

Company: EnCana Oil & Gas (USA)

Well: DV08B-23 (H23 4101)

Field: East Douglas Creek

County: Rio Blanco State: Colorado

ECS SPECTROLITH

County: Rio Blanco
Field: East Douglas Creek
Location: SHL: 1850 FNL 1235 FEL
Well: DV08B-23 (H23 4101)
Company: EnCana Oil & Gas (USA)

Location:		SHL: 1850 FNL 1235 FEL BHL: 1850 FNL 1235 FEL		Elev. K.B. 6783.00 ft G.L. 6753.00 ft D.F. 6783.00 ft	
Permanent Datum:		Ground Level		Elev.: 6753.00 f	
Log Measured From:		Kelly Bushing		30.00 ft above Perm. Datum	
Drilling Measured From:		Kelly Bushing			
API Serial No.		Section: 23		Township: 4S	
05-103-11919-00				Range: 101	

Logging Date 04-Jun-2012

Run Number 1

Depth Driller 6090.00 ft

Schlumberger Depth 6090.00 ft

Bottom Log Interval 6098.00 ft

Top Log Interval 200.00 ft

Casing Driller Size @ Depth 9.625 in @ 882.00 ft

Casing Schlumberger 882 ft

Bit Size 8.75 in

Type Fluid In Hole Water

Density 10.2 lbm/gal

Viscosity 53 s

Fluid Loss 4.8 cm3

PH 9.2

Source of Sample Active Tank

RM @ Meas Temp 1.64 ohm.m @ 75 degF

RMF @ Meas Temp 1.44 ohm.m @ 75 degF

RMC @ Meas Temp 1.4 ohm.m @ 68 degF

Source RMF RMC

RM @ BHT 0.47 @ 165

RMF @ BHT 0.37 @ 165

Max Recorded Temperatures 165 degF

Circulation Stopped 04-Jun-2012

Time 09:00:00

Logger on Bottom 04-Jun-2012

Time 11:31:05

Unit Number 9102

Location: Vernal

Recorded By Curtis Schaaf

Witnessed By Joe Beer

Disclaimer

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

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Operational Run Summary

Parameter (unit)	1					
Date Log Started	04-Jun-2012					
Time Log Started	11:32:45					
Date Log Finished	04-Jun-2012					
Time Log Finished	16:08:31					
Top Log Interval (ft)	200.00					
Bottom Log Interval (ft)	6098.00					
Total Depth (ft)	6098.00					
Max Hole Deviation (deg)	9.50					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	8.750					
Logging Unit Number	9102					
Logging Unit Location	Vernal					
Recorded By	Curtis Schaaf					
Witnessed By	Joe Beer					
Service Order Number	BY8P-00035					

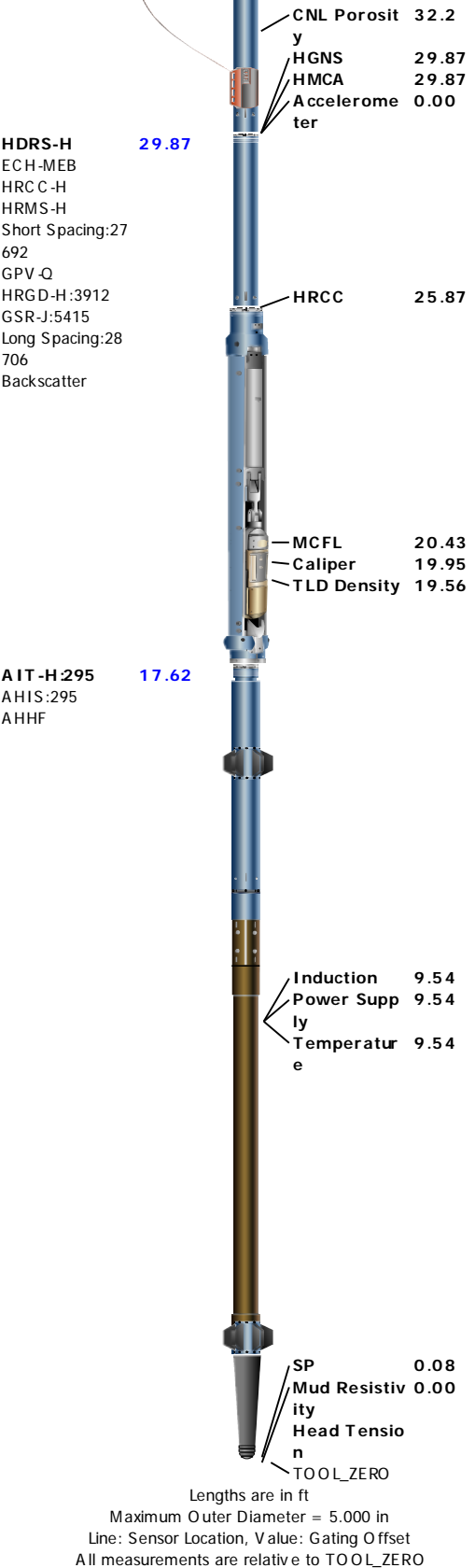
Borehole Fluids

Parameter(unit)	1					
Fluid Type	Water					
Max Recorded Temperatures (degF)	165					
Source of Sample	Active Tank					
Salinity (ppm)	1100					
Density (lbm/gal)	10.2					
Funnel Viscosity (s)	53					
Fluid Loss (cm3)	4.8					
PH	9.2					
Date/Time Circulation Stopped	04-Jun-2012 09:00:00					
Date Logger on Bottom	04-Jun-2012					
Time Logger on Bottom	11:31:05					
Source RMF	Calculated					
RMC	Calculated					
RM @ Meas Temp (ohm.m@degF)	1.64 @ 75					
RMF @ Meas Temp (ohm.m@degF)	1.44 @ 75					
RMC @ Meas Temp (ohm.m@degF)	1.4 @ 68					

ohm.m@degF)						
RM @ BHT (ohm.m@degF)	0.47 @ 165					
RMF @ BHT (ohm.m@degF)	0.37 @ 165					
RMC @ BHT (ohm.m@degF)	0.46 @ 165					
Total Solid (%)	6					
High Gravity Solids (%)						

Remarks and Equipment Summary

1: Toolstring				1: Remarks
Equip name LEH-QT LEH-QT	Length 70.53	MP name	Offset	Tool string run as per Tool Sketch
				Tool run eccentralized using 2 x 1" standoffs and bowspring
				First run in hole, full depth procedures followed (see Depth Summary)
EDTC-B:8054 EDTH-B:8054 EDTG-A EDTC-B:8054	67.62			Maximum temperature of 165F recorded by HGNS cartridge
				Maximum hole deviation 9.5deg
CTEM 64.12 ACCZ 0.00 HV 0.00				MATRIX: Sandstone, DENSITY: 2.68 g/cc
Gamma Ray 62.25				Hole size correction applied to neutron tool
TelStatus 61.12				Cement hole volume calculated using future casing diameter of 4.5"
HNGS-BA HEH-K:186 HNGS-BA	61.12			Tool string required maximum logging speed of 1800 ft/hr
GR 58.13				
HNGC-A HNGH-A:313 HNGC-A	52.93			
Tel Status 51.17				
LDSC-B LDSC-A:18 LDSC-B	49.43			
Tel Status 47.67				
ECS-A:130 ECSH-A ECS-A:130 ECSD-A NSR-F	45.93			
Detector 44.64				
HGNS-H:4748 HGNH NPV-N NSR-F:1260 HMCA-H HGNS-H:4748 HACCZ-H:2594	39.28			
Temperature 39.25				
GR 38.53				



Depth Summary			
Depth Control Parameters	1		
Conveyance Type	Wireline		
Log Sequence	First Run in Hole		
Stretch Correction (ft)	4.88		
Rig Type	Land		
Depth Remark Parameters	1		
Depth Remark 1	All Schlumberger Depth procedures followed		
Depth Remark 2	IDW used as primary depth measurement device		

Depth Remark 3	Z-chart used as secondary depth reference		
Depth Remark 4	Depth correction applied to main pass via WFDD		
Depth Measuring Device	1		
Type	IDW-B		
Serial Number	6122		
Calibration Date	11-Oct-2011		
Calibrator Serial Number	33		
Calibration Cable Type	7-46 AXS		
Wheel Correction 1	-6		
Wheel Correction 2	-5		
Tension Device	1		
Type	CMTD-B/A		
Serial Number	119		
Calibration Date	26-May-2012		
Calibrator Serial Number	1002518		
Calibration Points	10		
Calibration RMS	14		
Calibration Peak Error	20		
Logging Cable	1		
Type	7-46A-XS		
Serial Number	71425		
Logging Cable Length (ft)	24000.00		

1
MAIN PASS, 5 INCH

Integration Summary				
Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
Software Version				
Acquisition System		Version		
MaxWell		3.0.9609.0		
Application Patch		SP-20120409-3.0.9609.1919		
		EXP_APL-ADT-3.0.9609.1558		
		EXP_APL-OPElevation-3.0.9609.1966		
Tool Elements	Description	Software Version		Firmware Version
ECS-A	The ECS sonde is used to measure elemental concentrations.	3.0.9609.1919		

Pass Summary								
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
1	Log[4]:Up	Up	234.78 ft	6113.73 ft	04-Jun-2012 1:10:46 PM	04-Jun-2012 3:37:35 PM	0.00 ft	
All depths are referenced to toolstring zero								

Log	1: Log[4]:Up 0E1519BF-BEC1-43BD-A001-C00B950669B8
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Description: ECS SpectroLith Format: Log (ECS SpectroLith) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Jun-2012 18:35:34

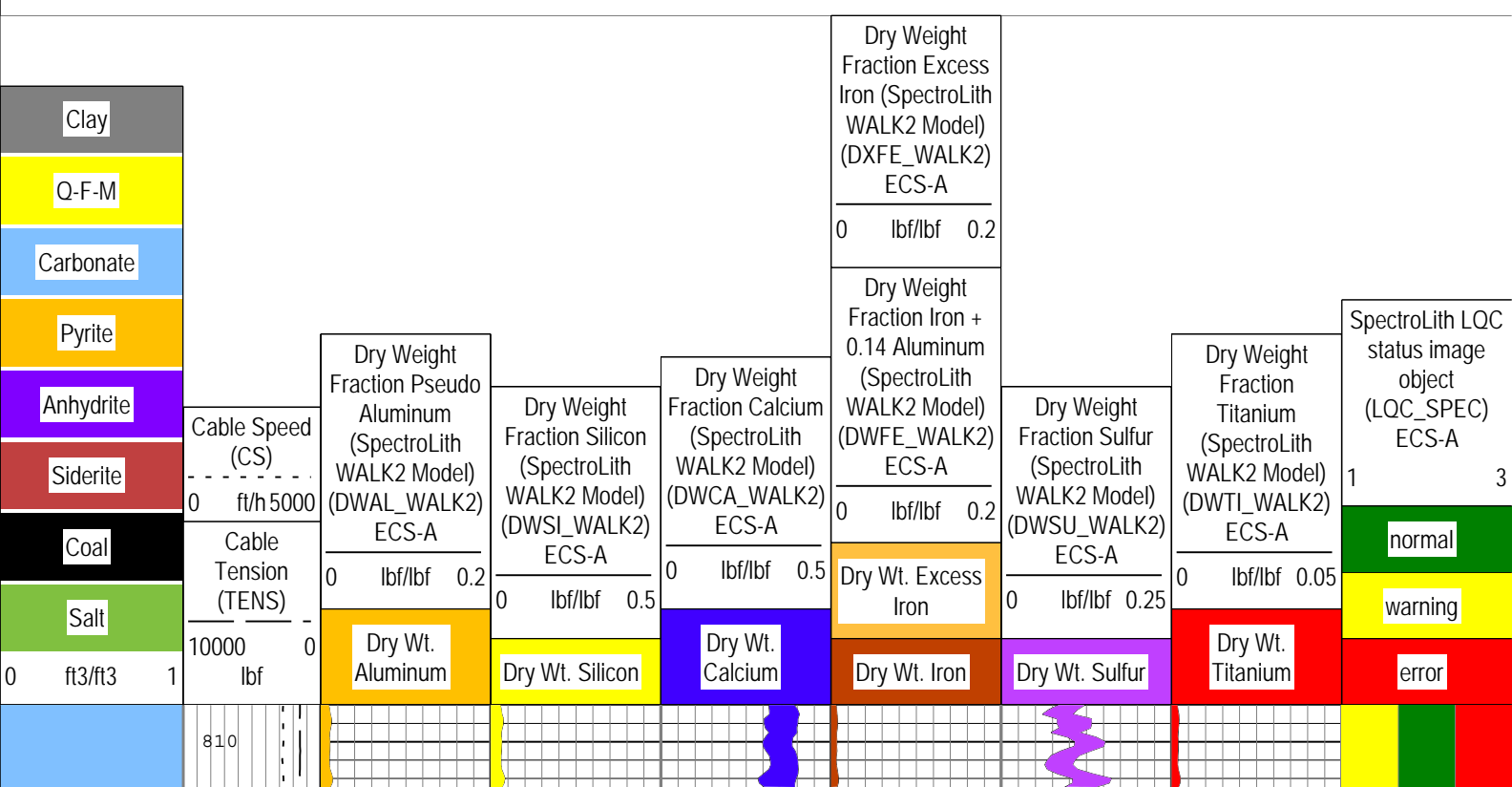
Channel	Source	Sampling
CS	WLWorkflow	6in
DWAL_WALK2	ECS-A:ECS-A:ECS-A	6in

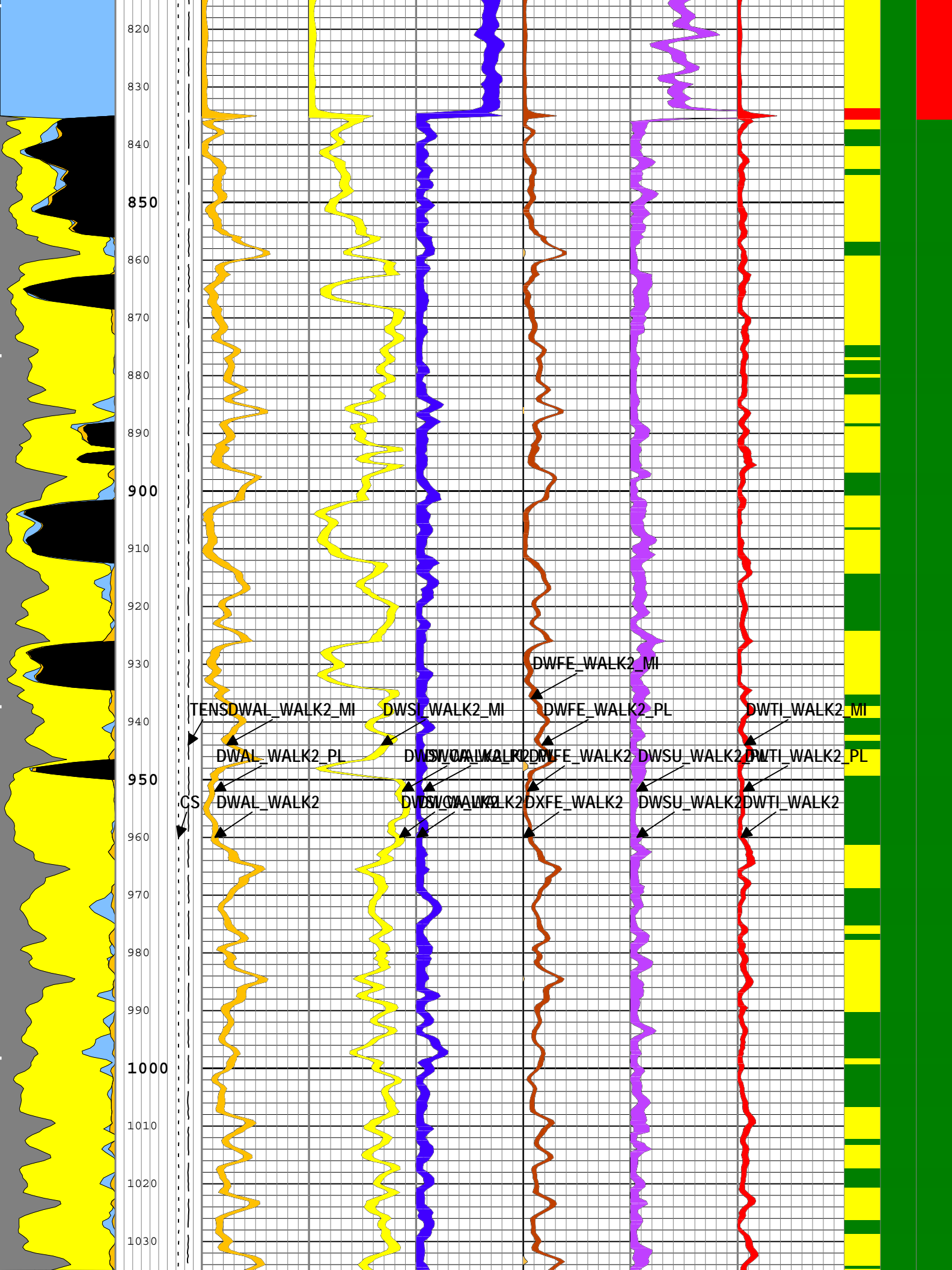
DWAL_WALK2_MI	ECS-A:ECS-A:ECS-A	6in
DWAL_WALK2_PL	ECS-A:ECS-A:ECS-A	6in
DWCA_WALK2	ECS-A:ECS-A:ECS-A	6in
DWCA_WALK2_MI	ECS-A:ECS-A:ECS-A	6in
DWCA_WALK2_PL	ECS-A:ECS-A:ECS-A	6in
DWFE_WALK2	ECS-A:ECS-A:ECS-A	6in
DWFE_WALK2_MI	ECS-A:ECS-A:ECS-A	6in
DWFE_WALK2_PL	ECS-A:ECS-A:ECS-A	6in
DWSI_WALK2	ECS-A:ECS-A:ECS-A	6in
DWSI_WALK2_MI	ECS-A:ECS-A:ECS-A	6in
DWSI_WALK2_PL	ECS-A:ECS-A:ECS-A	6in
DWSU_WALK2	ECS-A:ECS-A:ECS-A	6in
DWSU_WALK2_MI	ECS-A:ECS-A:ECS-A	6in
DWSU_WALK2_PL	ECS-A:ECS-A:ECS-A	6in
DWTI_WALK2	ECS-A:ECS-A:ECS-A	6in
DWTI_WALK2_MI	ECS-A:ECS-A:ECS-A	6in
DWTI_WALK2_PL	ECS-A:ECS-A:ECS-A	6in
DXFE_WALK2	ECS-A:ECS-A:ECS-A	6in
LQC_SPEC	ECS-A:ECS-A:ECS-A	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

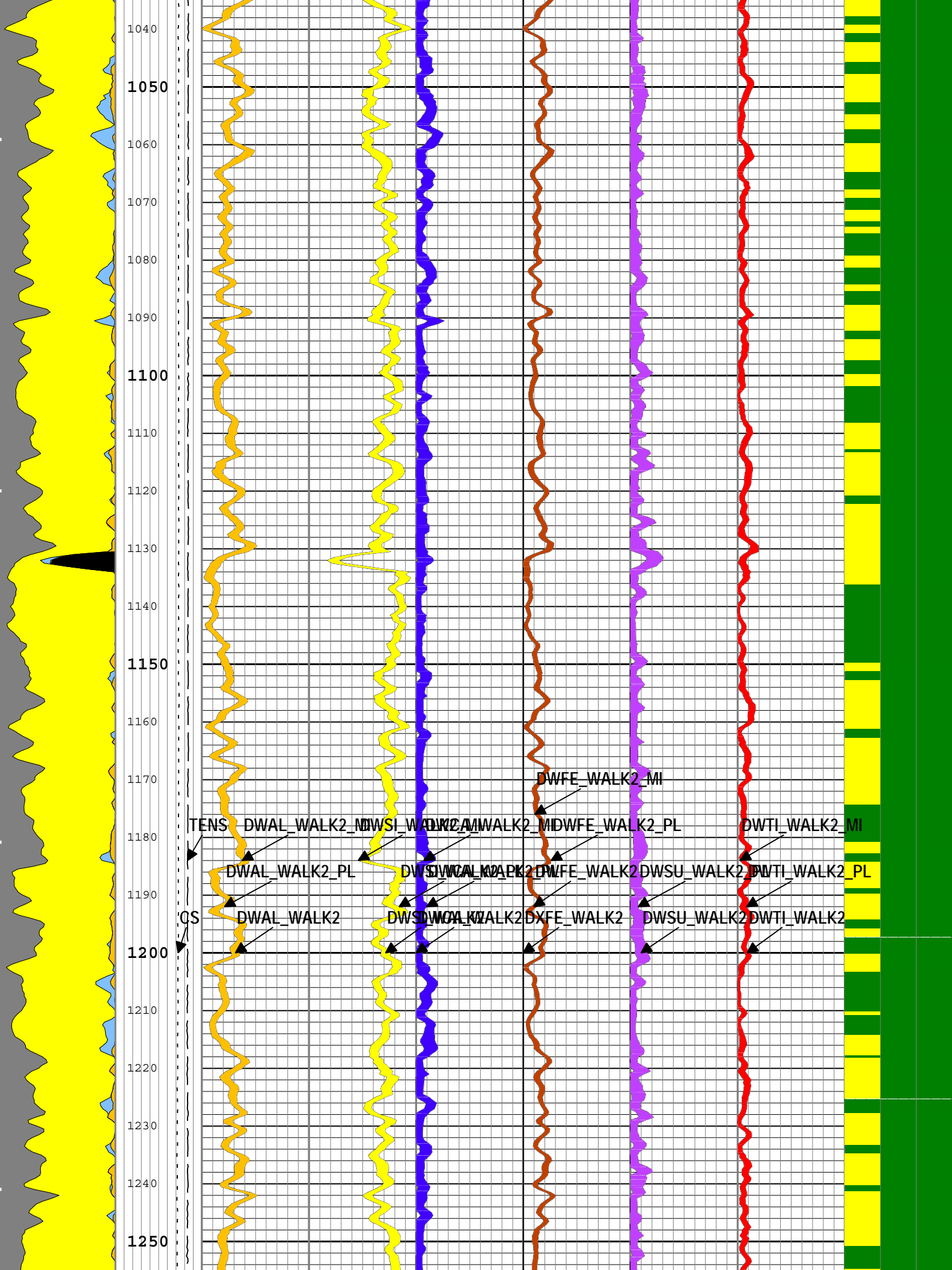
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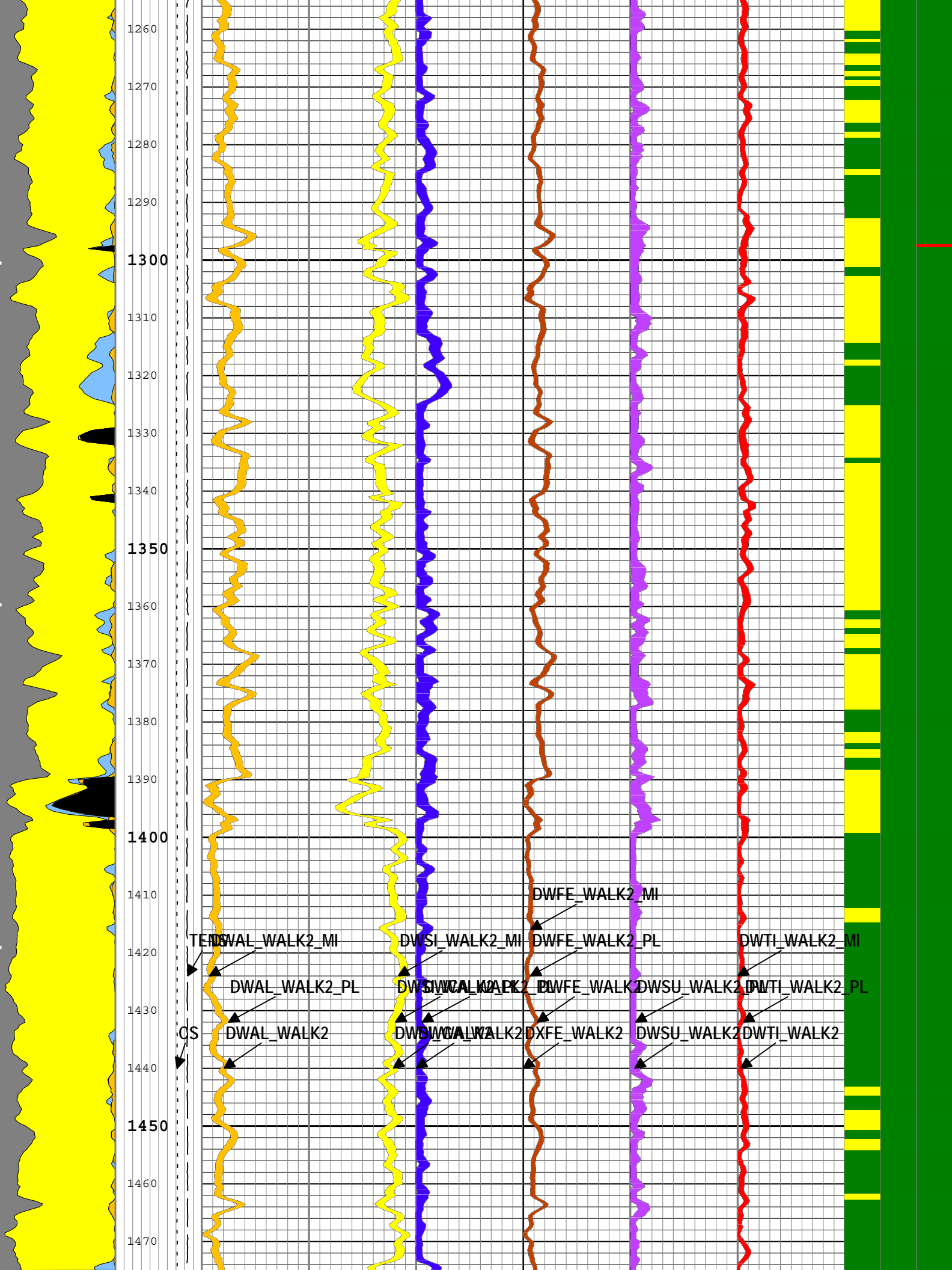
SpectroLith LQC status image object (LQC_SPEC) ECS-A

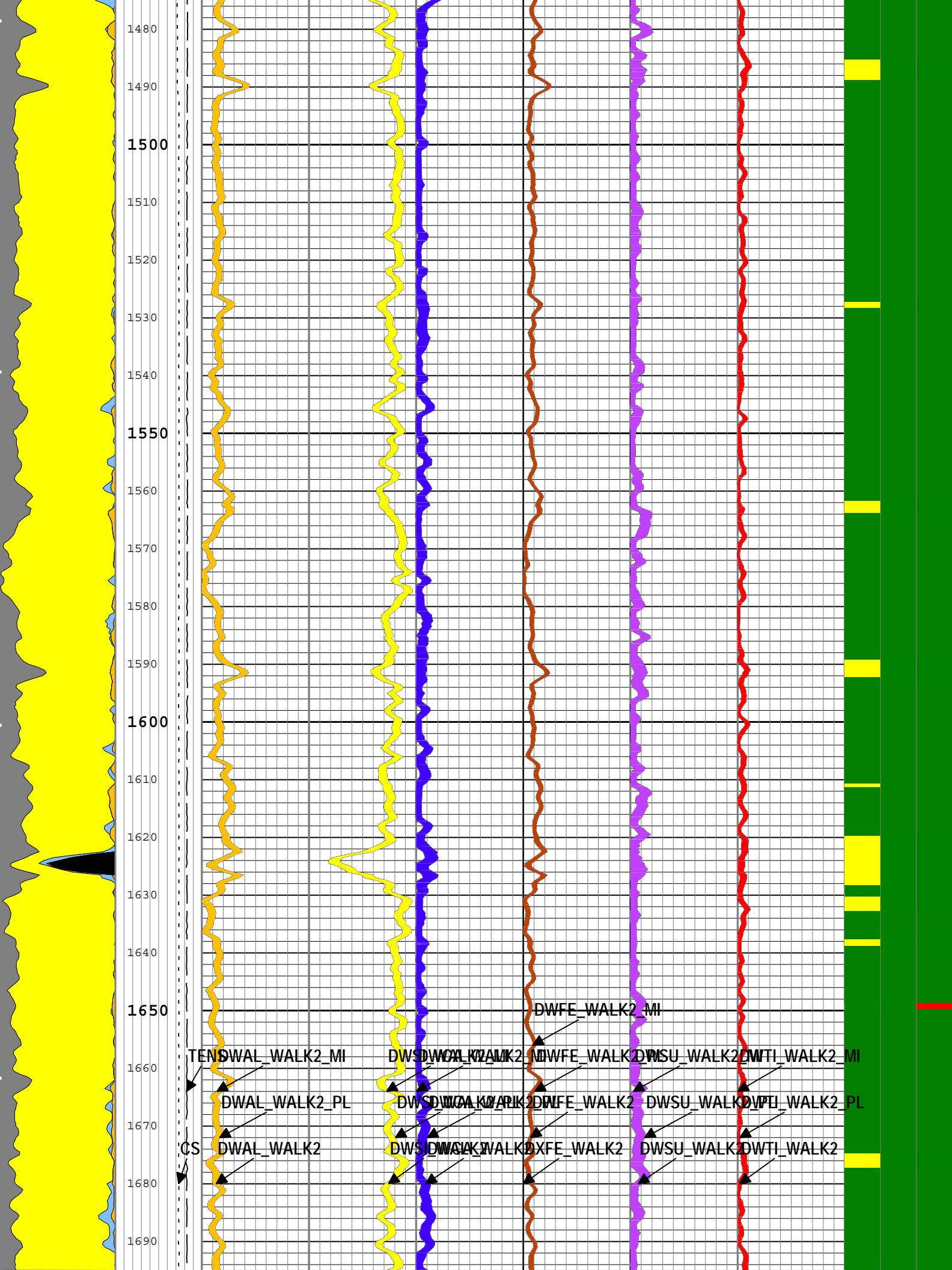
- 1 - Elemental Statistical Uncertainty Quality Check (ESUF_WALK2) - :
- Elemental Statistical Uncertainty Quality Check: Normal
- Elemental Statistical Uncertainty Quality Check: Warning
- Elemental Statistical Uncertainty Quality Check: Error
- 2 - BGO Crystal Temperature Quality Check (ECST) - :
- Temperature Quality Check < 40 °C
- 40 °C <= Temperature Quality Check < 70 °C
- Temperature Quality Check >= 70 °C
- 3 - Photomultiplier Status (QCPMT) - :
- Photomultiplier Status: Normal
- Photomultiplier Status: Error (> 2.75)

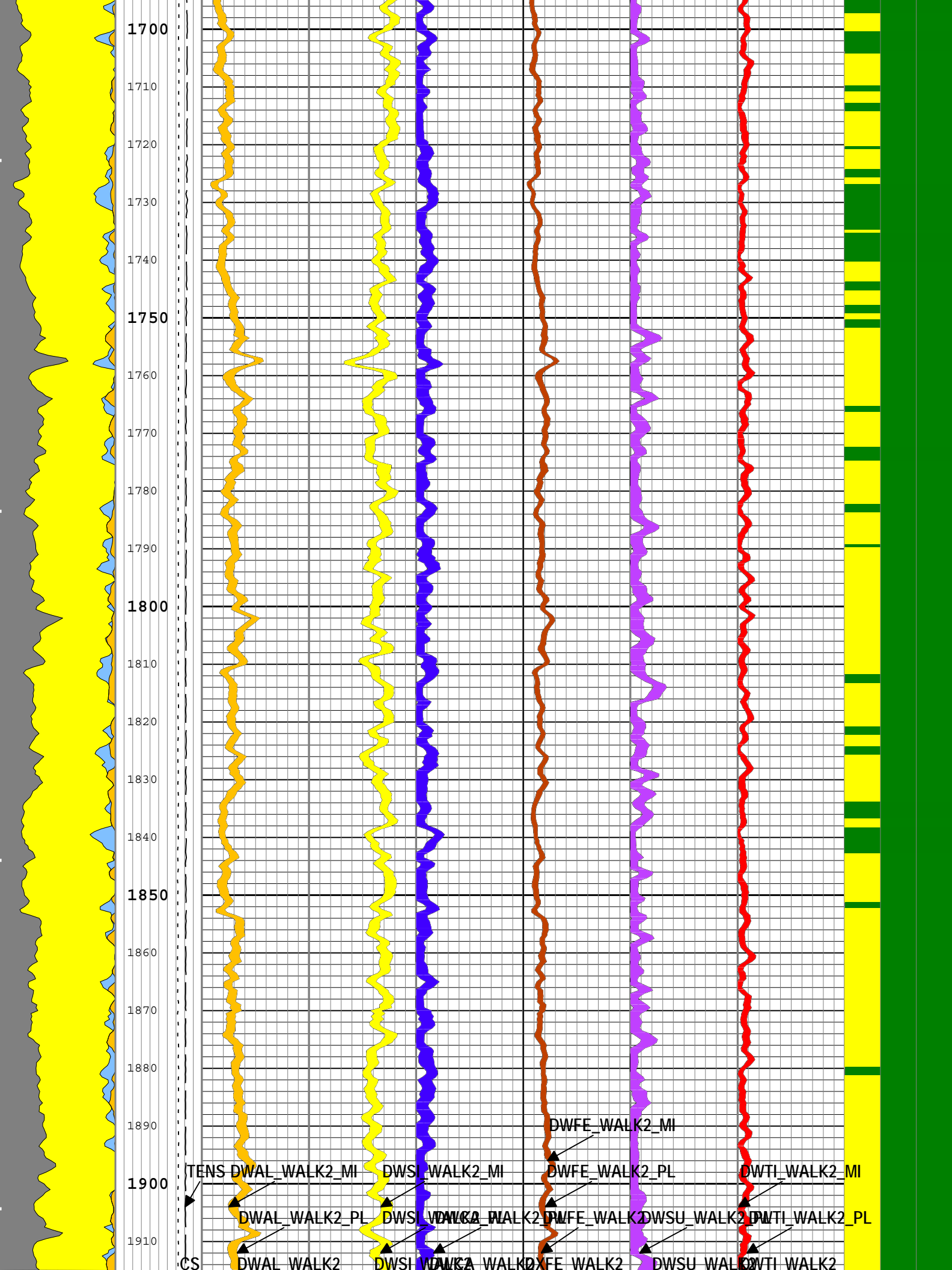


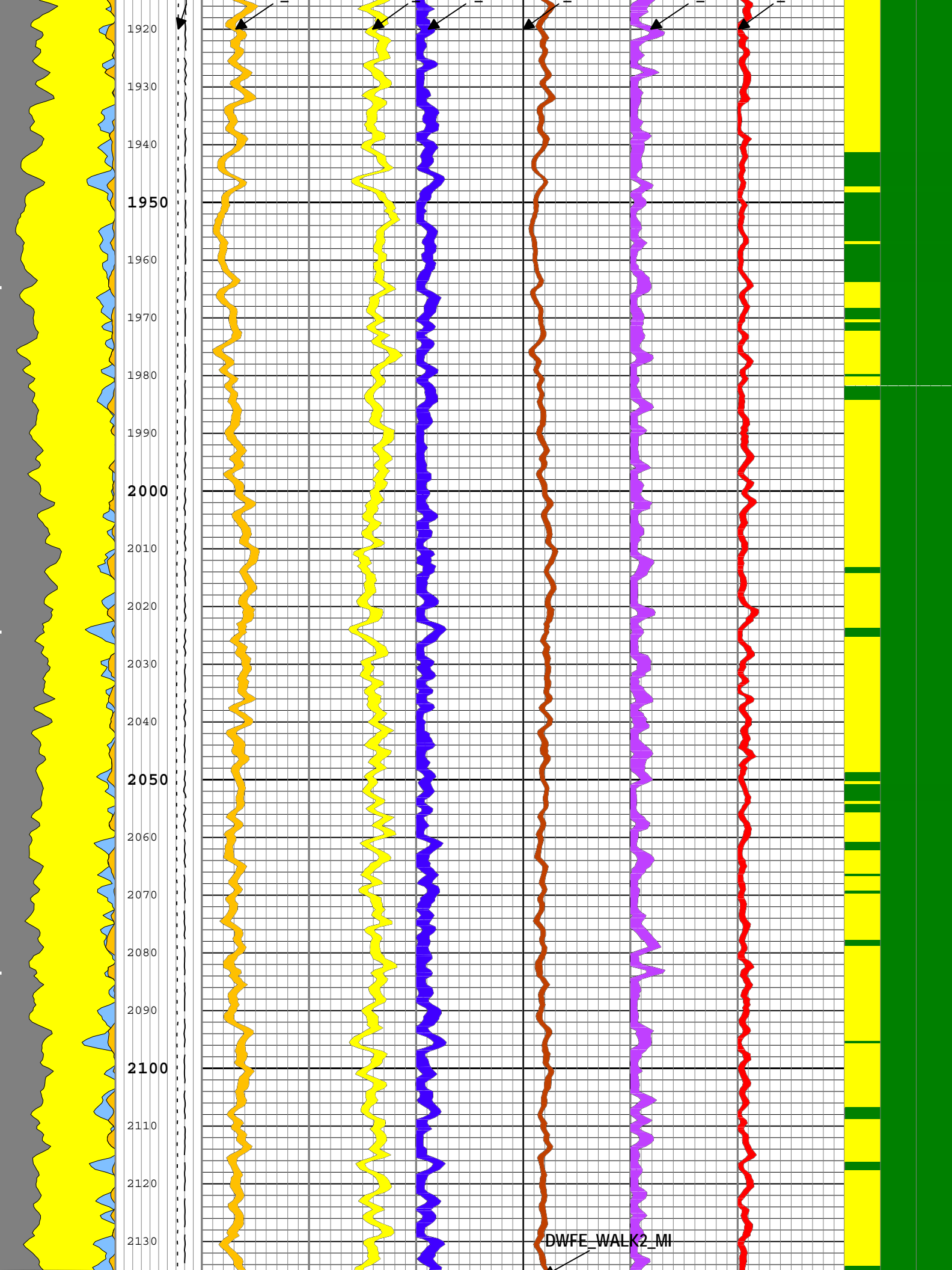


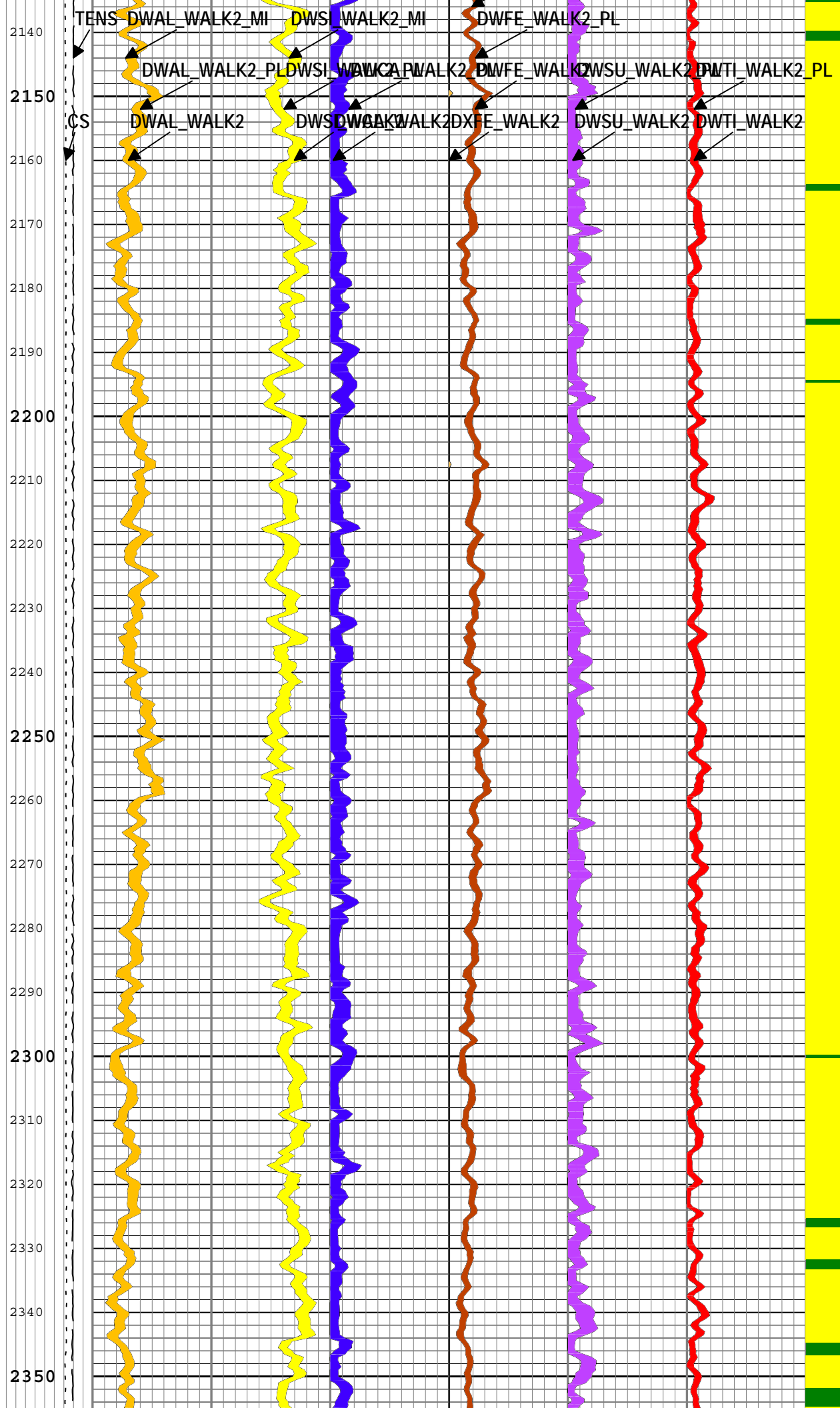


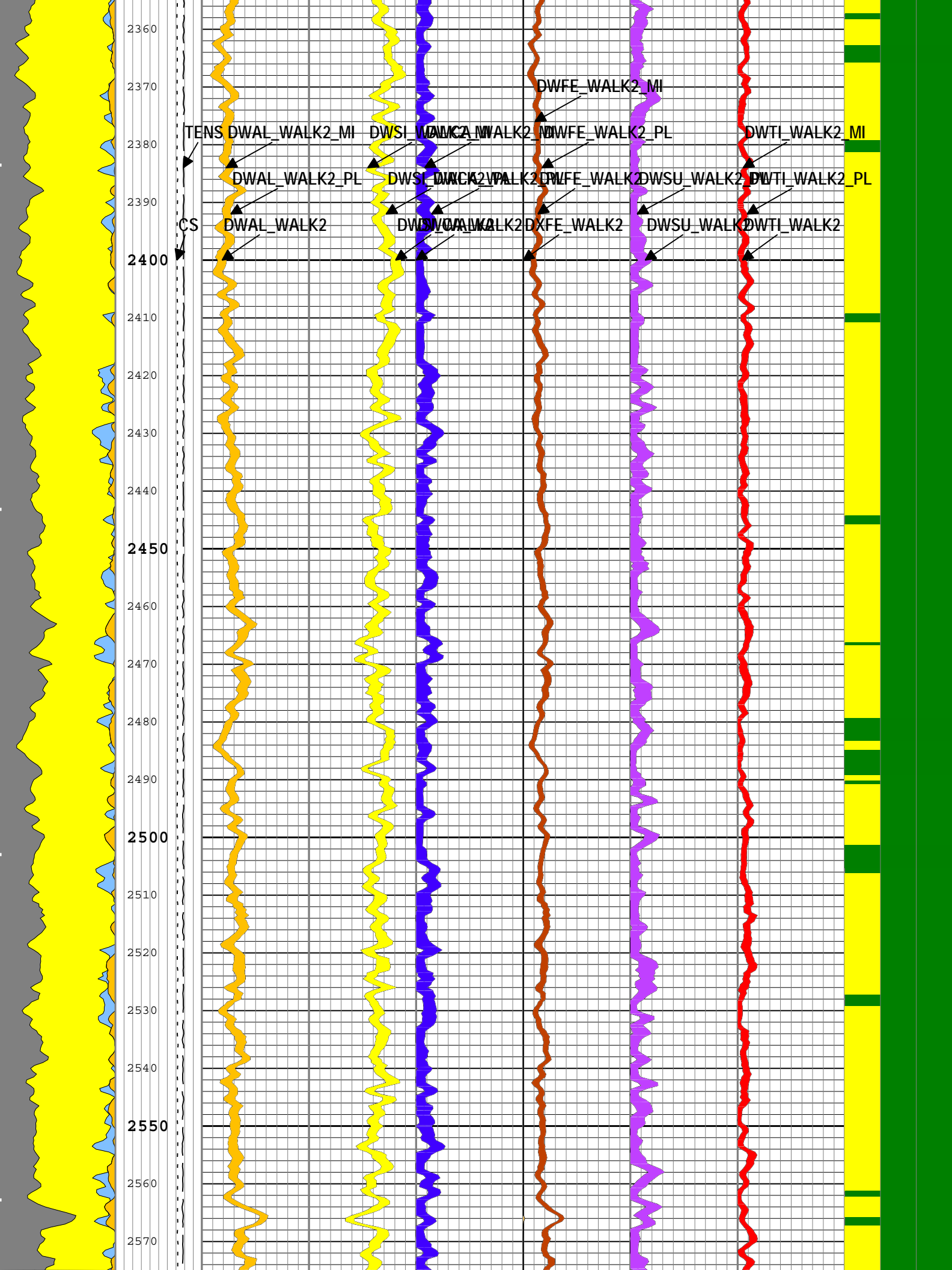












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TENS
CS

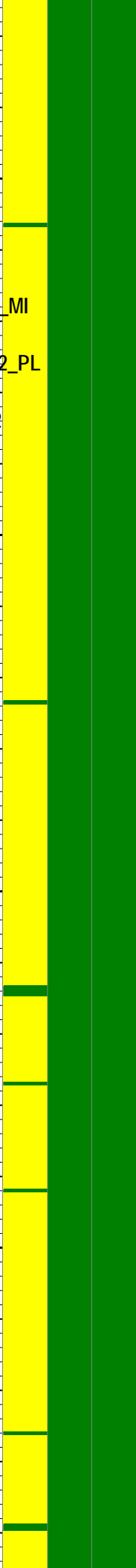
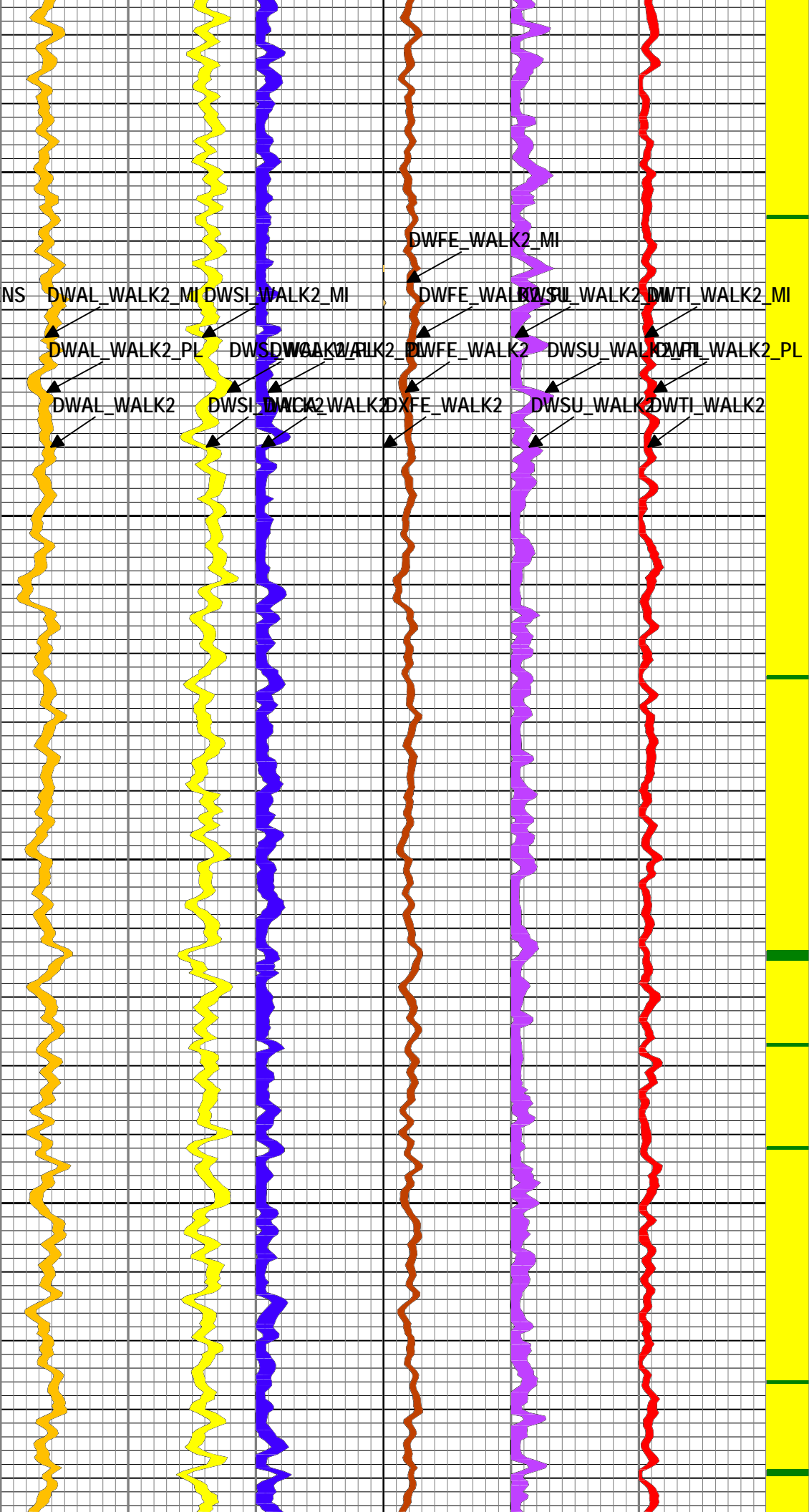
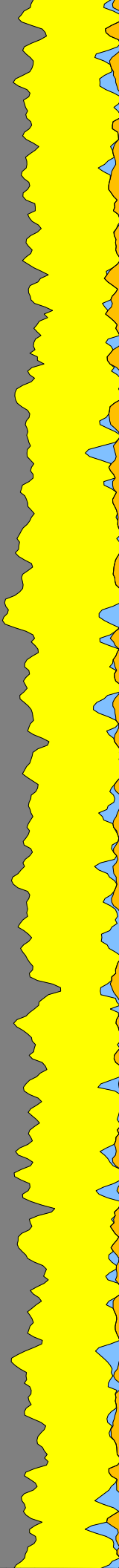
DWAL_WALK2_MI
DWAL_WALK2_PL
DWAL_WALK2

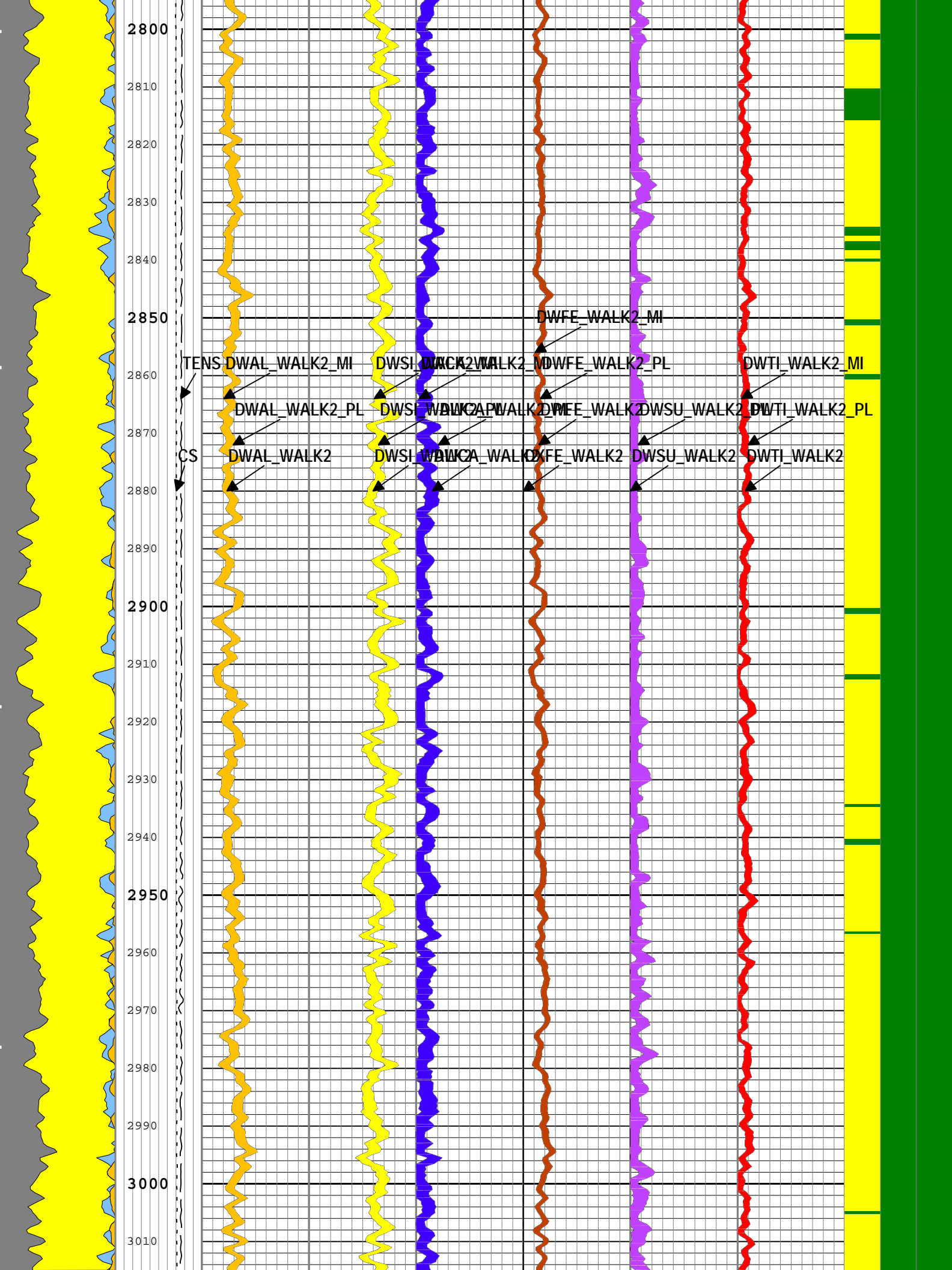
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DWSI_WALK2_PL
DWSI_WALK2

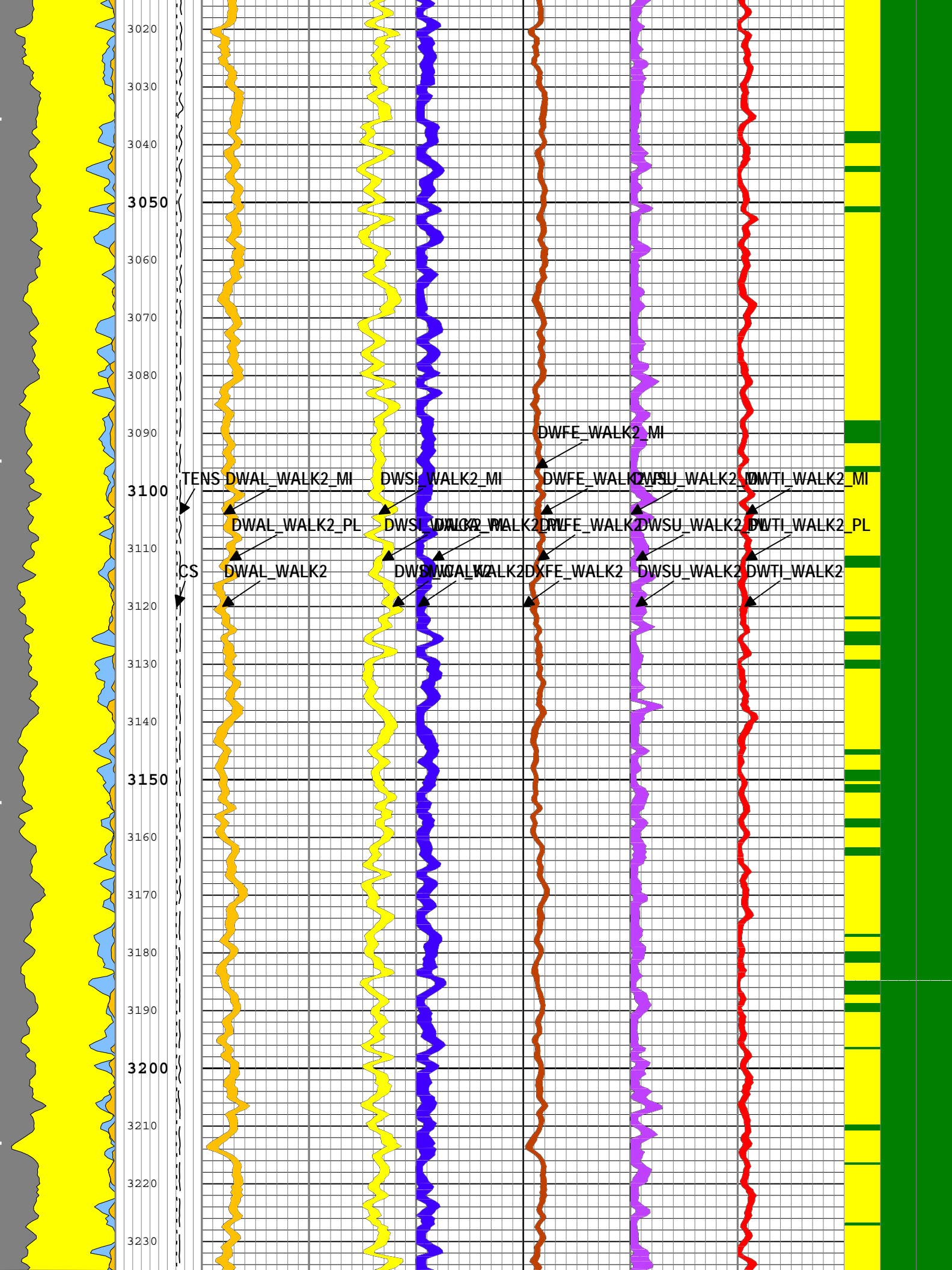
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DWFE_WALK2_PL
DWFE_WALK2

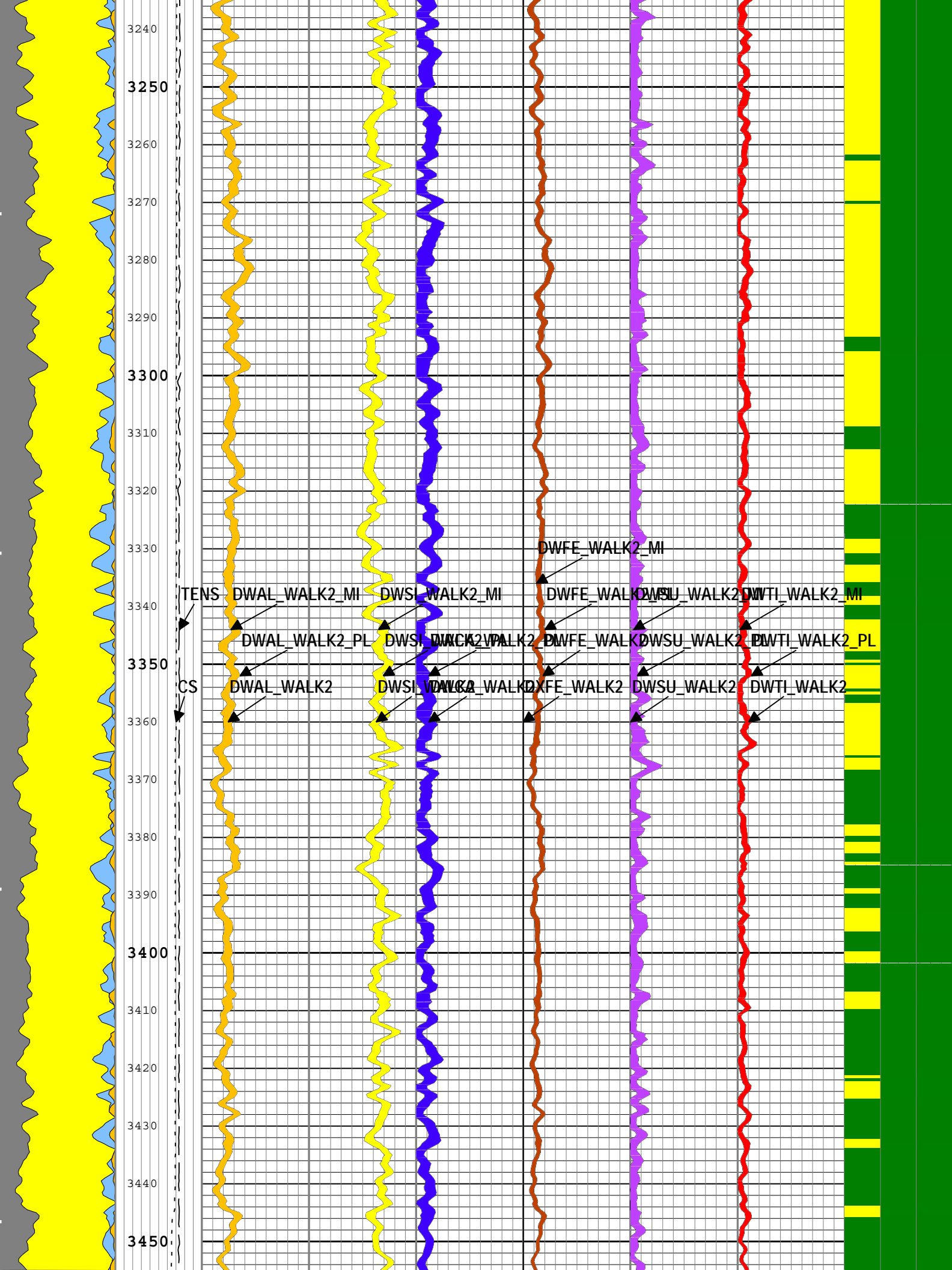
DWSU_WALK2_MI
DWSU_WALK2_PL
DWSU_WALK2

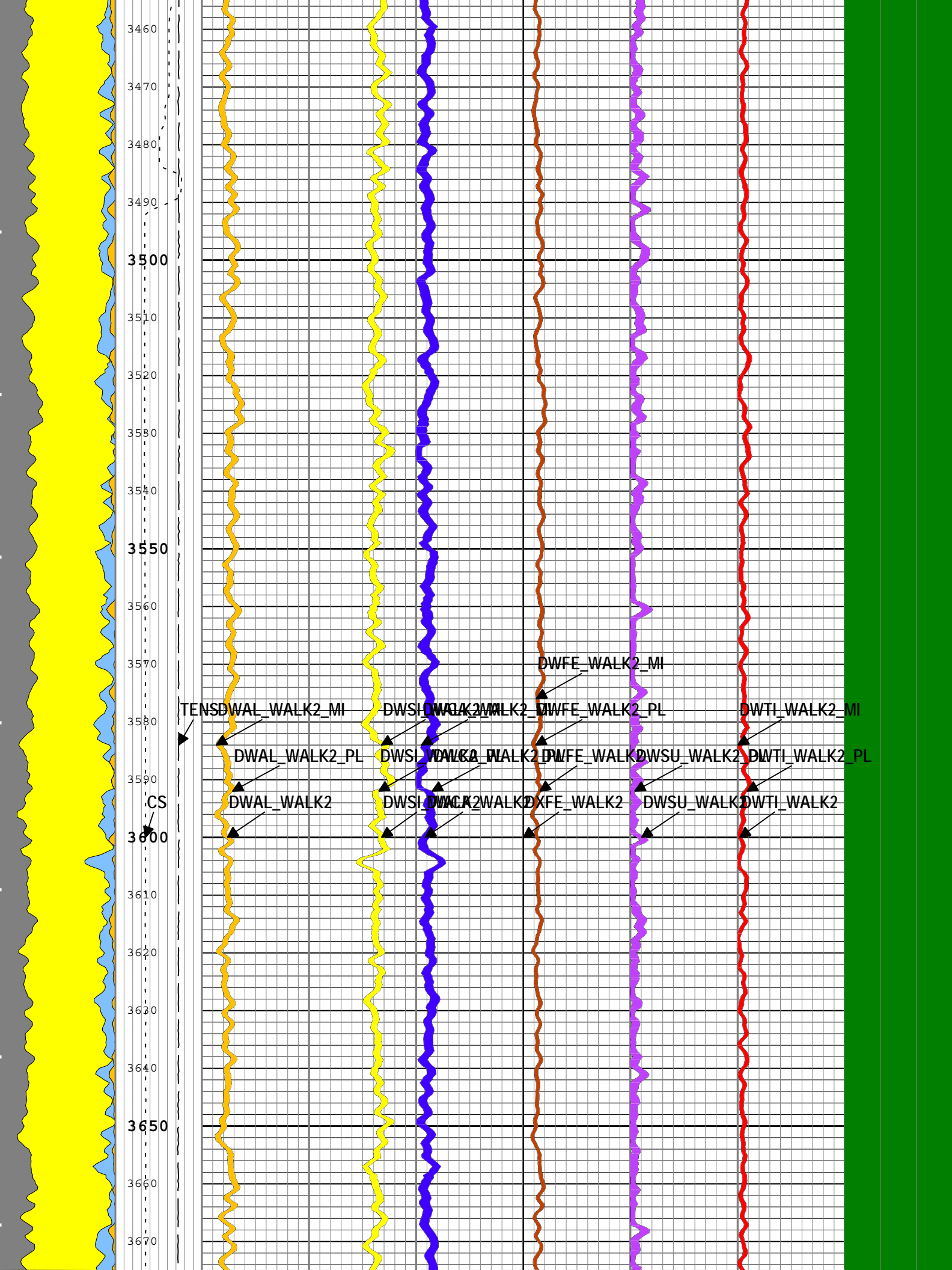
DWTI_WALK2_MI
DWTI_WALK2_PL
DWTI_WALK2

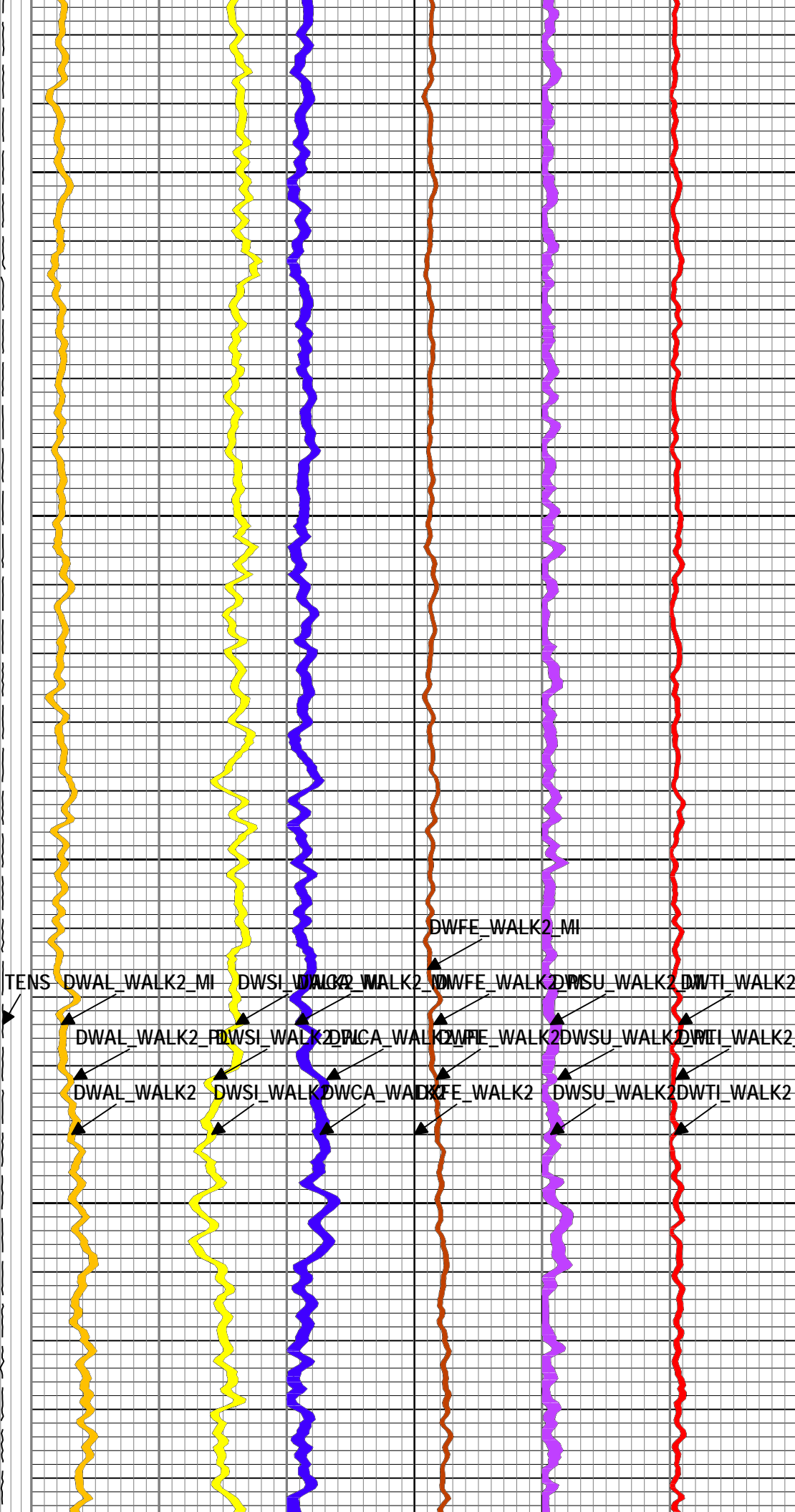
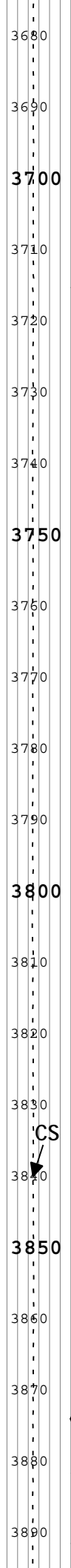
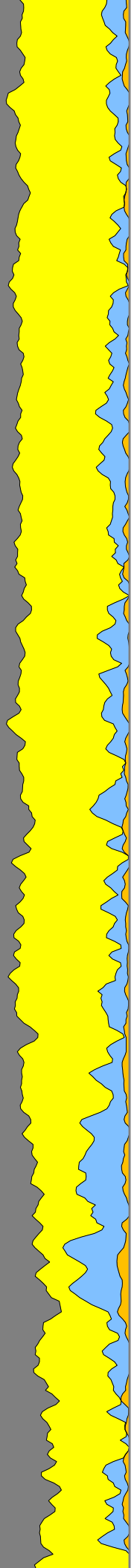




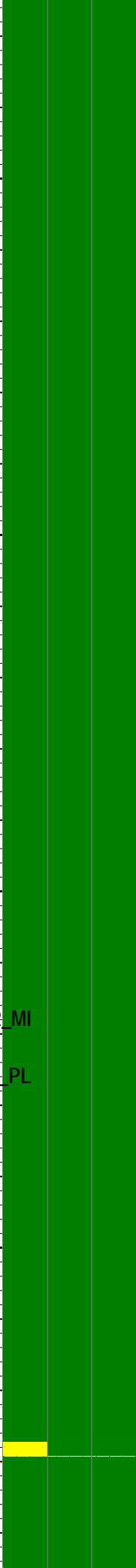


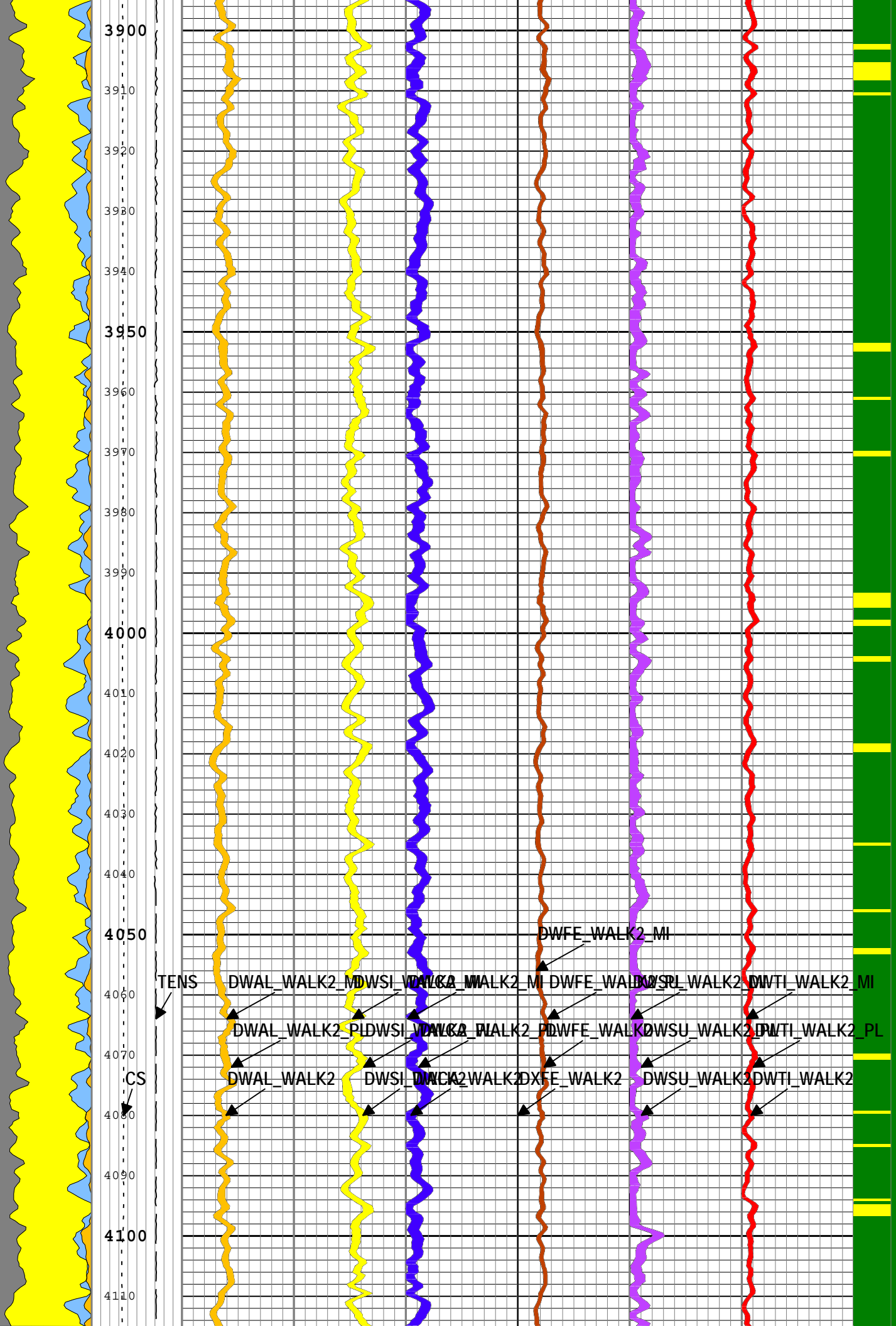


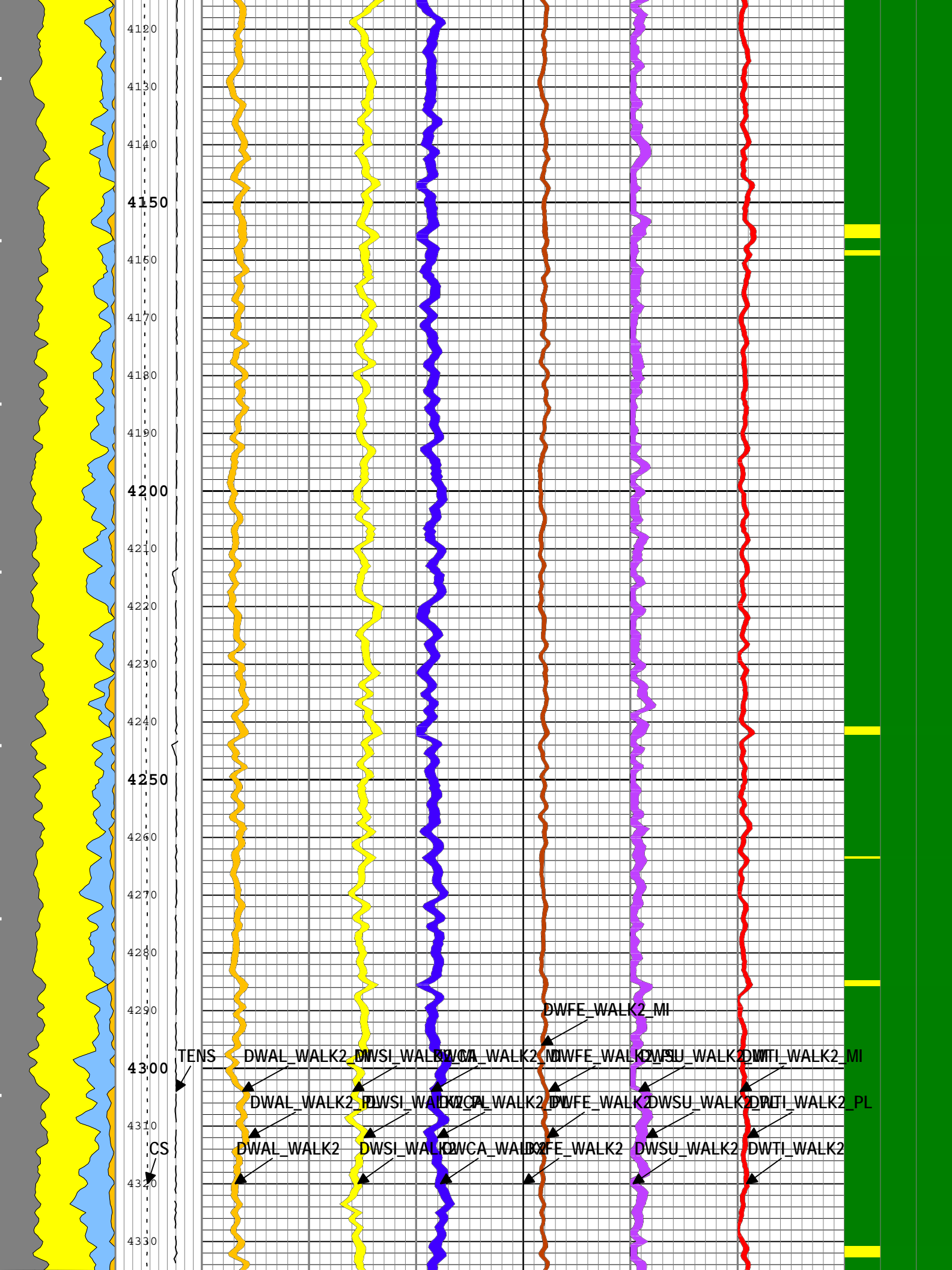


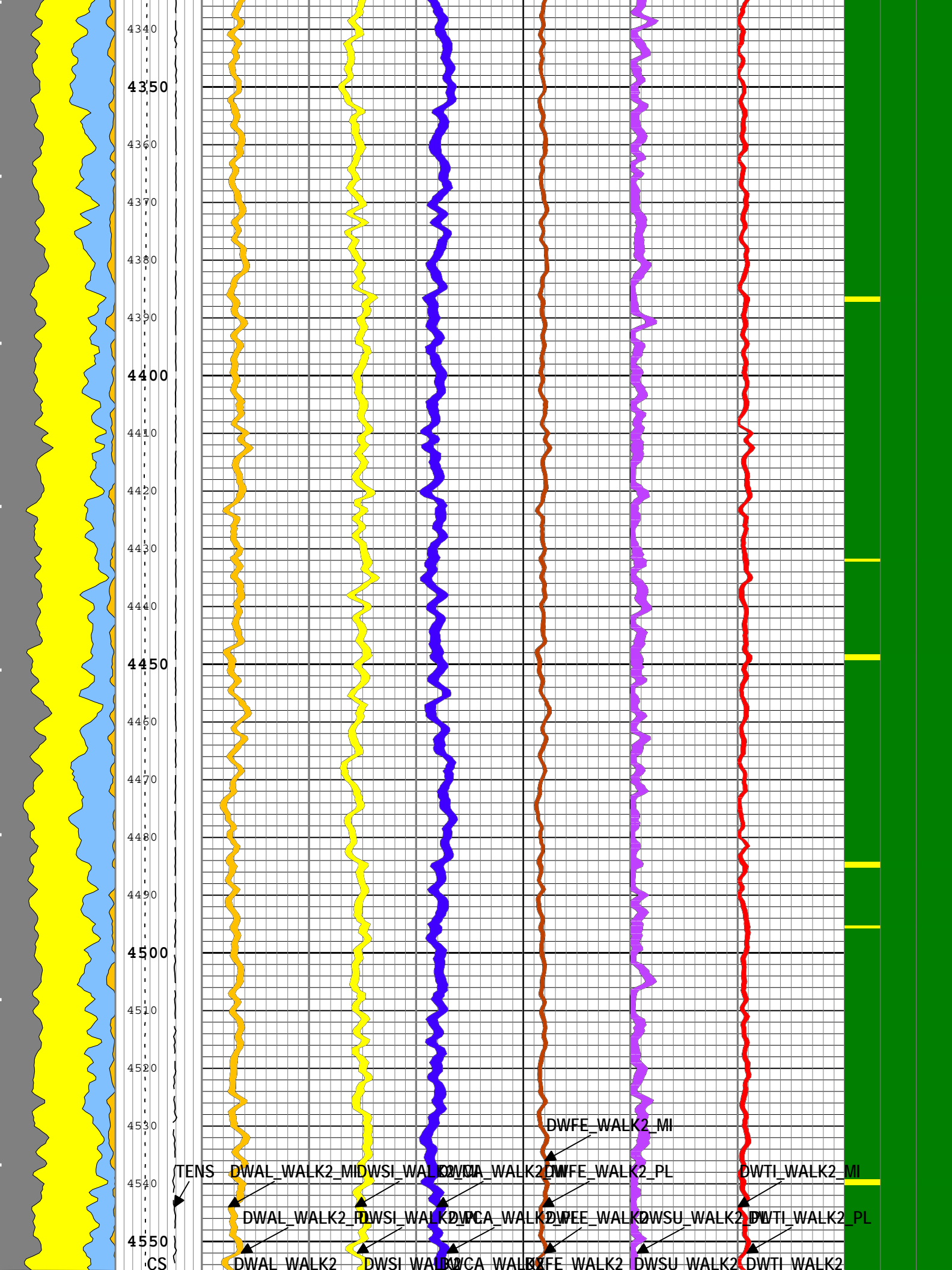


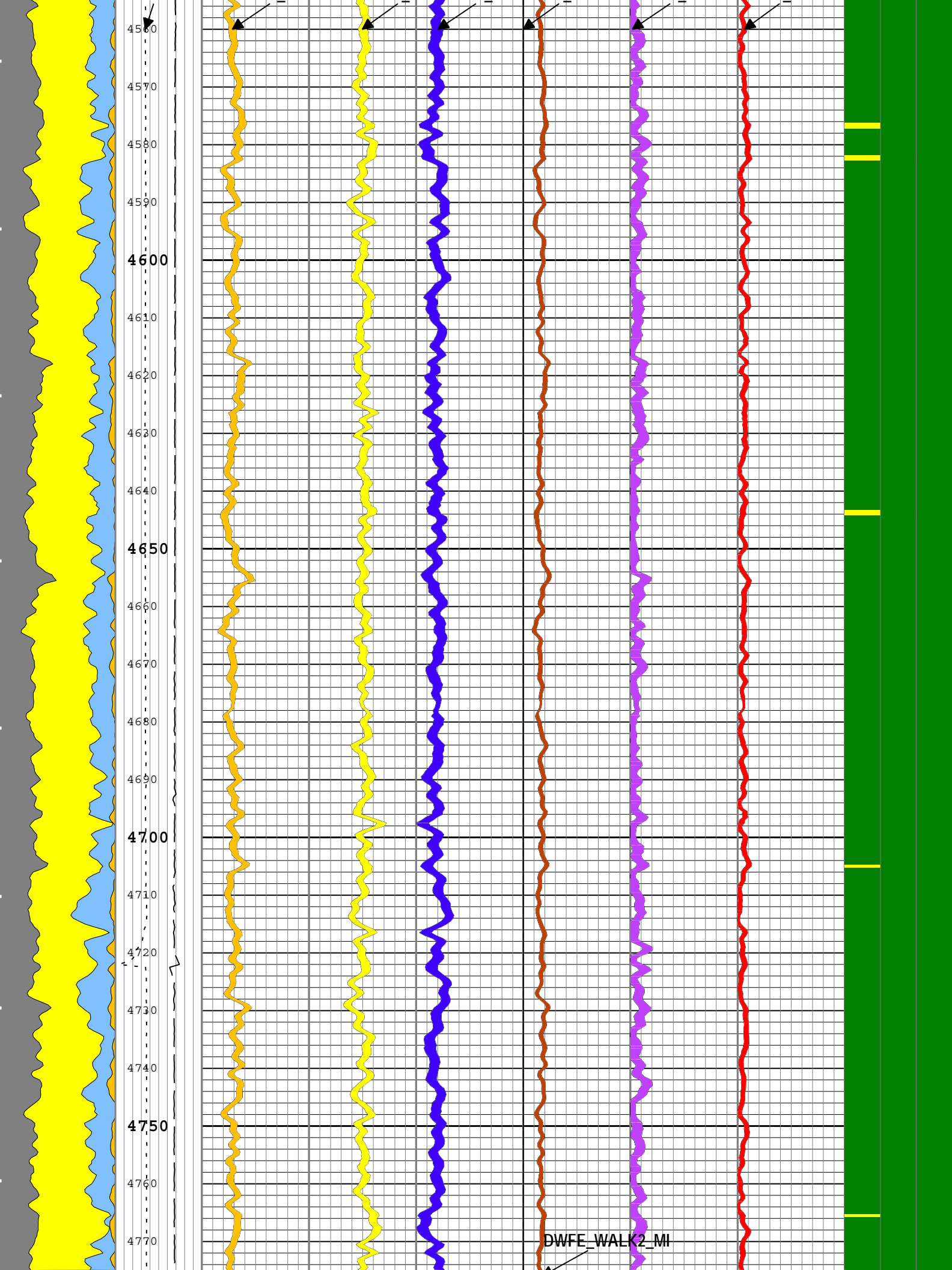
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DWAL_WALK2_PL DWSI_WALK2_PL DWCA_WALK2_PL DWFE_WALK2_PL DWSU_WALK2_PL DWTI_WALK2_PL
CS DWAL_WALK2 DWSI_WALK2 DWCA_WALK2 DWFE_WALK2 DWSU_WALK2 DWTI_WALK2

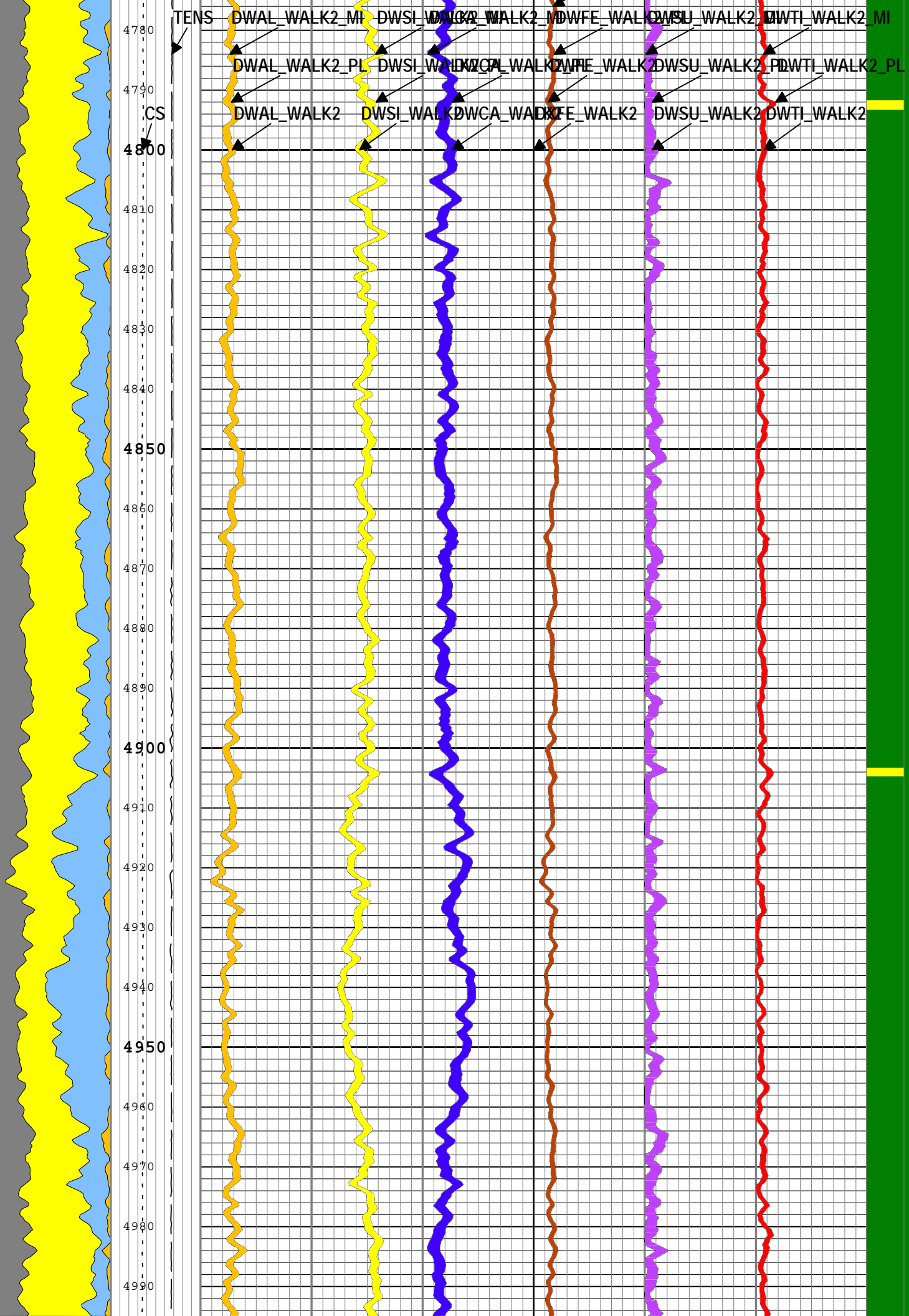


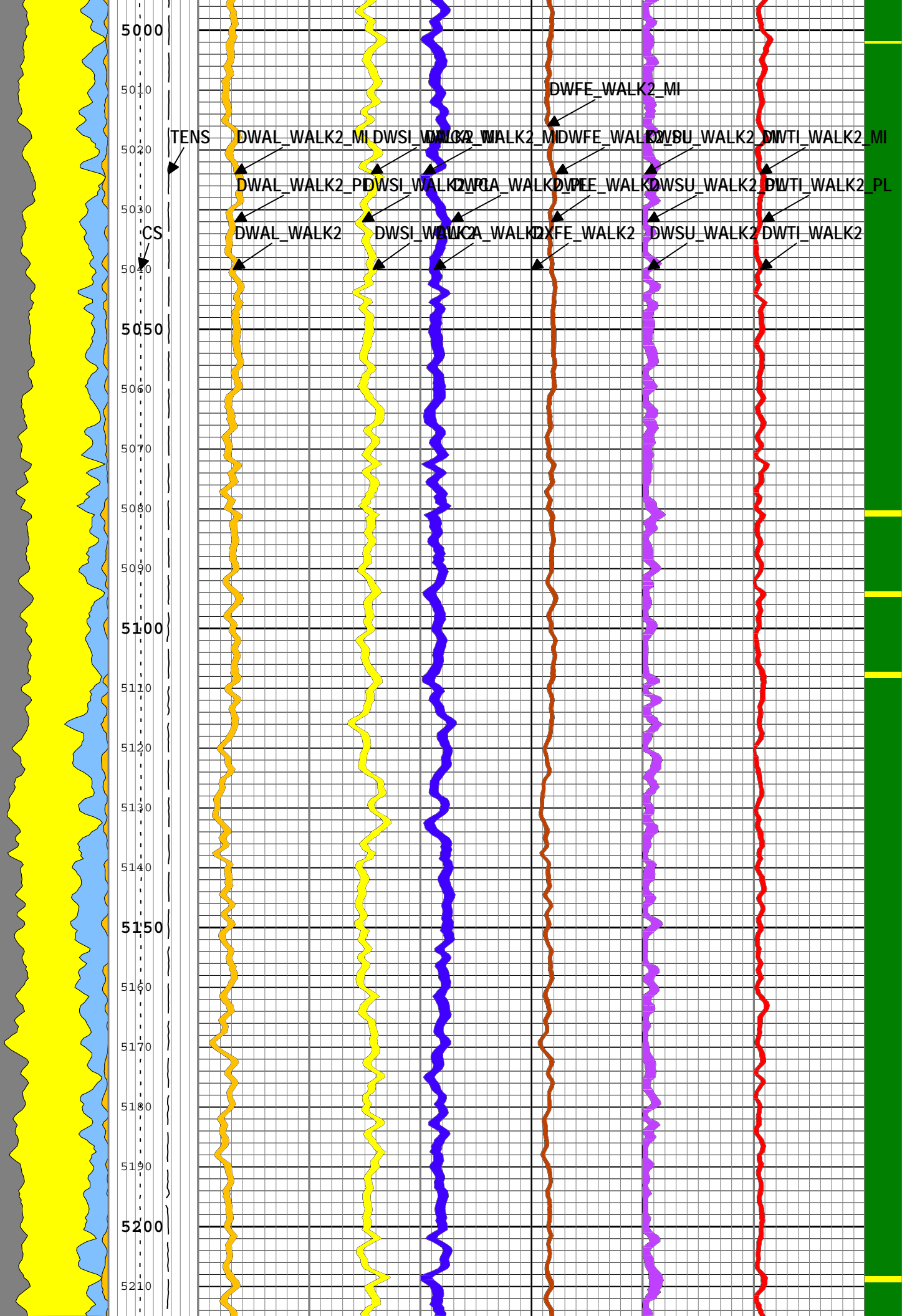


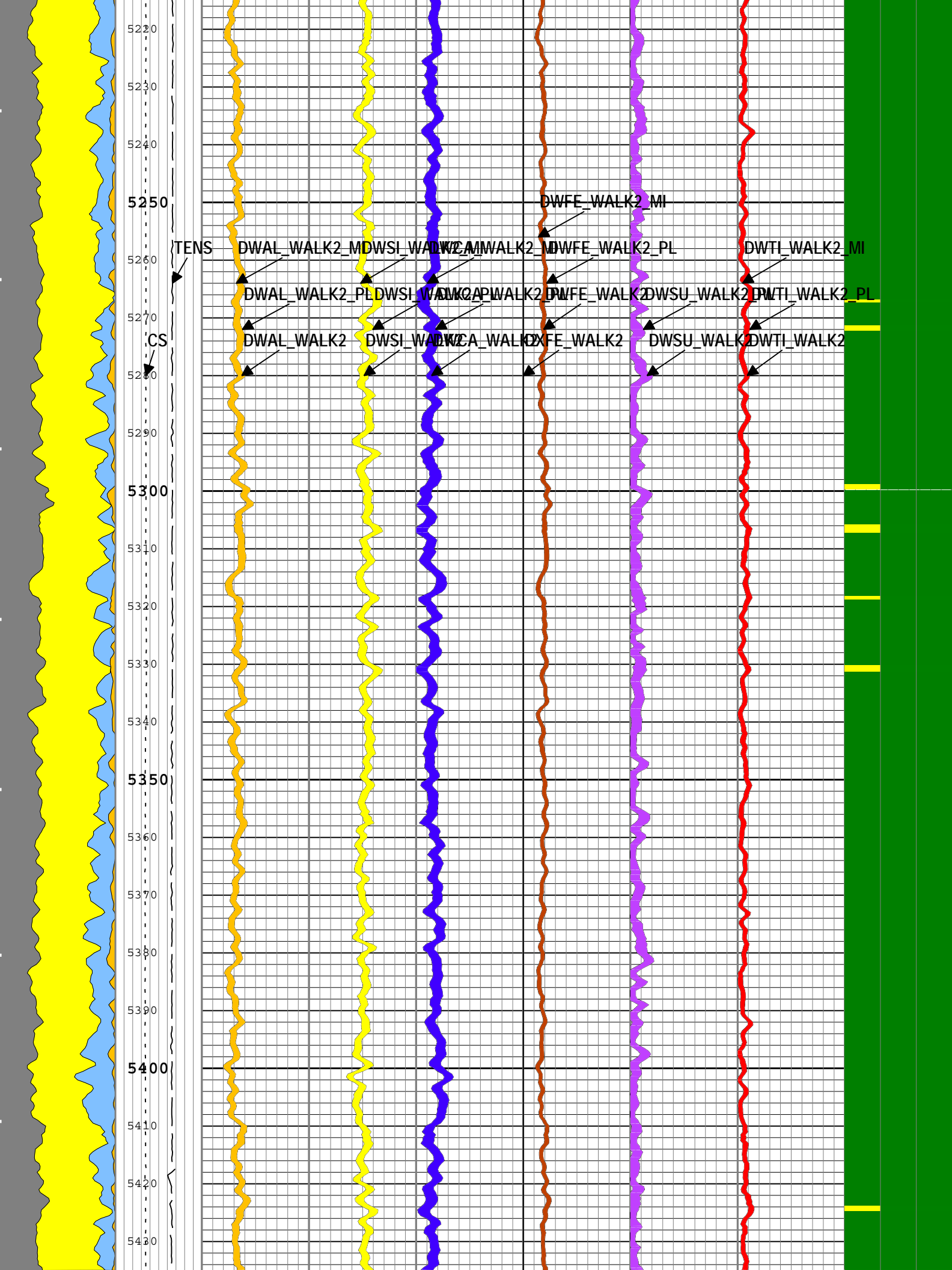


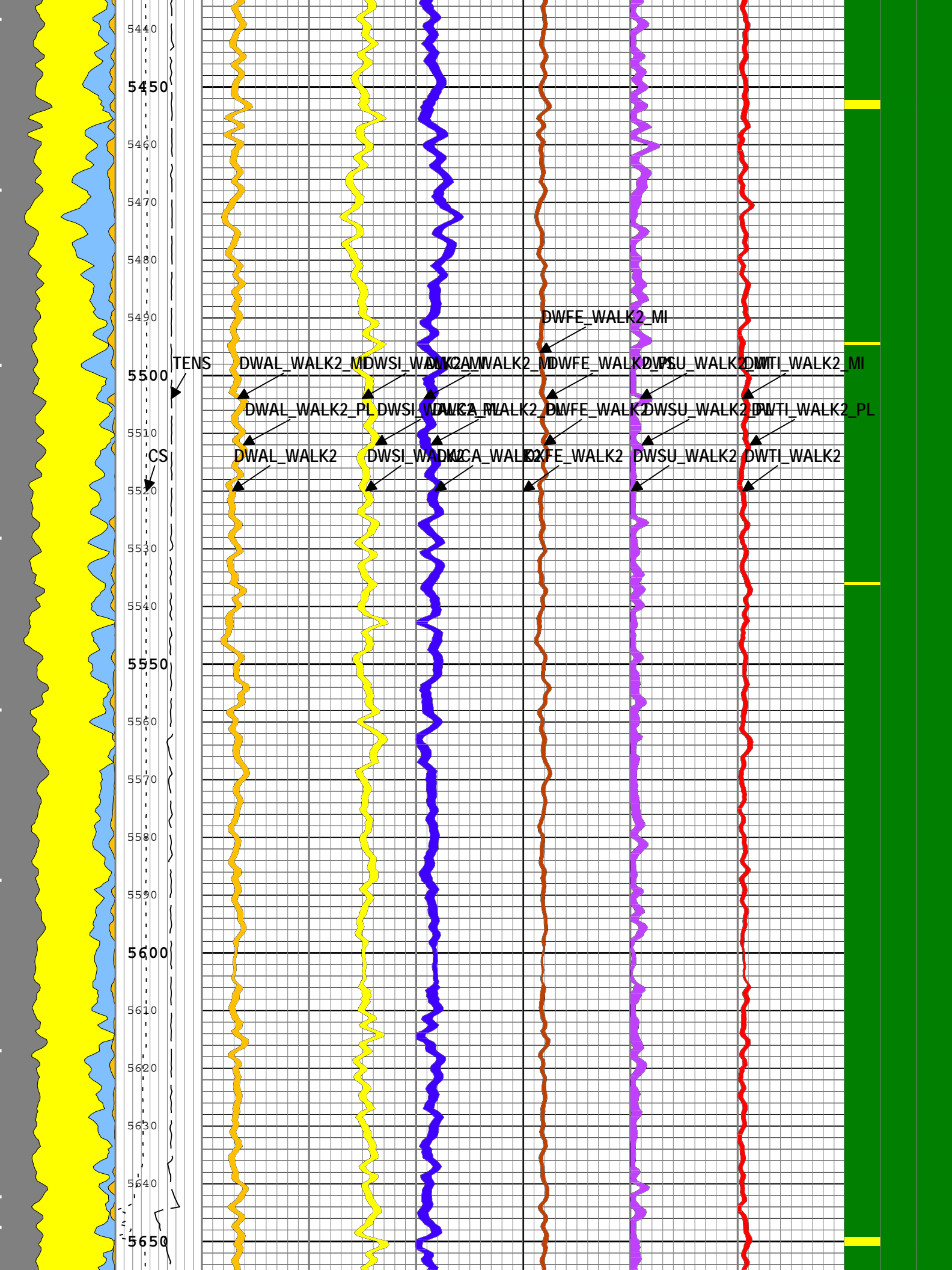


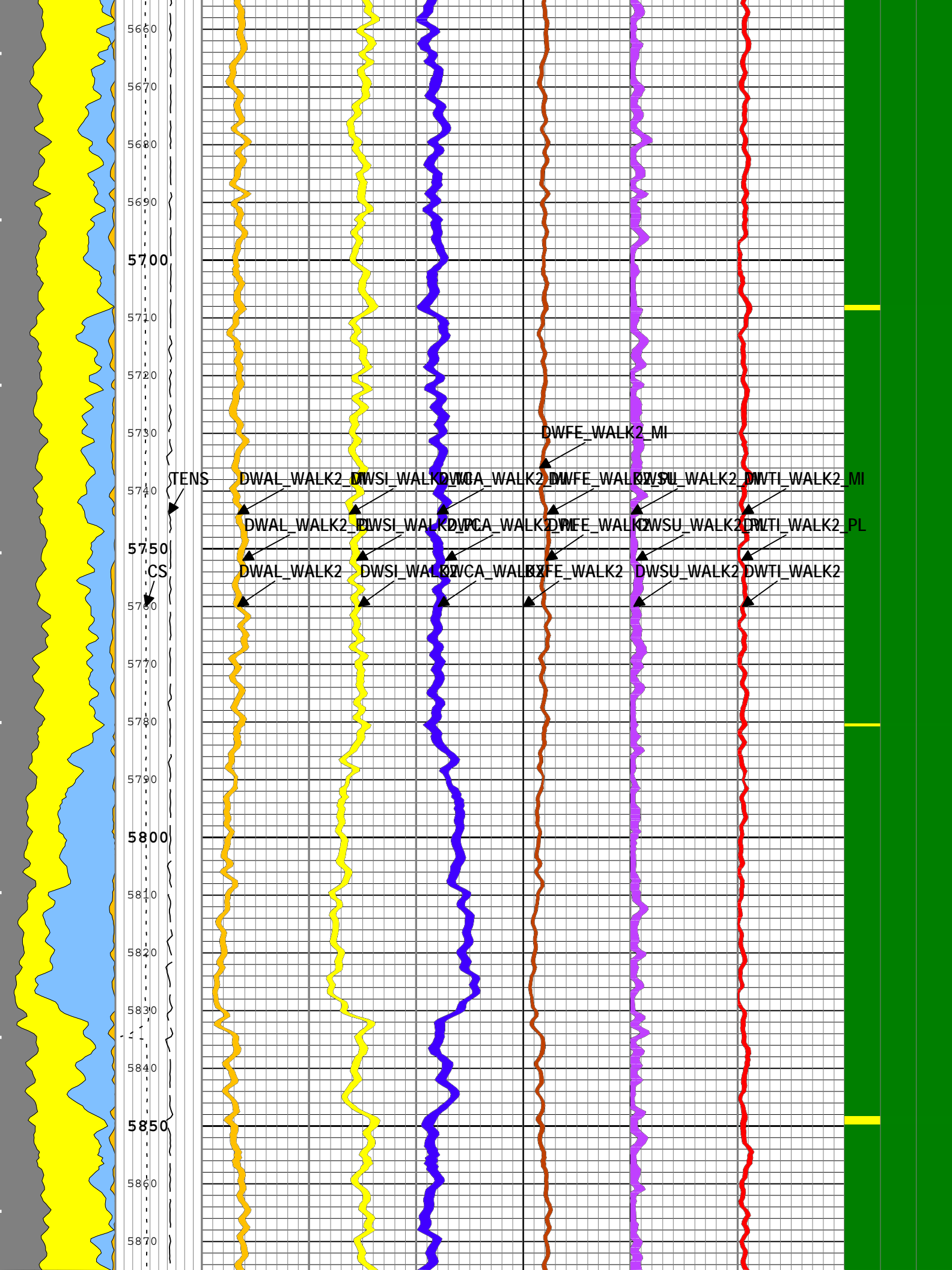


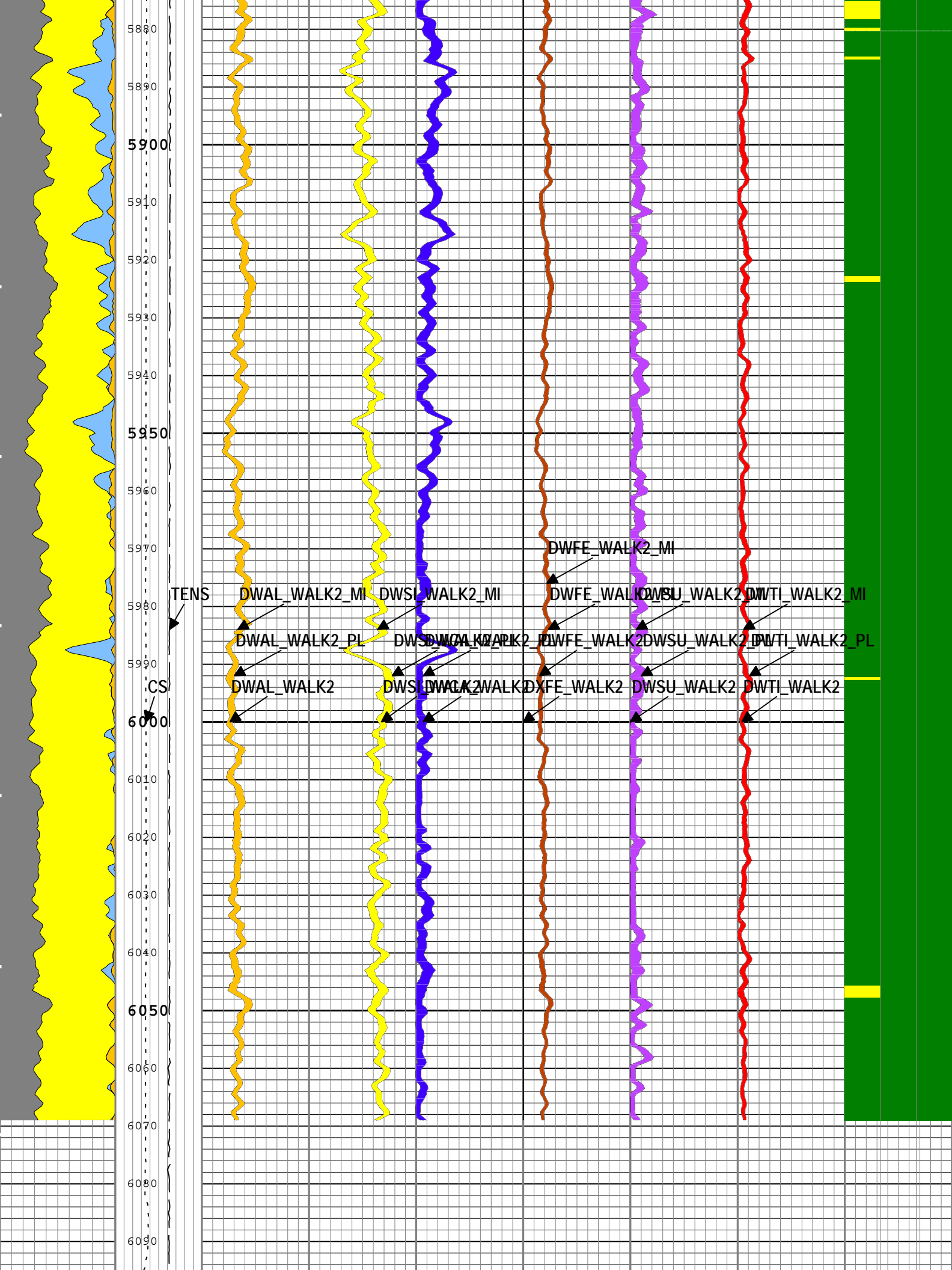












	6100								
	6110								
Clay	Cable Speed (CS)	Dry Weight Fraction Pseudo Aluminum (SpectroLith WALK2 Model) (DWAL_WALK2) ECS-A	Dry Weight Fraction Silicon (SpectroLith WALK2 Model) (DWSI_WALK2) ECS-A	Dry Weight Fraction Calcium (SpectroLith WALK2 Model) (DWCA_WALK2) ECS-A	Dry Weight Fraction Excess Iron (SpectroLith WALK2 Model) (DXFE_WALK2) ECS-A	Dry Weight Fraction Sulfur (SpectroLith WALK2 Model) (DWSU_WALK2) ECS-A	Dry Weight Fraction Titanium (SpectroLith WALK2 Model) (DWTI_WALK2) ECS-A	SpectroLith LOC status image object (LOC_SPEC) ECS-A	
Q-F-M	0 ft/h 5000							1 3	
Carbonate	Cable Tension (TENS)								
Pyrite	10000 lbf	0 lbf/lbf 0.2	0 lbf/lbf 0.5	0 lbf/lbf 0.5	0 lbf/lbf 0.2	0 lbf/lbf 0.25	0 lbf/lbf 0.05	normal	
Anhydrite		Dry Wt. Aluminum	Dry Wt. Silicon	Dry Wt. Calcium	Dry Weight Fraction Iron + 0.14 Aluminum (SpectroLith WALK2 Model) (DWFE_WALK2) ECS-A	Dry Wt. Sulfur	Dry Wt. Titanium	warning	
Siderite								error	
Coal									
Salt									
0 ft3/ft3 1					0 lbf/lbf 0.2				
					Dry Wt. Excess Iron				
					Dry Wt. Iron				

SpectroLith LOC status image object (LOC_SPEC) ECS-A	
1 - Elemental Statistical Uncertainty Quality Check (ESUF_WALK2) - :	<div> <div></div> Elemental Statistical Uncertainty Quality Check: Normal <div></div> Elemental Statistical Uncertainty Quality Check: Warning <div></div> Elemental Statistical Uncertainty Quality Check: Error </div>
2 - BGO Crystal Temperature Quality Check (ECST) - :	<div> <div></div> Temperature Quality Check < 40 °C <div></div> 40 °C <= Temperature Quality Check < 70 °C <div></div> Temperature Quality Check >= 70 °C </div>
3 - Photomultiplier Status (QCPMT) - :	<div> <div></div> Photomultiplier Status: Normal <div></div> Photomultiplier Status: Error (> 2.75) </div>

TIME_1900 - Time Marked every 60.00 (s)
Description: ECS SpectroLith Format: Log (ECS SpectroLith) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Jun-2012 18:35:34

Channel Processing Parameters				
Parameter	Description	ToolPath	Value	Unit
SPEC_BARITE_FL	Barite Mud Flag for Spectroscopy Processing	ECS-A:ECS-A:ECS-A	On	
SPEC_BARITE_LG	Automatic Barite Logic for Spectroscopy Processing	ECS-A:ECS-A:ECS-A	On	
SPEC_CSG_DEPTH	Casing Depth for Spectroscopy Processing	ECS-A:ECS-A:ECS-A	0	ft
SPEC_CSG_LOGIC	Automatic Casing Logic for Spectroscopy Processing	ECS-A:ECS-A:ECS-A	On	
SPEC_CSG_THR	Automatic Casing Logic Threshold Value for Spectroscopy Processing	ECS-A:ECS-A:ECS-A	0.5	
SPEC_WLEN_HBSL	Window Length for Hydrogen Relative Yield Baseline Removal for Coal Processing	ECS-A:ECS-A:ECS-A	100	
SPL_CH_OFF_OPT	SpectroLith Cased Hole Offset Logic	ECS-A:ECS-A:ECS-A	Auto	
SPL_CLAY_MODEL	SpectroLith Clay Model	ECS-A:ECS-A:ECS-A	Arenite	
SPL_CLAY_OFFS	SpectroLith Clay Offset for Calibrated Model	ECS-A:ECS-A:ECS-A	0	
SPL_CLAY_SLOPE	SpectroLith Clay Slope for Calibrated Model	ECS-A:ECS-A:ECS-A	1	
SPL_CLAYMOD_LG	SpectroLith Automatic Clay Model Logic	ECS-A:ECS-A:ECS-A	On	
SPL_CLAYMOD_TH	SpectroLith Automatic Clay Model Logic Clay Fraction Threshold	ECS-A:ECS-A:ECS-A	0.2	
SPL_COAL_OPT	SpectroLith Coal Processing Option	ECS-A:ECS-A:ECS-A	Bituminous	
SPL_MIN_COAL	SpectroLith Minimum Coal Threshold	ECS-A:ECS-A:ECS-A	0.2	lbf/lbf

SPL_SALT_ESSR	SpectroLith Spectral Count Rate Threshold for Salt Logic	ECS-A:ECS-A:ECS-A	0.95	1/s
SPL_SALT_OPT	SpectroLith Salt Processing Option	ECS-A:ECS-A:ECS-A	On	
SPL_SALT_SCF	SpectroLith Silicon+Calcium+Iron Threshold for Salt Logic (Si+Ca+Fe Relative Yields)	ECS-A:ECS-A:ECS-A	0.05	
SPL_SIDE_OPT	SpectroLith Siderite Option	ECS-A:ECS-A:ECS-A	On	
SPL_SULFUR_LG	SpectroLith Automatic Sulfur Mineral Logic	ECS-A:ECS-A:ECS-A	On	
SPL_SULFUR_MIN	SpectroLith Sulfur Mineral Option	ECS-A:ECS-A:ECS-A	None	

Tool Control Parameters				
Parameter	Description	ToolPath	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLWorkflow	1800	ft/h
WTMT	ECS Gain Regulation Accumulation Time	ECS-A:ECS-A:ECS-A	60	s
1				
REPEAT PASS, 5 INCH				

Integration Summary				
Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
Software Version				
Acquisition System		Version		
MaxWell		3.0.9609.0		
Application Patch		SP-20120409-3.0.9609.1919		
		EXP_APL-ADT-3.0.9609.1558		
		EXP_APL-OPElevation-3.0.9609.1966		
Tool Elements	Description	Software Version		Firmware Version
ECS-A	The ECS sonde is used to measure elemental concentrations.	3.0.9609.1919		

Pass Summary								
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
1	Log[3]:Up	Up	5769.48 ft	6117.18 ft	04-Jun-2012 12:50:59 PM	04-Jun-2012 1:03:40 PM	4.88 ft	
All depths are referenced to toolstring zero								

Log	1: Log[3]:Up 2D016807-51F0-4828-88FE-DA35575B2089
-----	---

Description: ECS SpectroLith Format: Log (ECS SpectroLith) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Jun-2012 18:35:42

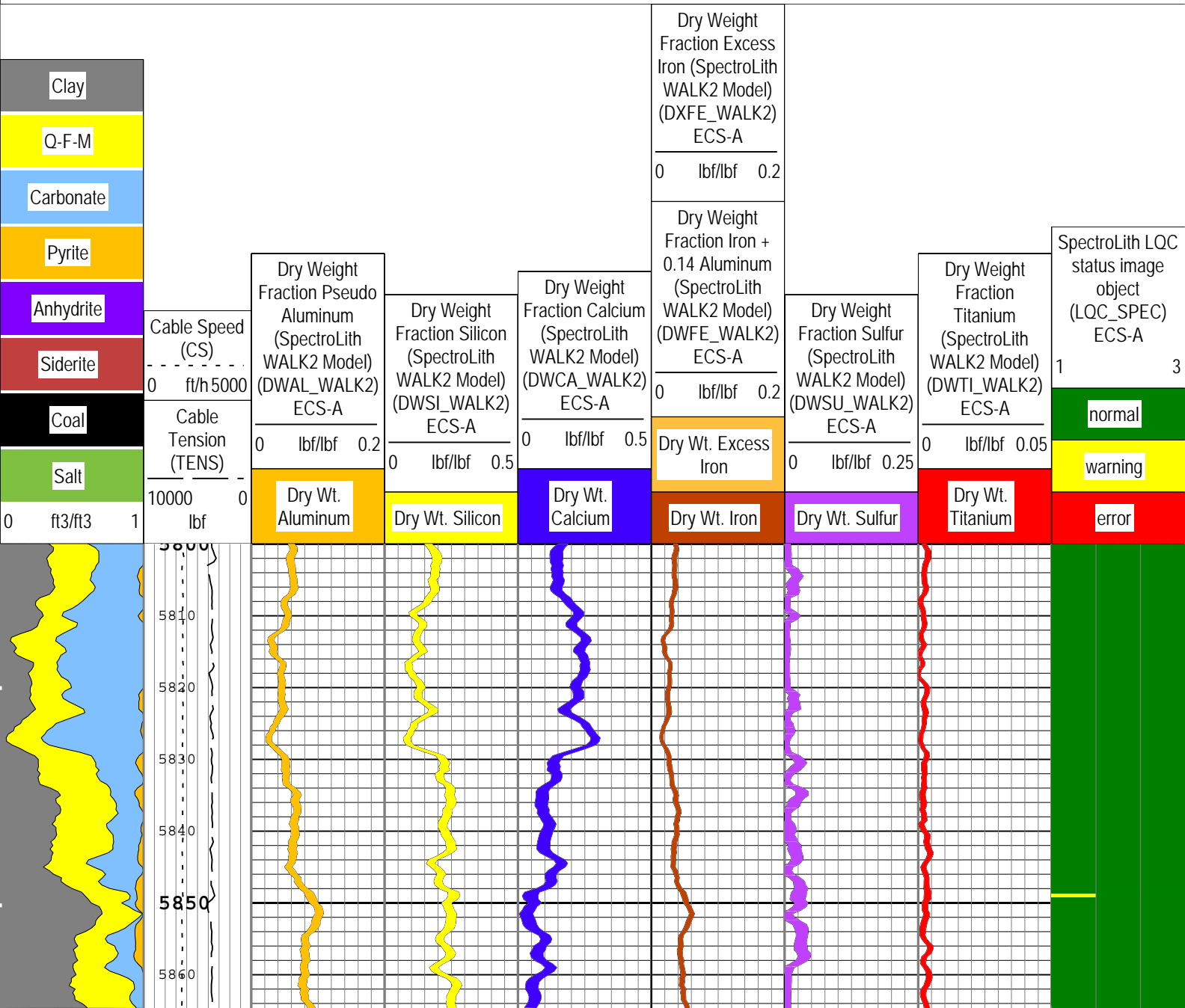
Channel	Source	Sampling
CS	WLWorkflow	6in
DWAL_WALK2	ECS-A:ECS-A:ECS-A	6in
DWAL_WALK2_MI	ECS-A:ECS-A:ECS-A	6in
DWAL_WALK2_PL	ECS-A:ECS-A:ECS-A	6in
DWCA_WALK2	ECS-A:ECS-A:ECS-A	6in
DWCA_WALK2_MI	ECS-A:ECS-A:ECS-A	6in
DWCA_WALK2_PL	ECS-A:ECS-A:ECS-A	6in
DWFE_WALK2	ECS-A:ECS-A:ECS-A	6in
DWFE_WALK2_MI	ECS-A:ECS-A:ECS-A	6in
DWFE_WALK2_PL	ECS-A:ECS-A:ECS-A	6in
DWSI_WALK2	ECS-A:ECS-A:ECS-A	6in
DWSI_WALK2_MI	ECS-A:ECS-A:ECS-A	6in
DWSI_WALK2_PL	ECS-A:ECS-A:ECS-A	6in
DWSU_WALK2	ECS-A:ECS-A:ECS-A	6in
DWSU_WALK2_MI	ECS-A:ECS-A:ECS-A	6in

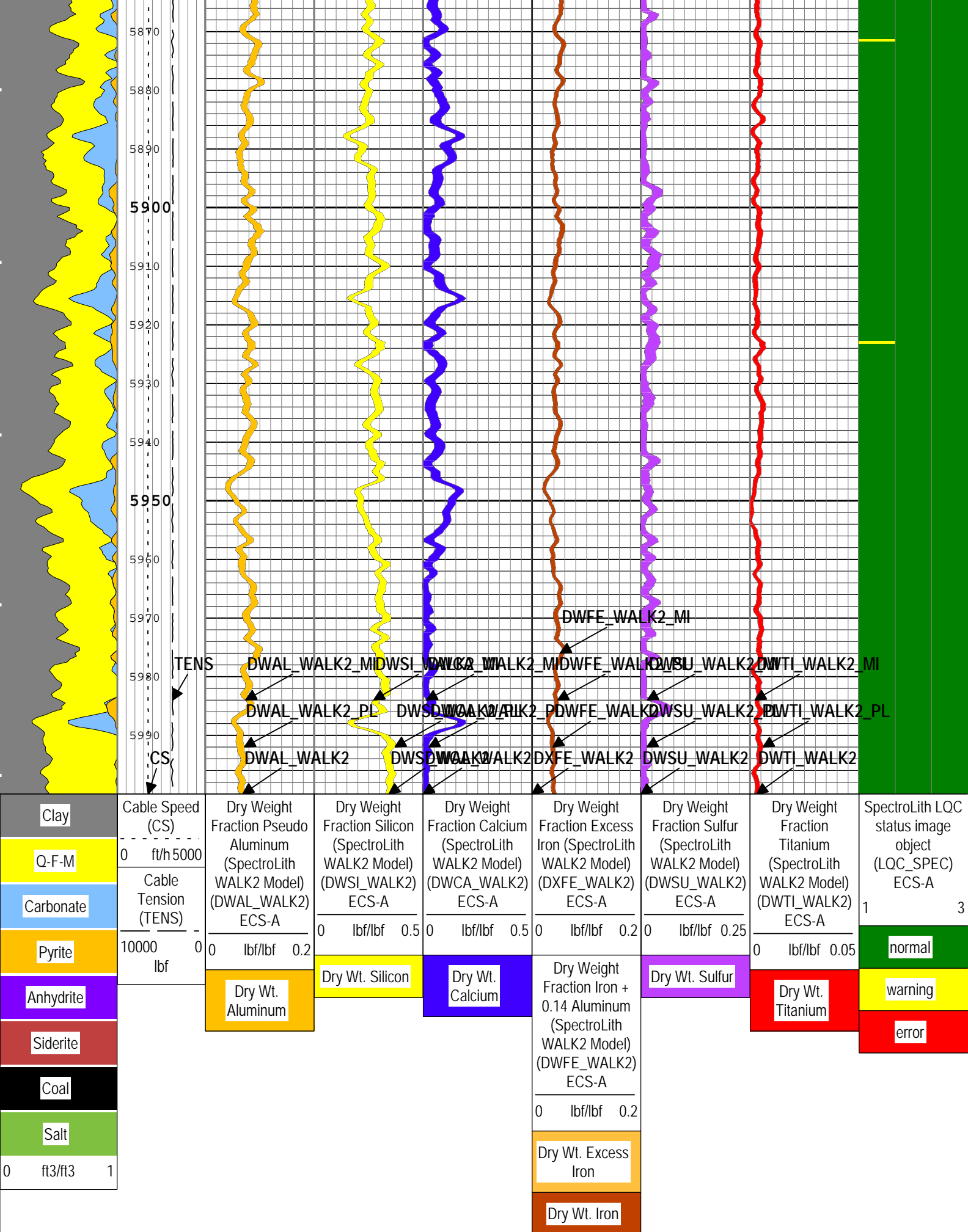
DWSU_WALK2_PL	ECS-A:ECS-A:ECS-A	6in
DWTI_WALK2	ECS-A:ECS-A:ECS-A	6in
DWTI_WALK2_MI	ECS-A:ECS-A:ECS-A	6in
DWTI_WALK2_PL	ECS-A:ECS-A:ECS-A	6in
DXFE_WALK2	ECS-A:ECS-A:ECS-A	6in
LQC_SPEC	ECS-A:ECS-A:ECS-A	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

TIME_1900 - Time Marked every 60.00 (s)

SpectroLith LQC status image object (LQC_SPEC) ECS-A

- 1 - Elemental Statistical Uncertainty Quality Check (ESUF_WALK2) - :
- Elemental Statistical Uncertainty Quality Check: Normal
 - Elemental Statistical Uncertainty Quality Check: Warning
 - Elemental Statistical Uncertainty Quality Check: Error
- 2 - BGO Crystal Temperature Quality Check (ECST) - :
- Temperature Quality Check < 40 °C
 - 40 °C <= Temperature Quality Check < 70 °C
 - Temperature Quality Check >= 70 °C
- 3 - Photomultiplier Status (QCPMT) - :
- Photomultiplier Status: Normal
 - Photomultiplier Status: Error (> 2.75)





SpectroLith LOC status image object (LOC_SPEC) ECS-A

1 - Elemental Statistical Uncertainty Quality Check (ESUF_WALK2) - : ■ Elemental Statistical Uncertainty Quality Check: Normal

2 - BGO Crystal Temperature Quality Check (ECST) - :

3 - Photomultiplier Status (QCPMT) - :

TIME_1900 - Time Marked every 60.00 (s)

Description: ECS SpectroLith Format: Log (ECS SpectroLith) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Jun-2012 18:35:42

Elemental Statistical Uncertainty Quality Check: Warning

Elemental Statistical Uncertainty Quality Check: Error

Temperature Quality Check < 40 °C

40 °C <= Temperature Quality Check < 70 °C

Temperature Quality Check >= 70 °C

Photomultiplier Status: Normal

Photomultiplier Status: Error (> 2.75)

Channel Processing Parameters				
Parameter	Description	ToolPath	Value	Unit
SPEC_BARITE_FL	Barite Mud Flag for Spectroscopy Processing	ECS-A:ECS-A:ECS-A	On	
SPEC_BARITE_LG	Automatic Barite Logic for Spectroscopy Processing	ECS-A:ECS-A:ECS-A	On	
SPEC_CSG_DEPTH	Casing Depth for Spectroscopy Processing	ECS-A:ECS-A:ECS-A	0	ft
SPEC_CSG_LOGIC	Automatic Casing Logic for Spectroscopy Processing	ECS-A:ECS-A:ECS-A	On	
SPEC_CSG_THR	Automatic Casing Logic Threshold Value for Spectroscopy Processing	ECS-A:ECS-A:ECS-A	0.5	
SPEC_WLEN_HBSL	Window Length for Hydrogen Relative Yield Baseline Removal for Coal Processing	ECS-A:ECS-A:ECS-A	100	
SPL_CH_OFF_OPT	SpectroLith Cased Hole Offset Logic	ECS-A:ECS-A:ECS-A	Auto	
SPL_CLAY_MODEL	SpectroLith Clay Model	ECS-A:ECS-A:ECS-A	Arenite	
SPL_CLAY_OFFS	SpectroLith Clay Offset for Calibrated Model	ECS-A:ECS-A:ECS-A	0	
SPL_CLAY_SLOPE	SpectroLith Clay Slope for Calibrated Model	ECS-A:ECS-A:ECS-A	1	
SPL_CLAYMOD_LG	SpectroLith Automatic Clay Model Logic	ECS-A:ECS-A:ECS-A	On	
SPL_CLAYMOD_TH	SpectroLith Automatic Clay Model Logic Clay Fraction Threshold	ECS-A:ECS-A:ECS-A	0.2	
SPL_COAL_OPT	SpectroLith Coal Processing Option	ECS-A:ECS-A:ECS-A	Bituminous	
SPL_MIN_COAL	SpectroLith Minimum Coal Threshold	ECS-A:ECS-A:ECS-A	0.2	lbf/lbf
SPL_SALT_ESSR	SpectroLith Spectral Count Rate Threshold for Salt Logic	ECS-A:ECS-A:ECS-A	0.95	1/s
SPL_SALT_OPT	SpectroLith Salt Processing Option	ECS-A:ECS-A:ECS-A	On	
SPL_SALT_SCF	SpectroLith Silicon+Calcium+Iron Threshold for Salt Logic (Si+Ca+Fe Relative Yields)	ECS-A:ECS-A:ECS-A	0.05	
SPL_SIDE_OPT	SpectroLith Siderite Option	ECS-A:ECS-A:ECS-A	On	
SPL_SULFUR_LG	SpectroLith Automatic Sulfur Mineral Logic	ECS-A:ECS-A:ECS-A	On	
SPL_SULFUR_MIN	SpectroLith Sulfur Mineral Option	ECS-A:ECS-A:ECS-A	None	

Tool Control Parameters				
Parameter	Description	ToolPath	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLWorkflow	1800	ft/h
WTMT	ECS Gain Regulation Accumulation Time	ECS-A:ECS-A:ECS-A	60	s

Calibration Report

AIT-H (Array Induction Tool - H) Calibration - Run 1

Primary Equipment :

Array Induction Sonde - H

AHIS

295

AIT Sonde Calibration - Test Loop Gain							
Master (EEPROM):		01:43:26 25-May-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Test Loop Gain - 0		Master	1.000	0.950	1.009	1.050	
Test Loop Phase - 0	deg	Master	0	-3.000	0.230	3.000	
Test Loop Gain - 1		Master	1.000	0.950	1.007	1.050	
Test Loop Phase - 1	deg	Master	0	-3.000	0.173	3.000	
Test Loop Gain - 2		Master	1.000	0.950	1.013	1.050	
Test Loop Phase - 2	deg	Master	0	-3.000	-0.157	3.000	
Test Loop Gain - 3		Master	1.000	0.950	1.010	1.050	

		Before-Master After-Before			0.790		
Thru Cal Mag - 3	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	0.422 0.422 ----- ----- -----	0.718 0.725 ----- 0.007 -----	0.986 0.986 ----- ----- -----	
Thru Cal Phase - 3	deg	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	5.000 5.000 ----- ----- -----	60.703 61.491 ----- 0.788 -----	125.000 125.000 ----- ----- -----	
Thru Cal Mag - 4	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	0.802 0.802 ----- ----- -----	1.347 1.360 ----- 0.013 -----	1.872 1.872 ----- ----- -----	
Thru Cal Phase - 4	deg	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	-1.000 -1.000 ----- ----- -----	54.289 55.050 ----- 0.761 -----	119.000 119.000 ----- ----- -----	
Thru Cal Mag - 5	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	1.173 1.173 ----- ----- -----	1.955 1.973 ----- 0.018 -----	2.737 2.737 ----- ----- -----	
Thru Cal Phase - 5	deg	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	-3.000 -3.000 ----- ----- -----	52.388 53.135 ----- 0.747 -----	117.000 117.000 ----- ----- -----	
Thru Cal Mag - 6	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	1.173 1.173 ----- ----- -----	1.955 1.973 ----- 0.018 -----	2.737 2.737 ----- ----- -----	
Thru Cal Phase - 6	deg	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	-3.000 -3.000 ----- ----- -----	52.394 53.140 ----- 0.746 -----	117.000 117.000 ----- ----- -----	
Thru Cal Mag - 7	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	0.849 0.849 ----- ----- -----	1.390 1.401 ----- 0.011 -----	1.981 1.981 ----- ----- -----	
Thru Cal Phase - 7	deg	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	-7.000 -7.000 ----- ----- -----	48.592 49.193 ----- 0.601 -----	113.000 113.000 ----- ----- -----	
SPA Zero	mV	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	-50.000 -50.000 ----- ----- -----	-0.168 -0.171 ----- -0.003 -----	50.000 50.000 ----- ----- -----	
SPA Plus	mV	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	941.000 941.000 ----- ----- -----	990.794 990.818 ----- 0.024 -----	1040.000 1040.000 ----- ----- -----	
Temperature Zero	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	-0.050 -0.050 ----- ----- -----	0.000 0.000 ----- 0.000 -----	0.050 0.050 ----- ----- -----	
Temperature Plus	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	0.870 0.870 ----- ----- -----	0.917 0.917 ----- 0.017 -----	0.960 0.960 ----- ----- -----	

		Before	-----	0.870	0.917	0.960		
		After	-----	-----	-----	-----		
		Before-Master	-----	-----	0.000	-----		
		After-Before	-----	-----	-----	-----		

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

Primary Equipment :

HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	3912

Auxiliary Equipment :

HRDD Backscatter Detector	Backscatter	
HRDD Long Spacing Detector	Long Spacing	28706
HRDD Short Spacing Detector	Short Spacing	27692
Cesium 137 Gamma-Ray Logging Source	GSR-J	5415
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	

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): 12:37:46 03-Jun-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Small Ring	in	Before	8.00	6.00	9.13	10.00		
Large Ring	in	Before	12.00	9.00	13.24	15.00		

HDRS Density Calibration - Inversion Results

Master (EEPROM): 15:22:40 29-May-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Rho Aluminum	g/cm3	Master	2.596	2.586	2.599	2.606		
Rho Magnesium	g/cm3	Master	1.686	1.676	1.690	1.696		
Pe Aluminum		Master	2.570	2.470	2.537	2.670		
Pe Magnesium		Master	2.650	2.550	2.623	2.750		

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 15:22:40 29-May-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
BS Average Deviation	%	Master	0	-0.6000	0.3922	0.6000		
BS Max Deviation	%	Master	0	-1.6000	0.7681	1.6000		
SS Average Deviation	%	Master	0	-1.0000	0.2664	1.0000		
SS Max Deviation	%	Master	0	-2.5000	1.0208	2.5000		
LS Average Deviation	%	Master	0	-1.5000	0.5544	1.5000		
LS Max Deviation	%	Master	0	-3.5000	1.8506	3.5000		

HDRS Density Calibration - Background Summary

Master (EEPROM): 15:22:40 29-May-2012

Before (Measured):

12:30:32 03-Jun-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
BS Window Ratio		Master	1.0000	-----	0.7483	-----		
		Before	0.7483	0.7109	0.7451	0.7858		
		Before-Master	-----	-----	-0.0032	-----		
BS Window Sum	1/s	Master	1	-----	24514	-----		
		Before	24514	23288	24617	25740		
		Before-Master	-----	-----	103	-----		
SS Window Ratio		Master	1.0000	-----	0.4790	-----		
		Before	0.4790	0.4551	0.4787	0.5030		
		Before-Master	-----	-----	-0.0003	-----		
SS Window Sum	1/s	Master	1	-----	11553	-----		
		Before	11553	10975	11551	12130		
		Before-Master	-----	-----	-2	-----		
LS Window Ratio		Master	1.0000	-----	0.3009	-----		
		Before	0.3009	0.2858	0.3017	0.3159		
		Before-Master	-----	-----	0.0008	-----		
LS Window Sum	1/s	Master	1	-----	1254	-----		

		Before	1254	1191	1249	1316	
		Before-Master	-----	-----	-5	-----	

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM):		15:22:40 29-May-2012		Before (Measured):		12:30:32 03-Jun-2012	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS PM High Voltage	V	Master	-----	1000	1960	2400	
		Before	-----	1000	1923	2400	
		Before-Master	-----	-100	-37	100	
SS PM High Voltage	V	Master	-----	1000	1877	2400	
		Before	-----	1000	1850	2400	
		Before-Master	-----	-100	-27	100	
LS PM High Voltage	V	Master	-----	1000	1603	2400	
		Before	-----	1000	1597	2400	
		Before-Master	-----	-100	-6	100	

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM):		15:22:40 29-May-2012		Before (Measured):		12:30:32 03-Jun-2012	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Crystal Resolution	%	Master	-----	5.00	11.13	25.00	
		Before	-----	5.00	11.08	25.00	
		Before-Master	-----	-1.00	-0.05	1.00	
SS Crystal Resolution	%	Master	-----	5.00	10.01	20.00	
		Before	-----	5.00	9.84	20.00	
		Before-Master	-----	-1.00	-0.17	1.00	
LS Crystal Resolution	%	Master	-----	5.00	8.86	20.00	
		Before	-----	5.00	8.88	20.00	
		Before-Master	-----	-1.00	0.02	1.00	

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured):		11:53:13 04-Jun-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Main Resistivity	ohm.m	Before	3875	3565	3862	4185	
Deep Resistivity	ohm.m	Before	3830	3524	3775	4136	
Shallow Resistivity	ohm.m	Before	3830	3524	3809	4136	

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

HGNS-H (HILT Gamma-Ray and Neutron Sonde, 150 degC) Calibration			
Primary Equipment :			
HILT Gamma-Ray and Neutron Sonde, 150 degC	HGNS-H		4748
Auxiliary Equipment :			
HGNS Accelerometer, 150 degC	HACCZ-H		2594
AmBe Neutron Logging Source	NSR-F		1260
Calibration Parameter :			
Water Temperature			
Housing Size			
JIG-BKG (Jig minus background reference)		165	

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured):		11:52:33 04-Jun-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.2	32.8	

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM):		00:00:00 15-Feb-2004					
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	-----	-----	-236.900	-----	
Accelerometer Coefficients - 1		Master	-----	-----	24.030	-----	
Accelerometer Coefficients - 2		Master	-----	-----	0.001	-----	
Accelerometer Coefficients - 3		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 4		Master	-----	-----	2.751	-----	
Accelerometer Coefficients - 5		Master	-----	-----	0.000	-----	

Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 7		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 8		Master	-----	-----	299.600	-----	
Accelerometer Coefficients - 9		Master	-----	-----	0.998	-----	

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 16:54:48 13-Apr-2012		Before (Measured): 12:28:14 03-Jun-2012		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Zero Measurement	1/s	Master	0	5.0	27.5	40.0	
		Before	0	5.0	28.8	40.0	
		After	-----	-----	-----	-----	
		Before-Master	-----	-4.1	1.3	4.1	
		After-Before	-----	-----	-----	-----	
Far Zero Measurement	1/s	Master	0	5.0	29.7	40.0	
		Before	0	5.0	30.2	40.0	
		After	-----	-----	-----	-----	
		Before-Master	-----	-4.5	0.5	4.5	
		After-Before	-----	-----	-----	-----	
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	5566.0	6900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	2214.0	2900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Near Corrected Plus Measurement - 0	1/s	Master	-----	4700.0	5601.0	6900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Far Corrected Plus Measurement - 0	1/s	Master	-----	1900.0	2222.0	2900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

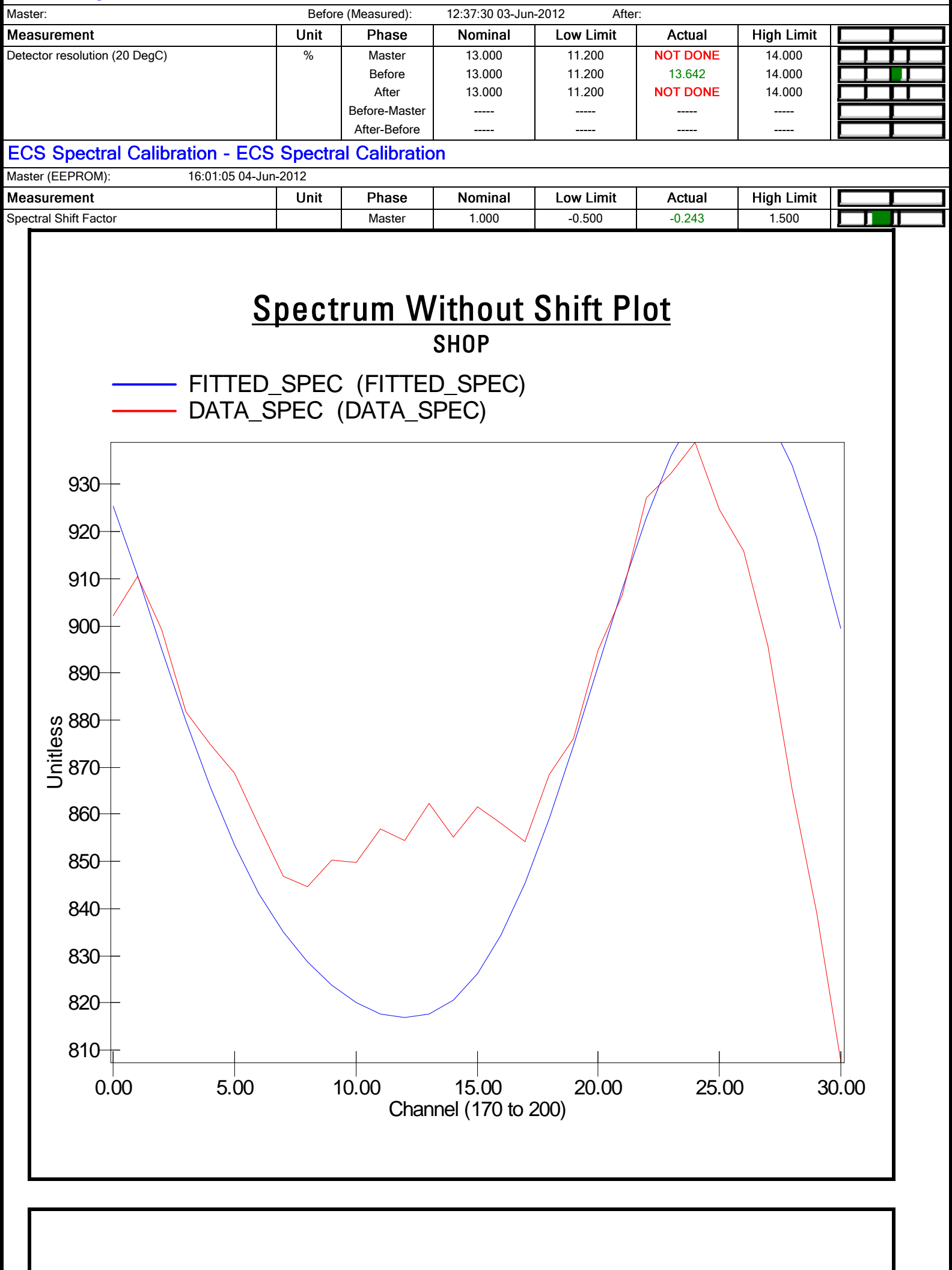
HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 12:41:11 03-Jun-2012		After:					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before	30.0	0	45.2	120.0	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
RGR Plus Measurement	gAPI	Before	185.4	157.1	167.5	206.3	
		After	-----	-----	NOT DONE	-----	
		After-Before	-----	-----	-----	-----	
GR Calibration Gain		Before	0.89	0.80	0.98	1.05	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

ECS-A (Elemental Capture Spectroscopy Tool) Calibration - Run 1

Primary Equipment :			
The ECS sonde is used to measure elemental concentrations.		ECS-A	130
Auxiliary Equipment :			
Litho-Density Spectroscopy Cartridge		LDSC-B	
Housing for the LDSC		LDSH-A	18
Housing to contain the ECS Sonde Assembly		ECSH-A	
The gamma ray BGO detector is used to detect prompt capture gamma rays for spectroscopy measurement.		ECSD-A	
The AmBe source provides neutrons for the prompt capture spectroscopy measurement.		NSR-F	

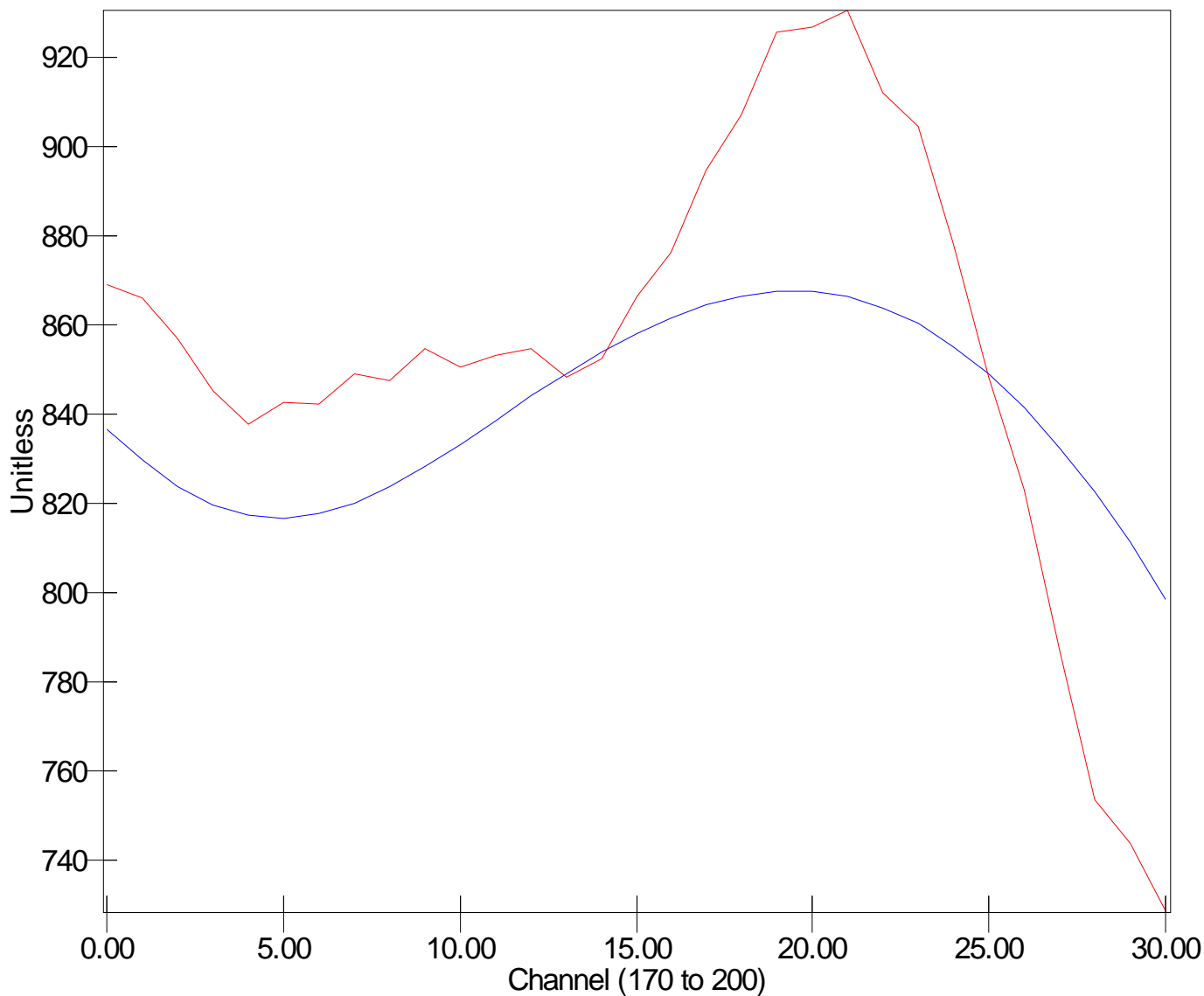
ECS Background Measurement Check - ECS Calibration Check



Spectrum With Shift Plot

SHOP

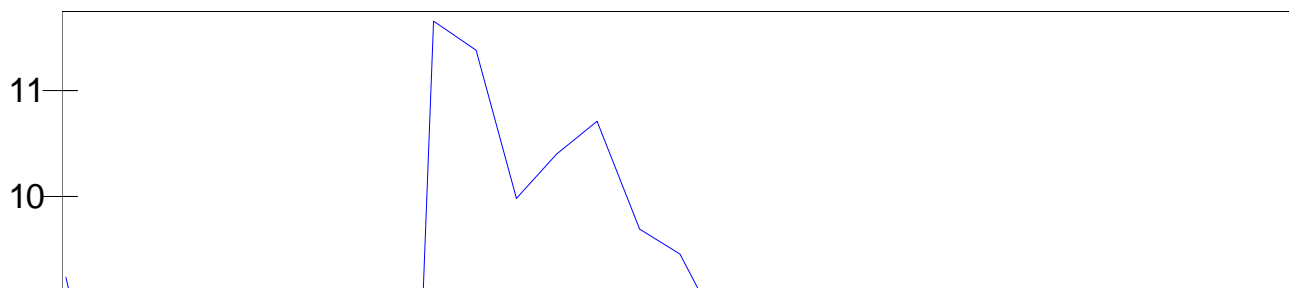
FITTED_SPEC_SF (FITTED_SPEC_SF)
DATA_SPEC_SF (DATA_SPEC_SF)

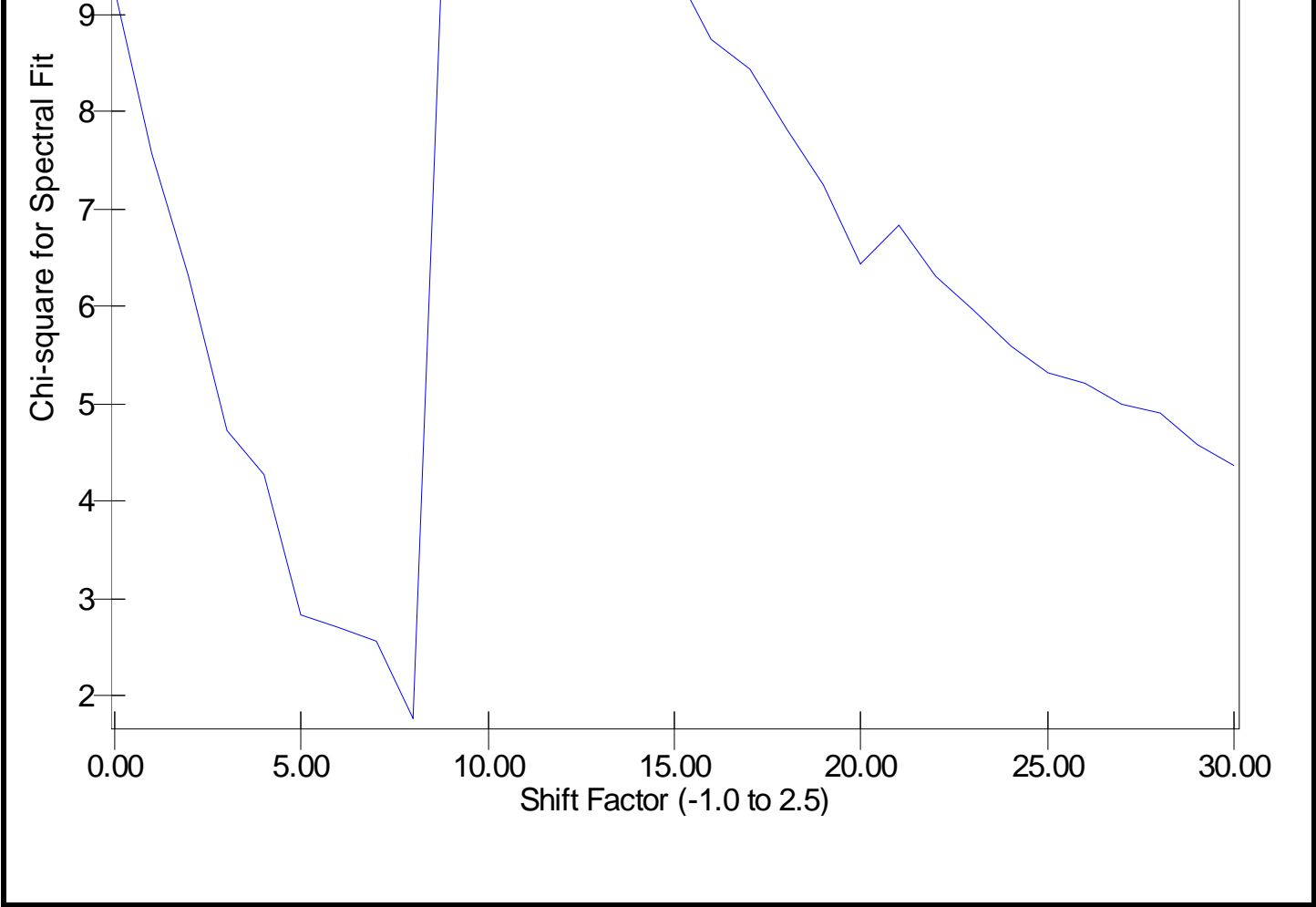


Chi Square for Spectral Fit Plot

SHOP

CHISQ_SPEC_FIT





HNGS-BA (Hostile-environment Natural Gamma-ray Sonde) Calibration - Run 1

Primary Equipment :			
HNGS Sonde Element		HNGS-BA	
Auxiliary Equipment :			
Hostile Natural Gamma Ray Cartridge		HNGC-A	
Housing for the HNGC		HNGH-A	313
HNGS Housing Element		HEH-K	186

HNGS Background and Na22 Set Point Determination - Detector 1 Check

Master (Manual Entry): 13:26:13 31-Mar-2012		Before (Measured): 12:29:22 03-Jun-2012		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Location		Master	----	----	38.598	----	
		Before	40.000	37.500	38.704	42.500	
		After	----	----	----	----	
		Before-Master	----	----	0.106	----	
		After-Before	----	----	----	----	
Na 511 Peak Resolution	%	Master	----	----	14.537	----	
		Before	15.500	12.000	16.149	19.000	
		After	----	----	----	----	
		Before-Master	----	----	1.612	----	
		After-Before	----	----	----	----	
High Voltage DAC Value	V	Master	----	----	----	----	
		Before	1150.000	850.000	1047.088	1600.000	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Na 1785 Peak Location		Master	----	----	139.124	----	
		Before	142.650	135.000	139.867	150.300	
		After	----	----	----	----	
		Before-Master	----	----	0.743	----	
		After-Before	----	----	----	----	

Na 1785 Peak Resolution	%	Master Before After Before-Master After-Before	----- 8.500 ----- ----- -----	----- 7.000 ----- ----- -----	8.878 8.770 ----- -0.108 -----	----- 11.000 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>
Temperature	degF	Master Before After Before-Master After-Before	----- 59.900 ----- ----- -----	----- -20.002 ----- ----- -----	----- 68.394 ----- ----- -----	----- 140.000 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>
Na Count Rate	CPS	Master Before After Before-Master After-Before	45.000 45.000 ----- ----- -----	10.000 10.000 ----- ----- -----	14.879 46.109 ----- 31.230 -----	100.000 100.000 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>

HNGS Background and Na22 Set Point Determination - Detector 2 Check

Master (Manual Entry): 13:26:13 31-Mar-2012		Before (Measured): 12:29:22 03-Jun-2012		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Na 511 Peak Location		Master Before After Before-Master After-Before	----- 40.000 ----- ----- -----	----- 37.500 ----- ----- -----	39.760 39.624 ----- -0.136 -----	----- 42.500 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>
Na 511 Peak Resolution	%	Master Before After Before-Master After-Before	----- 15.500 ----- ----- -----	----- 12.000 ----- ----- -----	15.230 16.459 ----- 1.229 -----	----- 19.000 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>
High Voltage DAC Value	V	Master Before After Before-Master After-Before	----- 1150.000 ----- ----- -----	----- 850.000 ----- ----- -----	----- 1084.917 ----- ----- -----	----- 1600.000 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>
Na 1785 Peak Location		Master Before After Before-Master After-Before	----- 142.650 ----- ----- -----	----- 135.000 ----- ----- -----	141.858 142.325 ----- 0.467 -----	----- 150.300 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>
Na 1785 Peak Resolution	%	Master Before After Before-Master After-Before	----- 8.500 ----- ----- -----	----- 7.000 ----- ----- -----	9.375 9.387 ----- 0.012 -----	----- 11.000 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>
Temperature	degF	Master Before After Before-Master After-Before	----- 59.900 ----- ----- -----	----- -20.002 ----- ----- -----	----- 70.212 ----- ----- -----	----- 140.000 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>
Na Count Rate	CPS	Master Before After Before-Master After-Before	45.000 45.000 ----- ----- -----	10.000 10.000 ----- ----- -----	14.937 45.751 ----- 30.814 -----	100.000 100.000 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>

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

Master (Manual Entry): 13:26:13 31-Mar-2012		Before (Measured): 12:29:22 03-Jun-2012		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Coincidence Count Rate Ratio		Master Before After Before-Master After-Before	----- 1.000 ----- ----- -----	----- 0.950 ----- ----- -----	----- 1.003 ----- ----- -----	----- 1.050 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>

HNGS Background and Na22 Set Point Determination - Detector 1 Calibration

Master (Manual Entry): 13:26:13 31-Mar-2012		Before (Measured): 12:29:22 03-Jun-2012		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Th Peak Location - 0		Master Before After Before-Master After-Before	209.630 ----- ----- ----- -----	201.000 ----- ----- ----- -----	207.370 ----- ----- ----- -----	218.250 ----- ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>

		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Th Peak Resolution - 0	%	Master	7.000	5.000	7.063	9.000	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Background Count Rate	CPS	Master	-----	-----	-----	-----	
		Before	142.500	10.000	119.460	265.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Gain Ratio - 0		Master	1.000	0.940	1.022	1.060	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HNGS Background and Na22 Set Point Determination - Detector 2 Calibration

Master (Manual Entry): 13:26:13 31-Mar-2012		Before (Measured): 12:29:22 03-Jun-2012		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Th Peak Location - 0		Master	209.630	201.000	207.997	218.250	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Th Peak Resolution - 0	%	Master	7.000	5.000	6.932	9.000	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Background Count Rate	CPS	Master	-----	-----	-----	-----	
		Before	142.500	10.000	123.131	265.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Gain Ratio - 0		Master	1.000	0.940	0.995	1.060	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HNGS Background and Na22 Set Point Determination - Detector 1 Calibration

Master (Manual Entry): 13:26:13 31-Mar-2012		Before (Measured): 12:29:22 03-Jun-2012		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Set Point - 0		Master	40.000	38.000	40.000	43.500	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HNGS Background and Na22 Set Point Determination - Detector 2 Calibration

Master (Manual Entry): 13:26:13 31-Mar-2012		Before (Measured): 12:29:22 03-Jun-2012		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Set Point - 0		Master	40.000	38.000	41.000	43.500	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

EDTC-B (Enhanced Digital Telemetry Cartridge - Version B) Calibration - Run 1

Primary Equipment :			
Enhanced Digital Telemetry Cartridge - B		EDTC-B	8054
Calibration Parameter :			
Plus Reference (Jig minus background reference)		165	

EDTC-B Accelerometer Calibration - EDTC-B Accelerometer Calibration							
Before (Measured):		11:52:29 04-Jun-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div></div>
AZ Vertical Measurement	ft/s2	Before	32.19	31.53	32.38	32.84	<div><div></div><div></div><div></div><div></div></div>
EDTC-B Memory Data - EDTC-B Memory Data							
Master (EEPROM):		12:33:13 04-Jun-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div></div>
Initial PMT HV	V	Master	----	----	1574.000	----	<div><div></div><div></div></div>
Accelerometer Serial Number		Master	----	----	0	----	<div><div></div><div></div></div>
Accelerometer Coefficients - 0		Master	----	----	2.933	----	<div><div></div><div></div></div>
Accelerometer Coefficients - 1		Master	----	----	0.000	----	<div><div></div><div></div></div>
Accelerometer Coefficients - 2		Master	----	----	0.000	----	<div><div></div><div></div></div>
Accelerometer Coefficients - 3		Master	----	----	0.000	----	<div><div></div><div></div></div>
Accelerometer Coefficients - 4		Master	----	----	0.000	----	<div><div></div><div></div></div>
Accelerometer Coefficients - 5		Master	----	----	0.000	----	<div><div></div><div></div></div>
Accelerometer Coefficients - 6		Master	----	----	0.000	----	<div><div></div><div></div></div>
Accelerometer Coefficients - 7		Master	----	----	-0.011	----	<div><div></div><div></div></div>
Accelerometer Coefficients - 8		Master	----	----	0.000	----	<div><div></div><div></div></div>
Accelerometer Coefficients - 9		Master	----	----	0.000	----	<div><div></div><div></div></div>
Accelerometer Coefficients - 10		Master	----	----	0.000	----	<div><div></div><div></div></div>
Accelerometer Coefficients - 11		Master	----	----	0.000	----	<div><div></div><div></div></div>
Gamma-Ray Detector Serial Number		Master	----	----	77758	----	<div><div></div><div></div></div>
EDTC-B Gamma-Ray Calibration - Gamma Ray Coefficients							
Before (Measured):		12:46:40 03-Jun-2012		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div></div>
Gamma Ray Gain		Before	1.000	0.900	1.084	1.100	<div><div></div><div></div><div></div><div></div></div>
		After	----	----	----	----	<div><div></div><div></div></div>
		After-Before	----	----	----	----	<div><div></div><div></div></div>
EDTC-B Gamma-Ray Calibration - Gamma Ray Accumulations							
Before (Measured):		12:46:40 03-Jun-2012		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div></div>
RGR Zero Measurement	gAPI	Before	----	0	36.011	120.000	<div><div></div><div></div><div></div><div></div></div>
		After	----	----	----	----	<div><div></div><div></div></div>
		After-Before	----	----	----	----	<div><div></div><div></div></div>
RGR Plus Measurement	gAPI	Before	165.000	150.000	152.213	180.000	<div><div></div><div></div><div></div><div></div></div>
		After	----	----	----	----	<div><div></div><div></div></div>
		After-Before	----	----	----	----	<div><div></div><div></div></div>

Company:	EnCana Oil & Gas (USA)	Schlumberger
Well:	DV08B-23 (H23 4101)	
Field:	East Douglas Creek	
County:	Rio Blanco	
State:	Colorado	
ECS SPECTROLITH		