

Company: Bonanza Creek

Well: State Seventy Holes J-18

Field: Wattenberg

County: Weld State: Colorado

Spectral Gamma Ray

County:	Weld				
Field:	Wattenberg				
Location:	SESW, Sec18. T4N, R62W				
Well:	State Seventy Holes J-18				
Company:	Bonanza Creek				
		Location:			
		SESWSec18. T4N, R62W	Elev.:	K.B.	4577.50 ft
		SHL: 610FSL x 1455' FWL		G.L.	4564.00 ft
		Lat/Long: 40.306861/-104.371342		D.F.	4576.50 ft
		Permanent Datum:	Ground Level	Elev.:	4564.00 f
		Log Measured From:	Kelly Bushing	13.50 ft	above Perm.Datum
		Drilling Measured From:	Kelly Bushing		
		API Serial No.	Section:	Township:	Range:
		05-123-41614	18	4N	62W
Logging Date	28-Sep-2016				

Run Number	One	
Depth Driller	6800.00 ft	
Schlumberger Depth	6800.00 ft	
Bottom Log Interval	6798.00 ft	
Top Log Interval	1459.00 ft	
Casing Driller Size @ Depth	9.625 in @ 1465.00 ft	
Casing Schlumberger	1465 ft	
Bit Size	8.75 in	
Type Fluid In Hole	Water	
Density	9.7 lbm/gal	33 s
Fluid Loss	PH 11.6 cm3	9.7
MUD	Source of Sample	Active Tank
RM @ Meas Temp	2.24 ohm.m @ 75.3 degF	
RMF @ Meas Temp	2.11 ohm.m @ 75 degF	
RMC @ Meas Temp	2.52 ohm.m @ 75 degF	
Source RMF	RMC Calculated	
RM @ BHT	0.83 @ 216 0.77 @ 216	
Max Recorded Temperatures	216 degF	
Circulation Stopped	28-Sep-2016 04:30:00	
Logger on Bottom	28-Sep-2016 16:30:00	
Unit Number	9115	FtMorgan
Recorded By	B Kesek	
Witnessed By	Tim Jayne	

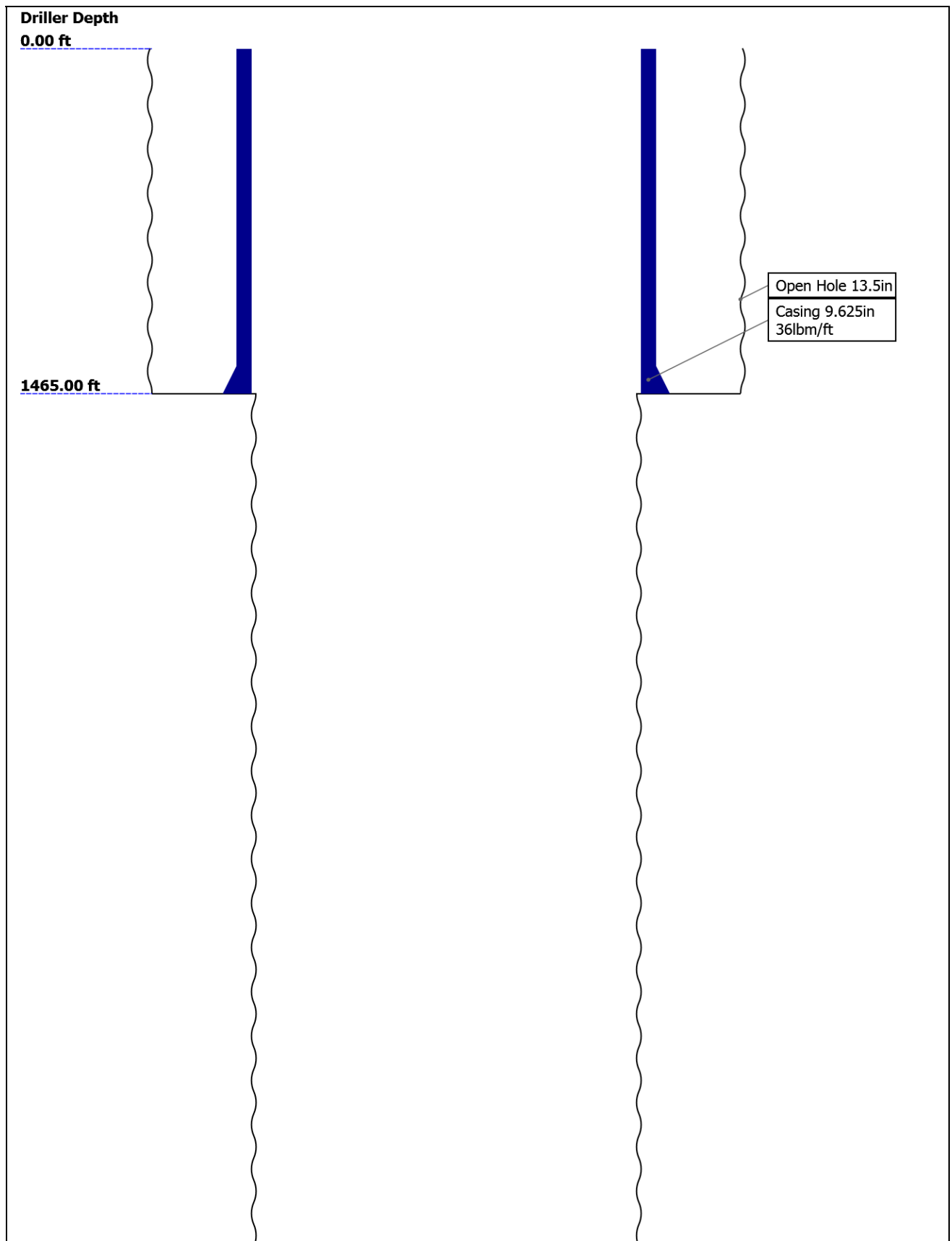
Disclaimer

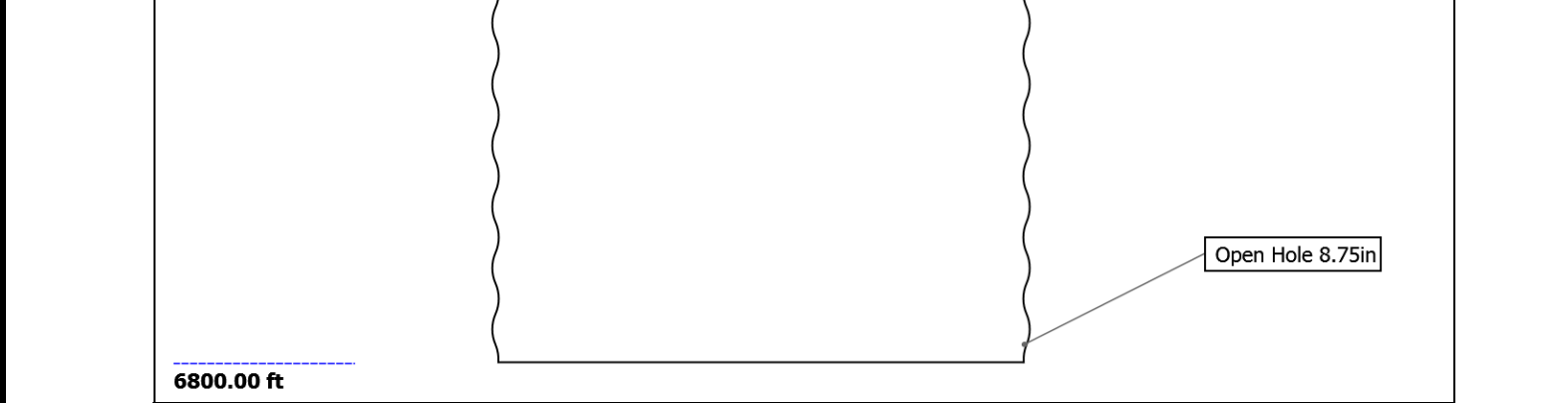
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Well Sketch



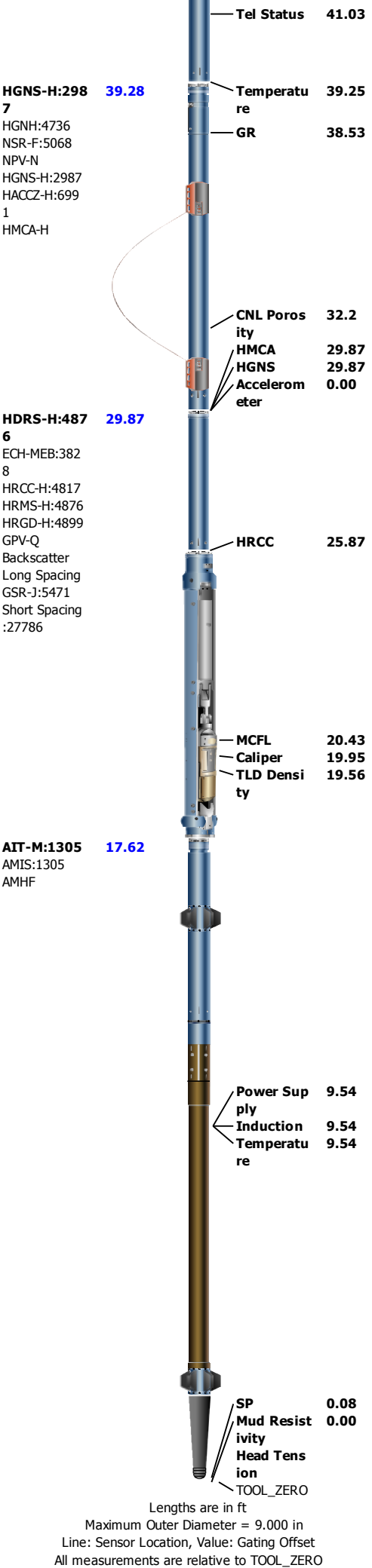


Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5	8.75				
Top Driller (ft)	0	1465				
Top Logger (ft)	0	1465				
Bottom Driller (ft)	1465	6800				
Bottom Logger (ft)	1465	6800				
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)	1465					
Bottom Logger (ft)	1465					

Remarks and Equipment Summary























One: Toolstring				One: Remarks
<div><div><div>Equip name</div><div>LEH-QT</div><div>LEH-QT</div></div><div><div>Length</div><div>56.88</div></div></div> <div></div> <div><div>MP name</div><div>Offset</div></div>	This is the first run in the well.			
	Toolstring ran as per toolsketch.			
	Neutron corrections: Holesize, Standoff			
	Matrix: Limestone. MDen: 2.71g/cm3			
	Repeat pass performed below casing shoe due to adverse hole conditions at bottom.			
<div><div><div>DTC-H:8980</div><div>ECH-KC:1005</div><div>3</div><div>DTC-H:8980</div></div><div><div>Length</div><div>53.97</div></div></div> <div></div> <div><div>CTEM</div><div>53.07</div><div>HV</div><div>0.00</div></div>	Caliper closed at: 6490-6464ft 5500-5494ft Due to adverse hole conditions. Discussed with company man.			
	Hole finder at the bottom of AIT used succesfully to get passed a bridge.			
<div><div><div>HNGS-BA:16</div><div>6</div><div>HEH-K:177</div><div>HNGS-BA:166</div></div><div><div>Length</div><div>50.97</div></div></div> <div></div> <div><div>TelStatus</div><div>50.97</div><div>ToolStatus</div><div>50.97</div></div>				
<div><div><div>HNGC-B:108</div><div>HNGH-A:46</div><div>HNGC-B:108</div></div><div><div>Length</div><div>42.78</div></div></div> <div></div> <div><div>GR</div><div>47.98</div></div>				

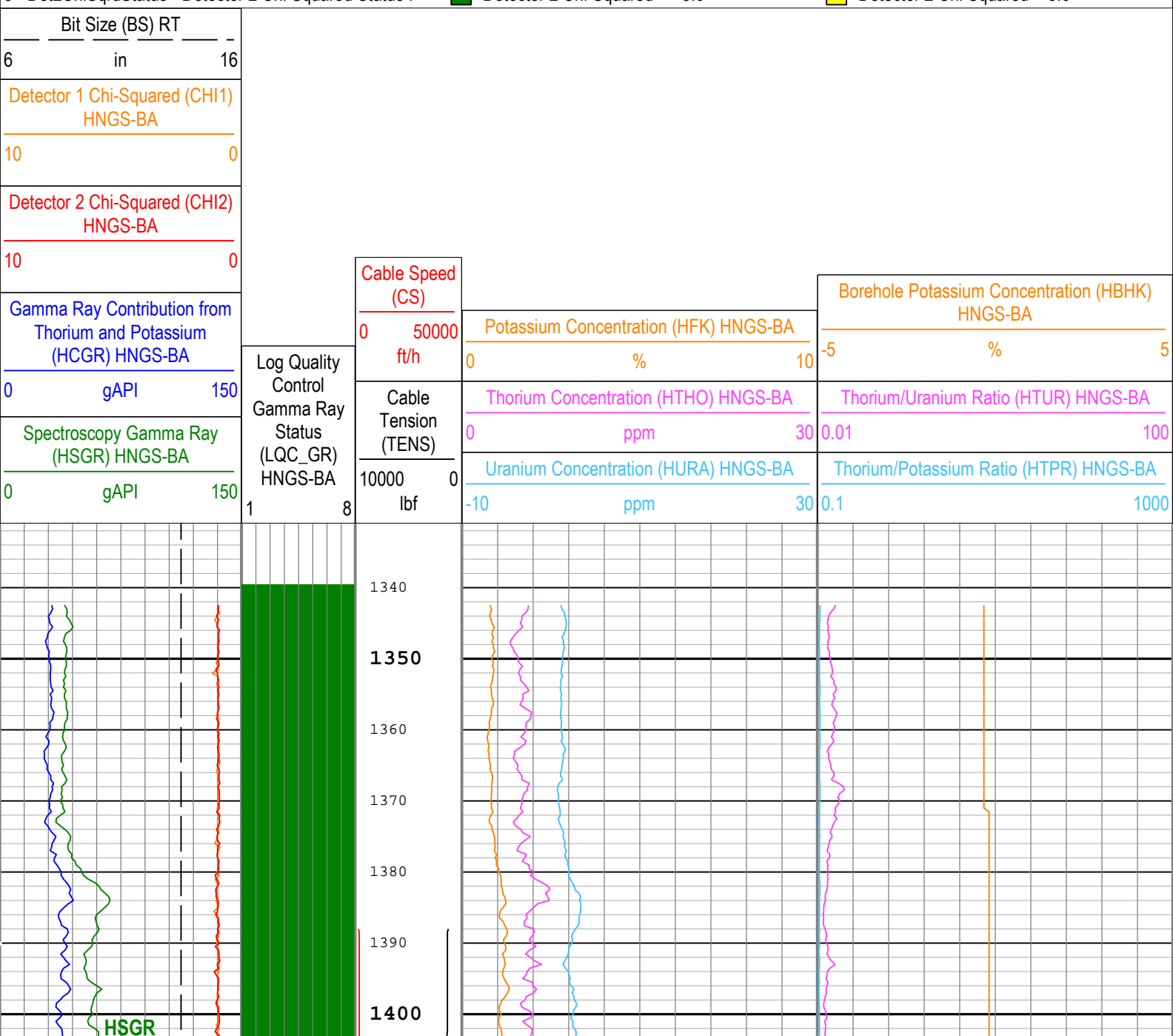


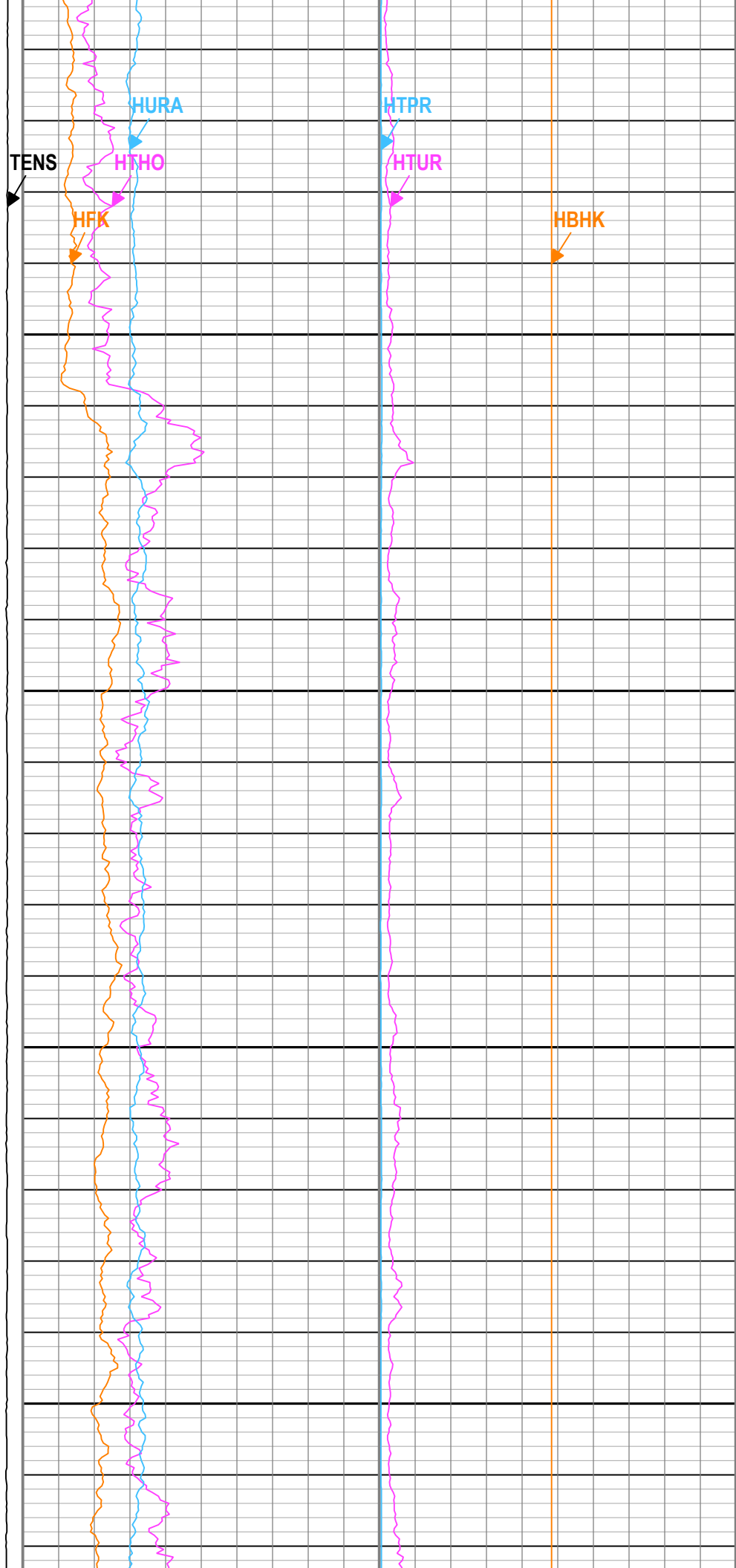
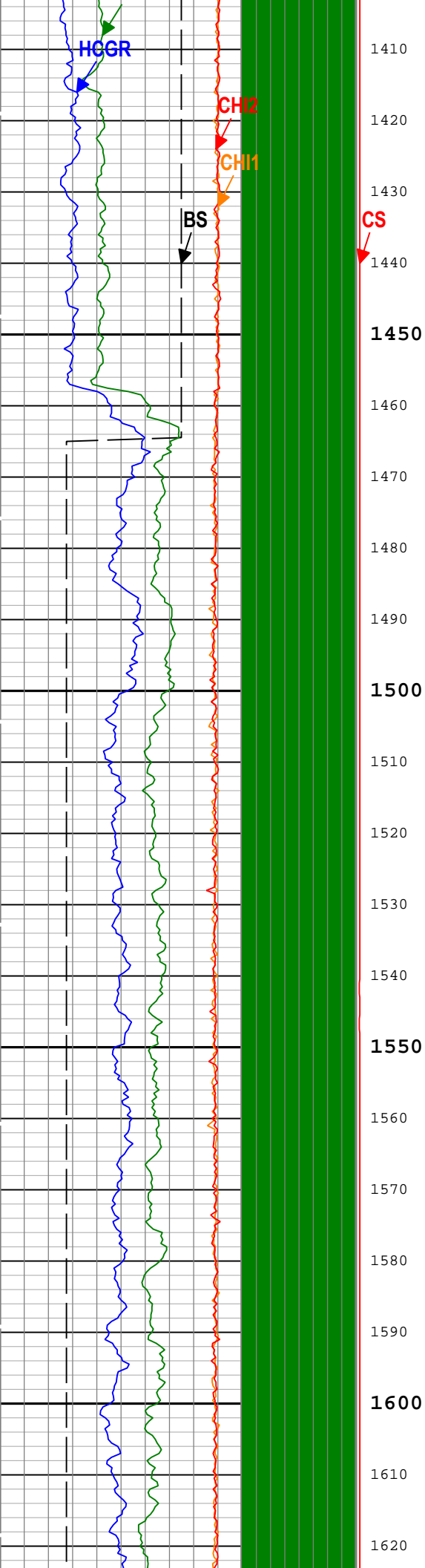
Depth Summary										
		One								
Depth Measuring Device										
Type		IDW-B								
Serial Number										
Calibration Date										
Calibrator Serial Number										
Calibration Cable Type		7-46axs								
Wheel Correction 1		0								
Wheel Correction 2		0								
Tension Device										
Type		CMTD-B/A								
Serial Number		146								
Calibration Date		26-Sep-2016								
Calibrator Serial Number										
Number of Calibration Points		10								
Calibration Root Mean Square Error		4								
Calibration Peak Error		7								
Logging Cable										
Type		7-46NT-XS								
Serial Number										
Length		24000.00 ft								
Conveyance Type		Wireline								
Rig Type										
One:Depth Control Parameters					Depth Control Remarks					
Log Sequence		First Log In the Well			All Schlumberger depth procedures followed.					
Rig Up Length At Surface					IDW used as primary depth control device.					
Rig Up Length At Bottom					Z-chart used as secondary depth control device.					
Rig Up Length Correction										
Stretch Correction										
Tool Zero Check At Surface										
One										
Software Version										
Acquisition System						Version				
Maxwell 2016 SP2						6.2.68624.3100				
Pass Summary										
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data	
One	Log[4]:Up	Up	1387.81 ft	6810.88 ft	28-Sep-2016 5:33:25 PM	28-Sep-2016 9:39:06 PM	ON	4.00 ft	Yes	
All depths are referenced to toolstring zero										
Log	Company:Bonanza Creek Well:State Seventy Holes J-18									
One: Log[4]:Up:S003										
Description: UNCS Basic - Format: Log (UNCS Basic) - Index Scale: 5 in per 100 ft - Index Unit: ft - Index Type: Measured Depth - Creation Date:										

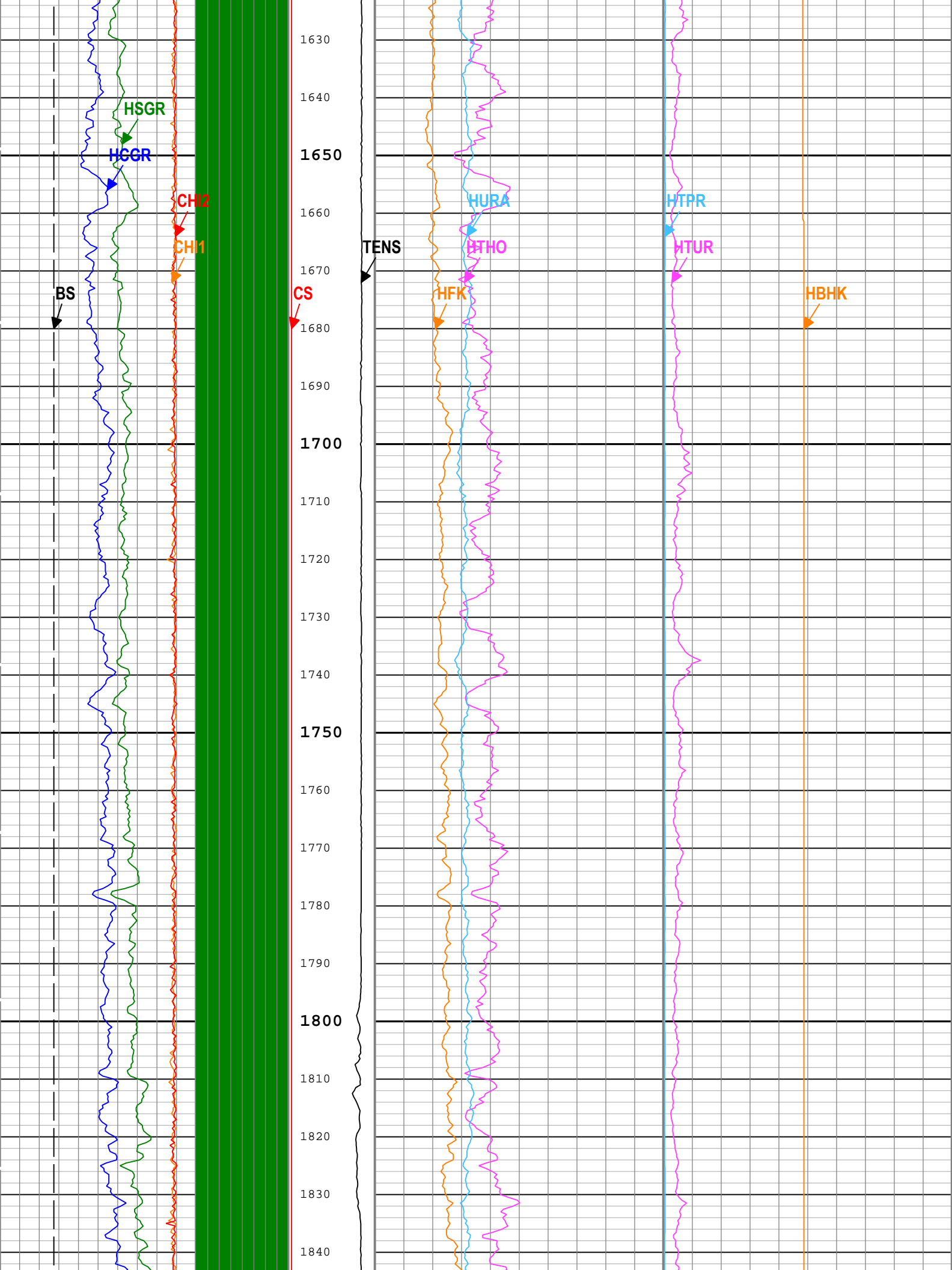
Description: HNGS Basic Format: Log (HNGS Basic) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Sep-2016 22:55:59

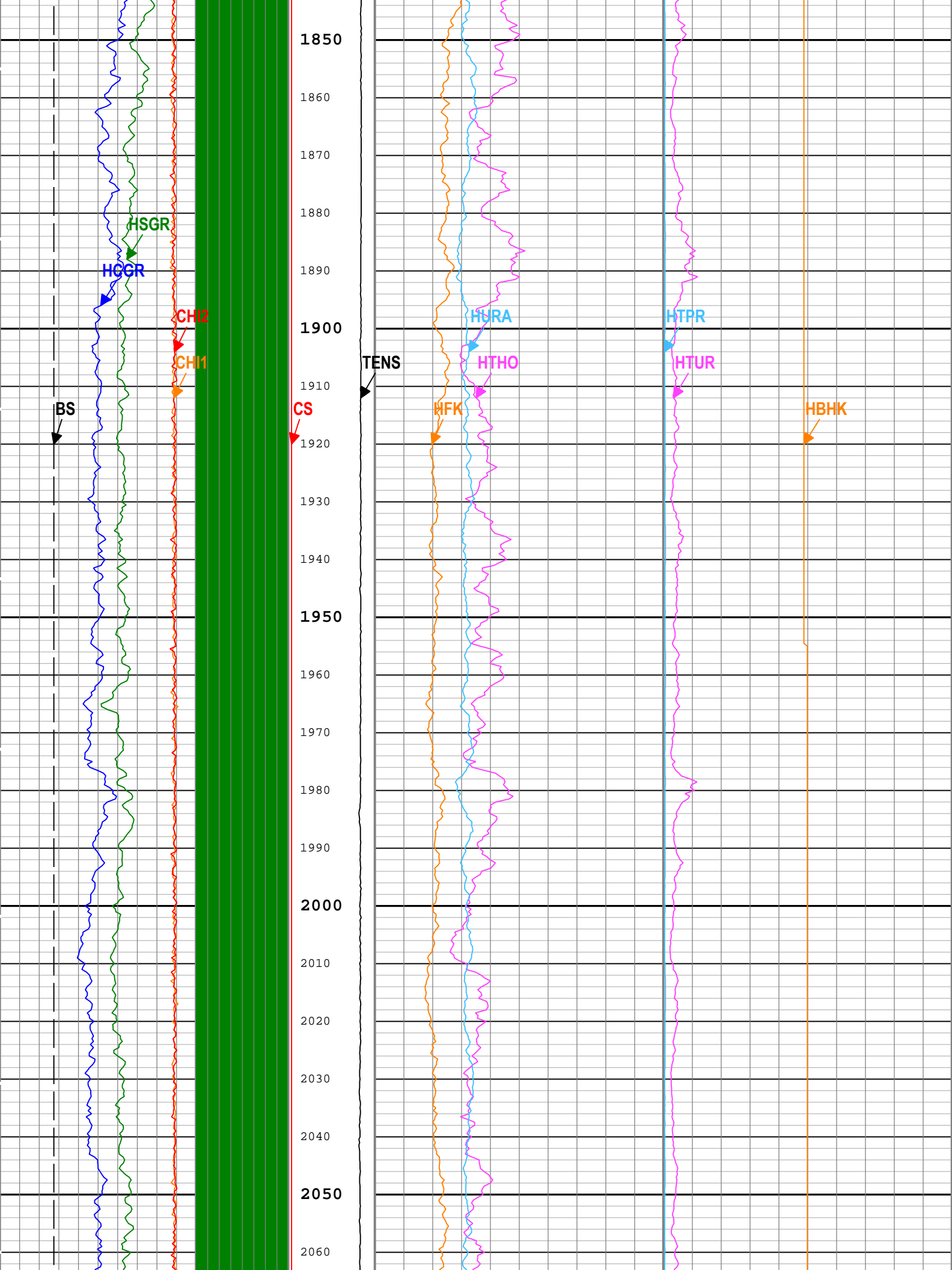
Log Quality Control Gamma Ray Status (LQC GR) HNGS-BA

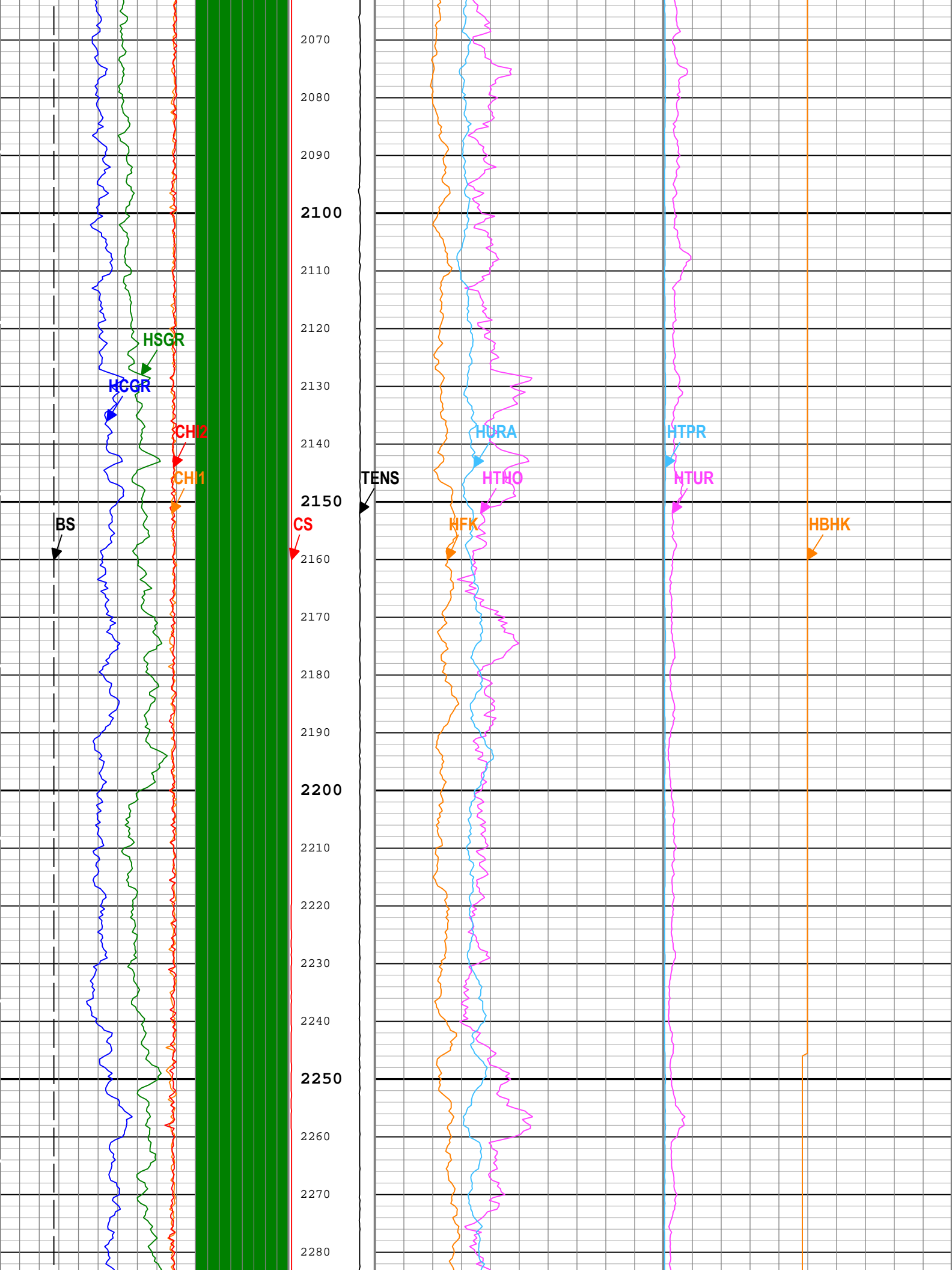
- | | | |
|---|--|---|
| 1 - CartHwStatus - Cartridge Hardware Status : |  Cartridge Hardware: Normal |  Cartridge Hardware: Warning |
| |  Cartridge Hardware: Error | |
| 2 - CartTempStatus - Cartridge Temperature Status : |  Cartridge Temperature < 150 °C | |
| |  150 °C <= Cartridge Temperature < 175 °C |  Cartridge Temperature >= 175 °C |
| 3 - Det1TempStatus - Detector 1 Temperature Status : |  Detector 1 Temperature < 50 °C |  50 °C <= Detector 1 Temperature < 80 °C |
| |  Detector 1 Temperature >= 80 °C | |
| 4 - Det2TempStatus - Detector 2 Temperature Status : |  Detector 2 Temperature < 50 °C |  50 °C <= Detector 2 Temperature < 80 °C |
| |  Detector 2 Temperature >= 80 °C | |
| 5 - Det1CtrlLoopStatus - Detector 1 Control Loop Status : |  Detector 1 Control Loop: Normal |  Detector 1 Control Loop: Warning |
| |  Detector 1 Control Loop: Error | |
| 6 - Det2CtrlLoopStatus - Detector 2 Control Loop Status : |  Detector 2 Control Loop: Normal |  Detector 2 Control Loop: Warning |
| |  Detector 2 Control Loop: Error | |
| 7 - Det1ChiSqrdStatus - Detector 1 Chi Squared Status : |  Detector 1 Chi Squared <= 3.0 |  Detector 1 Chi Squared > 3.0 |
| 8 - Det2ChiSqrdStatus - Detector 2 Chi Squared Status : |  Detector 2 Chi Squared <= 3.0 |  Detector 2 Chi Squared > 3.0 |

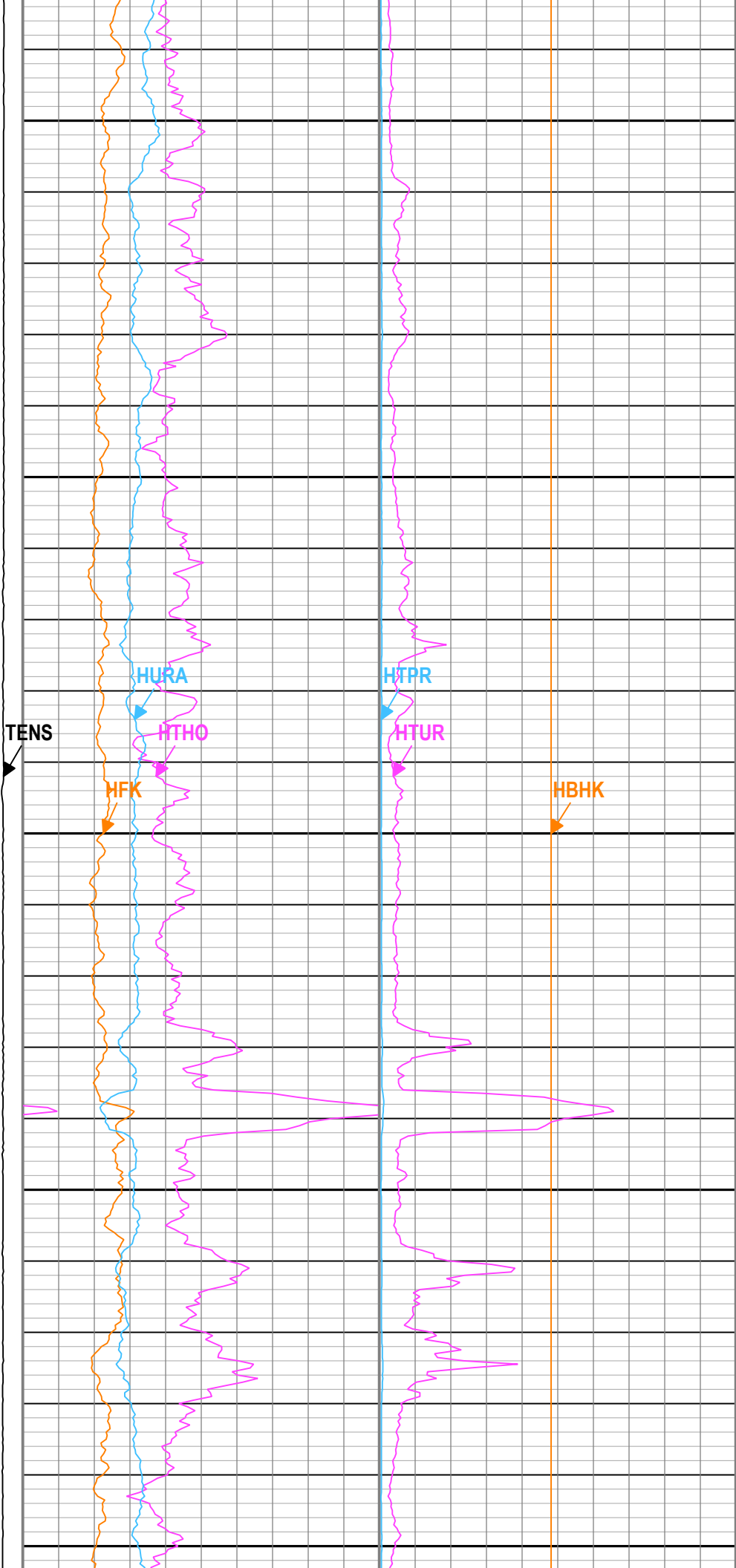
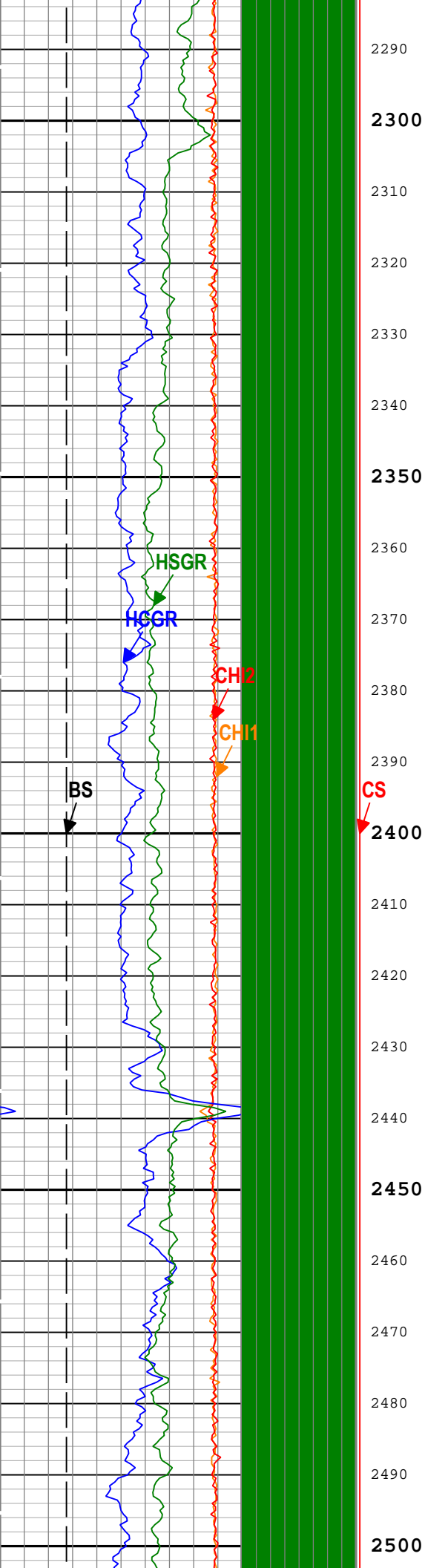


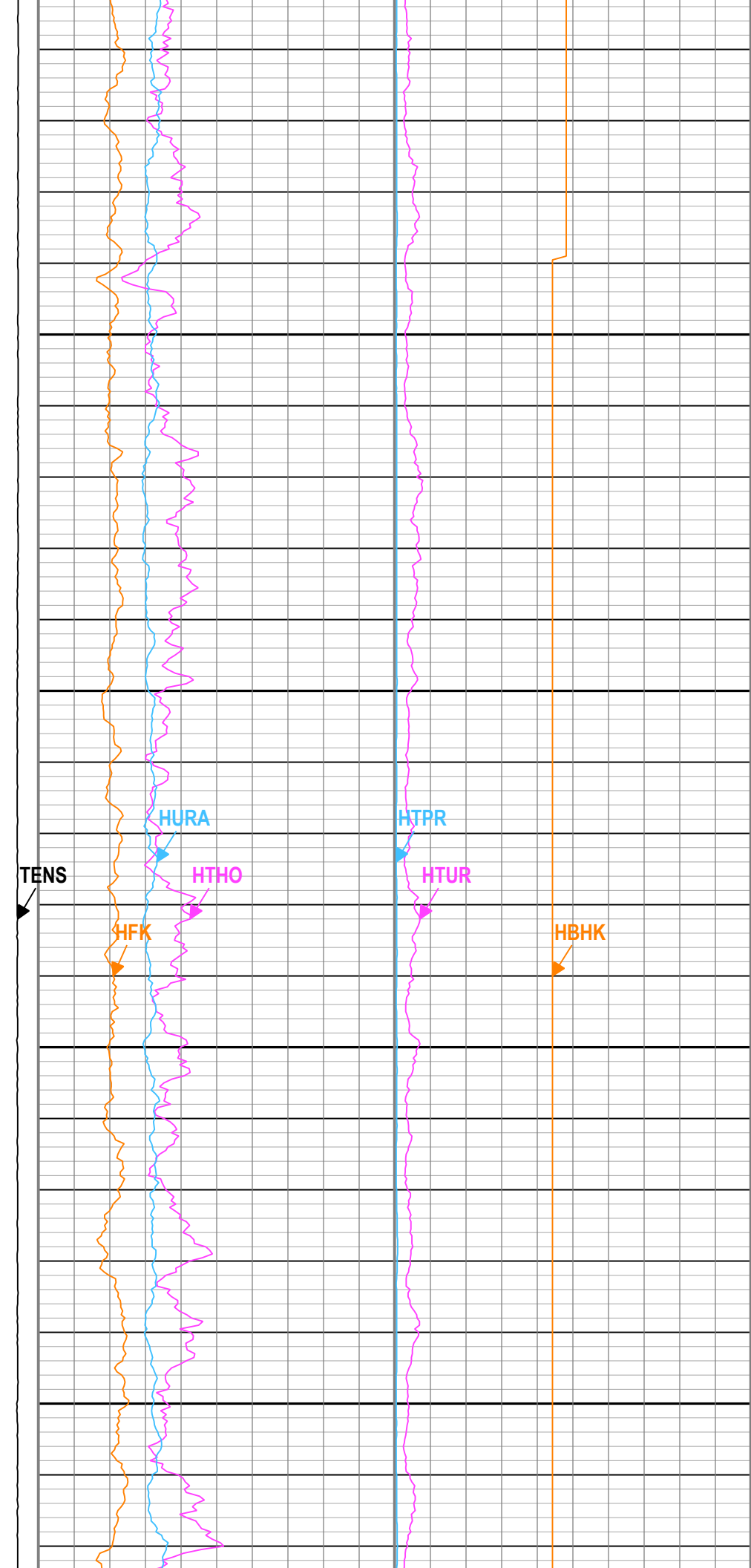
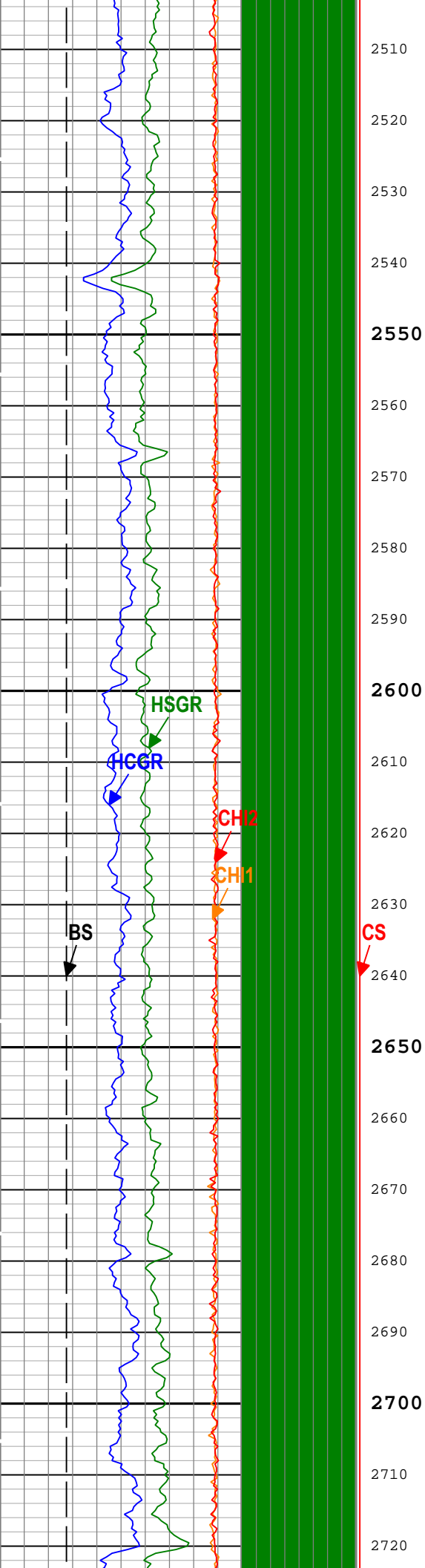


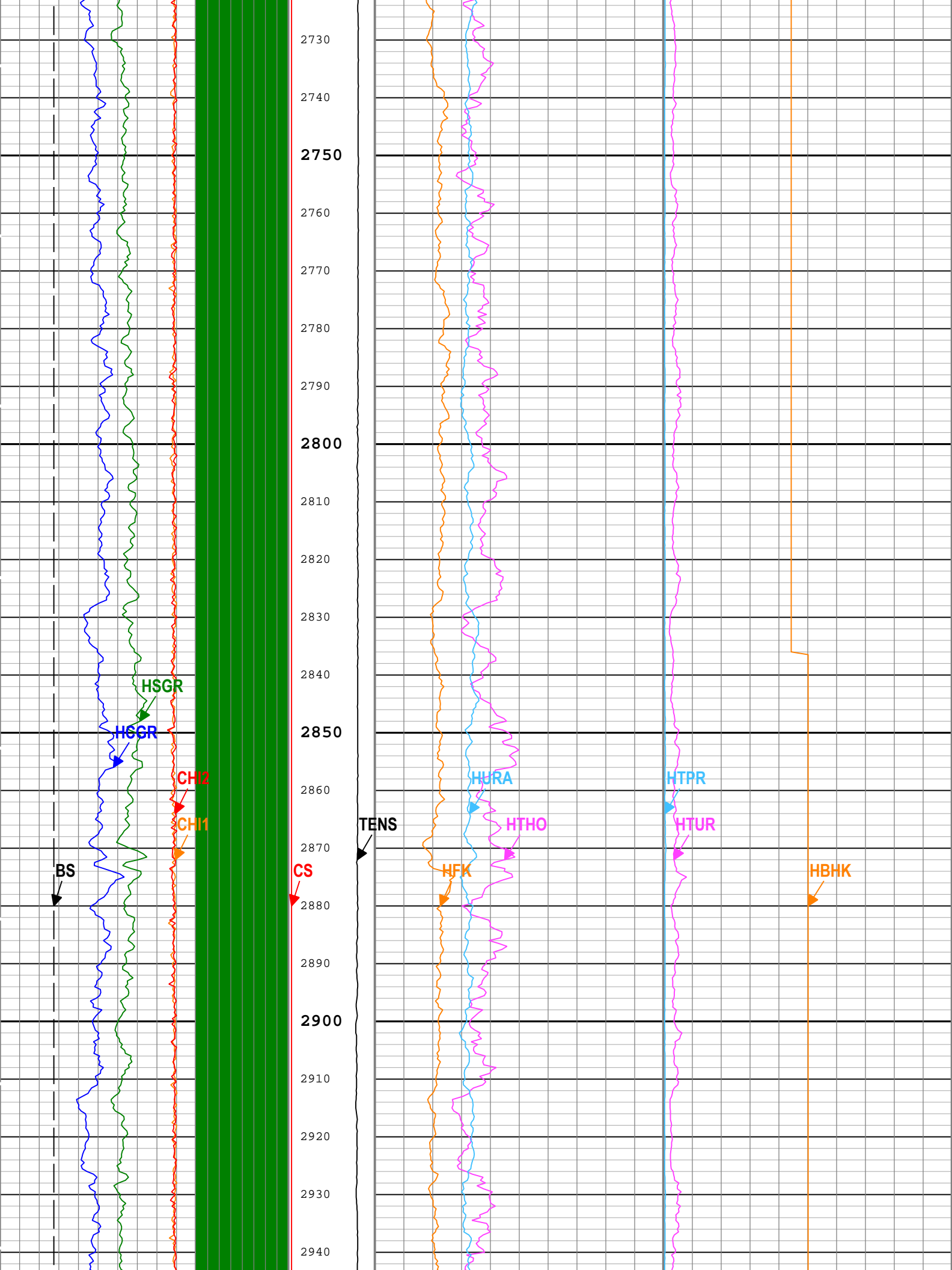


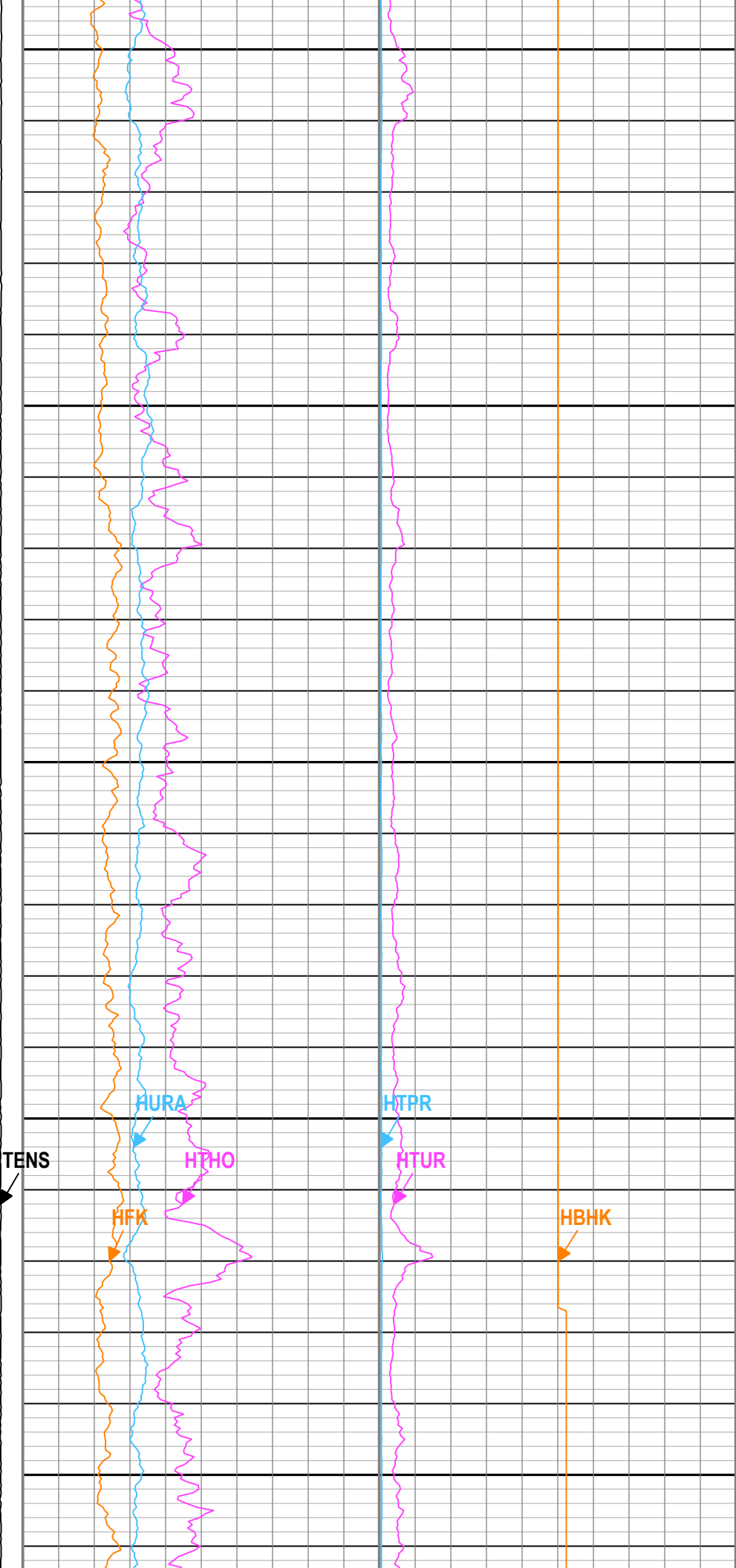
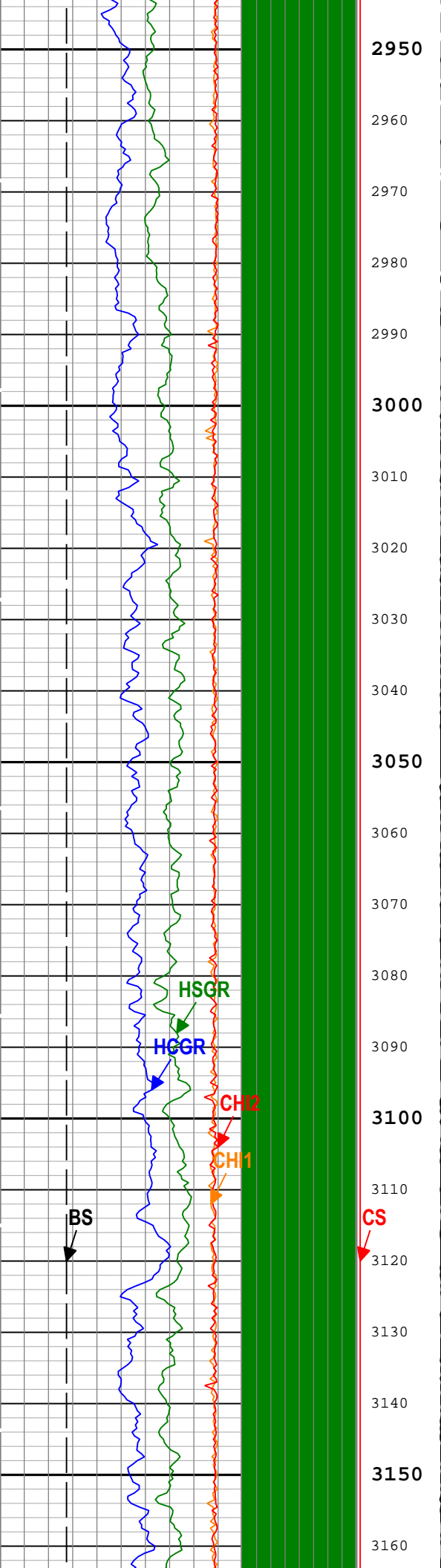












2950

2960

2970

2980

2990

3000

3010

3020

3030

3040

3050

3060

3070

3080

3090

3100

3110

3120

3130

3140

3150

3160

HSGR

HCCR

CH2

CH1

BS

CS

TENS

HURA

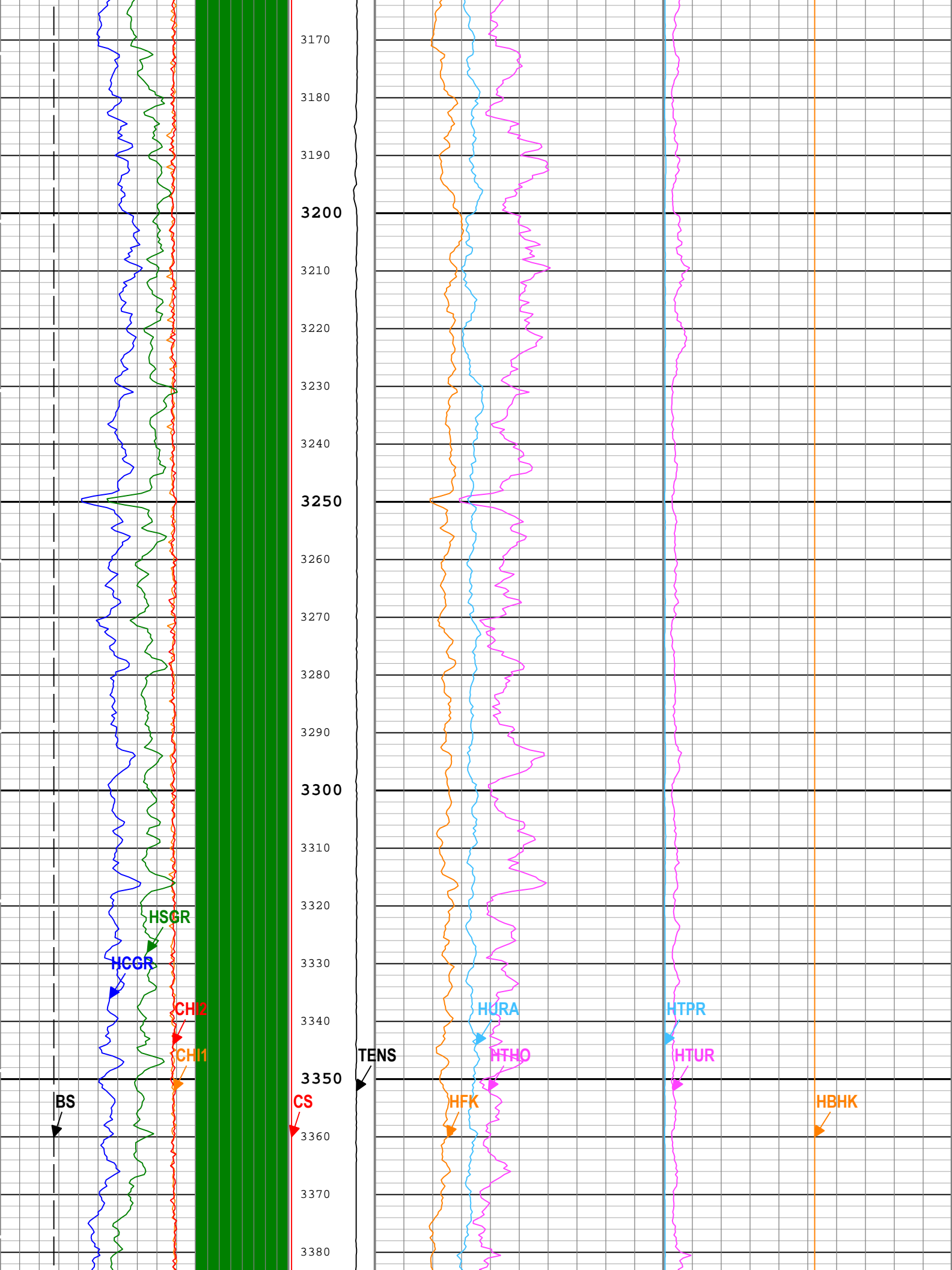
HFK

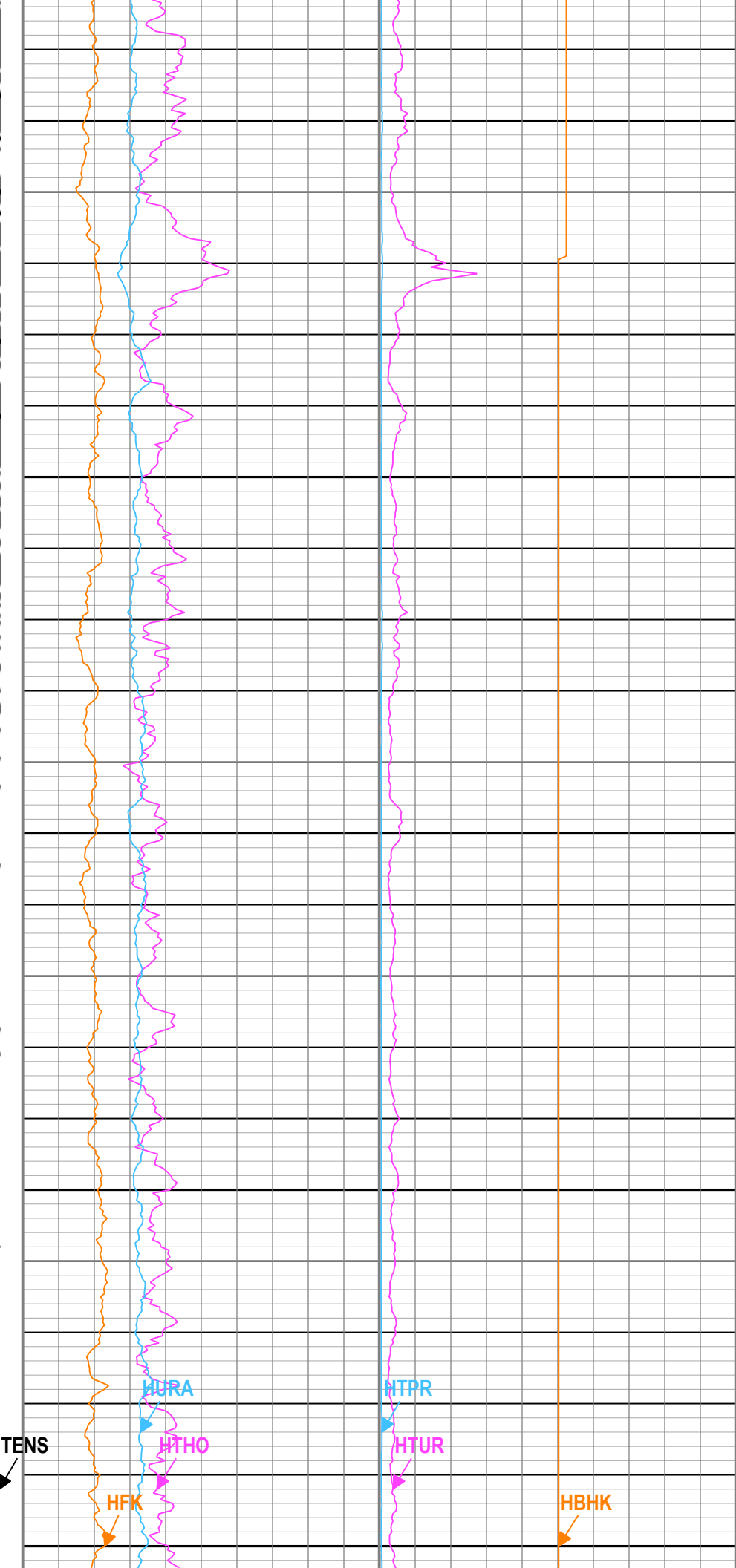
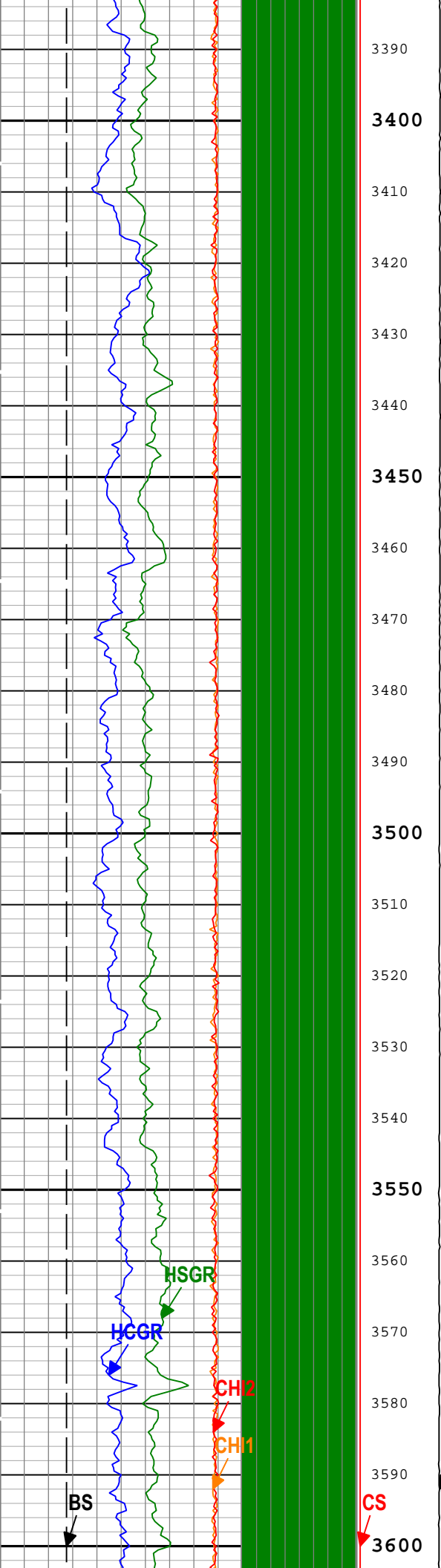
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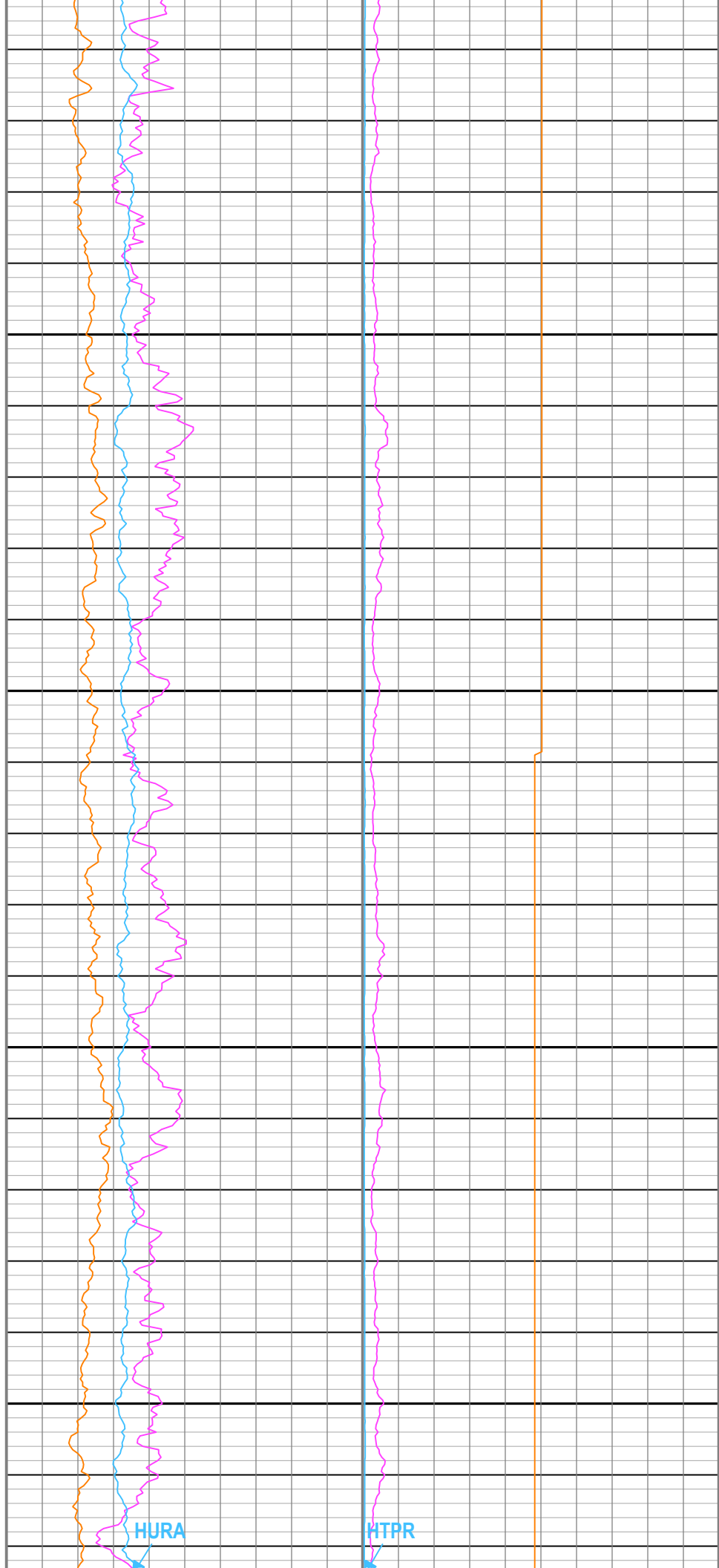
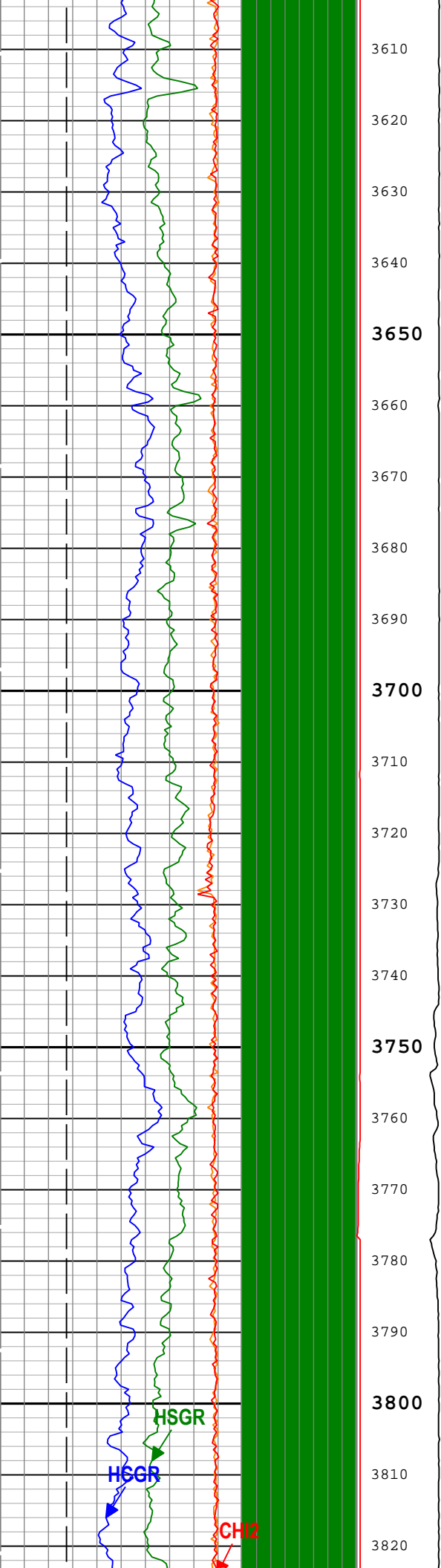
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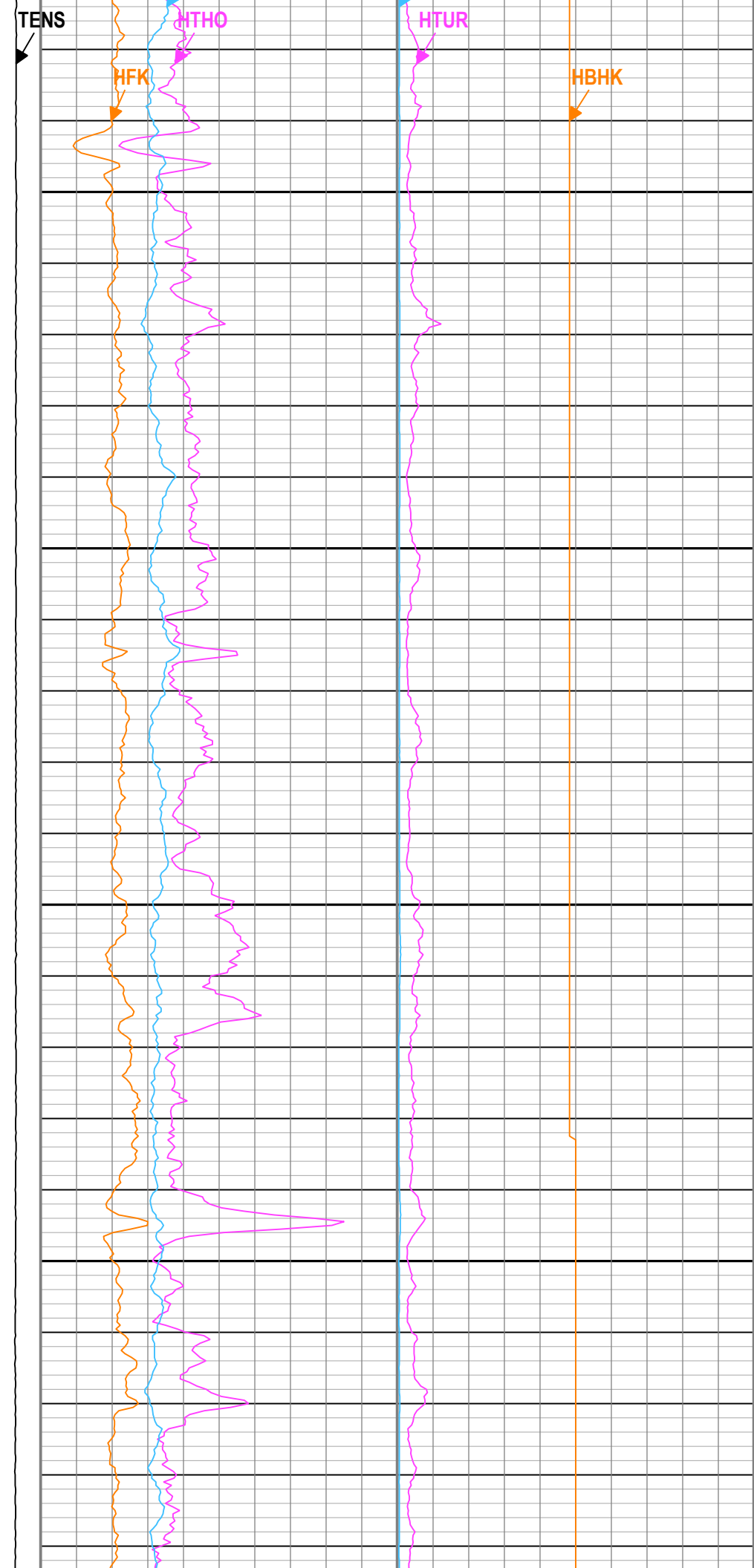
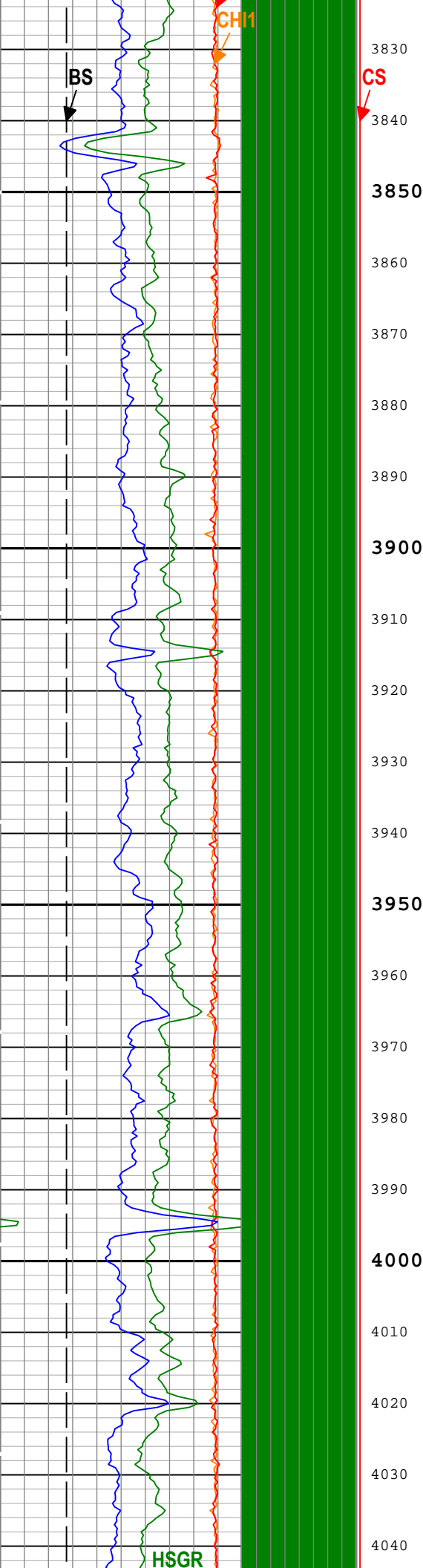
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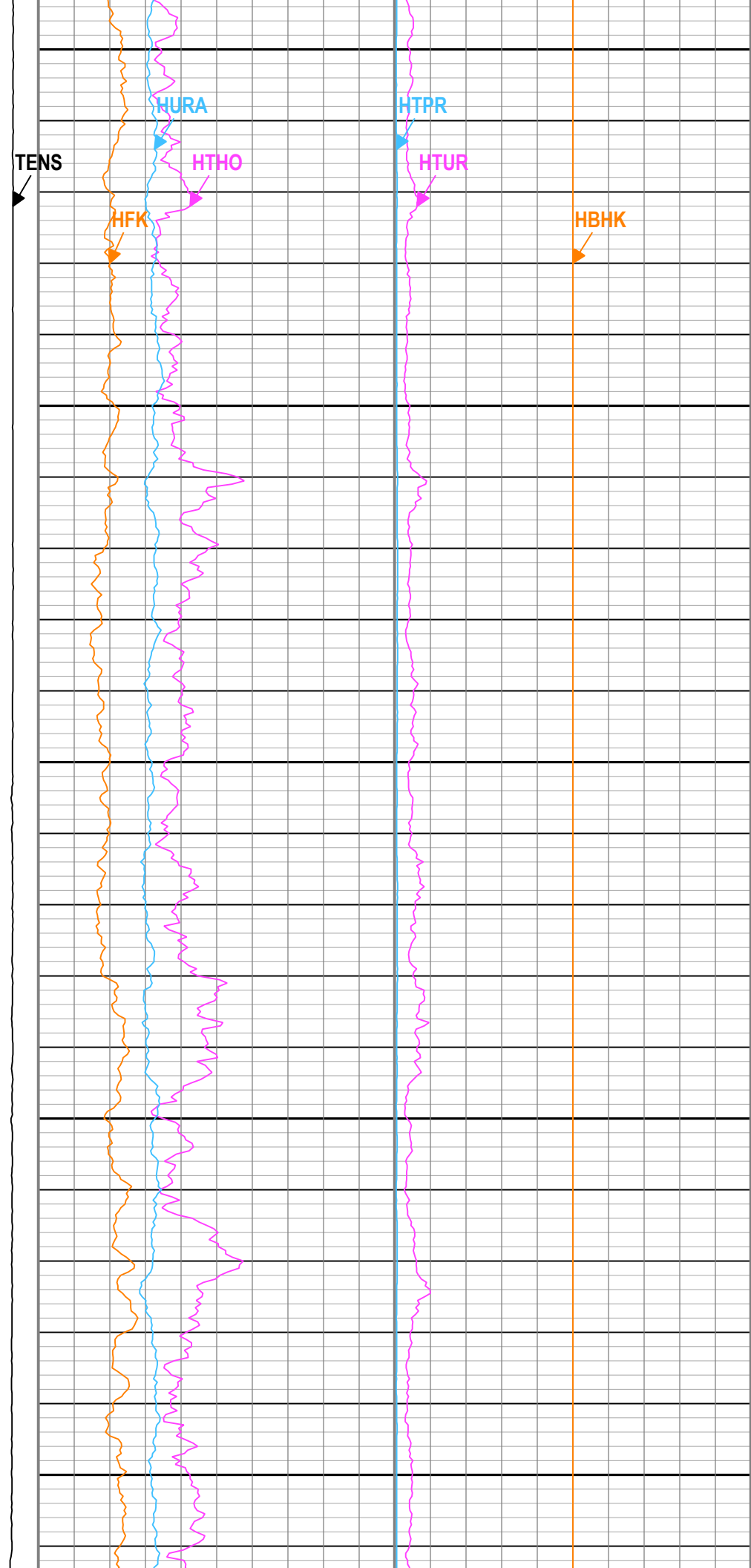
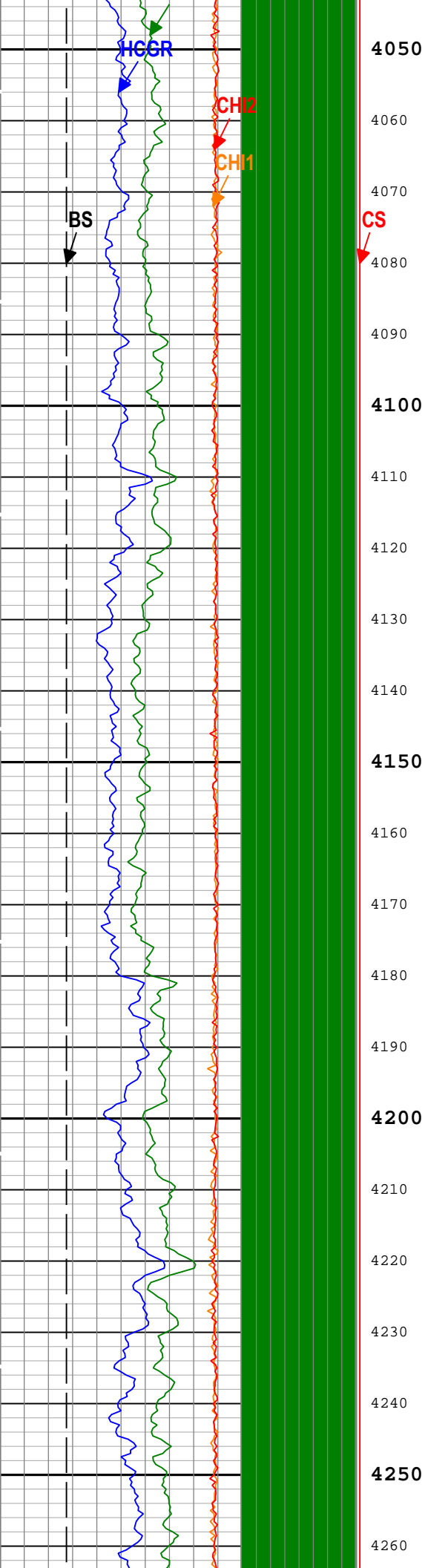
HBHK

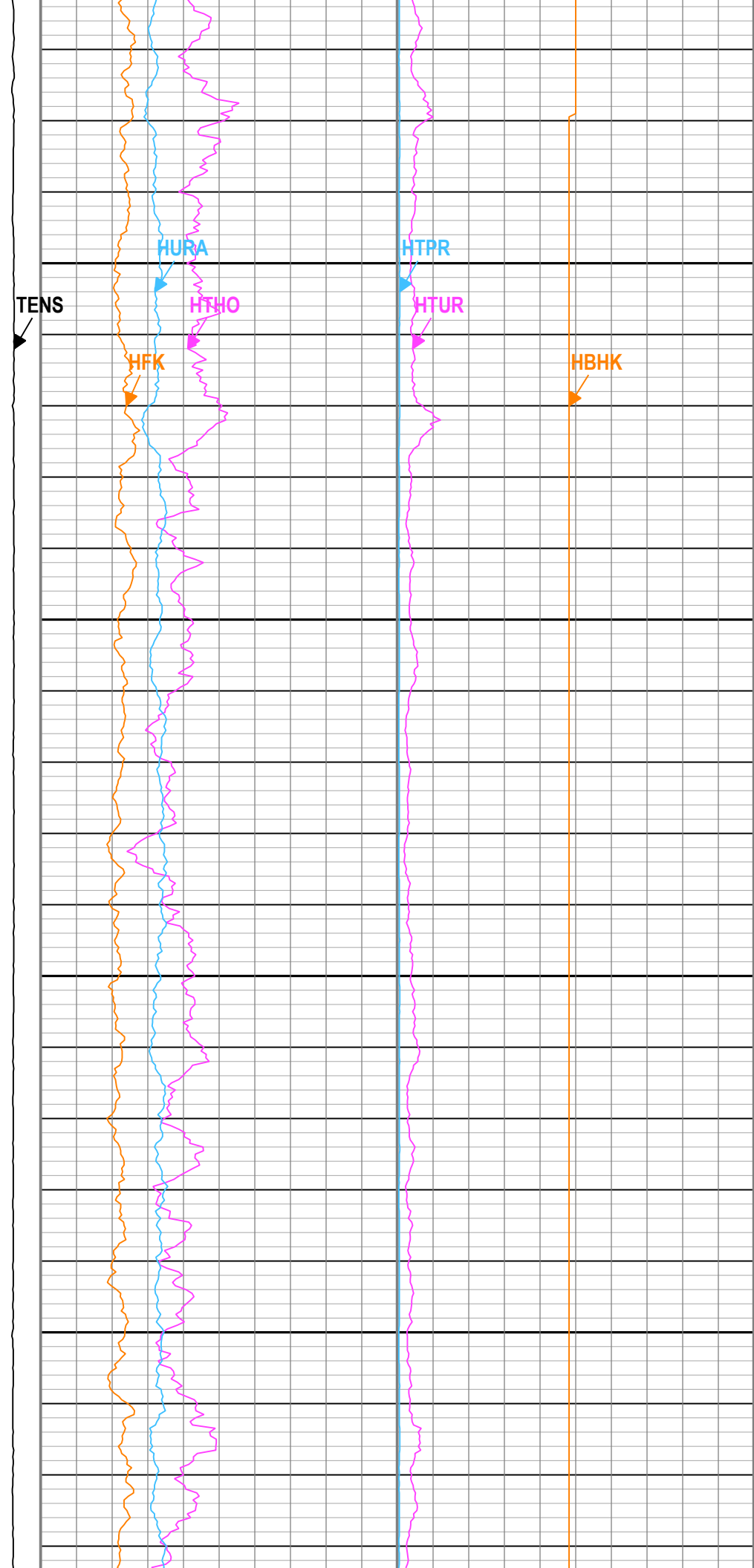
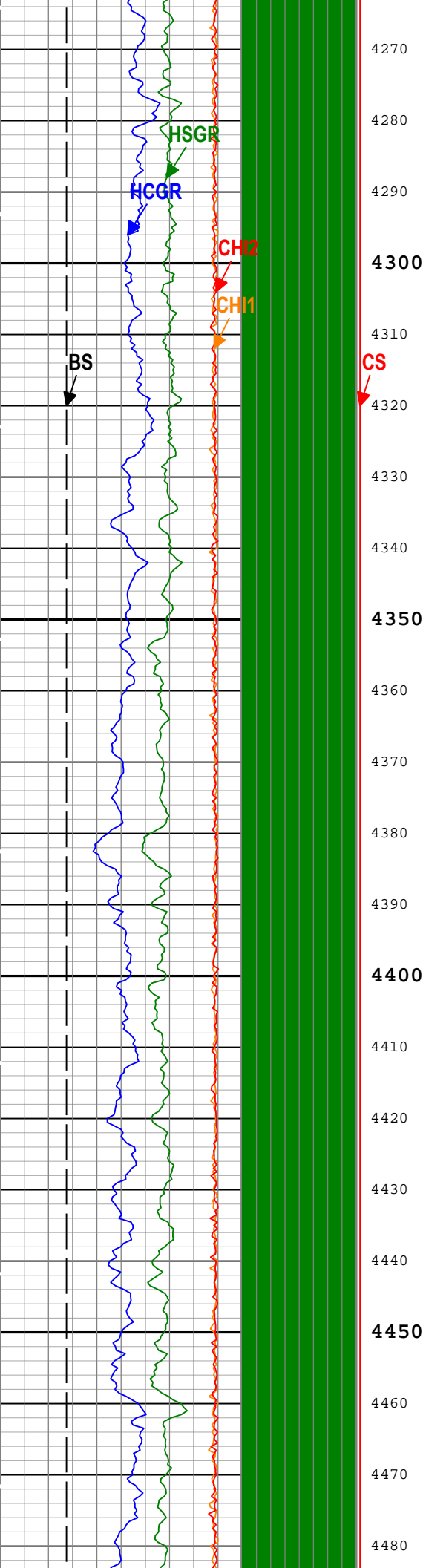


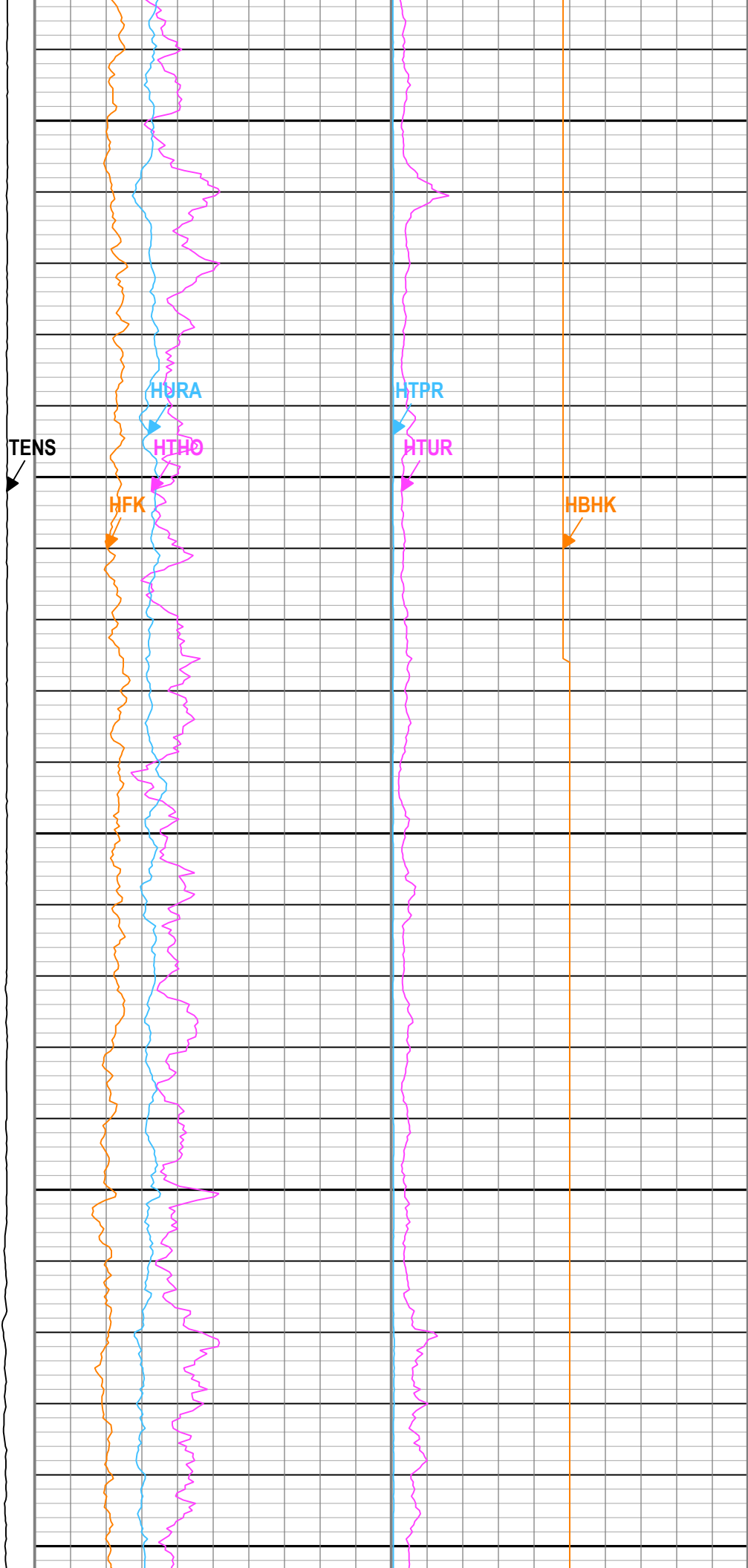
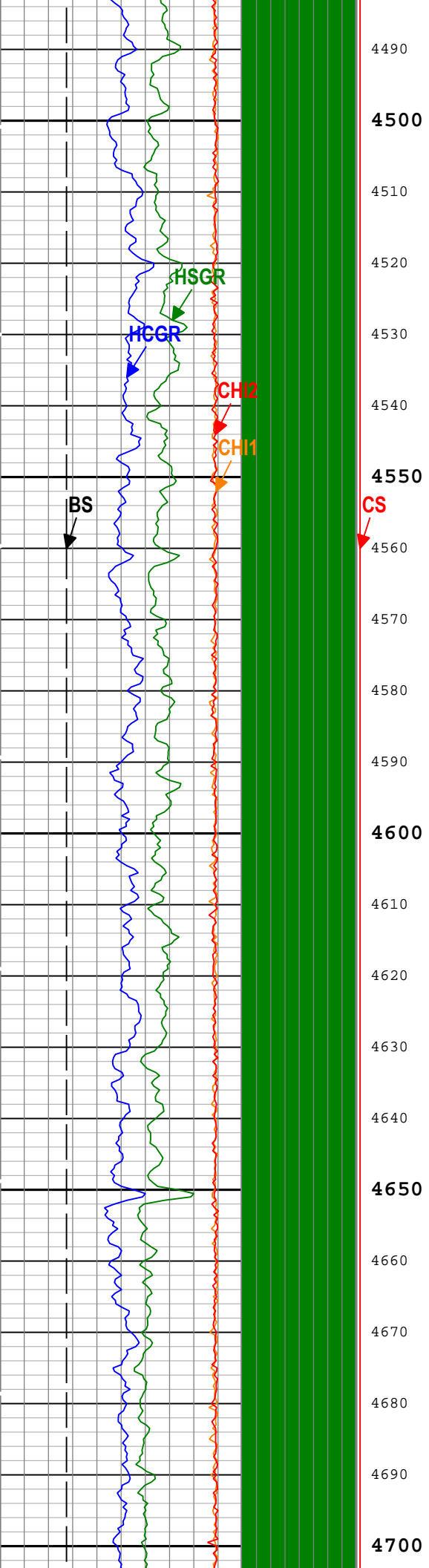


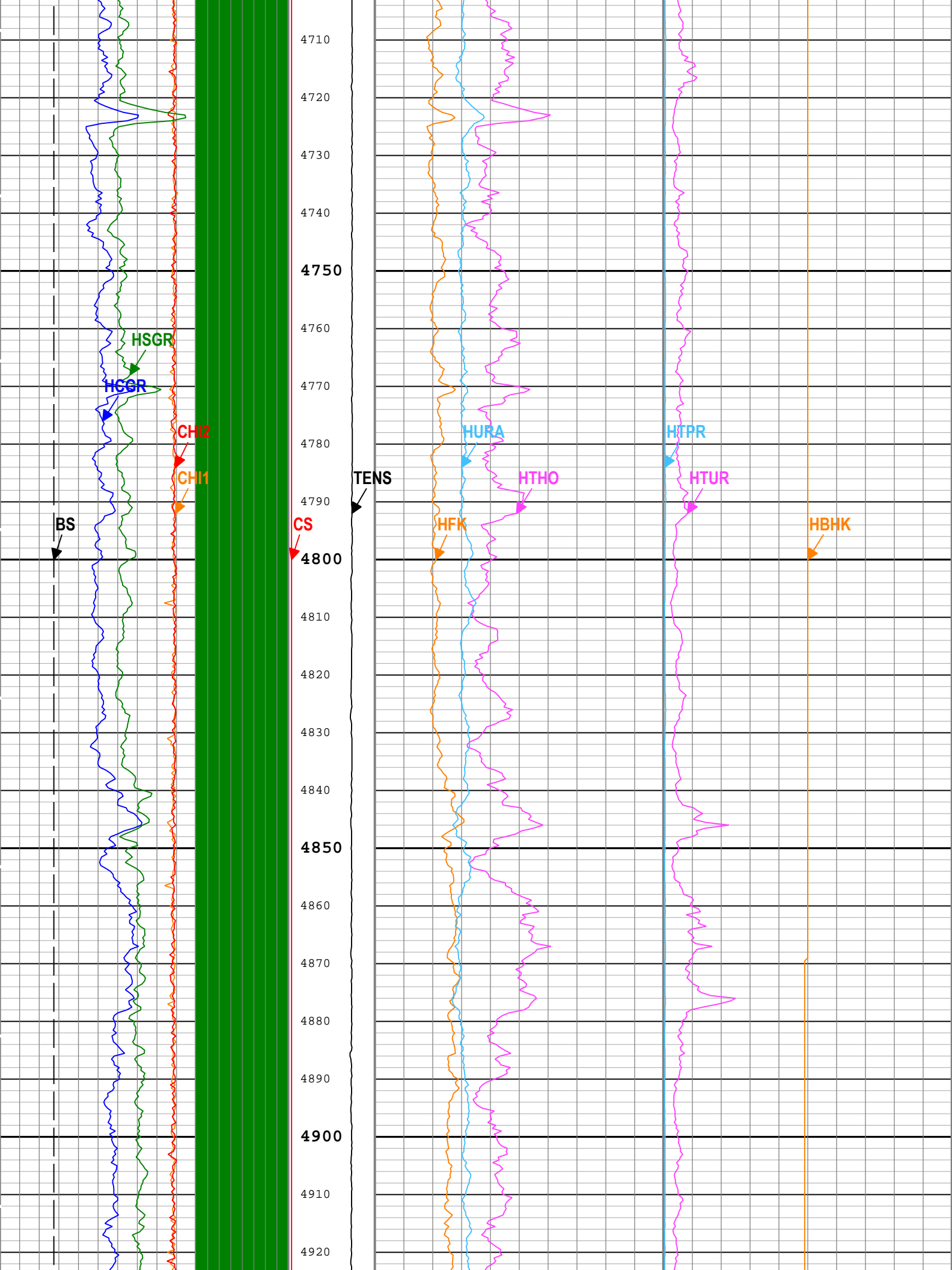


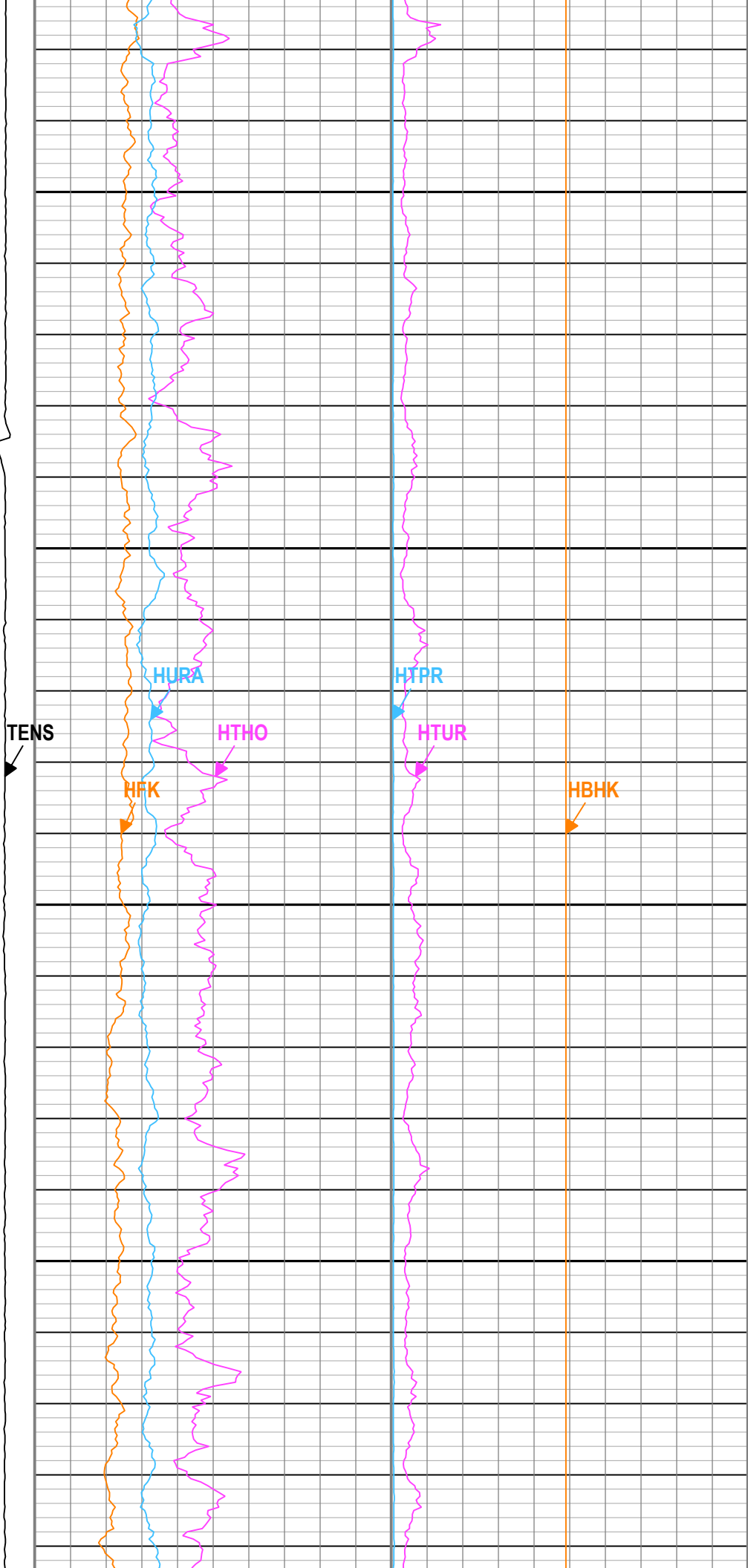
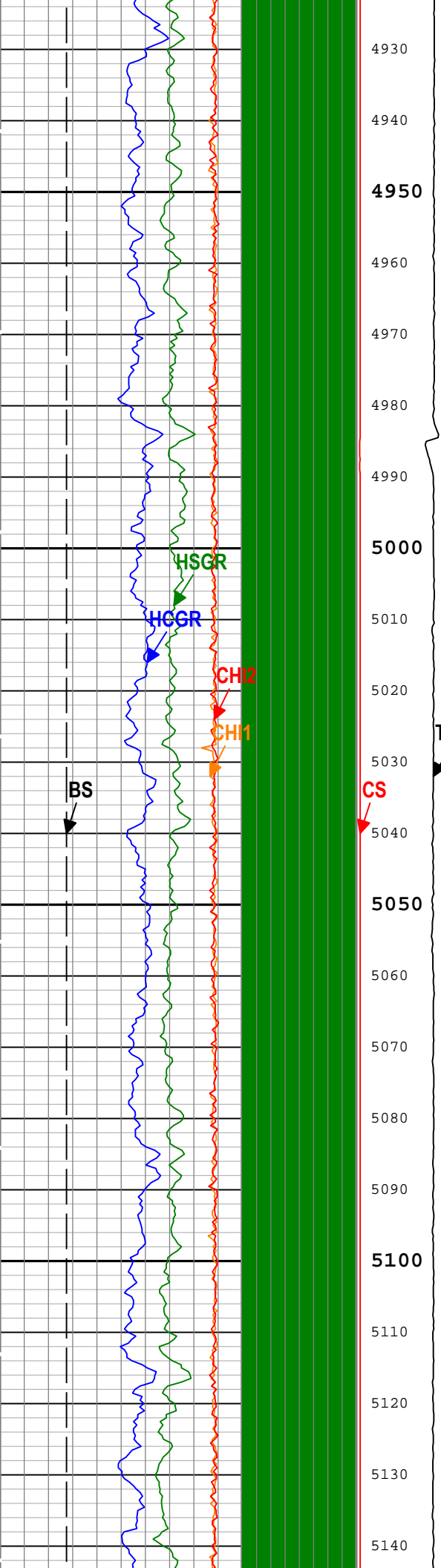


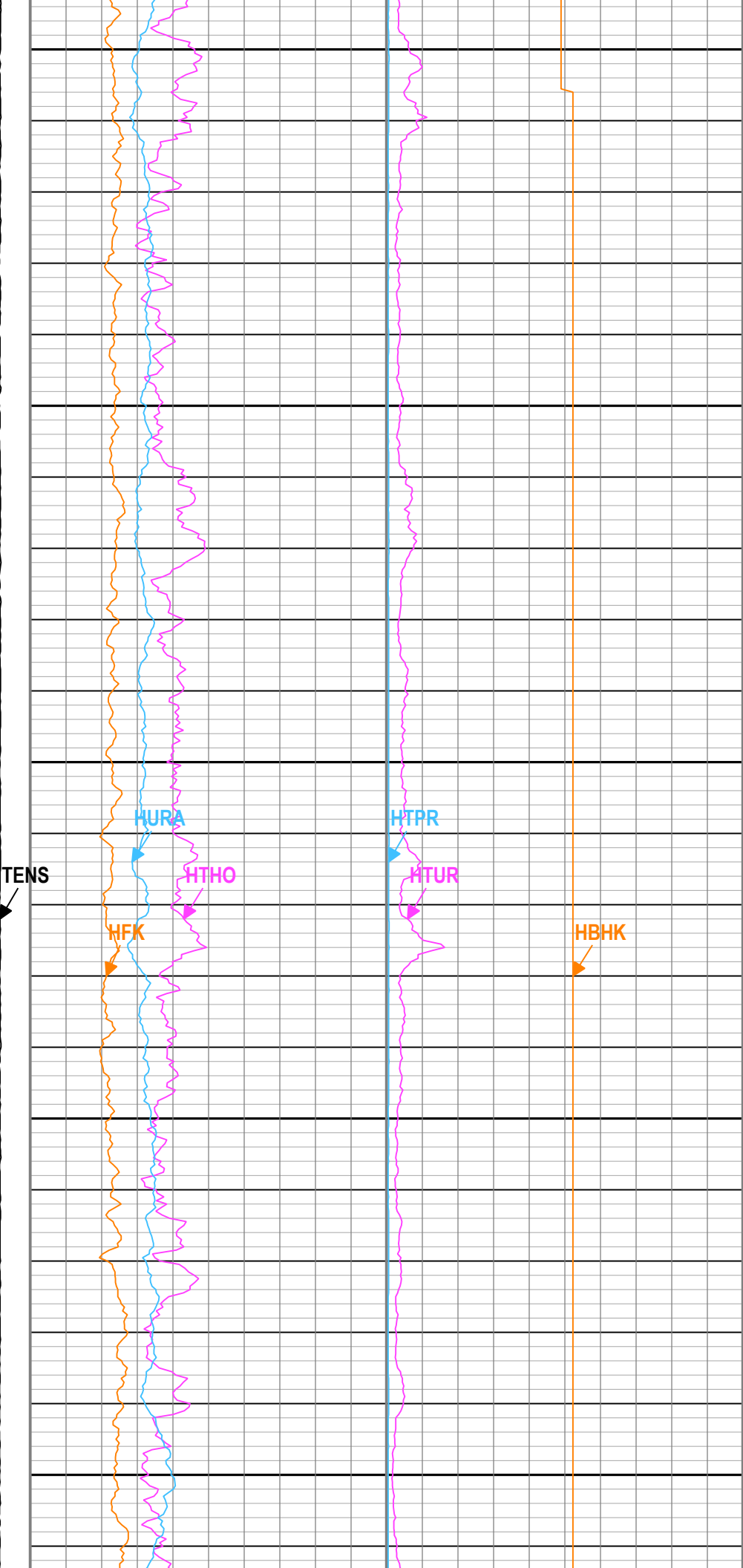
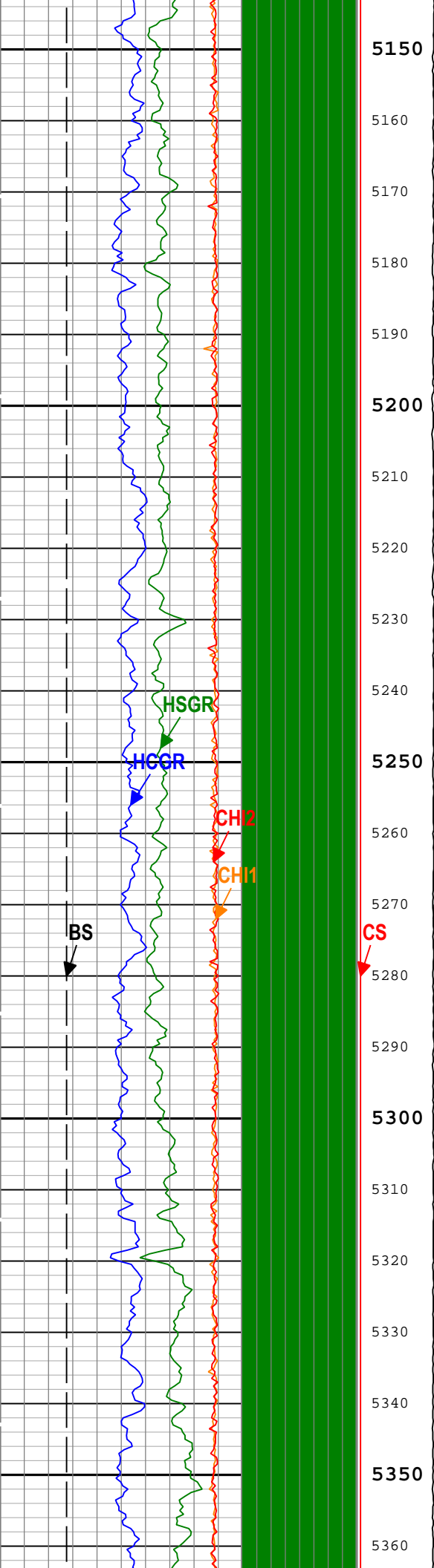


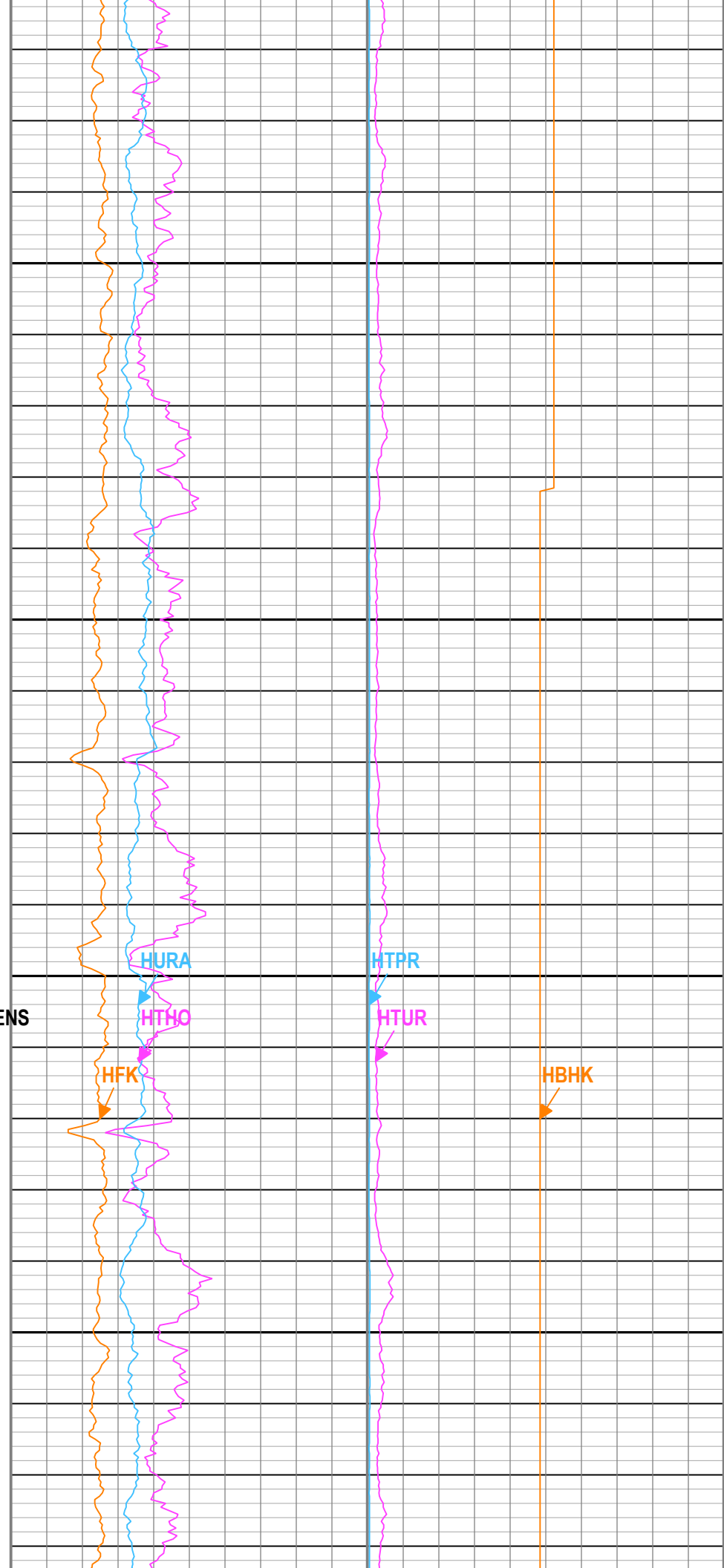
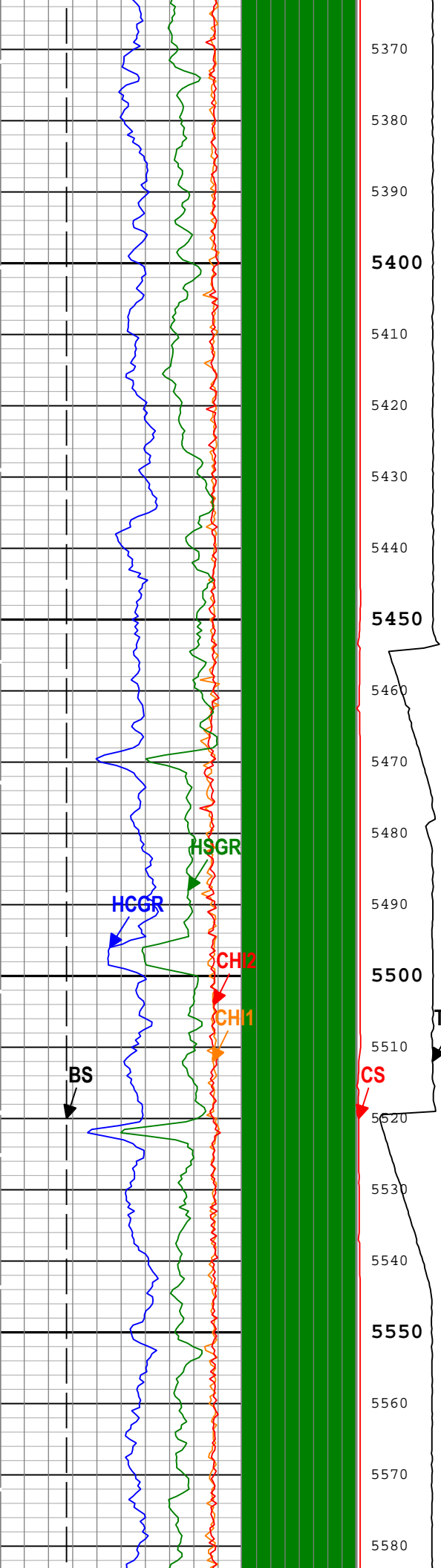


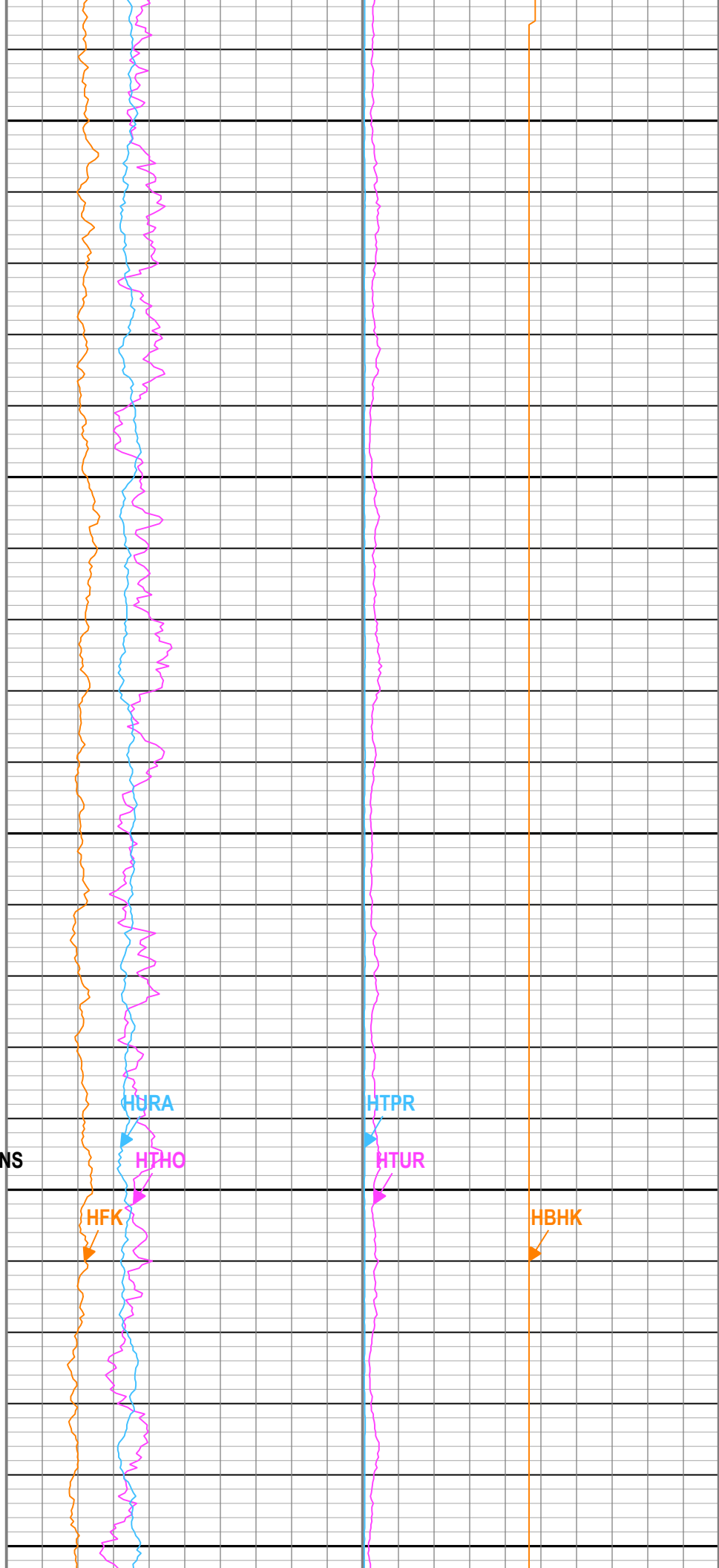
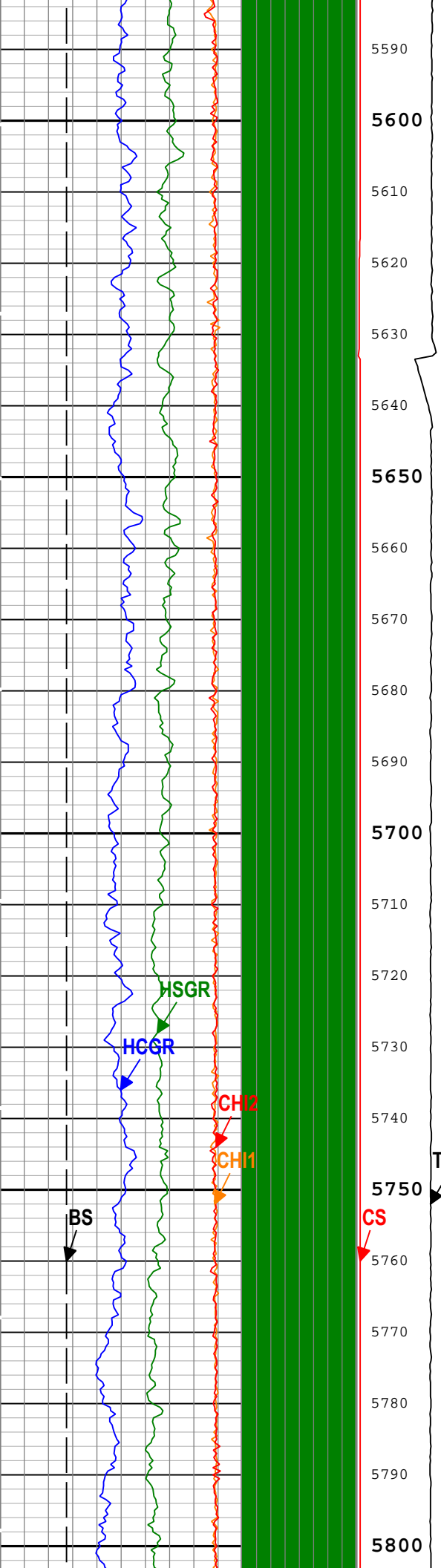


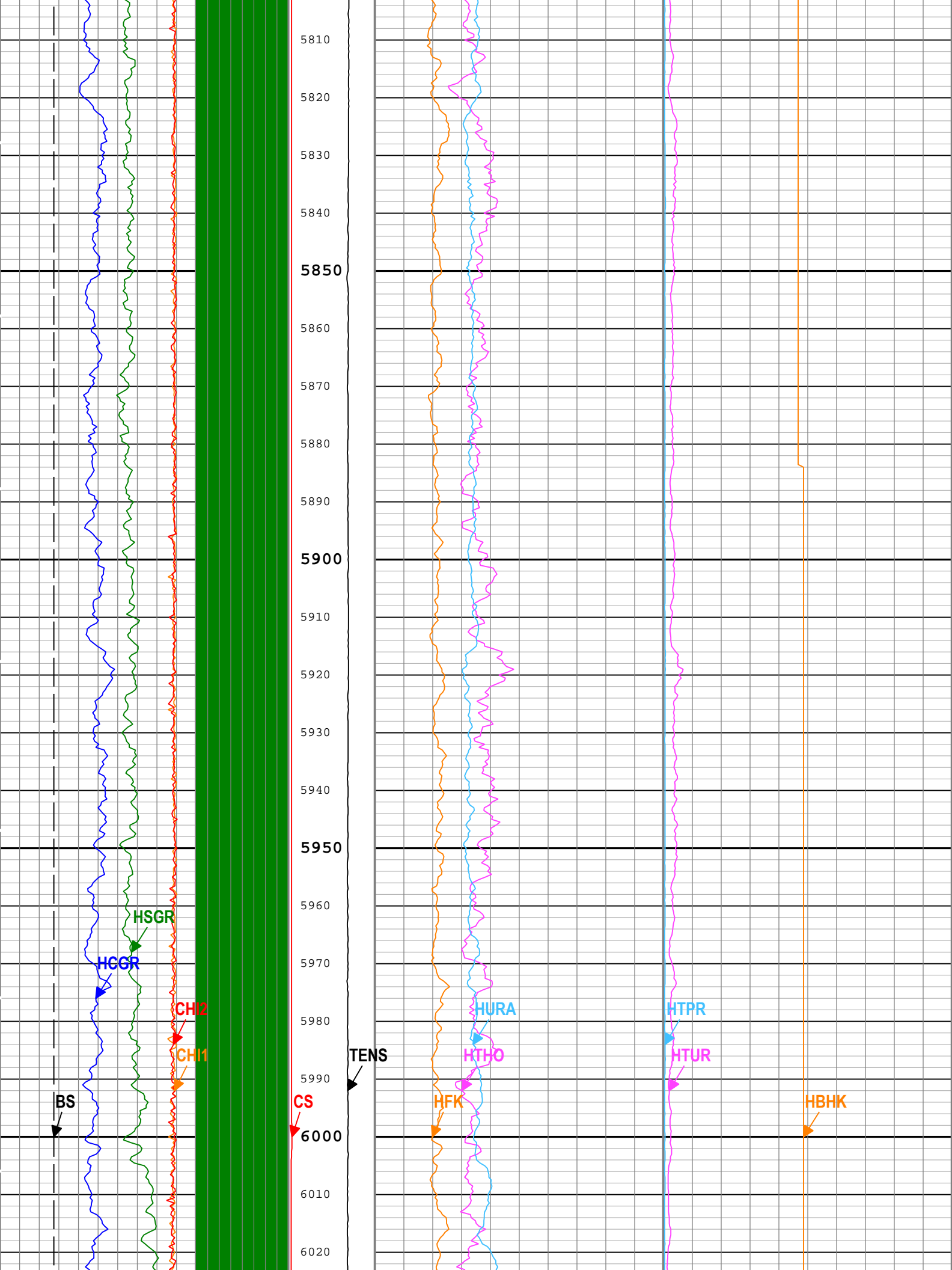


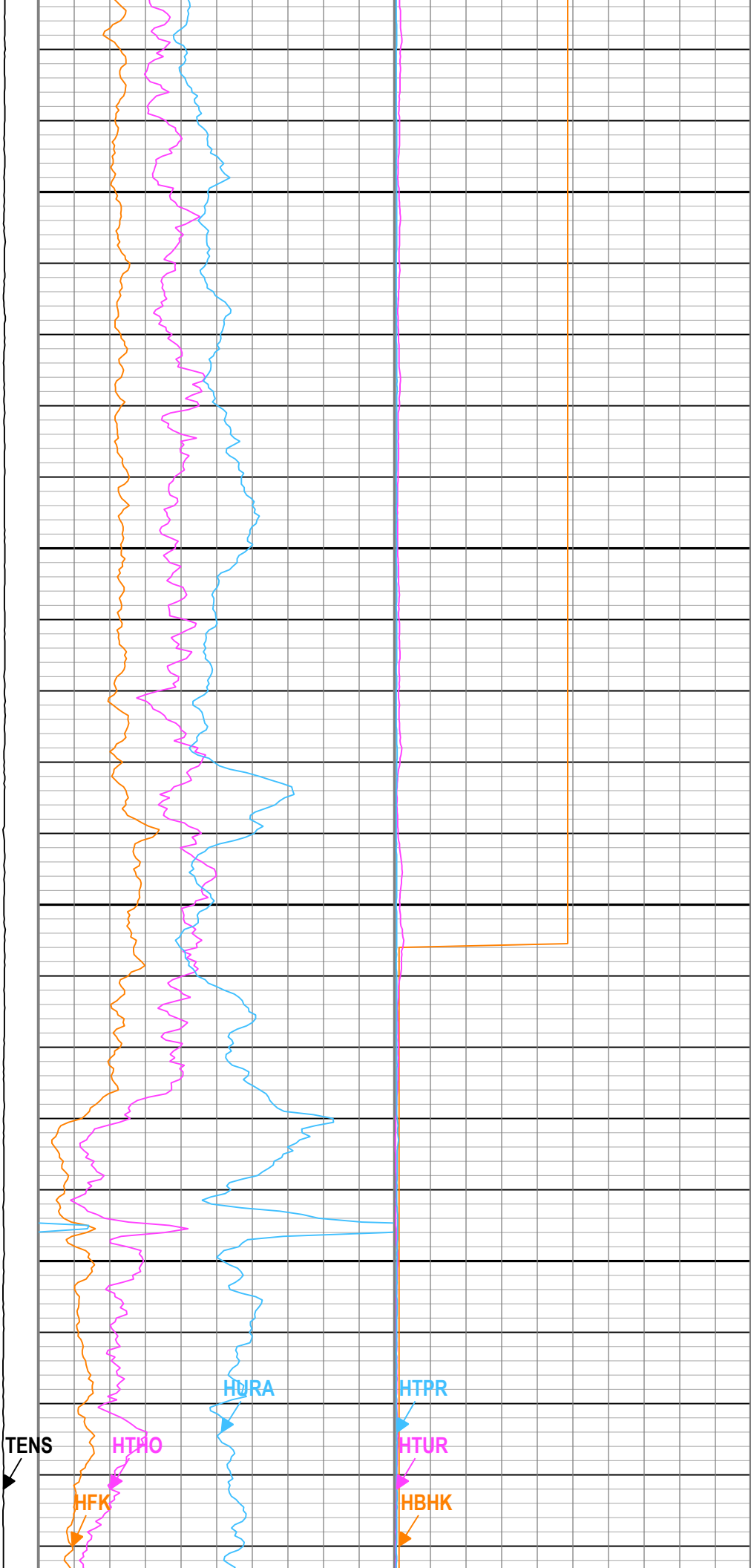
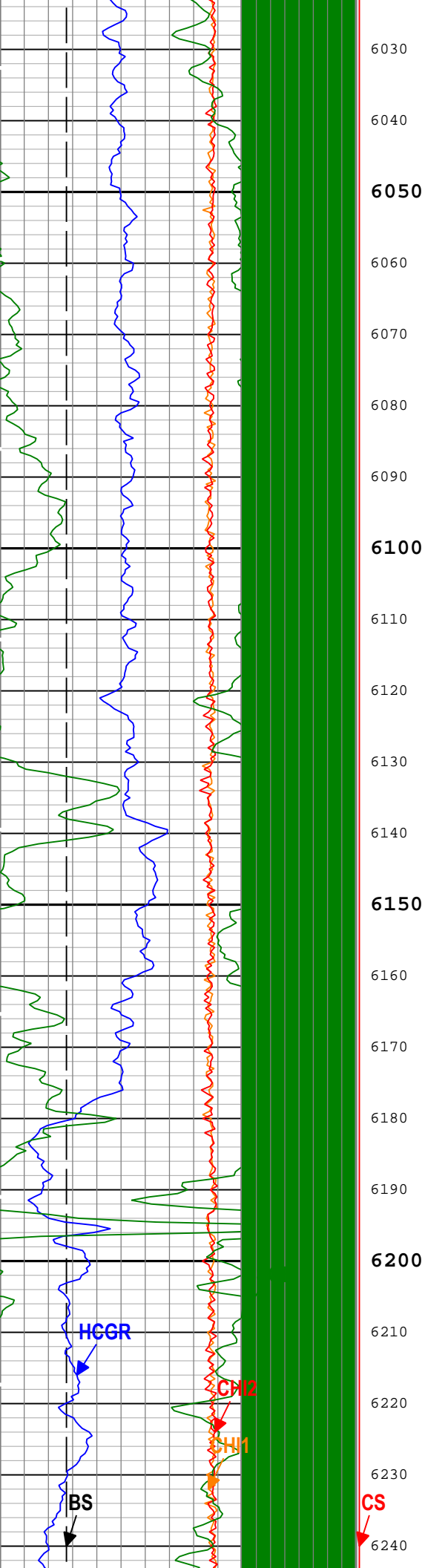


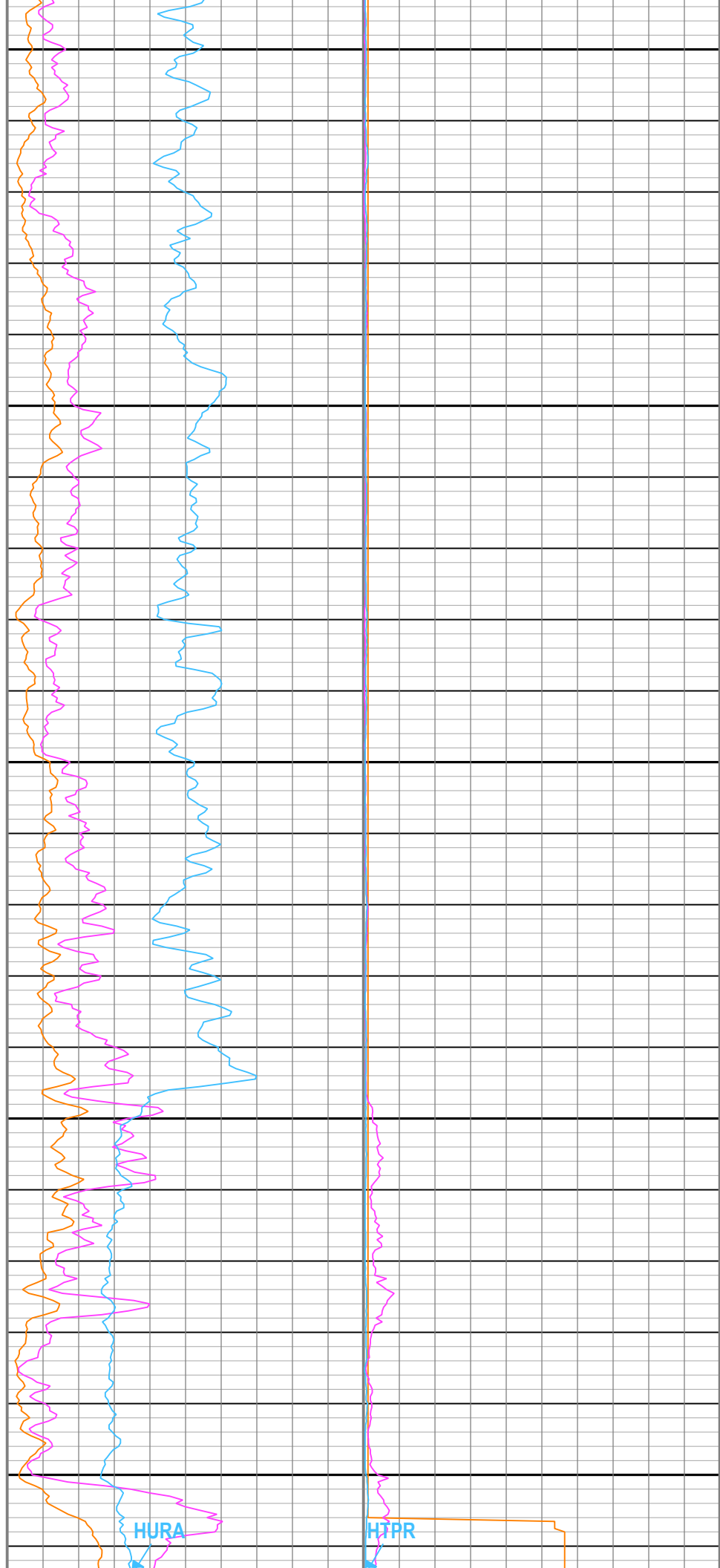
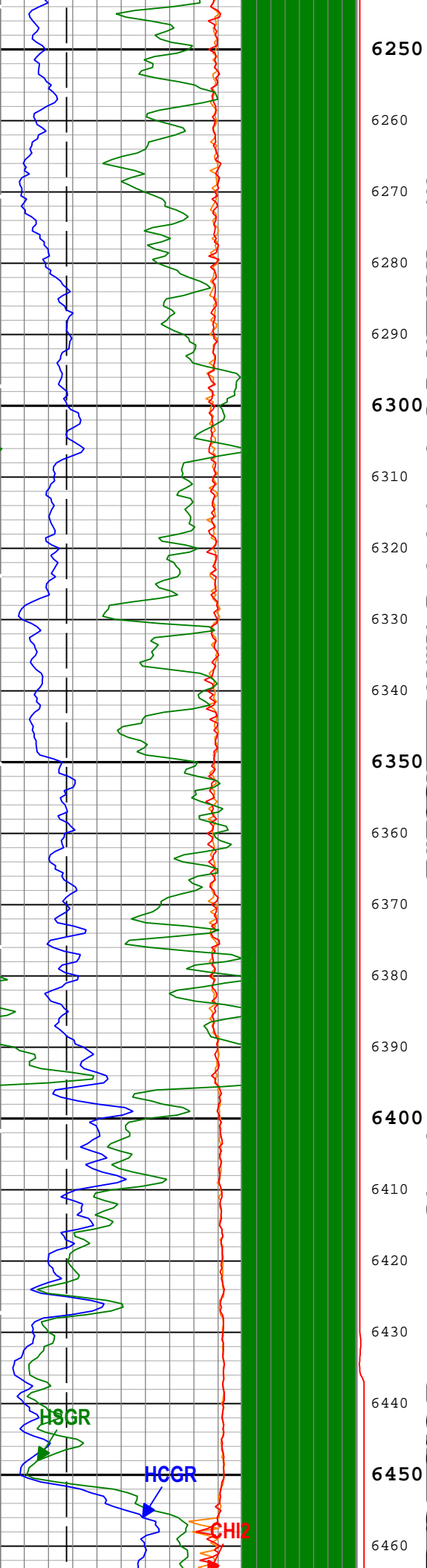


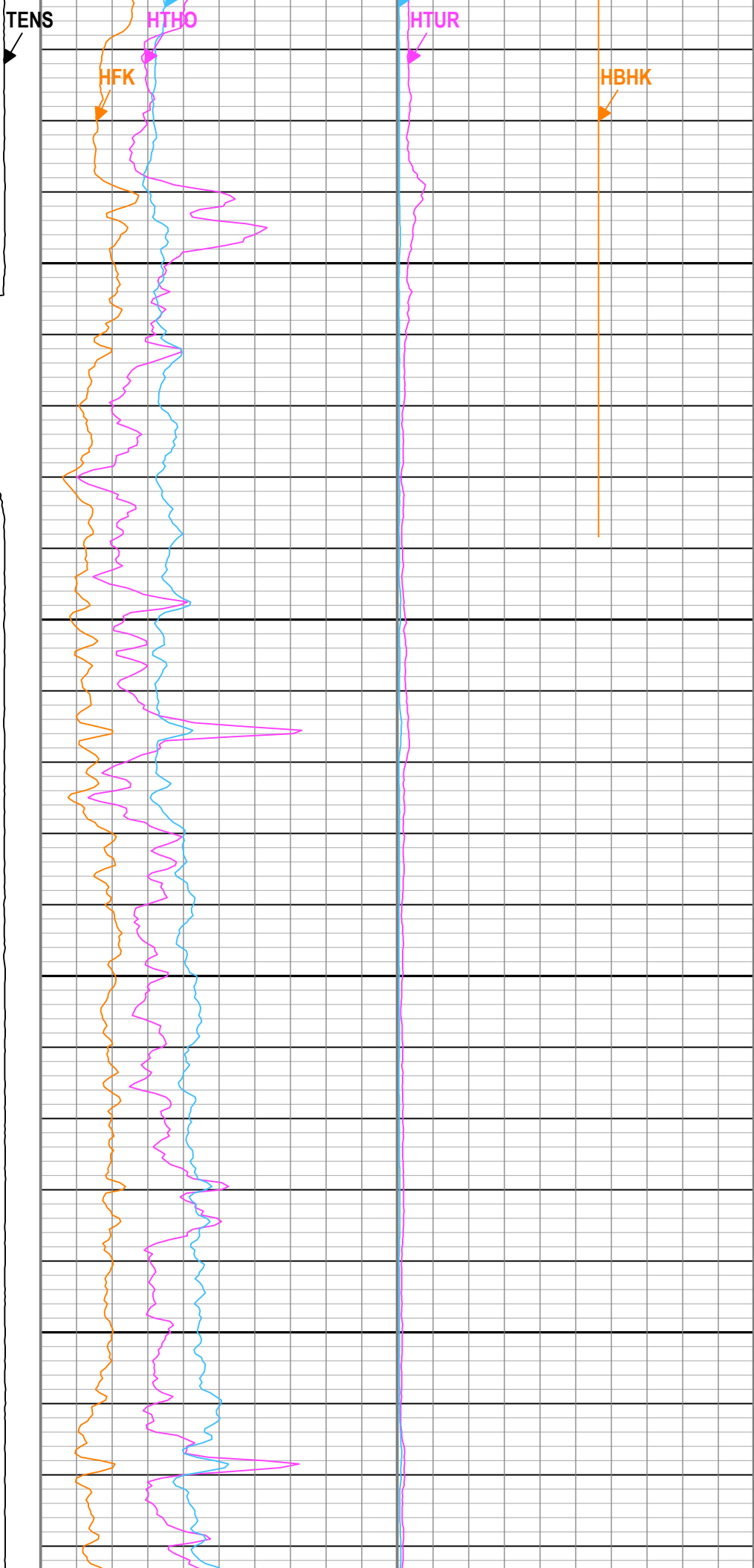
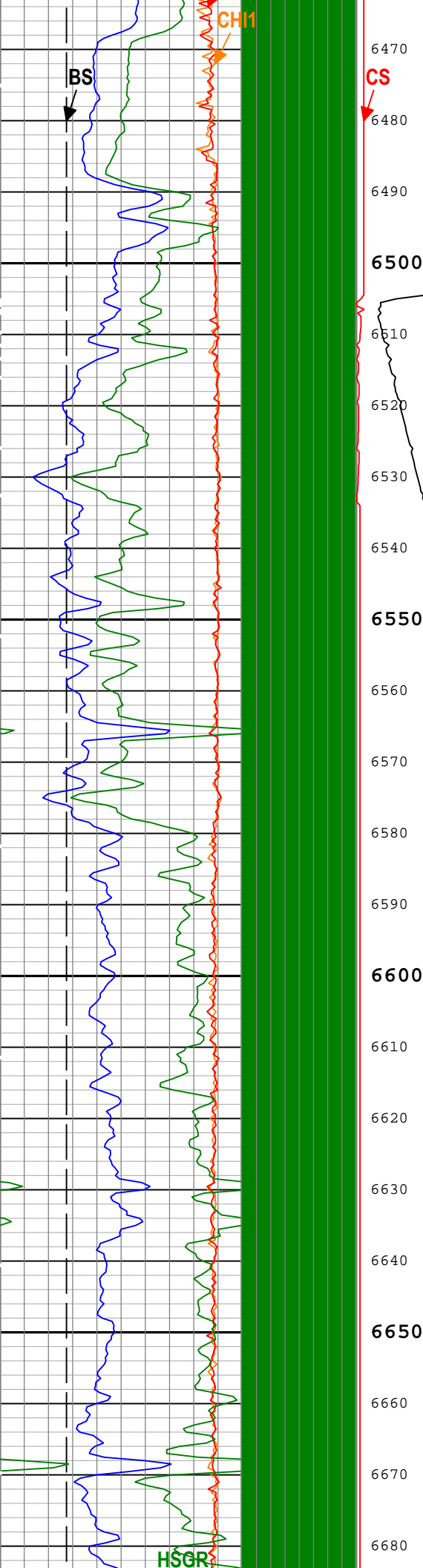


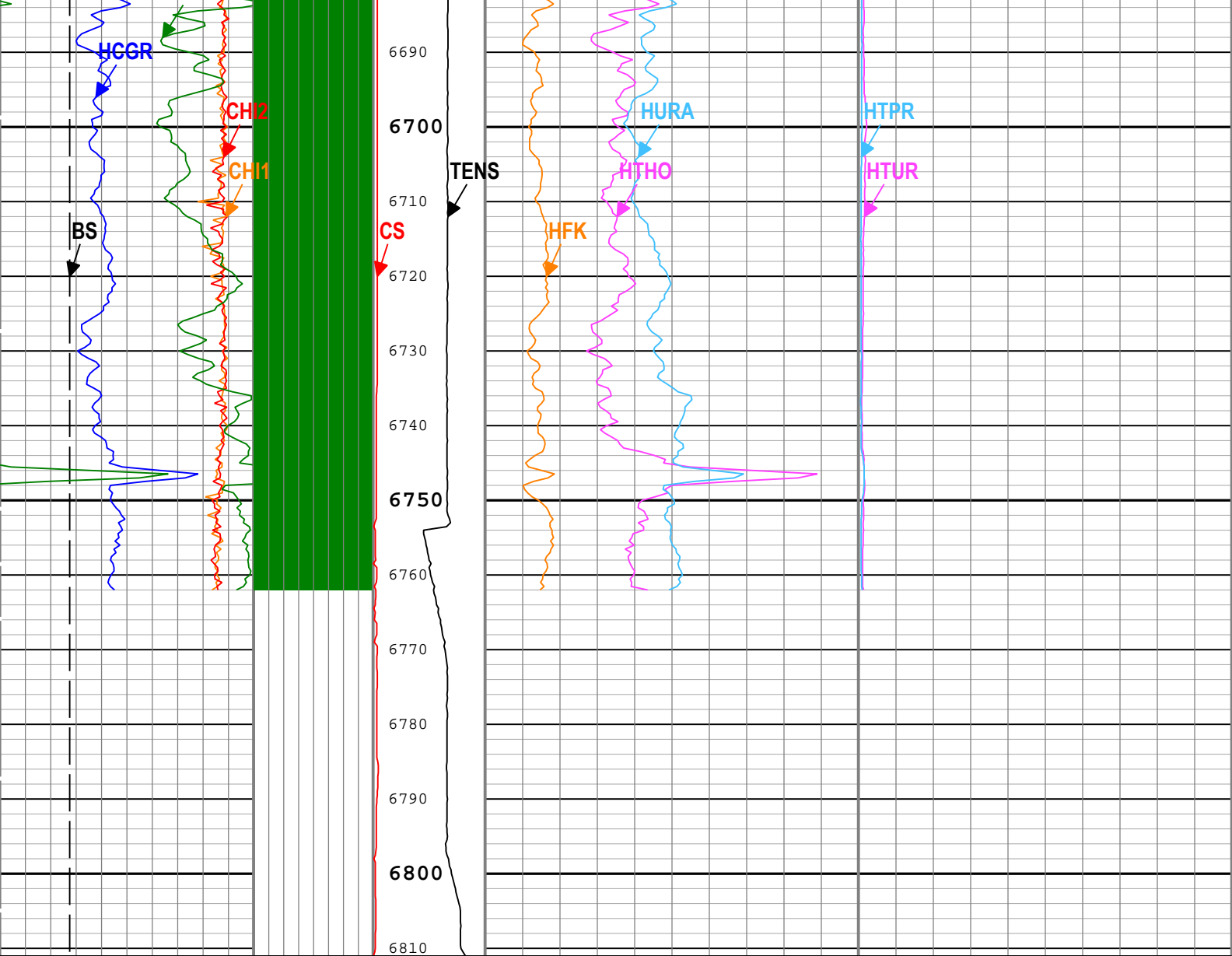












Bit Size (BS) RT			Log Quality Control Gamma Ray Status (LQC_GR) HNGS-BA	Cable Speed (CS)		Potassium Concentration (HFK) HNGS-BA		Borehole Potassium Concentration (HBHK) HNGS-BA			
6	in	16		0	50000 ft/h	0	%	10	-5	%	5
Detector 1 Chi-Squared (CHI1) HNGS-BA				Cable Tension (TENS)	Thorium Concentration (HTHO) HNGS-BA		Thorium/Uranium Ratio (HTUR) HNGS-BA				
10		0			0	ppm	30	0.01			
Detector 2 Chi-Squared (CHI2) HNGS-BA					Uranium Concentration (HURA) HNGS-BA		Thorium/Potassium Ratio (HTPR) HNGS-BA				
10		0		10000 lbf	-10	ppm	30	0.1			
Gamma Ray Contribution from Thorium and Potassium (HCGR) HNGS-BA											
0	gAPI	150									
Spectroscopy Gamma Ray (HSGR) HNGS-BA											
0	gAPI	150									

Log Quality Control Gamma Ray Status (LQC_GR) HNGS-BA

1 - CartHwStatus - Cartridge Hardware Status :

Cartridge Hardware: Normal

Cartridge Hardware: Error

Cartridge Hardware: Warning

2 - CartTempStatus - Cartridge Temperature Status :

Cartridge Temperature < 150 °C

150 °C ≤ Cartridge Temperature < 175 °C

Cartridge Temperature ≥ 175 °C

3 - Det1TempStatus - Detector 1 Temperature Status :	<div></div> Detector 1 Temperature < 50 °C	<div></div> 50 °C <= Detector 1 Temperature < 80 °C
	<div></div> Detector 1 Temperature >= 80 °C	
4 - Det2TempStatus - Detector 2 Temperature Status :	<div></div> Detector 2 Temperature < 50 °C	<div></div> 50 °C <= Detector 2 Temperature < 80 °C
	<div></div> Detector 2 Temperature >= 80 °C	
5 - Det1CtrlLoopStatus - Detector 1 Control Loop Status :	<div></div> Detector 1 Control Loop: Normal	<div></div> Detector 1 Control Loop: Warning
	<div></div> Detector 1 Control Loop: Error	
6 - Det2CtrlLoopStatus - Detector 2 Control Loop Status :	<div></div> Detector 2 Control Loop: Normal	<div></div> Detector 2 Control Loop: Warning
	<div></div> Detector 2 Control Loop: Error	
7 - Det1ChiSqrStatus - Detector 1 Chi Squared Status :	<div></div> Detector 1 Chi Squared <= 3.0	<div></div> Detector 1 Chi Squared > 3.0
8 - Det2ChiSqrStatus - Detector 2 Chi Squared Status :	<div></div> Detector 2 Chi Squared <= 3.0	<div></div> Detector 2 Chi Squared > 3.0

TIME_1900 - Time Marked every 60.00 (s)

Description: HNGS Basic Format: Log (HNGS Basic) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Sep-2016 22:55:59

Channel Processing Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHK	Drilling Fluid Potassium Concentration	Borehole	0	%
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	-0.8	in
CBLO	Casing Bottom (Logger)	WLSESSION	1465	ft
DBCC	Barite Constant Correction Flag	HNGS-BA	None	
DFD	Drilling Fluid Density	Borehole	9.7	lbm/gal
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	
HCRB	Apply Borehole Potassium Correction	HNGS-BA	None	
HEMA	Hematite Presence Flag	Borehole	No	
SGRC	Standard Gamma Ray Correction Flag	HNGS-BA	Yes	

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	1331	1465
BS	8.75	1465	6800

All depth are actual.

Tool Control Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h

One

Pass Summary























Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[4]:Up	Up	1387.81 ft	6810.88 ft	28-Sep-2016 5:33:25 PM	28-Sep-2016 9:39:06 PM	ON	4.00 ft	Yes
One	Log[5]:Up	Up	1387.33 ft	1776.64 ft	28-Sep-2016 9:43:34 PM	28-Sep-2016 9:57:15 PM	ON	4.10 ft	Yes

All depths are referenced to toolstring zero

Description: HNGS Basic Format: Log (HNGS Basic RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Sep-2016 22:56:07

TIME_1900 - Time Marked every 60.00 (s)

Log Quality Control Gamma Ray Status (LQC_GR) HNGS-BA

1 - CarthwStatus - Cartridge Hardware Status :	 Cartridge Hardware: Normal	 Cartridge Hardware: Warning
	 Cartridge Hardware: Error	
2 - CartTempStatus - Cartridge Temperature Status :	 Cartridge Temperature < 150 °C	
	 150 °C <= Cartridge Temperature < 175 °C	 Cartridge Temperature >= 175 °C
3 - Det1TempStatus - Detector 1 Temperature Status :	 Detector 1 Temperature < 50 °C	 50 °C <= Detector 1 Temperature < 80 °C
	 Detector 1 Temperature >= 80 °C	
4 - Det2TempStatus - Detector 2 Temperature Status :	 Detector 2 Temperature < 50 °C	 50 °C <= Detector 2 Temperature < 80 °C
	 Detector 2 Temperature >= 80 °C	
5 - Det1CtrlLoopStatus - Detector 1 Control Loop Status :	 Detector 1 Control Loop: Normal	 Detector 1 Control Loop: Warning
	 Detector 1 Control Loop: Error	
6 - Det2CtrlLoopStatus - Detector 2 Control Loop Status :	 Detector 2 Control Loop: Normal	 Detector 2 Control Loop: Warning
	 Detector 2 Control Loop: Error	
7 - Det1ChiSqrdStatus - Detector 1 Chi Squared Status :	 Detector 1 Chi Squared <= 3.0	 Detector 1 Chi Squared > 3.0
8 - Det2ChiSqrdStatus - Detector 2 Chi Squared Status :	 Detector 2 Chi Squared <= 3.0	 Detector 2 Chi Squared > 3.0

Main To Repeat
Repeat To Main
Spectroscopy Gamma Ray (HSGR) HNGS-BA
0 gAPI 150

Main To Repeat
Repeat To Main
Gamma Ray Contribution from Thorium and Potassium (HCGR) HNGS-BA
0 gAPI 150

Main To Repeat
Repeat To Main
Detector 1 Chi-Squared (CHI1) HNGS-BA
10 0

Main To Repeat
Repeat To Main
Detector 2 Chi-Squared (CHI2) HNGS-BA
10 0

Main To Repeat
Repeat To Main
Pit Size (PS) BT

Log Quality
Control
Gamma Ray
Status
(LQC GR)

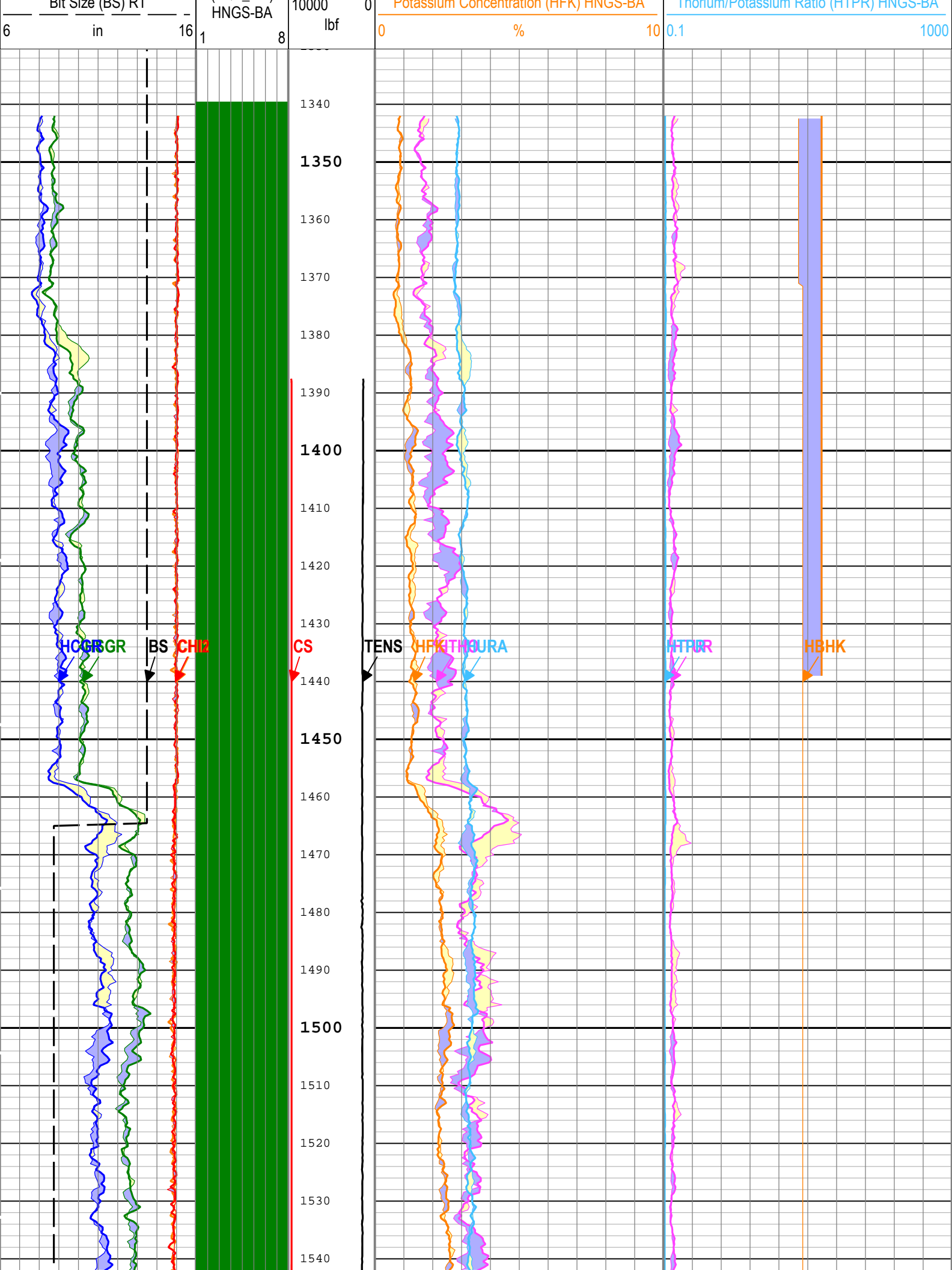
Main To Repeat
Repeat To Main
Cable Speed (CS)
0 50000 ft/h
Main To Repeat
Repeat To Main
Cable Tension (TENS)

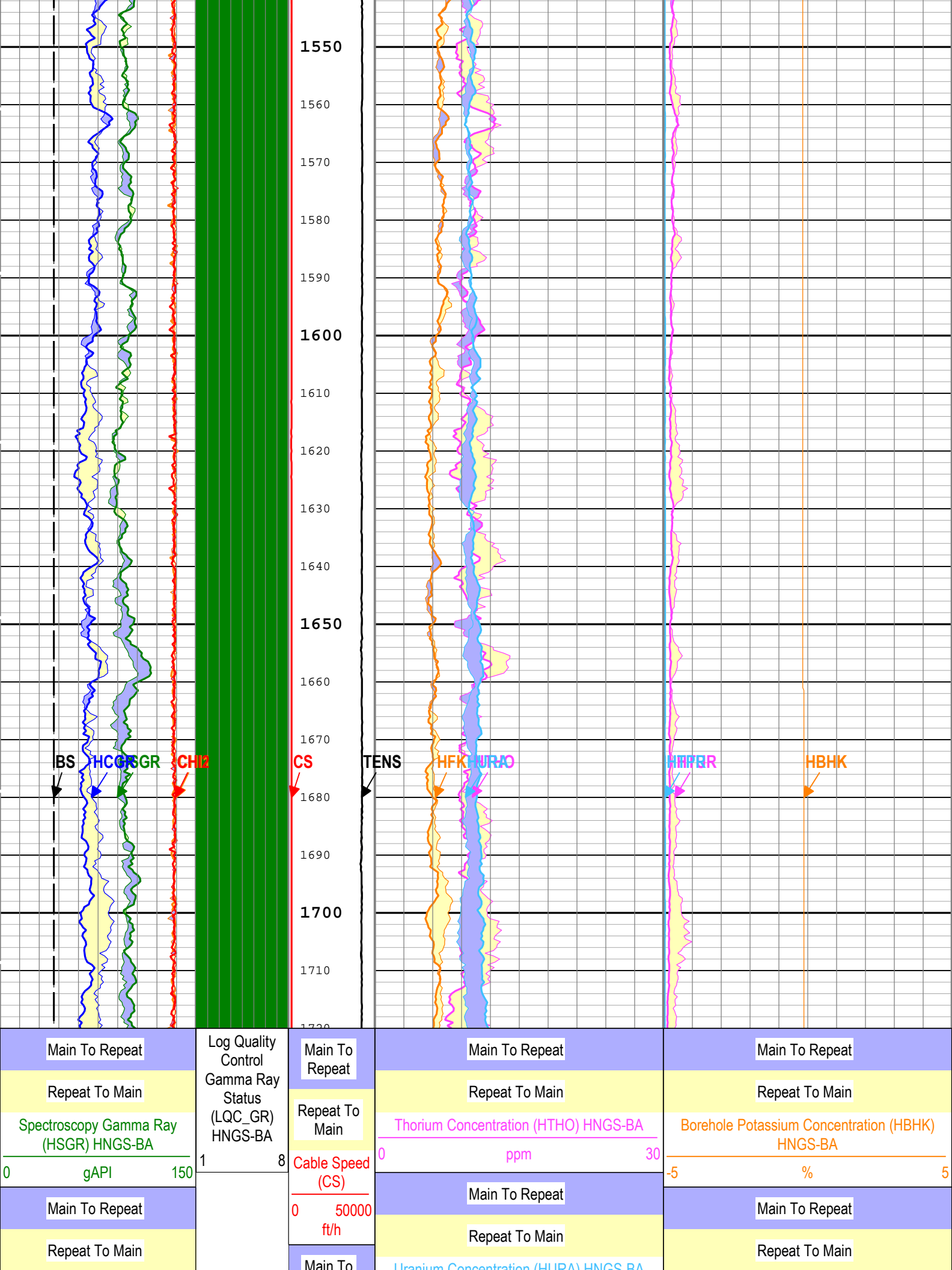
Main To Repeat
Repeat To Main
Thorium Concentration (HTHO) HNGS-BA
0 ppm 30
Main To Repeat
Repeat To Main
Uranium Concentration (HURA) HNGS-BA
-10 ppm 30
Main To Repeat
Repeat To Main

Main To Repeat
Repeat To Main
Borehole Potassium Concentration (HBHK) HNGS-BA
-5 % 5
Main To Repeat
Repeat To Main
Thorium/Uranium Ratio (HTUR) HNGS-BA
0.01 100
Main To Repeat
Repeat To Main

Main To Repeat
Repeat To Main
Potassium Concentration (HLEK) HNGS-BA

Main To Repeat
Repeat To Main
Thorium/Potassium Ratio (HTPR) HNGS-BA





Gamma Ray Contribution from Thorium and Potassium (HNGR) HNGS-BA		
0	gAPI	150
Main To Repeat		
Repeat To Main		
Detector 1 Chi-Squared (CHI1) HNGS-BA		
10		0
Main To Repeat		
Repeat To Main		
Detector 2 Chi-Squared (CHI2) HNGS-BA		
10		0
Main To Repeat		
Repeat To Main		
Bit Size (BS) RT		
6	in	16

Main To Repeat	Uranium Concentration (HNGR) HNGS-BA		
	-10	ppm	30
Repeat To Main	Main To Repeat		
	Repeat To Main		
Cable Tension (TENS)	Potassium Concentration (HFK) HNGS-BA		
	0	%	10
10000	0		
lbf			

Thorium/Uranium Ratio (HTUR) HNGS-BA	
0.01	100
Main To Repeat	
Repeat To Main	
Thorium/Potassium Ratio (HTPR) HNGS-BA	
0.1	1000

Log Quality Control Gamma Ray Status (LQC_GR) HNGS-BA		
1 - CarthwStatus - Cartridge Hardware Status :	<div><div></div> Cartridge Hardware: Normal</div>	<div><div></div> Cartridge Hardware: Warning</div>
	<div><div></div> Cartridge Hardware: Error</div>	
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3 - Det1TempStatus - Detector 1 Temperature Status :	<div><div></div> Detector 1 Temperature < 50 °C</div>	<div><div></div> 50 °C <= Detector 1 Temperature < 80 °C</div>
	<div><div></div> Detector 1 Temperature >= 80 °C</div>	
4 - Det2TempStatus - Detector 2 Temperature Status :	<div><div></div> Detector 2 Temperature < 50 °C</div>	<div><div></div> 50 °C <= Detector 2 Temperature < 80 °C</div>
	<div><div></div> Detector 2 Temperature >= 80 °C</div>	
5 - Det1CtrlLoopStatus - Detector 1 Control Loop Status :	<div><div></div> Detector 1 Control Loop: Normal</div>	<div><div></div> Detector 1 Control Loop: Warning</div>
	<div><div></div> Detector 1 Control Loop: Error</div>	
6 - Det2CtrlLoopStatus - Detector 2 Control Loop Status :	<div><div></div> Detector 2 Control Loop: Normal</div>	<div><div></div> Detector 2 Control Loop: Warning</div>
	<div><div></div> Detector 2 Control Loop: Error</div>	
7 - Det1ChiSqrdStatus - Detector 1 Chi Squared Status :	<div><div></div> Detector 1 Chi Squared <= 3.0</div>	<div><div></div> Detector 1 Chi Squared > 3.0</div>
8 - Det2ChiSqrdStatus - Detector 2 Chi Squared Status :	<div><div></div> Detector 2 Chi Squared <= 3.0</div>	<div><div></div> Detector 2 Chi Squared > 3.0</div>
TIME_1900 - Time Marked every 60.00 (s)		

Description: HNGS Basic Format: Log (HNGS Basic RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Sep-2016 22:56:07

Calibration Report		
HNGS-BA (Hostile-environment Natural Gamma-ray Sonde) Calibration - Run One		
Primary Equipment :		
HNGS Sonde Element	HNGS-BA	166
Auxiliary Equipment :		
Hostile Natural Gamma Ray Cartridge	HNGC-B	108
HNGS Housing Element	HEH-K	177
		0
Housing for the HNGC	HNGH-A	46
Calibration Date Calibration Date		

Calibration History - Calibration History

Master:							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
- 0		Master	----	----	----	----	

HNGS Background and Na22 Set Point Determination - Detector 1 Check

Master (EEPROM):		19:24:28 18-Aug-2016		Before (Measured):		06:29:33 28-Sep-2016	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Location		Master	40.000	37.500	40.542	42.500	
		Before	40.000	37.500	40.749	42.500	
		Before-Master	----	----	0.207	----	
Na 511 Peak Resolution	%	Master	15.500	12.000	16.793	19.000	
		Before	15.500	12.000	15.661	19.000	
		Before-Master	----	----	-1.132	----	
High Voltage DAC Value	V	Master			1117.540		
		Before	1150.000	850.000	1109.031	1600.000	
		Before-Master	----	----	-8.509	----	
Na 1785 Peak Location		Master	142.650	135.000	147.613	150.300	
		Before	142.650	135.000	146.536	150.300	
		Before-Master	----	----	-1.077	----	
Na 1785 Peak Resolution	%	Master	8.500	6.500	9.246	11.000	
		Before	8.500	6.500	8.085	11.000	
		Before-Master	----	----	-1.161	----	
Temperature - 0	degF	Master	----	----	----	----	
		Before	59.900	-20.002	79.623	140.000	
		Before-Master	----	----	----	----	
Na Count Rate	CPS	Master	45.000	10.000	18.751	100.000	
		Before	45.000	10.000	20.418	100.000	
		Before-Master	----	----	1.667	----	

HNGS Background and Na22 Set Point Determination - Detector 2 Check

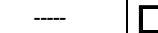
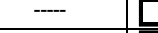
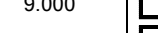

Master (EEPROM):		19:24:28 18-Aug-2016		Before (Measured):		06:29:33 28-Sep-2016	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Location		Master	40.000	37.500	39.505	42.500	
		Before	40.000	37.500	39.781	42.500	
		Before-Master	----	----	0.276	----	
Na 511 Peak Resolution	%	Master	15.500	12.000	16.132	19.000	
		Before	15.500	12.000	15.447	19.000	
		Before-Master	----	----	-0.685	----	
High Voltage DAC Value	V	Master			1012.574		
		Before	1150.000	850.000	1005.747	1600.000	
		Before-Master	----	----	-6.827	----	
Na 1785 Peak Location		Master	142.650	135.000	141.291	150.300	
		Before	142.650	135.000	142.527	150.300	
		Before-Master	----	----	1.236	----	
Na 1785 Peak Resolution	%	Master	8.500	6.500	8.719	11.000	
		Before	8.500	6.500	9.650	11.000	
		Before-Master	----	----	0.931	----	
Temperature - 0	degF	Master	----	----	----	----	
		Before	59.900	-20.002	78.114	140.000	
		Before-Master	----	----	----	----	
Na Count Rate	CPS	Master	45.000	10.000	18.590	100.000	
		Before	45.000	10.000	20.198	100.000	
		Before-Master	----	----	1.608	----	

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

Master (EEPROM):		19:24:28 18-Aug-2016		Before (Measured):		06:29:33 28-Sep-2016	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Coincidence Count Rate Ratio		Master			1.013		
		Before	1.000	0.950	1.013	1.050	
		Before-Master	----	----	0.000	----	

HNGS Background and Na22 Set Point Determination - Detector 1 Calibration

Master (EEPROM):		19:24:28 18-Aug-2016		Before (Measured):		06:29:33 28-Sep-2016	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	

Th Peak Location		Master Before Before-Master	209.630 ----- -----	201.000 ----- -----	209.241 ----- -----	218.250 ----- -----	
Th Peak Resolution	%	Master Before Before-Master	7.000 ----- -----	5.000 ----- -----	8.423 ----- -----	9.000 ----- -----	
Background Count Rate	CPS	Master Before Before-Master	142.500 ----- -----	10.000 ----- -----	88.555 195.663 107.108	265.000 ----- -----	
Gain Ratio		Master Before Before-Master	1.000 ----- -----	0.940 ----- -----	0.981 ----- -----	1.060 ----- -----	

HNGS Background and Na22 Set Point Determination - Detector 2 Calibration

Master (EEPROM):		19:24:28 18-Aug-2016		Before (Measured):		06:29:33 28-Sep-2016			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit			
Th Peak Location		Master	209.630	201.000	209.746	218.250			
		Before	----	----	----	----			
		Before-Master	----	----	----	----			
Th Peak Resolution	%	Master	7.000	5.000	7.282	9.000			
		Before	----	----	----	----			
		Before-Master	----	----	----	----			
Background Count Rate	CPS	Master			85.614				
		Before	142.500	10.000	235.001	265.000			
		Before-Master	----	----	149.387	----			
Gain Ratio		Master	1.000	0.940	1.010	1.060			
		Before	----	----	----	----			
		Before-Master	----	----	----	----			

HNGS Background and Na22 Set Point Determination - Detector 1 Calibration

Master (EEPROM):		19:24:28 18-Aug-2016		Before (Measured):		06:29:33 28-Sep-2016	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Set Point		Master	40.000	38.000	42.000	43.500	
		Before	----	----	----	----	
		Before-Master	----	----	----	----	

HNGS Background and Na22 Set Point Determination - Detector 2 Calibration

Master (EEPROM):		19:24:28 18-Aug-2016		Before (Measured):		06:29:33 28-Sep-2016	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Set Point		Master	40.000	38.000	41.000	43.500	
		Before	----	----	----	----	
		Before-Master	----	----	----	----	

Company:	Bonanza Creek	Schlumberger
Well:	State Seventy Holes J-18	
Field:	Wattenberg	
County:	Weld	
State:	Colorado	
Spectral Gamma Ray		