

# HALLIBURTON

## SPECTRAL DENSITY DUAL SPACED NEUTRON BOREHOLE COMPENSATED ARRAY COMPENSATED TRUE RESISTIVITY

COMPANY BRIDGE ENERGY.LLC  
WELL ESPINO 1 - 2  
FIELD WILDCAT  
COUNTY PAYETTE  
STATE IDAHO

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COUNTY PAYETTE  
STATE IDAHO

API No. 11075200040000  
Location SURFACE HOLE LOCATION:  
1603' FSL & 1247' FEL NESE

Other Services:  
RWCH

Sect. 2 Twp. 7N Rge. 4W

Permanent Diameter Log measured from KB Elev. 2223.0 ft  
Log measured from KB 12.0 ft above perm. Datum D.F. 2294.0 ft  
Drilling measured from KB G.L. 2223.0 ft

Date 03-Apr-10  
Run No. ONE

Depth - Driller 4500.00 ft  
Depth - Logger 4493.0 ft

Bottom - Logged Interval 4493.0 ft  
Top - Logged Interval 100.0 ft

Casing - Driller 9.625 in @ 793.0 ft  
Casing - Logger 791.0 ft

Bit Size 8.750 in @  
Type Fluid In Hole WBM @

Density 10.3 ppg 50.00 sqft  
PH 8.40 pH 7.2 cphn

Source of Sample MUD TANK  
Rm @ Meas. Temperature 1.720 ohmm @ 66.80 degF @  
Rmf @ Meas. Temperature 1.42 ohmm @ 75.00 degF @  
Rmc @ Meas. Temperature 1.253 ohmm @ 75.00 degF @

Source Rmf Rmc MEAS MEAS  
Rm @ BHT 1.61 ohmm @ 181.0 degF @

Time Since Circulation 12.0 hr  
Time on Bottom 03-Apr-10 12:02

Max. Rec. Temperature 181.0 degF @ 4498.0 ft @  
Equipment Location 11170614 ROCK SPRING @

Recorded By J. MAYNE  
Witnessed By RON RICHARDS

Fold here

Service Ticket No.: 7284307		API Serial No.: 11075200040000		PGM Version: WL INSITE R3.0.3 (Build 5)				
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.	Other
Rmf @ Meas. Temp.	@	@		ONE	ACRT-	N/A	1.5" S.O.	N/A
Rmc @ Meas. Temp.	@	@			E171-S970			
Source Rmf	Rmc							
Rm @ BHT	@	@						
Rmf @ BHT	@	@						
Rmc @ BHT	@	@						
EQUIPMENT DATA								
GAMMA		ACOUSTIC		DENSITY		NEUTRON		
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE	
Serial No.	11230317	Serial No.	10939067	Serial No.	10947725	Serial No.	11020400	
Model No.	GTET	Model No.	BSAT	Model No.	SDLT	Model No.	DSN T	
Diameter	3.625"	No. of Cent.	2	Diameter	4.5"	Diameter	3.625"	
Detector Model No.	102A	Spacing	5'	Log Type	3AM 3AM	Log Type	THERM/THERM	
Type	SCINT			Source Type	73187	Source Type	Am241Be	
Length	8'	LSA [Y/N]	N	Serial No.	5235CW	Serial No.	08-018	
Distance to Source	10"	FWDA [Y/N]	N	Strength	1.6Ci	Strength	16Ci	
LOGGING DATA								
GENERAL		GAMMA		ACOUSTIC		NEUTRON		

Run No.	Depth		Speed ft/min	Scale		Matrix	Scale		Matrix	Scale		Matrix		
	From	To		L	R		L	R		L	R			
ONE	4498'	100'	REC	0	200	40%	0%	55.5 us/t	40%	0%	2.68 g/cc	40%	0%	SAND
<b>CONFIDENTIAL</b>														
DIRECTIONAL INFORMATION														
Maximum Deviation						@	KOP						@	
Remarks: RWCH-GTET-DSNT-SDLT-BSAT-ACRT WERE RAN IN COMBINATION														
ANNULAR HOLE VOLUME CALCULATED FOR 5.5" CASING														
BOREHOLE RUGOSITY, TENSION PULLS AND WASHOUTS MAY EFFECT LOG QUALITY														
LATITUDE:43deg 58' 17.86														
LONGITUDE:-116deg 46' 37.19														
TODAY'S CREW: D. MILLER, S. BENGSTON & PAT RITZKIE						RIG: ENSIGN 516								
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES, ROCK SPRINGS, (307) 352-8600 ***														
<p>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.</p>														
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## PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP	SHARED	BS	Bit Size	8.750	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDWT	Borehole Fluid Weight	10.250	ppg
	SHARED	OBM	Oil Based Mud System?	No	
	SHARED	RMUD	Mud Resistivity	2.000	ohm m
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	5.500	in
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	4500.00	ft
	SHARED	BHT	Bottom Hole Temperature	200.0	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	ohm m
	Rwa /	TMFR	Rmf Ref Temp	75.00	degF
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CrossPlot	RWA	Resistivity of Formation Water	0.05	ohm m
Rwa / CrossPlot	ADP	Use Air Porosity to Calculate CrossPlot	No	
Rwa / CrossPlot	GROK	Process Gamma Ray?	Yes	
GTET	GRSO	Gamma Tool Standoff	0.000	in
GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	POTA	Potassium	0.00	%
GTET	MDTP	Mud Type	Natural	
GTET	TPOS	Tool Position	Standoff	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	No	
DSNT	NLIT	Neutron Lithology	Sandstone	
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	AD	Is Hole Air Drilled?	No	
SDLT	CB	Logging Calibration Blocks?	No	
SDLT	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT	DTWN	Disable temperature warning	No	
SDLT	MDTP	Weighted Mud Correction Type?	Barite	
SDLT	DMA	Formation Density Matrix	2.680	g/cc
SDLT	DFL	Formation Density Fluid	1.000	g/cc
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT	MLOK	Process MicroLog Outputs?	Yes	
BSAT	MBOK	Compute BCAS Results?	Yes	
BSAT	FLLO	Semblance Filter Low Pass Value?	5000	Hz
BSAT	FLHI	Semblance Filter High Pass Value?	27000	Hz
BSAT	DTFL	Delta-T Fluid	189.00	uspf
BSAT	DTMT	Delta-T Matrix Type	Sandstone 55.5	
BSAT	DTSH	Delta-T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wylie	
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	Free Hanging	
ACRt	RMOP	Rmud Source	Mud Cell	
ACRt	RMIN	Minimum Resistivity for MAP	0.20	ohm m
ACRt	RMIN	Maximum Resistivity for MAP	200.00	ohm m
ACRt	THQY	Threshold Quality	0.50	

BOTTOM

Data: BRIDGE\_ESP\_1\_210001 QUAD-BSATIDLE

Date: 04-Apr-10 13:23:57

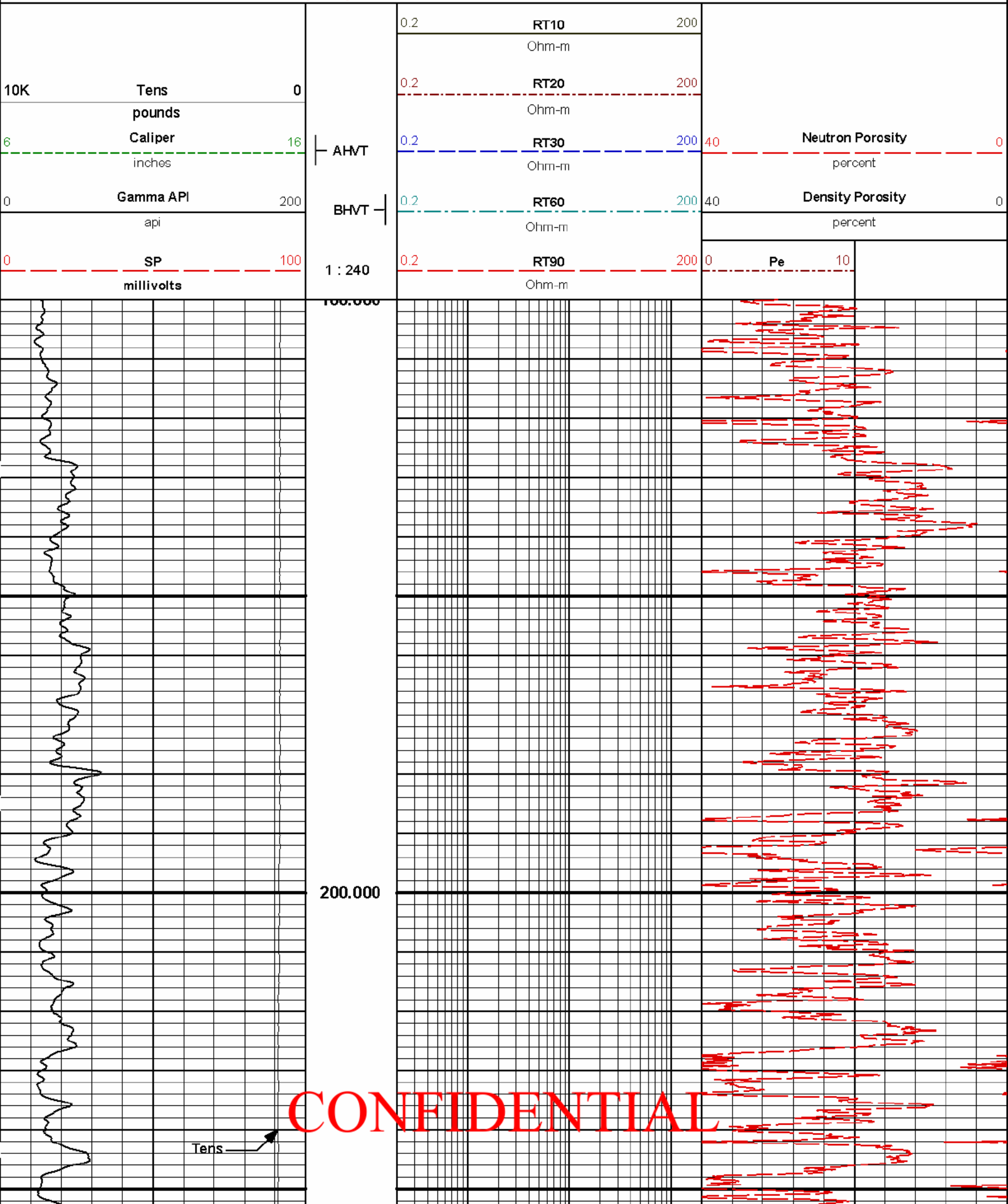
**HALLIBURTON**

Plot Time: 04-Apr-10 20:43:05  
 Plot Range: 100 ft to 4501.92 ft  
 Data: BRIDGE\_ESP\_1\_21Well Based M... IN...  
 Plot File: \\not saved\NO\_COMPOSITE\_ACR\_T\_IN\_FWI

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MAIN PASS 5" = 100'

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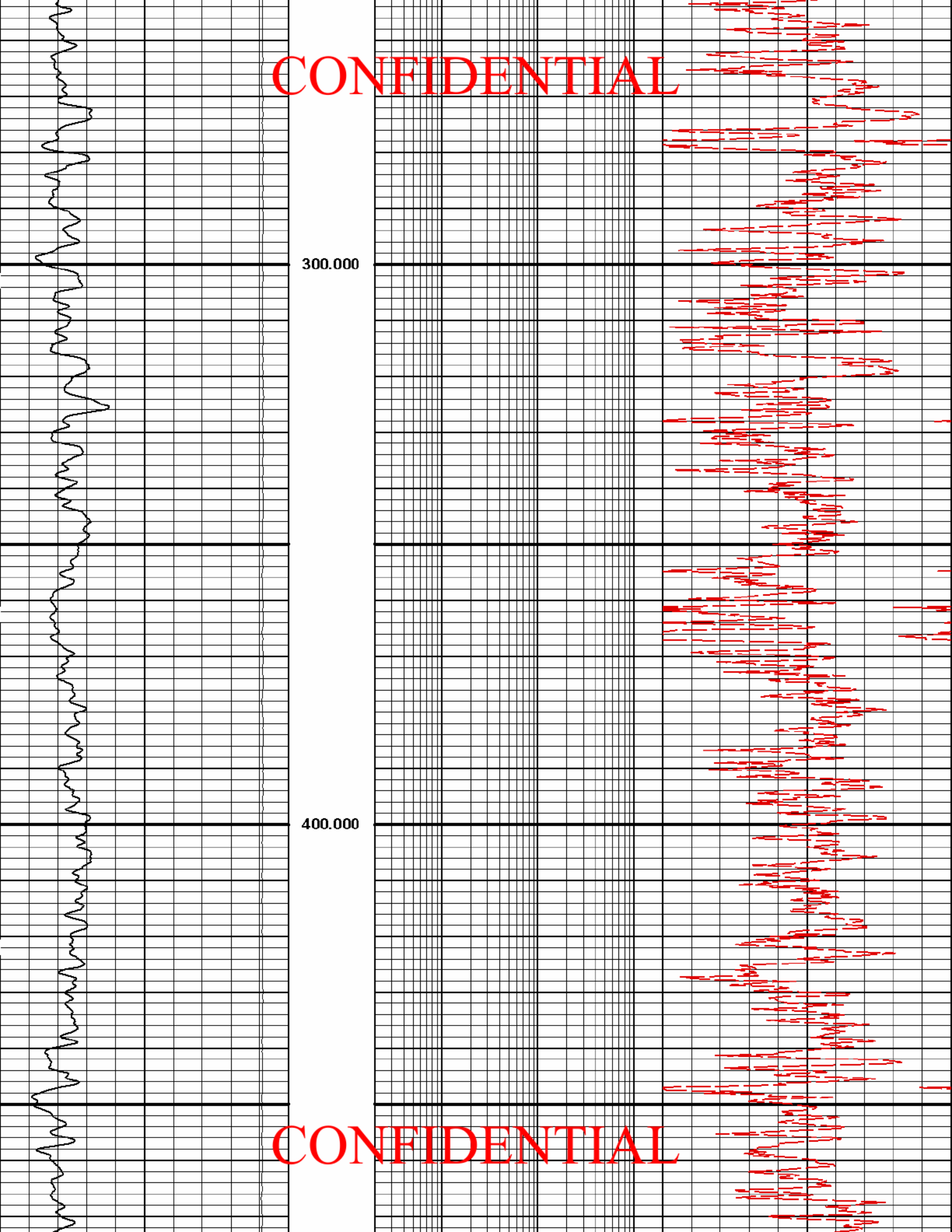
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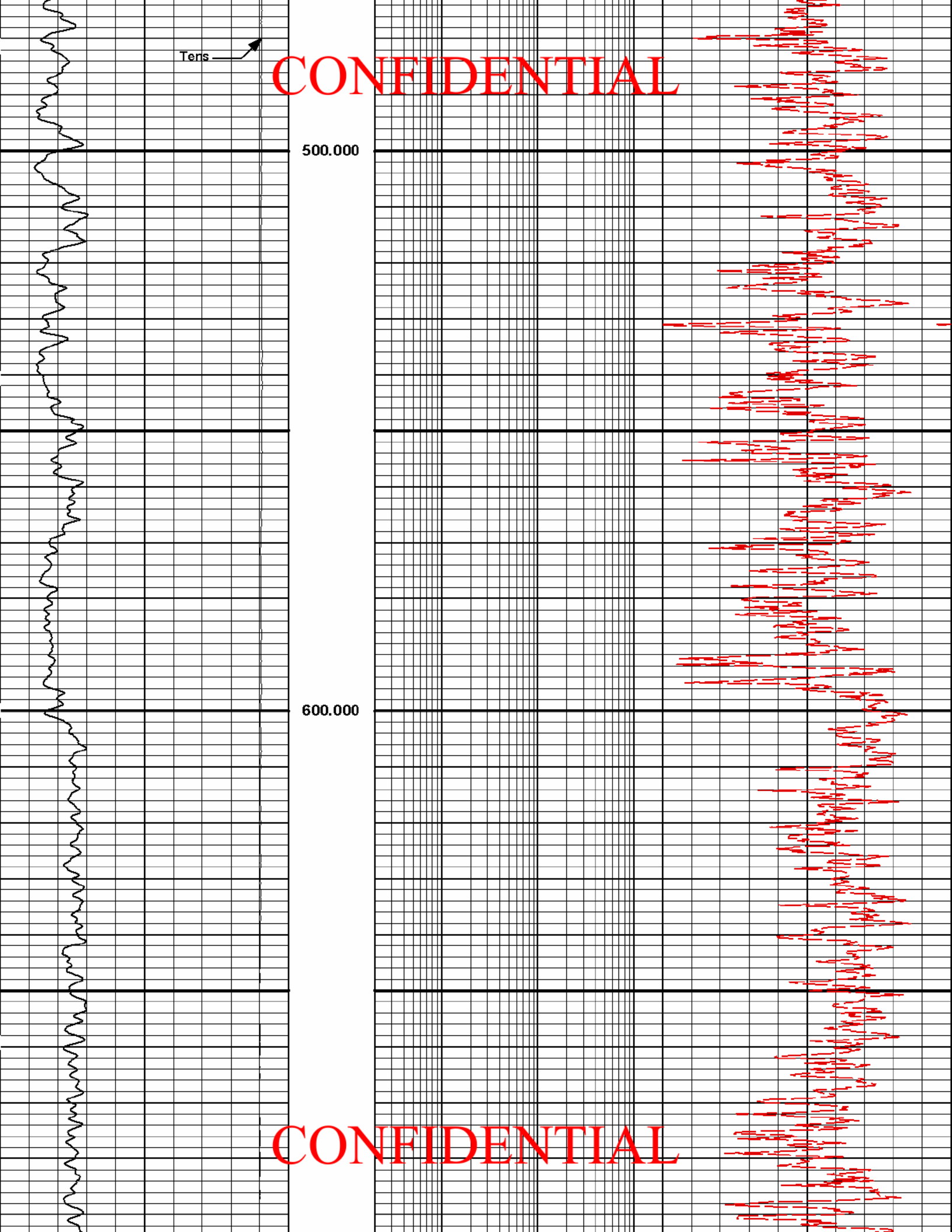
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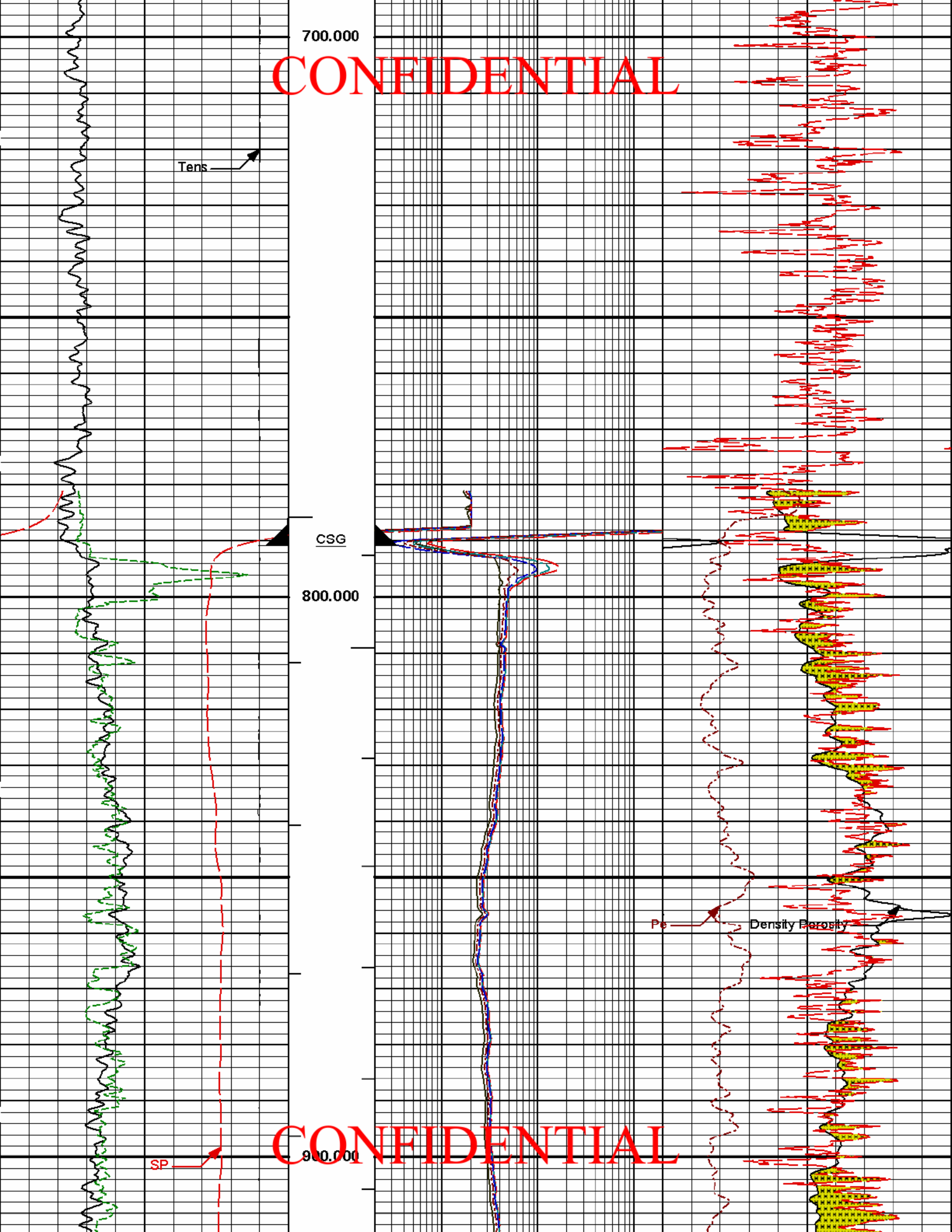
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600.000

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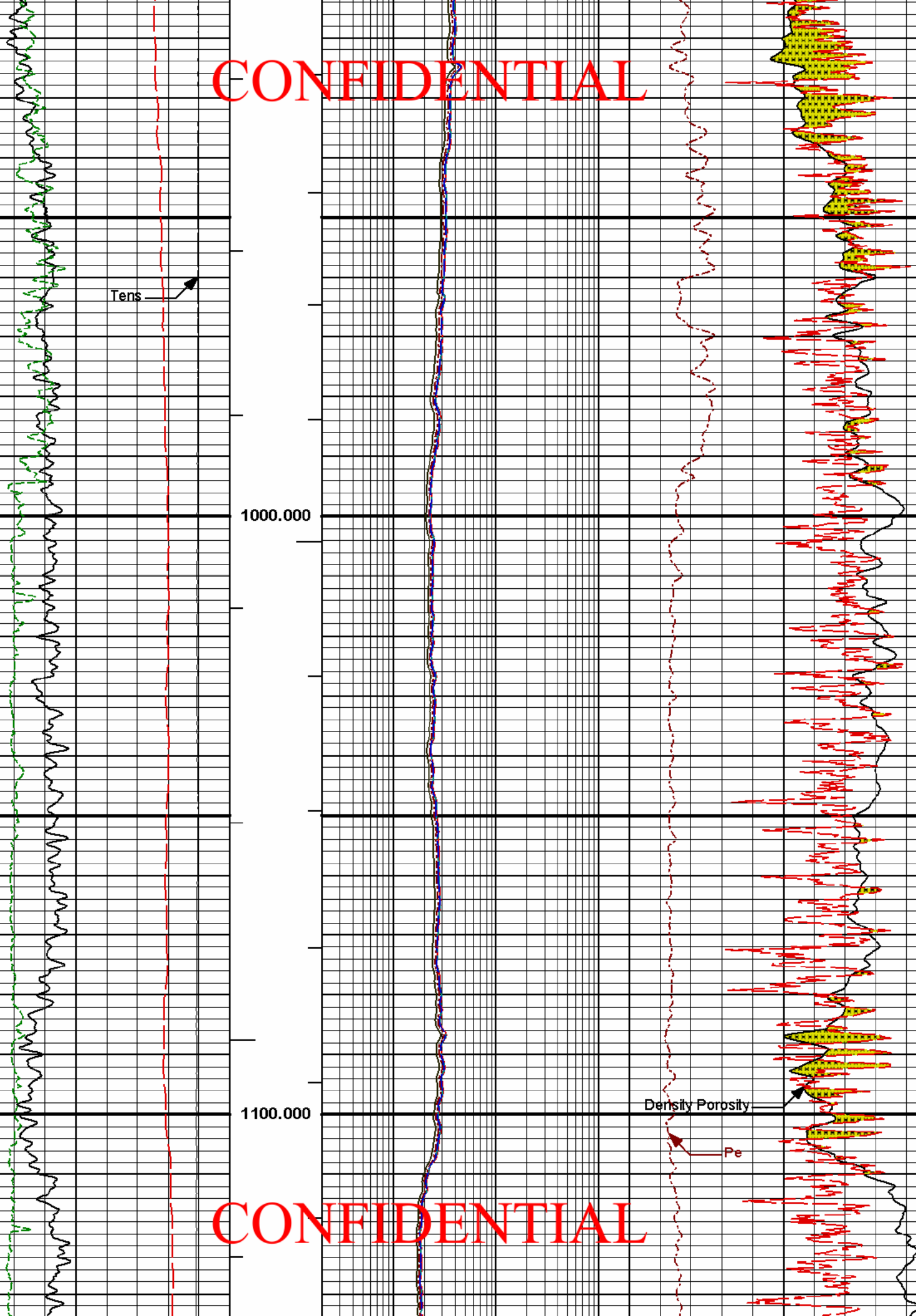


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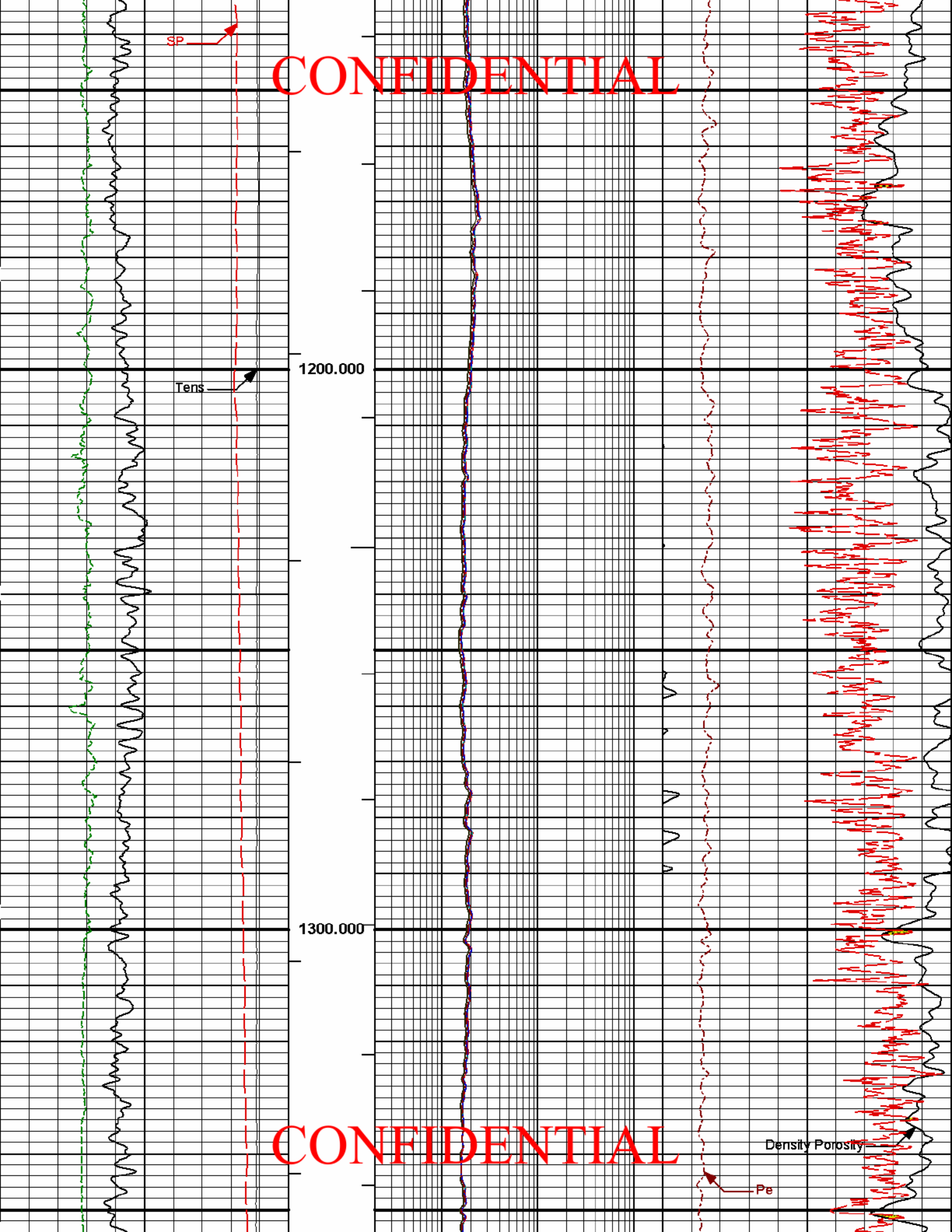
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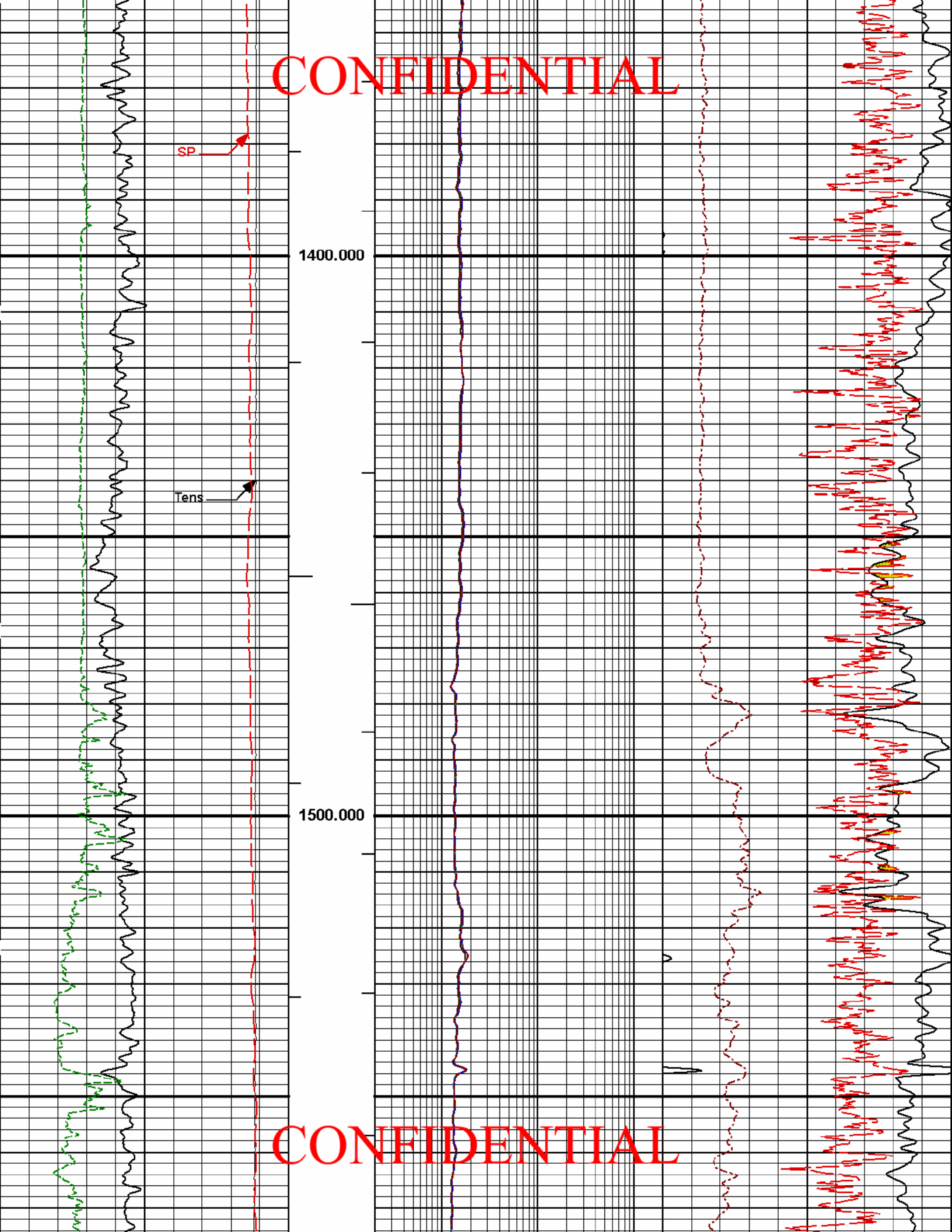


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1600.000

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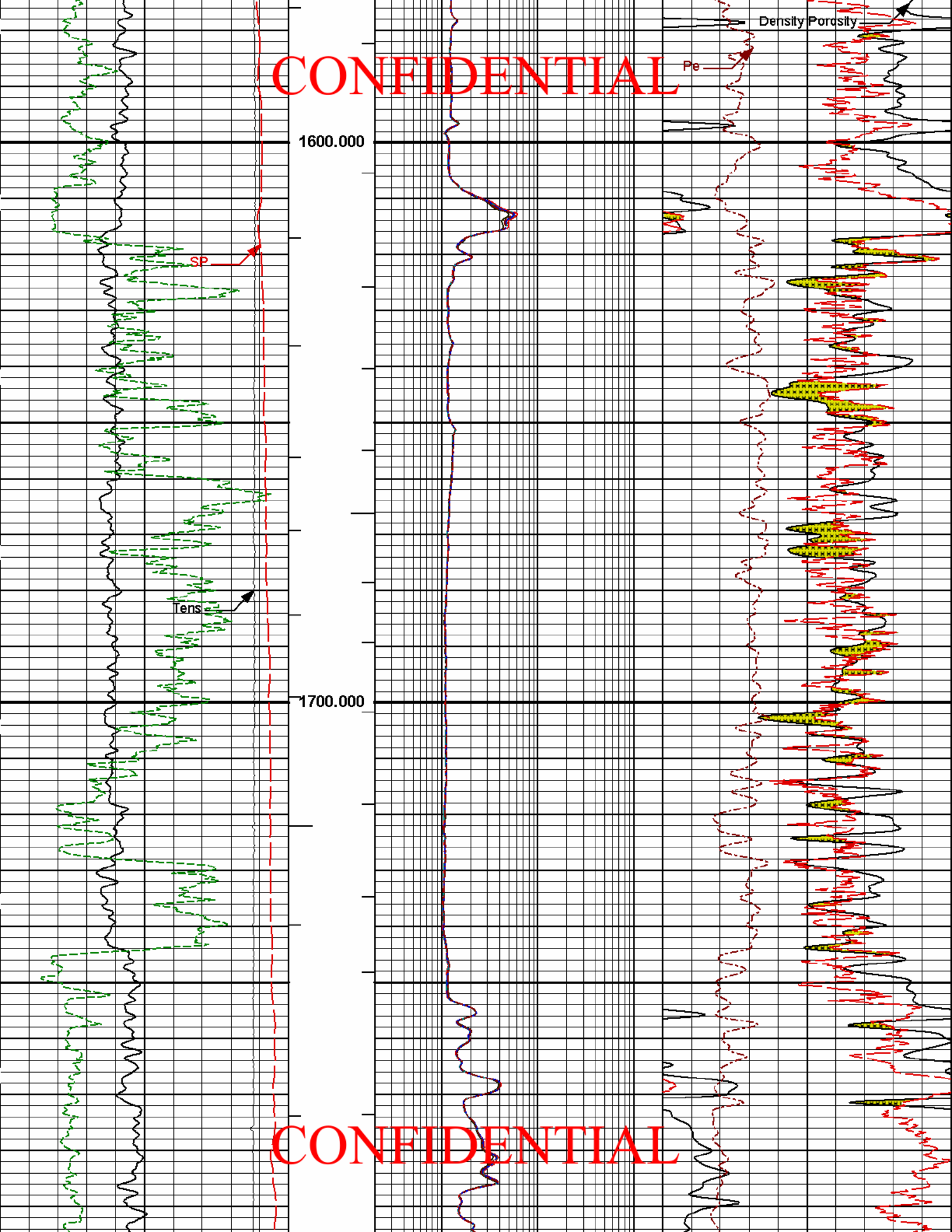
Density Porosity

Pe

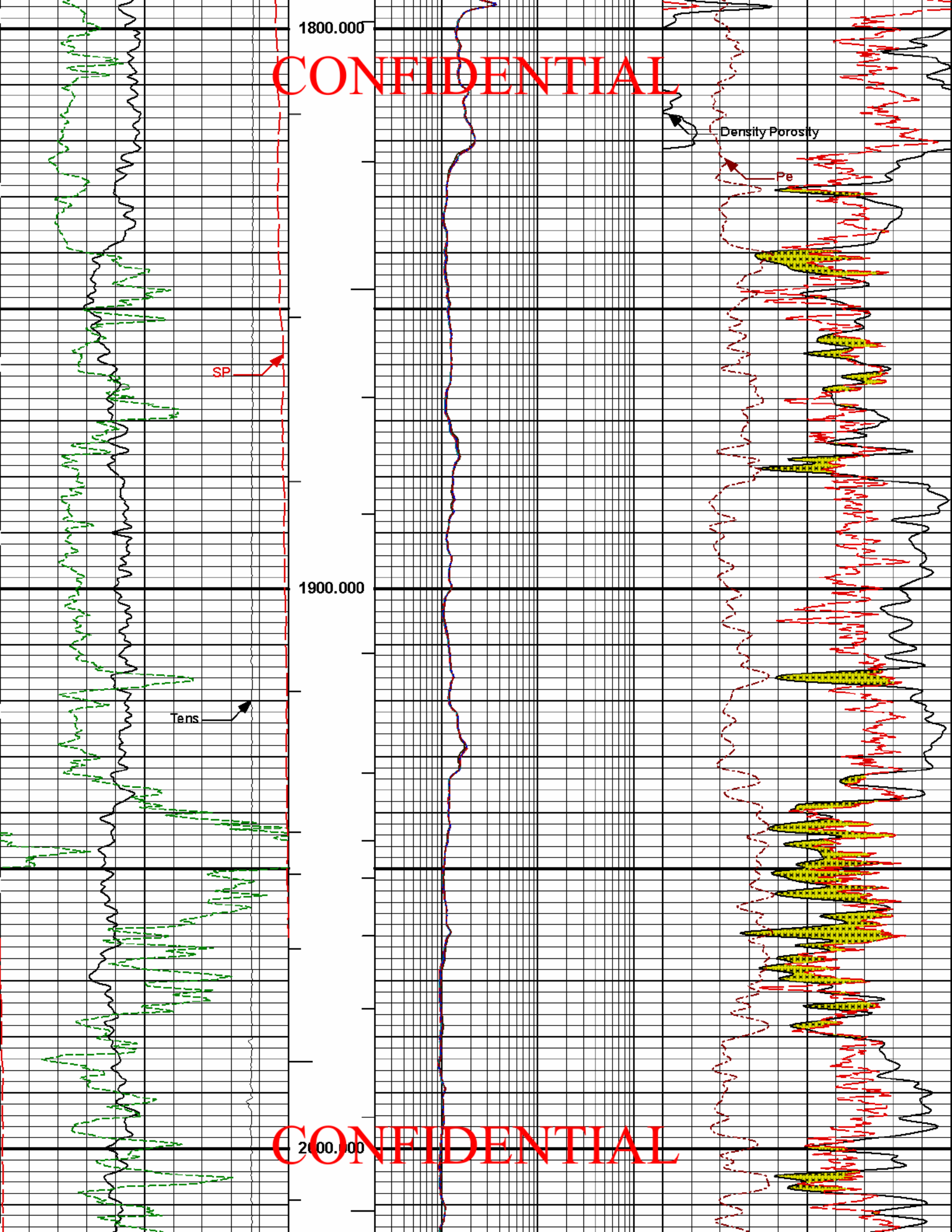
SP

lens

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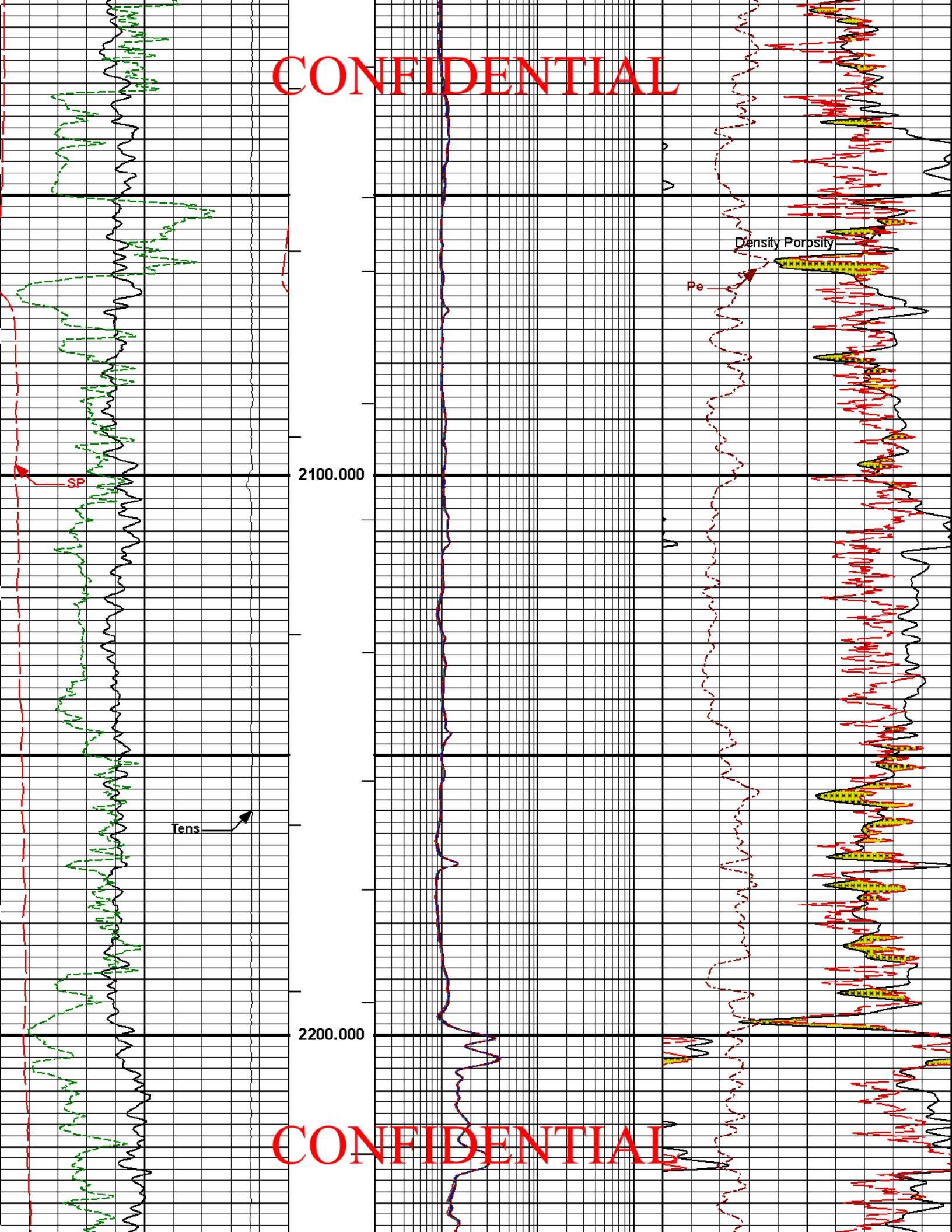


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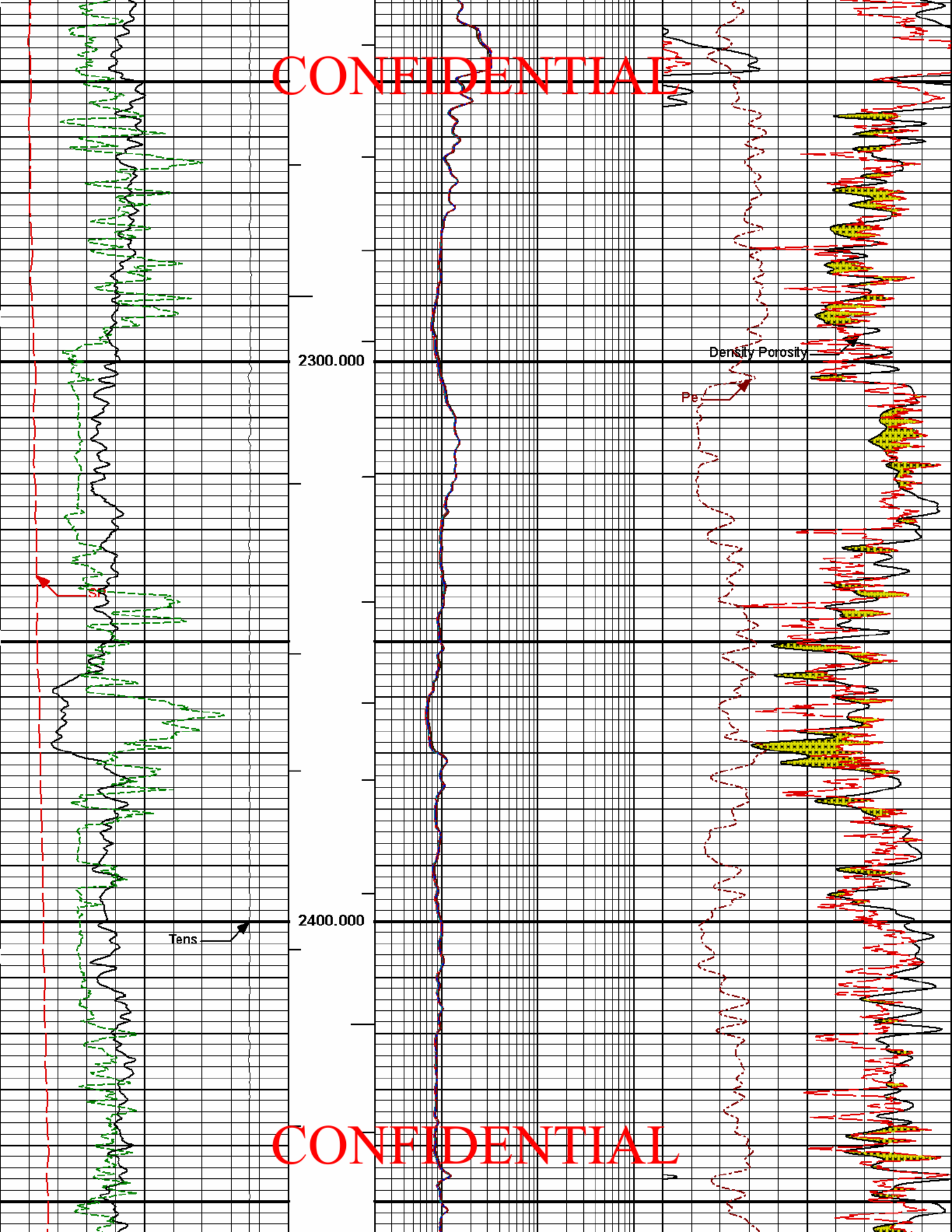
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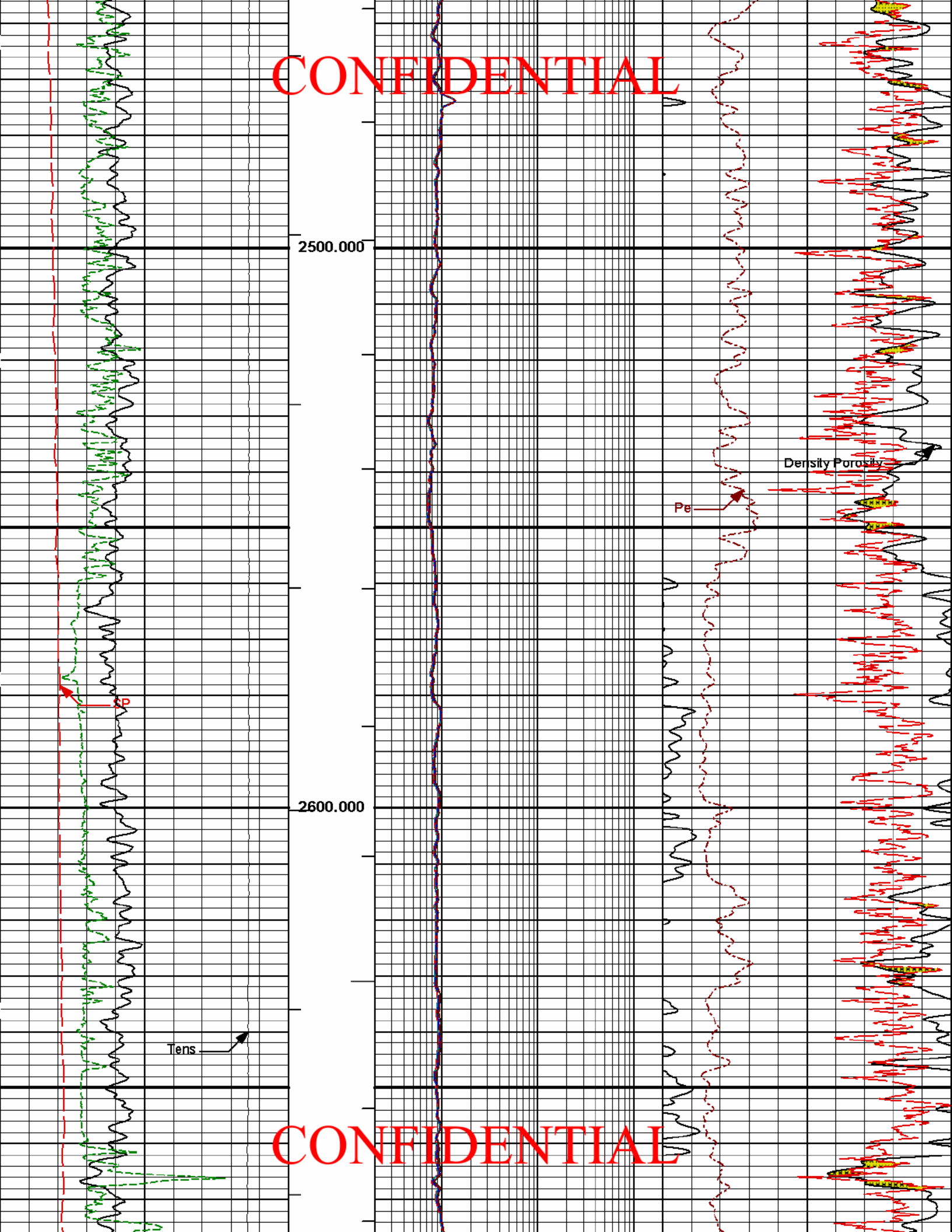
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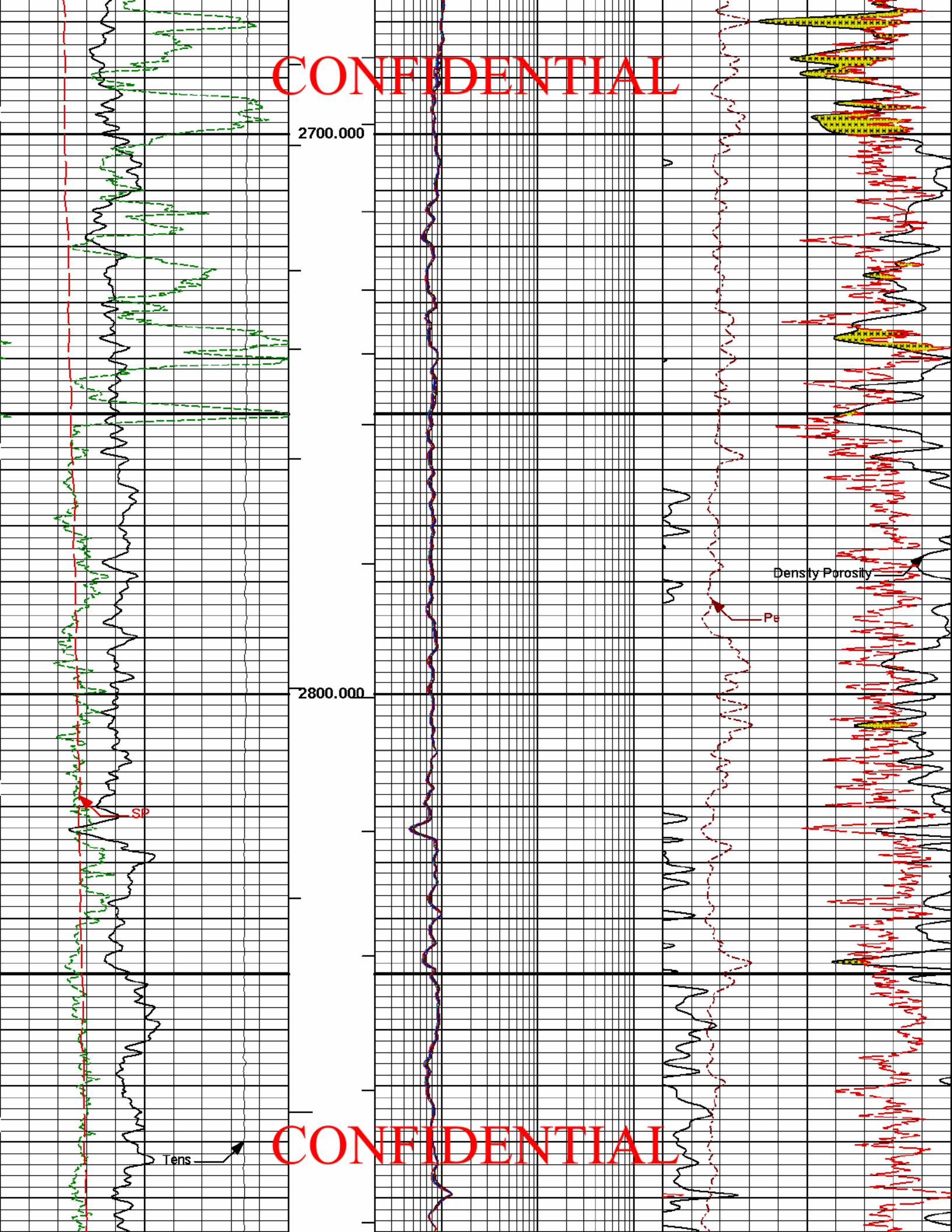
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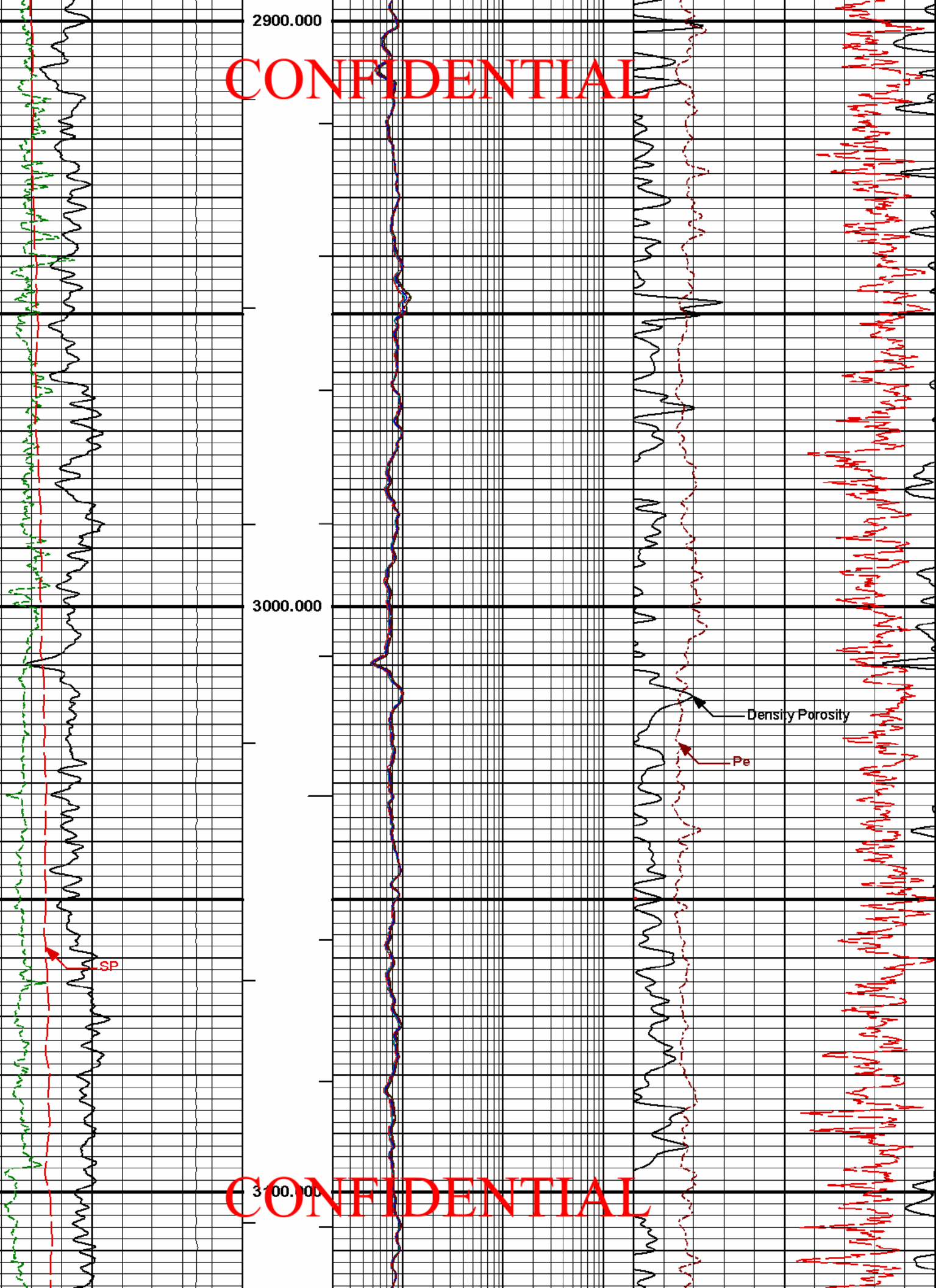
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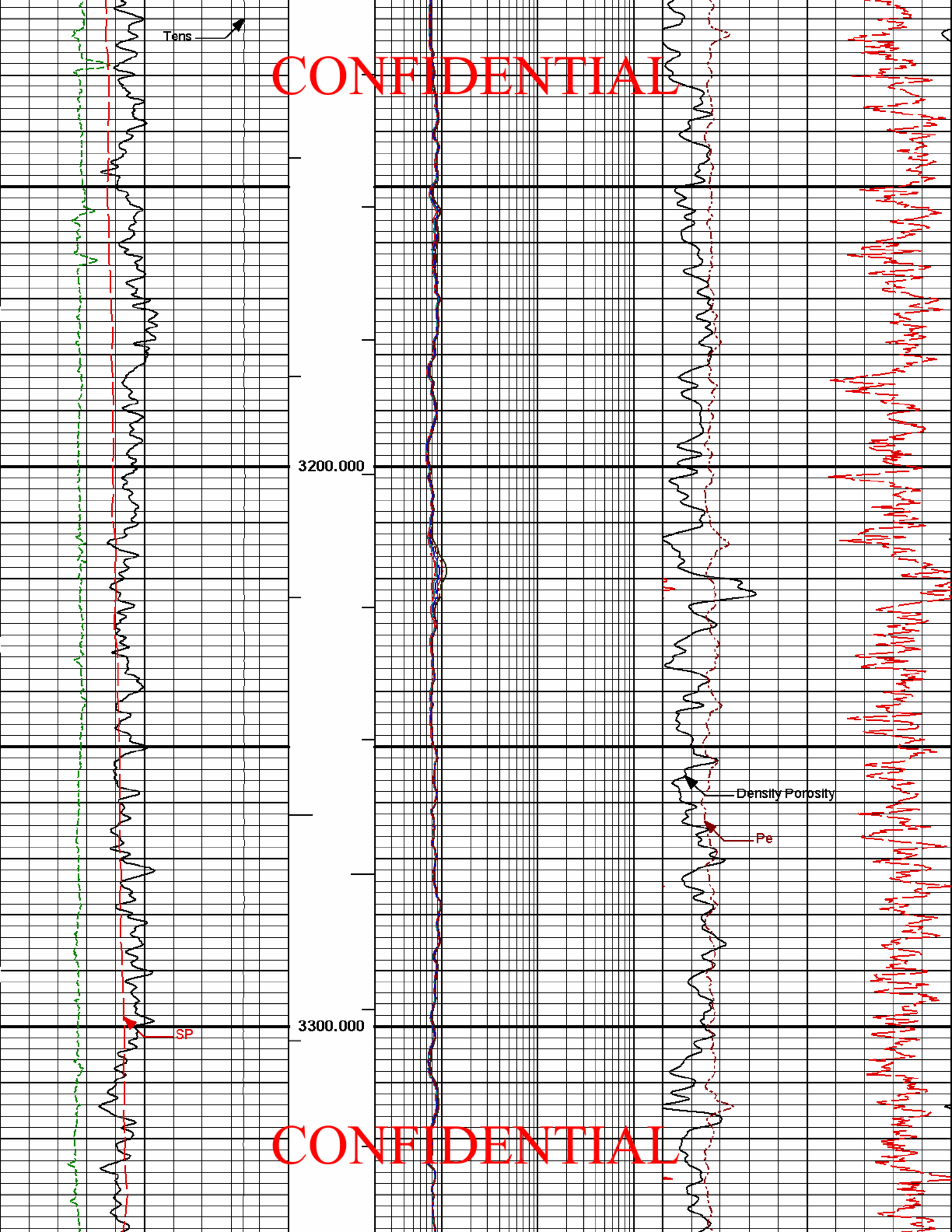


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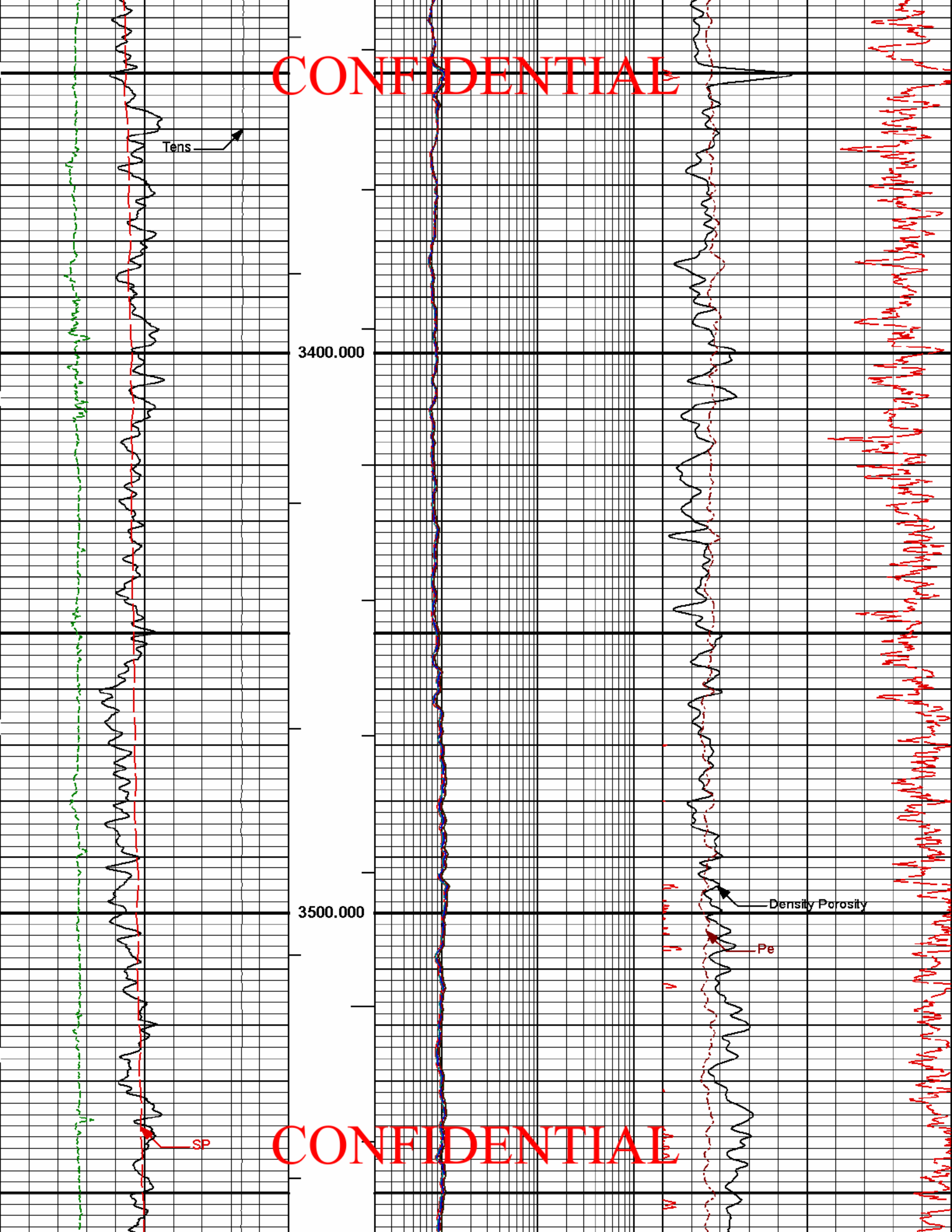


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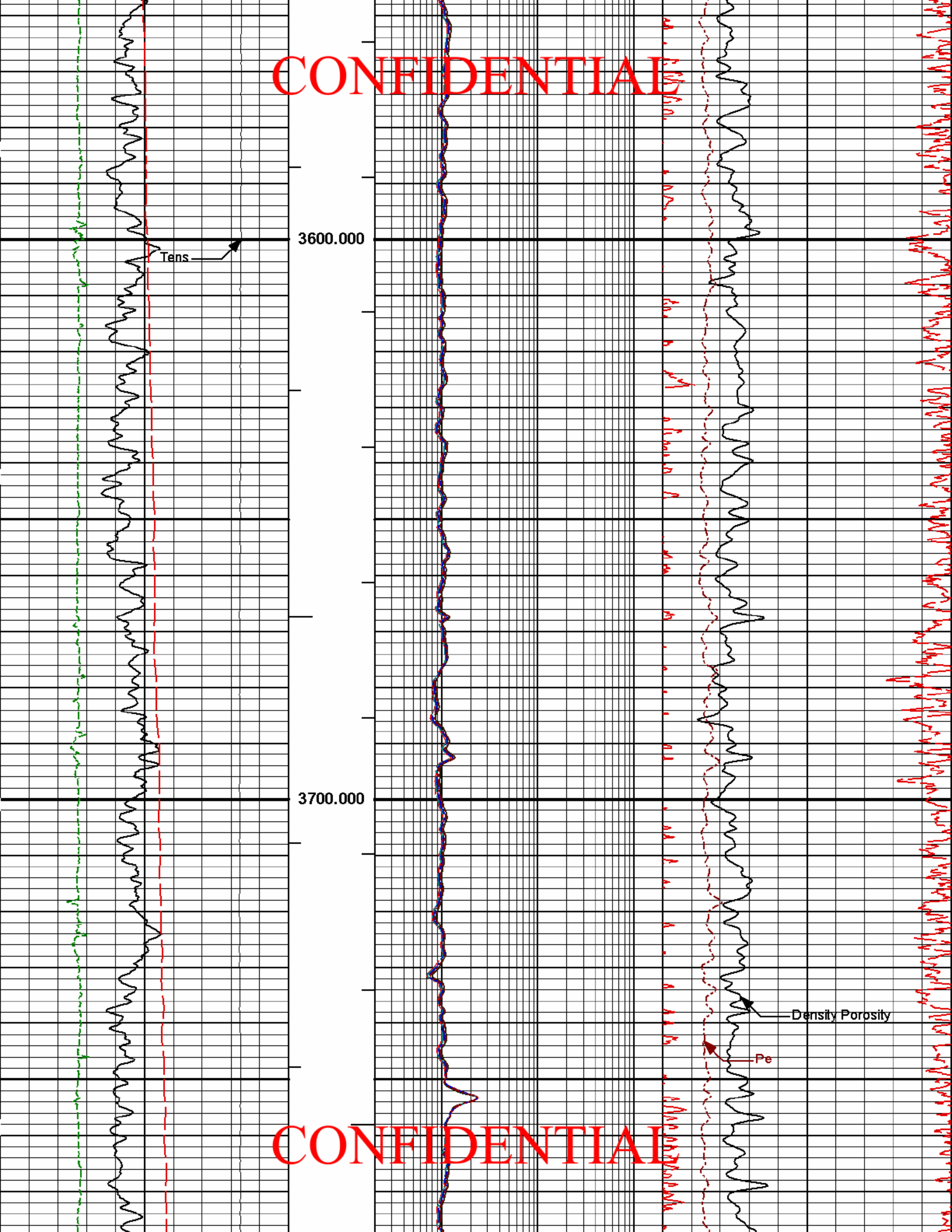


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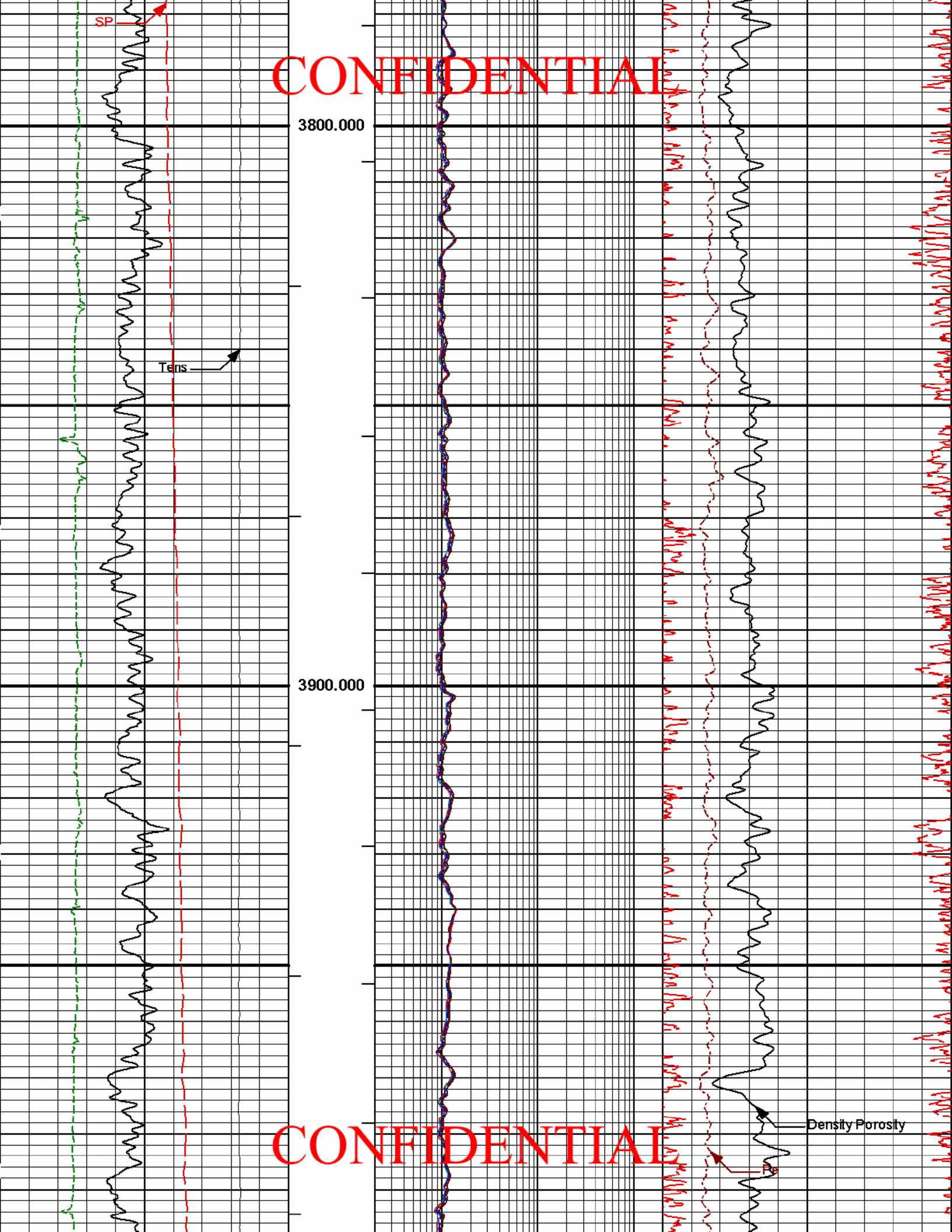
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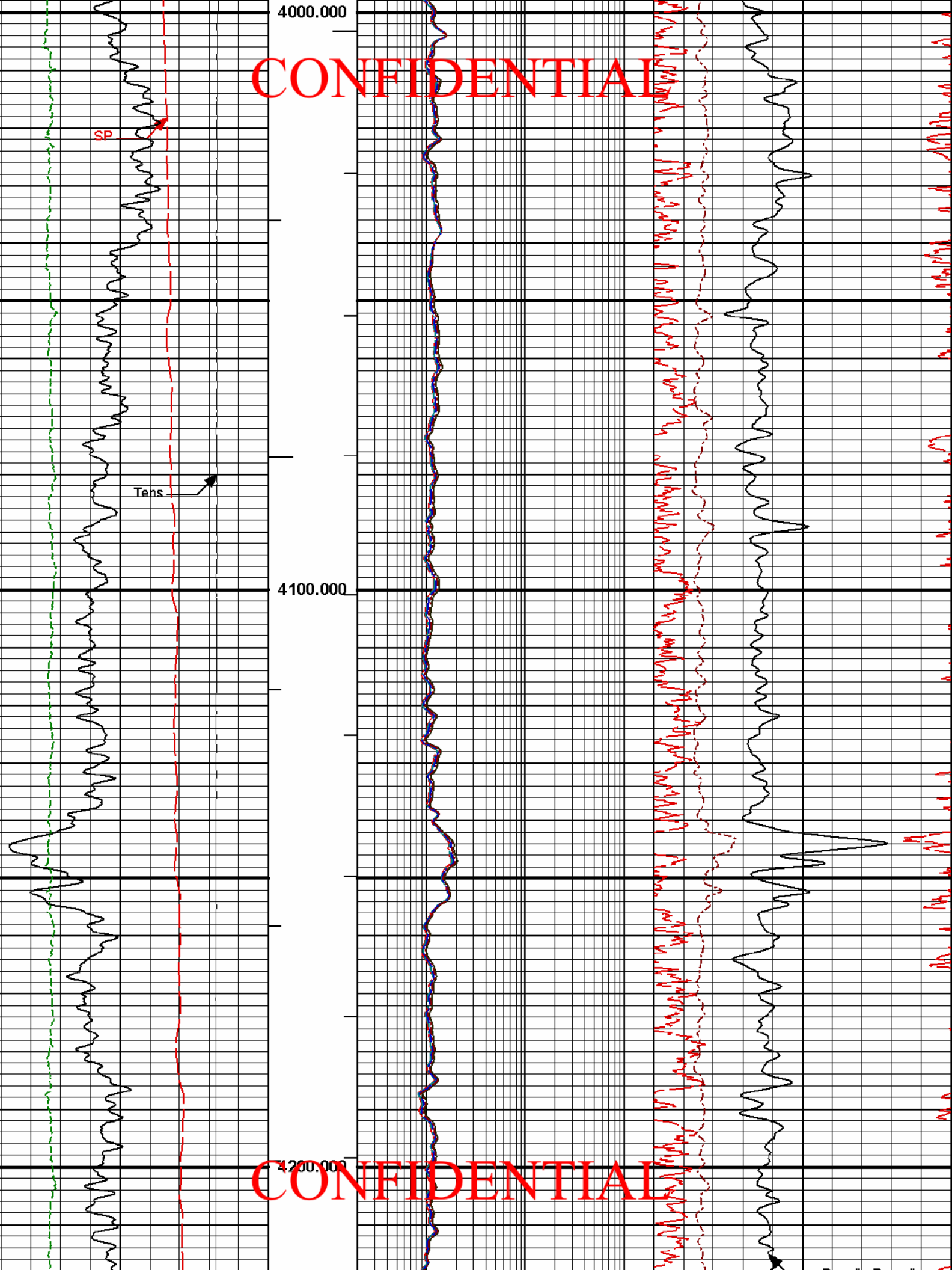
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SP

Tens

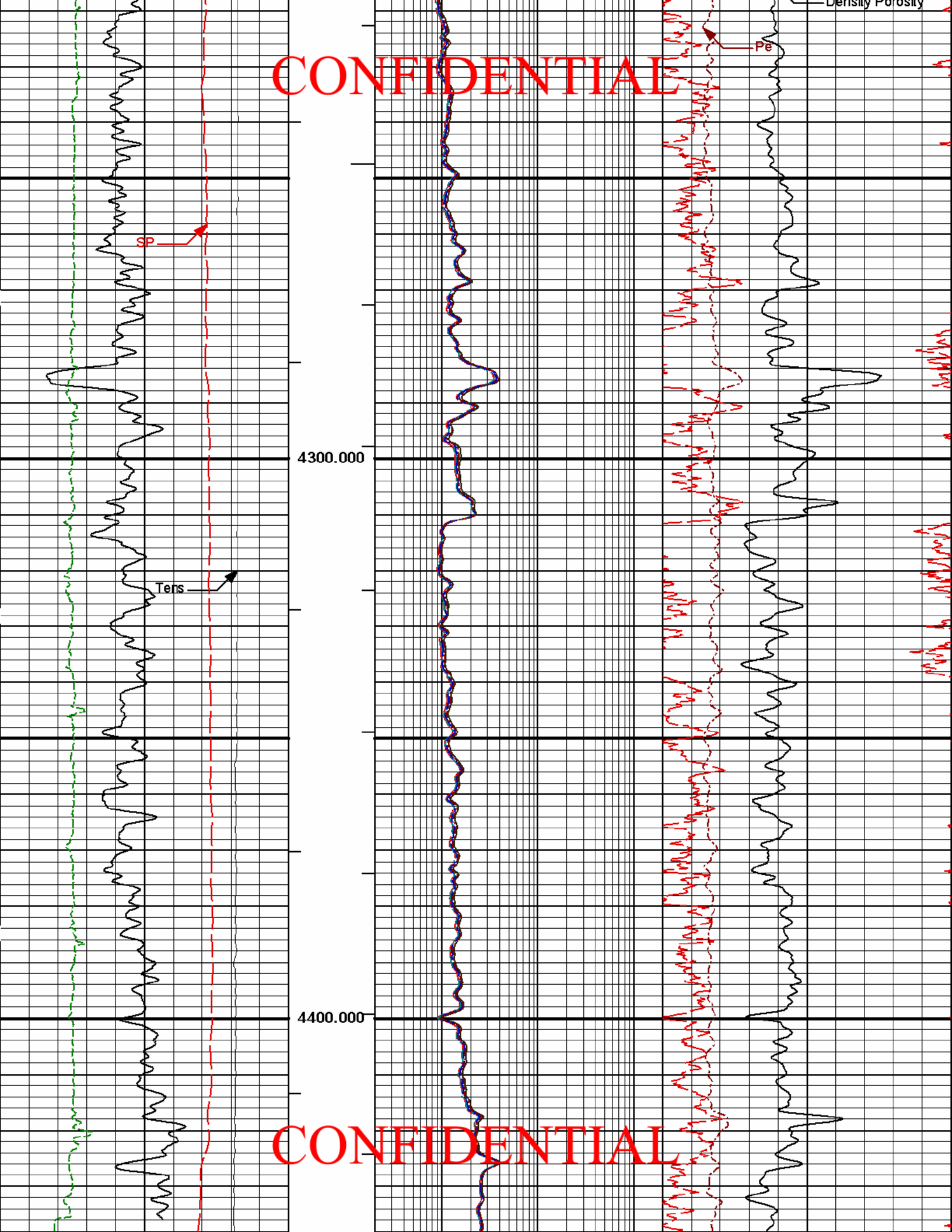
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4100.000

4200.000

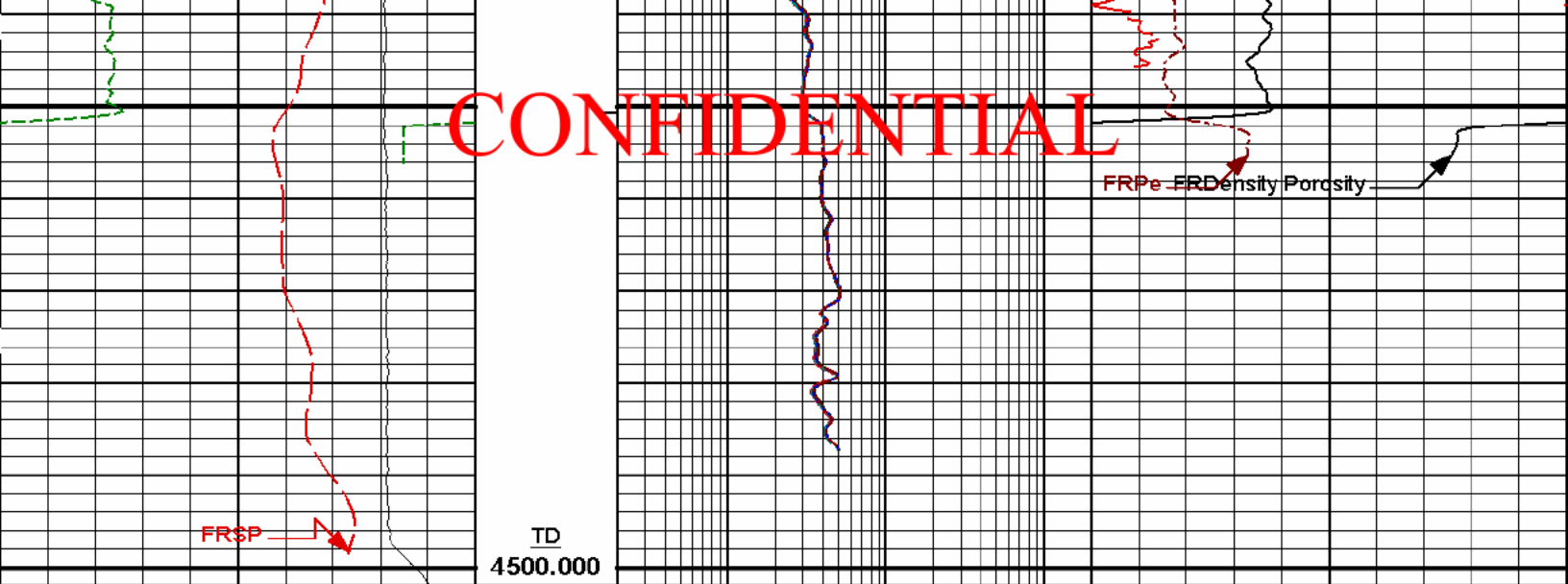
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0	SP	100	1 : 240	0.2	RT90	200	0	Pe	10
	millivolts				Ohm-m				
0	Gamma API	200	BHVT	0.2	RT60	200	40	Density Porosity	0
	api				Ohm-m			percent	
6	Calliper	16	AHVT	0.2	RT30	200	40	Neutron Porosity	0
	inches				Ohm-m			percent	
10K	Tens	0		0.2	RT20	200			
	pounds				Ohm-m				
				0.2	RT10	200			
					Ohm-m				

**HALLIBURTON** Plot Time: 04-Apr-10 20:43:25  
 Plot Range: 100 ft to 4501.92 ft  
 Data: BRIDGE\_ESP\_1\_2Well Based\MAIN\*  
 Plot File: \\not saved\IQ\_COMPOSITE\_ACRT\_5IN\_RM

MAIN PASS 5" = 100'

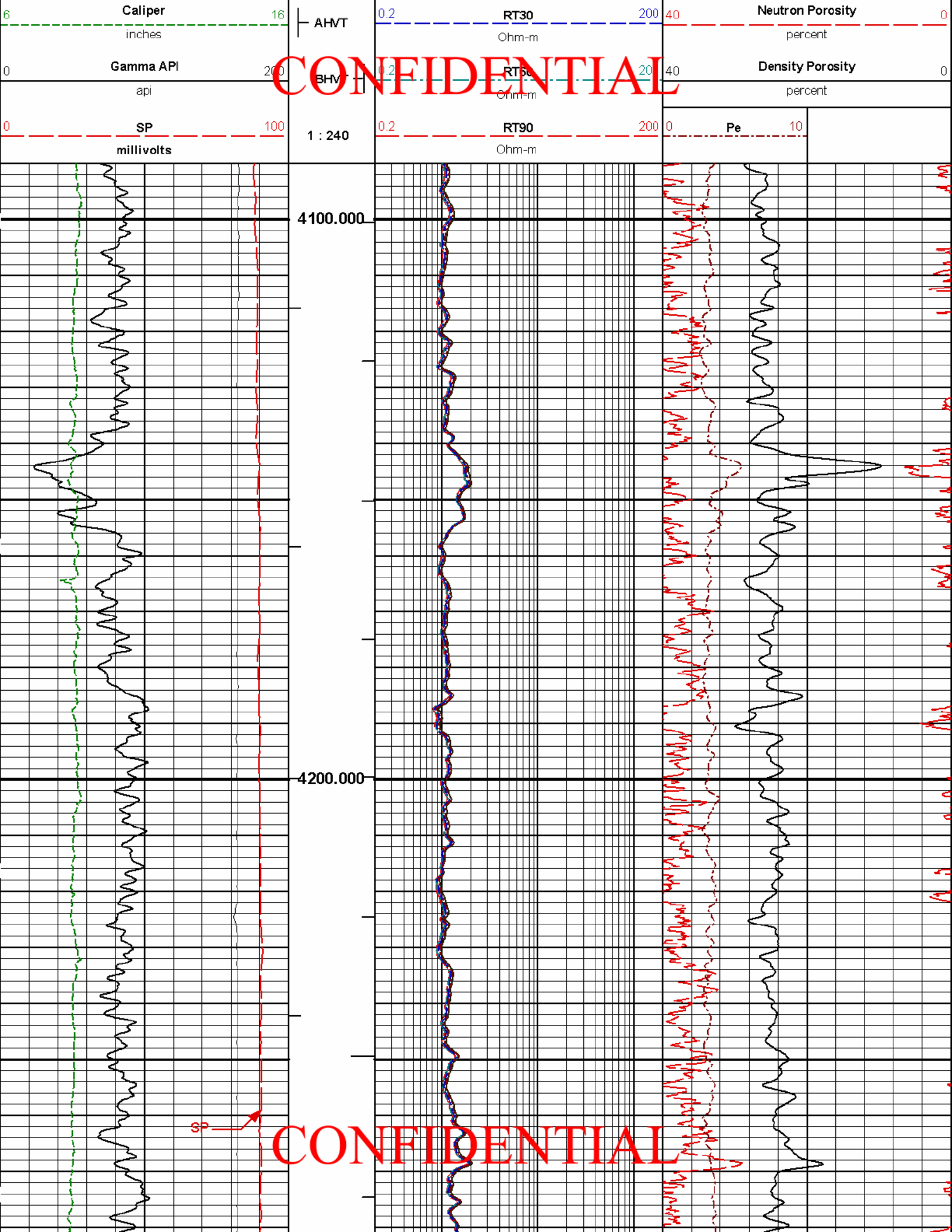
**HALLIBURTON** Plot Time: 04-Apr-10 20:43:26  
 Plot Range: 4090 ft to 4502.92 ft  
 Data: BRIDGE\_ESP\_1\_2Well Based\RPTV\*  
 Plot File: \\not saved\IQ\_COMPOSITE\_ACRT\_5IN\_RM

REPEAT SECTION 5" = 100'

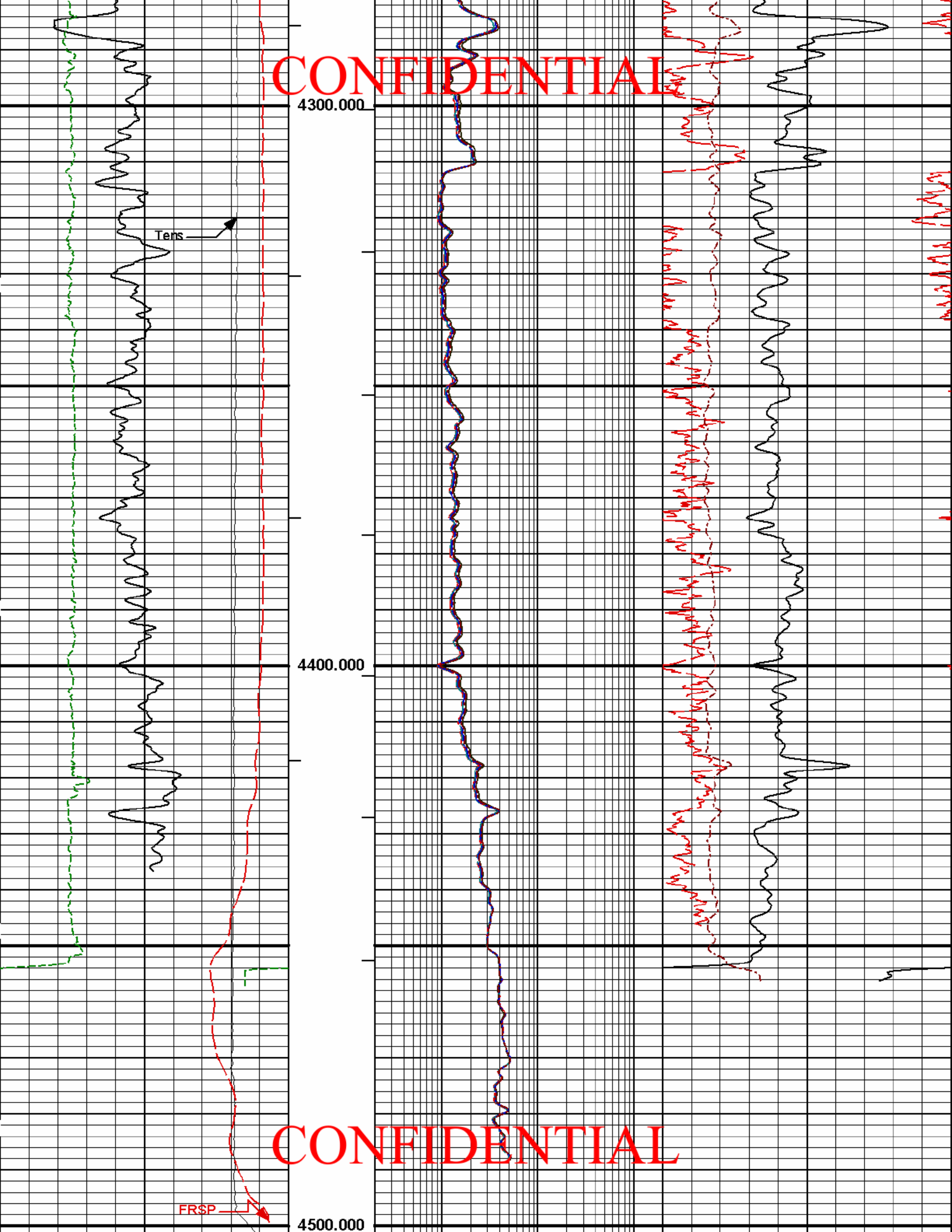
10K	Tens	0	0.2	RT20	200
	pounds			Ohm-m	

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0	SP	100	1 : 240	0.2	RT90	200	0	Pe	10
	millivolts				Ohm-m				
0	Gamma API	200	BLVT	0.2	RT60	200	40	Density Porosity	0
	api				Ohm-m			percent	
6	Calliper	16	AHVT	0.2	RT30	200	40	Neutron Porosity	0
	inches				Ohm-m			percent	
10K	Tens	0		0.2	RT20	200			
	pounds				Ohm-m				
				0.2	RT10	200			
					Ohm-m				

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**HALLIBURTON** Plot Time: 04-Apr-10 20:43:30  
 Plot Range: 4090 ft to 4502.92 ft  
 Data: BRIDGE\_ESP\_1\_2Well Based|RPTV\*  
 Plot File: \\(not saved)\IQ\_COMPOSITE\_ACRT\_5IN\_RM

REPEAT SECTION 5" = 100'

**HALLIBURTON**

## CALIBRATION REPORT

**NATURAL GAMMA RAY TOOL SHOP CALIBRATION**

<b>Tool Name:</b> GTET - 11238317	<b>Reference Calibration Date:</b> 10-Feb-10 11:34:32
<b>Engineer:</b> D. CULVER	<b>Calibration Date:</b> 05-Mar-10 15:44:24
<b>Software Version:</b> WL INSITE R2.4 (Build 20)	<b>Calibration Version:</b> 1

Calibrator Source S/N: TB-270  
 Calibrator API Reference: 259.00 api

Measurement	Measured	Calibrated	Units
Background	38.8	39.1	api
Background + Calibrator	296.1	298.1	api
Calibrator	259.3	259.0	api

**NATURAL GAMMA RAY TOOL FIELD CALIBRATION**

<b>Tool Name:</b> GTET - 11238317	<b>Reference Calibration Date:</b> 05-Mar-10 15:44:24
<b>Engineer:</b> J. MAYNE	<b>Calibration Date:</b> 03-Apr-10 17:18:39
<b>Software Version:</b> WL INSITE R3.0.3 (Build 5)	<b>Calibration Version:</b> 1

Calibrator Source S/N: TB-270  
 Calibrator API Reference: 259.00 api

Field Verification	Shop	Field	Units
Background	39.1	41.6	api
Background + Calibrator	298.1	306.2	api
Calibrator	259.0	264.6	api

Shop	Field	Difference	Tolerance
259.0	264.6	-5.6	+/- 9.00

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**NATURAL GAMMA RAY TOOL POST CALIBRATION**

Tool Name: GTET - 11238317

Reference Calibration Date: 03-Apr-10 17:18:39

Engineer: J. MAYNE

Calibration Date: 04-Apr-10 13:16:23

Software Version: WL INSITE R3.0.3 (Build 4)

Calibration Version: 1

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Calibrator Source S/N: TB-270

Calibrator API Reference: 259.00 api

Post Verification	Field	Post	Units
Background	41.6	44.4	api
Background + Calibrator	306.2	304.2	api
Calibrator	264.6	259.8	api

Shop	Field	Post	Difference	Tolerance
259.0	264.6	259.8	4.8	+/- 9.00

**DUAL SPACED NEUTRON SHOP CALIBRATION**

Tool Name: DSNT - 11020488

Reference Calibration Date: 10-Feb-10 11:25:51

Engineer: D. CULVER

Calibration Date: 06-Mar-10 10:06:00

Software Version: WL INSITE R2.4 (Build 20)

Calibration Version: 1

Logging Source S/N: 08-018

Tank Serial Number: ROCK SPRINGS

Reference value assigned to Tank: 51.650

Snow Block S/N: 11170614

Calibration Tank Water Temperature: 70 degF

Min. Tool Housing Outside Diameter: 3.625 in

**CALIBRATION CONSTANTS**

Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.962	0.966	0.900 - 1.100

**WATER TANK SUMMARY (Horizontal Water Tank)**

Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (dec):	0.2096	0.2108	0.0012	+/- 0.0020
Calibrated Ratio:	9.68	9.72	0.040	+/- 0.050

**VERIFIER**

Measurement	Value	Control Limit
Snow-Block Porosity (dec):	0.0786	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 - 11020488

Reference Calibration Date: 06-Mar-10 10:06:00

Engineer: J. MAYNE

Calibration Date: 03-Apr-10 17:27:22

Software Version: WL INSITE R3.0.3 (Build 4)

Calibration Version: 1

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Logging Source S/N: 08-018

Snow Block S/N: 11170614

**NEUTRON FIELD-CHECK SUMMARY**

	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0786	0.0653	-0.0134	+/- 0.0150

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**PASS/FAIL SUMMARY**

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

**DUAL SPACED NEUTRON POST CALIBRATION**

<b>Tool Name:</b> DSNT - 11020488	<b>Reference Calibration Date:</b> 03-Apr-10 17:27:22
<b>Engineer:</b> J. MAYNE	<b>Calibration Date:</b> 04-Apr-10 13:18:45
<b>Software Version:</b> WL INSITE R3.0.3 (Build 5)	<b>Calibration Version:</b> 1

Logging Source S/N: 08-018  
Snow Block S/N: 11170614

**NEUTRON POST-CHECK SUMMARY**

	Field Value	Post Value	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0653	0.0606	-0.0046	+/- 0.0150

**PASS/FAIL SUMMARY**

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

**SPECTRAL DENSITY SHOP CALIBRATION**

<b>Tool Name:</b> SDLT - 10947725	<b>Reference Calibration Date:</b> 10-Feb-10 09:36:07
<b>Engineer:</b> D. CULVER	<b>Calibration Date:</b> 06-Mar-10 09:17:56
<b>Software Version:</b> WL INSITE R2.4 (Build 20)	<b>Calibration Version:</b> 1

Logging Source S/N: 5235GW

Aluminum Block S/N: ROCK SPRINGS	Density: 2.606g/cc	Pe: 3.069
Magnesium Block S/N: ROCK SPRINGS	Density: 1.683g/cc	Pe: 2.594

**DENSITY CALIBRATION SUMMARY**

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0126	1.0048	0.90 - 1.10
Near Dens Gain	1.0016	0.9949	0.90 - 1.10
Near Peak Gain	0.9840	0.9789	0.90 - 1.10
Near Lith Gain	0.9702	0.9636	0.90 - 1.10
Far Bar Gain	1.0127	1.0125	0.90 - 1.10
Far Dens Gain	1.0041	1.0018	0.90 - 1.10
Far Peak Gain	0.9992	0.9987	0.90 - 1.10
Far Lith Gain	0.9823	0.9806	0.90 - 1.10
<hr/>			
Near Bar Offset	-0.1039	-0.0351	NONE
Near Dens Offset	-0.0261	0.0313	NONE
Near Peak Offset	0.1089	0.1491	NONE
Near Lith Offset	0.1888	0.2417	NONE
Far Bar Offset	-0.1846	-0.1893	NONE
Far Dens Offset	-0.1217	-0.1063	NONE
Far Peak Offset	-0.1058	-0.1030	NONE
Far Lith Offset	0.0054	0.0102	NONE
<hr/>			
Near Bar Background	967.76	970.67	700 - 1450

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Near Dens Background	319.82	323.69	230 - 480
Near Peak Background	138.93	138.17	100 - 210
Near Lith Background	170.73	170.72	125 - 260
Far Bar Background	566.27	564.59	450 - 900
Far Dens Background	218.21	219.65	175 - 345
Far Peak Background	87.46	86.39	70 - 140
Far Lith Background	89.84	90.81	75 - 145

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CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
<b>MAGNESIUM</b>				
Density (g/cc)	0.000	1.682	1.682	+/- 0.015
Pe	0.000	2.579	2.579	+/- 0.150
<b>ALUMINUM</b>				
Density (g/cc)	0.000	2.604	2.604	+/- 0.01500
Pe	0.000	3.061	3.061	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
<b>QUALITY</b>				
Background	-0.0013	+/- 0.0110	-0.0016	+/- 0.0140
Magnesium Block	-0.0010	+/- 0.0110	-0.0037	+/- 0.0140
Aluminum Block	-0.0006	+/- 0.0110	-0.0019	+/- 0.0140
Resolution	9.54	6.00 - 11.50	9.06	6.00 - 11.50
Internal Verifier(B+D+P+L)	1603	1200 - 2700	961	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			
<b>Tool Name:</b>	<b>SDLT - 10947725</b>	<b>Reference Calibration Date:</b>	<b>06-Mar-10 09:17:56</b>
<b>Engineer:</b>	<b>J. MAYNE</b>	<b>Calibration Date:</b>	<b>03-Apr-10 17:19:29</b>
<b>Software Version:</b>	<b>WL INSITE R3.0.3 (Build 5)</b>	<b>Calibration Version:</b>	<b>1</b>

Pad Temperature: 57.6 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1603.252	1592.707	-10.545	16.100
Far (B+D+P+L) cps	9514.15	9672.13	5308	16.693
Near Resolution	9.54	9.63	0.090	0.50
Far Resolution	9.06	9.31	0.250	1.00

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PASS/FAIL SUMMARY



**SDLT CALIPER FIELD CALIBRATION**

**Tool Name:** SDLT - 10947725

**Reference Calibration Date:** 02-Apr-10 11:13:27

**Engineer:** J. MAYNE

**Calibration Date:** 03-Apr-10 17:23:07

**Software Version:** WL INSITE R3.0.3 (Build 5)

**Calibration Version:** 1

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**MEASURED CALIPER VALUES**

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.73	-0.02	+/- 0.10
Ring Diameter	8.25	8.29	0.04	+/- 0.15

**PASS/FAIL SUMMARY**

Pad Extension Check: Passed  
 Diameter Check: Passed

**SDLT CALIPER POST CALIBRATION**

**Tool Name:** SDLT - 10947725

**Reference Calibration Date:** 03-Apr-10 17:23:07

**Engineer:** J. MAYNE

**Calibration Date:** 04-Apr-10 13:14:57

**Software Version:** WL INSITE R3.0.3 (Build 5)

**Calibration Version:** 1

**MEASURED CALIPER VALUES**

Measurement	Field	Post	Change	Control Limit On New Value
Pad Extension	3.73	3.74	0.00	+/- 0.10
Ring Diameter	8.30	8.15	-0.15	+/- 0.15

**PASS/FAIL SUMMARY**

Pad Extension Check: Passed  
 Diameter Check: Passed

**BCAS FIELD CASING CHECK**

**Tool Name:** BSAT - 10939067

**Calibration Date:** 03-Apr-10 18:07:00

**Engineer:** J. MAYNE

**Software Version:** WL INSITE R3.0.3 (Build 5)

**Calibration Version:** 1

Pre-Log Check	Check Depth	Shop	Field	Difference	Tolerance	Units
Delta-T Compensated	442.95	57000000.00	56.02	56,999,943.9800	1.00	uspf

**ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION**

**Tool Name:** ACRT - E171\_S970

**Reference Calibration Date:** 20-Feb-10 12:59:47

**Engineer:** J. MAYNE

**Calibration Date:** 22-Mar-10 10:03:03

**Software Version:** WL INSITE R3.0.3 (Build 5)

**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	1.0080	1.05	0.95	1.0089	1.05	0.95	1.0046	1.05
A2 (50")	0.95	1.0142	1.05	0.95	1.0163	1.05	0.95	1.0140	1.05
A3 (29")	0.95	0.9994	1.05	0.95	1.0013	1.05	0.95	0.9974	1.05
A4 (17")	0.95	1.0020	1.05	0.95	1.0019	1.05	0.95	0.9997	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.0011	1.05	0.95	0.9980	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9761	1.05	0.95	0.9728	1.05

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**TYPICAL SONDE OFFSET RANGE**

Subarray	R12KHz			R36KHz			R72KHz		
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	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	-5	-0.591	2	-6	-3.483	-2	-8	-4.654	-2
A2 (50")	-7	-1.767	2	-6	-3.577	-2	-7	-4.499	-2
A3 (29")	-27	-12.716	9	9	-3.576	3	-7	-3.074	-1
A4 (17")	-180	-95.049	-60	-45	-29.911	-15	-39	-25.183	-13
A5 (10")	N/A	N/A	N/A	-150	-99.718	-50	-80	-48.320	-10
A6 (6")	N/A	N/A	N/A	175	323.640	525	90	156.294	270

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**TRANSMITTER CURRENT GAIN**

**R-MUD VERIFICATION**

Signal	Lower	R	Upper	Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
12K	0.6	0.8325	1.3	Mud Cell	0.95	1.001	1.05
36K	1.0	1.3058	2.0				
72K	1.0	1.6007	2.0				

**CALIBRATION SUMMARY**

Sensor	Shop	Field	Post	Difference	Tolerance	Units
<b>GTET-11238317</b>						
Gamma Ray Calibrator	259.0	264.6	259.8	4.8	+/- 9.00	api
<b>DSNT-11020488</b>						
Snow-Block Porosity	0.0786	0.0653	0.0606	0.0047	+/- 0.0150	decp
<b>SDLT-10947725</b>						
Near(B+D+P+L)	1603.252	1592.707	1599.724	-7.017	+/-16.100	cps
Far(B+D+P+L)	961.435	967.243	966.790	0.453	+/-16.693	cps
Pad Extension	3.75	3.73	3.74	-0.01	+/-0.10	in
Ring Diameter	8.25	8.29	8.15	0.140	+/-0.15	in
<b>ACRt-E171_S970</b>						
Mud Cell	1.001	-----	-----	0.000	-----	ohm-m

Data: BRIDGE\_ESP\_1\_2\0001 QUAD-BSAT\IDLE Date: 04-Apr-10 13:19:32

**HALLIBURTON**

**CUSTOMER EVENT LOG**

Event Type	Time & Date	Depth (ft)	Event Description
	03-Apr-10 18:14:54	999.75	Logging 001 03-Apr-10 18:14 Up @999.8f
	03-Apr-10 18:21:08	652.98	Halting 001 03-Apr-10 18:14 Up @999.8f
	03-Apr-10 18:21:36	548.00	Logging 002 03-Apr-10 18:21 Dn @548.0f
	03-Apr-10 19:21:29	1705.11	Halting 002 03-Apr-10 18:21 Dn @548.0f
	04-Apr-10 09:32:40	703.50	Logging 003 04-Apr-10 09:32 Dn @703.5f
	04-Apr-10 10:37:46	4455.53	Halting 003 04-Apr-10 09:32 Dn @703.5f
	04-Apr-10 10:38:59	4503.50	Logging 004 04-Apr-10 10:38 Up @4503.5f
	04-Apr-10 10:48:42	4003.14	Halting 004 04-Apr-10 10:38 Up @4503.5f
	04-Apr-10 10:54:16	4502.75	Logging 005 04-Apr-10 10:54 Up @4502.8f
	04-Apr-10 12:19:19	81.25	Halting 005 04-Apr-10 10:54 Up @4502.8f

Data: BRIDGE\_ESP\_1\_2\0001 QUAD-BSAT\HALLIBUR-1A34A9 Date: 04-Apr-10 13:24:16

**HALLIBURTON**

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**TOOL STRING DIAGRAM REPORT**

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RWCH-11173131  
135.00 lbs

Ø 3.625 in →

← Load Cell @ 74.36 ft  
← BH Temperature @ 73.80 ft

78.05 ft  
6.25 ft

GTET-11238317  
165.00 lbs

Ø 3.625 in →

← GammaRay @ 65.74 ft

71.80 ft  
8.52 ft

DSNT-11020488  
174.00 lbs

DSN Decentralizer-  
10860047  
6.60 lbs

Ø 3.625 in\* →

Ø 3.625 in →

← DSN Far @ 56.34 ft  
← DSN Near @ 55.59 ft

63.28 ft  
9.69 ft

SDLT-10947725  
360.00 lbs

Ø 4.500 in →

Ø 4.750 in →

← SDL Microlog @ 45.78 ft  
← SDL Caliper @ 45.59 ft  
← SDL @ 45.53 ft

53.59 ft  
10.81 ft

IQ Flex-ORANGE  
140.00 lbs

Ø 3.625 in →

42.78 ft  
5.67 ft

Centralizer 25 Hostile-  
OVERBODY  
7.00 lbs

Ø 4.000 in\* →

37.11 ft

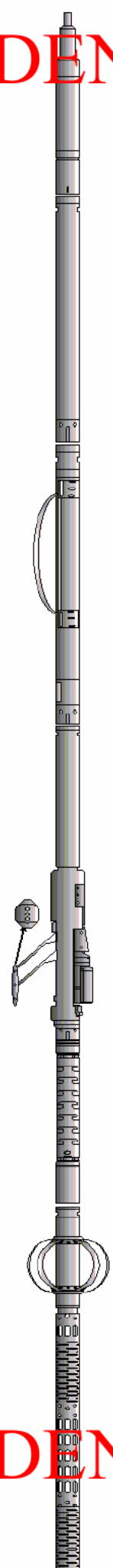
BSAT-10939067  
300.00 lbs

Ø 3.625 in →

← Sonic Receivers @ 28.59 ft

15.77 ft

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Centralizer 25 Hostile-  
OVERBODY2  
7.00 lbs

Regal Standoff 6.75-  
STANDOFF  
20.00 lbs

ACRt-E171\_S970  
250.00 lbs

SP Ring-1  
0.00 lbs

Hole Finder-  
HOLE\_FINDER  
50.00 lbs

∅ 4.000 in

∅ 6.750 in

∅ 3.625 in

∅ 3.625 in

∅ 2.800 in

∅ 3.625 in

Mud Resistivity @ 14.94 ft

ACRt @ 10.96 ft

SP @ 3.36 ft

21.33 ft

19.25 ft

2.08 ft

2.08 ft

0.00 ft

Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max. Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	11173131	135.00	6.25	71.80	300.00
GTET	Gamma Telemetry Tool	11238317	165.00	8.52	63.28	60.00
DSNT	Dual Spaced Neutron	11020488	174.00	9.69	53.59	60.00
DCNT	DSN Decentralizer	10860047	6.60	5.13	* 56.92	300.00
SDLT	Spectral Density Tool	10947725	360.00	10.81	42.78	60.00
IQF	IQ Flex tool	ORANGE	140.00	5.67	37.11	300.00
BCAS	Borehole Sonic Array Tool	10939067	300.00	15.77	21.33	60.00
OBCEN	Centralizer - 25 in. Hostile Overbody	OVERBODY2	7.00	2.08	* 21.40	300.00
OBCEN	Centralizer - 25 in. Hostile Overbody	OVERBODY	7.00	2.08	* 33.99	300.00
ACRt	Array Compensated True Resistivity	E171_S970	250.00	19.25	2.08	300.00
SP	SP Ring	1	0.00	0.25	* 3.36	300.00
RSOF	Regal Standoff 6.75"	STANDOFF	20.00	0.52	* 18.89	300.00
HFND	Hole Finder	HOLE_FINDER	50.00	2.08	0.00	300.00
<b>Total</b>			<b>1,614.60</b>	<b>78.05</b>		

\* Not included in Total Length and Length Accumulation.  
Date: 04-Apr-10 13:24:43

Data: BRIDGE\_ESP\_1\_210001 QUAD-BSATIDLE

COMPANY	BRIDGE ENERGY.LLC
WELL	ESPINO 1 - 2
FIELD	WILDCAT
COUNTY	PAYETTE

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HALLIBURTON

STATE      DATE

SPECTRAL DENSITY  
DUAL SPACED NEUTRON  
BOREHOLE COMP SONIC  
ARRAY COMPENSATED  
TRUE RESISTIVITY

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