

# HALLIBURTON

ARRAY COMPENSATED  
TRUE RESISTIVITY  
SPECTRAL DENSITY  
DUAL SPACED NEUTRON

COMPANY		KERR-MCGEE OIL & GAS ONSHORE LP	
WELL		NICHOLS 21-8	
FIELD		WATTENBERG	
COUNTY		WELD	
STATE		CO	
Permanent Datum		GL	
Log measured from		KB	
Drilling measured from		KB	
Date		23-Jun-11	
Run No.		ONE	
Depth - Driller		7950.00 ft	
Depth - Logger		7912.0 ft	
Bottom - Logged Interval		7910 ft	
Top - Logged Interval		CASING	
Casing - Driller		8.625 in @ 837.0 ft	
Casing - Logger		838.0 ft	
Bit Size		7.875 in	
Type Fluid in Hole		WATER BASED MUD	
Density		8.4 ppq	
Viscosity		26.00 s/qt	
PH		6.50 pH	
Source of Sample		MUD CELL	
Rm @ Meas. Temperature		0.920 ohmm @ 93.60 degF	
Rmf @ Meas. Temperature		0.96 ohmm @ 75.00 degF	
Rmc @ Meas. Temperature		1.011 ohmm @ 75.00 degF	
Source Rmf		CHART	
Rmc		CHART	
Rm @ BHT		0.36 ohmm @ 250.0 degF	
Time Since Circulation		5.0 hr	
Time on Bottom		23-Jun-11 11:53	
Max. Rec. Temperature		250.0 degF @ 7912.0 ft	
Equipment		10800785	
Location		BRIGHTON	
Recorded By		R. TWEETEN	
Witnessed By		D. WARNER	
Other Services:		RWCH	
Location		SURFACE LOCATION: 529' FNL & 2.630' FEL NWNE BOTTOM LOCATION: 1.357' FNL & 2.531' FWL SWNW	
LATITUDE: 40.159065° LONGITUDE: -104.687677°			
Sect. 8		Twp. 2N	
Rge. 65W			
Elev. 4876.0 ft		Elev. 4890.0 ft	
D.F. 4889.0 ft		D.F. 4876.0 ft	
14.0 ft above perm. Datum			

Fold here

Service Ticket No.: 8261245				API Serial No.: 05123331260000				PGM Version: WL INSITE R3.2.5 (Build 2)											
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE								RESISTIVITY SCALE CHANGES											
Date		Sample No.						Type Log		Depth		Scale Up Hole		Scale Down Hole					
Depth-Driller																			
Type Fluid in Hole																			
Density		Viscosity																	
Ph		Fluid Loss																	
Source of Sample								RESISTIVITY EQUIPMENT DATA											
Rm @ Meas. Temp		@		@				Run No.		Tool Type & No.		Pad Type		Tool Pos.					
Rmf @ Meas. Temp.		@		@				ONE		ACRt		N/A		1.5" S.O.					
Rmc @ Meas. Temp.		@		@						90255013									
Source Rmf		Rmc																	
Rm @ BHT		@		@															
Rmf @ BHT		@		@															
Rmc @ BHT		@		@															
EQUIPMENT DATA																			
GAMMA				ACOUSTIC				DENSITY				NEUTRON							
Run No.		ONE		Run No.				Run No.		ONE		Run No.		ONE					
Serial No.		11215095		Serial No.				Serial No.		I332M319		Serial No.		11219332					
Model No.		GTET		Model No.				Model No.		SDLT		Model No.		DSNT					
Diameter		3.625"		No. of Cent.				Diameter		4.5"		Diameter		3.625"					
Detector Model No.		GTET		Spacing				Log Type		GAM-GAM		Log Type		NEU-NEU					
Type		SCINT						Source Type		CS-137		Source Type		AM241BE					
Length		8"		LSA [Y/N]				Serial No.		5256GW		Serial No.		DSN-430					
Distance to Source		9'		FWDA [Y/N]				Strength		1.78 CI		Strength		15 CI					
LOGGING DATA																			
GENERAL				GAMMA				ACOUSTIC				DENSITY				NEUTRON			

GENERAL			GAMMA		ACOUSTIC		DENSITY		NEUTRON							
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix		
No.	From	To	ft/min	L	R	L	R		L	R		L	R			
ONE	7912	CSG	REC	0	200				20	0	2.71	20	0	LIME		
DIRECTIONAL INFORMATION																
Maximum Deviation									@	KOP						@
Remarks: RWCH-GTET-DSNT-SDLT-ACRt RUN IN COMBINATION.																
ANNULAR HOLE VOLUME CALCULATED USING 4.5-INCH PRODUCTION CASING.																
TENSION PULLS AND BOREHOLE RUGOSITY AFFECT LOG RESPONSE.																
CHLORIDES REPORTED AT 750 ppm.																
DSNT DECENTRALIZER NOT RUN AT CLIENT'S REQUEST.																
YOUR CREW TODAY: J. WALKER, R. PERSHALL, M. BURNETT, C. MURNAN																
RIG: PATTERSON 189																
THANK YOU FOR USING HALLIBURTON LOGGING SERVICES - BRIGHTON, CO - (303) 335-7218																
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.																
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PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	7.875	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	8.400	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	0.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	0.920	ohmm
	SHARED	TRM	Temperature of Mud	93.6	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	4.500	in
	SHARED	ST	Surface Temperature	85.0	degF
	SHARED	TD	Total Well Depth	7912.00	ft
	SHARED	BHT	Bottom Hole Temperature	250.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	NONE	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
	Rwa / CrossPlot	AFAC	Archie A factor	0.6200	

Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GRSO	Gamma Tool Standoff	0.000	in
GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	TPOS	Tool Position	Centered	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	No	
DSNT	NLIT	Neutron Lithology	Limestone	
DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.000	in
DSNT	DNTP	Temperature Correction Type	None	
DSNT	DPRS	DSN Pressure Correction Type	None	
DSNT	SHCO	View More Correction Options	No	
DSNT	UTVD	Use TVD for Gradient Corrections?	No	
DSNT	LHWT	Logging Horizontal Water Tank?	No	
SDLT	DNOK	Process Density?	Yes	
SDLT	DNOK	Process Density EVR?	No	
SDLT	CB	Logging Calibration Blocks?	No	
SDLT	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT	DTWN	Disable temperature warning	No	
SDLT	DMA	Formation Density Matrix	2.710	g/cc
SDLT	DFL	Formation Density Fluid	1.000	g/cc
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT	MLOK	Process MicroLog Outputs?	Yes	
ACRt	RTOK	Process ACRt?	Yes	
ACRt	MNSO	Minimum Tool Standoff	1.50	in
ACRt	TCS1	Temperature Correction Source	FP Lwr & FP Up	
ACRt	TPOS	Tool Position	Eccentered	
ACRt	RMOP	Rmud Source	Mud Cell	
ACRt	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt	THQY	Threshold Quality	0.50	
BOTTOM_____				

Data: NICHOLS\_21-8\0001 TRIPLEVDLE

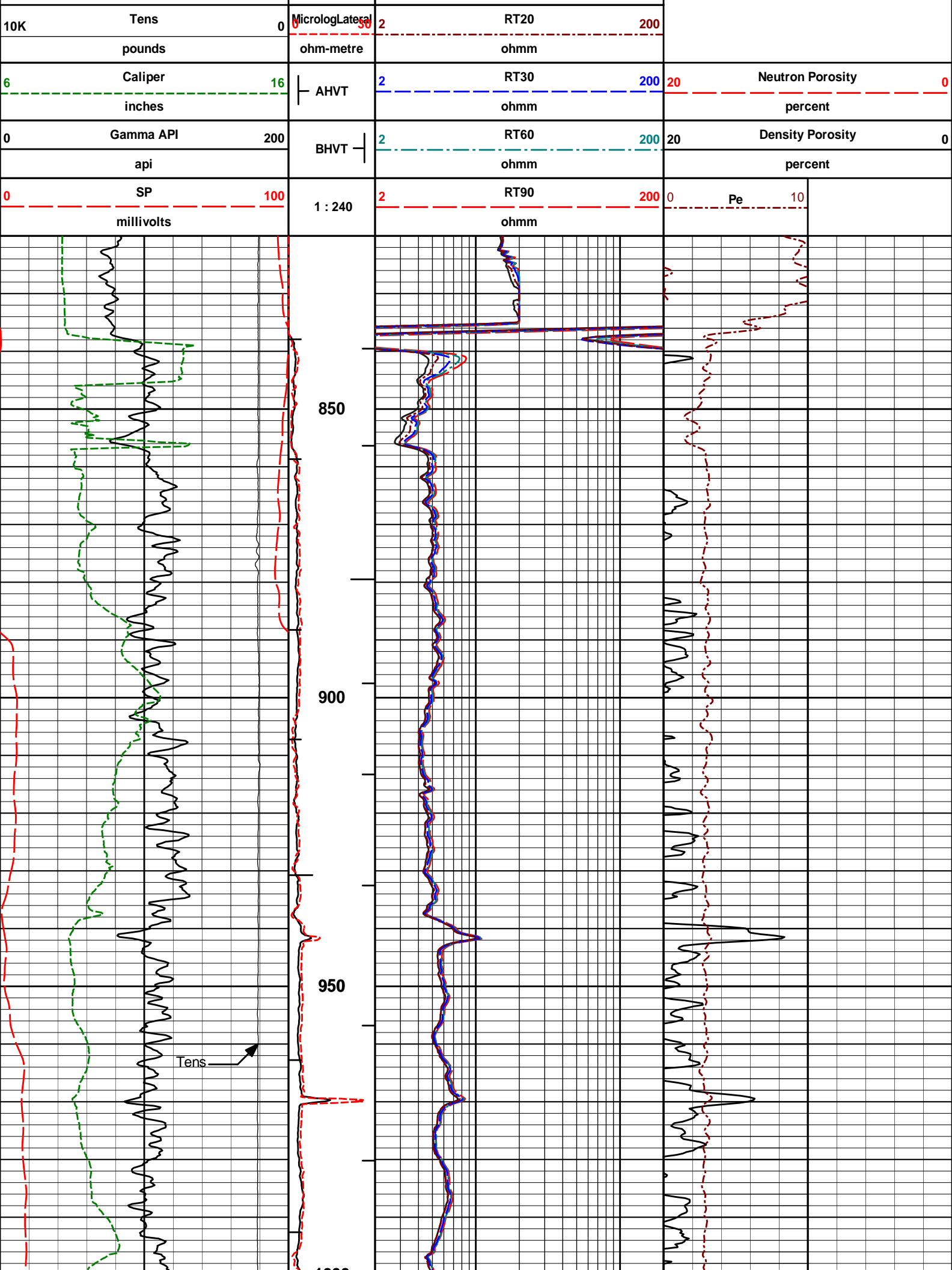
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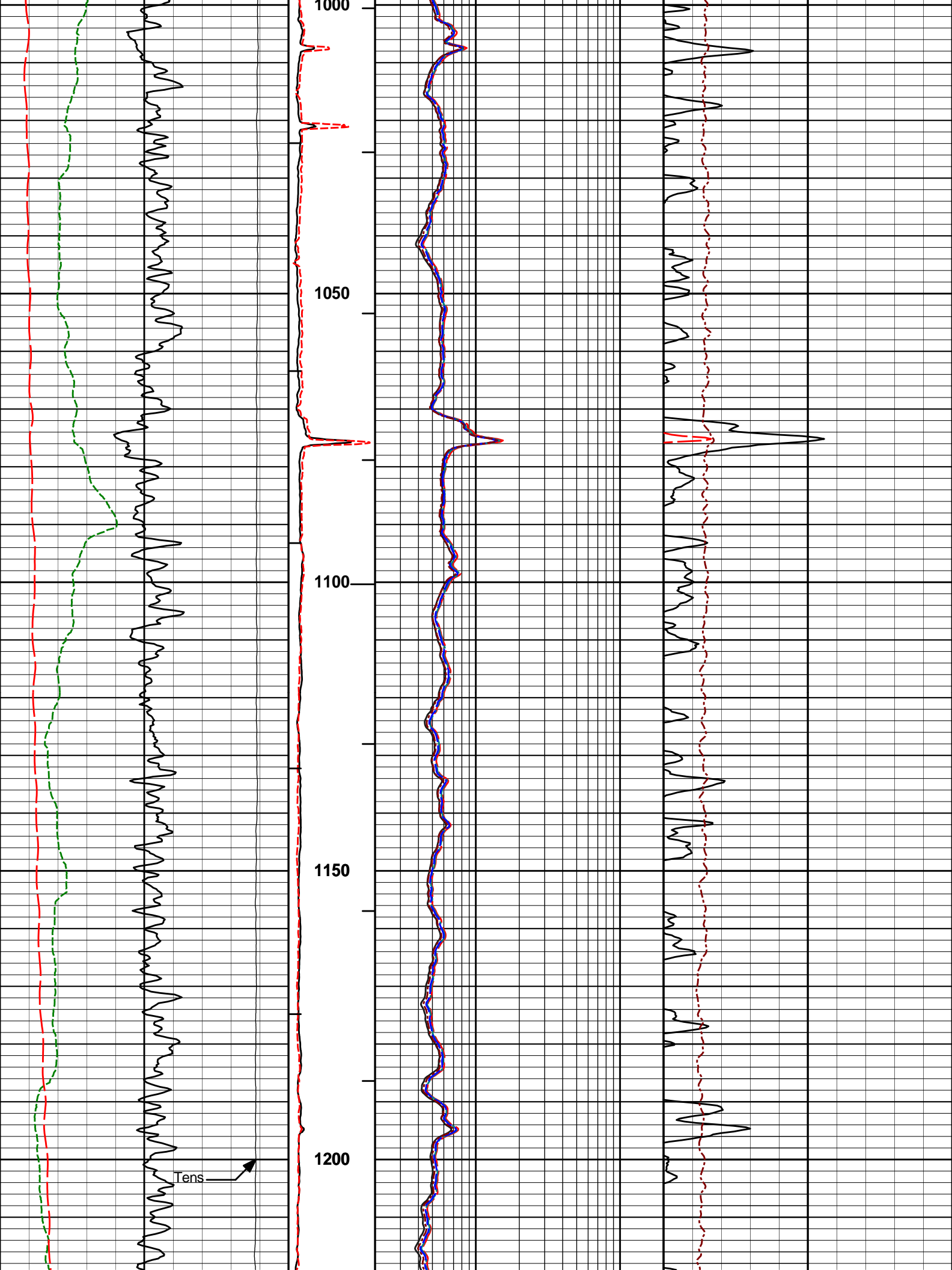
HALLIBURTON

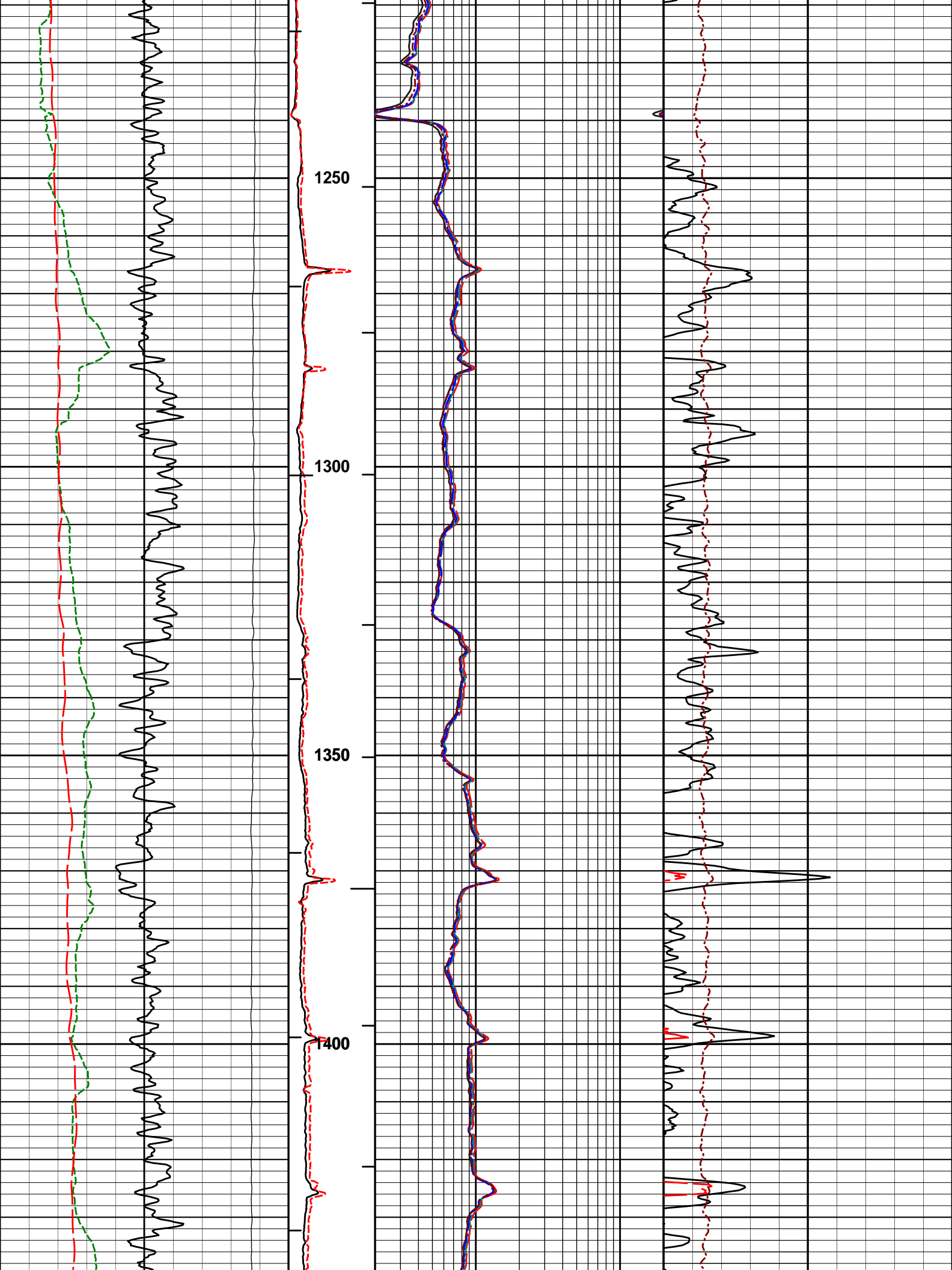
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Plot Range: 820 ft to 7908.58 ft  
Data: NICHOLS\_21-8\Well Based\MAIN\*  
Plot File: \\COMP\MAIN

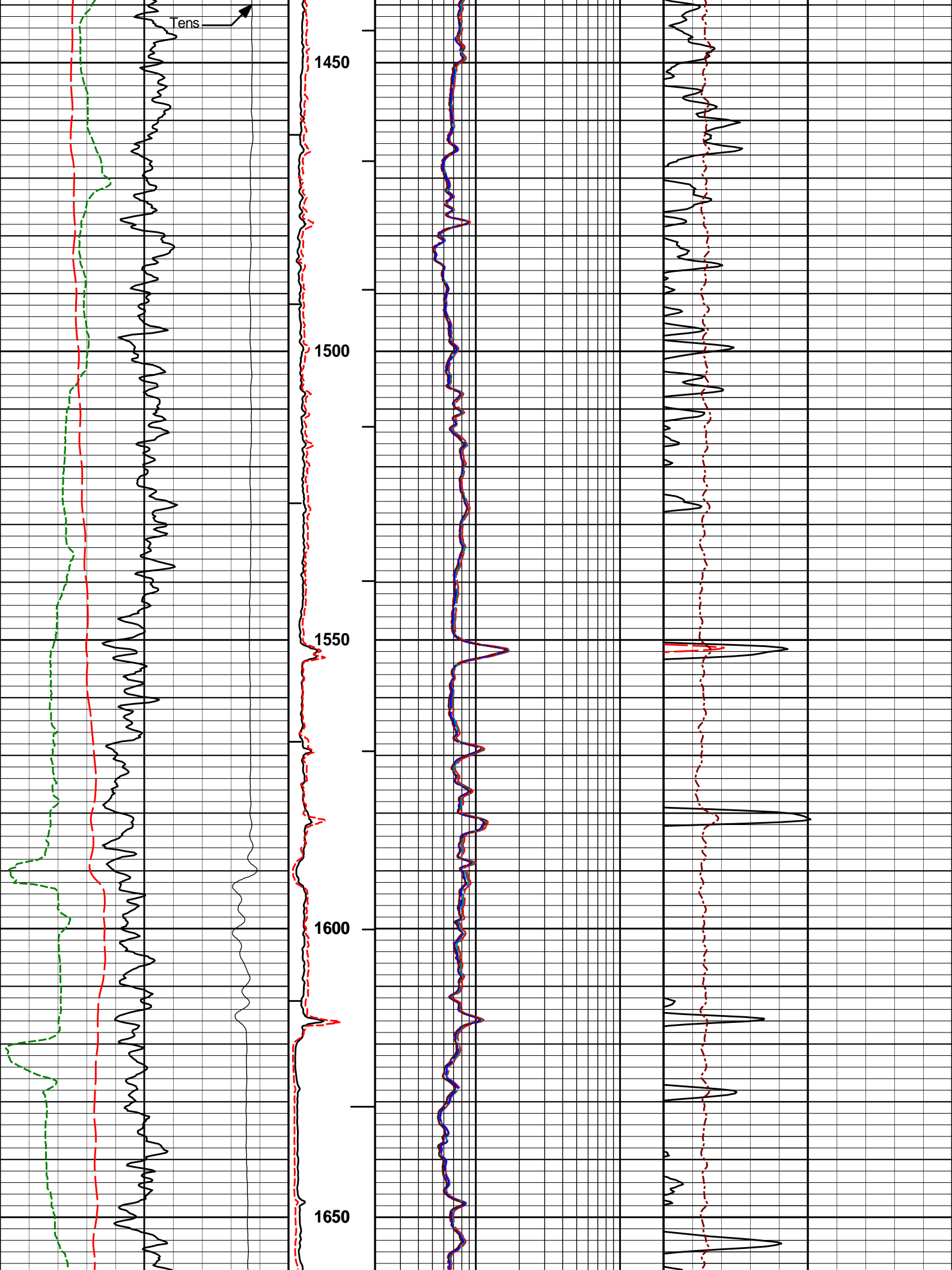
MAIN PASS 5" = 100'

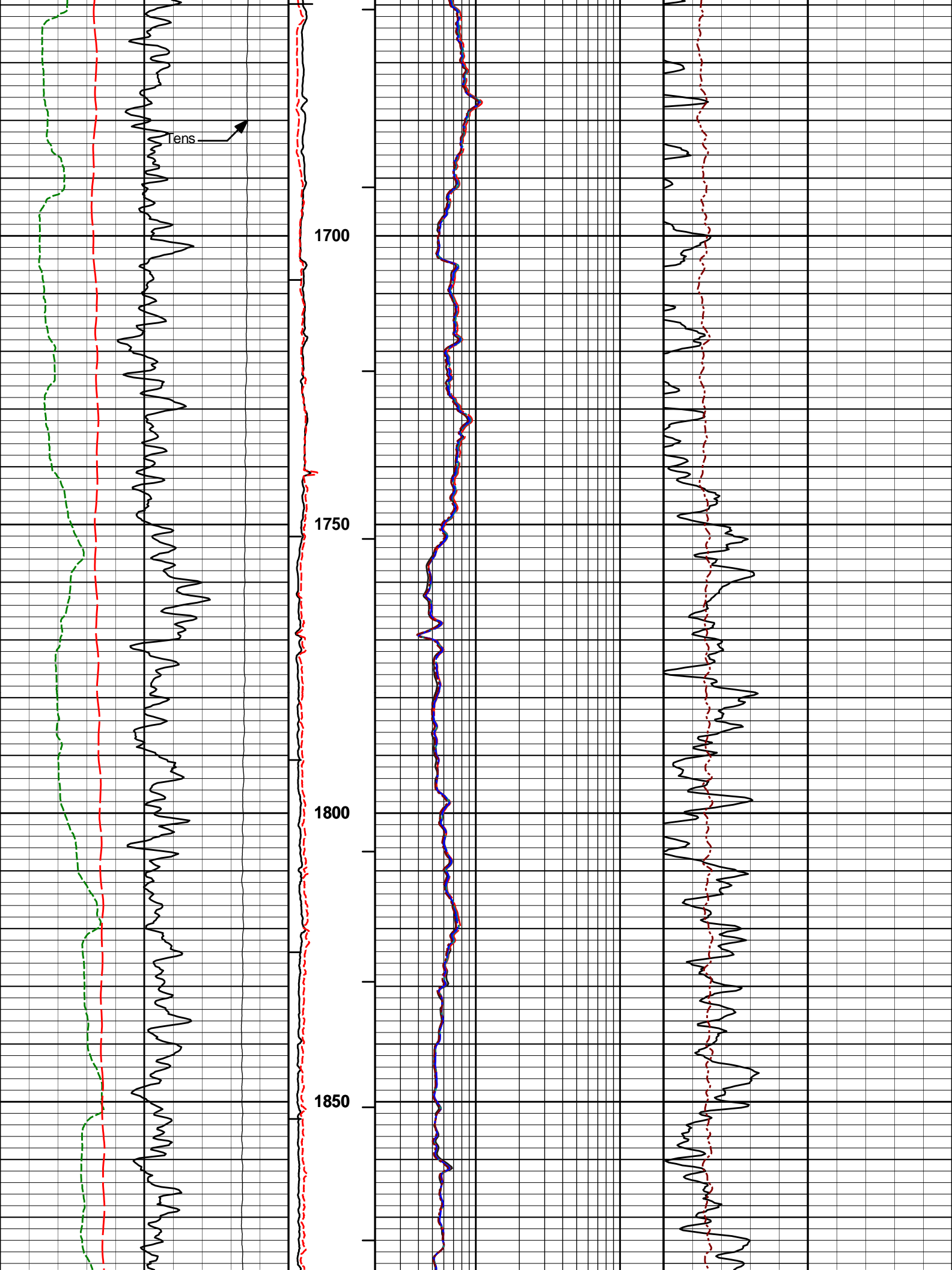
	MicrologNormal	2	RT10	200	
	ohm-metre		ohmm		



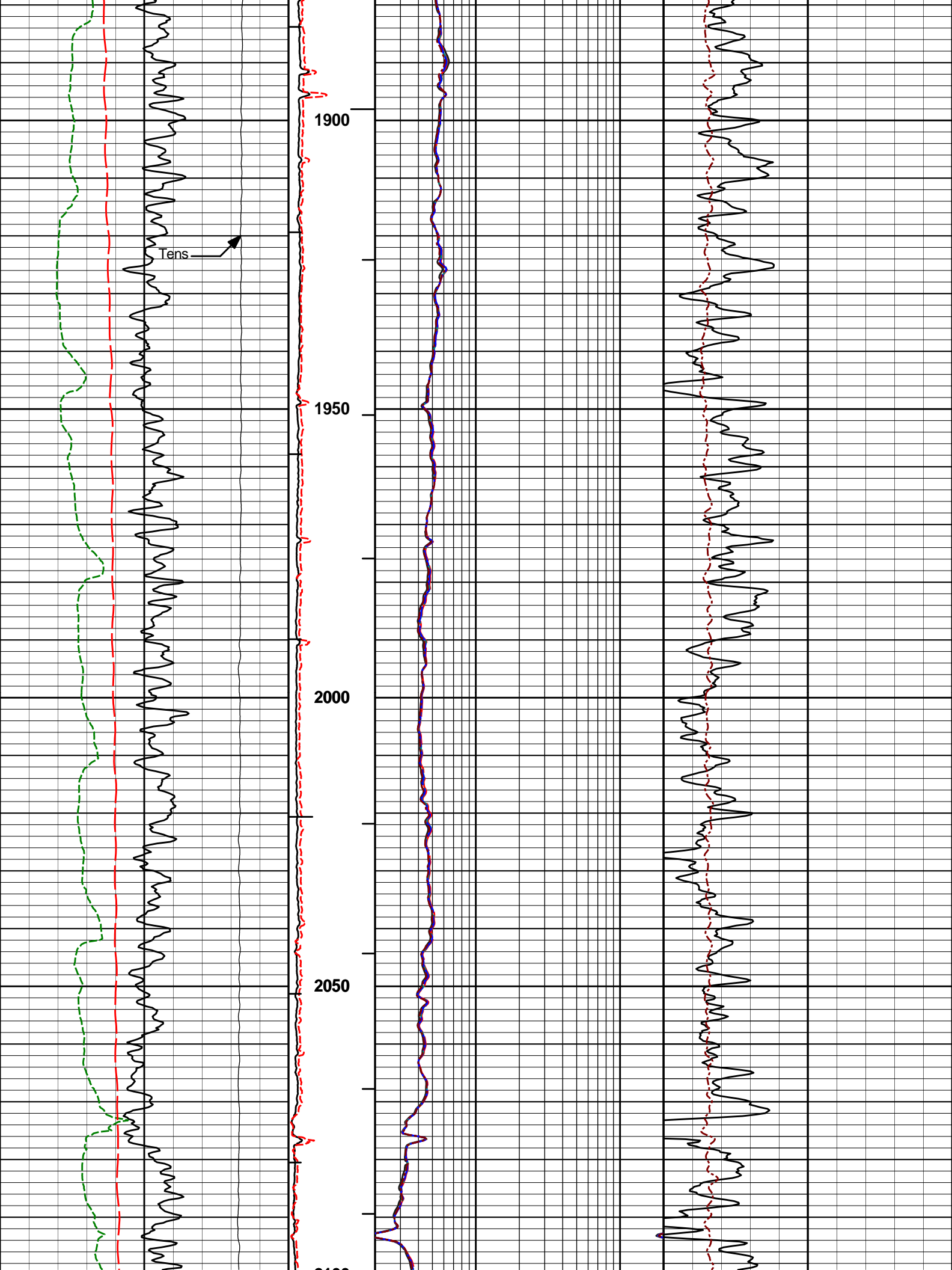


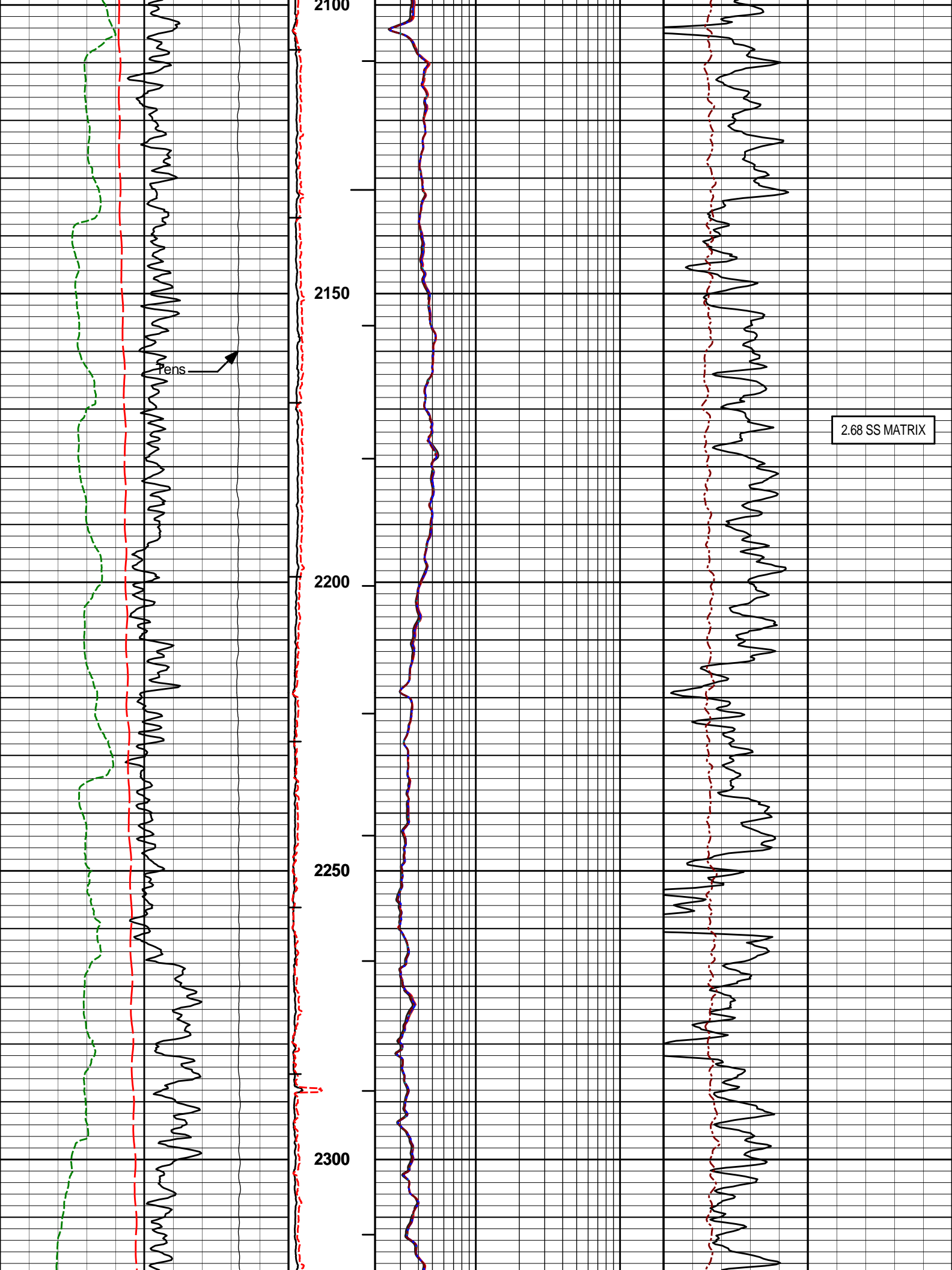


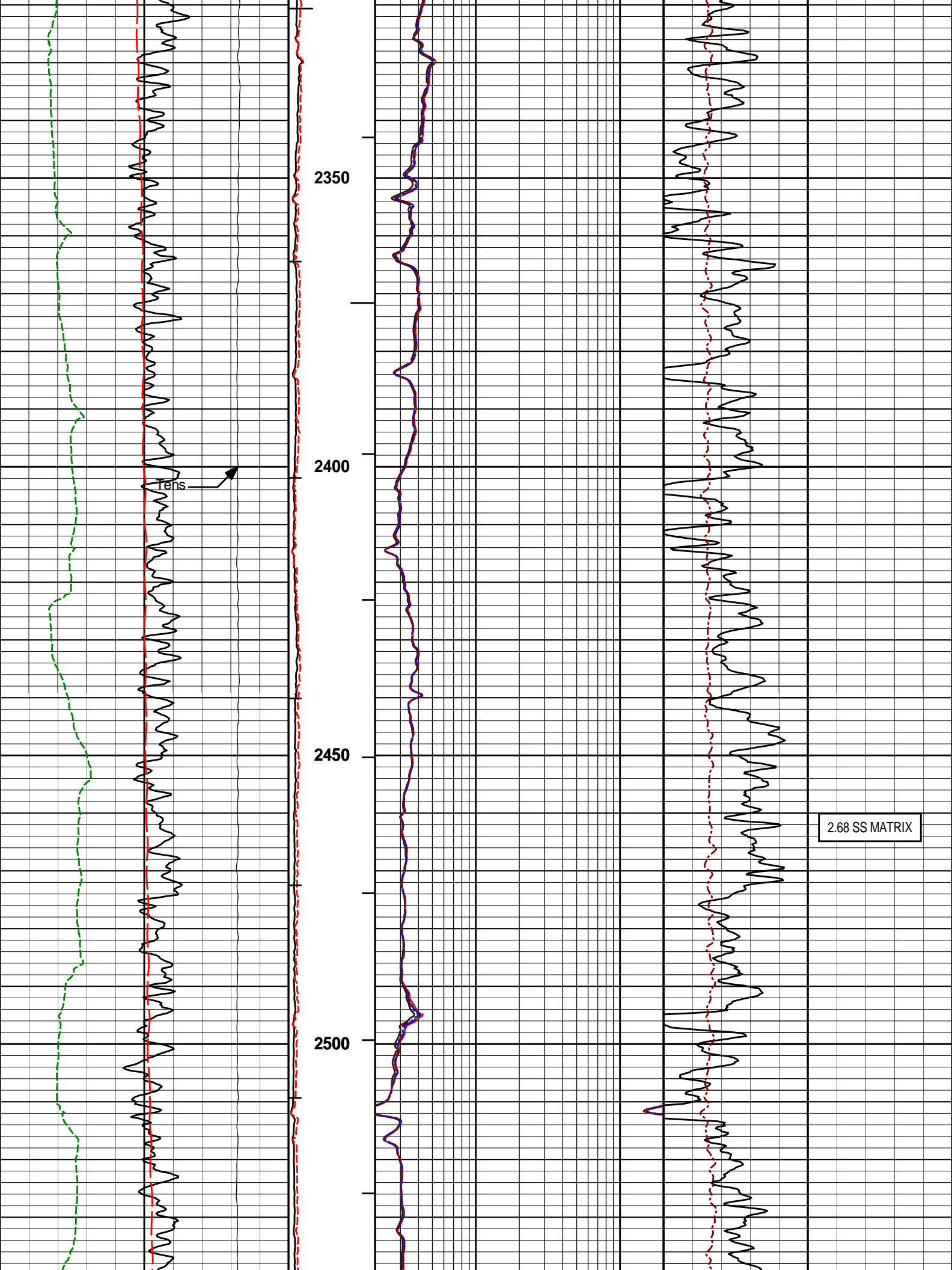


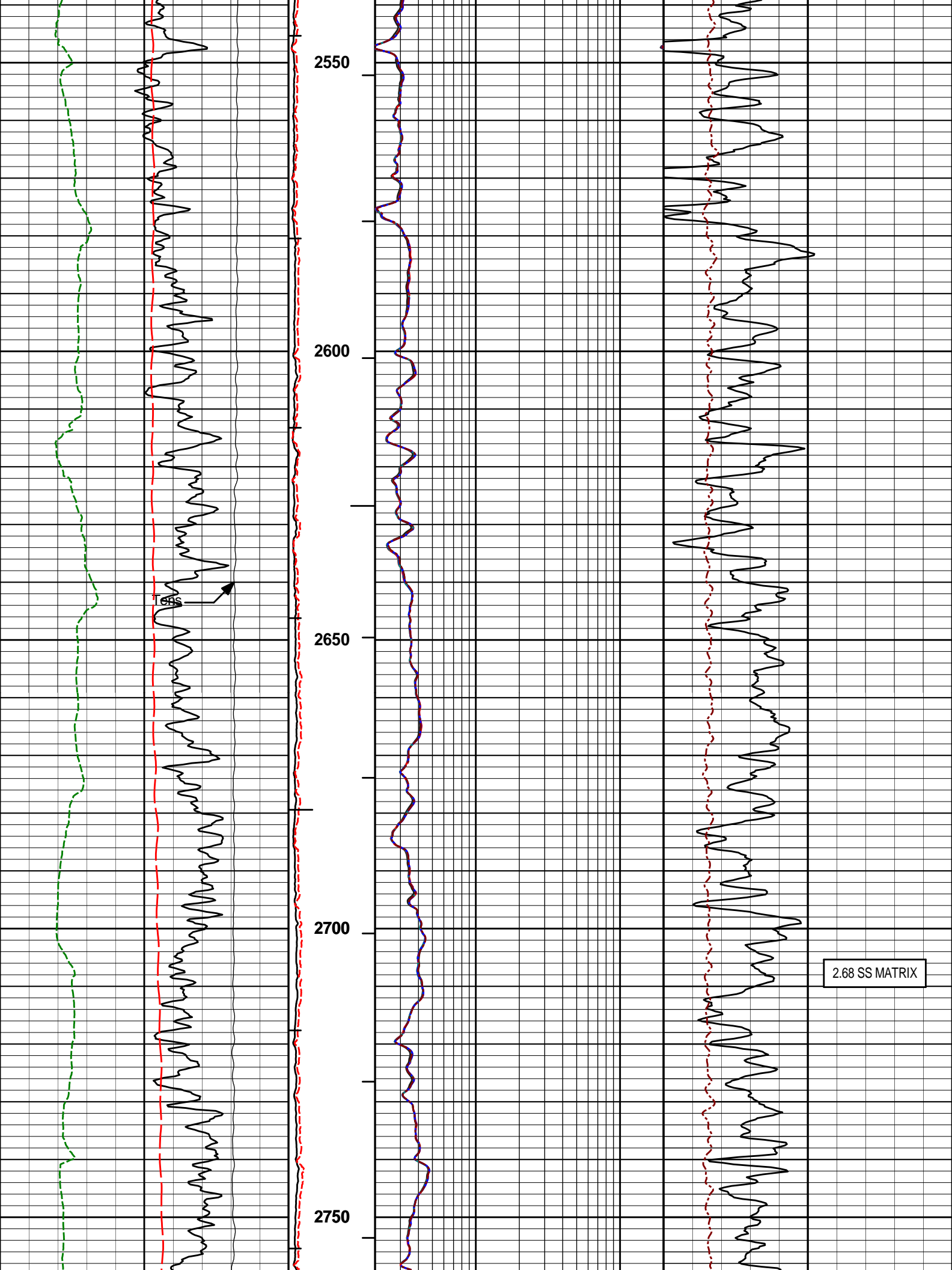


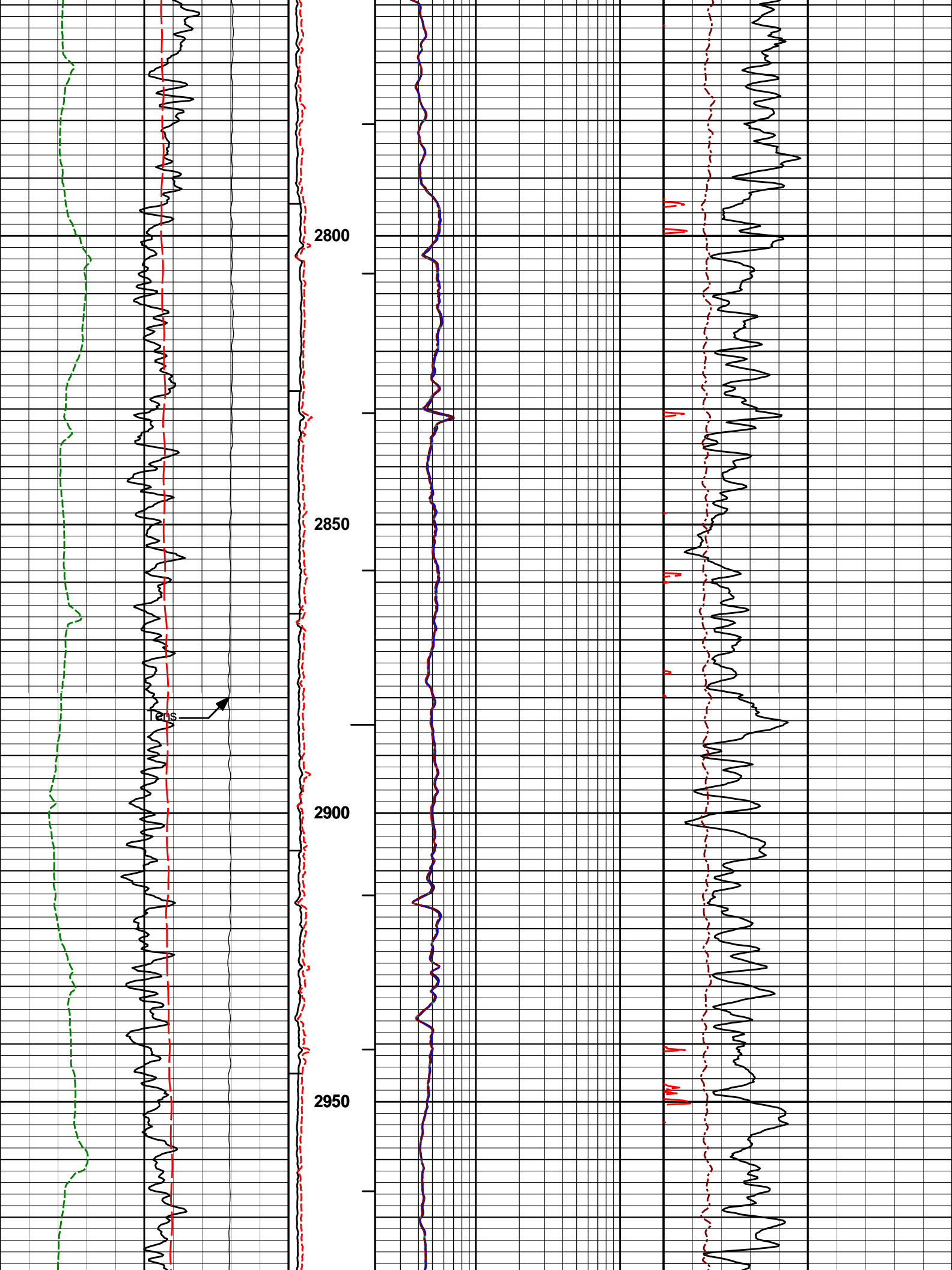


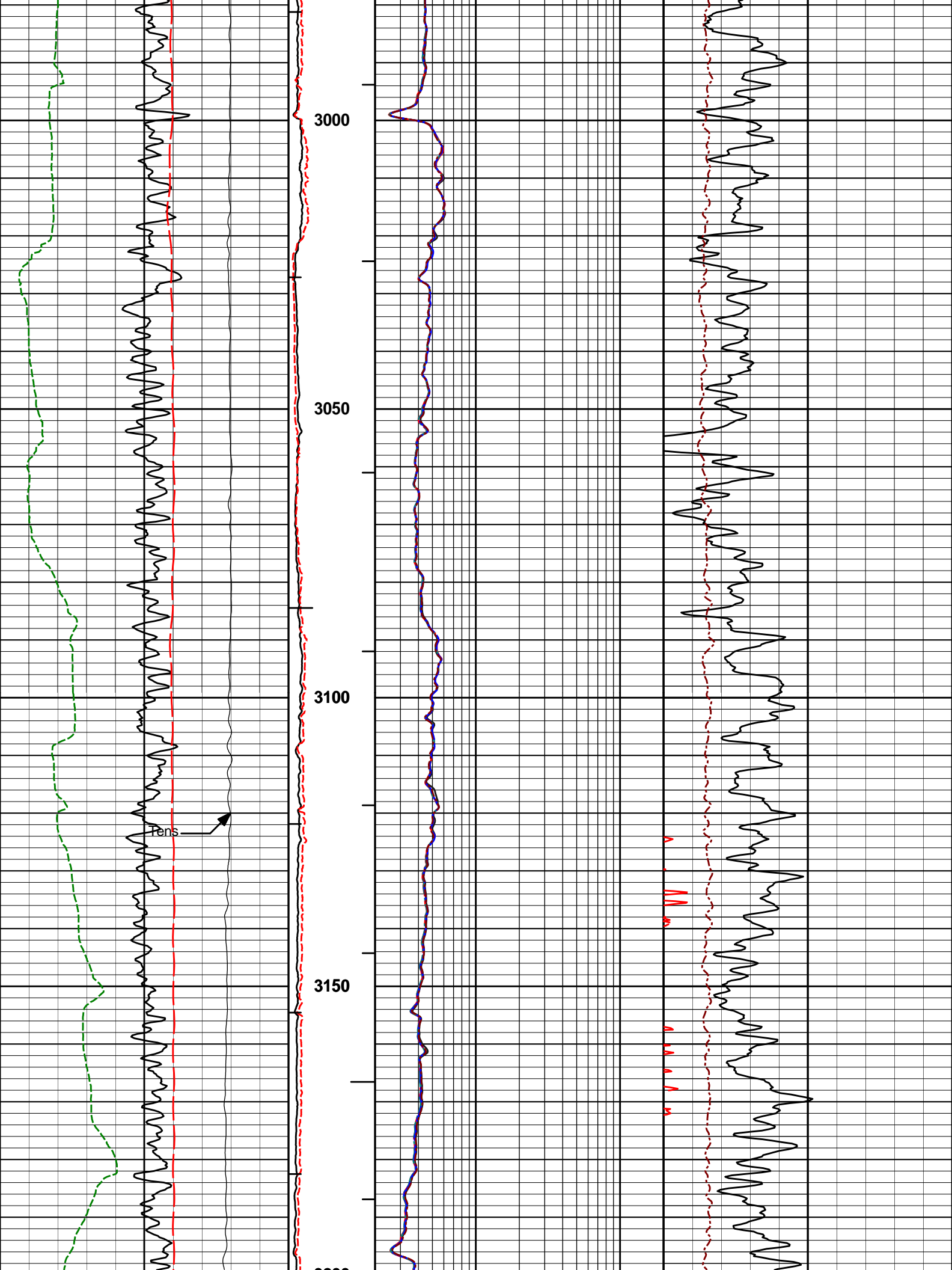


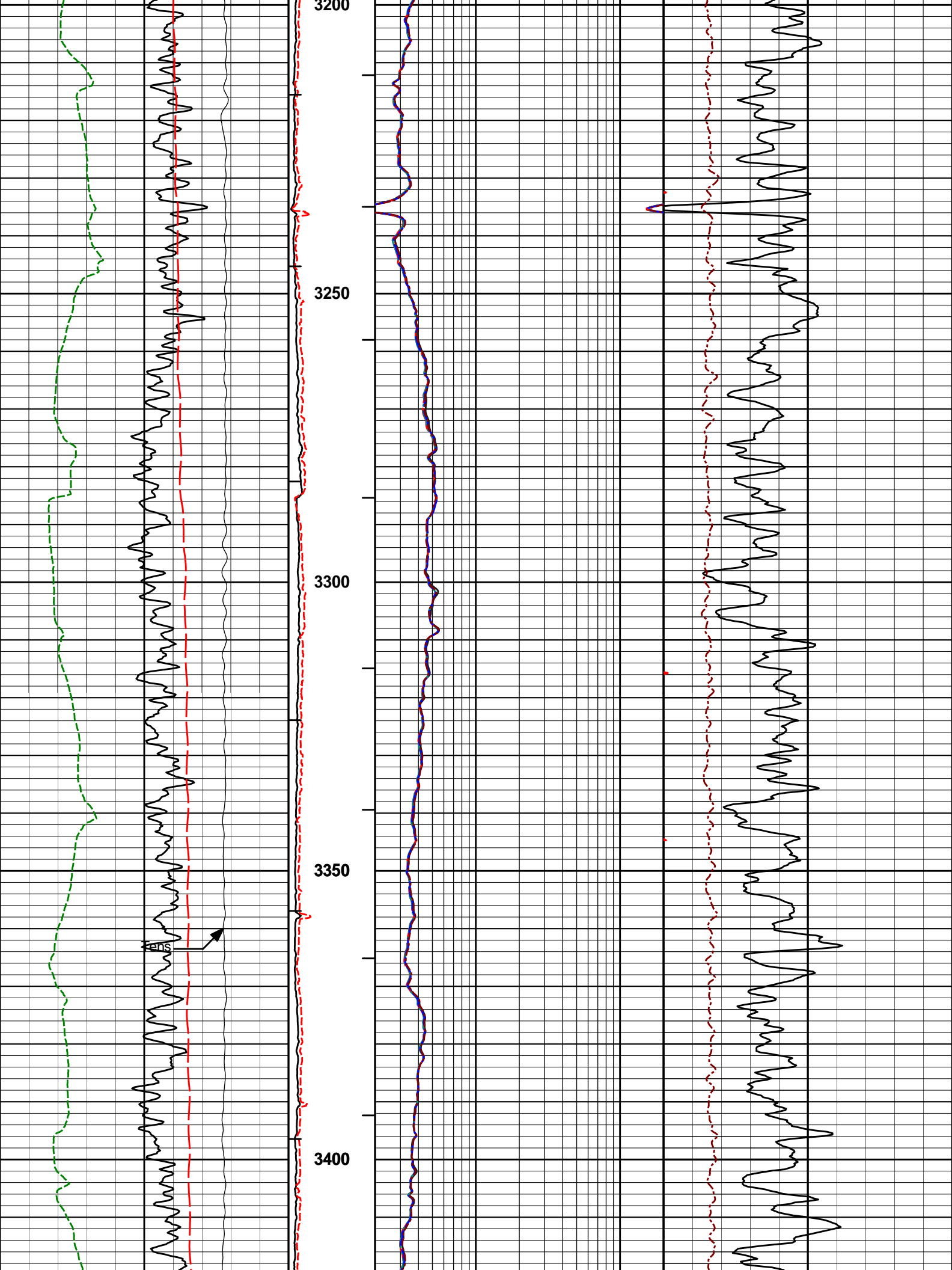


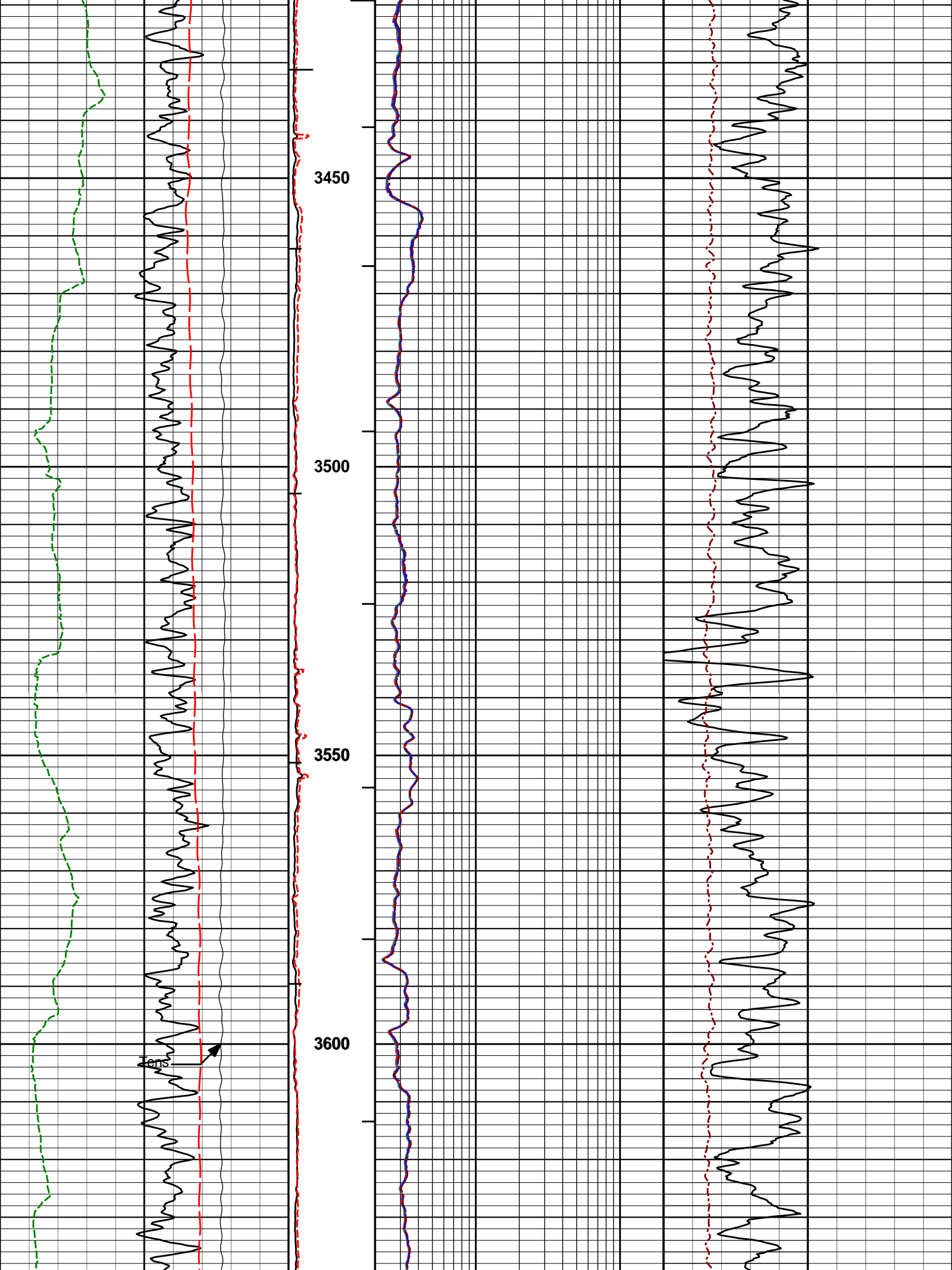




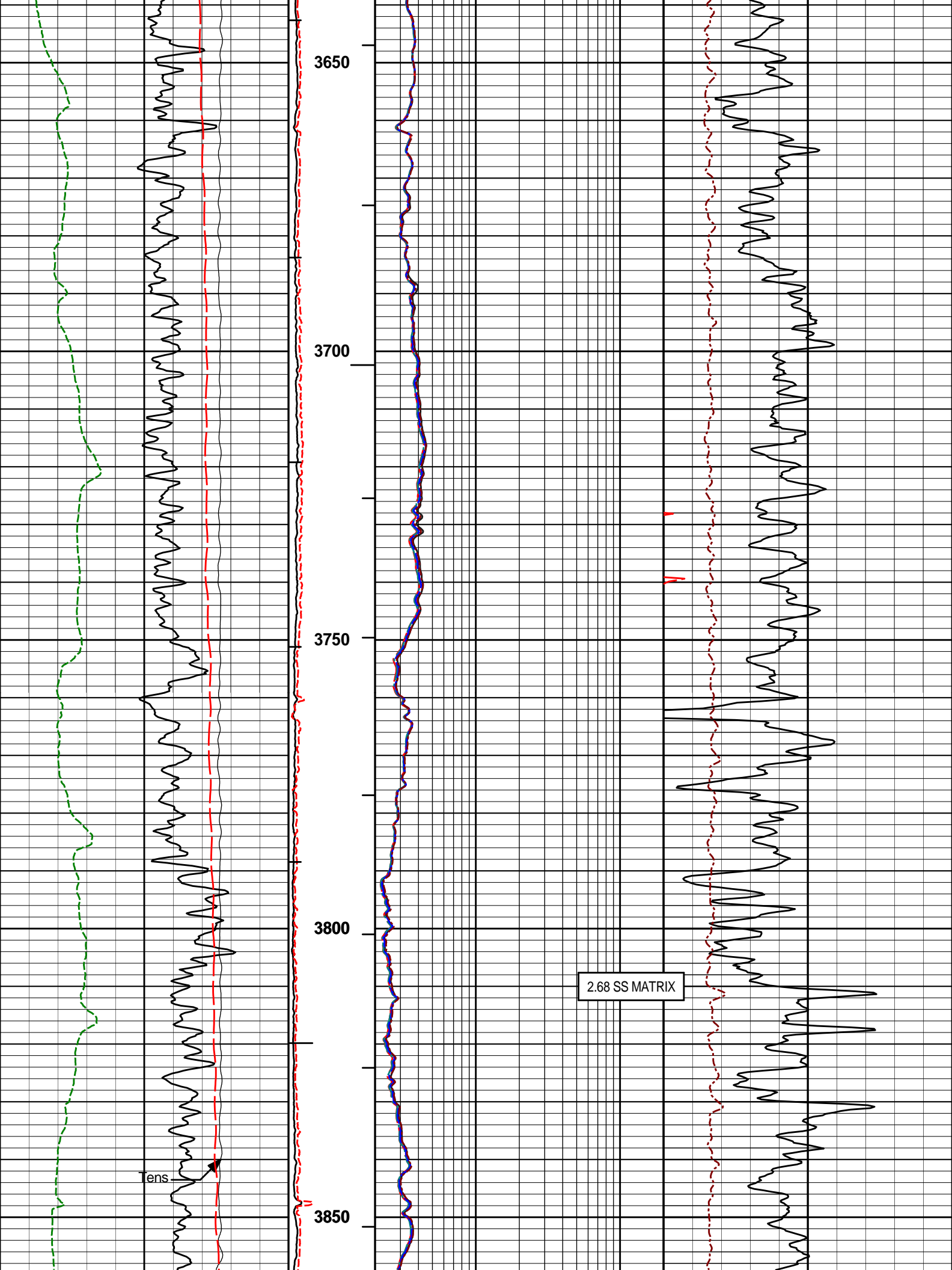


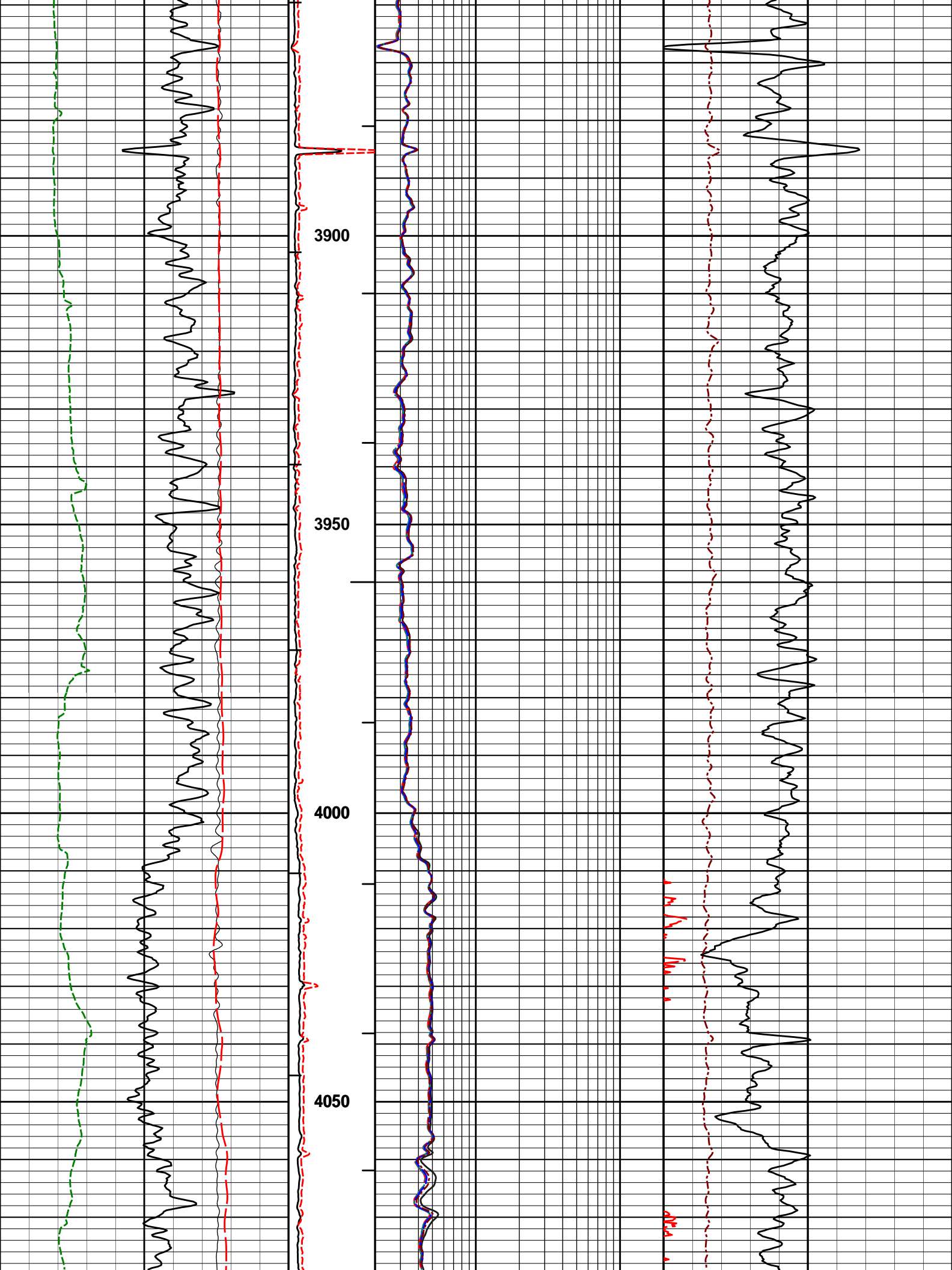


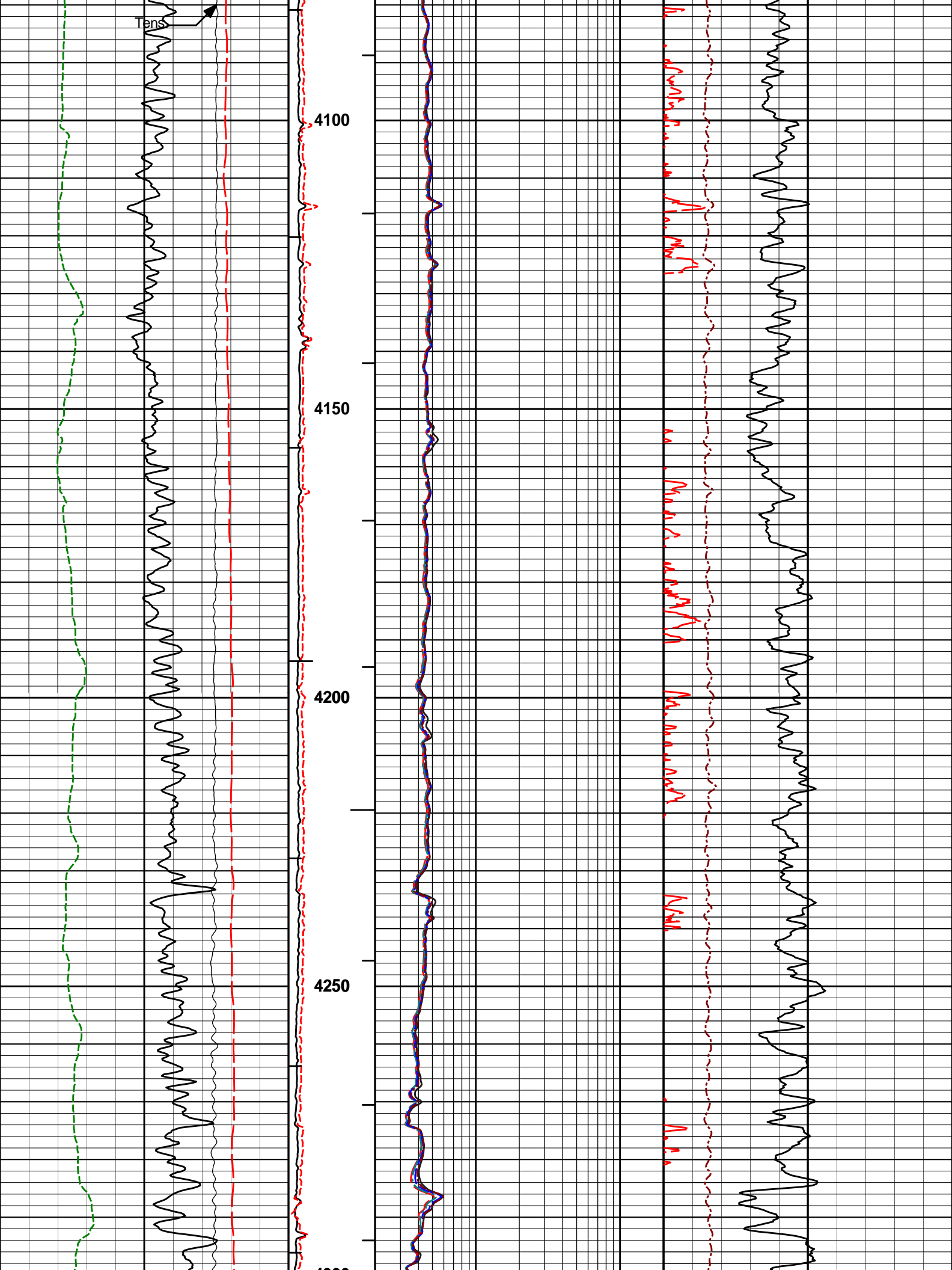


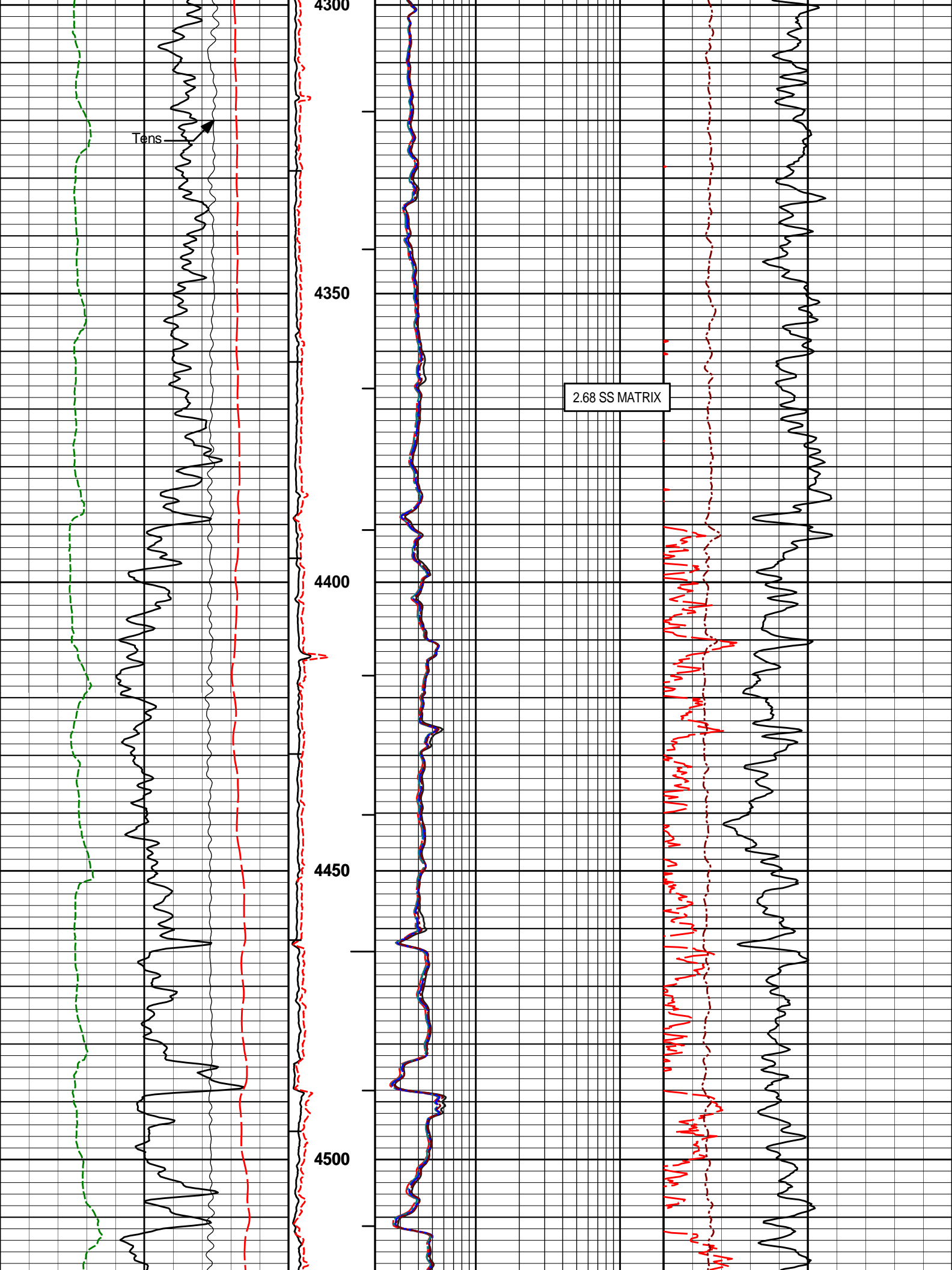


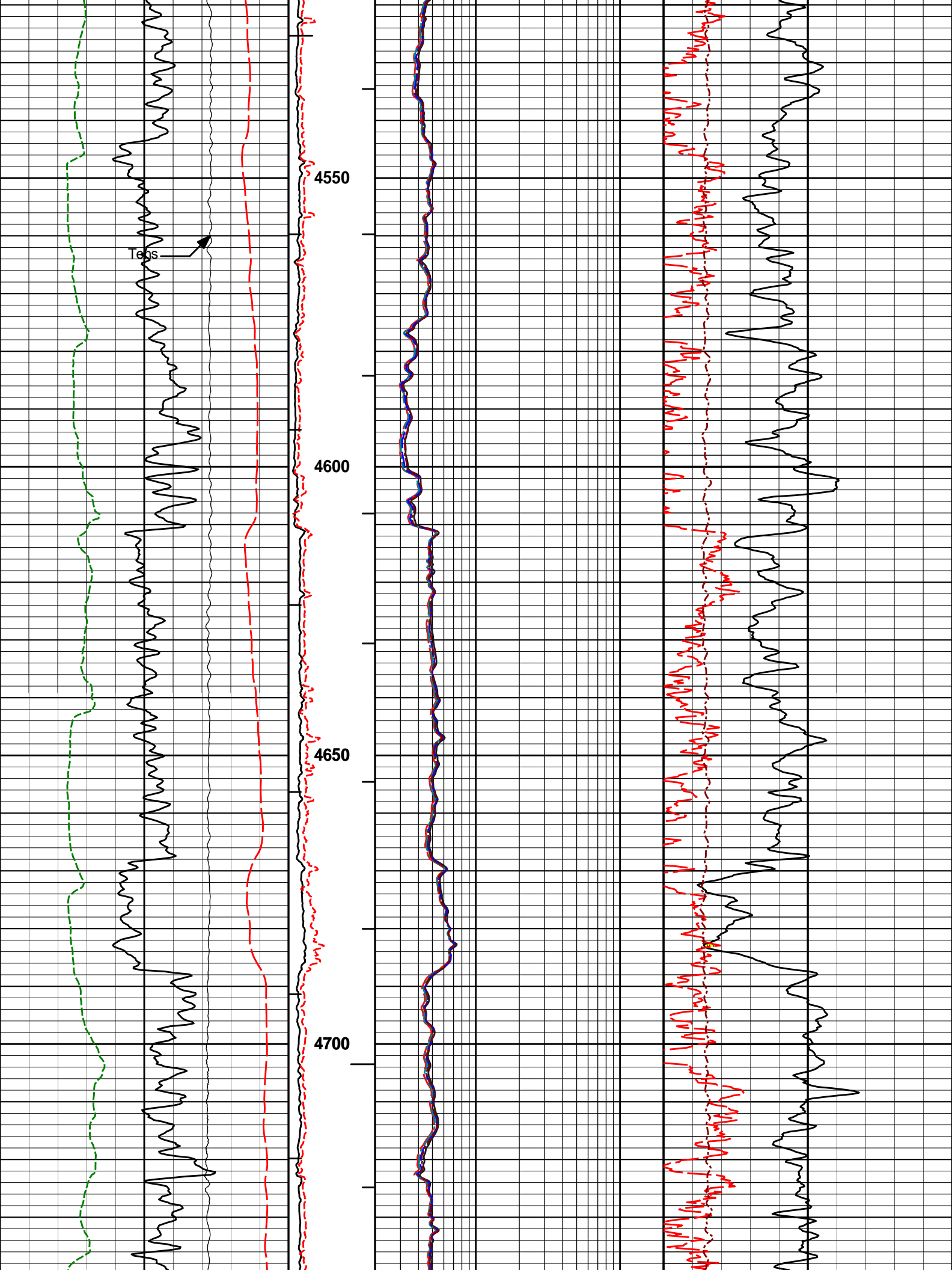


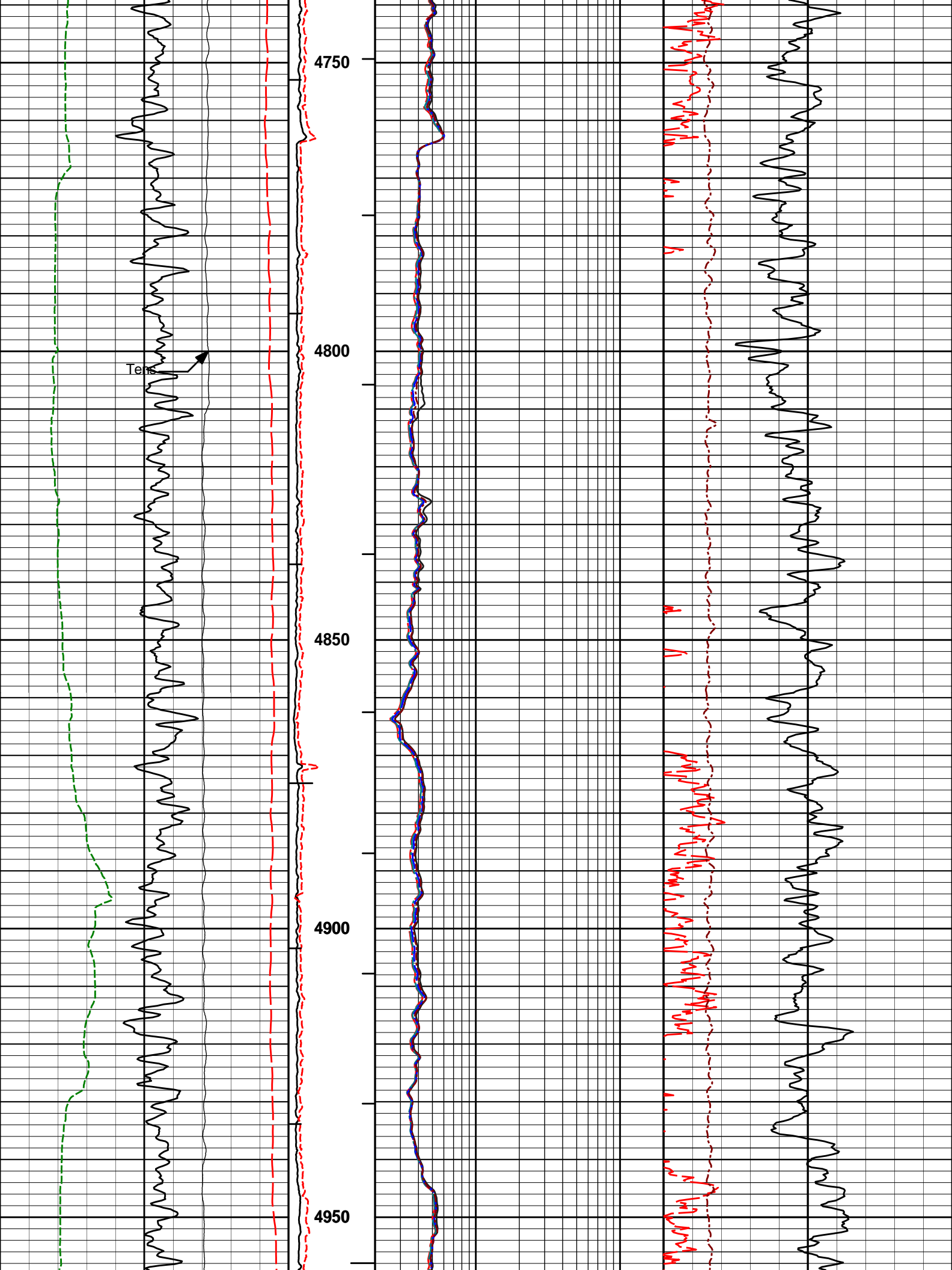


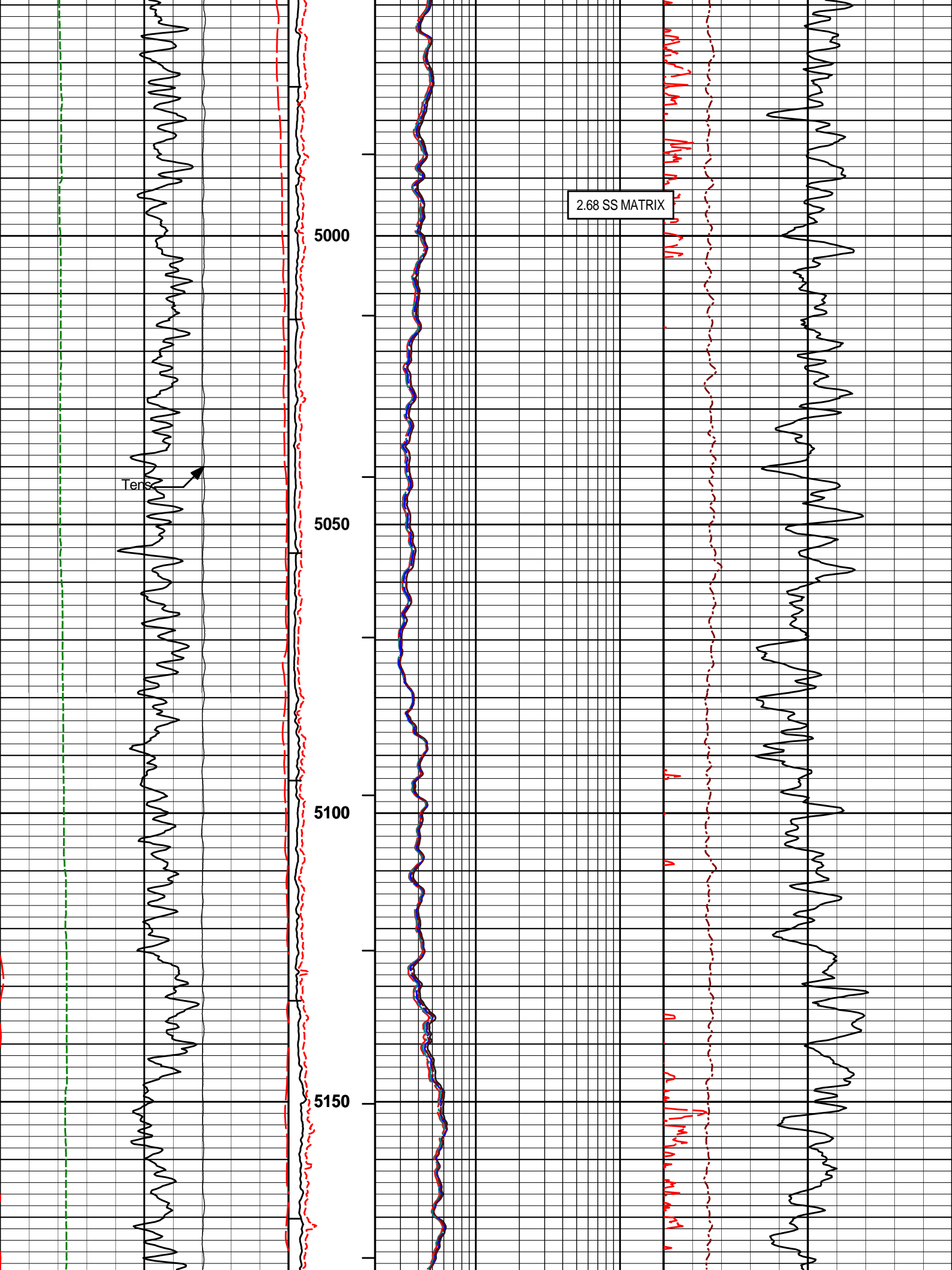


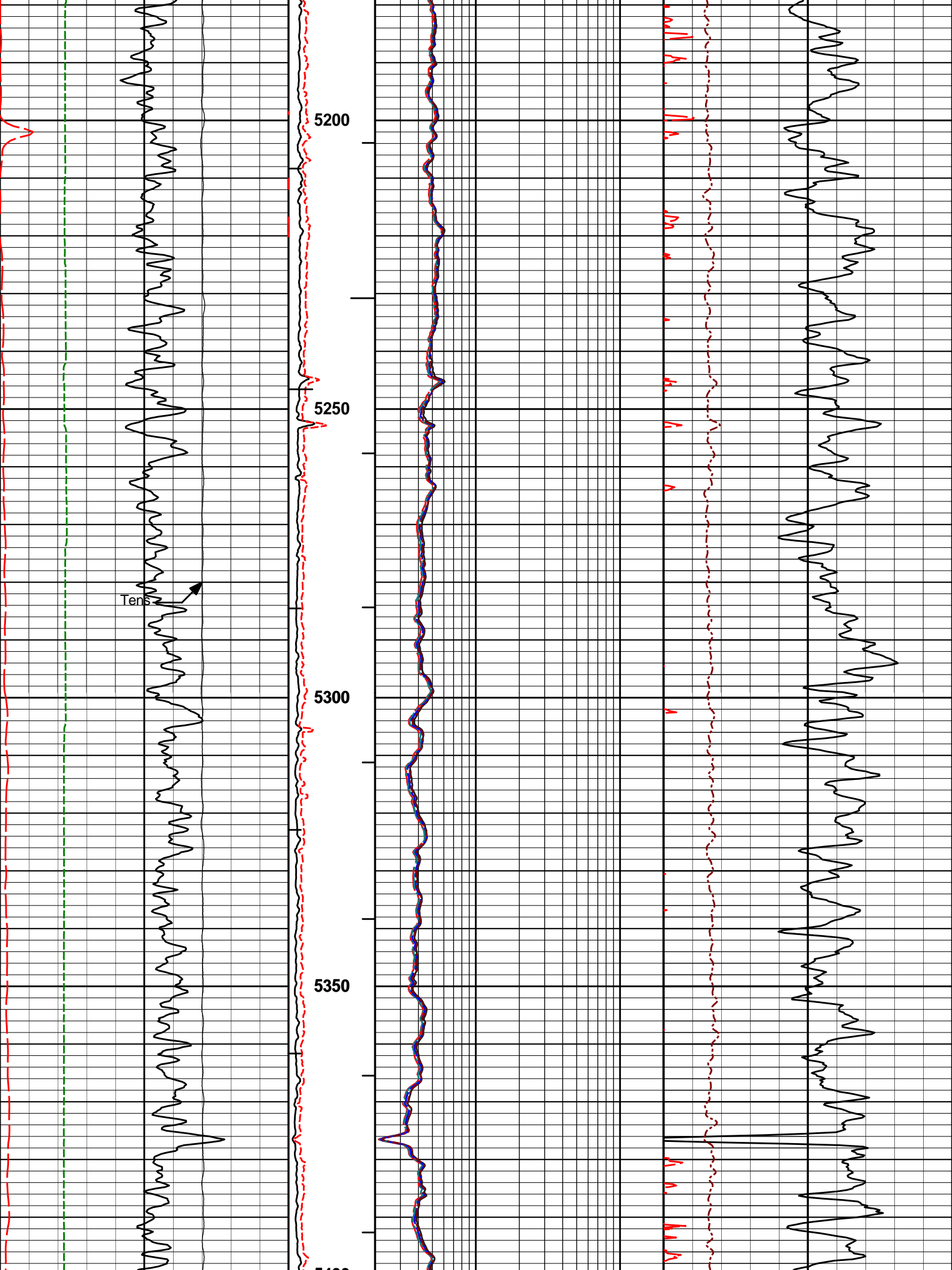




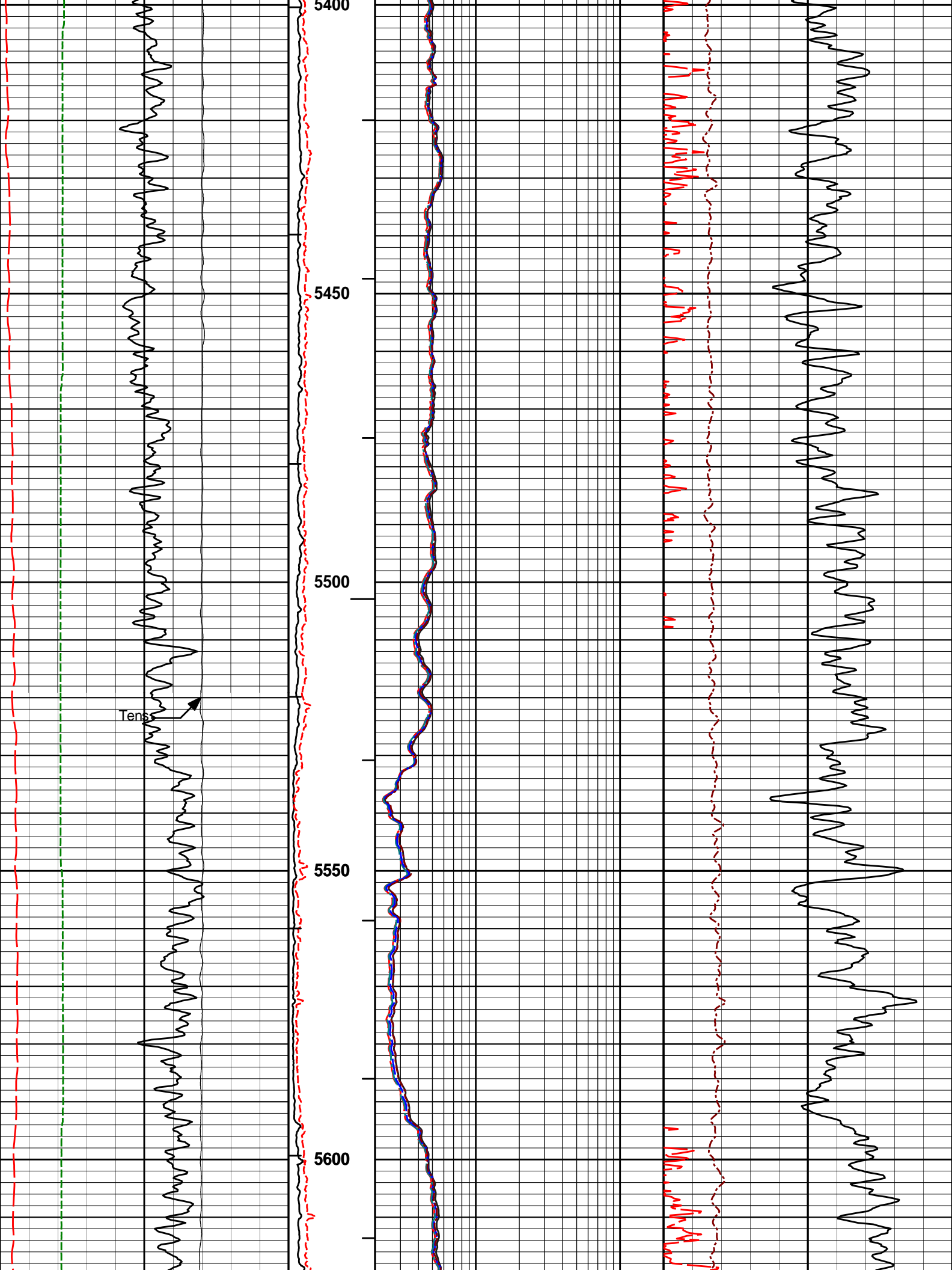


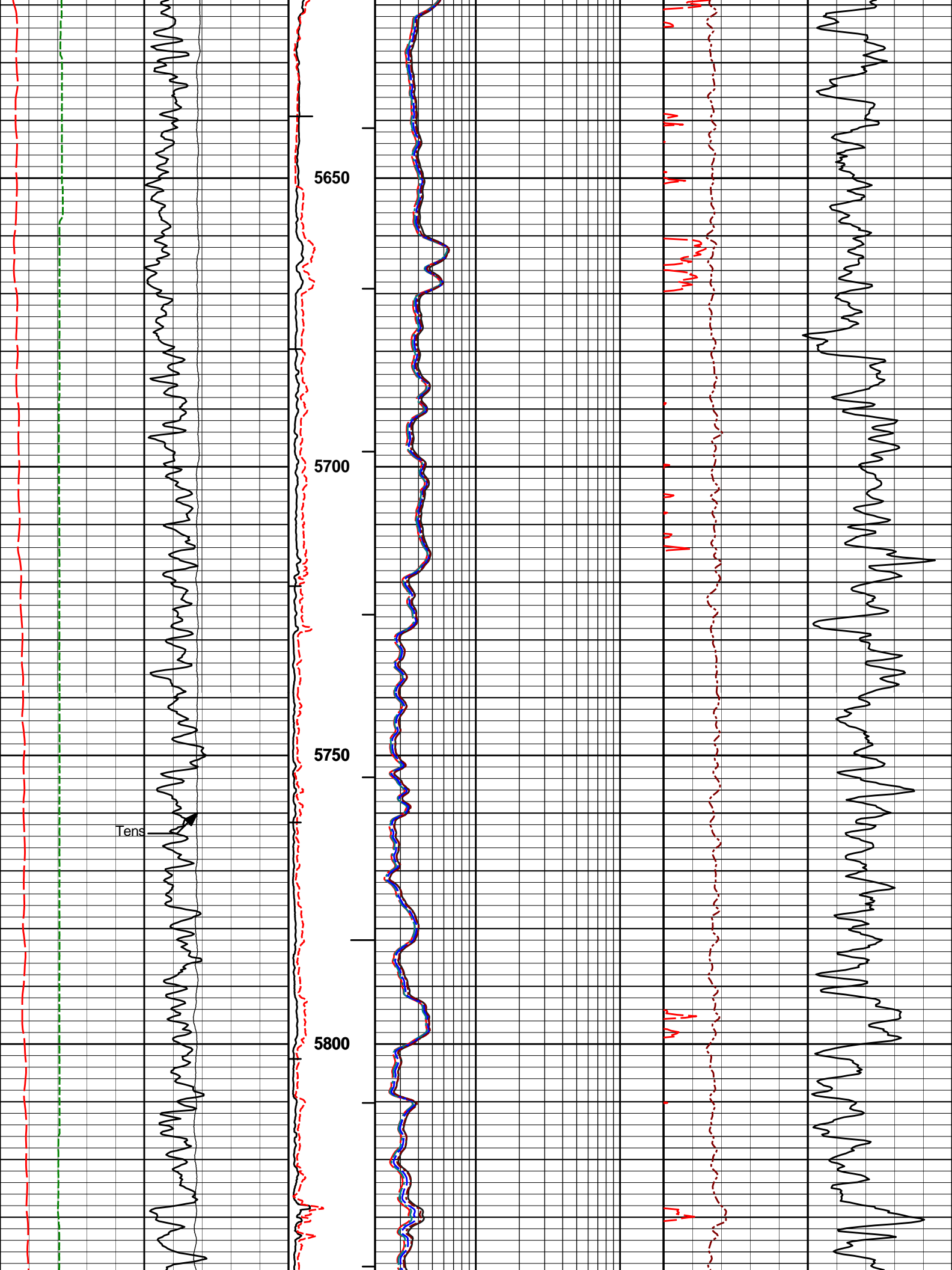


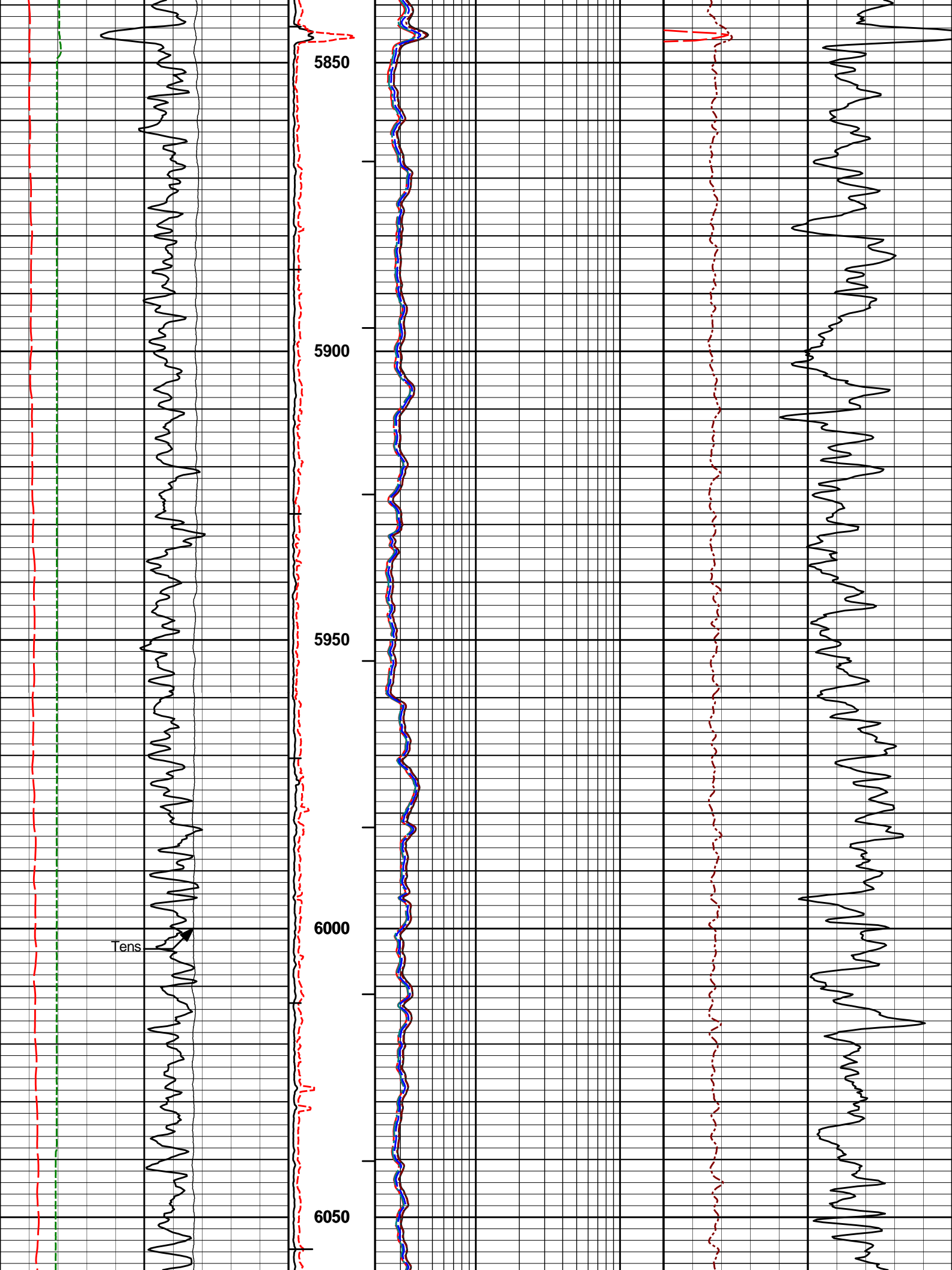


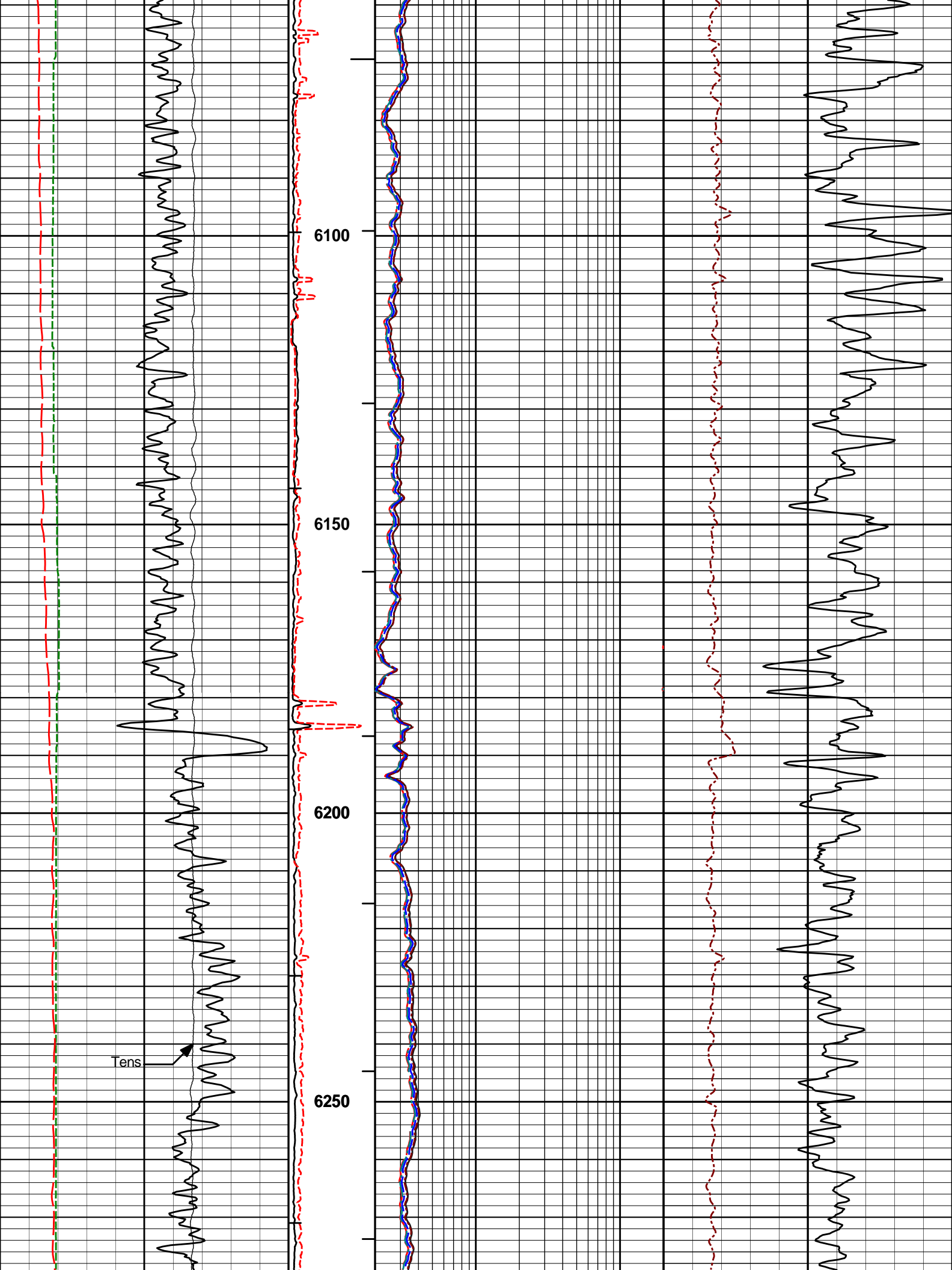


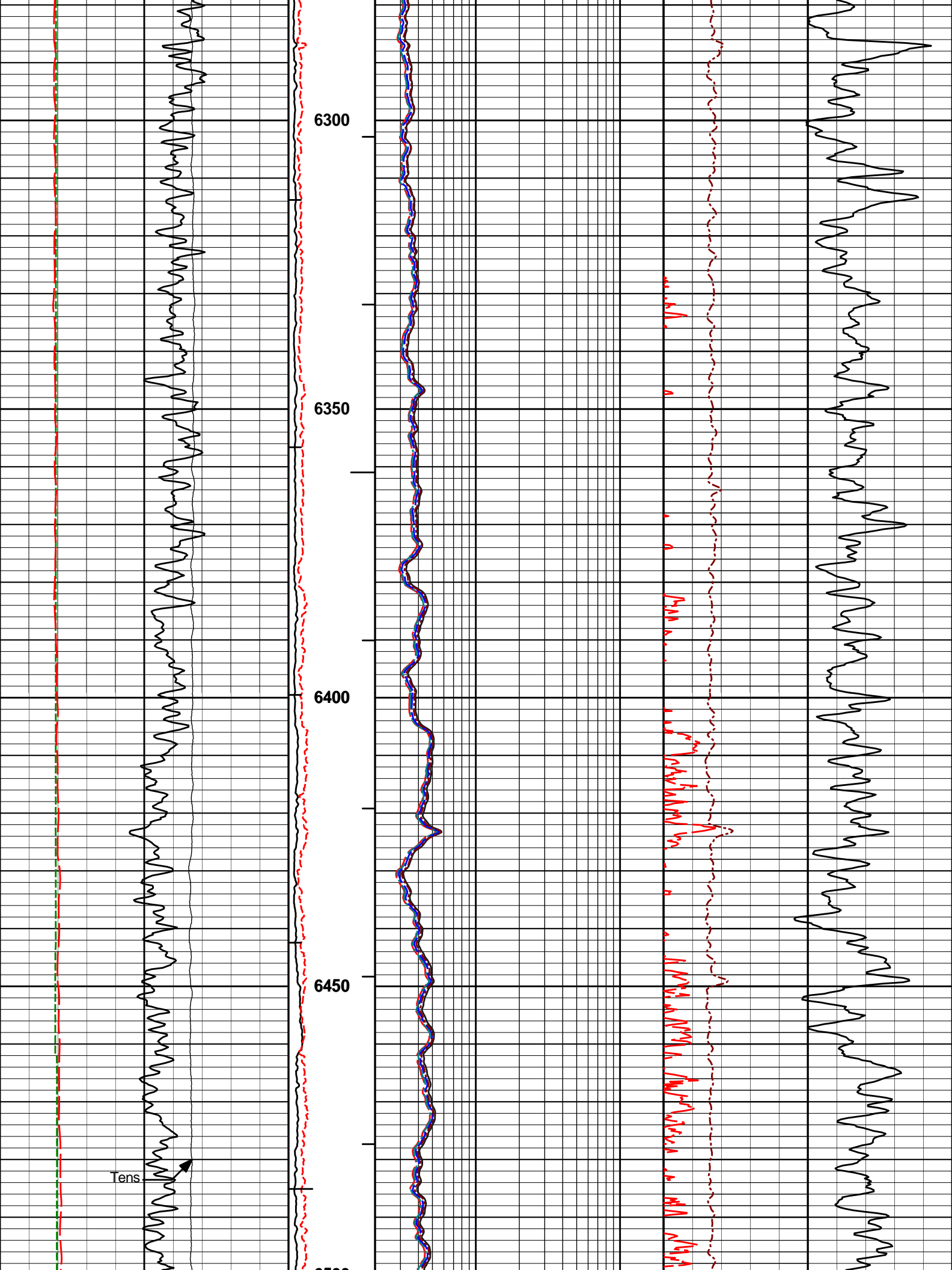


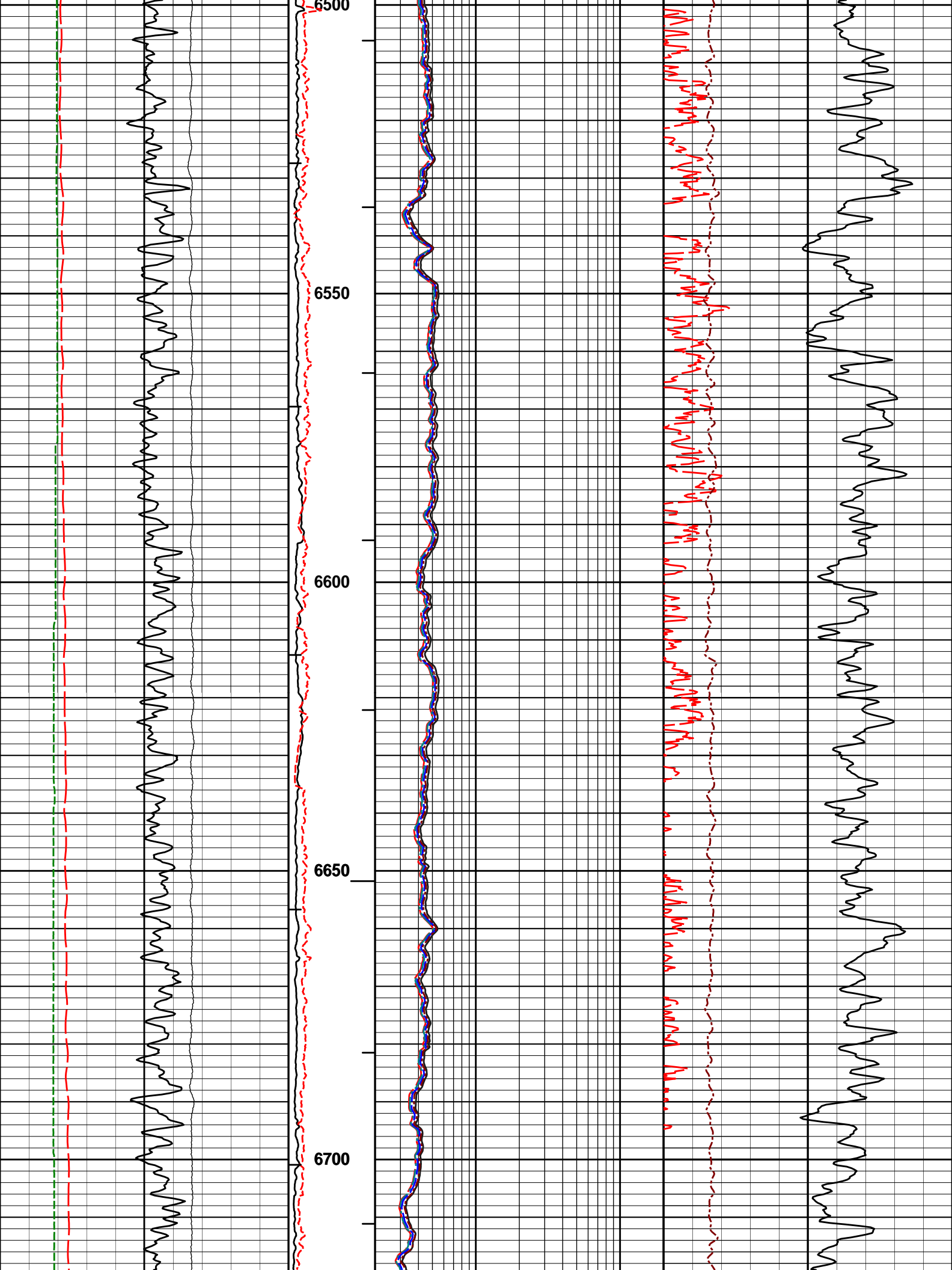


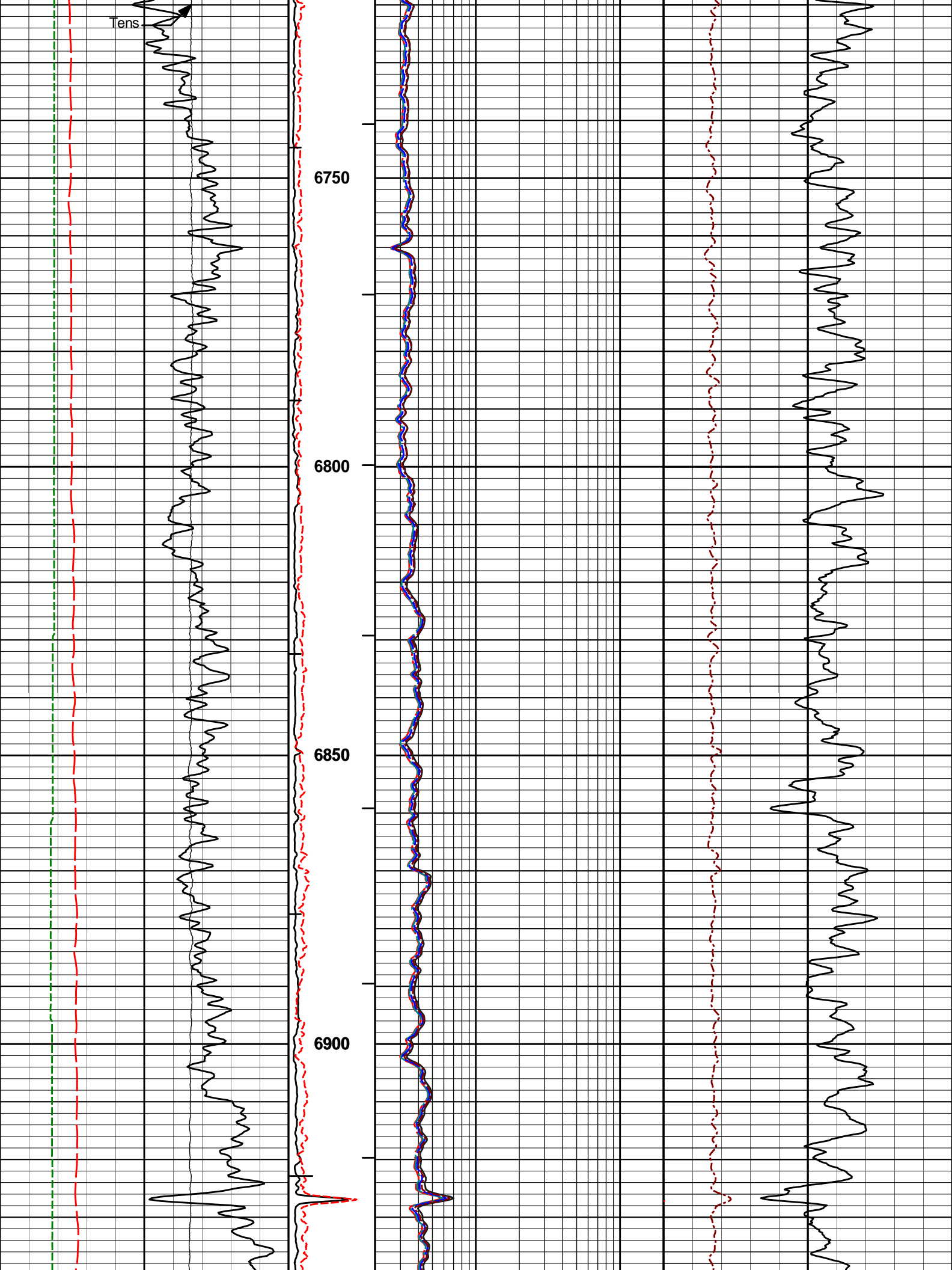


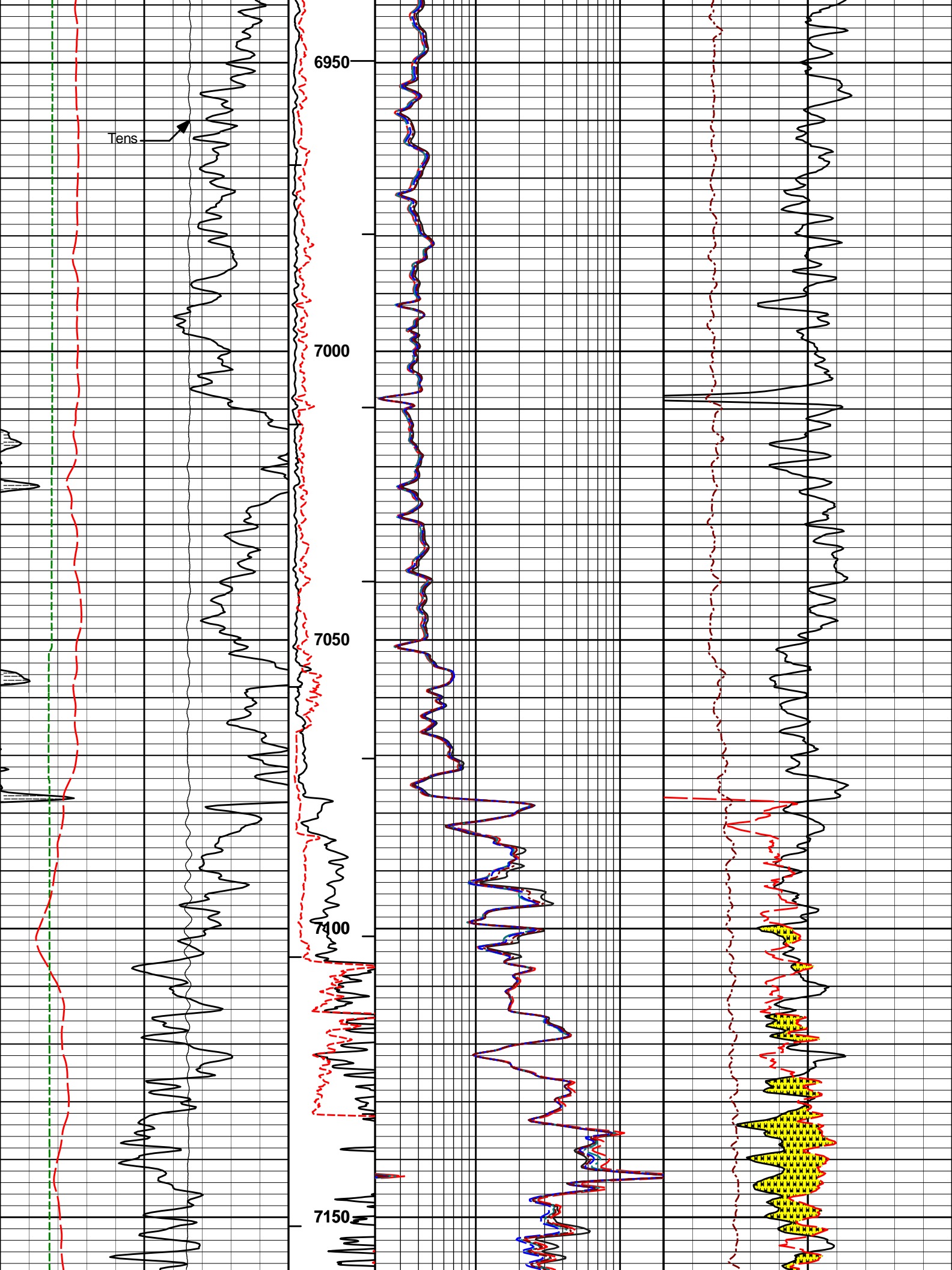




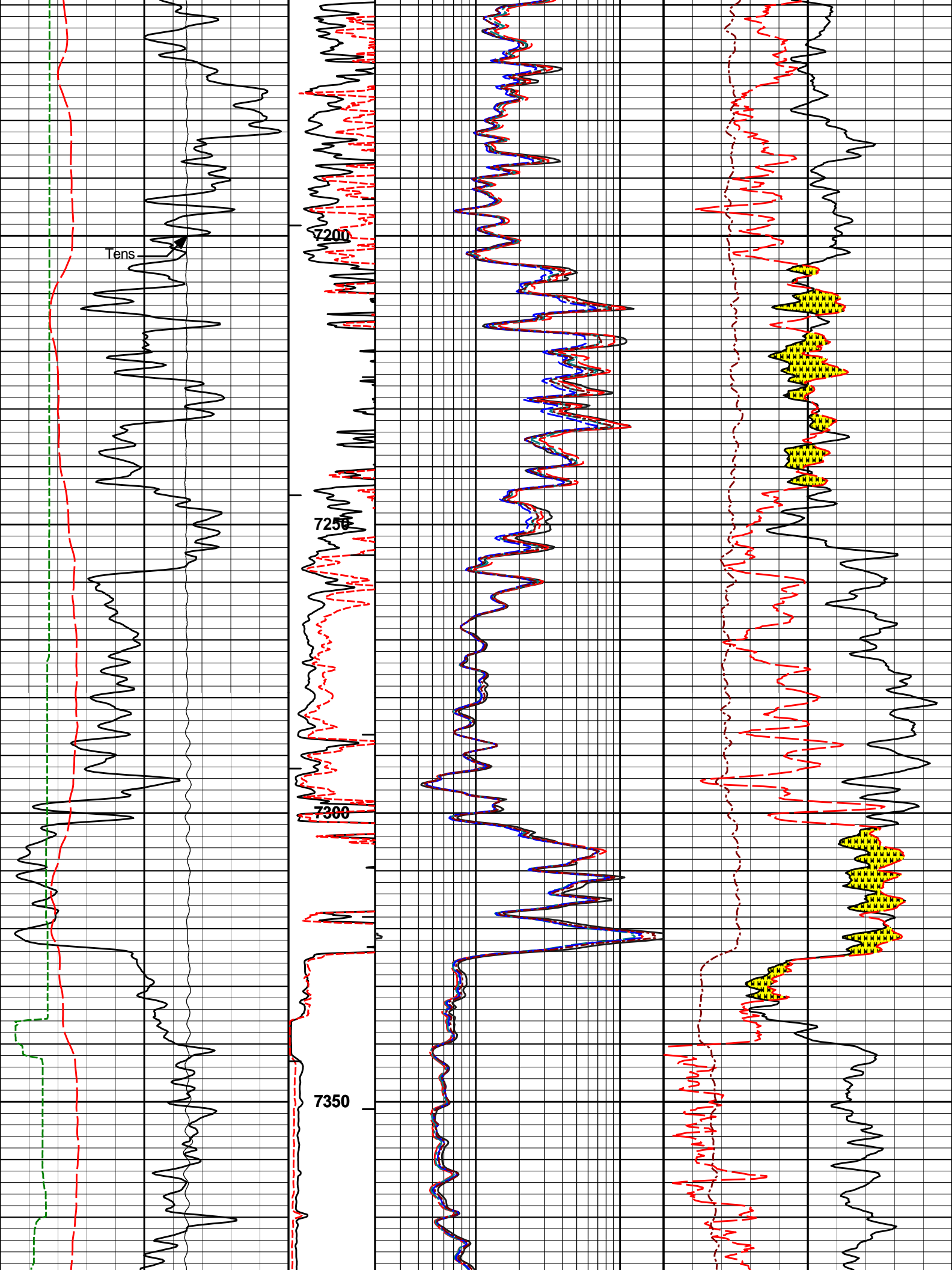


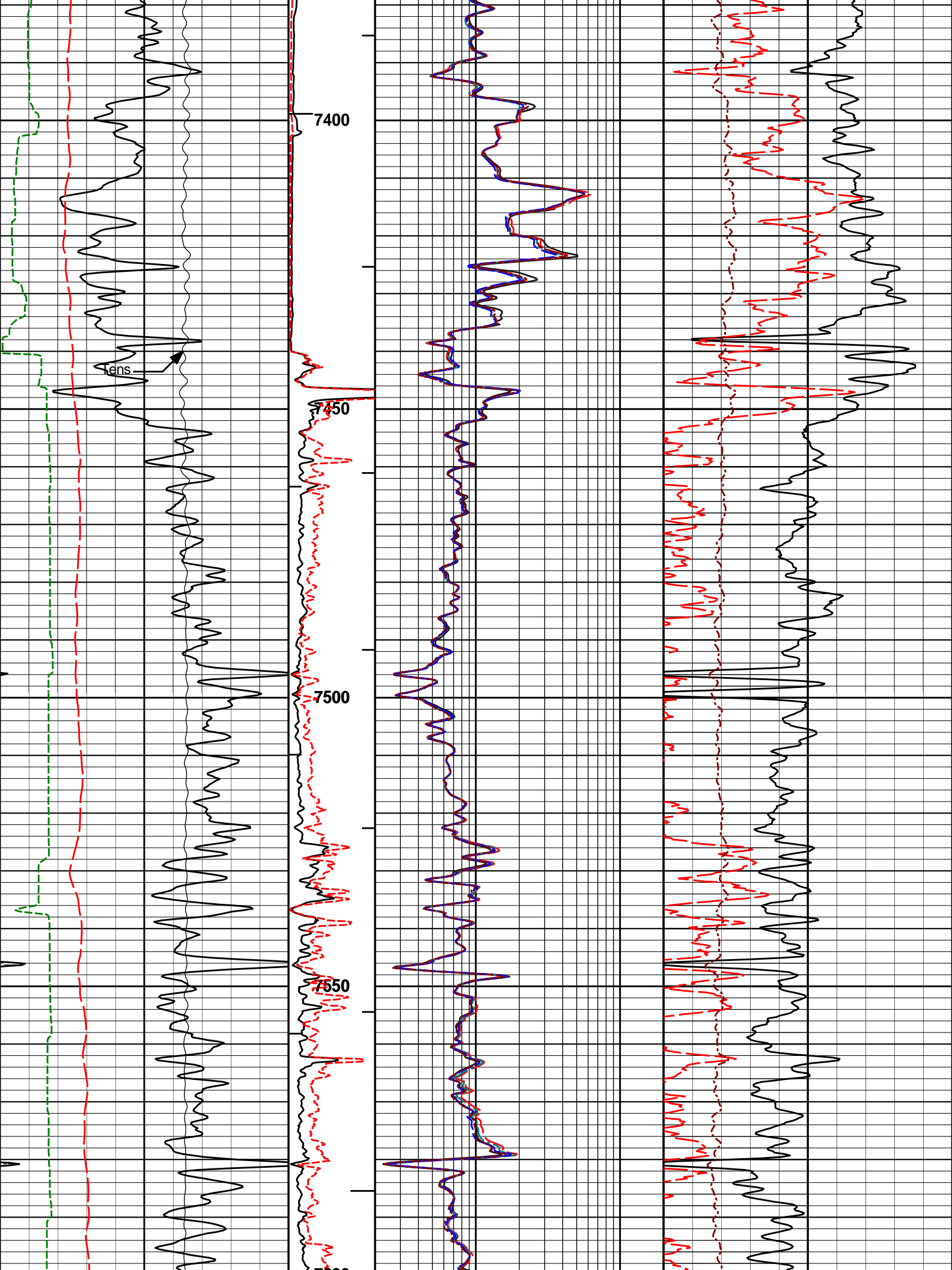


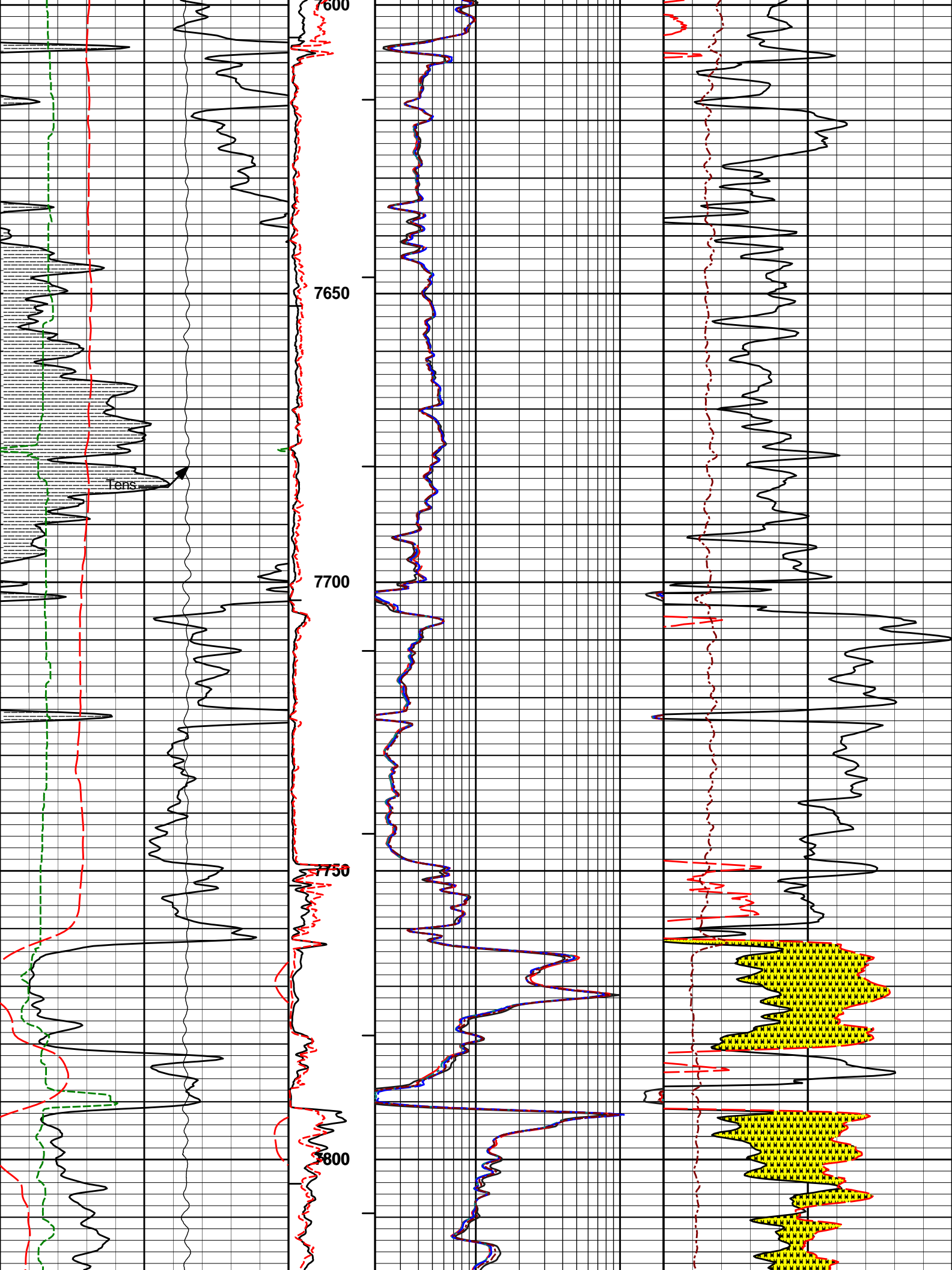


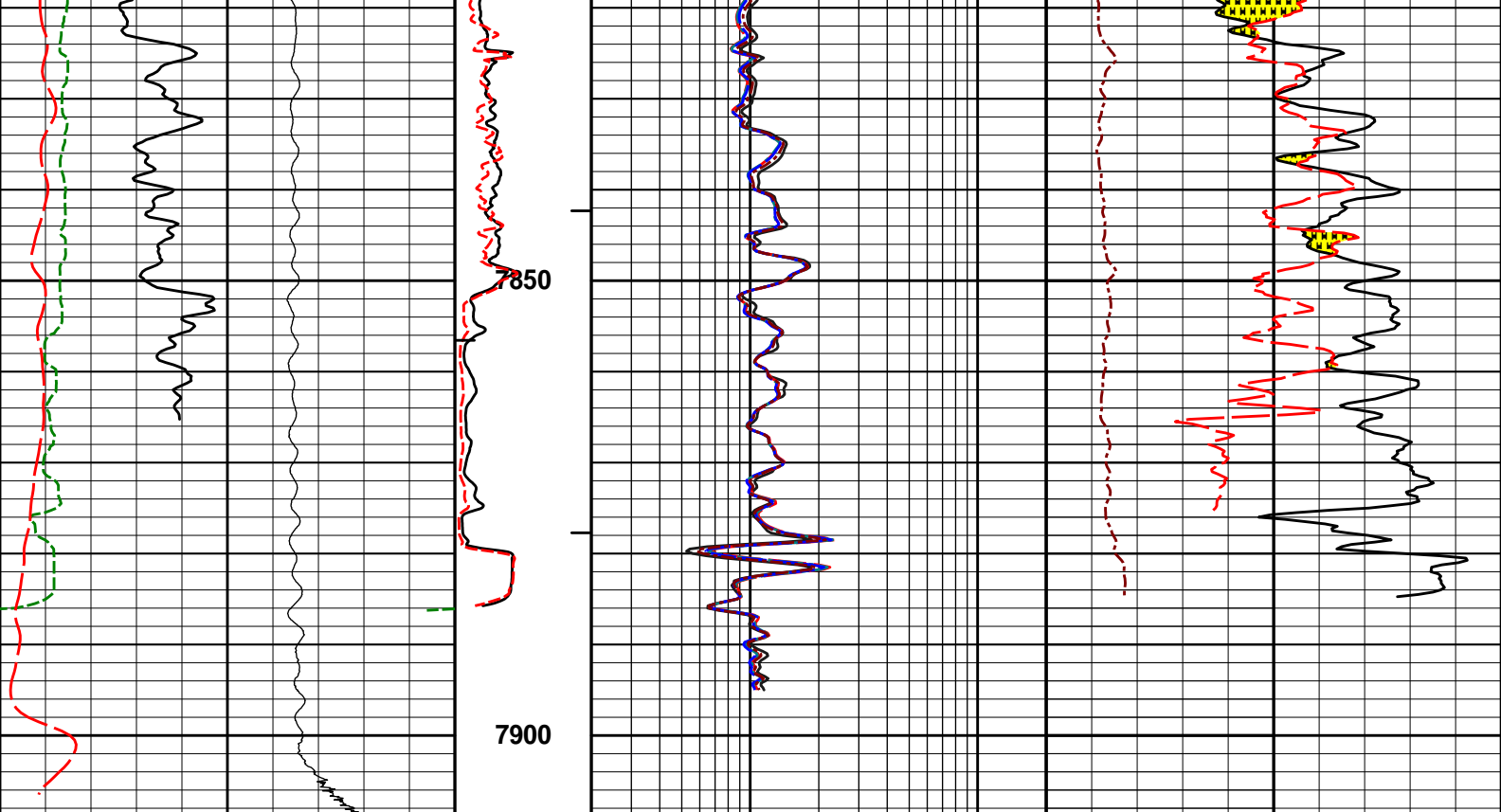












0	SP	100	1 : 240	2	RT90	200	0	Pe	10
	millivolts				ohmm				
0	Gamma API	200	BHVT	2	RT60	200	20	Density Porosity	0
	api				ohmm			percent	
6	Caliper	16	AHVT	2	RT30	200	20	Neutron Porosity	0
	inches				ohmm			percent	
10K	Tens	0	Microlog Lateral	2	RT20	200			
	pounds		ohm-metre		ohmm				
			Microlog Normal	2	RT10	200			
			ohm-metre		ohmm				

**HALLIBURTON**

Plot Time: 23-Jun-11 13:15:53  
 Plot Range: 820 ft to 7908.58 ft  
 Data: NICHOLS\_21-8\Well Based\MAIN\*  
 Plot File: \COMP\MAIN

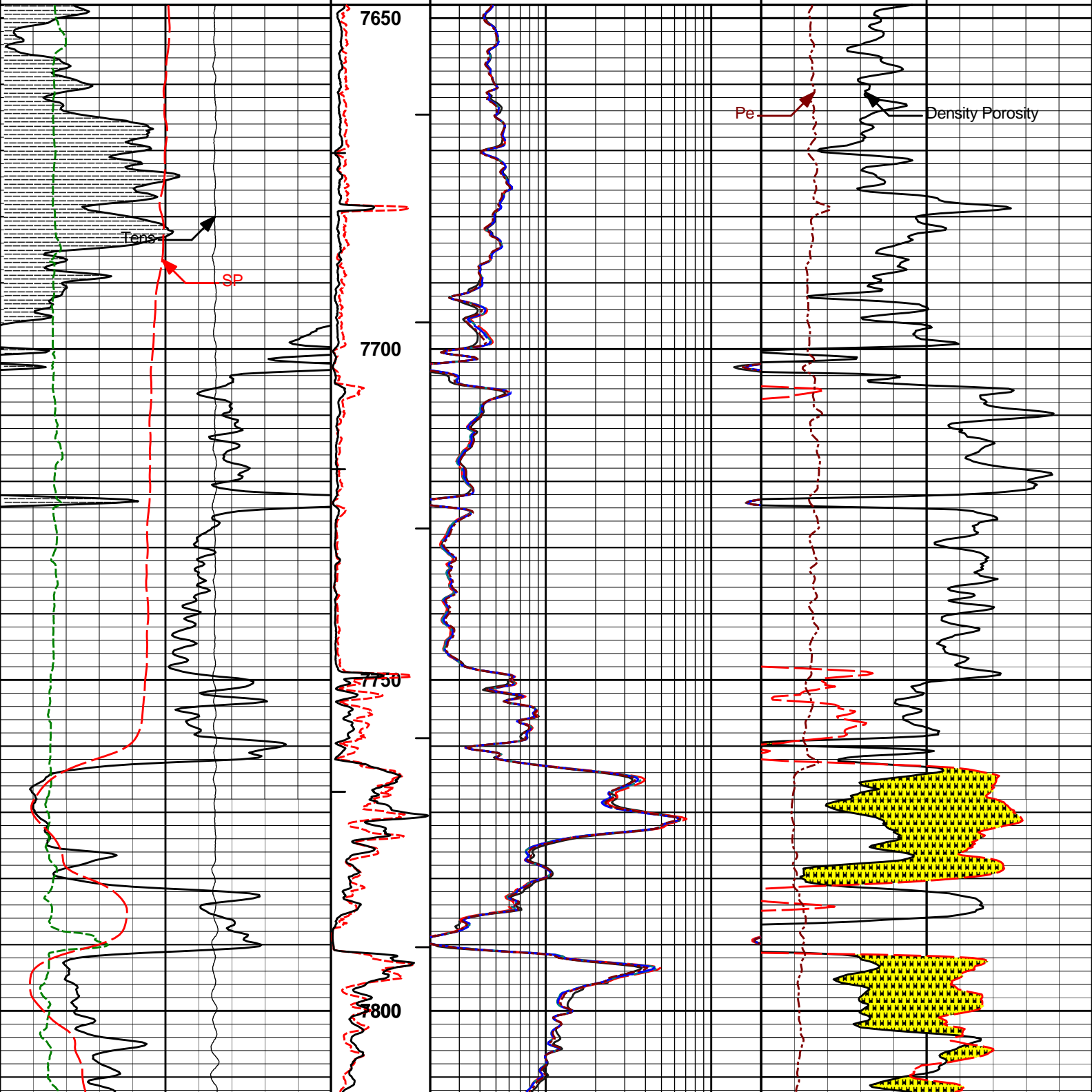
MAIN PASS 5" = 100'

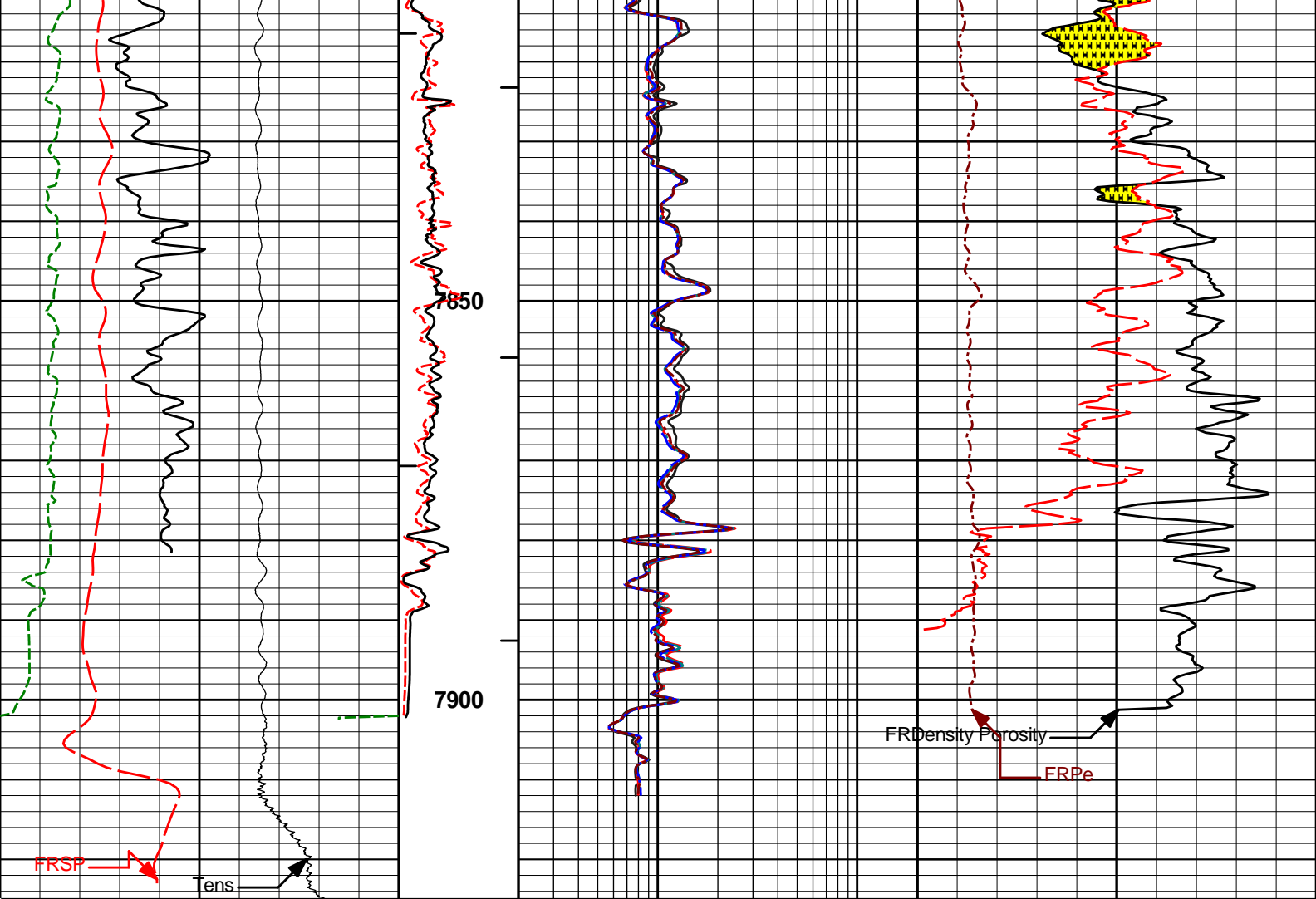
**HALLIBURTON**

Plot Time: 23-Jun-11 13:15:54  
 Plot Range: 7648 ft to 7925 ft  
 Data: NICHOLS\_21-8\Well Based\DAQ-0001-002\*  
 Plot File: \COMP\REPEAT

REPEAT SECTION 5" = 100'

		MicrologNormal	2	RT10	200				
		ohm-metre		ohmm					
10K	Tens	0	MicrologLateral	2	RT20			200	
	pounds		ohm-metre		ohmm				
6	Caliper	16	AHVT	2	RT30	200	20	Neutron Porosity	0
	inches				ohmm		percent		
0	Gamma API	200	BHVT	2	RT60	200	20	Density Porosity	0
	api				ohmm		percent		
0	SP	100	1 : 240	2	RT90	200	0	Pe	10
	millivolts				ohmm				





0	SP	100	1 : 240	2	RT90	200	0	Pe	10
	millivolts				ohmm				
0	Gamma API	200	BHVT	2	RT60	200	20	Density Porosity	0
	api				ohmm			percent	
6	Caliper	16	AHVT	2	RT30	200	20	Neutron Porosity	0
	inches				ohmm			percent	
10K	Tens	0	Microlog Laterals	2	RT20	200			
	pounds		ohm-metre		ohmm				
			Microlog Normal	2	RT10	200			
			ohm-metre		ohmm				

**HALLIBURTON**

Plot Time: 23-Jun-11 13:15:57  
 Plot Range: 7648 ft to 7925 ft  
 Data: NICHOLS\_21-8\\Well Based\\DAQ-0001-002\\\*  
 Plot File: \\COMP\\REPEAT

REPEAT SECTION 5" = 100'

**HALLIBURTON**

# CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION				
Tool Name:	GTET - 11215095		Reference Calibration Date:	24-Mar-11 08:55:16
Engineer:	R. TWEETEN		Calibration Date:	23-Jun-11 07:52:26
Software Version:	WL INSITE R3.2.5 (Build 2)		Calibration Version:	1
Calibrator Source S/N: TB290				
Calibrator API Reference:235.00 api				
Equivalent Calibrator API Reference:239.1 api				
	Measurement	Measured	Calibrated	Units
	Background	79.4	78.5	api
	Background + Calibrator	321.5	317.6	api
	Calibrator	238.2	239.1	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION				
Tool Name:	GTET - 11215095		Reference Calibration Date:	23-Jun-11 07:52:26
Engineer:	R. TWEETEN		Calibration Date:	23-Jun-11 07:54:44
Software Version:	WL INSITE R3.2.5 (Build 2)		Calibration Version:	1
Calibrator Source S/N: TB290				
Calibrator API Reference:235.00 api				
Equivalent Calibrator API Reference:239.1 api				
	Field Verification	Shop	Field	Units
	Background	78.5	78.9	api
	Background + Calibrator	317.6	314.1	api
	Calibrator	239.1	235.2	api
	Shop	Field	Difference	Tolerance
	239.1	235.2	3.9	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION					
Tool Name:	DSNT - 11219332		Reference Calibration Date:	21-Jun-11 16:10:35	
Engineer:	R. TWEETEN		Calibration Date:	21-Jun-11 16:25:38	
Software Version:	WL INSITE R3.2.5 (Build 2)		Calibration Version:	1	
Logging Source S/N: DSN-430					
Tank Serial Number: 11068236					
Reference value assigned to Tank: 53.720					
Snow Block S/N: 001					
Calibration Tank Water Temperature: 68 degF					
Min. Tool Housing Outside Diameter: 3.625 in					
CALIBRATION CONSTANTS					
	Measurement	Prev. Value	New Value	Control Limit On New Value	
	Gain:	0.993	0.992	0.900 - 1.100	
WATER TANK SUMMARY (Horizontal Water Tank)					
	Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
	Porosity (decp):	0.2225	0.2224	0.0002	+/- 0.0020
	Calibrated Ratio:	10.12	10.11	0.006	+/- 0.050
VERIFIER					
	Measurement	Value	Control Limit		

Snow-Block Porosity (decp): 0.0832 0.02000 - 0.09000

#### PASS/FAIL SUMMARY

Background Check: Passed  
Gain-Range Check: Passed  
Snow-Block Check: Passed

### DUAL SPACED NEUTRON FIELD CALIBRATION

Tool Name: DSNT - 11219332

Reference Calibration Date: 21-Jun-11 16:25:38

Engineer: R. TWEETEN

Calibration Date: 23-Jun-11 08:00:21

Software Version: WL INSITE R3.2.5 (Build 2)

Calibration Version: 1

Logging Source S/N: DSN-430

Snow Block S/N: 001

#### NEUTRON FIELD-CHECK SUMMARY

	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0832	0.0792	-0.0040	+/- 0.0150

#### PASS/FAIL SUMMARY

Block Change Check: Passed  
Snow Block Stat Check: Passed  
Temperature Check: Passed

### SPECTRAL DENSITY SHOP CALIBRATION

Tool Name: SDLT - I332M319

Reference Calibration Date: 21-Jun-11 15:21:22

Engineer: R. TWEETEN

Calibration Date: 21-Jun-11 15:39:13

Software Version: WL INSITE R3.2.5 (Build 2)

Calibration Version: 1

Logging Source S/N: 5256GW

Aluminum Block S/N: BRIGHTON

Density: 2.600g/cc

Pe: 3.100

Magnesium Block S/N: BRIGHTON

Density: 1.680g/cc

Pe: 2.594

#### DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0791	1.0558	0.90 - 1.10
Near Dens Gain	1.0151	1.0055	0.90 - 1.10
Near Peak Gain	1.0243	1.0106	0.90 - 1.10
Near Lith Gain	0.9983	0.9975	0.90 - 1.10
Far Bar Gain	1.0182	1.0161	0.90 - 1.10
Far Dens Gain	1.0049	1.0057	0.90 - 1.10
Far Peak Gain	0.9984	1.0000	0.90 - 1.10
Far Lith Gain	0.9837	0.9843	0.90 - 1.10
Near Bar Offset	-0.6962	-0.4805	NONE
Near Dens Offset	-0.0895	-0.0049	NONE
Near Peak Offset	-0.1754	-0.0612	NONE
Near Lith Offset	-0.0047	0.0011	NONE
Far Bar Offset	-0.1884	-0.1698	NONE
Far Dens Offset	-0.0719	-0.0799	NONE
Far Peak Offset	-0.0244	-0.0367	NONE
Far Lith Offset	0.0794	0.0774	NONE
Near Bar Background	930.30	933.03	700 - 1450
Near Dens Background	308.86	309.18	230 - 480
Near Peak Background	424.72	422.22	420 - 610
Near Lith Background	122.22	122.22	120 - 210
Far Bar Background	122.22	122.22	120 - 210
Far Dens Background	122.22	122.22	120 - 210
Far Peak Background	122.22	122.22	120 - 210
Far Lith Background	122.22	122.22	120 - 210



Near Peak Background	134.58	132.66	100 - 210
Near Lith Background	164.06	163.51	125 - 260
Far Bar Background	536.96	536.63	450 - 900
Far Dens Background	213.30	211.87	175 - 345
Far Peak Background	84.74	84.18	70 - 140
Far Lith Background	86.21	87.08	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.682	1.680	-0.002	+/- 0.015
Pe	2.562	2.560	-0.002	+/- 0.150
ALUMINUM				
Density (g/cc)	2.598	2.600	0.002	+/- 0.01500
Pe	3.049	3.068	0.019	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0004	+/- 0.0110	0.0008	+/- 0.0140
Magnesium Block	-0.0001	+/- 0.0110	-0.0008	+/- 0.0140
Aluminum Block	-0.0007	+/- 0.0110	0.0010	+/- 0.0140
Resolution	9.09	6.00 - 11.50	8.88	6.00 - 11.50
Internal Verifier(B+D+P+L)	1538	1200 - 2700	920	800 - 1700

PASS/FAIL SUMMARY	
Background Quality Check:	Passed
Background Range Check:	Passed
Background Resolution Check:	Passed
Background Verification Check:	Passed
Magnesium Quality Check:	Passed
Aluminum Quality Check:	Passed
Gains Check:	Passed
Changes in Calibration Blocks:	Passed

### SPECTRAL DENSITY FIELD CHECK

Tool Name:	SDLT - I332M319	Reference Calibration Date:	21-Jun-11 15:39:13
Engineer:	R. TWEETEN	Calibration Date:	23-Jun-11 07:51:34
Software Version:	WL INSITE R3.2.5 (Build 2)	Calibration Version:	1

Pad Temperature: 68.2 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1538.375	1535.012	-3.363	15.792
Far (B+D+P+L) cps	919.764	920.145	0.381	16.437
Near Resolution	9.09	9.18	0.090	0.50
Far Resolution	8.88	9.12	0.240	1.00

PASS/FAIL SUMMARY	
Bkg Quality Check:	Passed

Bkg Resolution Check:			Passed			
Bkg Verification Check:			Passed			
MICRO LOG SHOP CALIBRATION						
Tool Name: SDLT - I332M319		Reference Calibration Date:		21-Jun-11 16:47:59		
Engineer: R. TWEETEN		Calibration Date:		21-Jun-11 16:49:24		
Software Version: WL INSITE R3.2.5 (Build 2)		Calibration Version:		1		
	CALIBRATION COEFFICIENT SUMMARY					
	Measurement	Micro Log Normal		Micro Log Lateral		
		Measured	Calibrated	Measured	Calibrated	Units
	Tool Zero	-0.13	-0.13	-0.00	-0.00	ohmm
	Calibration Point #1	-0.00	0.00	-0.00	0.00	ohmm
	Calibration Point #2	19.59	20.00	20.31	20.00	ohmm
	Internal Reference	19.89	20.30	20.03	19.72	ohmm
	Measurement	Micro Log Normal Tool Value		Micro Log Lateral Tool Value		Units
Tool Zero	0.77		-0.27		V	
Calibration Point #1	35.51		0.45		V	
Calibration Point #2	5270.40		7028.96		V	
Internal Reference	5350.07		6932.18		V	
MICRO LOG FIELD CHECK						
Tool Name: SDLT - I332M319		Reference Calibration Date:		21-Jun-11 16:49:24		
Engineer: R. TWEETEN		Calibration Date:		23-Jun-11 07:55:19		
Software Version: WL INSITE R3.2.5 (Build 2)		Calibration Version:		1		
	Measurement	Micro Log Normal		Micro Log Lateral		
		Shop	Field	Shop	Field	Units
	Tool Zero	-0.13	-0.13	-0.00	0.01	ohmm
	Internal Reference	20.30	20.22	19.72	19.64	ohmm
	Summary					
	Signal	Shop	Field	Difference	Tolerance	
	Microlog Normal	20.30	20.22	0.08	+/- 0.80	
	Microlog Lateral	19.72	19.64	0.08	+/- 0.80	
DENSITY CALIPER SHOP CALIBRATION						
Tool Name: SDLT - I332M319		Reference Calibration Date:		21-Jun-11 16:39:17		
Engineer: R. TWEETEN		Calibration Date:		21-Jun-11 16:44:39		
Software Version: WL INSITE R3.2.5 (Build 2)		Calibration Version:		1		
	CALIBRATION COEFFICIENTS					
	Measurement	Previous Value		New Value		
	Pad Offset	-2686.18		-2675.10		
	Pad Gain	0.0003851		0.0003851		
	Arm Offset	-1616.06		-1682.03		
	Arm Gain	0.0005325		0.0005424		
	Arm Power	-0.000006152		-0.000006760		
The ring diameter is computed from: DIAMETER = PAD EXTENSION + ARM EXTENSION + TOOL DIAMETER						
Tool Diameter: 4.50 in						
	CALIBRATION RINGS					
	Measurement	Current Reading		Calibrated	Control Limit On	
			Change			

MEASURED COEFF.	(Previous Coeff.)	(New Coeff.)	Change	New Value
PAD EXTENSION:				
Small Ring (in)	2.00	2.00	0.00	+/- 0.20
Medium Ring (in)	3.75	3.75	0.00	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.50	6.50	0.00	+/- 0.20
Medium Ring (in)	8.23	8.25	0.02	+/- 0.20
Large Ring (in)	15.00	15.00	0.00	+/- 0.20
PASS/FAIL SUMMARY				
Calibration-Coefficients Range Check:			Passed	
Ring-Measurement Check:			Passed	
PASS/FAIL SUMMARY				
Calibration-Coefficients Range Check:			Passed	

SDLT CALIPER FIELD CALIBRATION					
Tool Name:	SDLT - I332M319			Reference Calibration Date:	21-Jun-11 16:44:39
Engineer:	R. TWEETEN			Calibration Date:	23-Jun-11 07:54:10
Software Version:	WL INSITE R3.2.5 (Build 2)			Calibration Version:	1

MEASURED CALIPER VALUES				
Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.70	-0.05	+/- 0.10
Ring Diameter	8.25	8.27	0.02	+/- 0.15
PASS/FAIL SUMMARY				
Pad Extension Check:			Passed	
Diameter Check:			Passed	

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION					
Tool Name:	ACRt - 90255013			Reference Calibration Date:	24-Jan-11 09:43:38
Engineer:	Prakash			Calibration Date:	24-Jan-11 09:49:20
Software Version:	WL INSITE R3.2.0 (Build 7)			Calibration Version:	1

TYPICAL GAIN RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0038	1.05	0.95	1.0067	1.05	0.95	1.0052	1.05
A2 (50")	0.95	1.0052	1.05	0.95	1.0085	1.05	0.95	1.0104	1.05
A3 (29")	0.95	0.9979	1.05	0.95	1.0004	1.05	0.95	1.0002	1.05
A4 (17")	0.95	0.9940	1.05	0.95	0.9939	1.05	0.95	0.9967	1.05
A5 (10")	N/A	N/A	N/A	0.95	0.9931	1.05	0.95	0.9945	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9808	1.05	0.95	0.9816	1.05




TYPICAL SONDE OFFSET RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	-5	-0.883	2	-6	-3.862	-2	-8	-4.735	-2
A2 (50")	-7	-1.758	-1	-6	-3.248	-2	-7	-4.350	-2
A3 (29")	-27	-14.816	-9	-9	-4.039	-3	-7	-3.128	-1
A4 (17")	-180	-101.960	-60	-45	-29.395	-15	-39	-24.259	-13
A5 (10")	N/A	N/A	N/A	-150	-79.653	-50	-80	-44.165	-10
A6 (6")	N/A	N/A	N/A	175	277.762	525	90	145.450	270

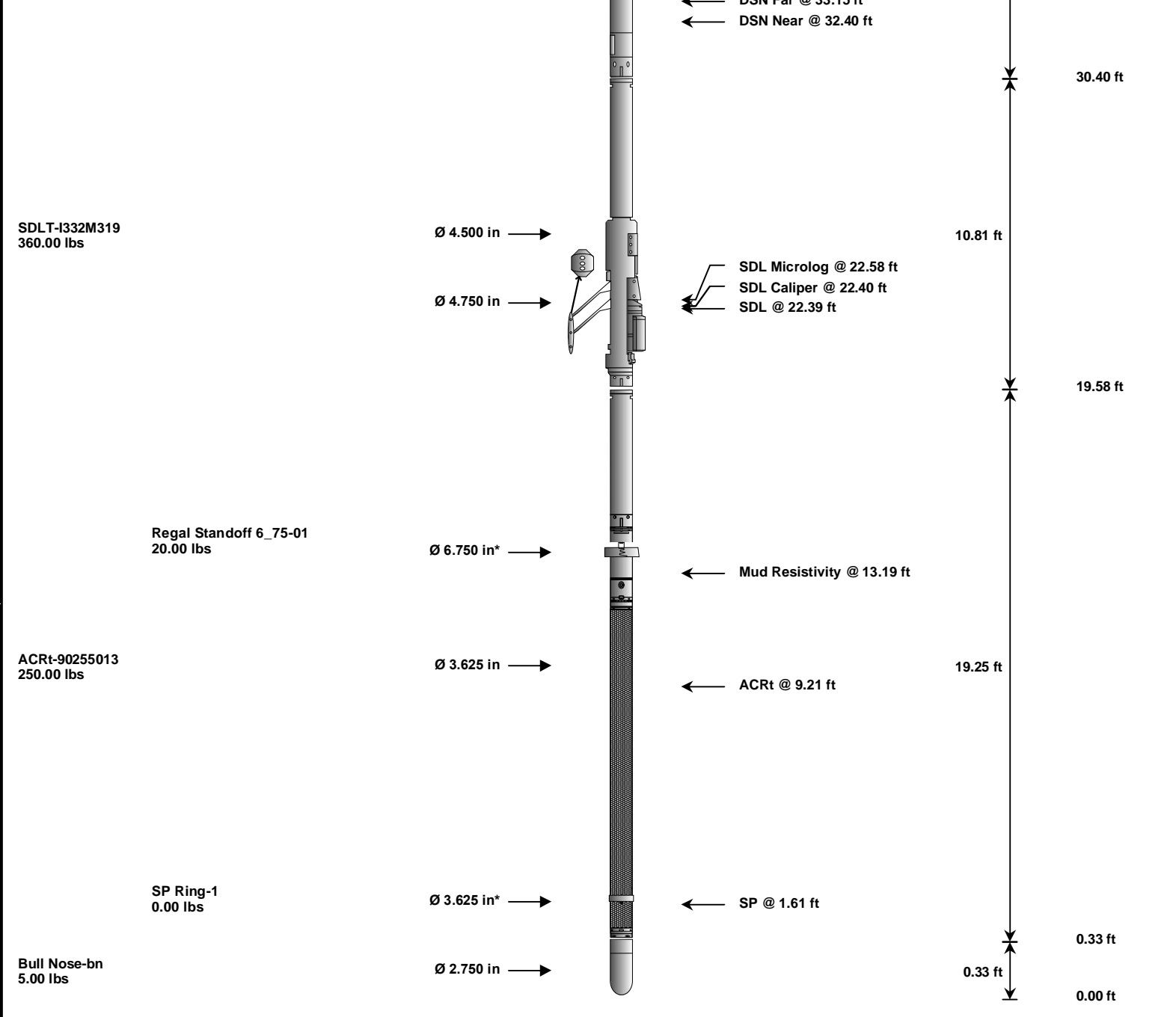
TRANSMITTER CURRENT GAIN				R-MUD VERIFICATION			
Signal	Lower	R	Upper	Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
12K	0.6	0.8745	1.3	Mud Cell	0.95	1.005	1.05
36K	1.0	1.8086	2.0				
72K	1.0	1.1234	2.0				

CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11215095						
Gamma Ray Calibrator	239.1	235.2	-----	3.9	+/- 9.00	api
DSNT-11219332						
Snow-Block Porosity	0.0832	0.0792	-----	0.0040	+/- 0.0150	decp
SDLT-I332M319						
Near(B+D+P+L)	1538.375	1535.012	-----	3.363	+/-15.792	cps
Far(B+D+P+L)	919.764	920.145	-----	-0.381	+/-16.437	cps
MicroLog Normal	20.30	20.22	-----	0.08	+/-0.80	ohmm
MicroLog Lateral	19.72	19.64	-----	0.08	+/-0.80	ohmm
Pad Extension	3.75	3.70	-----	0.05	+/-0.10	in
Ring Diameter	8.25	8.27	-----	-0.020	+/-0.15	in
ACRt-90255013						
Mud Cell	1.005	-----	-----	0.000	-----	ohm-m
Data: NICHOLS_21-8\0001 TRIPLE\IDLE					Date: 23-Jun-11 11:10:22	

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
RWCH-10895163 135.00 lbs		Ø 3.625 in →		← Load Cell @ 51.17 ft ← BH Temperature @ 50.60 ft	6.25 ft	54.85 ft
						48.60 ft
GTET-11215095 165.00 lbs		Ø 3.625 in →		← GammaRay @ 42.54 ft	8.52 ft	
						40.08 ft
DSNT-11219332 174.00 lbs		Ø 3.625 in →		← DSN Far @ 33.15 ft	9.69 ft	



Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head		10895163	135.00	6.25	48.60	300.00
GTET	Gamma Telemetry Tool		11215095	165.00	8.52	40.08	60.00
DSNT	Dual Spaced Neutron		11219332	174.00	9.69	30.40	60.00
SDLT	Spectral Density Tool		I332M319	360.00	10.81	19.58	60.00
ACRt	Array Compensated True Resistivity		90255013	250.00	19.25	0.33	300.00
SP	SP Ring		1	0.00	0.25	*	1.61
RSOF	Regal Standoff 6.75in		01	20.00	0.52	*	13.68
BLNS	Bull Nose		bn	5.00	0.33	0.00	300.00
Total				1,109.00	54.85		
* Not included in Total Length and Length Accumulation.							
Data: NICHOLS_21-8\0001 TRIPLEVDLE							
Date: 23-Jun-11 11:08:16							

COMPANY	KERR-MCGEE OIL & GAS ONSHORE LP
WELL	NICHOLS 21-8
FIELD	WATTENBERG

COUNTY	WELD	STATE	CO
HALLIBURTON		ARRAY COMPENSATED TRUE RESISTIVITY SPECTRAL DENSITY DUAL SPACED NEUTRON	