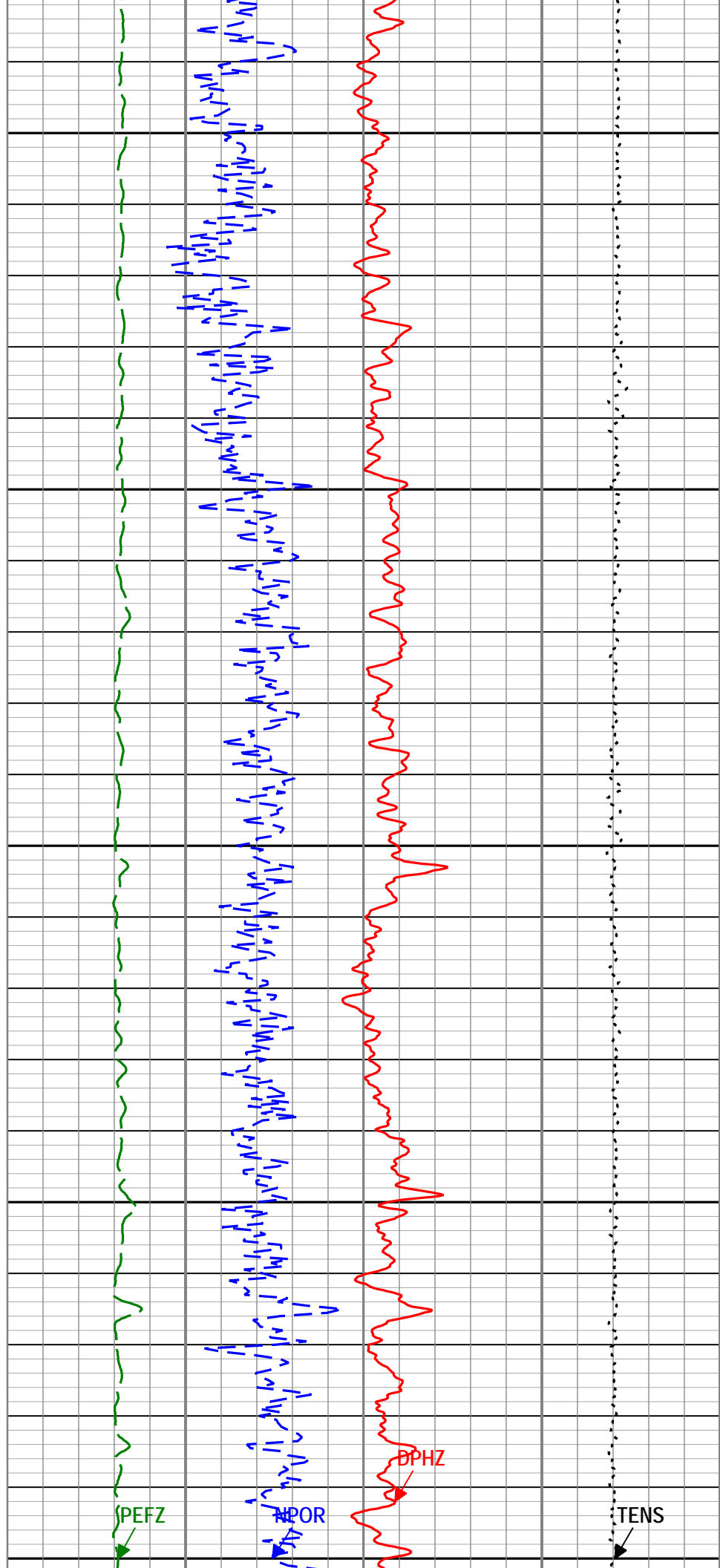
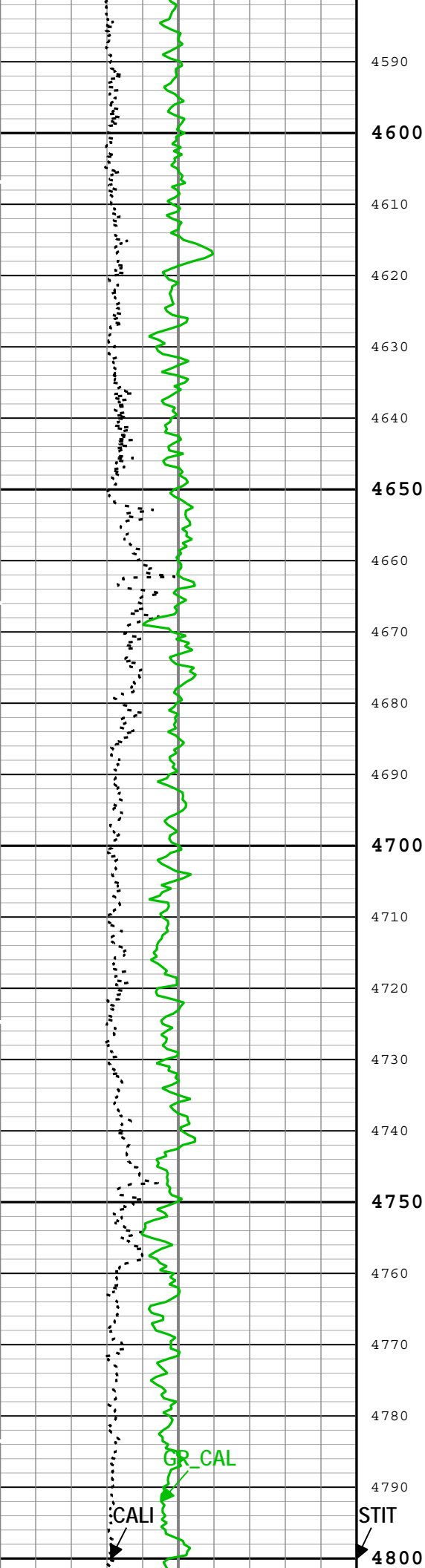


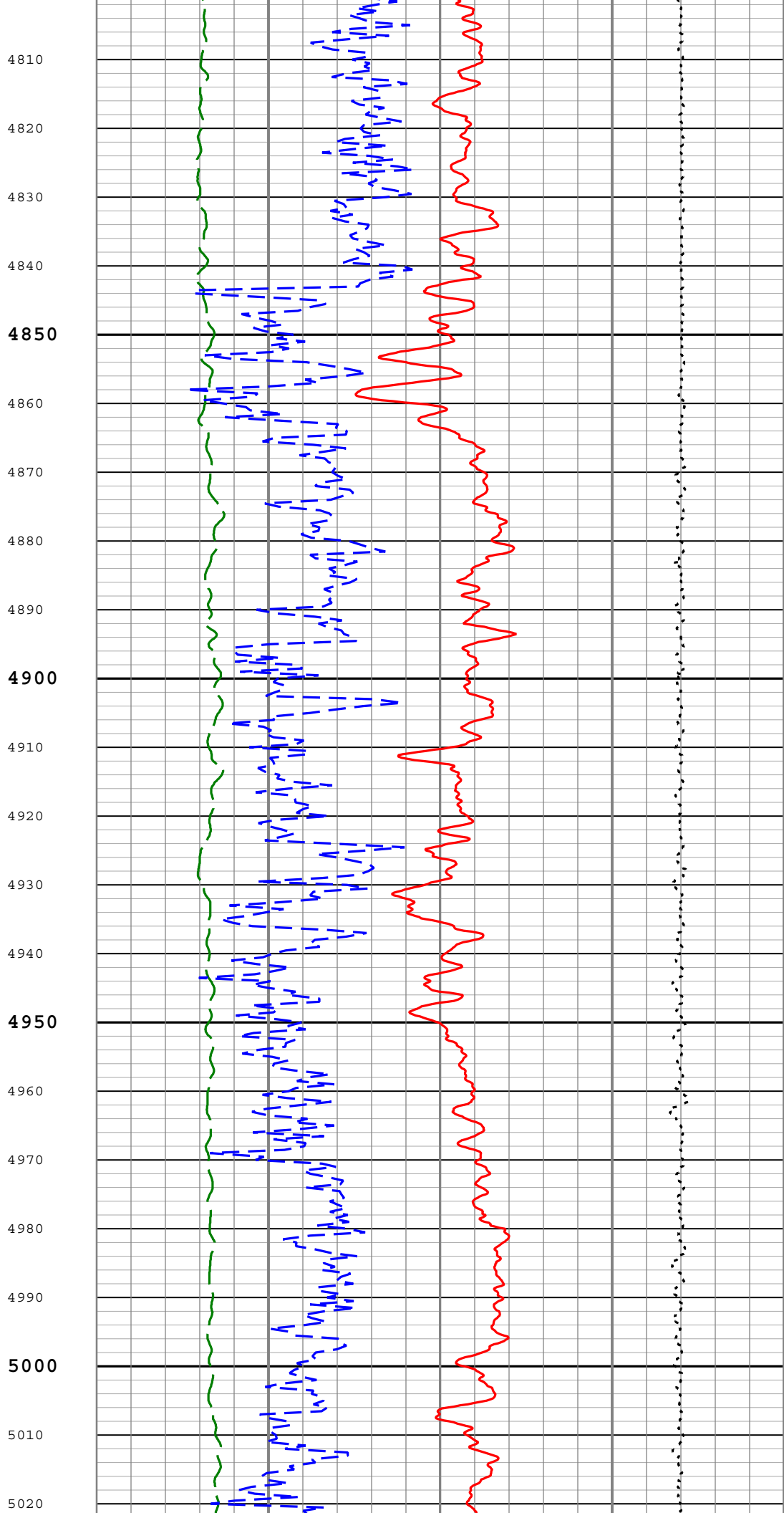
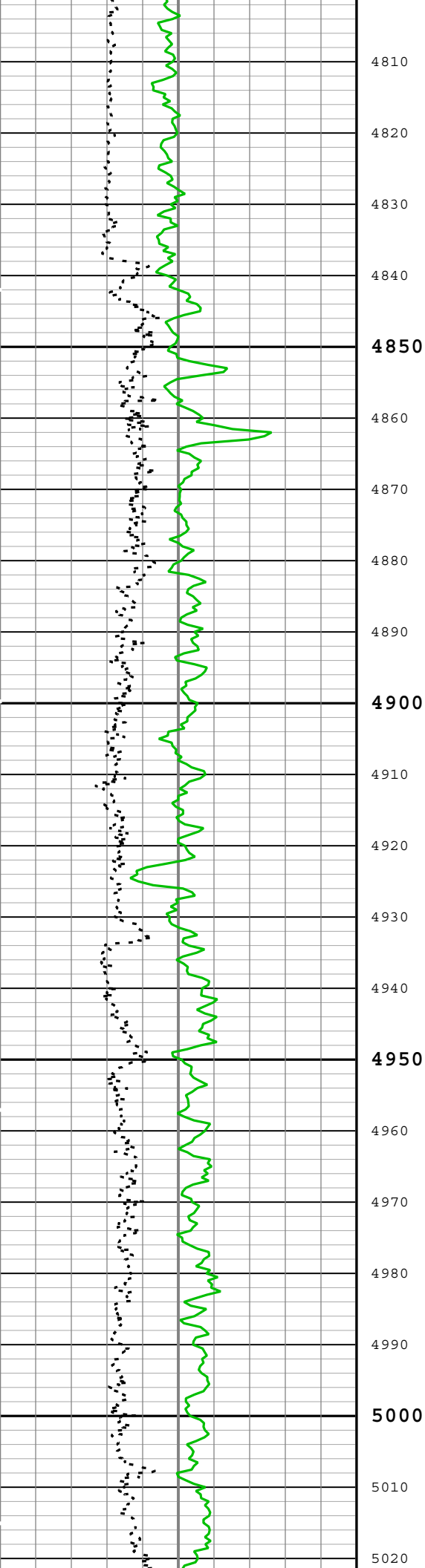


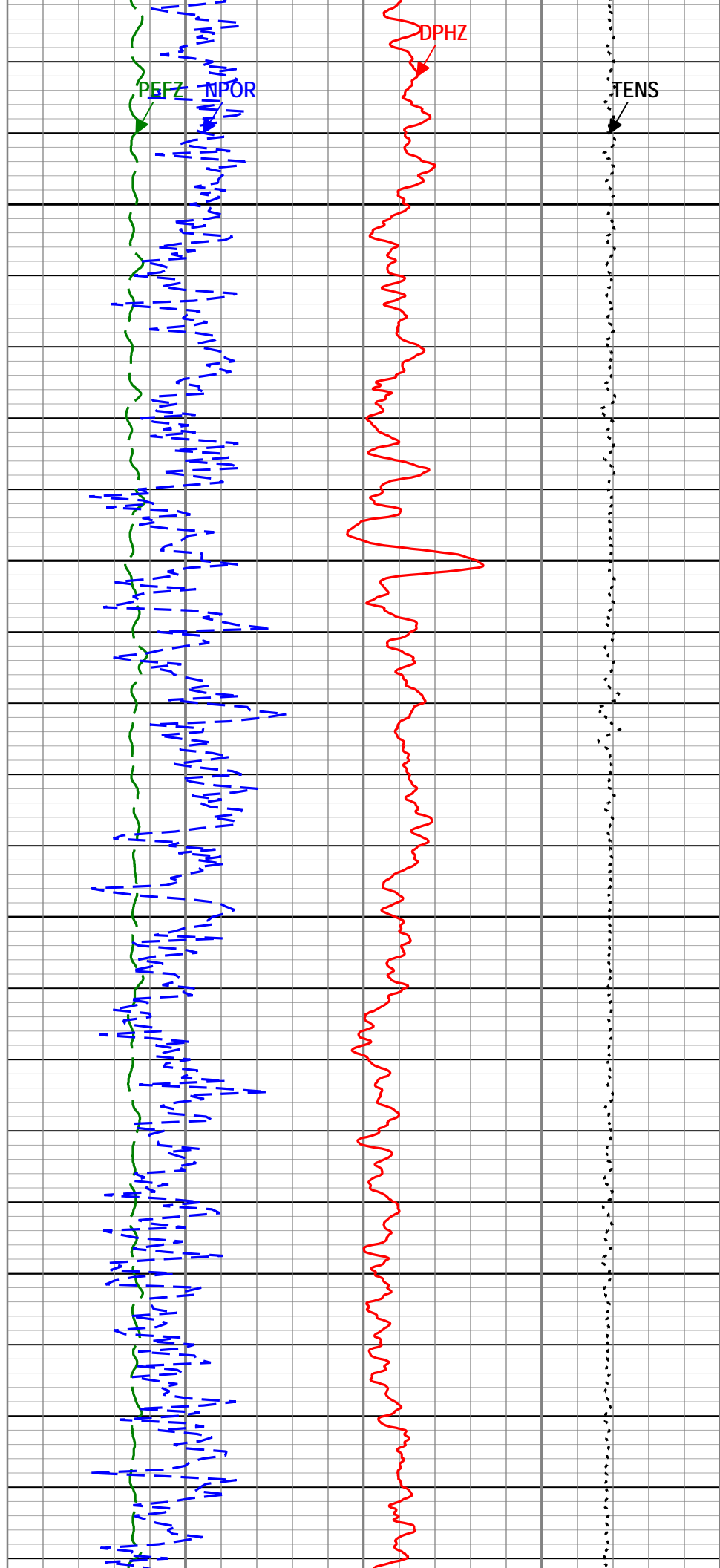
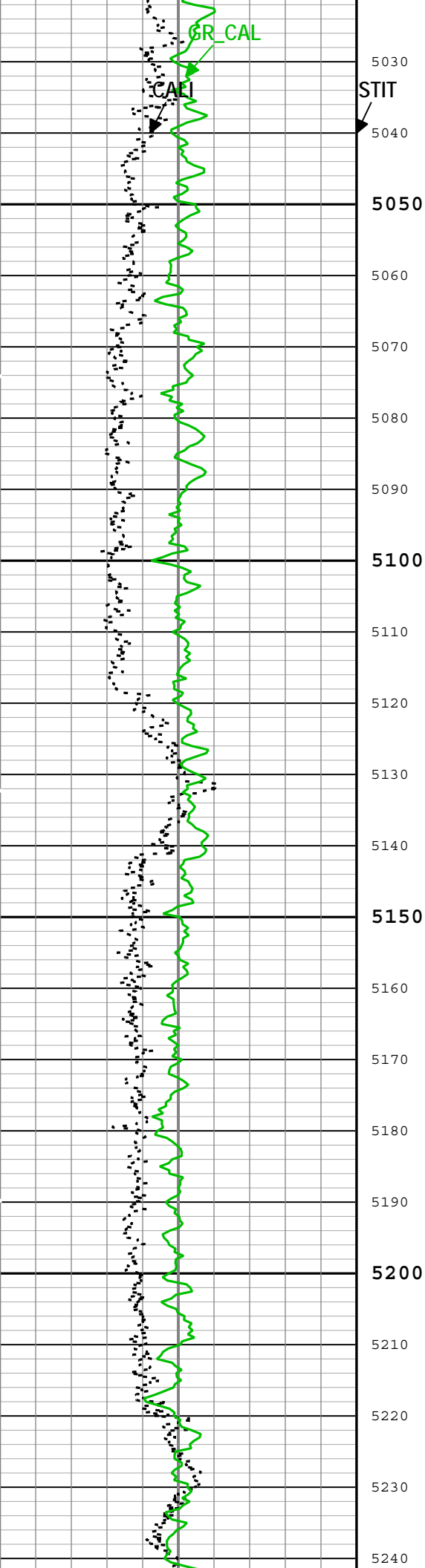


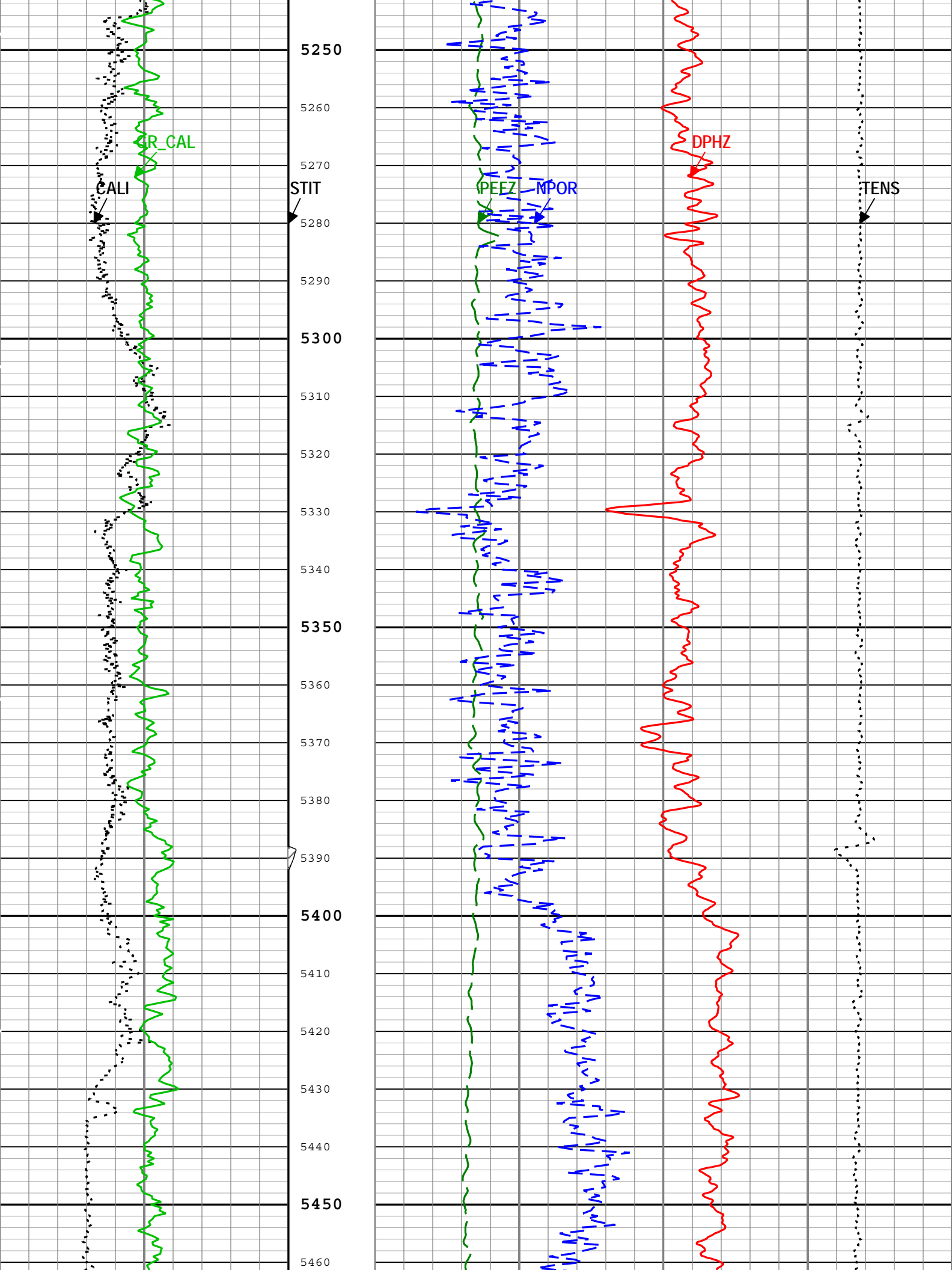


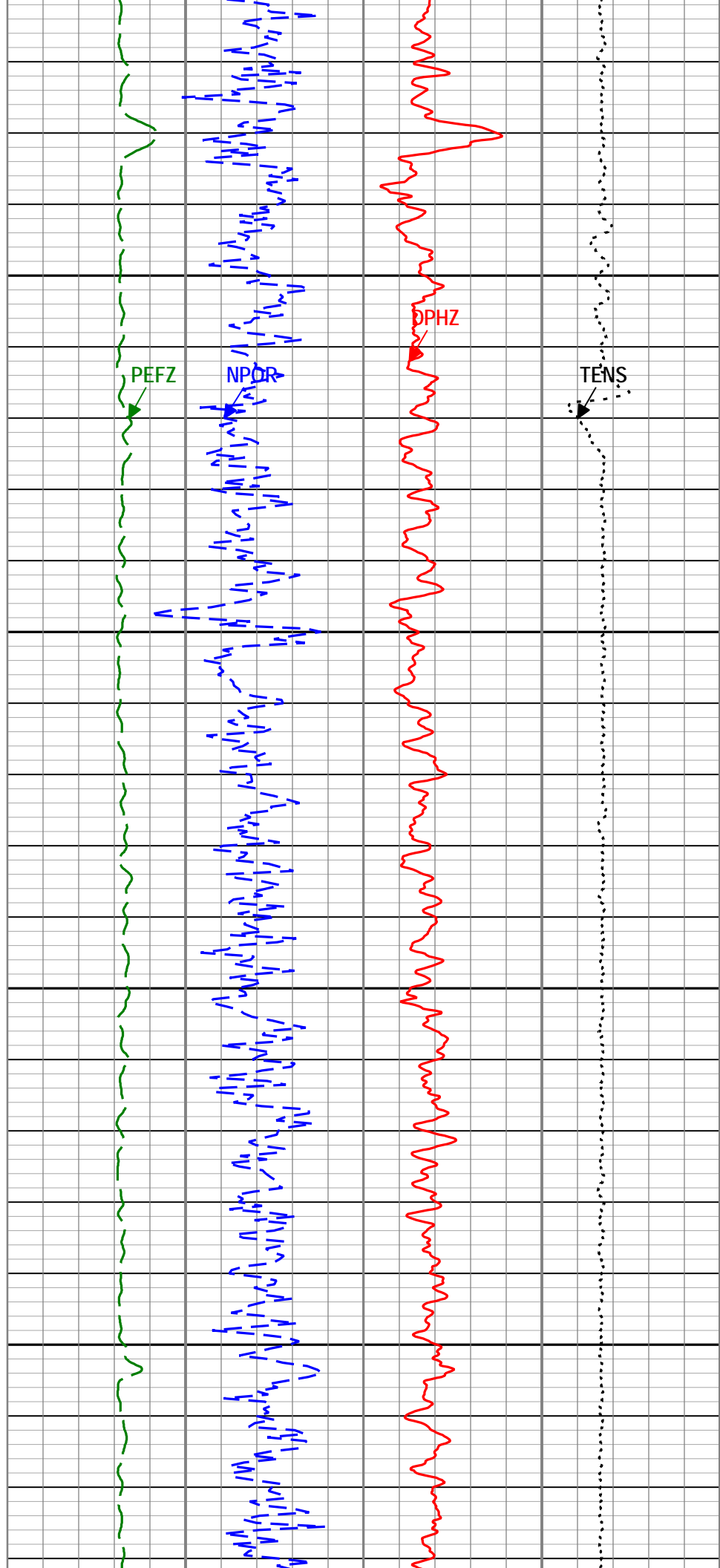
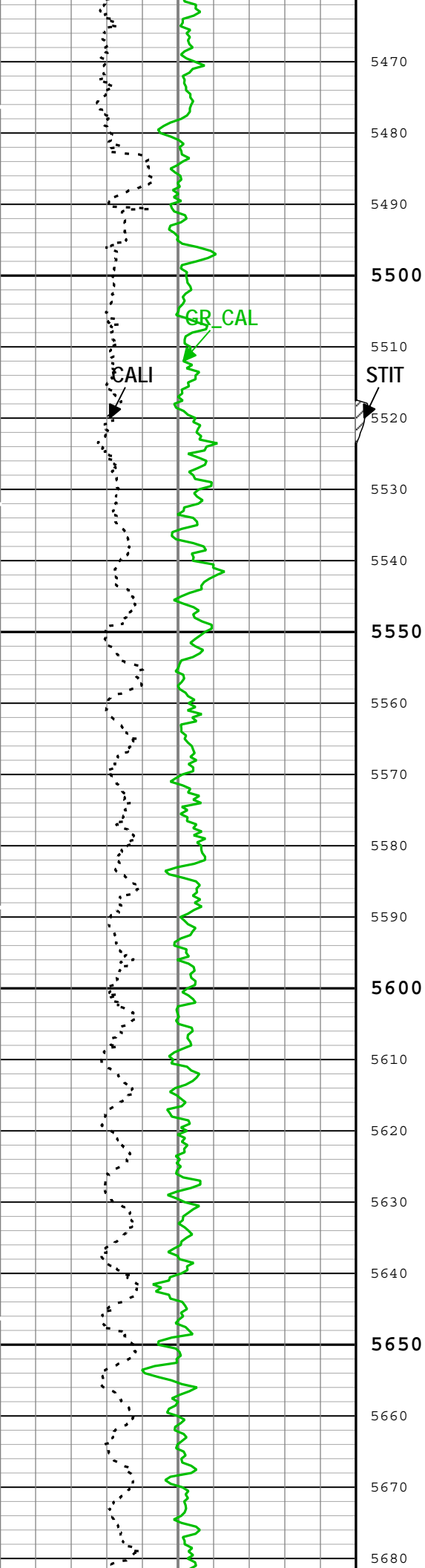


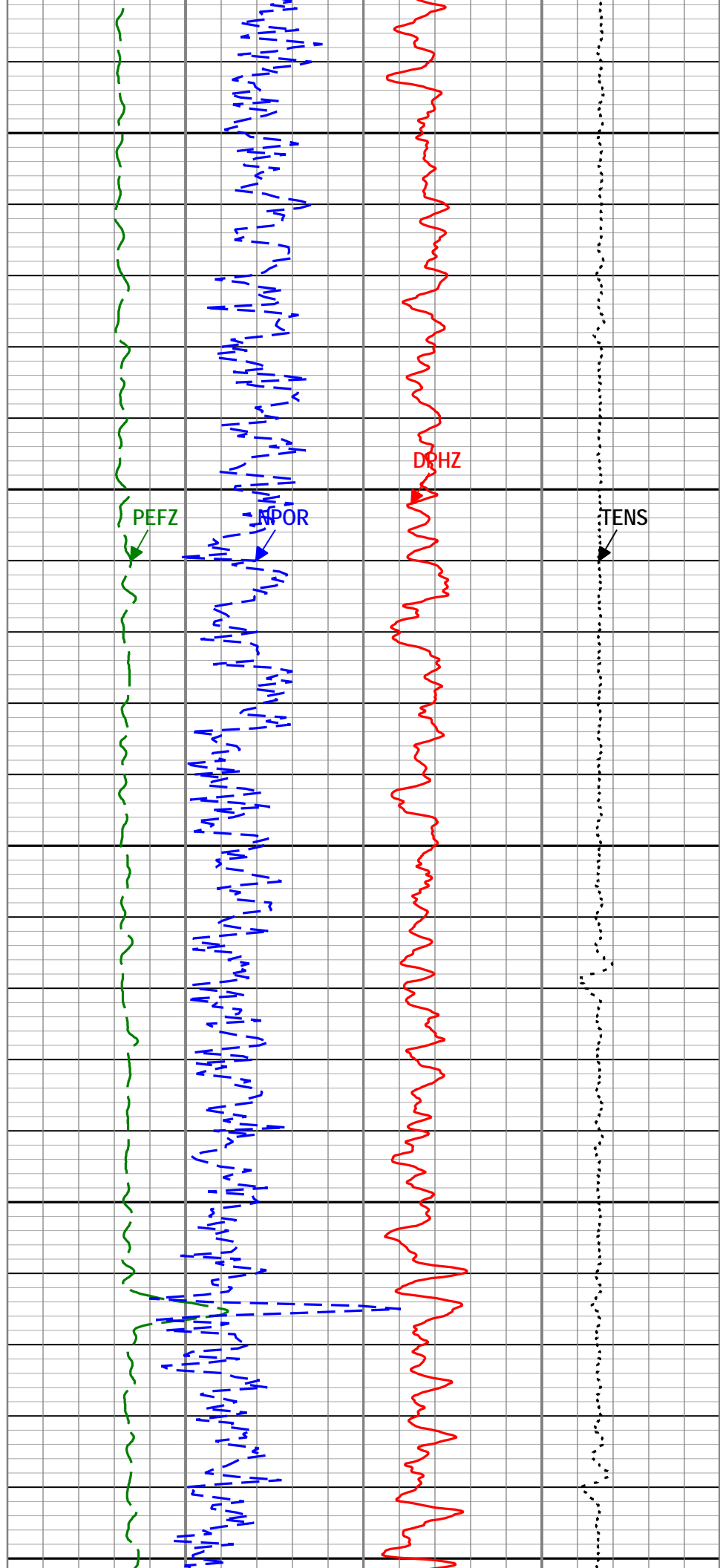
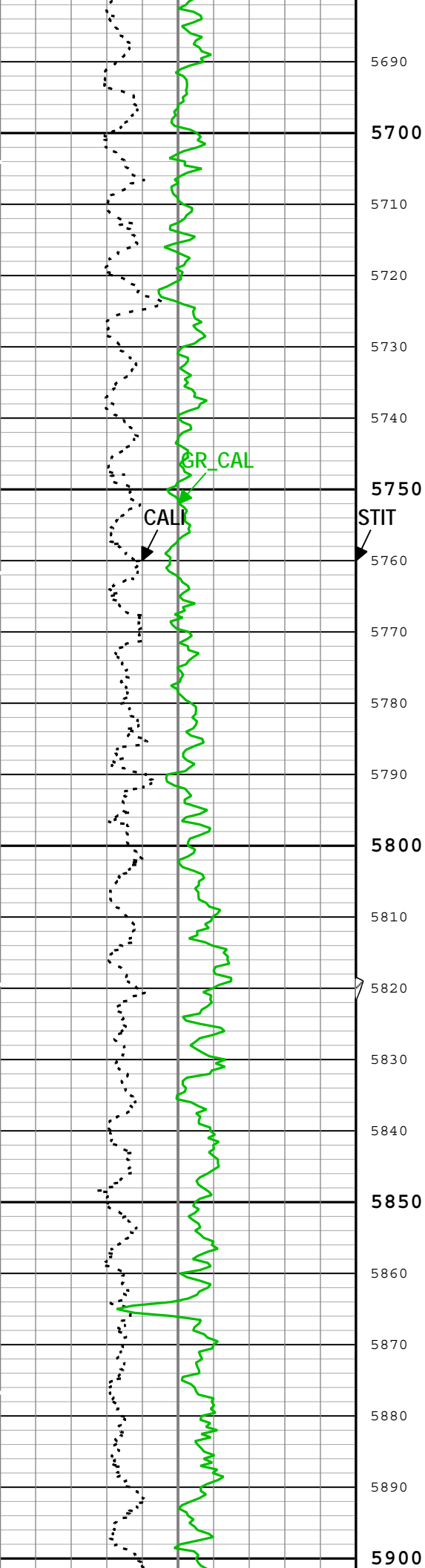


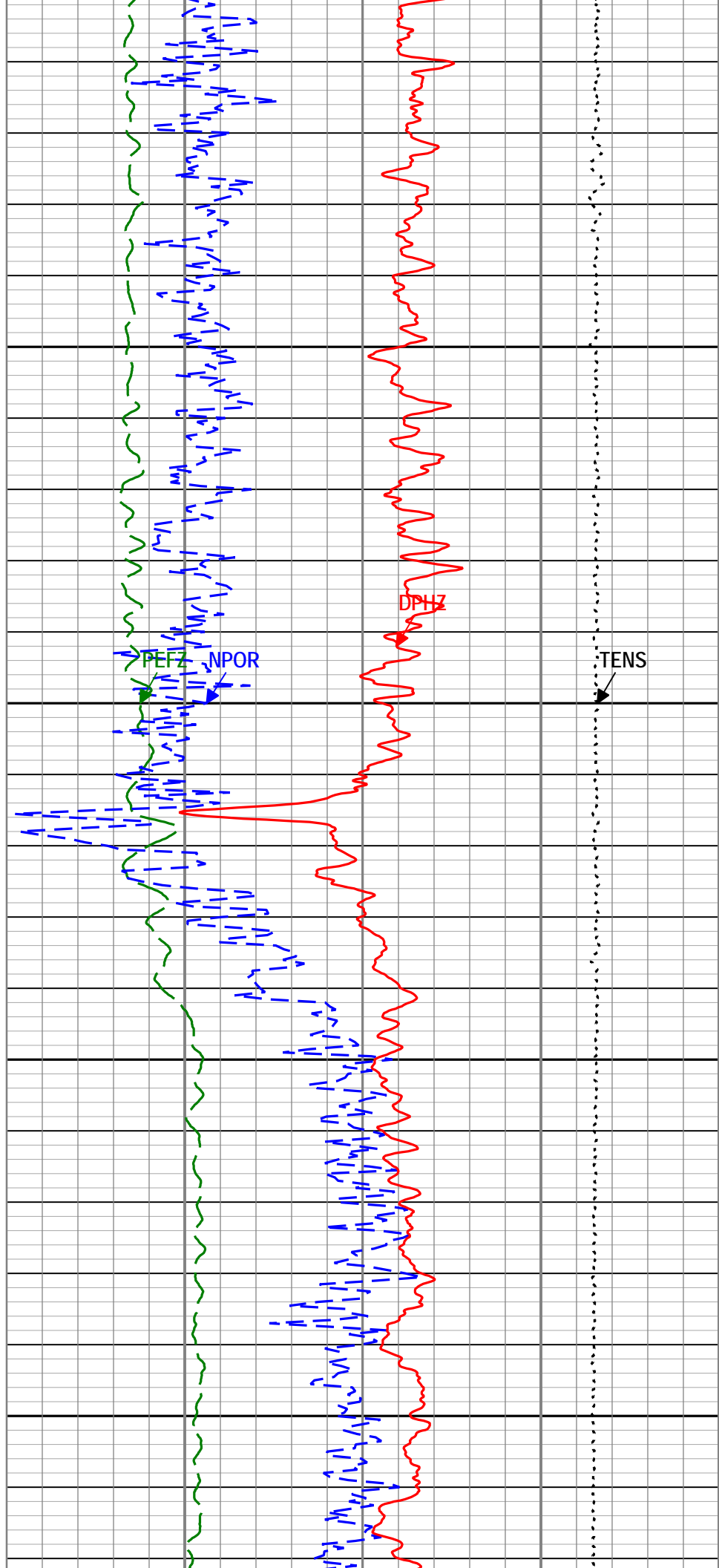
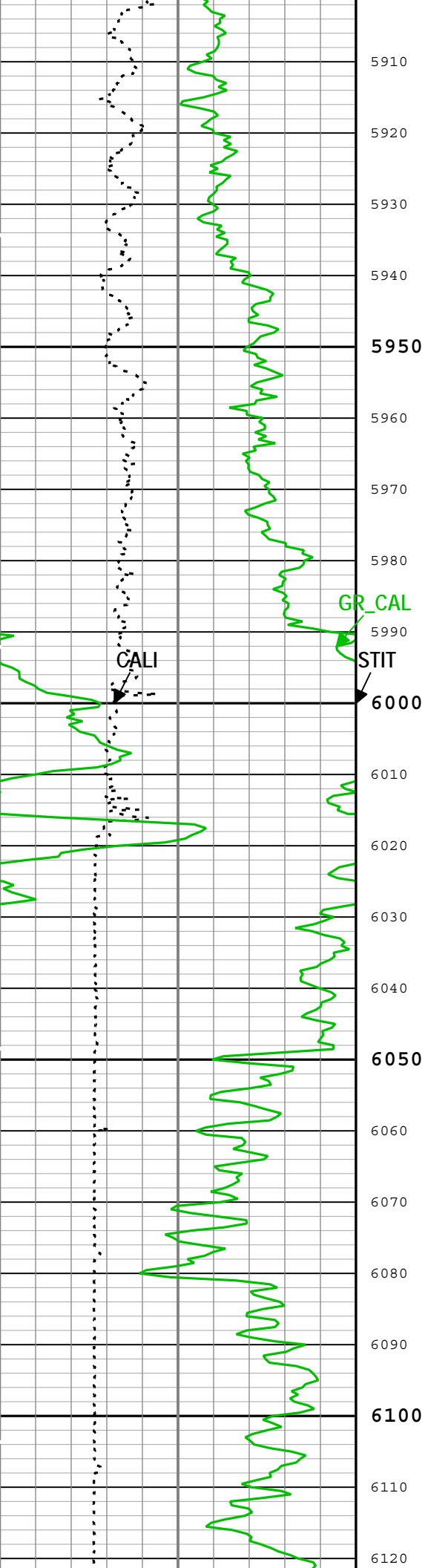


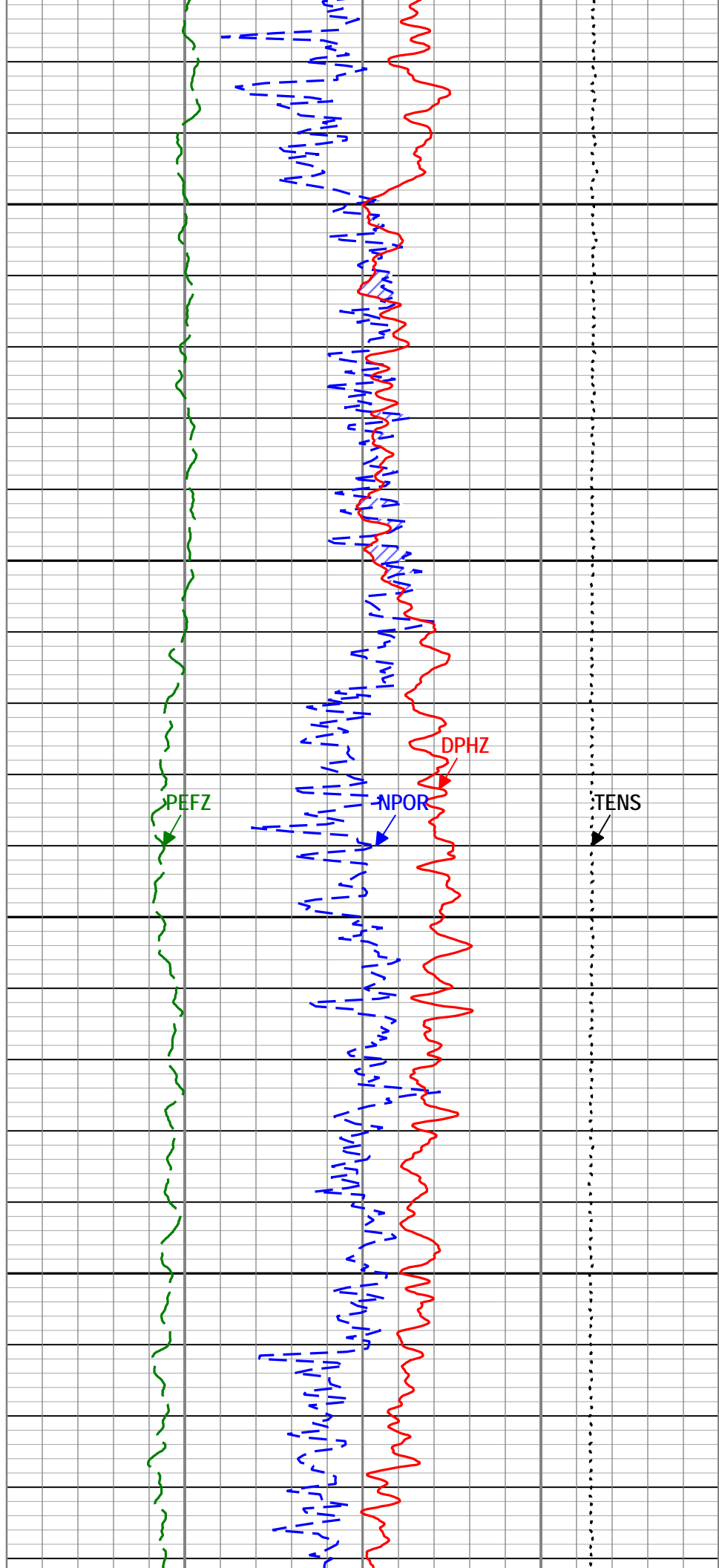
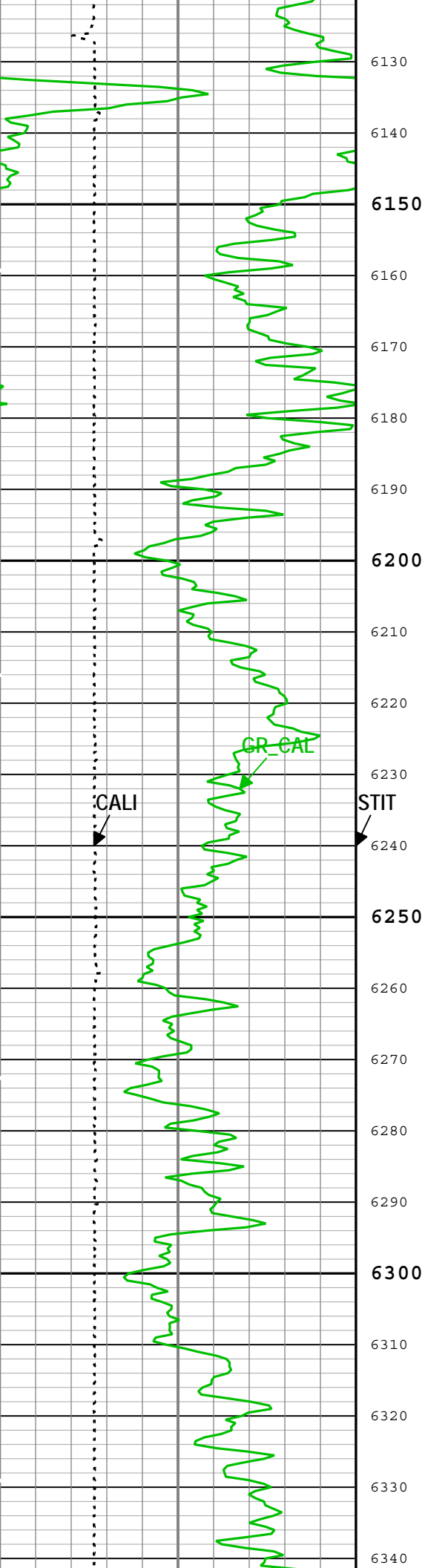


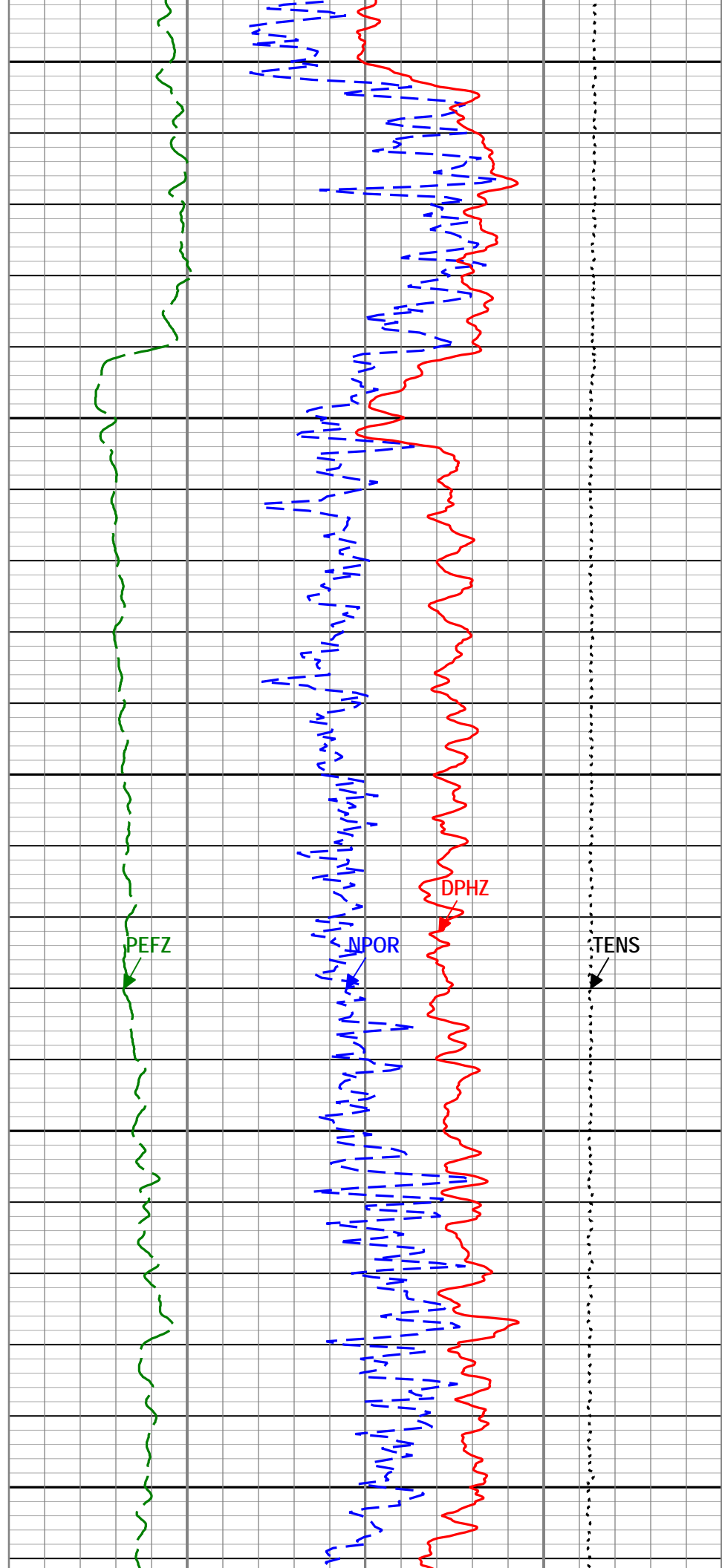
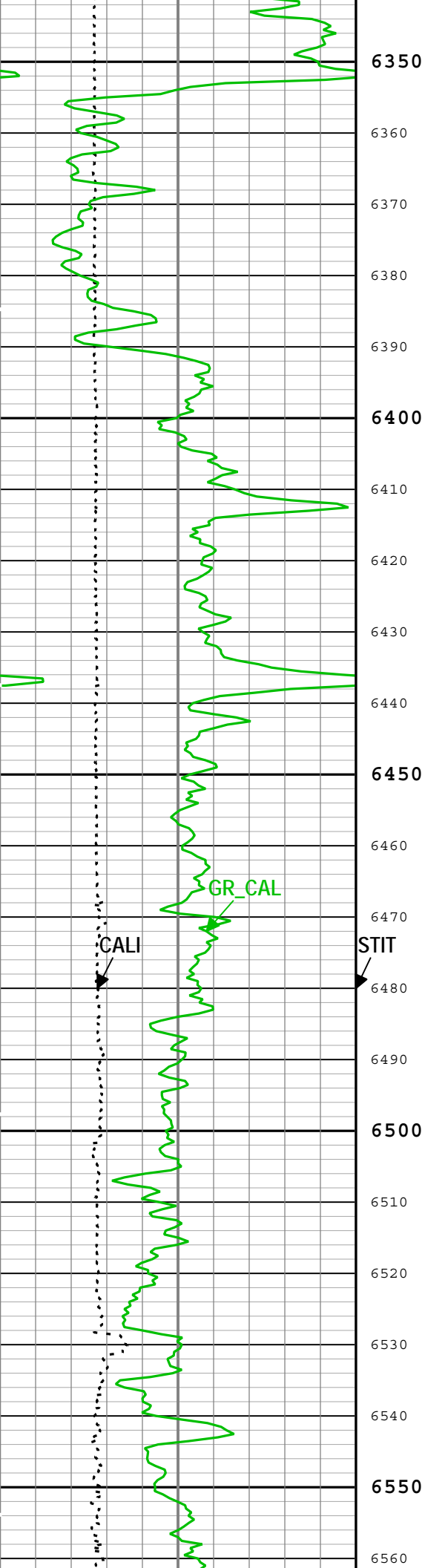


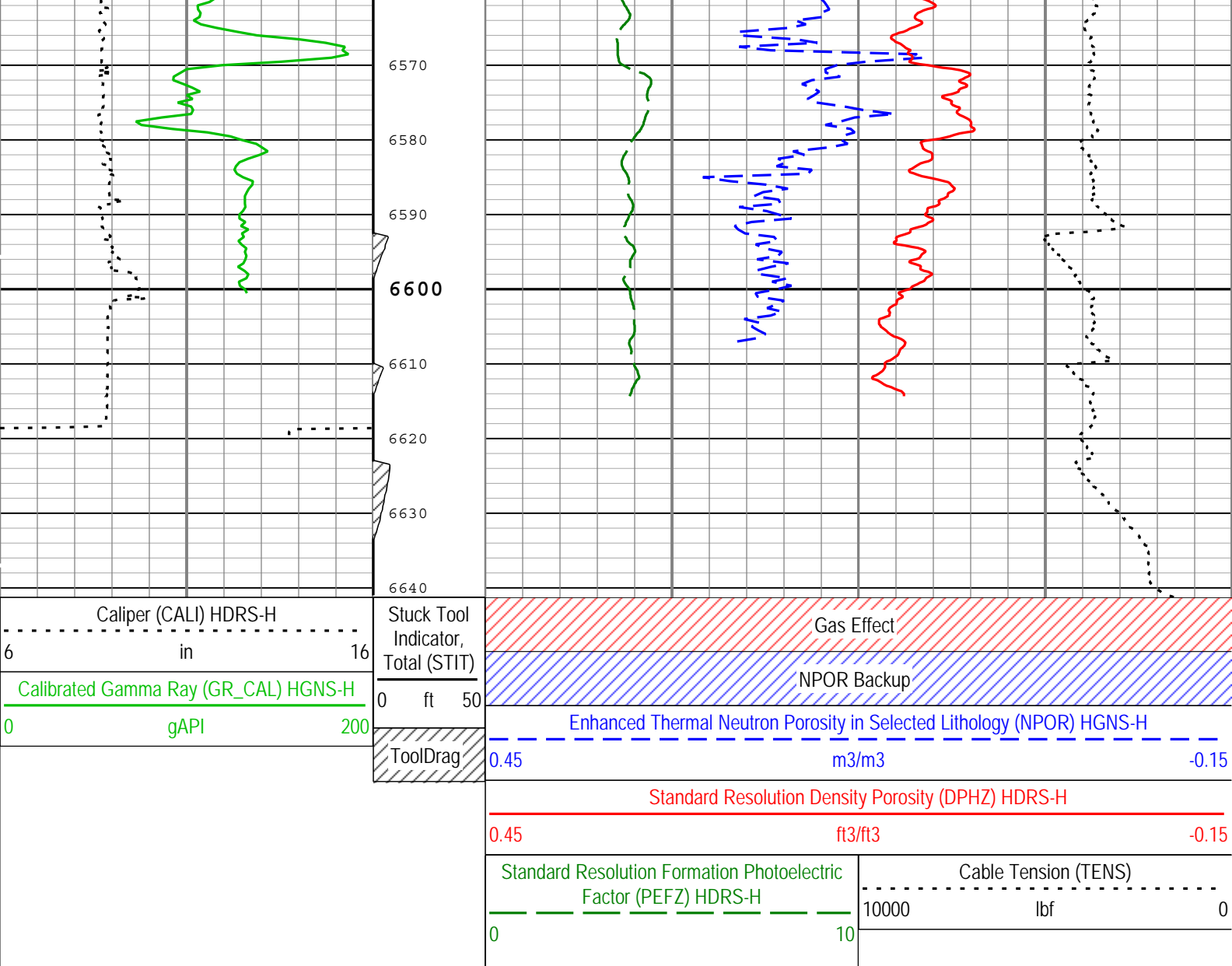












TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Porosity) Index Scale: 5 in per 100 ft Index Unit: ft Index
Type: Measured Depth Creation Date: 31-Aug-2014 02:34:38

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BHT	Bottom Hole Temperature	Borehole	190	degF
BS	Bit Size	WLSESSION	Depth Zoned	in
BSAL	Borehole Salinity	Borehole	1000	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.198	in
CBLO	Casing Bottom (Logger)	WLSESSION	1794	ft
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.3	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DFT_WATER	Drilling Fluid Water Type	Borehole	Polymer	
DHC	Density Hole Correction	HDRS-H	Bit Size	
FD	Fluid Density	Borehole	1	g/cm3
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	

GCSE_UP_PASS	Generalized Caliper Selection for VWL Log Up Passes	Borehole	CALI	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
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	LIMESTONE	
MDEN	Matrix Density for Density Porosity	Borehole	2.71	g/cm3
MFST	Mud Filtrate Sample Temperature	Borehole	75.4	degF
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.91	ohm.m
SOCO	Standoff Correction Option	HGNS-H	Yes	
TD	Total Measured Depth	Borehole	6618	ft

Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	12.25	1775	1792
BS	8.75	1792	6624
All depth are actual.			

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
One				

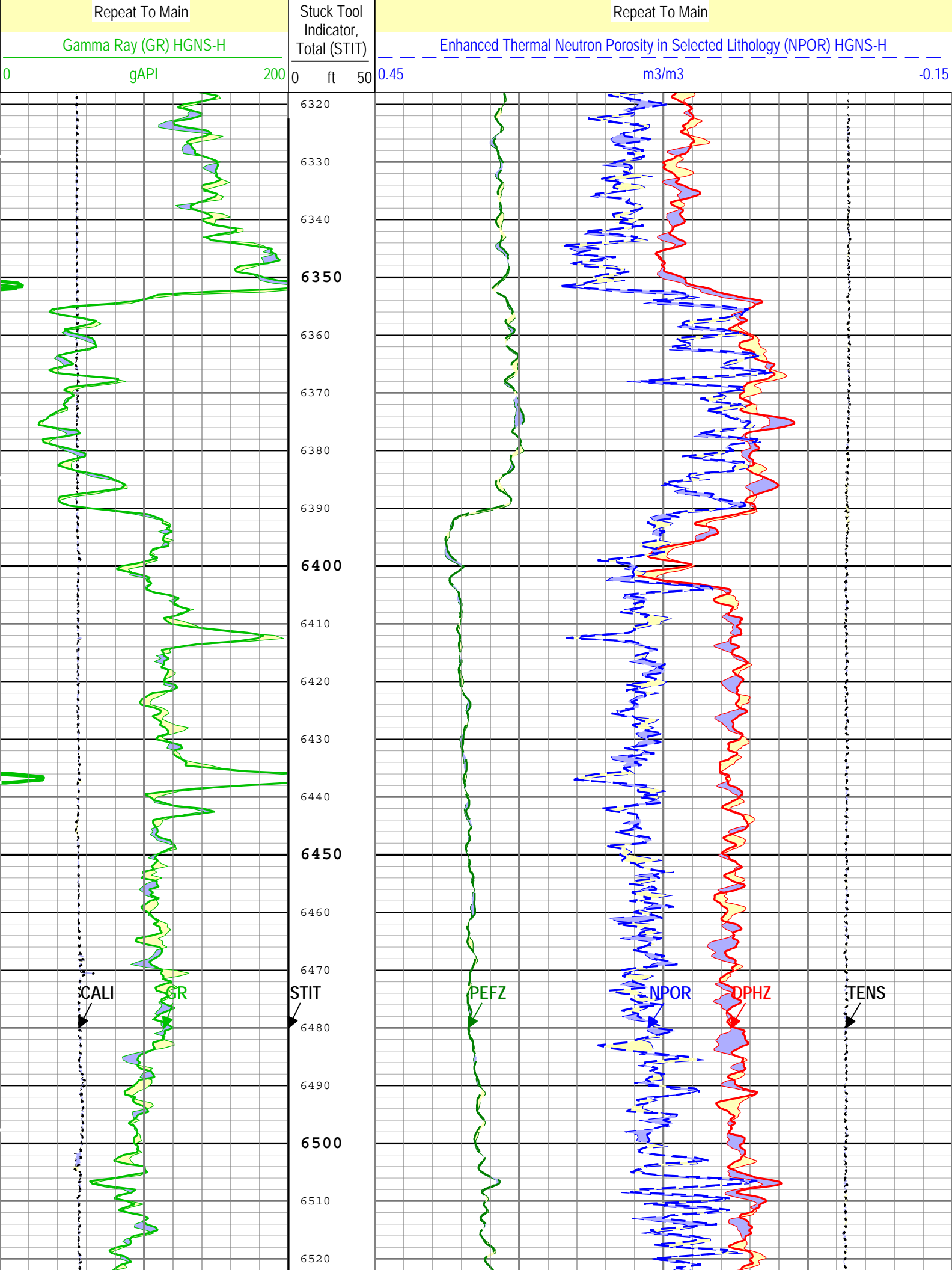
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Repeat[2]:Up	Up	6322.01 ft	6646.28 ft	30-Aug-2014 6:11:02 PM	30-Aug-2014 6:18:13 PM	ON	5.99 ft	No
One	Log[3]:Up	Up	59.61 ft	6641.24 ft	30-Aug-2014 6:23:41 PM	30-Aug-2014 8:11:43 PM	ON	6.77 ft	No
All depths are referenced to toolstring zero									

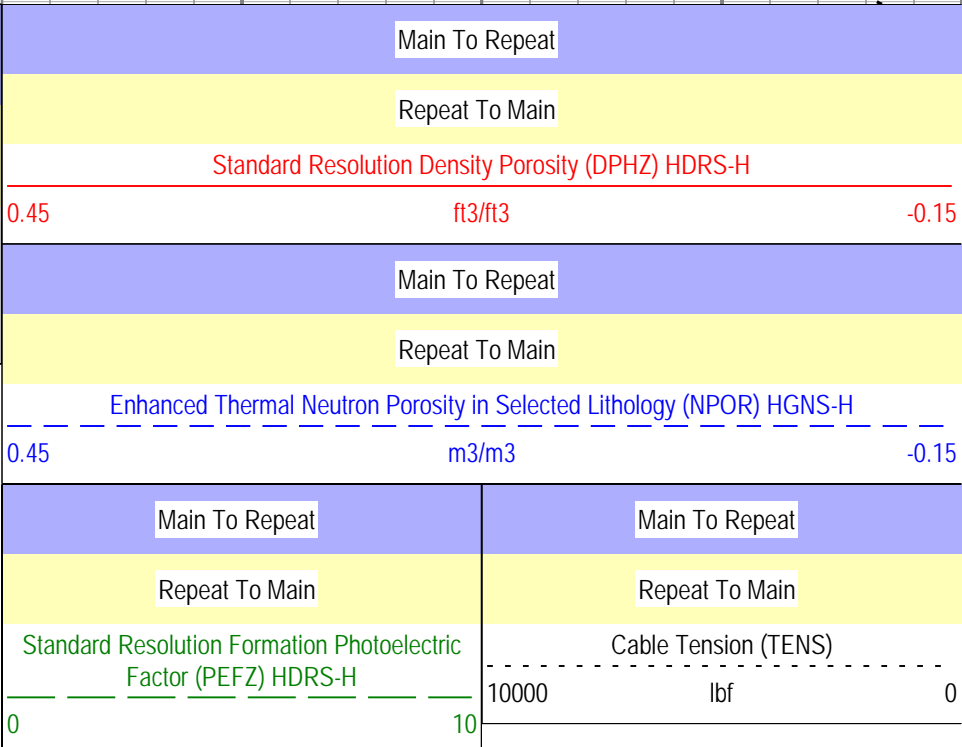
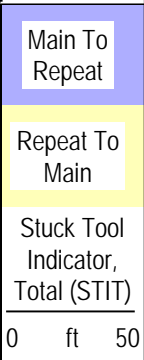
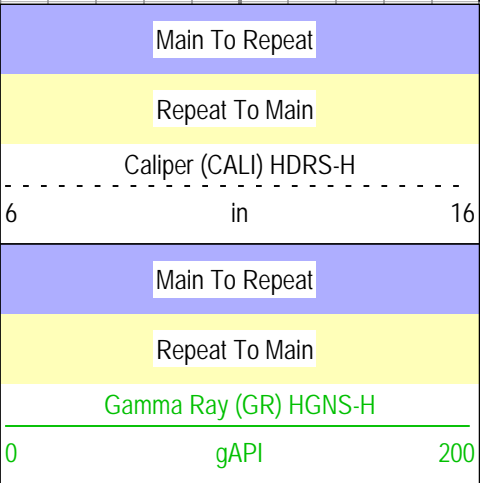
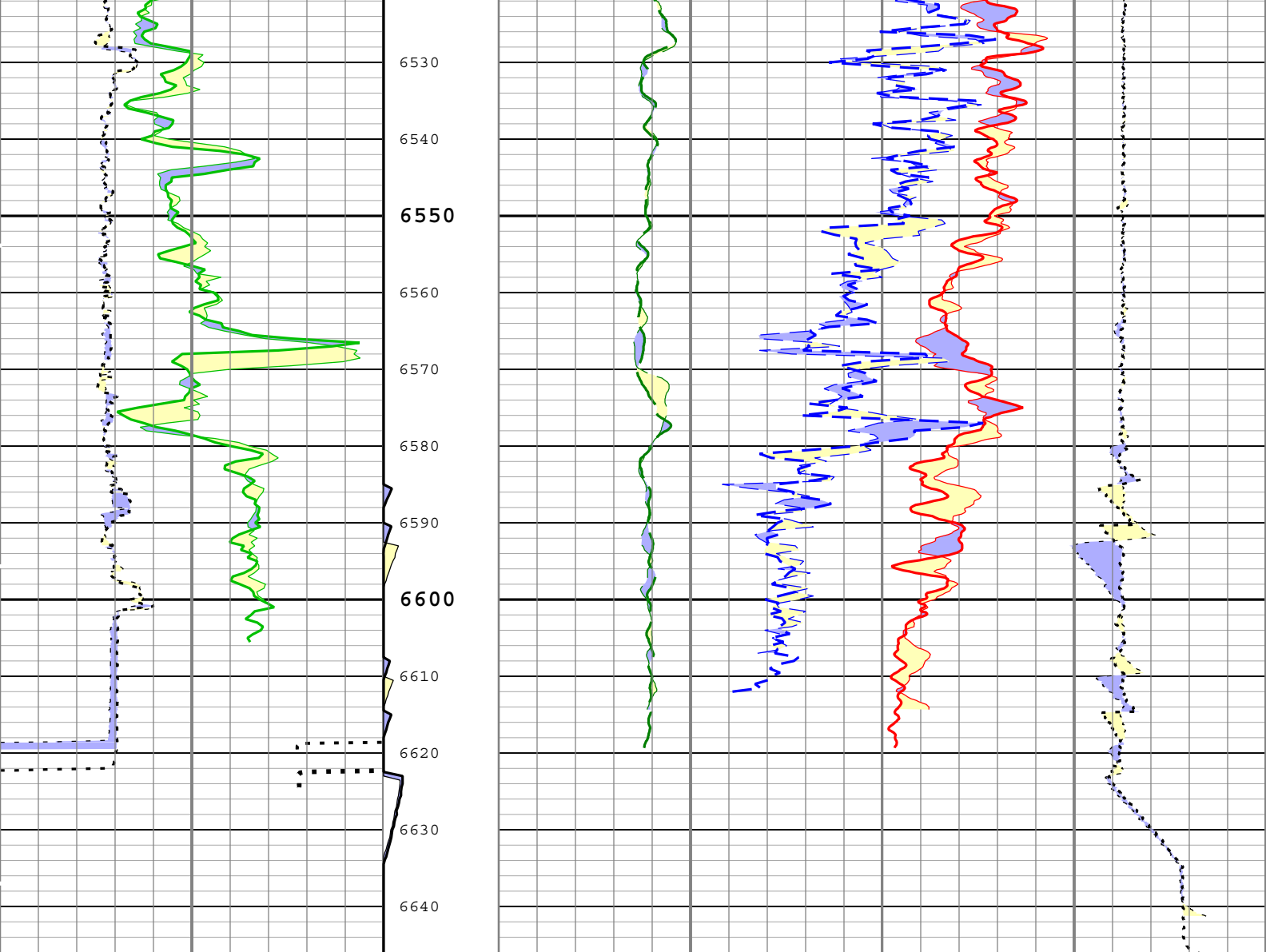
Log	Company:Whiting Oil and Gas Corporation	Well:Wolf 12L-0103
		One: Log[3]:Up:S010

Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Porosity RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 31-Aug-2014 02:34:40

TIME_1900 - Time Marked every 60.00 (s)

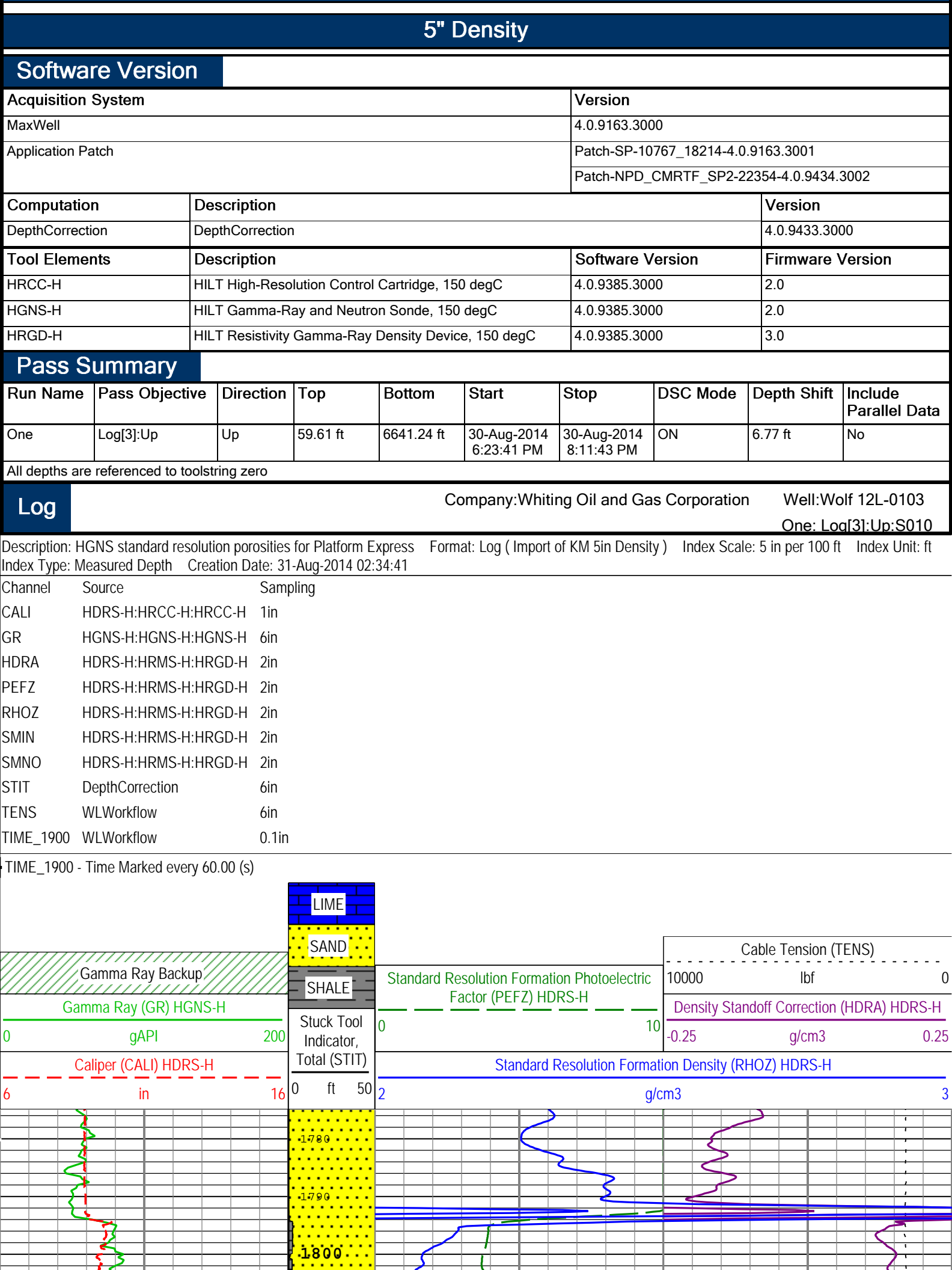
		Main To Repeat		Main To Repeat	
		Repeat To Main		Repeat To Main	
		Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H		Cable Tension (TENS)	
		010		10000lbf0	
Main To Repeat		Main To Repeat			
Repeat To Main		Repeat To Main			
Caliper (CALI) HDRS-H		Main To Repeat	Standard Resolution Density Porosity (DPHZ) HDRS-H		
6in16			0.45ft3/ft3-0.15		
Main To Repeat		Main To Repeat			

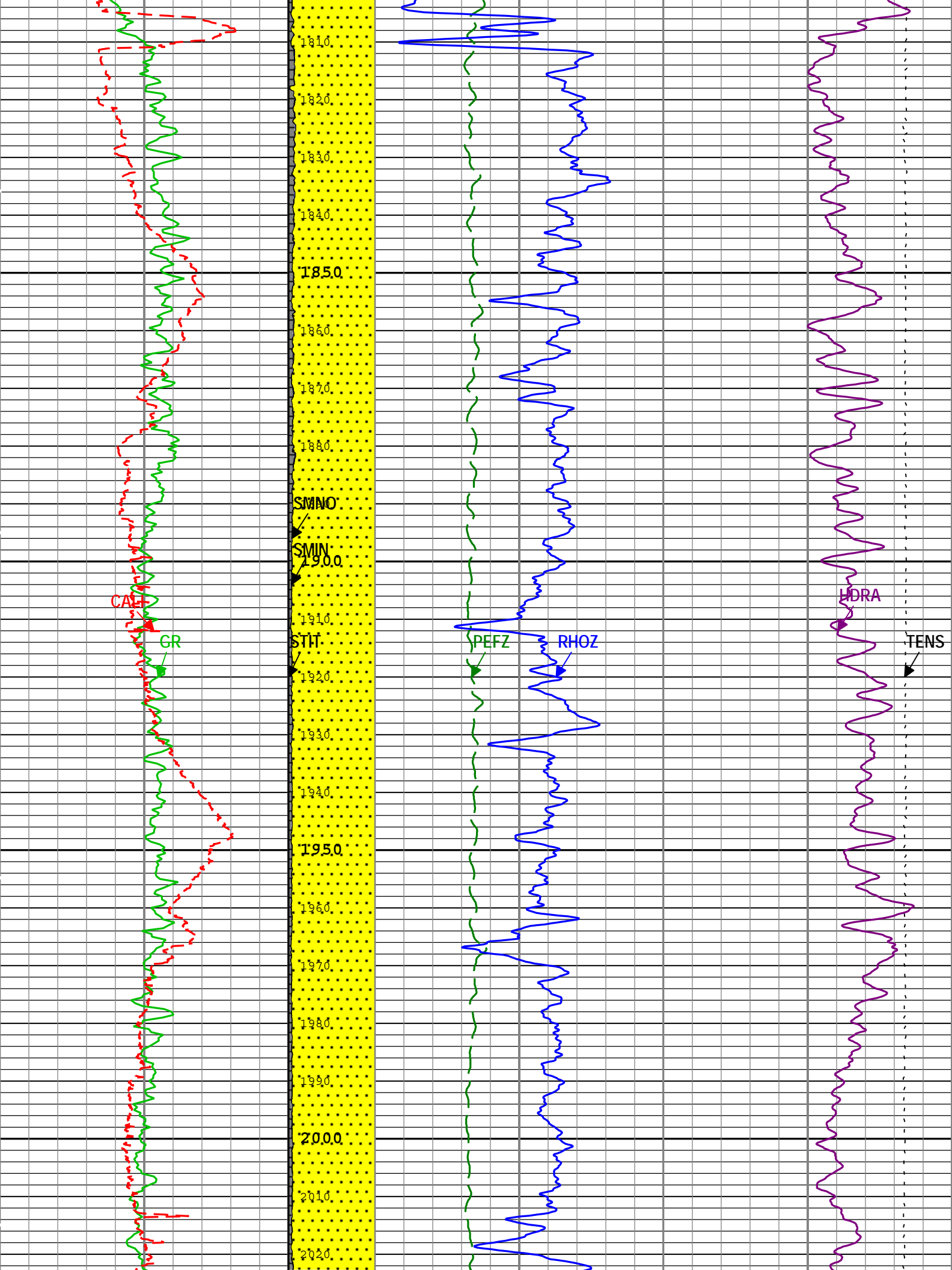


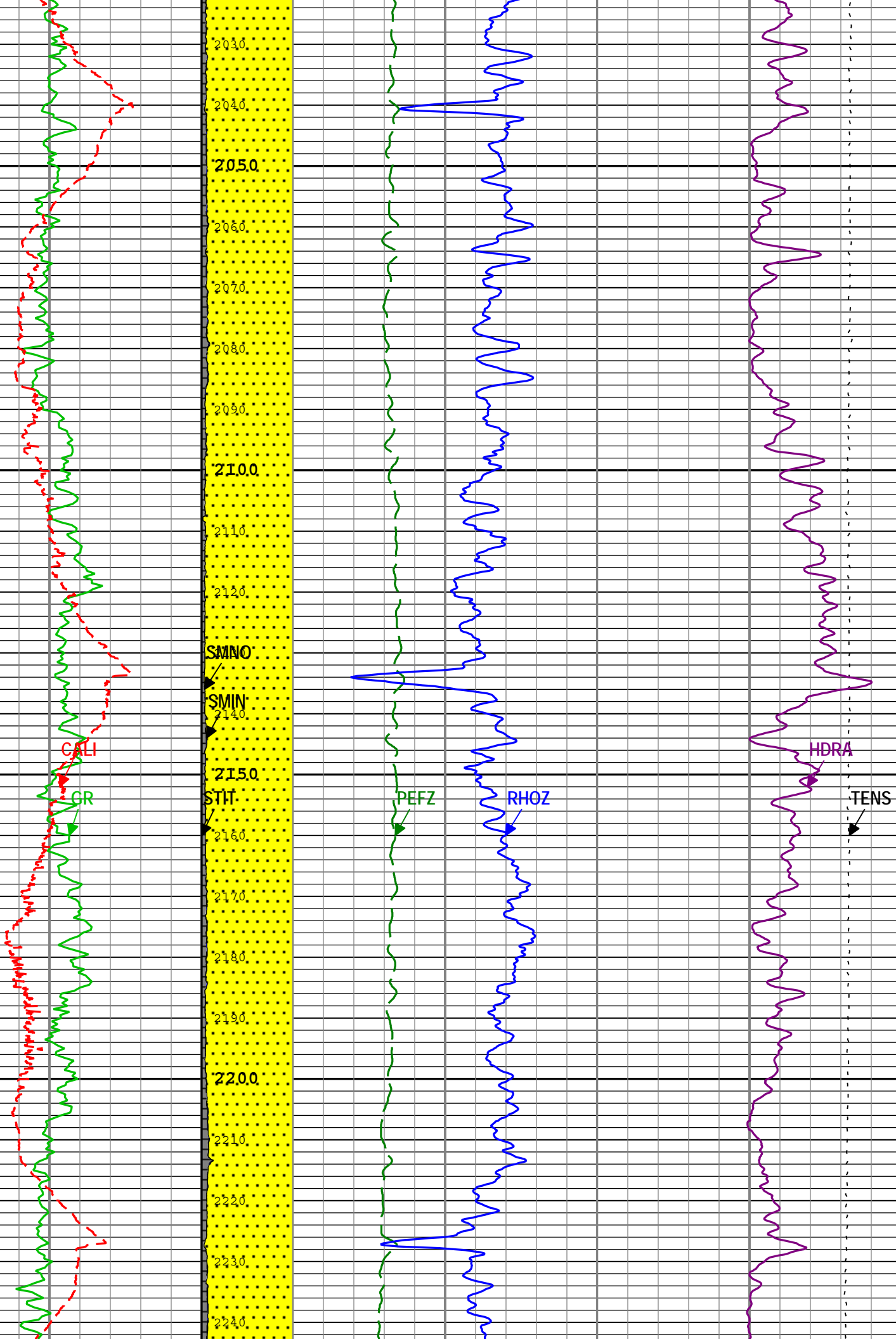


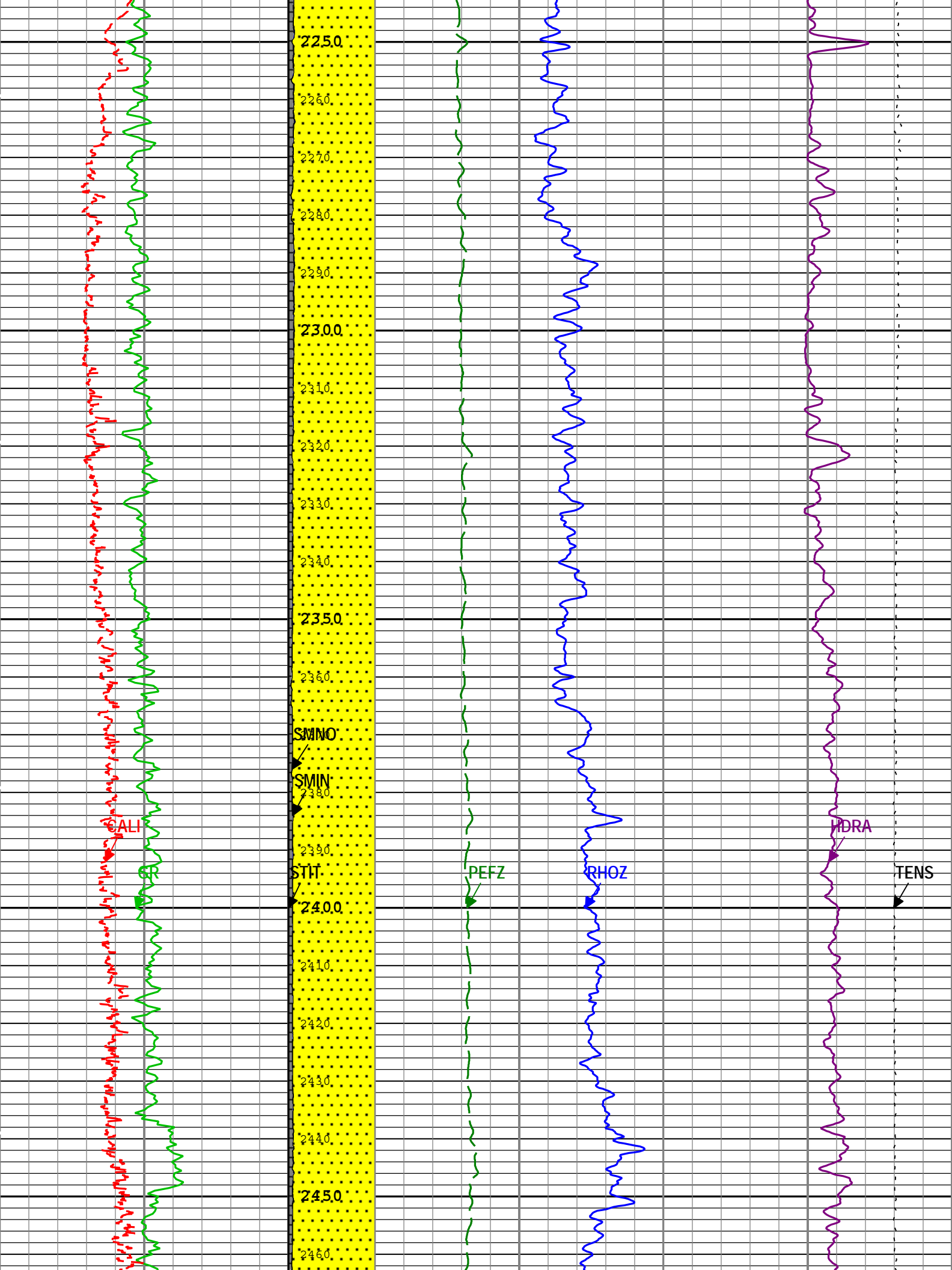
TIME_1900 - Time Marked every 60.00 (s)

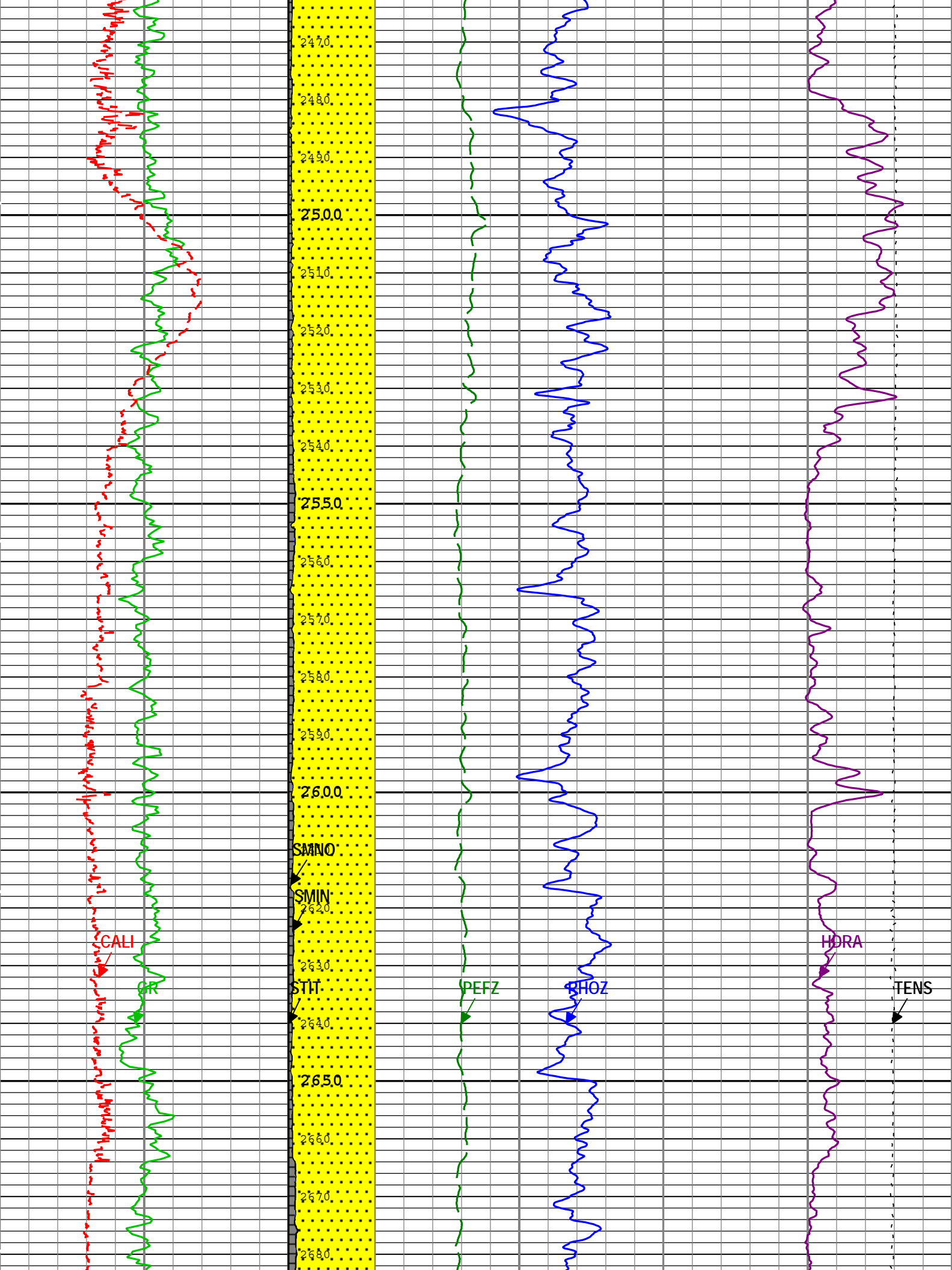
Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Porosity RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 31-Aug-2014 02:34:40

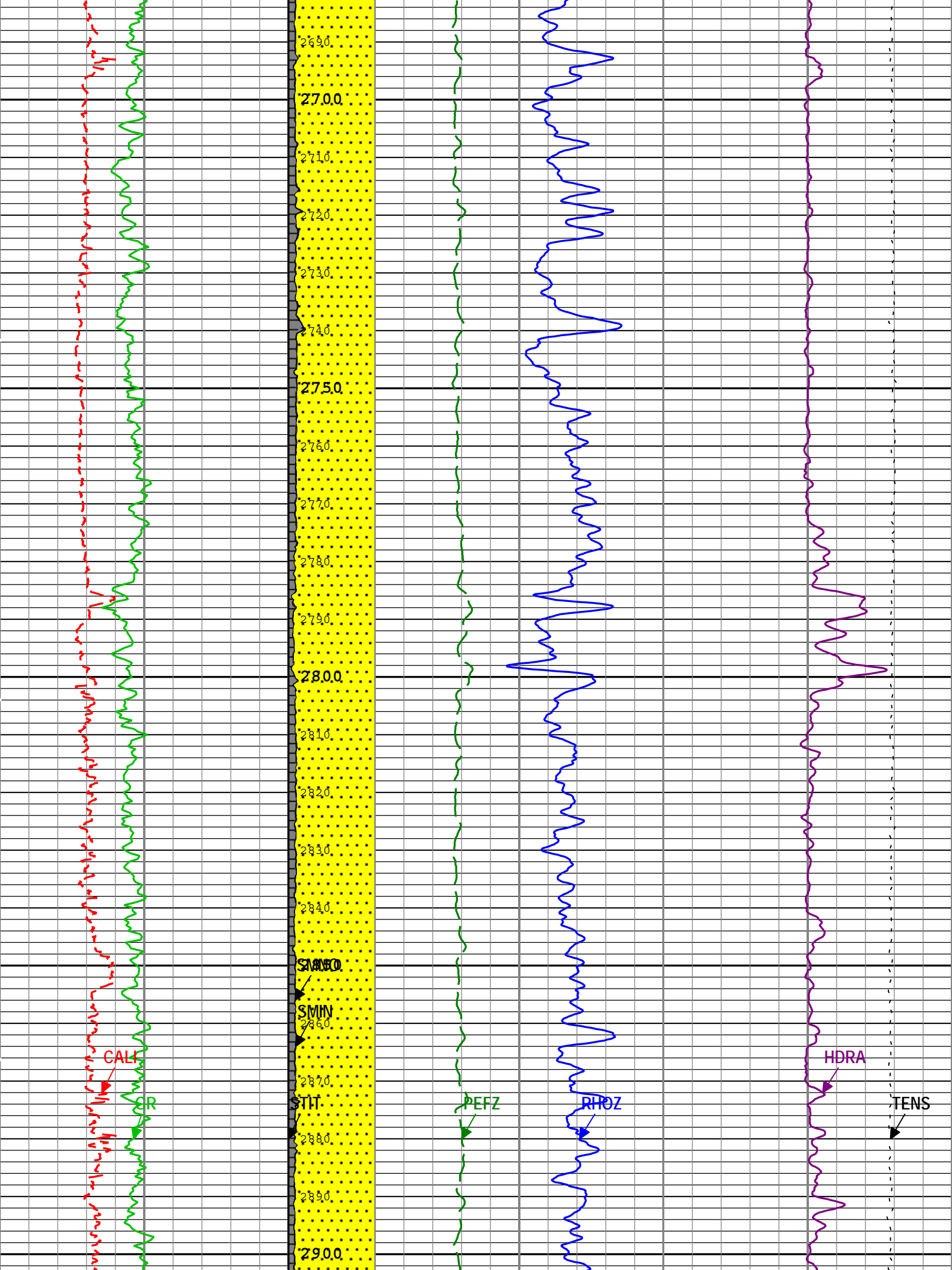


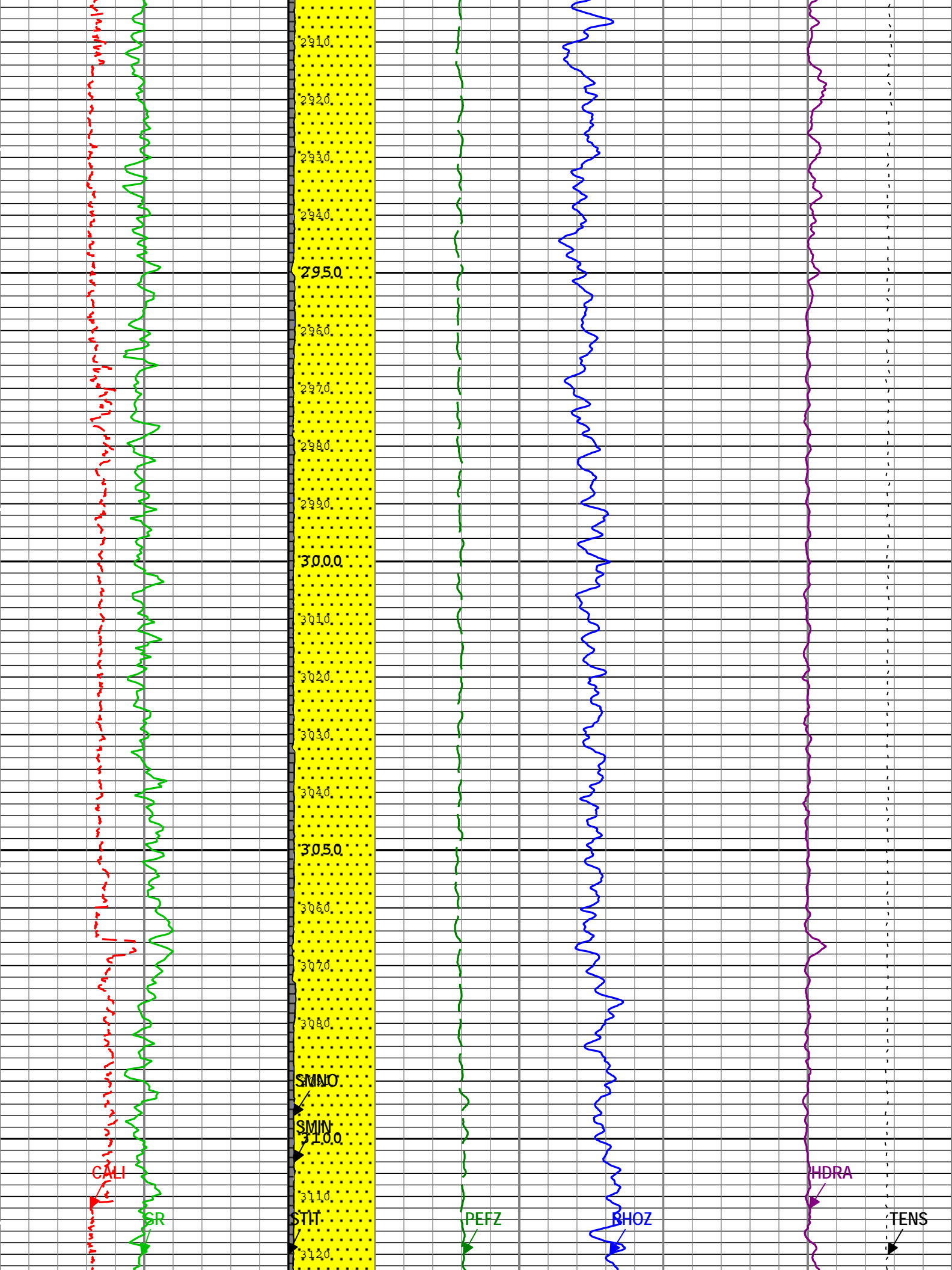


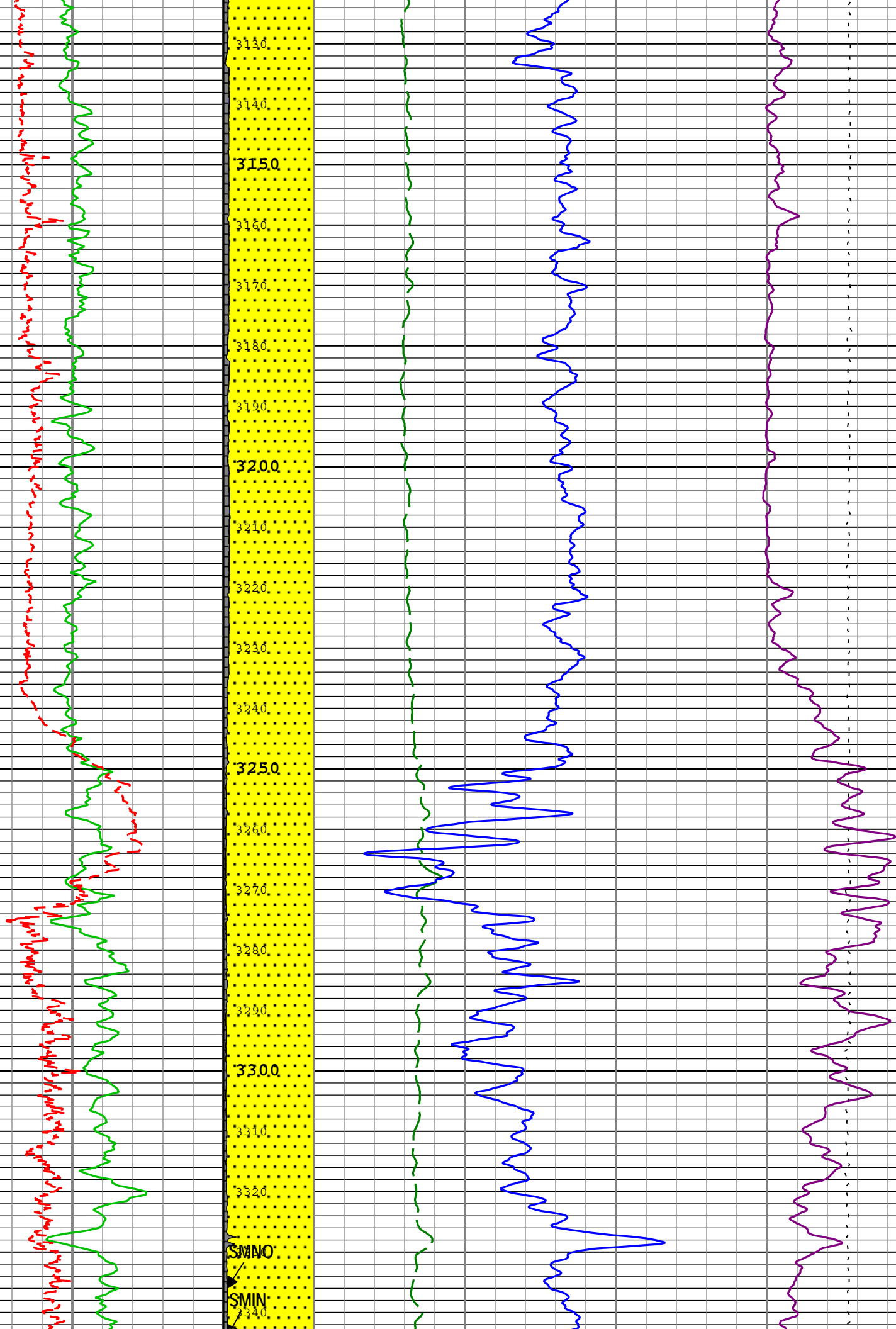


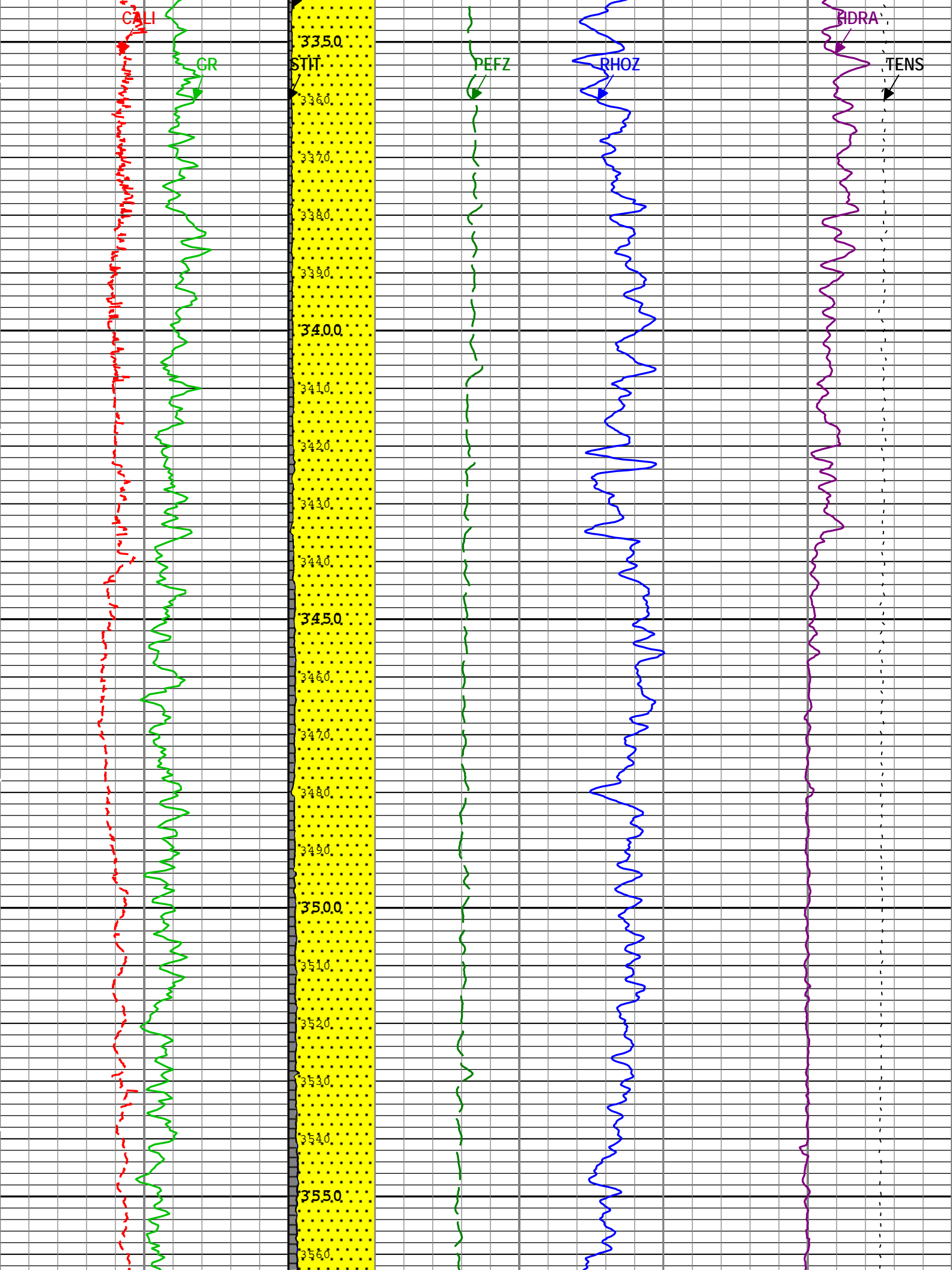


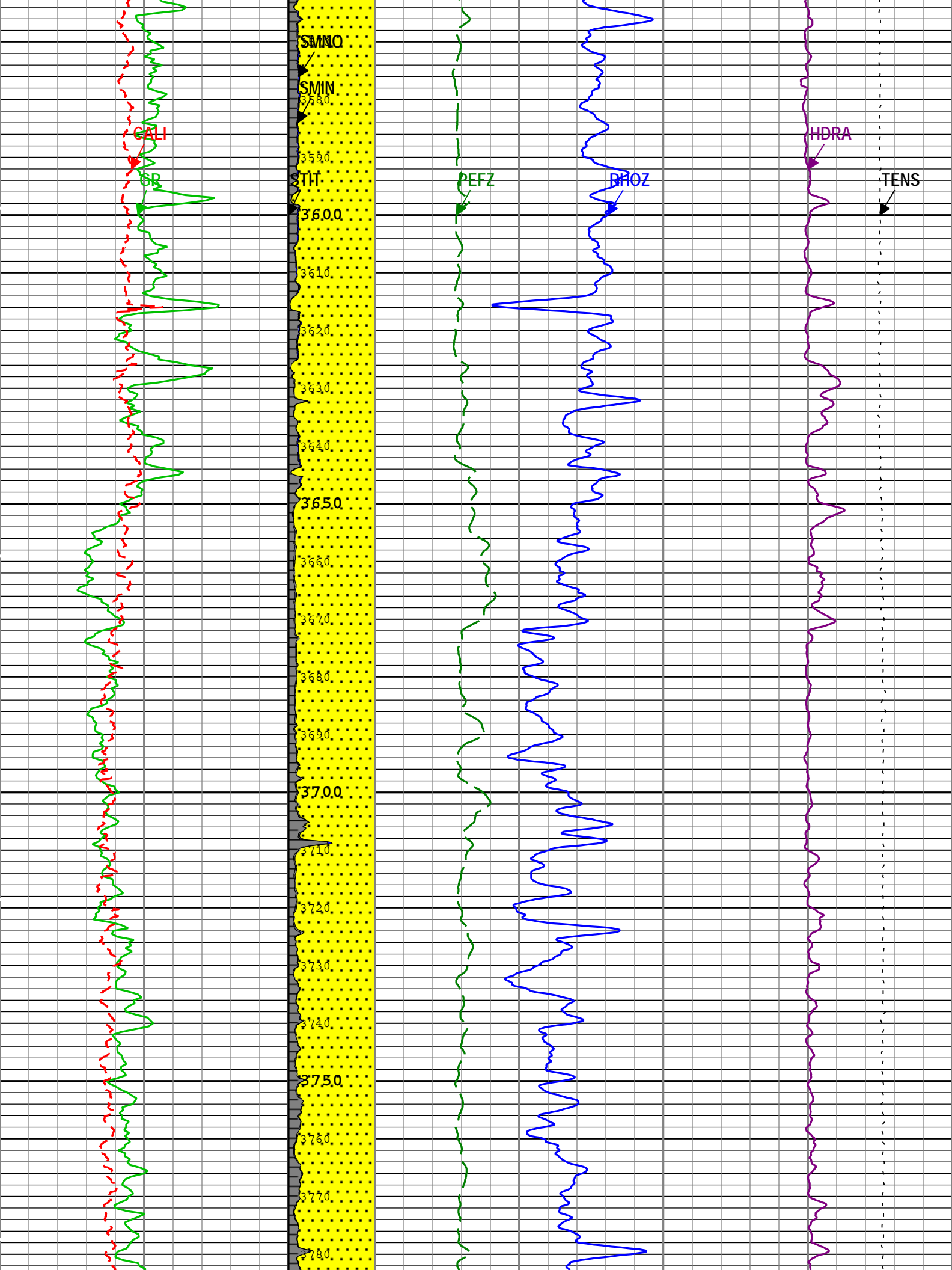


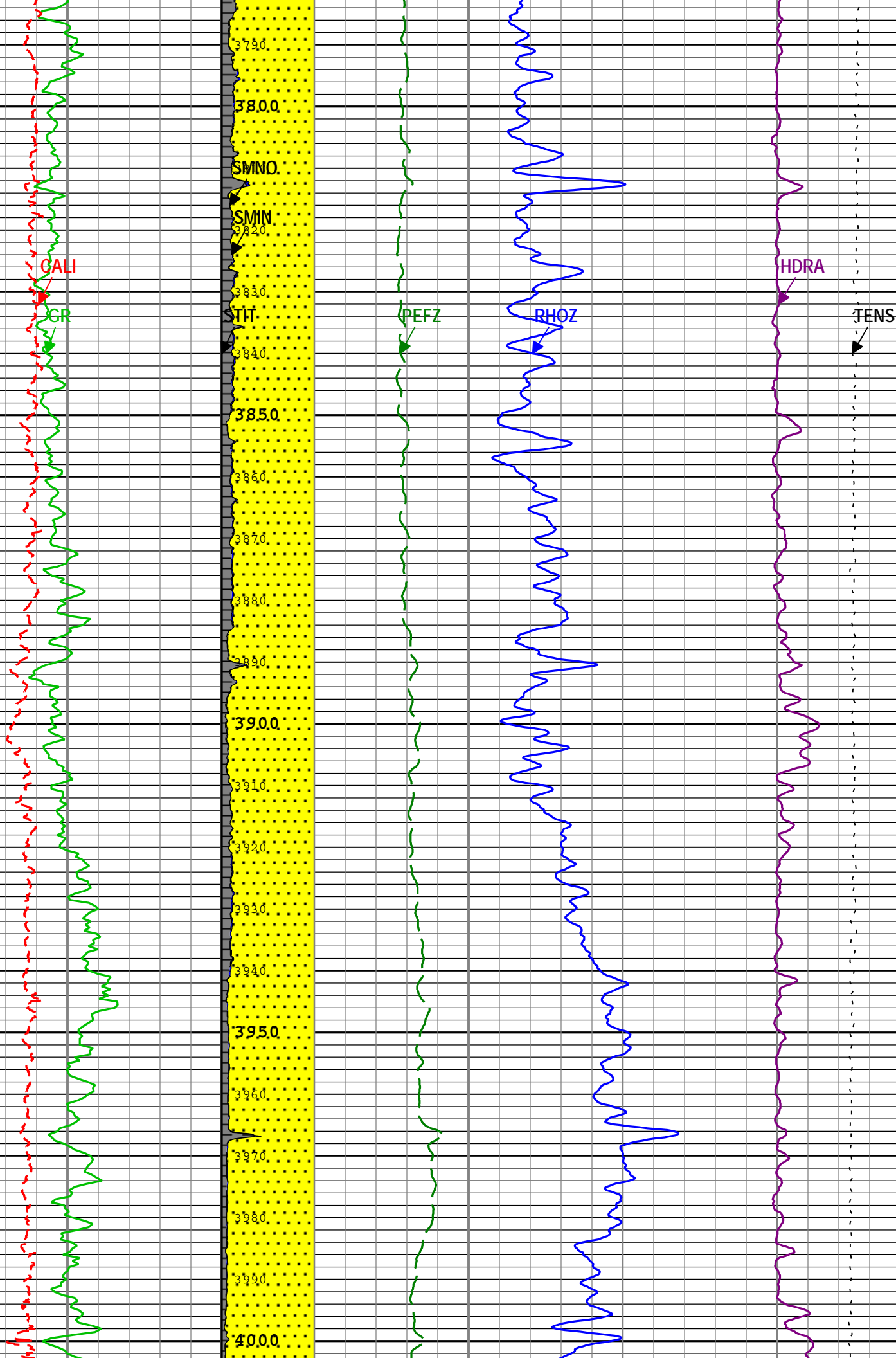


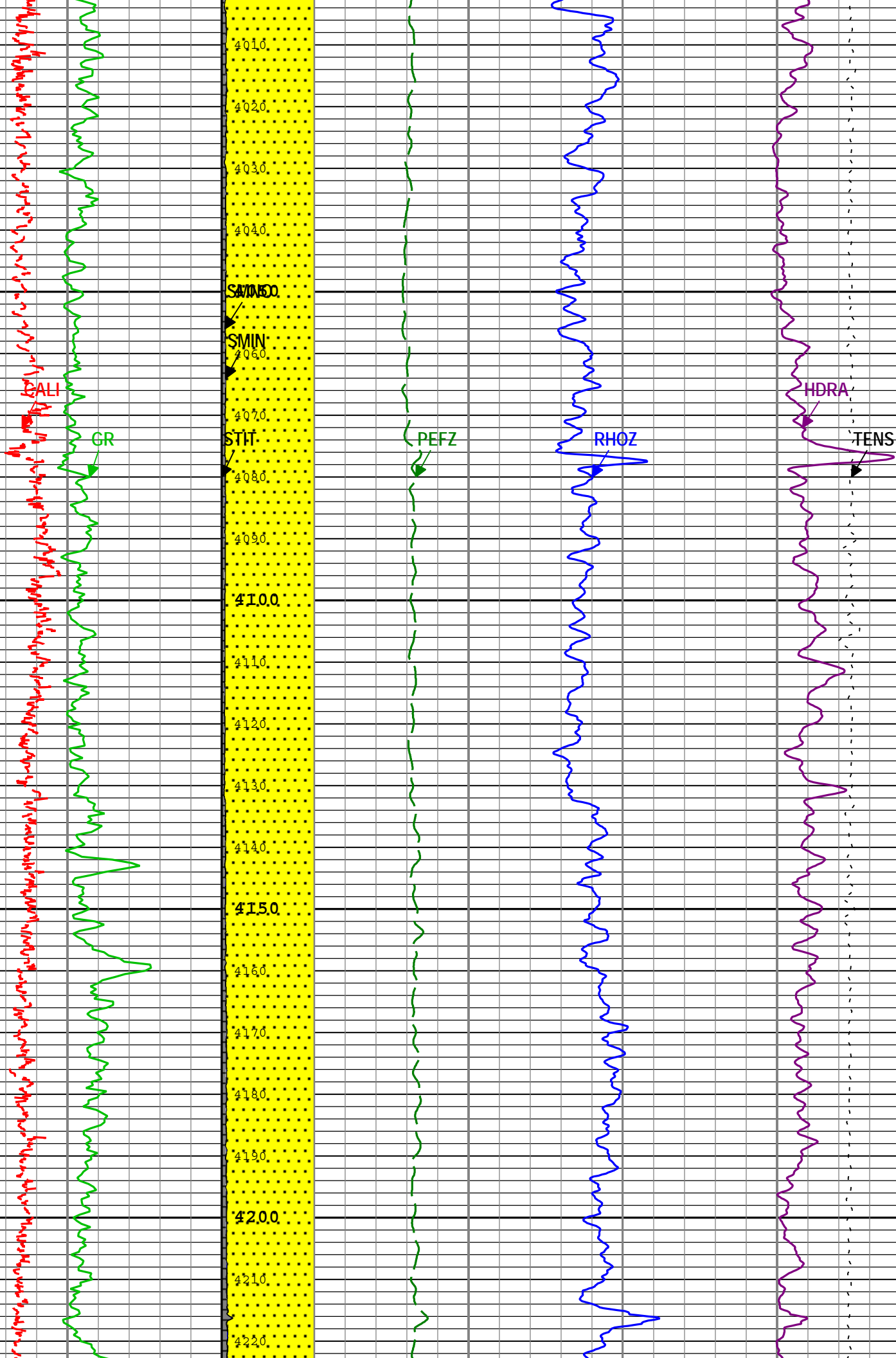


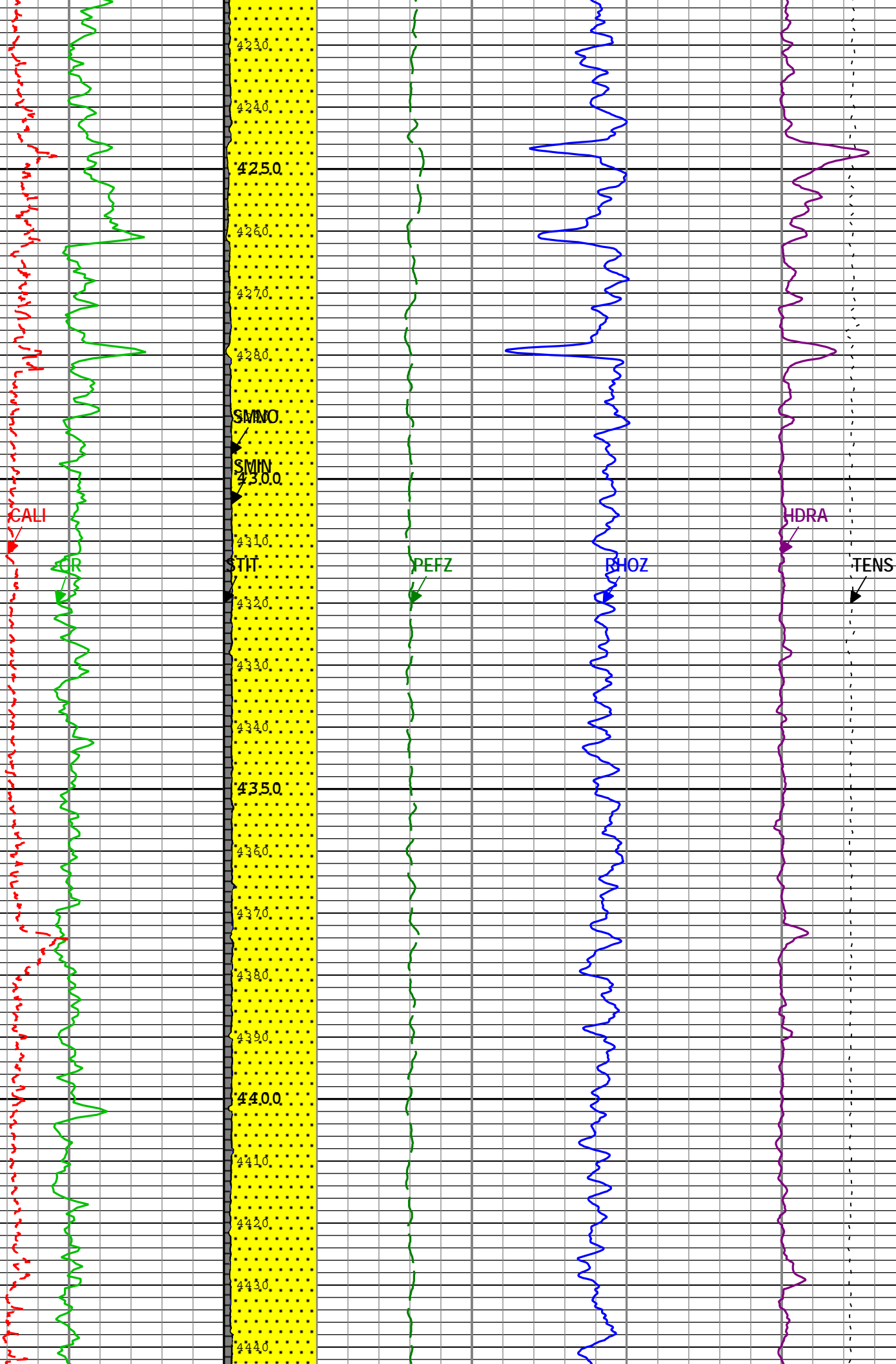


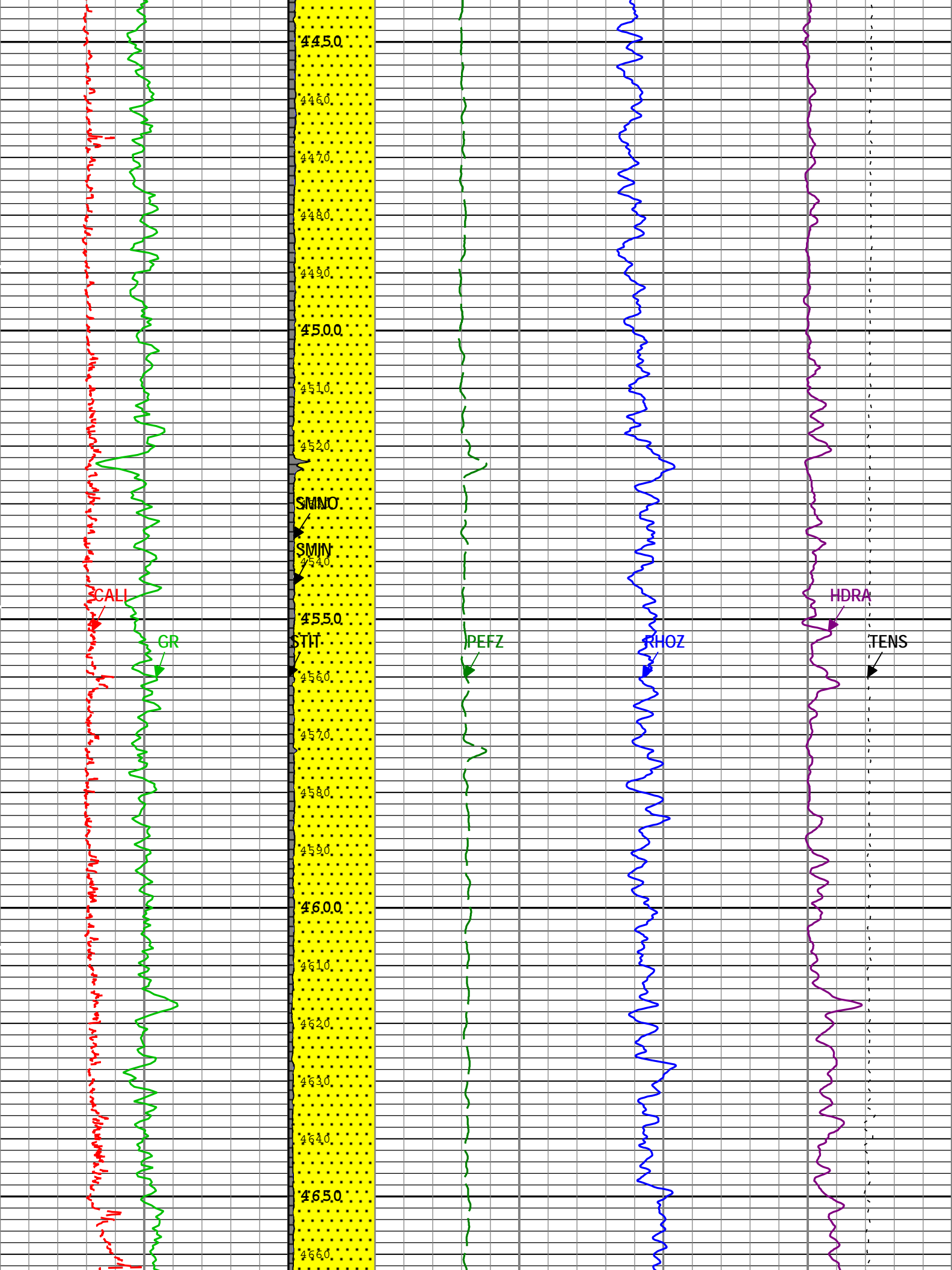


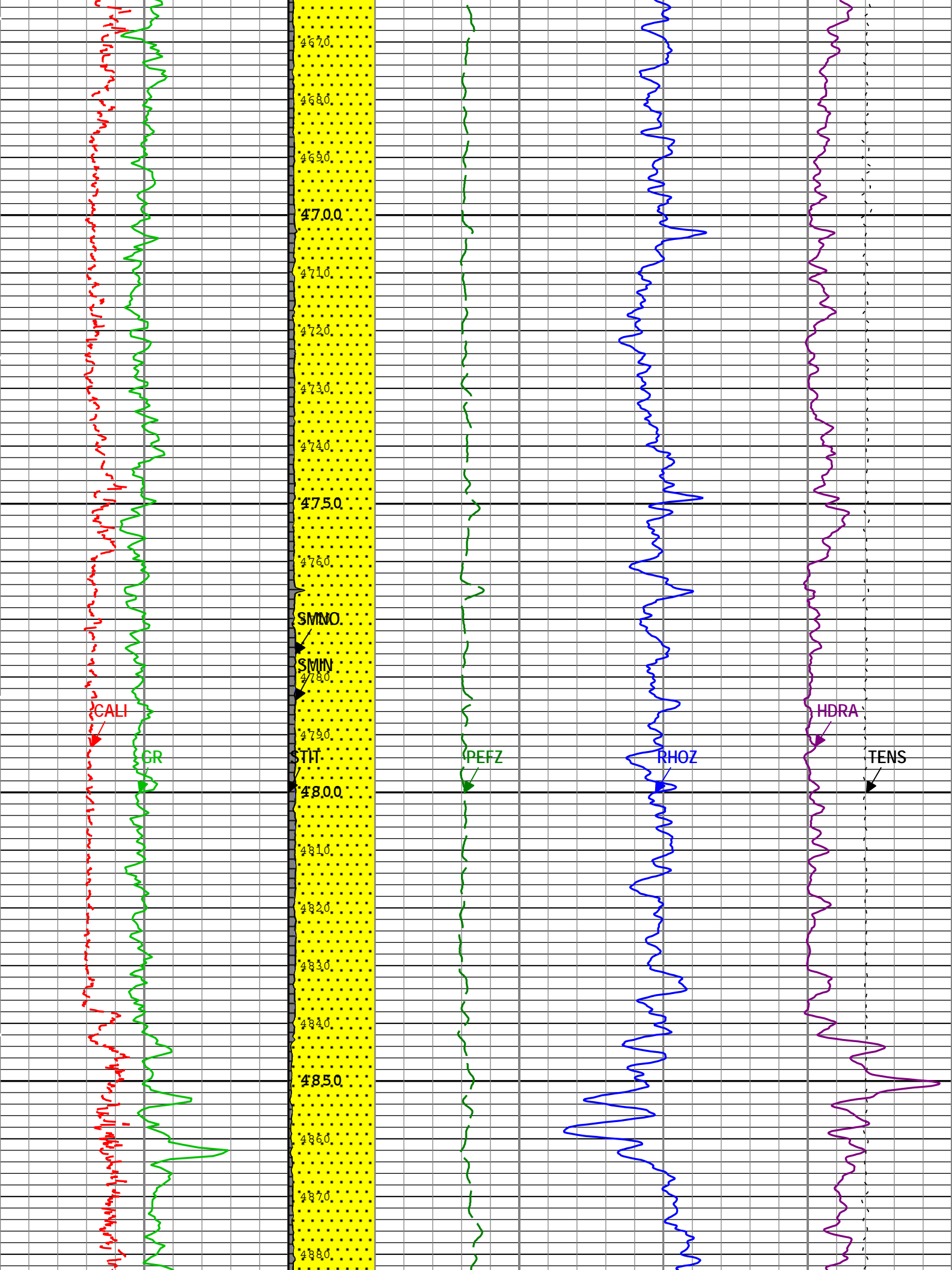


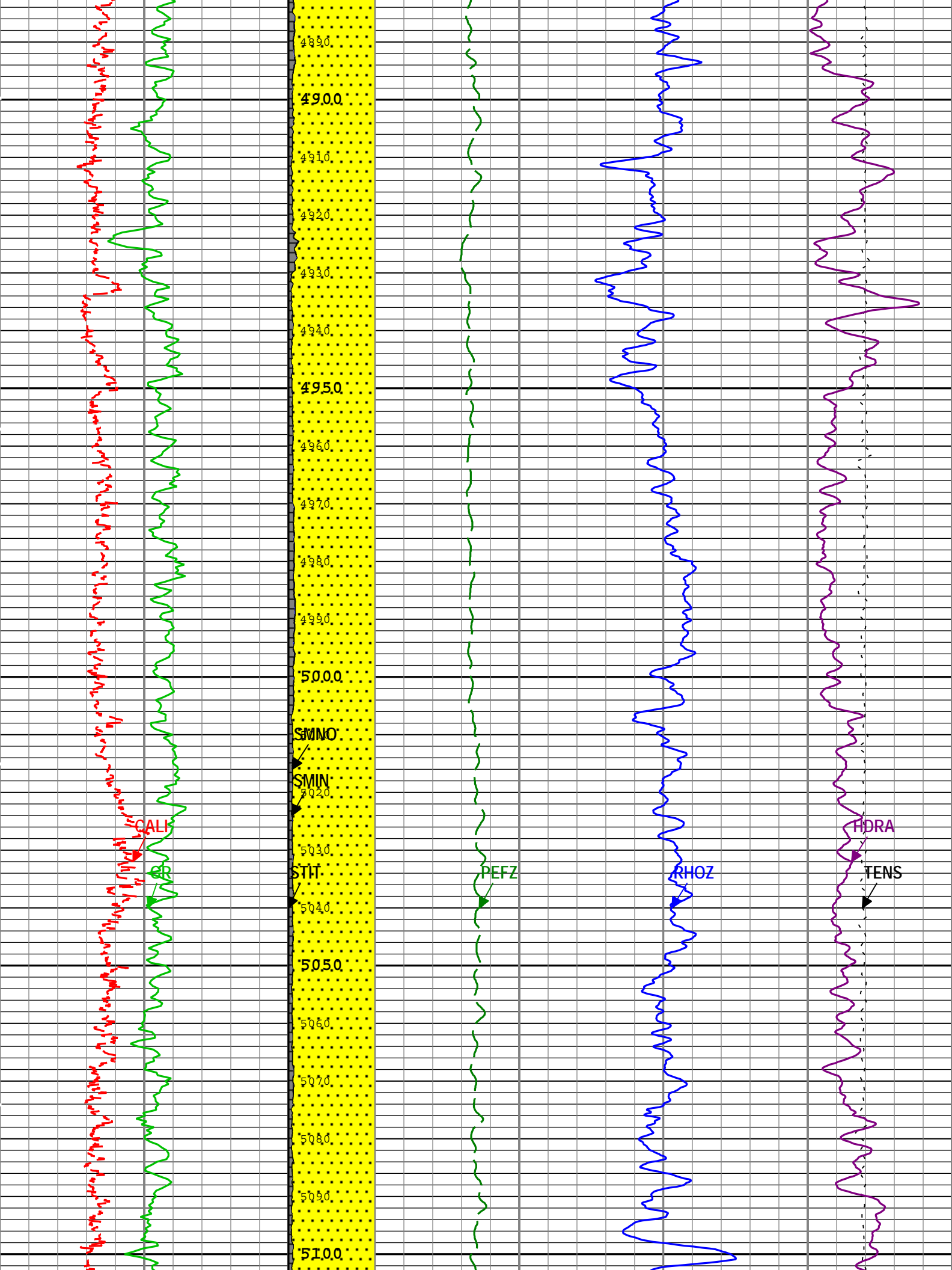


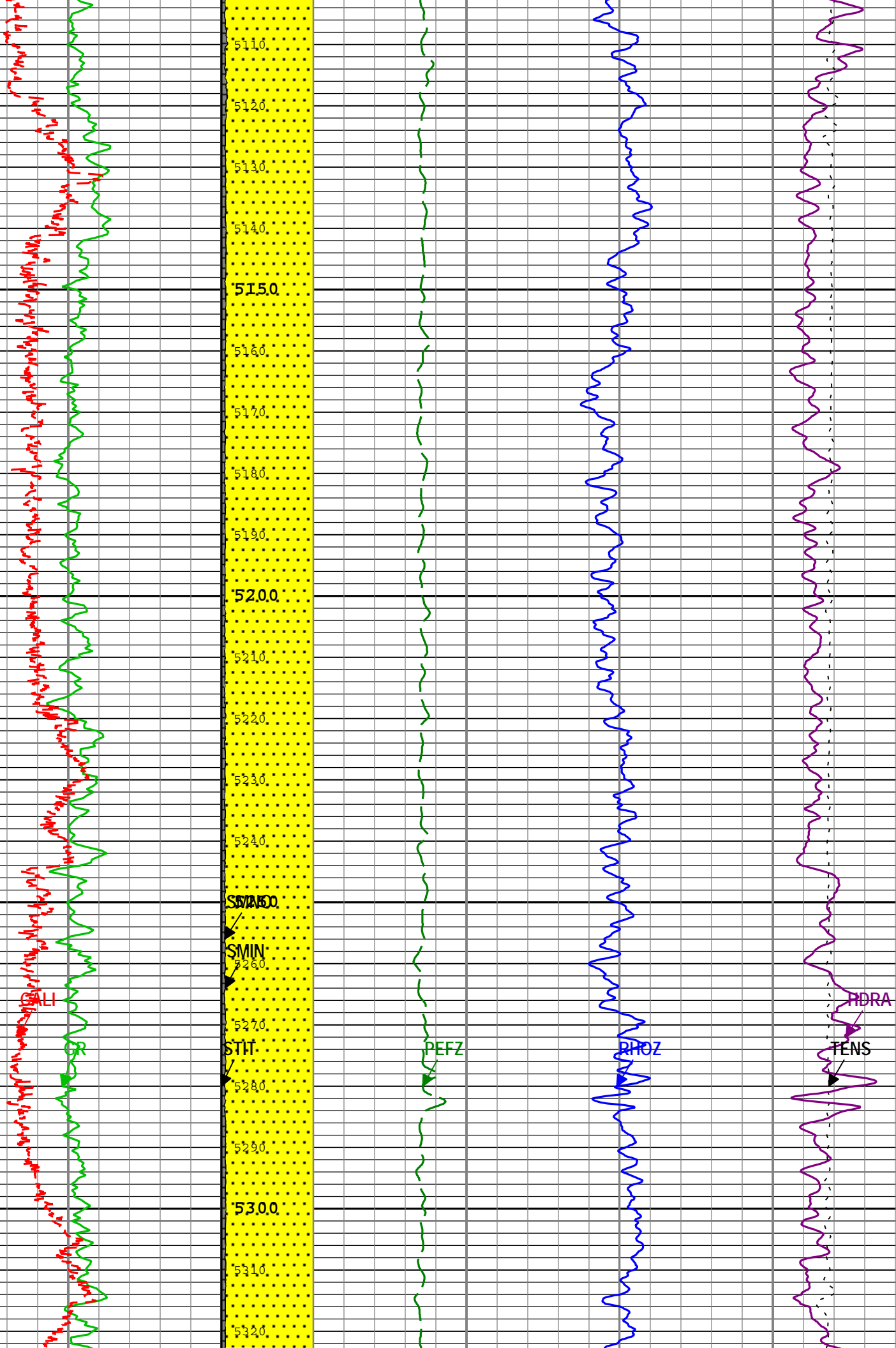


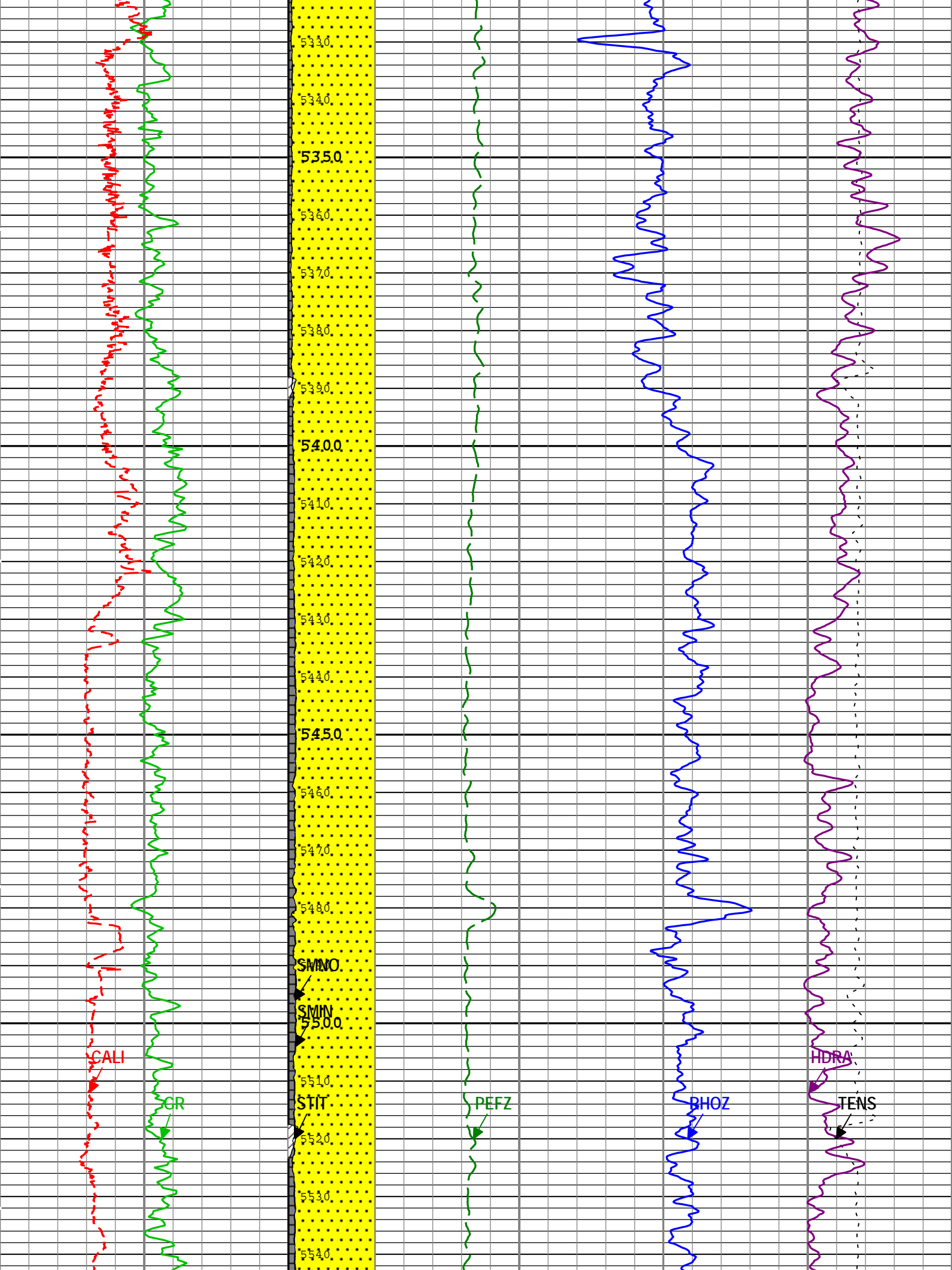


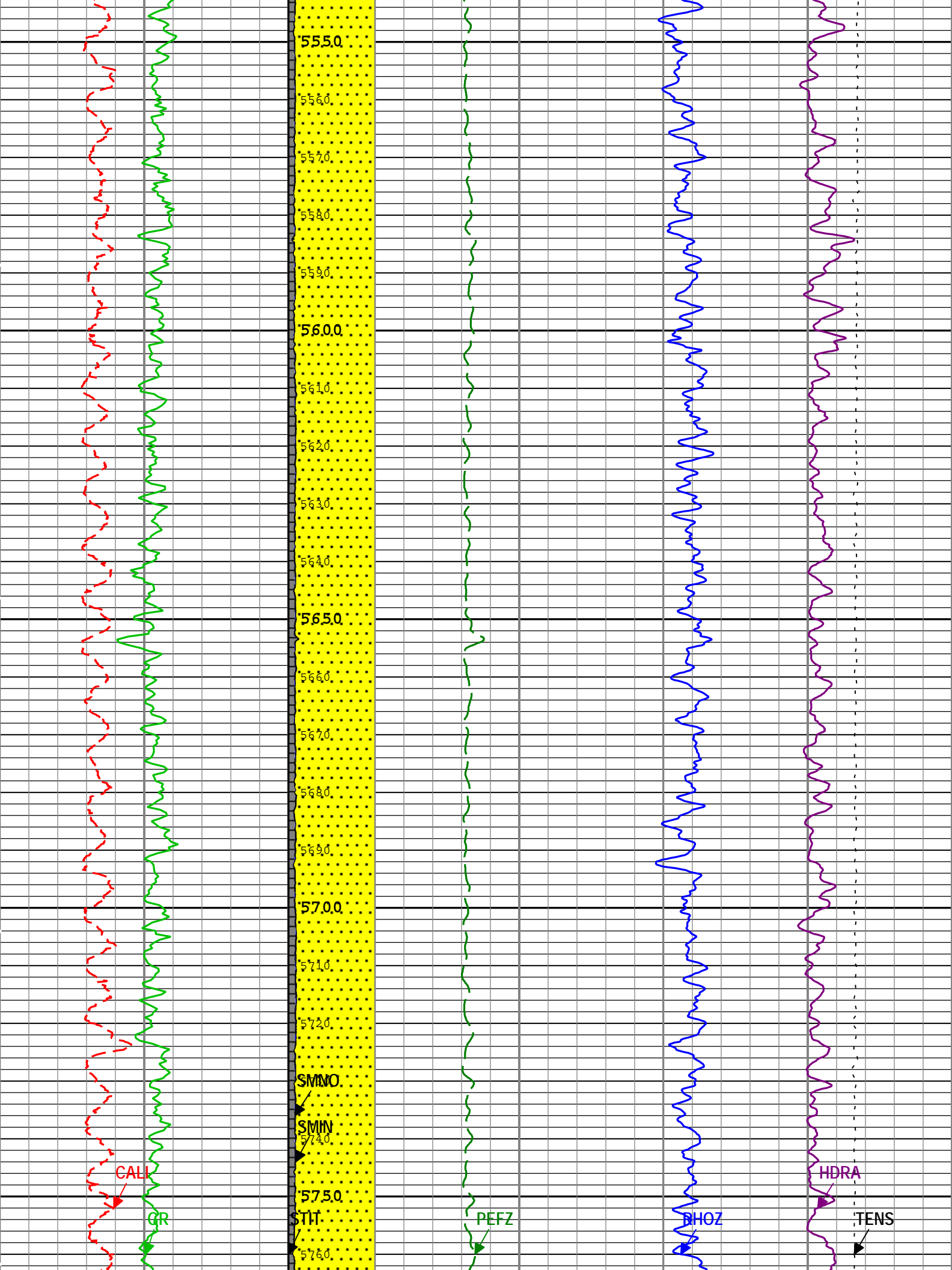


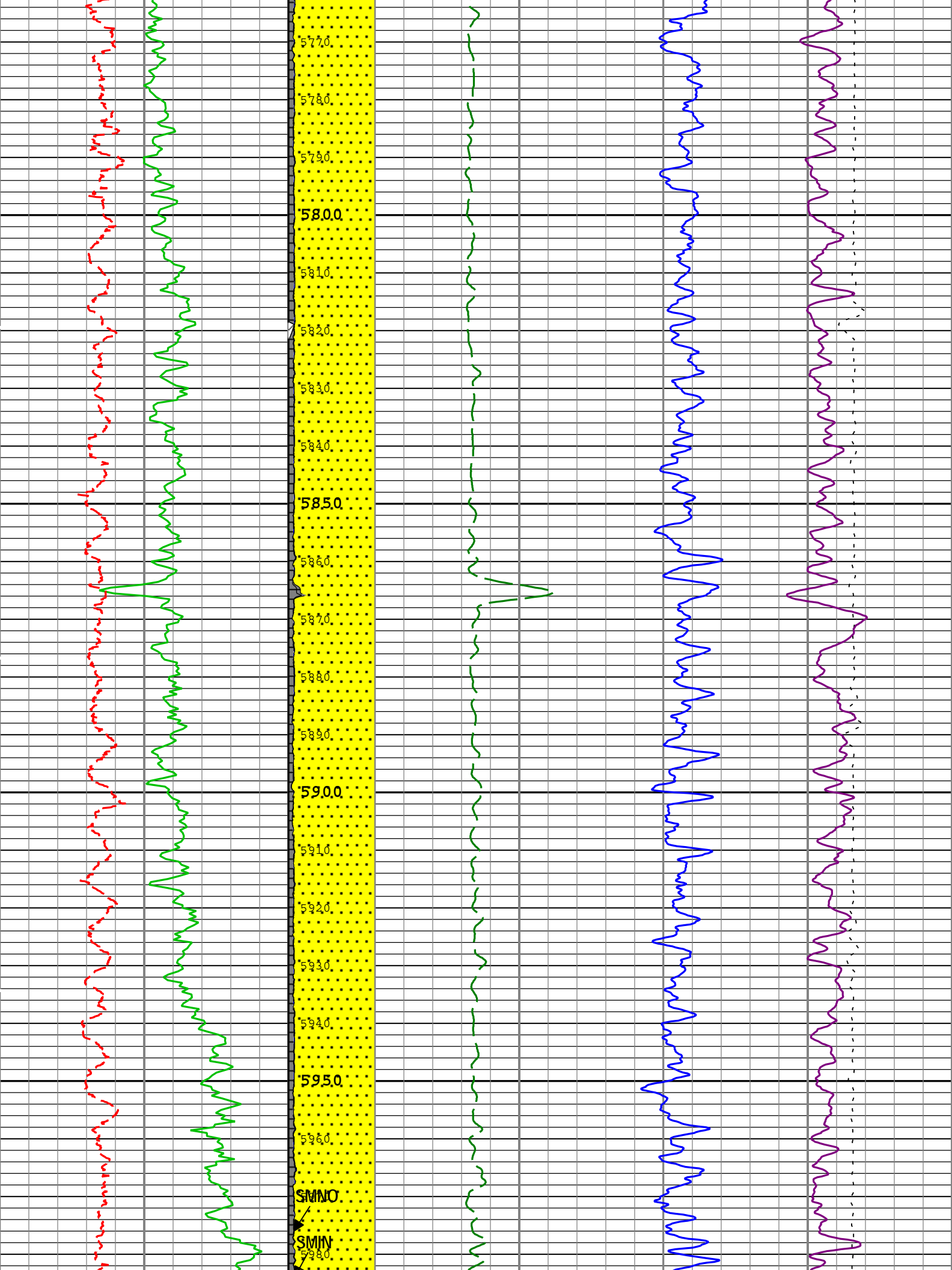


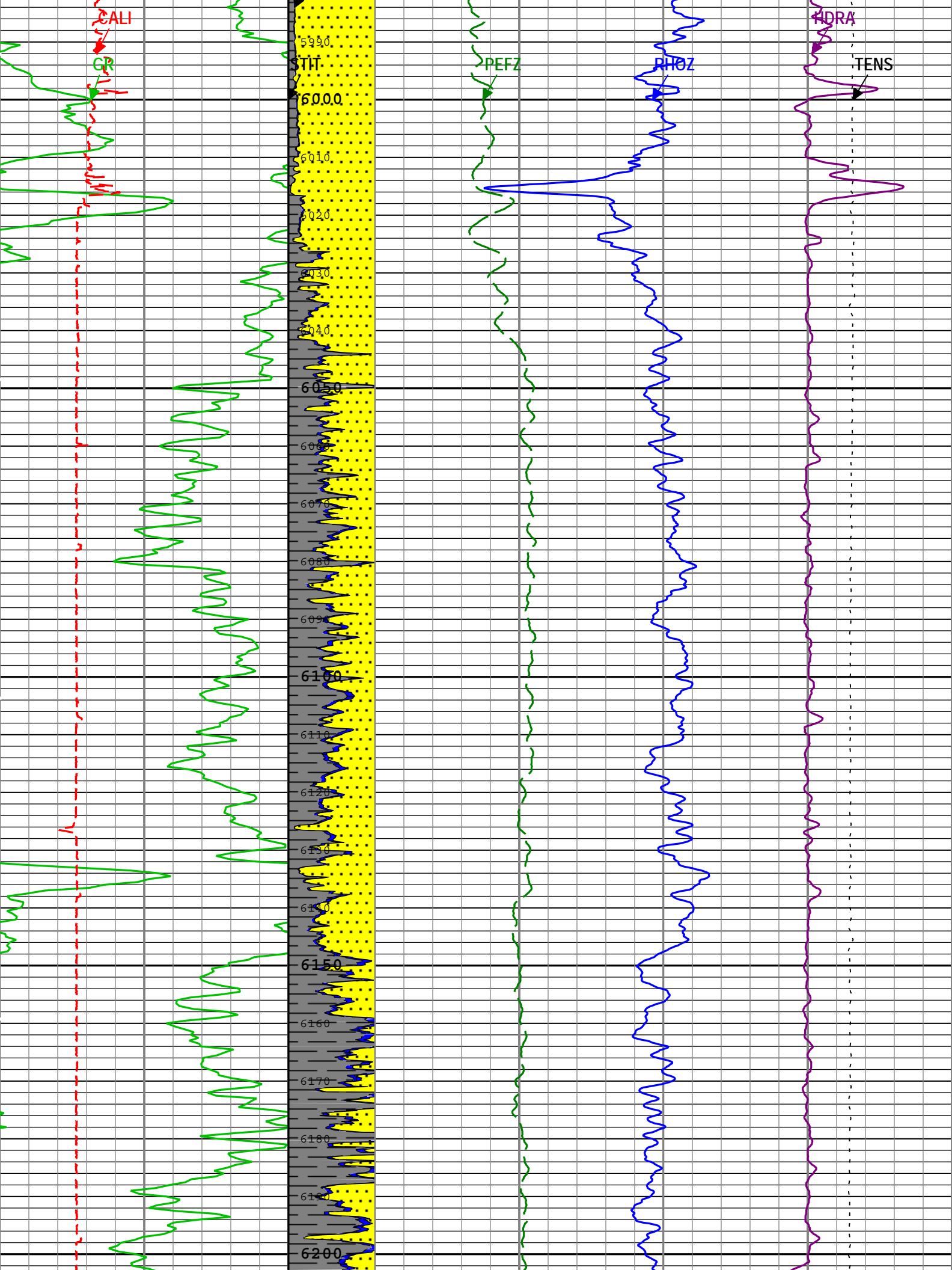


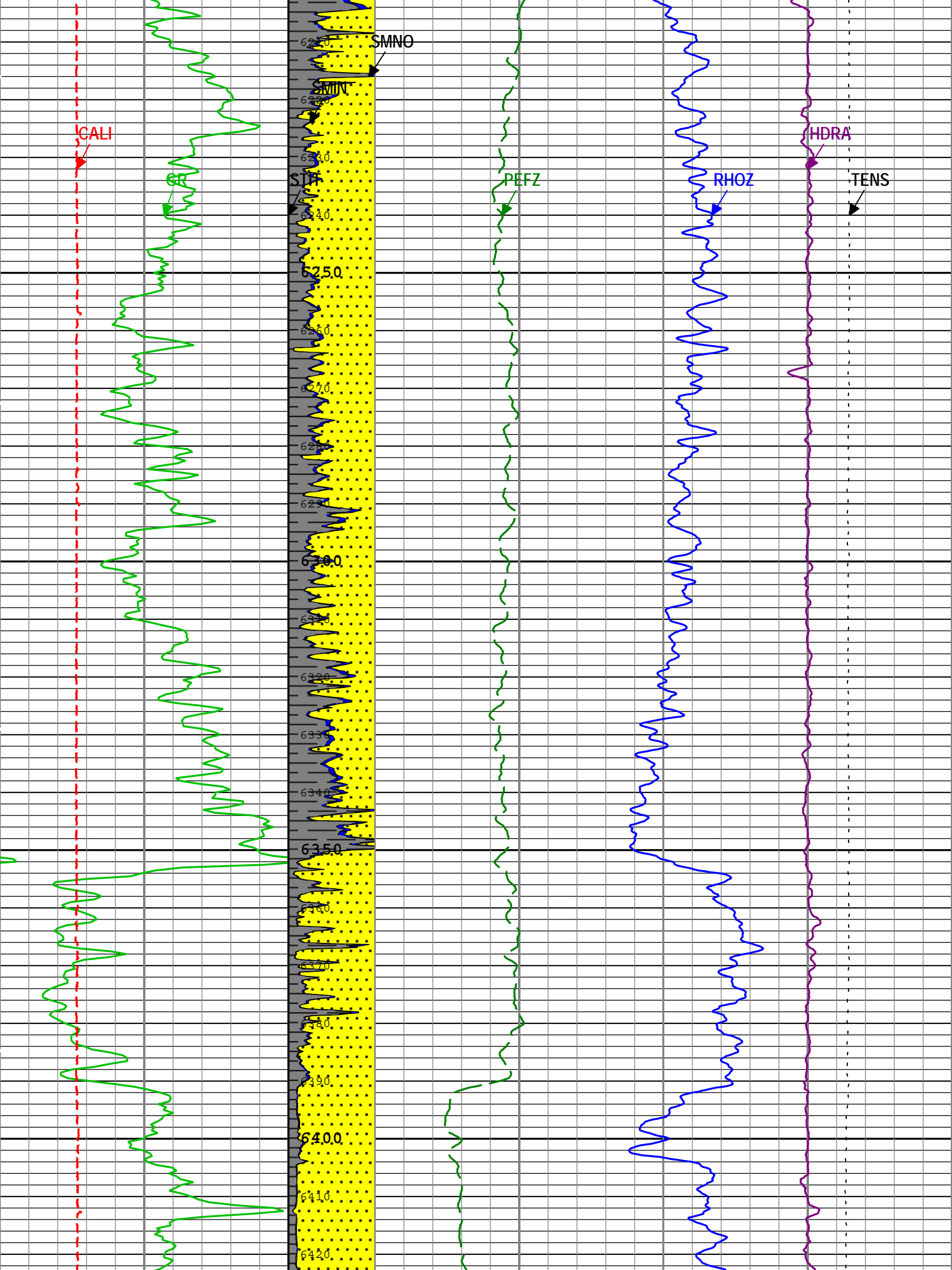


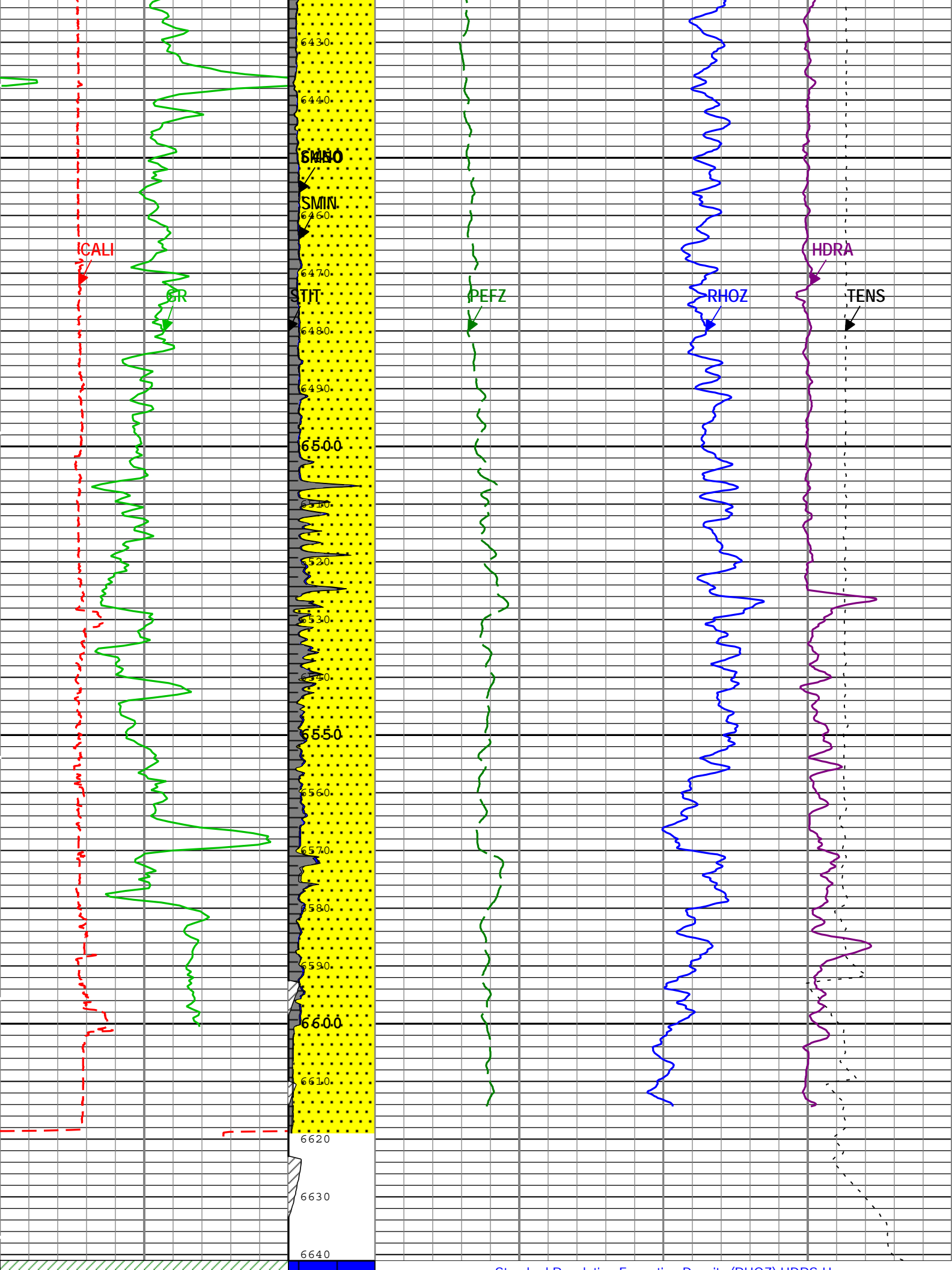












Gamma Ray Backup		Standard Resolution Formation Density (RHOU) HDRS-H	
Gamma Ray (GR) HGNS-H		g/cm3	
0	gAPI	200	3
Caliper (CALI) HDRS-H		Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H	
6	in	16	10
		Cable Tension (TENS)	
		10000 lbf	
		Density Standoff Correction (HDRA) HDRS-H	
		-0.25 g/cm3	
		0.25	
		Stuck Tool Indicator, Total (STIT)	
		0 ft 50	

TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (Import of KM 5in Density) Index Scale: 5 in per 100 ft Index Unit: ft
Index Type: Measured Depth Creation Date: 31-Aug-2014 02:34:41

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.198	in
CBLO	Casing Bottom (Logger)	WLSESSION	1794	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.3	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
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	AMF	
SOCO	Standoff Correction Option	HGNS-H	Yes	
TD	Total Measured Depth	Borehole	6618	ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	12.25	1775	1792
BS	8.75	1792	6624

All depth are actual.

Tool Control Parameters

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

Calibration Report

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

Primary Equipment :

HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	4923
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	3933

Auxiliary Equipment :

HRDD Backscatter Detector	Backscatter	28736
HRDD Long Spacing Detector	Long Spacing	28736
HRDD Short Spacing Detector	Short Spacing	28736
Cesium 137 Gamma-Ray Logging Source	GSR-J	5094
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	4923

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): 18:44:55 29-Aug-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Small Ring	in	Before	8.00	6.00	7.56	10.00	
Large Ring	in	Before	12.00	9.00	11.79	15.00	

HDRS Density Calibration - Inversion Results

Master (EEPROM): 11:18:48 06-Aug-2014

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	1.688	1.696	
Pe Aluminum		Master	2.570	2.470	2.538	2.670	
Pe Magnesium		Master	2.650	2.550	2.617	2.750	

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 11:18:48 06-Aug-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Average Deviation	%	Master	0	-0.6000	0.2920	0.6000	
BS Max Deviation	%	Master	0	-1.6000	0.6112	1.6000	
SS Average Deviation	%	Master	0	-1.0000	0.4157	1.0000	
SS Max Deviation	%	Master	0	-2.5000	1.0245	2.5000	
LS Average Deviation	%	Master	0	-1.5000	0.6722	1.5000	
LS Max Deviation	%	Master	0	-3.5000	2.5071	3.5000	

HDRS Density Calibration - Background Summary

Master (EEPROM): 11:18:48 06-Aug-2014 Before (Measured): 17:53:42 29-Aug-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Window Ratio		Master	1.0000		0.7465		
		Before	1.0000	0.9500	0.7485	1.0500	
		Before-Master	-----	-----	0.0020	-----	
BS Window Sum	1/s	Master	1		23422		
		Before	0	0	23394	0	
		Before-Master	-----	-----	-28	-----	
SS Window Ratio		Master	1.0000		0.4876		
		Before	1.0000	0.9500	0.4875	1.0500	
		Before-Master	-----	-----	-0.0001	-----	
SS Window Sum	1/s	Master	1		10990		
		Before	0	0	10965	0	
		Before-Master	-----	-----	-25	-----	
LS Window Ratio		Master	1.0000		0.2980		
		Before	1.0000	0.9500	0.2993	1.0500	
		Before-Master	-----	-----	0.0013	-----	
LS Window Sum	1/s	Master	1		1200		
		Before	0	0	1199	0	
		Before-Master	-----	-----	-1	-----	

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 11:18:48 06-Aug-2014 Before (Measured): 17:53:42 29-Aug-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS PM High Voltage	V	Master		1000	1586	2400	
		Before		1000	1595	2400	
		Before-Master	-----	-100	9	100	
SS PM High Voltage	V	Master		1000	1495	2400	
		Before		1000	1487	2400	
		Before-Master	-----	-100	-8	100	
LS PM High Voltage	V	Master		1000	1285	2400	
		Before		1000	1275	2400	
		Before-Master	-----	-100	-10	100	

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM): 11:18:48 06-Aug-2014 Before (Measured): 17:53:42 29-Aug-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
-------------	------	-------	---------	-----------	--------	------------	--

		Before Before-Master	-----	-----	-----	-----	
Near Corrected Plus Measurement	1/s	Master Before Before-Master	----- ----- -----	4700.0 ----- -----	4837.0 ----- -----	6900.0 ----- -----	
Far Corrected Plus Measurement	1/s	Master Before Before-Master	----- ----- -----	1900.0 ----- -----	2008.0 ----- -----	2900.0 ----- -----	

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured):		18:49:47 29-Aug-2014					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before	30.0	0	82.9	120.0	
RGR Plus Measurement	gAPI	Before	185.4	157.1	177.0	206.3	
GR Calibration Gain		Before	0.89	0.80	0.93	1.05	

Field:	Wildcat
County:	Weld
State:	Colorado

Platform Express
Compensated Neutron Log
LithoDensity