Schlumberger

Company: **ESSO Australia Pty. Ltd.**

8.5 in. Section

Well: **BMB−B16**

Field: **Bream B**

Rig: **ENSCO 102** State: **Victoria**

Rig: ENSCO 102
Field: Bream B
Location: Bass Strait
Well: BMB−B16
Company: ESSO Australia Pty. Ltd.

GeoVISION Density Neutron
1:200 Measured Depth
Recorded Mode Log

Location			Elevation		
	Total depth:	2641.0 m		K.B.	Top Drive
	Spud date:	05−Jul−05		G.L.	−61.0 m
	Runs:	2 To 4		D.F.	47.2 m
	Permanent datum:	Mean Sea Level		Elev.:	0.0 m
	Log measured from:	Drill Floor		47.2 m	above Perm. datum
	Depth reference:	Driller's Depth			

Service Order no.	x = 573164.77m (East)	Longitude	Latitude
ASQ−05−10	y = 5736349.58m (North)	E 147º 50' 21.375"	S 38º 31' 5.642"

Depth logged:	836.0 m To 2931.8 m	Mag decl: 13.133 deg.	Other services:
Date logged:	04−Aug−05 To 09−Aug−05	Mag dip: −69.032 deg.	Xceed* RSS, D&I Survey

Bore hole record			Casing record			
Hole size	from	to	Size	Density	from	to
12.25 in.	181.0 m	843.0 m	9.625 in.	47.0 lb/ft	27.2 m	836.0 m
8.5 in.	843.0 m	2641.0 m				

Mud record			Borehole deviation record			
Type	from	to	Min	Max	from	to
S−W/Bentonite	181.0 m	843.0 m	0.57 deg.	6.79 deg.	181.0 m	843.0 m
KCl/PHPA/Glycol	843.0 m	2641.0 m	4.85 deg.	58.13 deg.	843.0 m	2641.0 m

Surface equipment		Software record	
Unit	OLU−JA−9602	IDEAL Wis	ID10_2C_01
Depth system	PDA − DES−DA	SPM	hspm10_1c_05
		LWD	See Toolsketch
		MWD	V8.0B96

Bit Run Summary

Run number		2	3	4		
Bit size	in.	8.5	8.5	8.5		
Bit start depth	m	843.0	1253.0	1902.0		
Bit end depth	m	1253.0	1902.0	2641.0		
Top interval logged	m	836.0	1221.2	1870.2		
Bottom interval logged	m	1243.8	1892.8	2631.8		
Begin log: time		19:21	20:56	06:30		
Begin log: date		04−Aug−05	06−Aug−05	08−Aug−05		
End log: time		07:49	16:49	13:05		
End log: date		06−Aug−05	07−Aug−05	09−Aug−05		
Mud data						
Depth	m	1192.0	1809.0	2641.0		

Type		KCl/PHPA/Glycol	KCl/PHPA/Glycol	KCl/PHPA/Glycol							
Mud weight	ppg	9.60	9.70	9.85							
Solids	%	4.2	5.0	6.0							
Chlorides	mg/L	43000	45000	46000							
Rm	ohm.m@ºC	0.10@21.0	0.10@21.1	0.09@20.8							
Rmf	ohm.m@ºC	0.08@20.9	0.09@21.0	0.08@20.6							
Rmc	ohm.m@ºC	0.13@21.0	0.13@21.7	0.14@21.0							
Potassium	%	8.0	8.0	8.0							
Environmental data											
GR											
Mud weight	ppg	9.60	9.70	9.85							
Bit size	in.	8.5	8.5	8.5							
Resistivity											
Neutron porosity											
Hole Size	in.	8.5	8.5	8.5							
Mud weight	ppg	9.60	9.70	9.85							
Temperature	ºC	65.0	68.0	87.0							
Mud salinity	ppm	84775	76924	83929							
Formation salinity											
Recording rate 1	SEC	5 sec.	5 sec.	5 sec.							
Recording rate 2	SEC	5 sec.	5 sec.	5 sec.							
Filtering GR		3 pt.	3 pt.	3 pt.							
Filtering density		3 pt.	3 pt.	3 pt.							
Filtering Neutron		3 pt.	3 pt.	3 pt.							
Company representative		R. Bain	M. Jackson	J. MacKinnon							
Schlumberger D&M Personnel		J. Dolan	M. Y. Tan	D. Hastie	T. Auger	C. Soper	B. Hanson				

OTHER SERVICES FOR RUN2	OTHER SERVICES FOR RUN3	OTHER SERVICES FOR RUN4
Xceed* RSS D&I Survey	Xceed* RSS D&I Survey	Xceed* RSS D&I Survey
REMARKS: RUN NUMBER 2 8−1/2 in. hole section was drilled from 843.0 m to 1253.0 m. Depth is referenced to Driller's Depth. All data presented is from tool memory. Environmental Corrections: − GR is corrected for mud weight, tool and bit size, but not corrected for Potassium content. GVR* resistivity is corrected for bit size, mud resistivity and borehole temperature. Neutron porosity is calculated with a limestone matrix and is corrected for hole size (DCAV), borehole salinity, temperature and mud hyrdogen index (derived from mud weight. temperature and pressure at depth). Surface temperature is adjusted to give a correct computed downhole temperature gradient. Neutron porosity data was procesed without	REMARKS: RUN NUMBER 3 8−1/2 in. hole section was drilled from 1253.0 m to 1902.0 m. Depth is referenced to Driller's Depth. All data presented is from tool memory. Environmental Corrections: − GR is corrected for mud weight, tool and bit size, but not corrected for Potassium content. GVR*6 resistivity is corrected for bit size, mud resistivity and borehole temperature. Neutron porosity is calculated with a limestone matrix and is corrected for hole size (DCAV), borehole salinity, temperature and mud hydrogen index (derived from mud weight, temperature and pressure at depth). Surface temperature is adjusted to give a correct computed downhole temperature gradient. Resistivity data was processed until the depth	REMARKS: RUN NUMBER 4 8−1/2 in. hole section was drilled from 1902.0 m to 2641.0 m. Depth is referenced to Driller's Depth. All data presented is from tool memory. Environmental Corrections: − GR is corrected for mud weight, tool and bit size, but not corrected for Potassium content. GVR* resistivity is corrected for bit size, mud resistivity and borehole temperature. Neutron porosity is calculated with a limestone matrix and is corrected for hole size (DCAV), borehole salinity, temperature and mud hydrogen index (derived from mud weight, temperature and pressure at depth). Surface temperature is adjusted to give a correct computed downhole temperature gradient. Resistivity data between the interval of

FR11 and FR21.

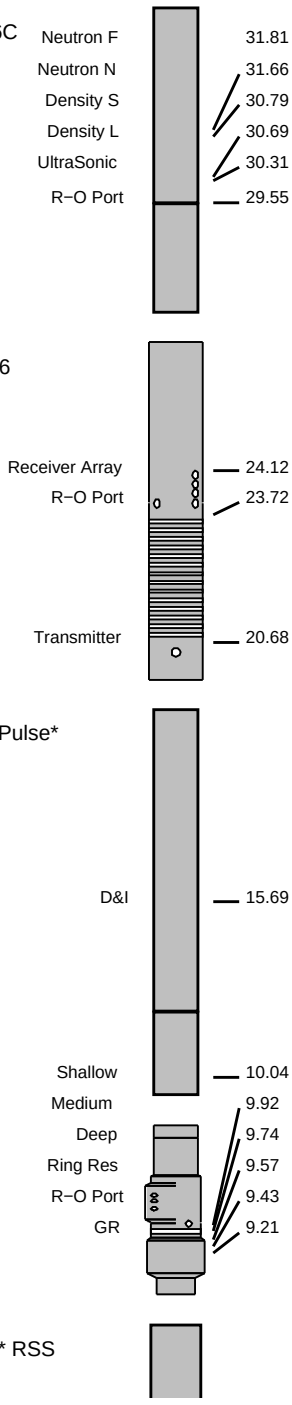
of 1864.0 m MD.

1864.0 m to 1893.0 m MD was acquired by reaming down the section.

EQUIPMENT DESCRIPTION

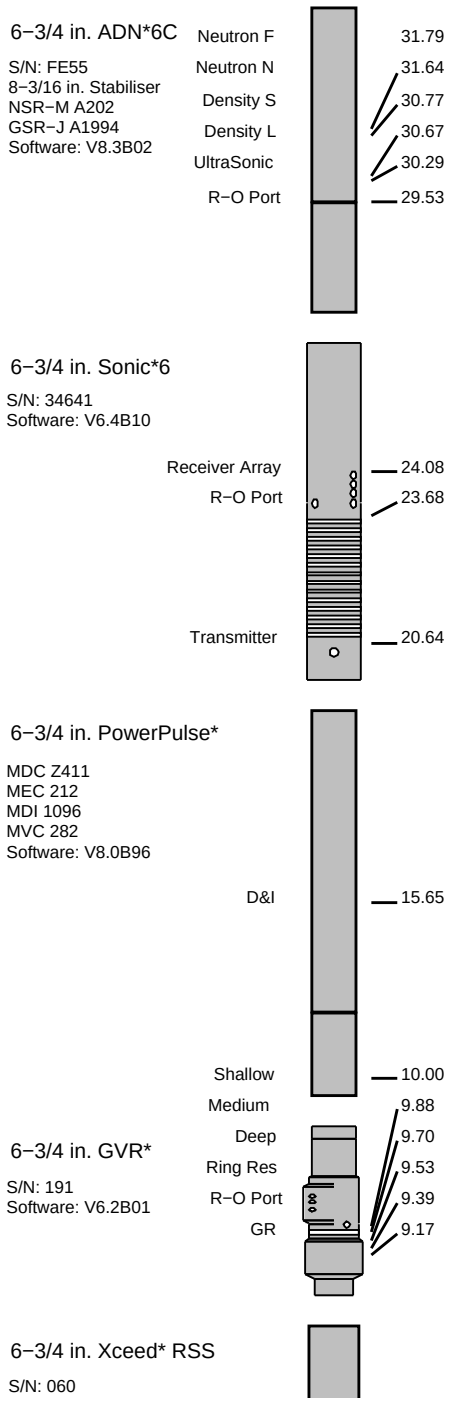
RUN2

DOWNHOLE EQUIPMENT



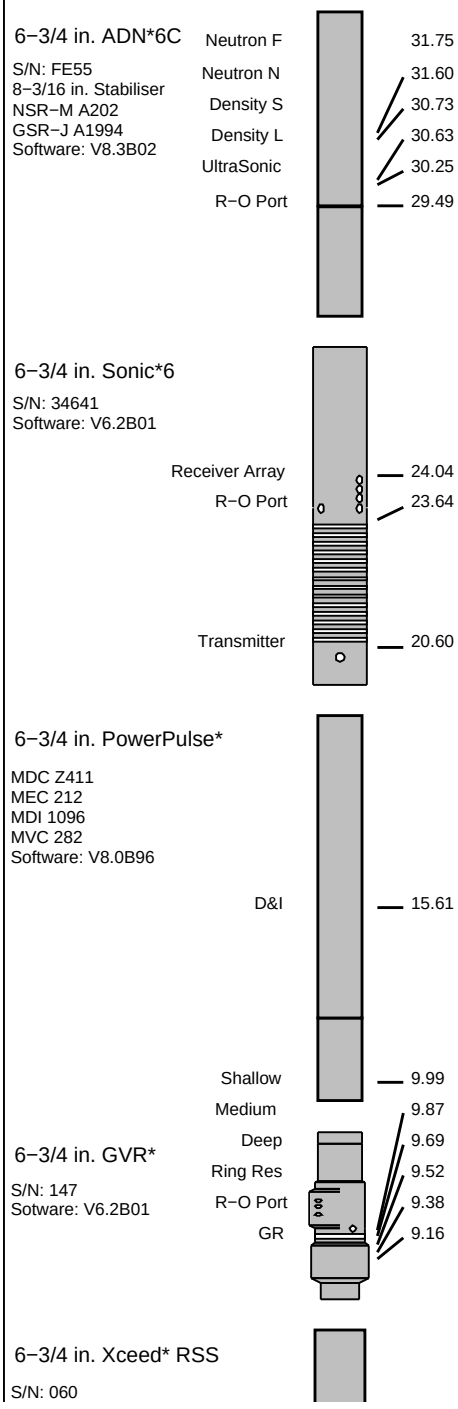
RUN3

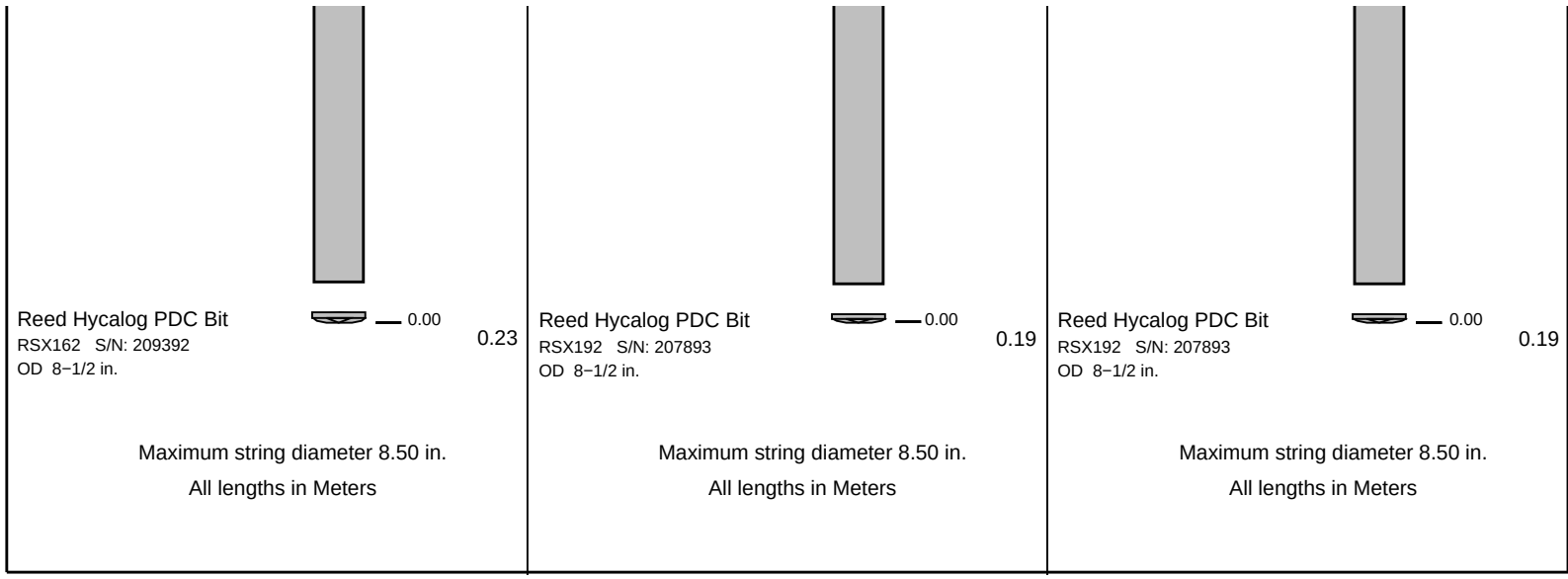
DOWNHOLE EQUIPMENT



RUN4

DOWNHOLE EQUIPMENT





IDEAL Version: ID10_0C_04

IDF

RAB	**id10_0c_04**	**MWD_10**	**id10_0c_04**
ADN	**id10_0c_04**		

Format: GeoVISION Density Neutron Log **Vertical Scale: 1:200** **Graphics File Created: 17−Aug−2005 10:05**

PIP SUMMARY

Neutron Ticks, 0.1 ft

Density Ticks, 0.1 ft

Rate of Penetration, Averaged over Last 5ft (ROP5_RM)
200 (M/HR) 0

Gas Area
From ADN/ROBB/DEPTH to ADN/TNPH/DEPTH

RAB Gamma Ray (GR_RAB)
0 (GAPI) 200

Thermal Neutron Porosity (TNPH)
45 (PU) −15

Density Caliper, Vertical (DCVE)
6 (IN) 16

Bulk Density, Bottom (ROBB)
1.85 (G/C3) 2.85

Density Caliper, Horizontal (DCHO)
6 (IN) 16

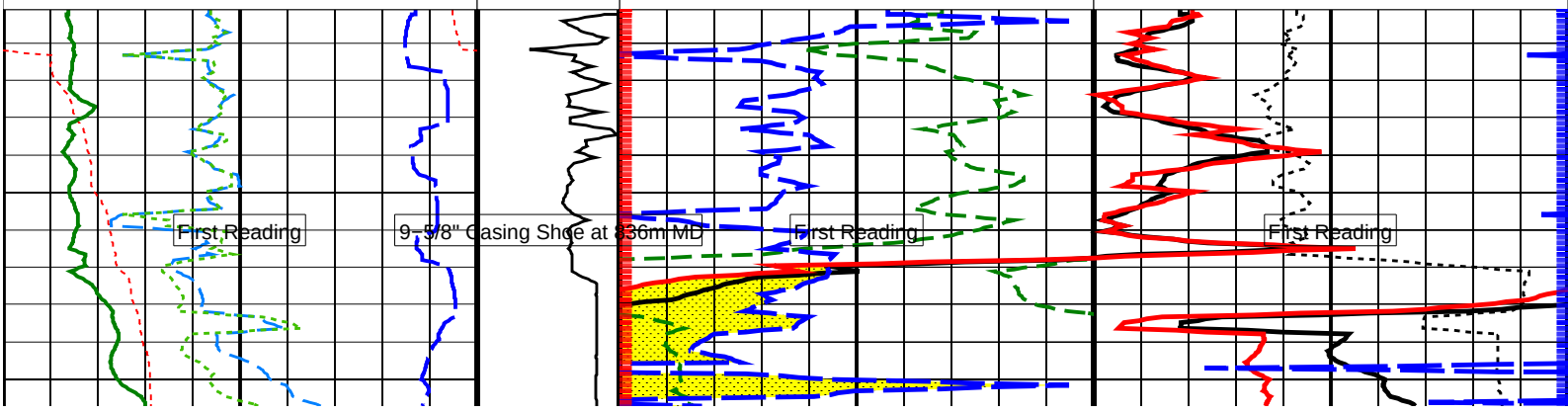
Bulk Density (RHOB)
1.85 (G/C3) 2.85

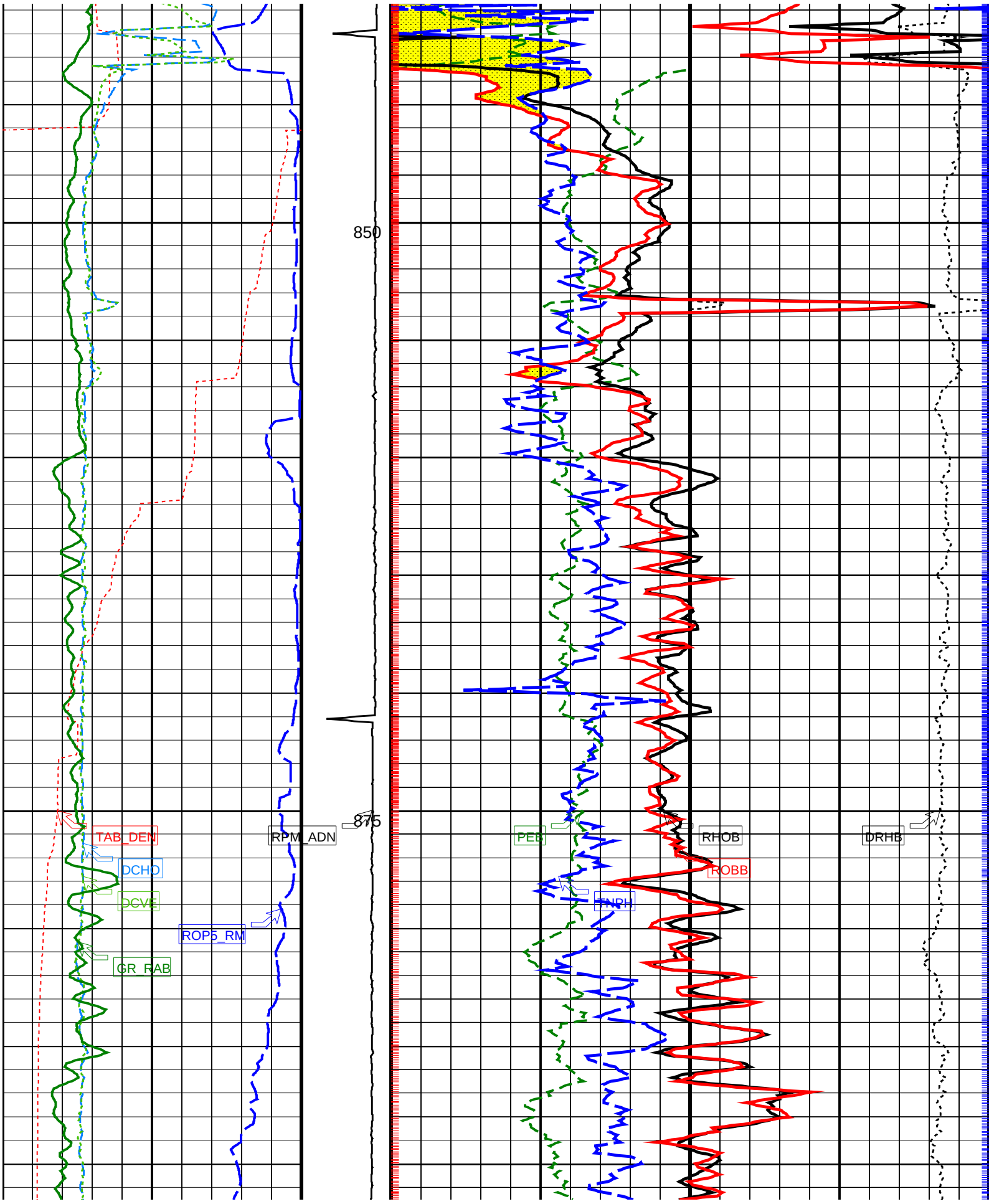
Density Time After Bit (TAB_DEN)
0 (HR) 10

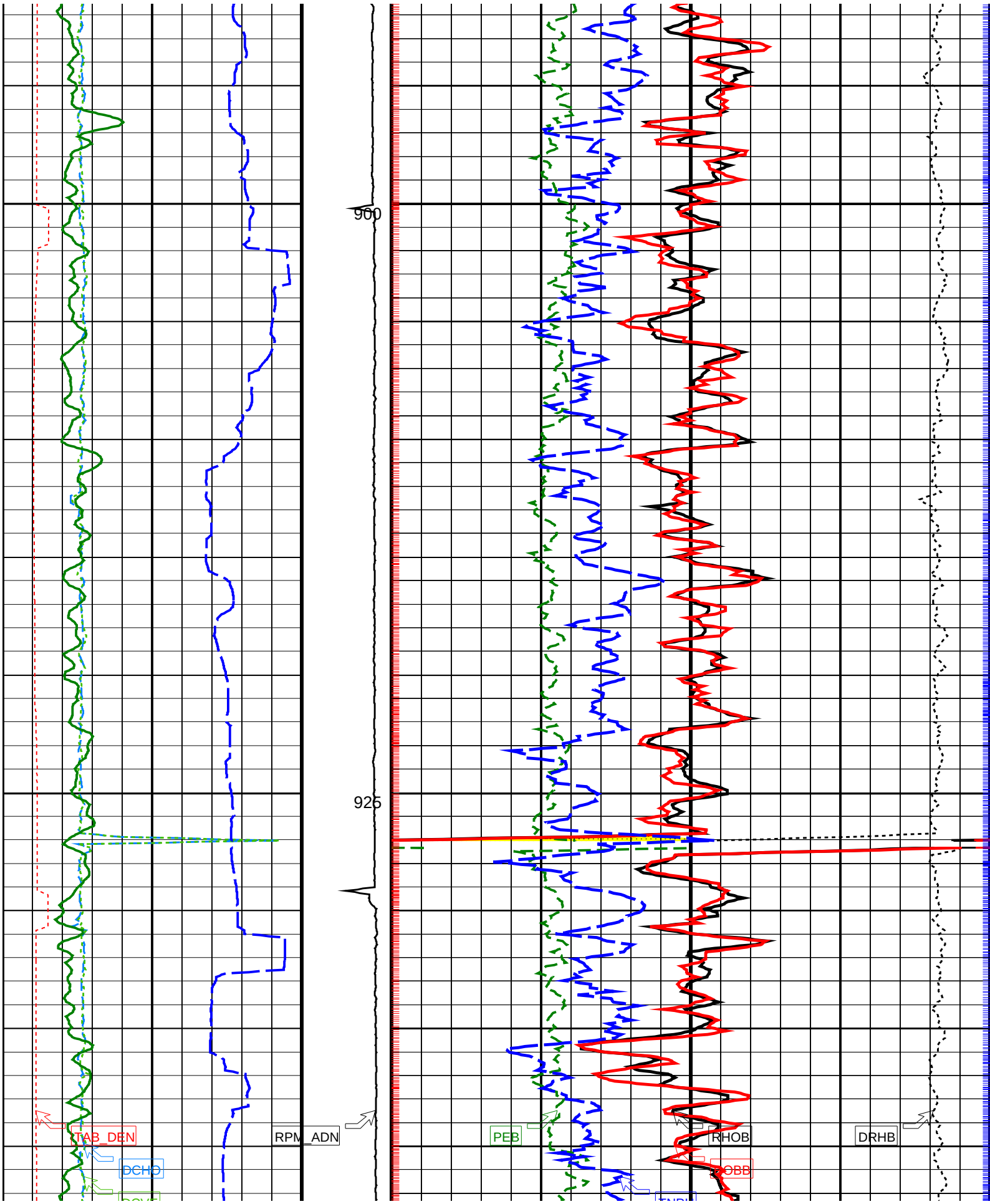
ADN Rotational Speed (RPM_ADN) (RPM)
0 250

Photoelectric Factor, Bottom (PEB)
0 (---- 10

Bulk Density Correction, Bottom (DRHB)
−0.75 (G/C3) 0.25




850
875
TAB_DEN
DCHD
DCVS
GR_RAB
ROP5_RM
RPM_ADN
PEB
RHOB
ROBB
TNPH
DRHB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925
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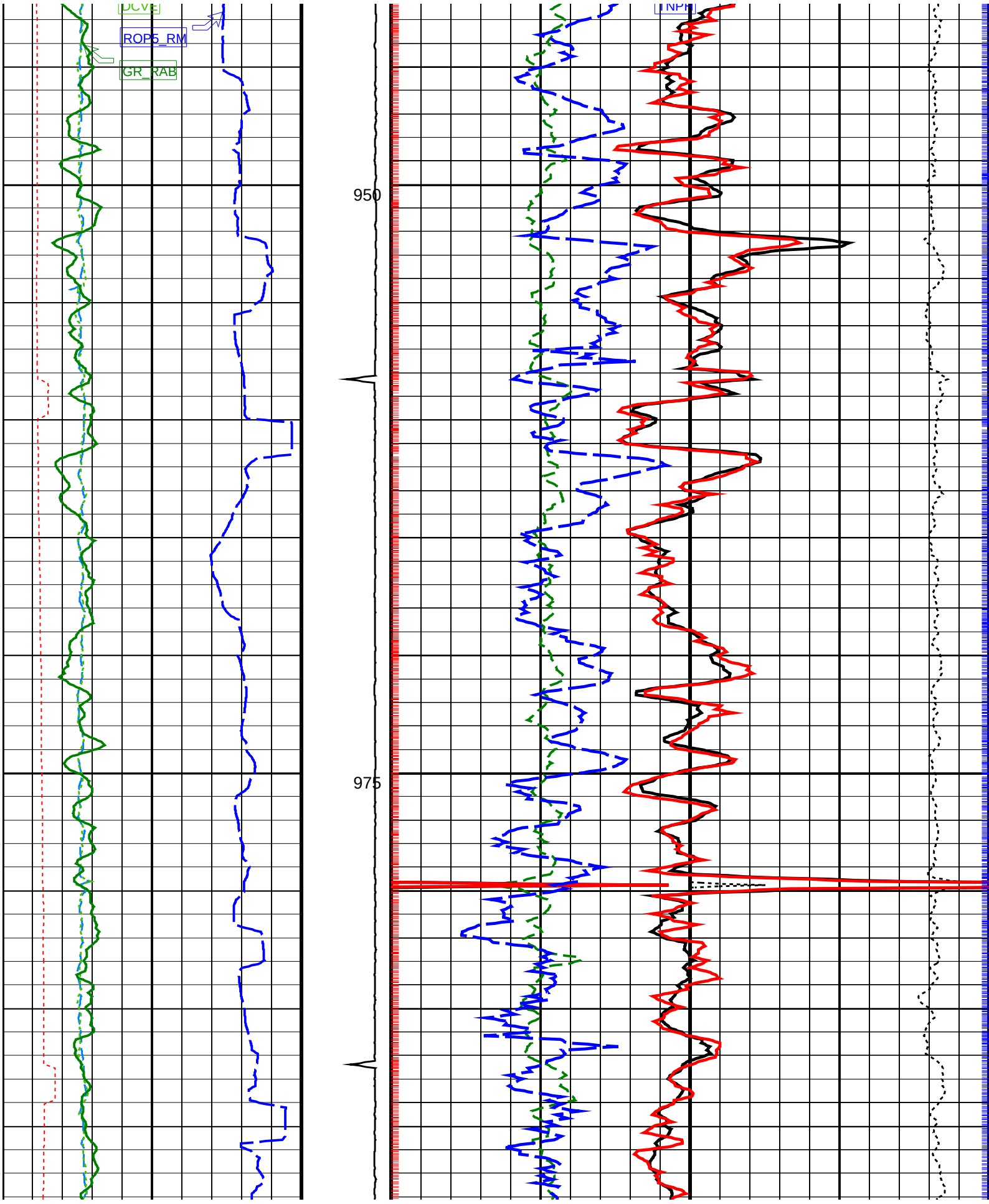
DCHD
RPM_ADN
PEB
RHOB
ZOBB
DRHB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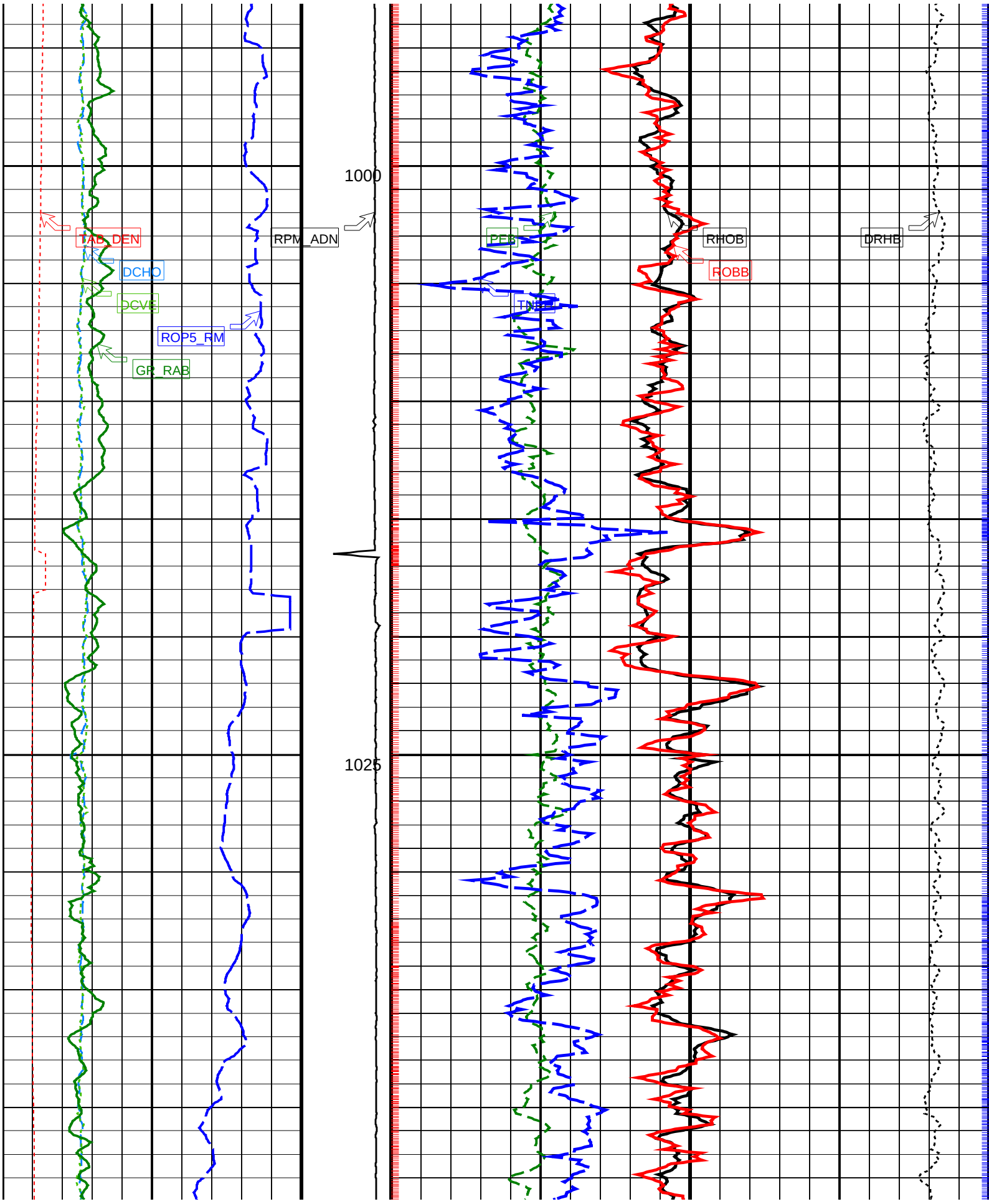
ROP5_RM
GR_RAB
TNPH
950
975


1000
1025
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DCHO
DCVB
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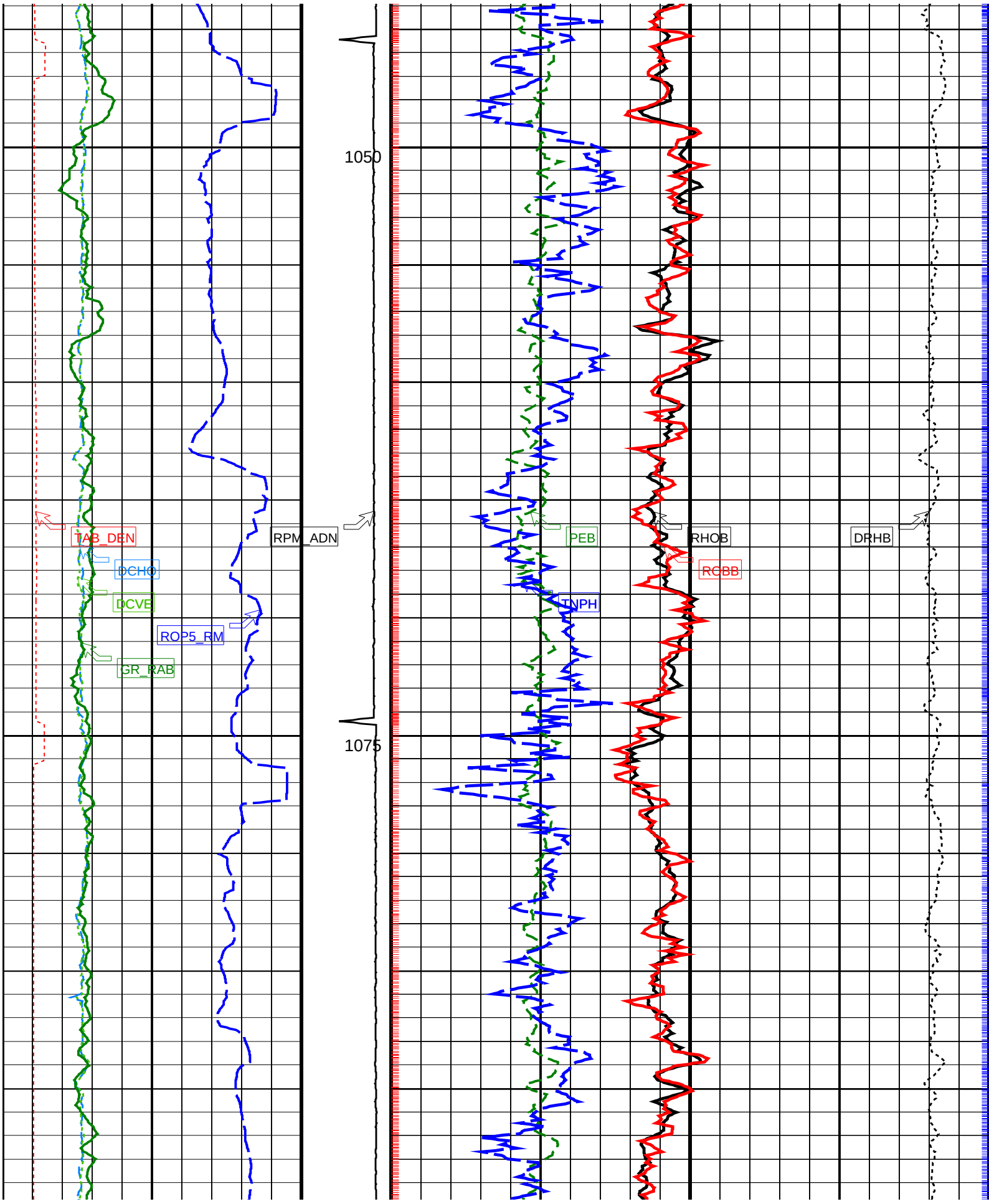
GR_RAB
RPM_ADN
PEB
TNPB
RHOB
ROBB
DRHB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1075
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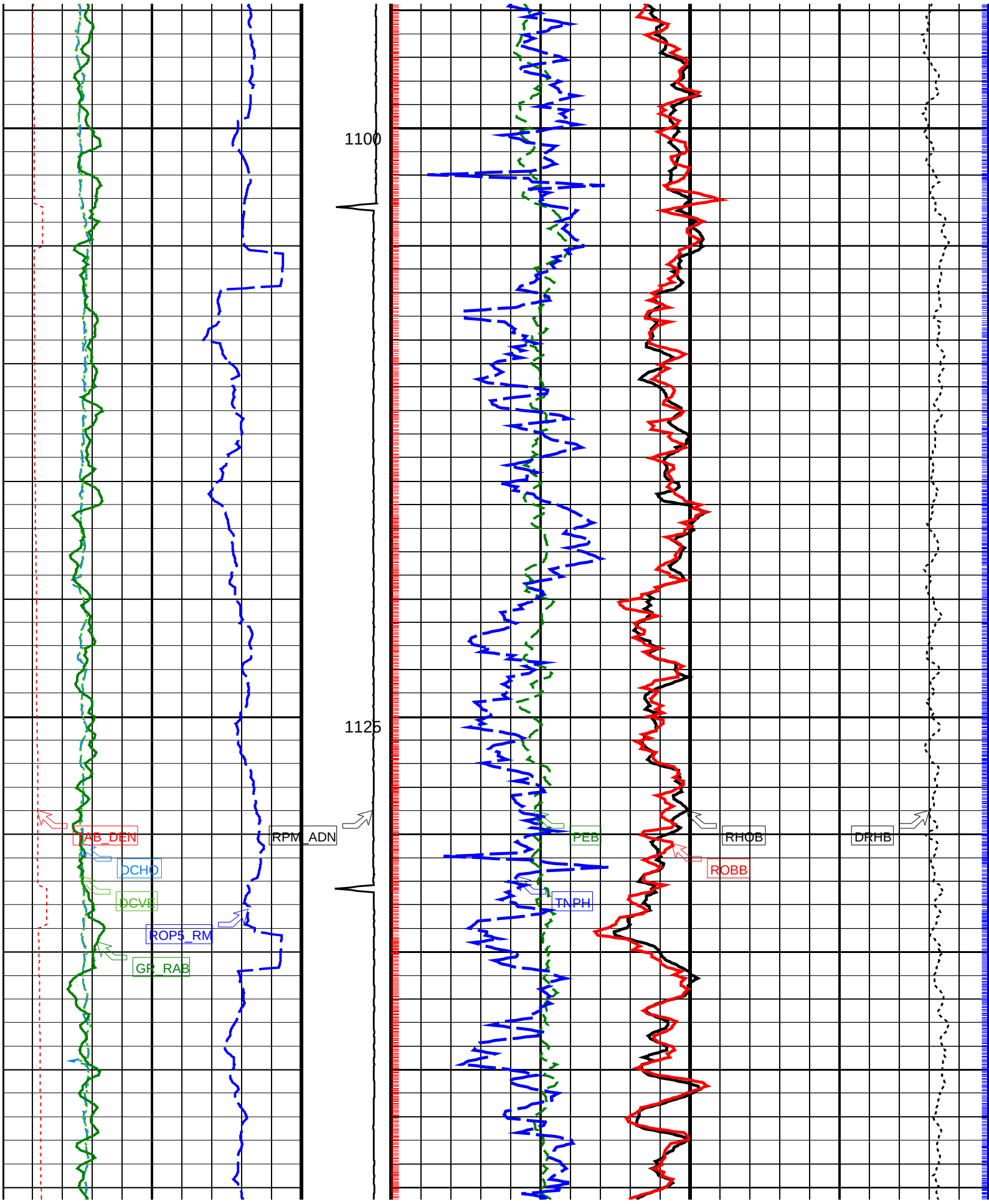
RPM_ADN
PEB
RHOB
RGBB
TNPH
DRHB


1100
1125
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DCHO
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GR_RAB
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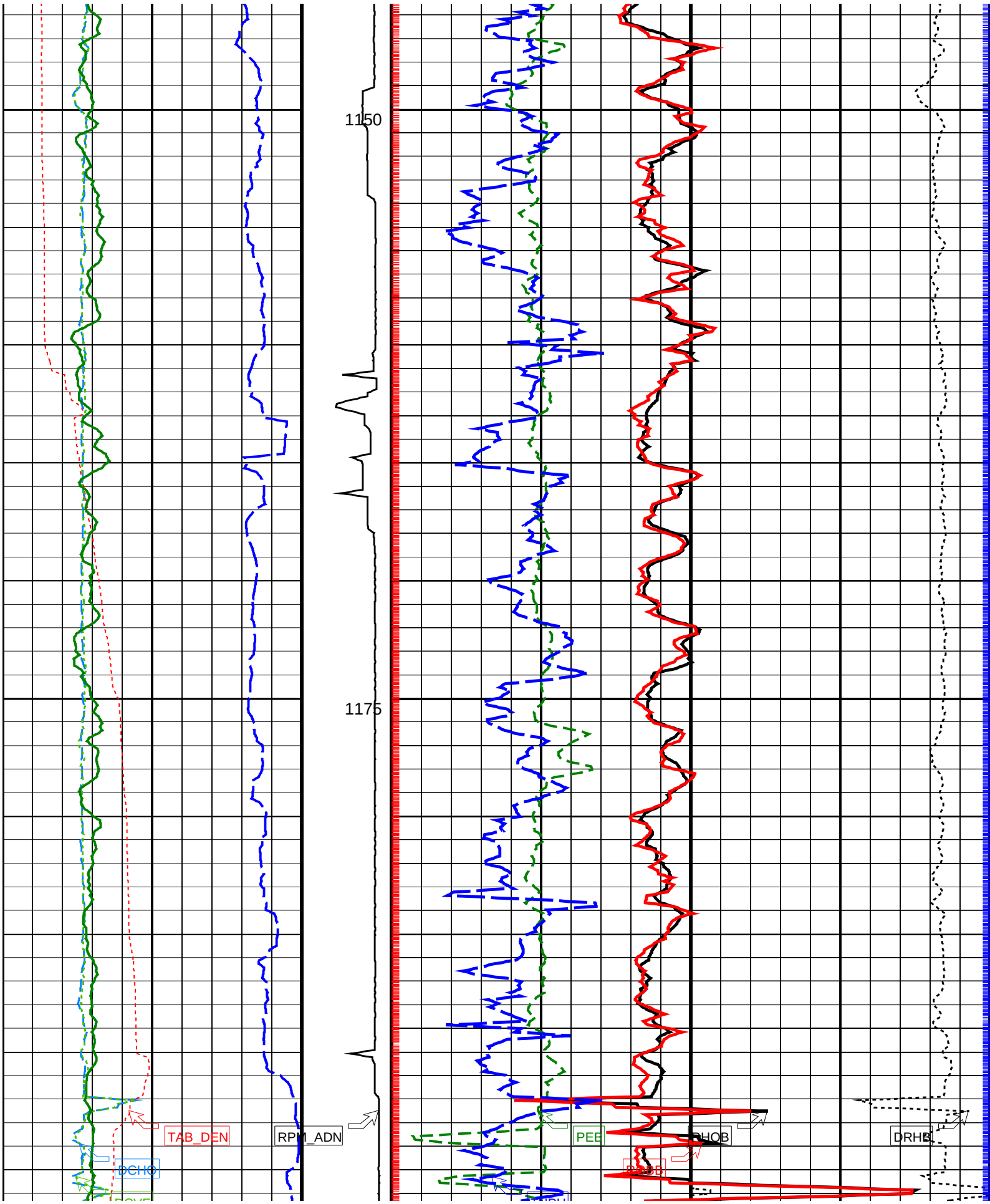
PEB
TNPH
RHOB
ROBB
DRHB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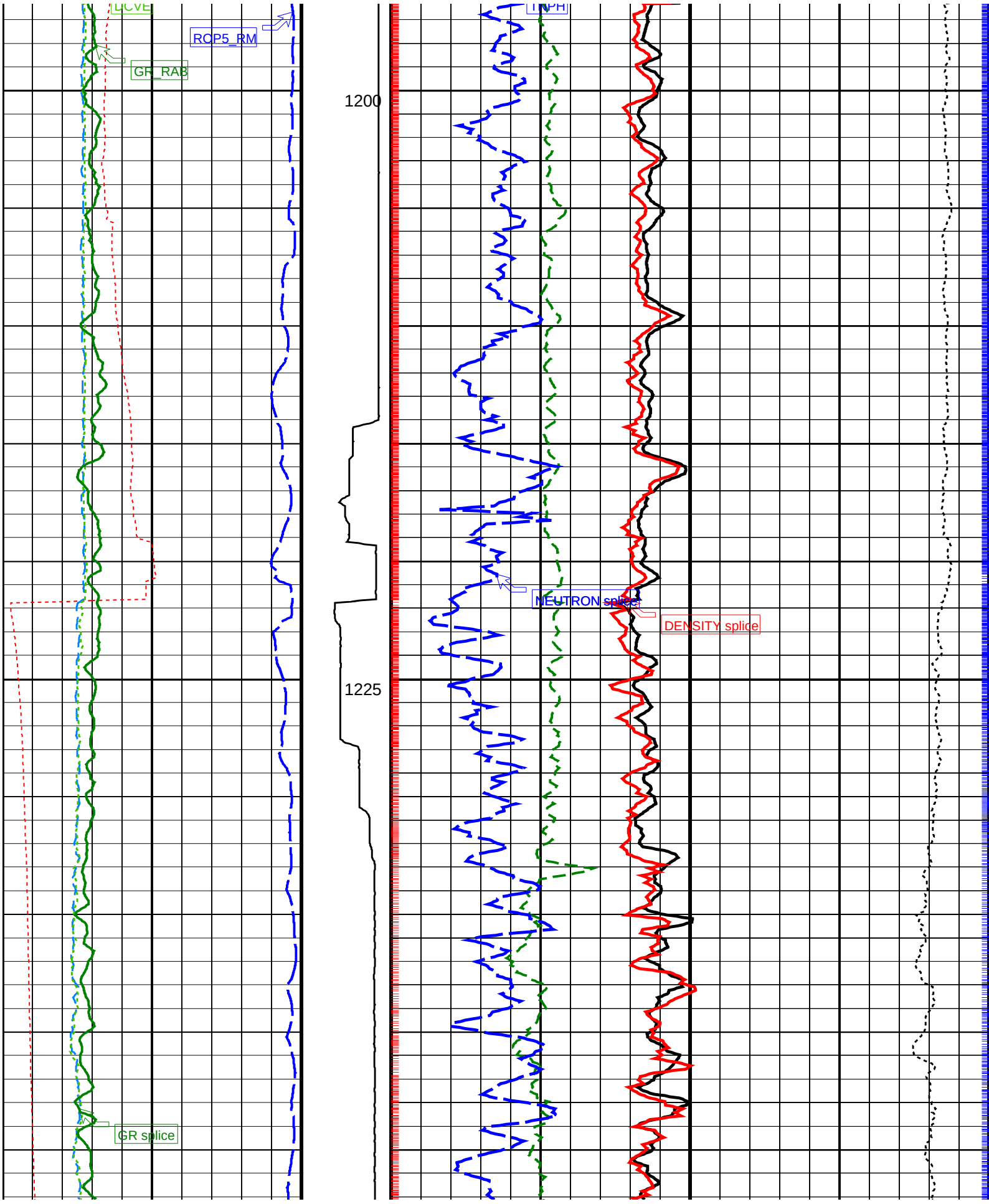
1175
TAB_DEN
RPM_ADN
PEB
RHOB
DRHB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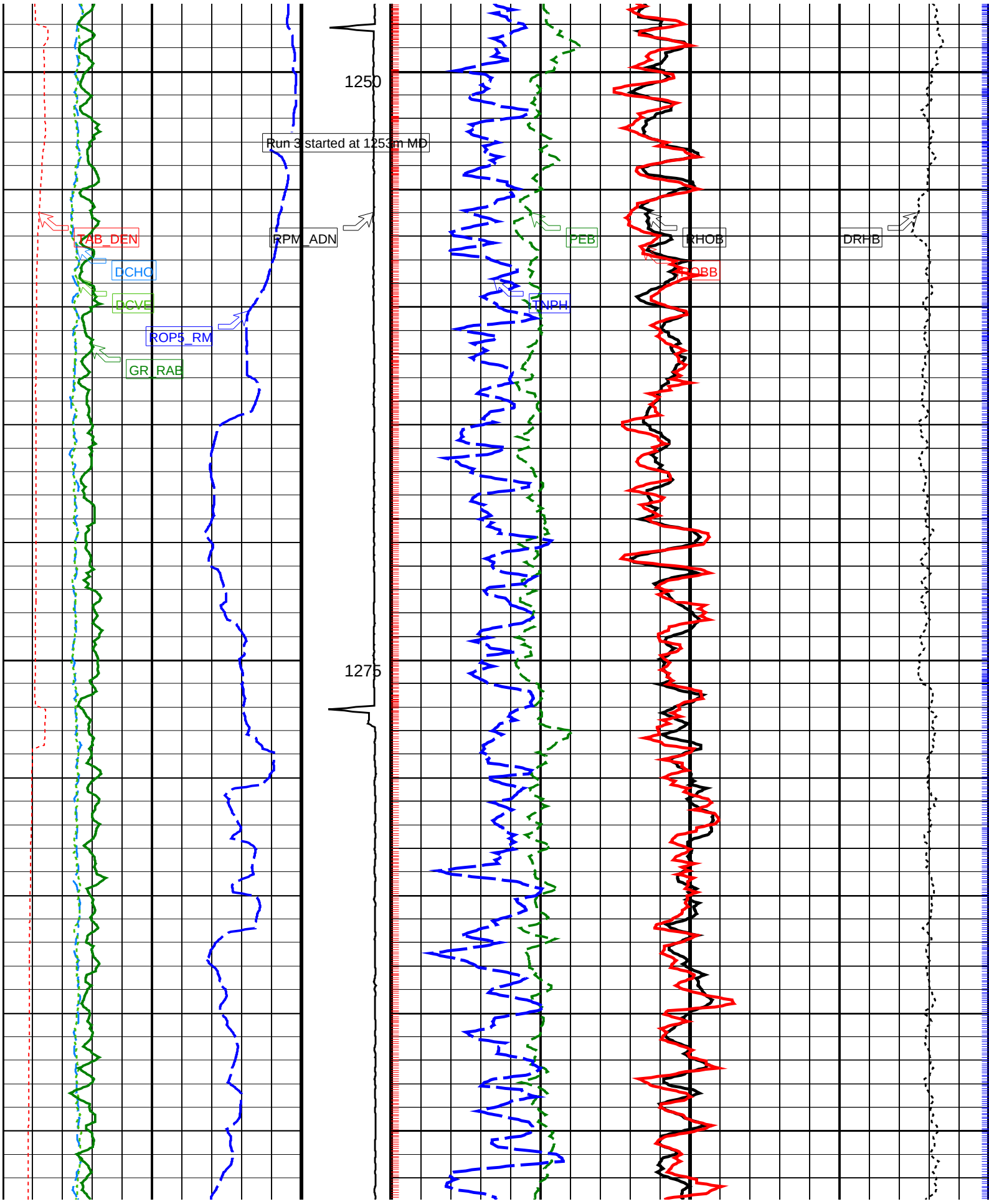
GR_RAB
1200
TNPH
NEUTRON splice
DENSITY splice
1225
GR splice


1250
Run 3 started at 1253m MD
RPM_ADN
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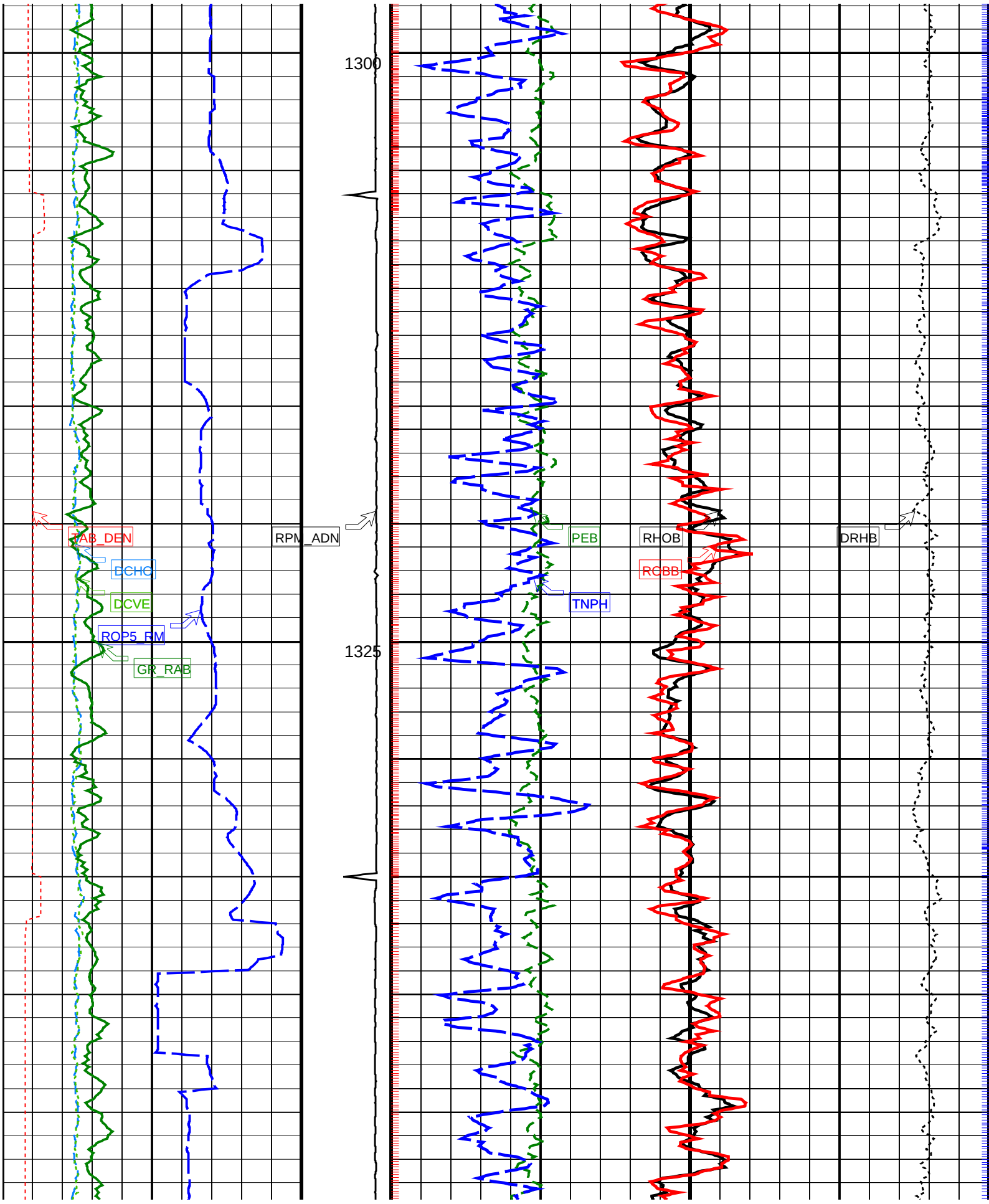
ROP5_RM
GR_RAB
PEB
RHOB
DRHB
ROBB
TNPH
1275


1300
1325
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GR_RAB
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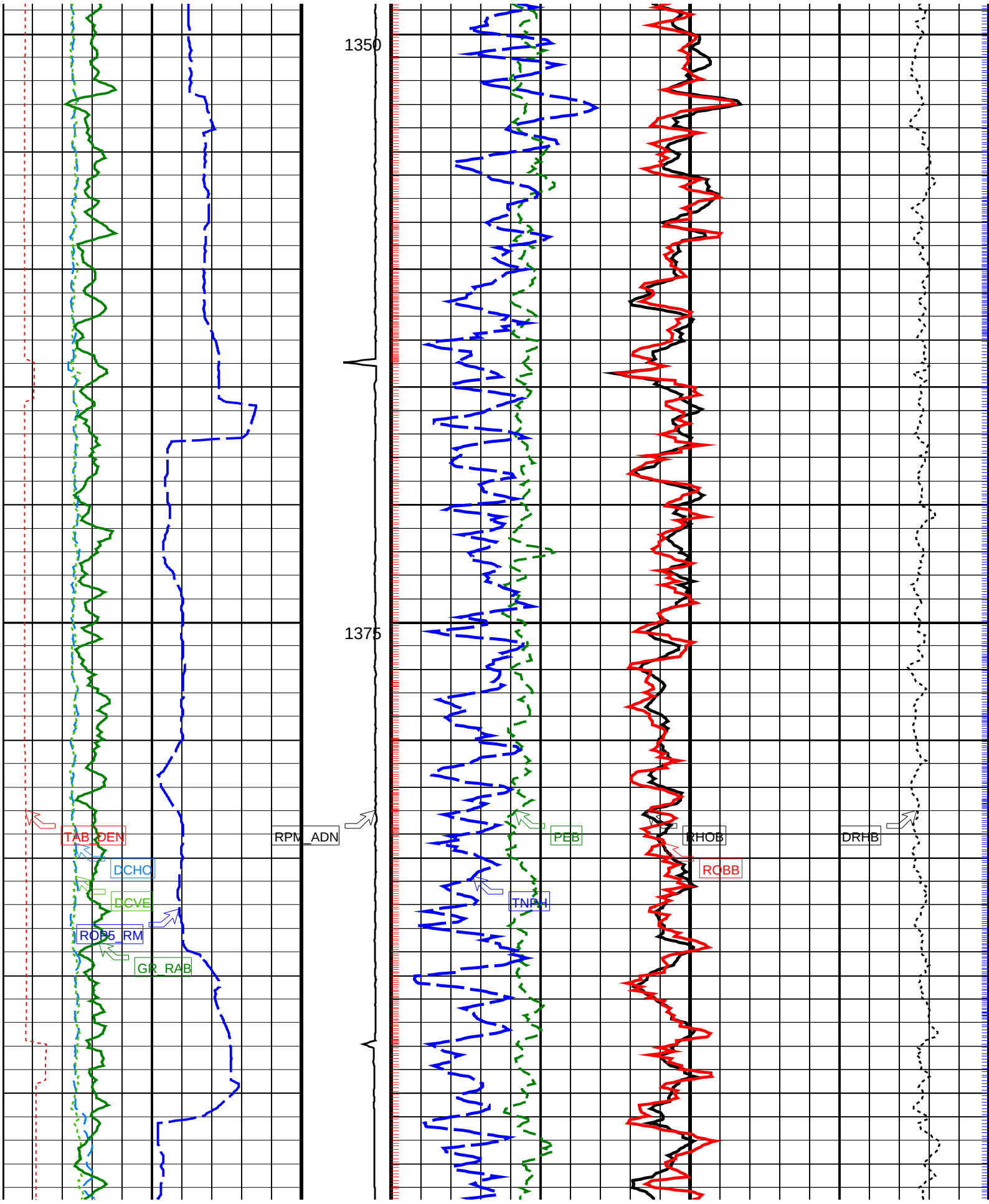
RCBB
DRHB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1375
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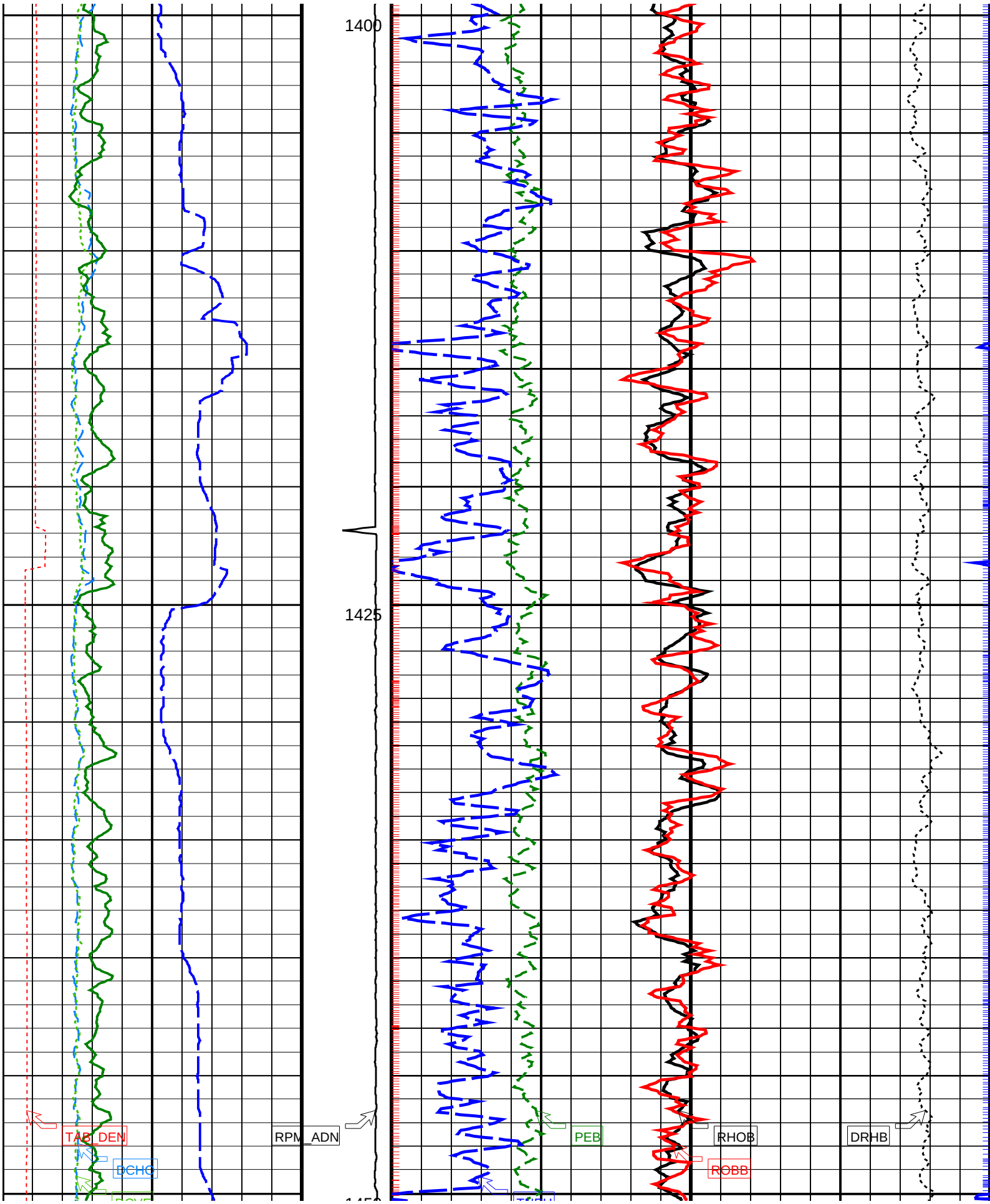
RHOB
ROBB
DRHB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DCHC
RPM_ADN
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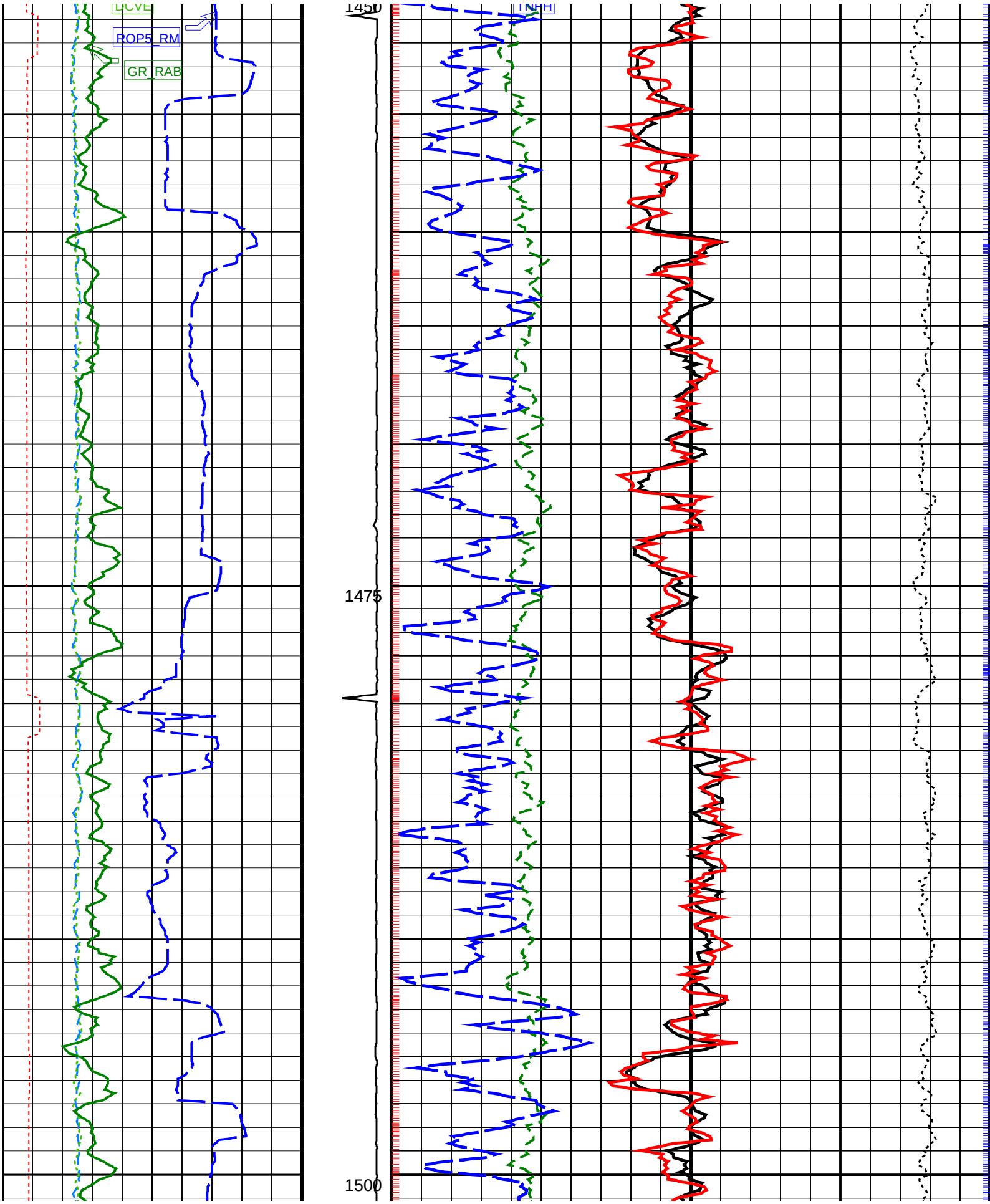
RHOB
ROBB
DRHB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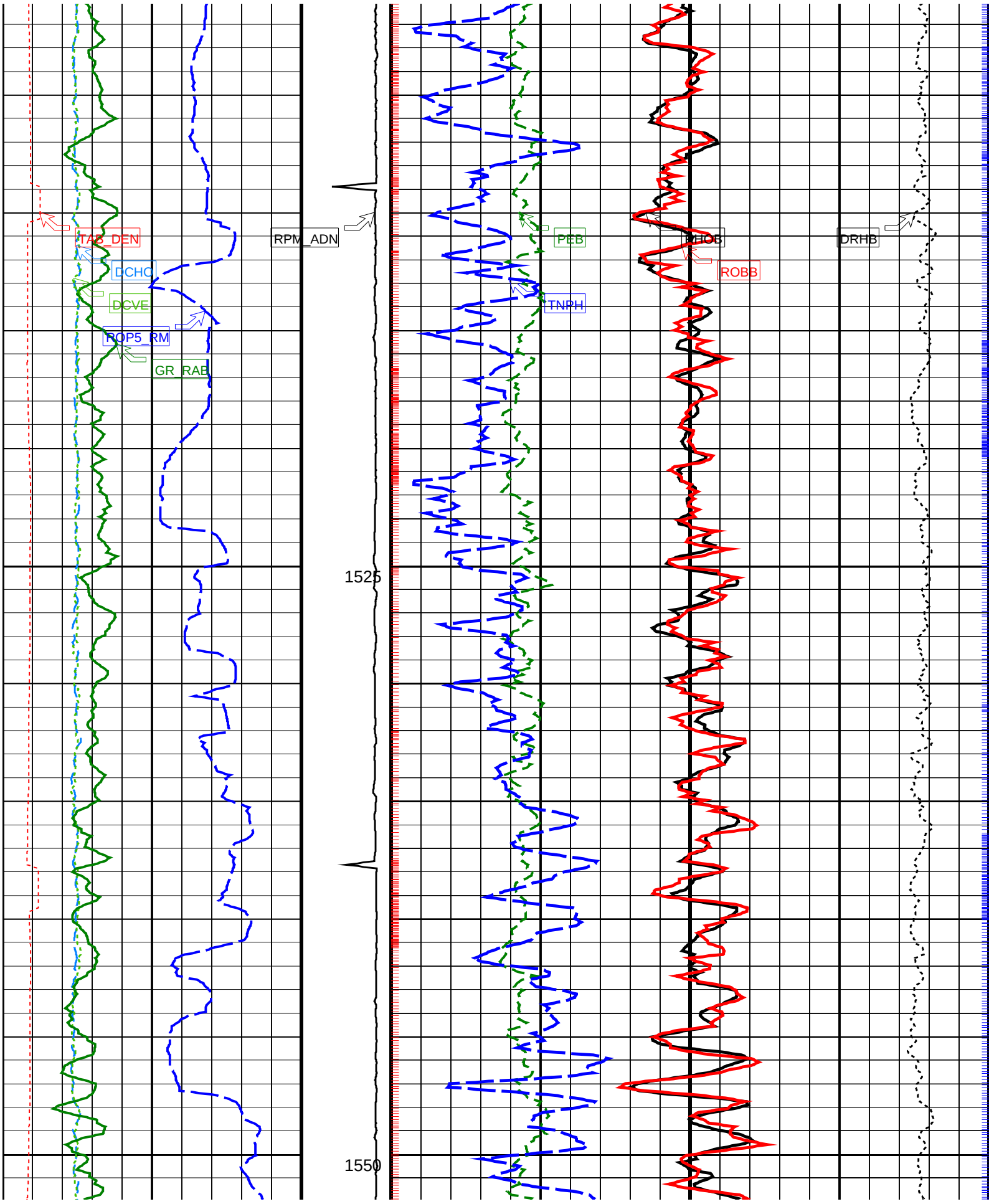
GR_RAB
1450
1475
1500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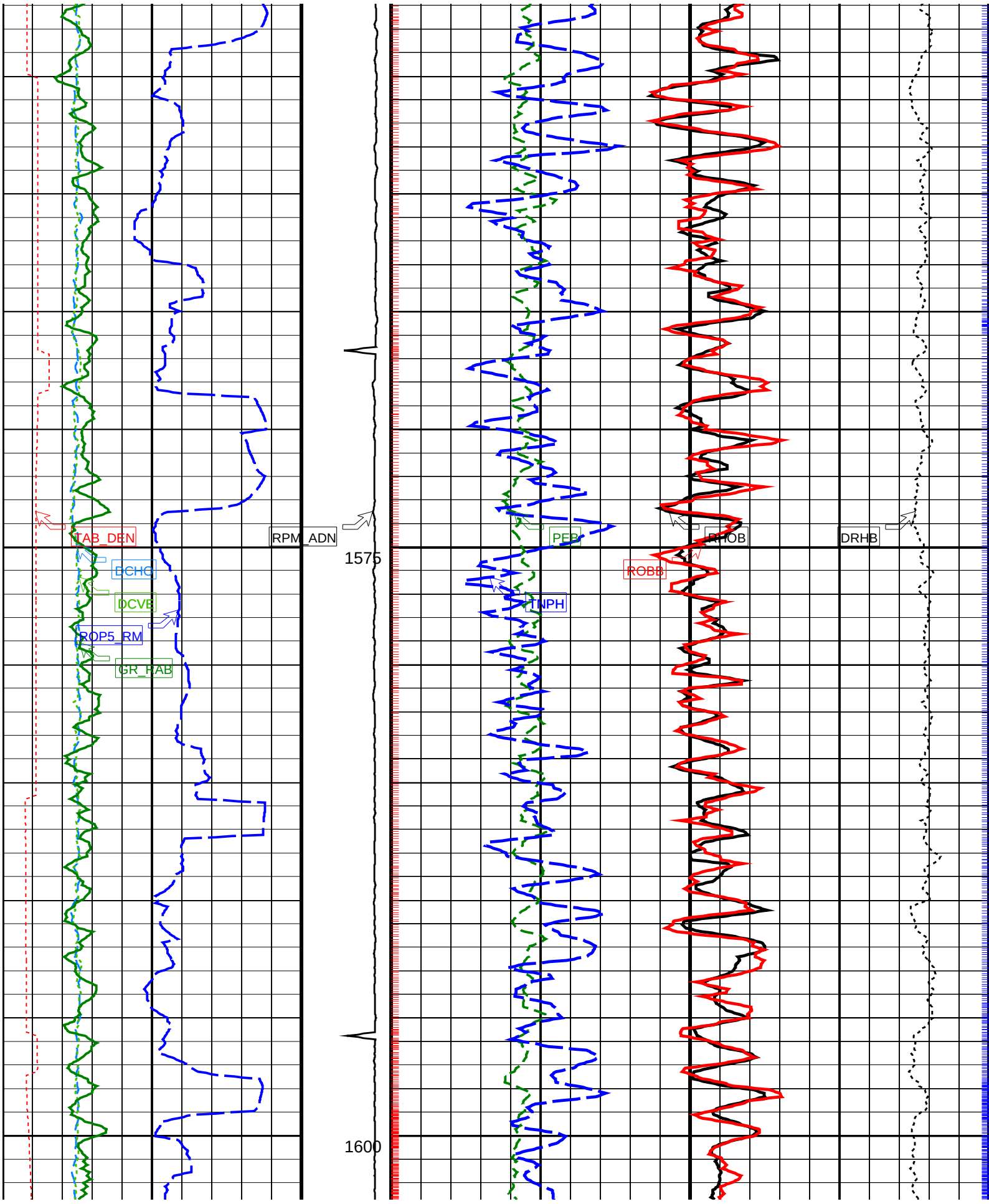
RHOB
ROBB
DRHB
1525
1550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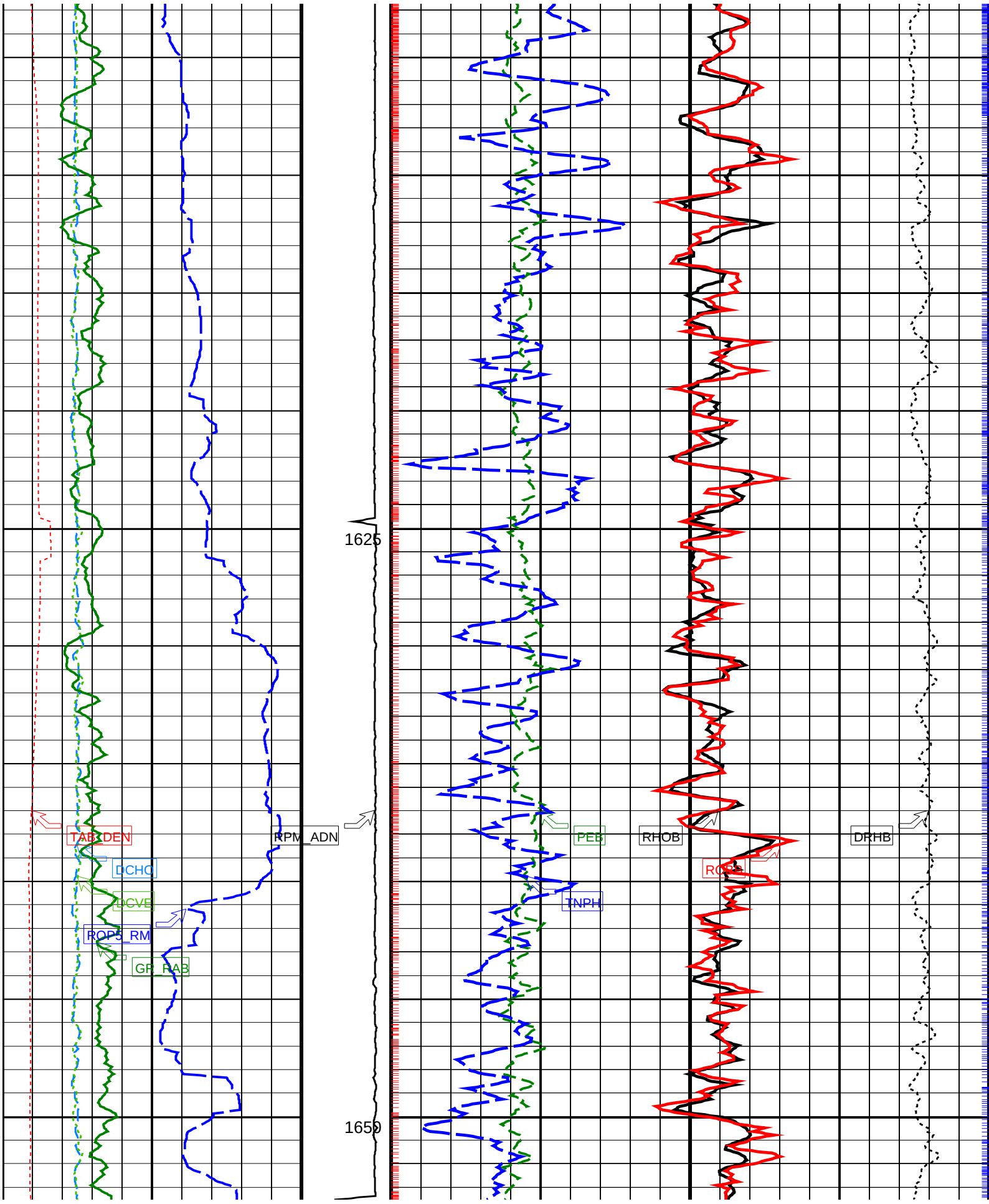
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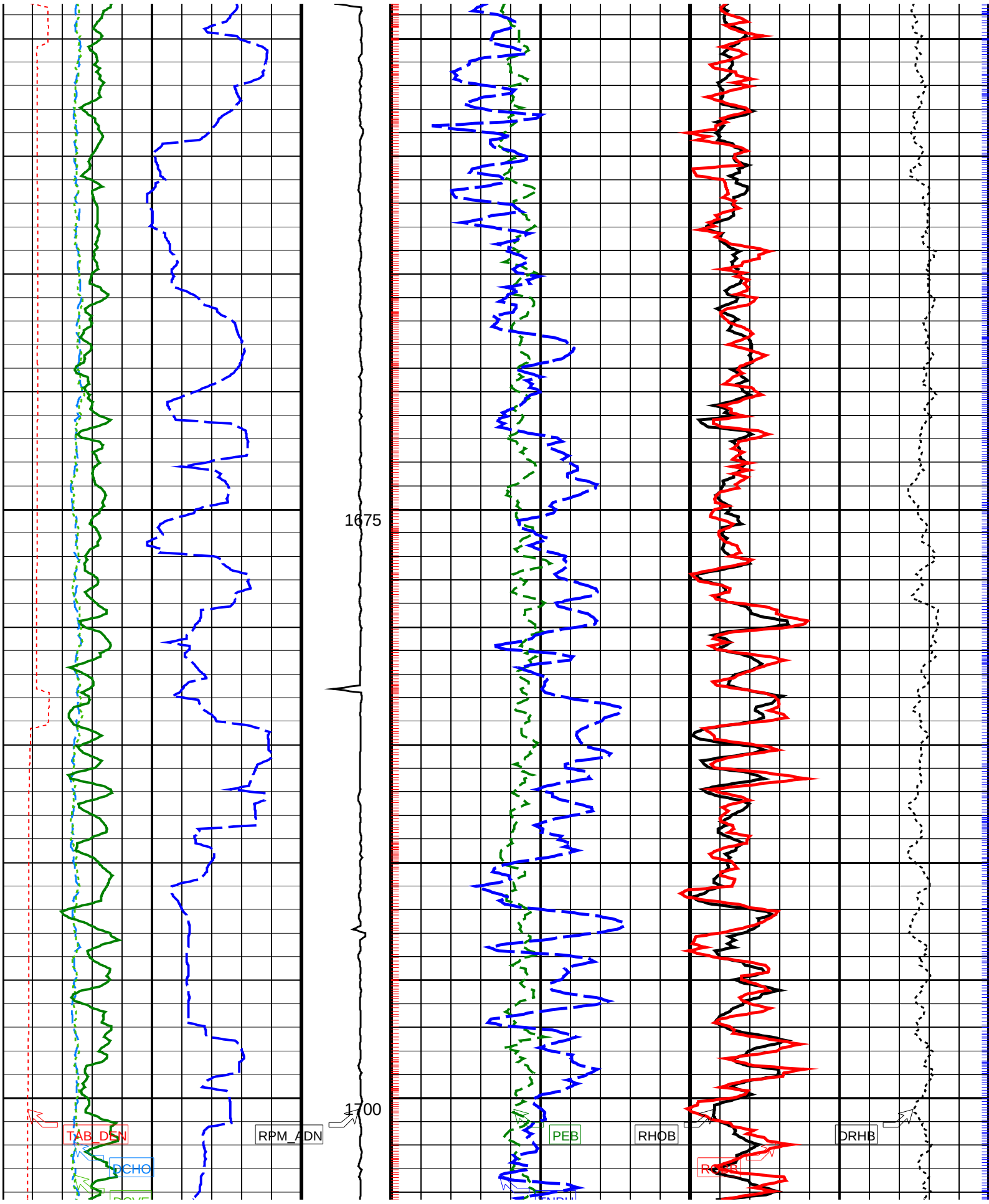
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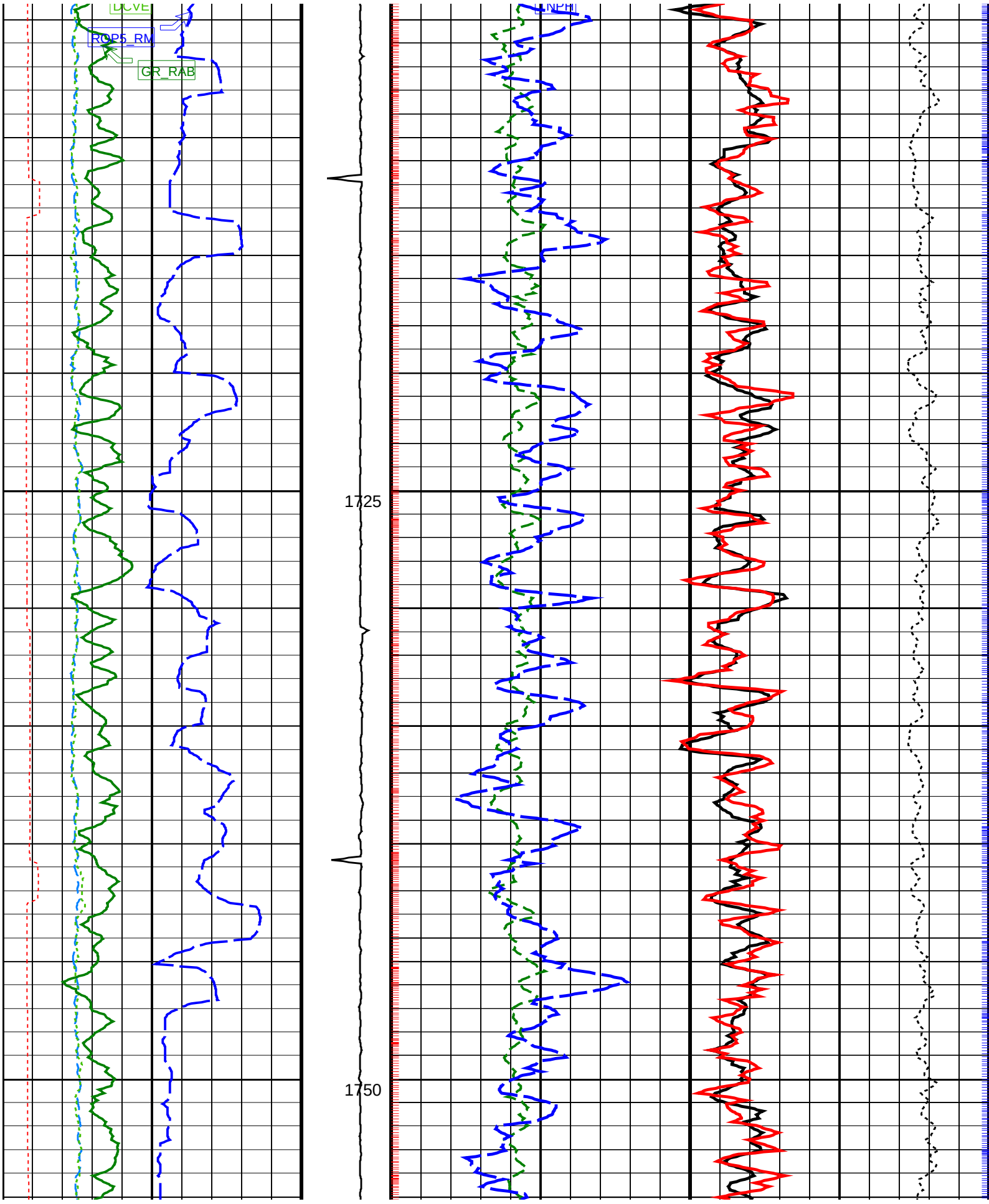
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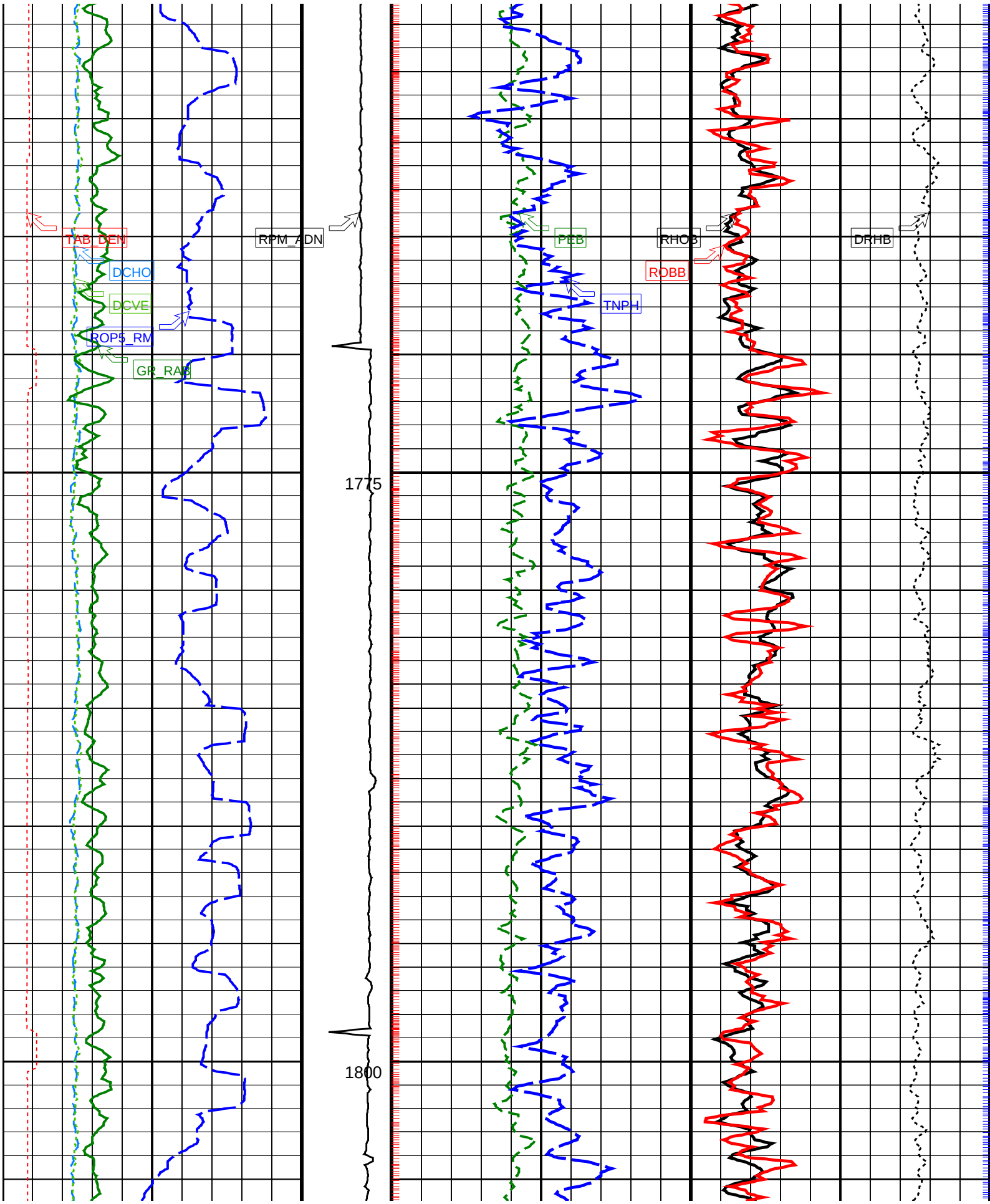
1725
1750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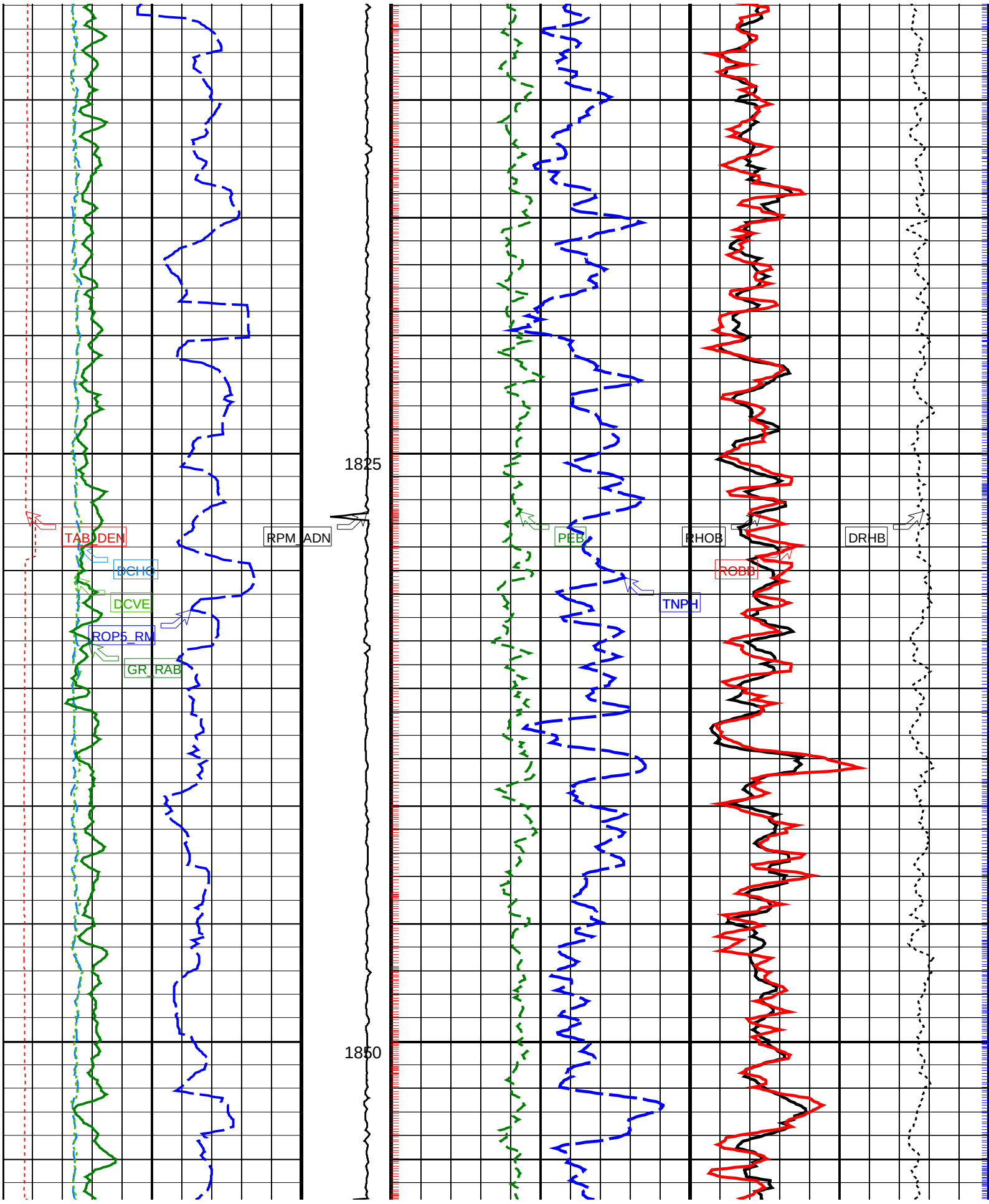
1775
1800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1850
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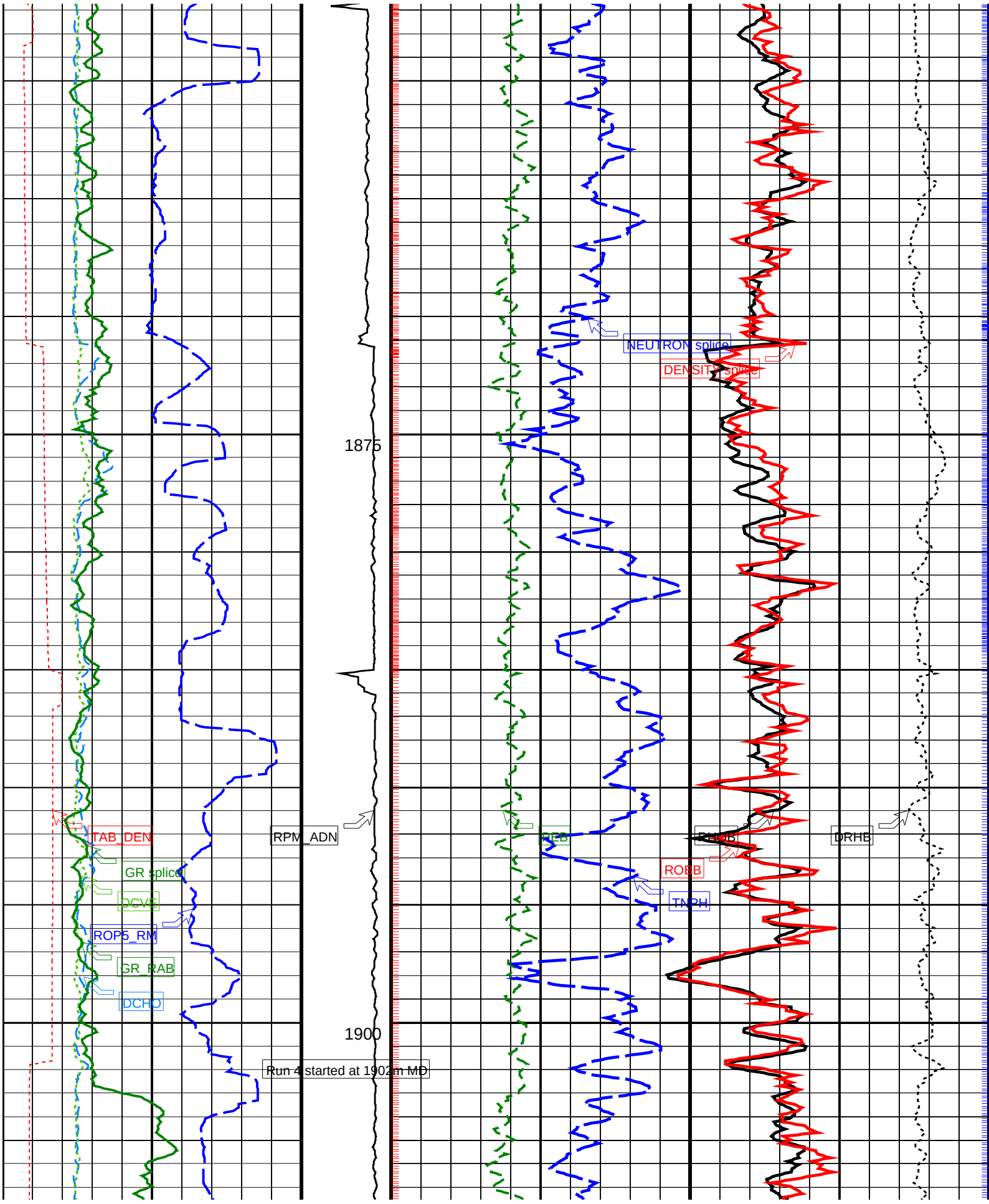
1875
1900
TAB_DEN
GR splice
DCVS
ROP5_RM
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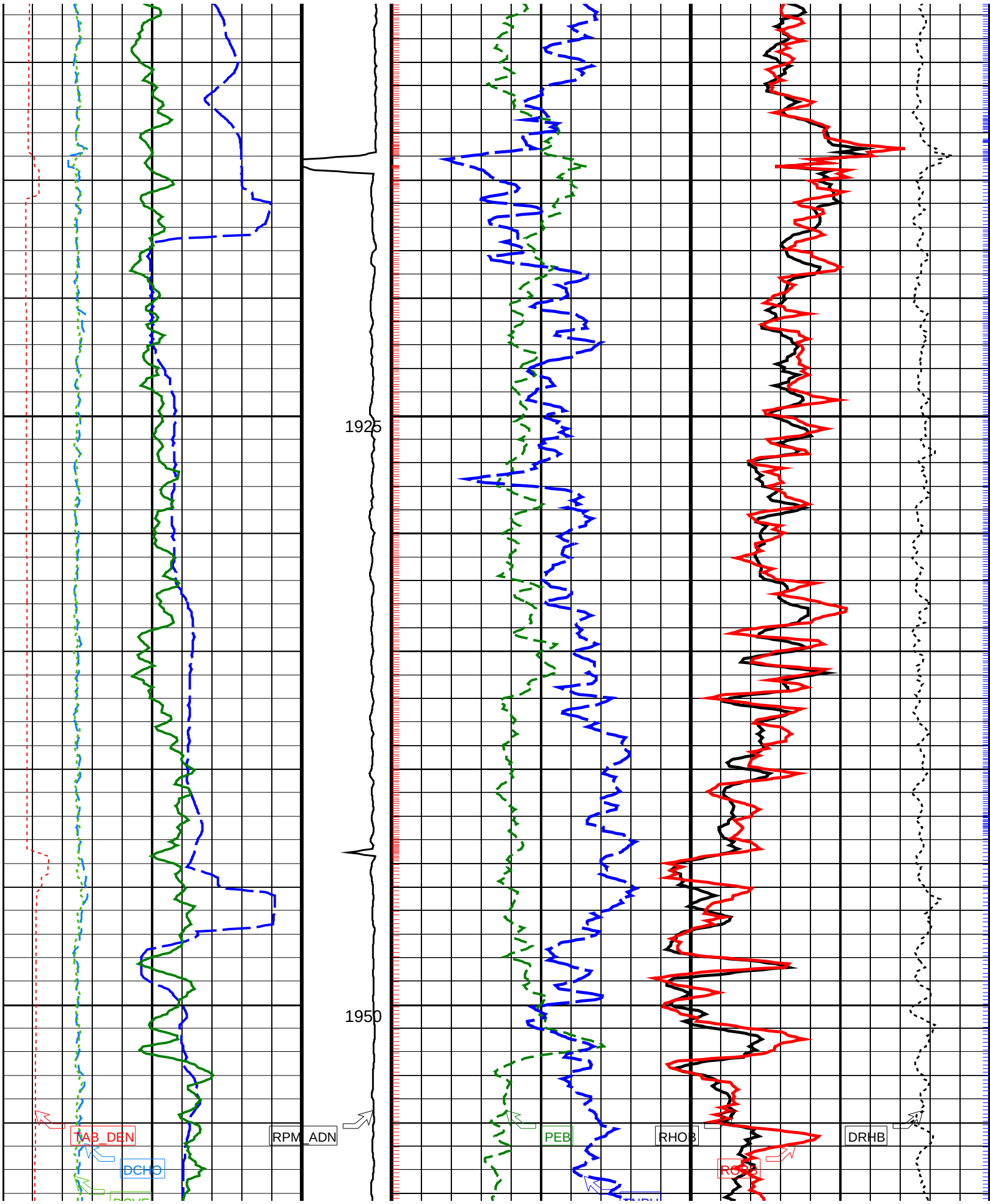
DCHO
RPM_ADN
NEUTRON splice
DENSITY splice
RED
ROBB
TNPH
RHOB
DRHB
Run 4 started at 1902m MD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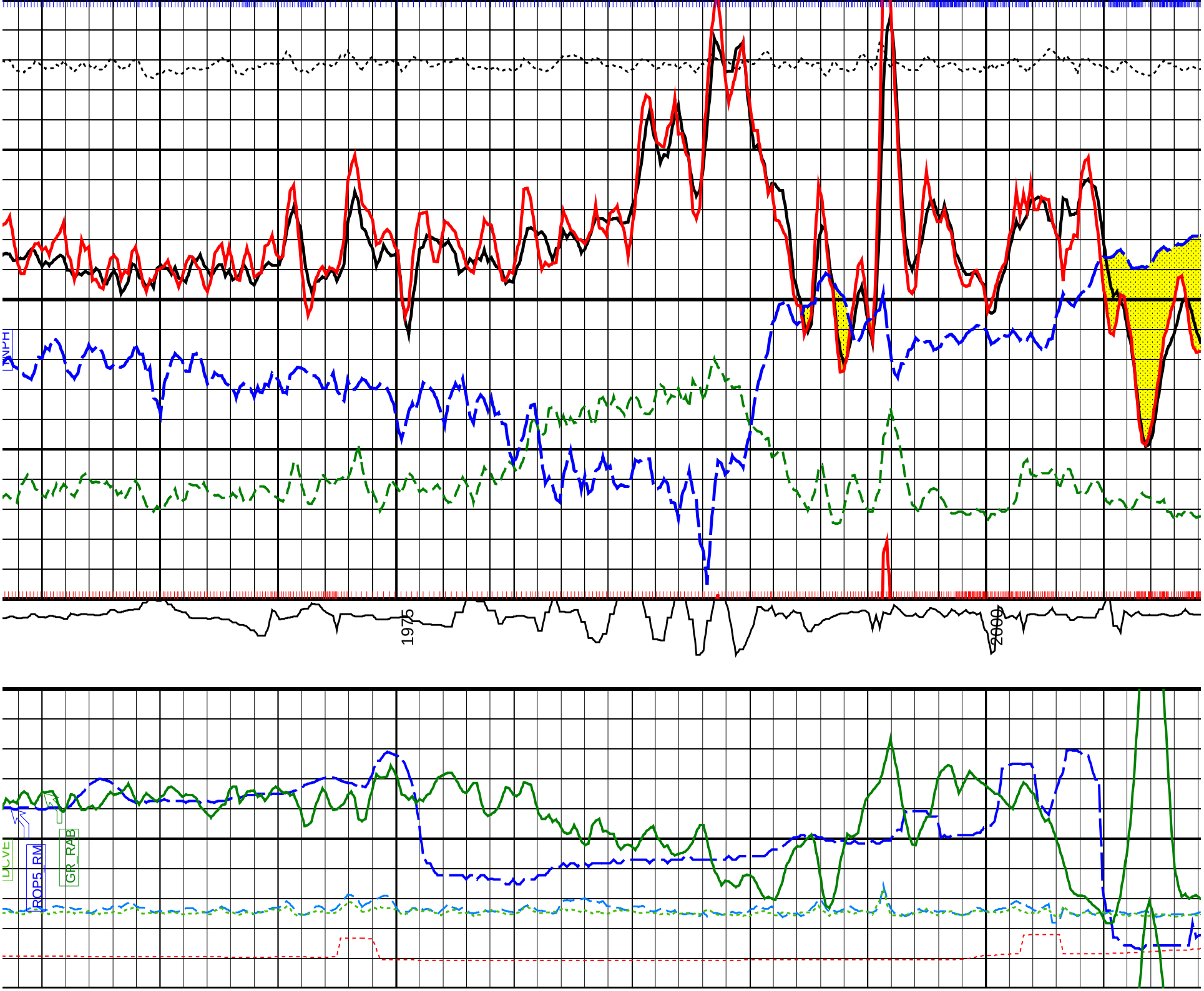
ROPA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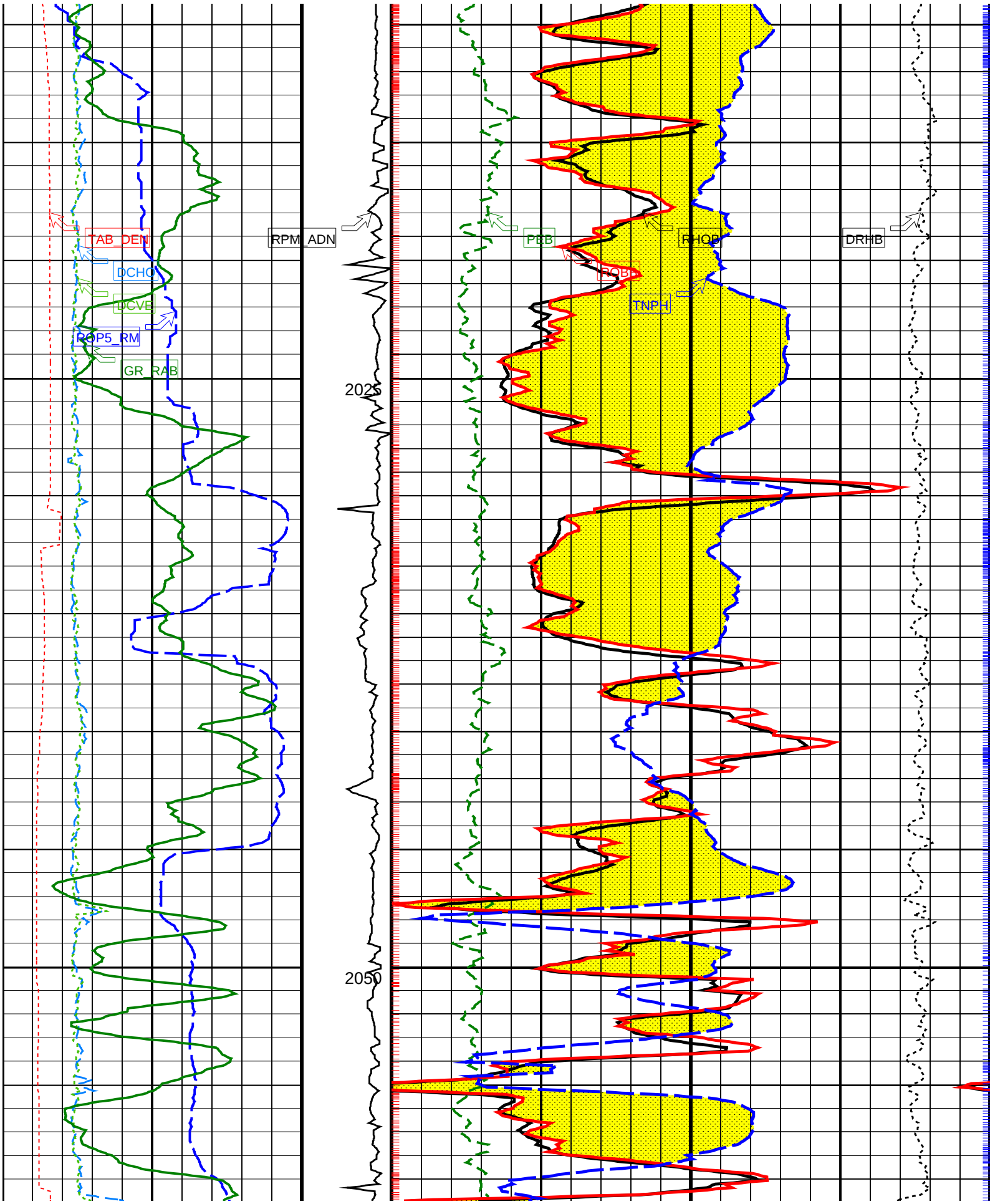
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GR_RAB
RPM_ADN
2025
2050
PEB
RHOB
RHOB
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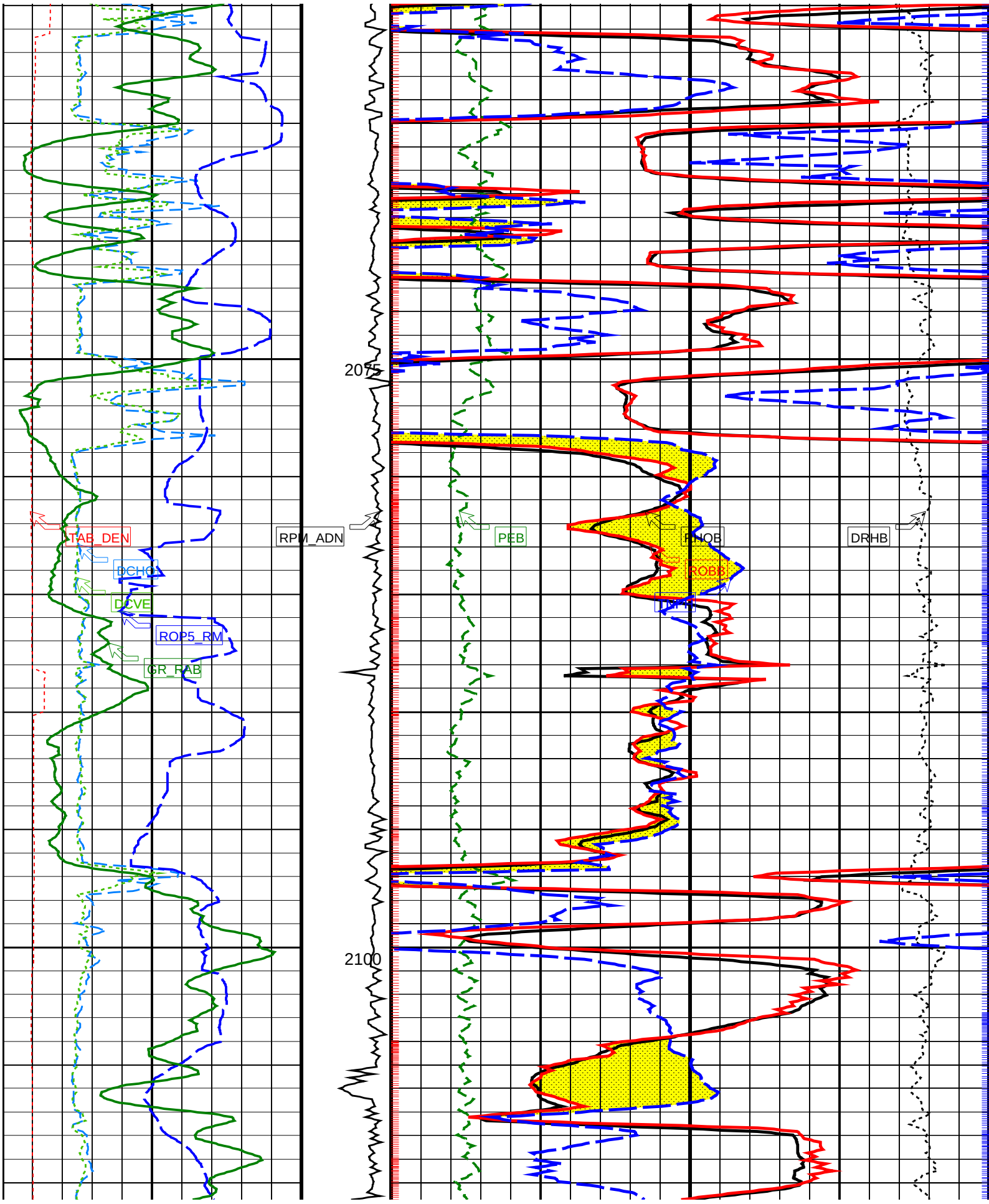
DRHB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2100
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RHOB
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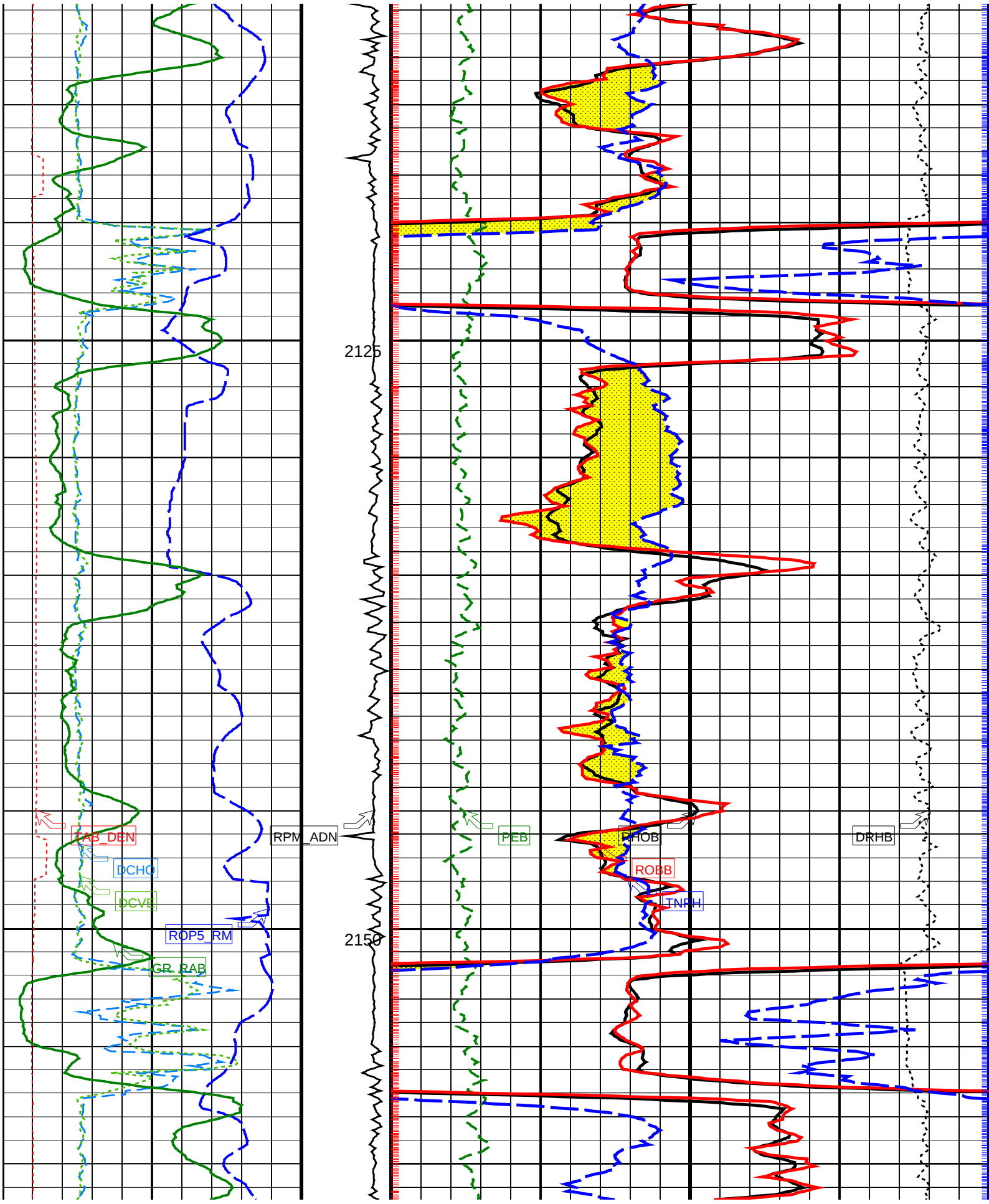
2125
2150
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PEB
RHOB
ROBB
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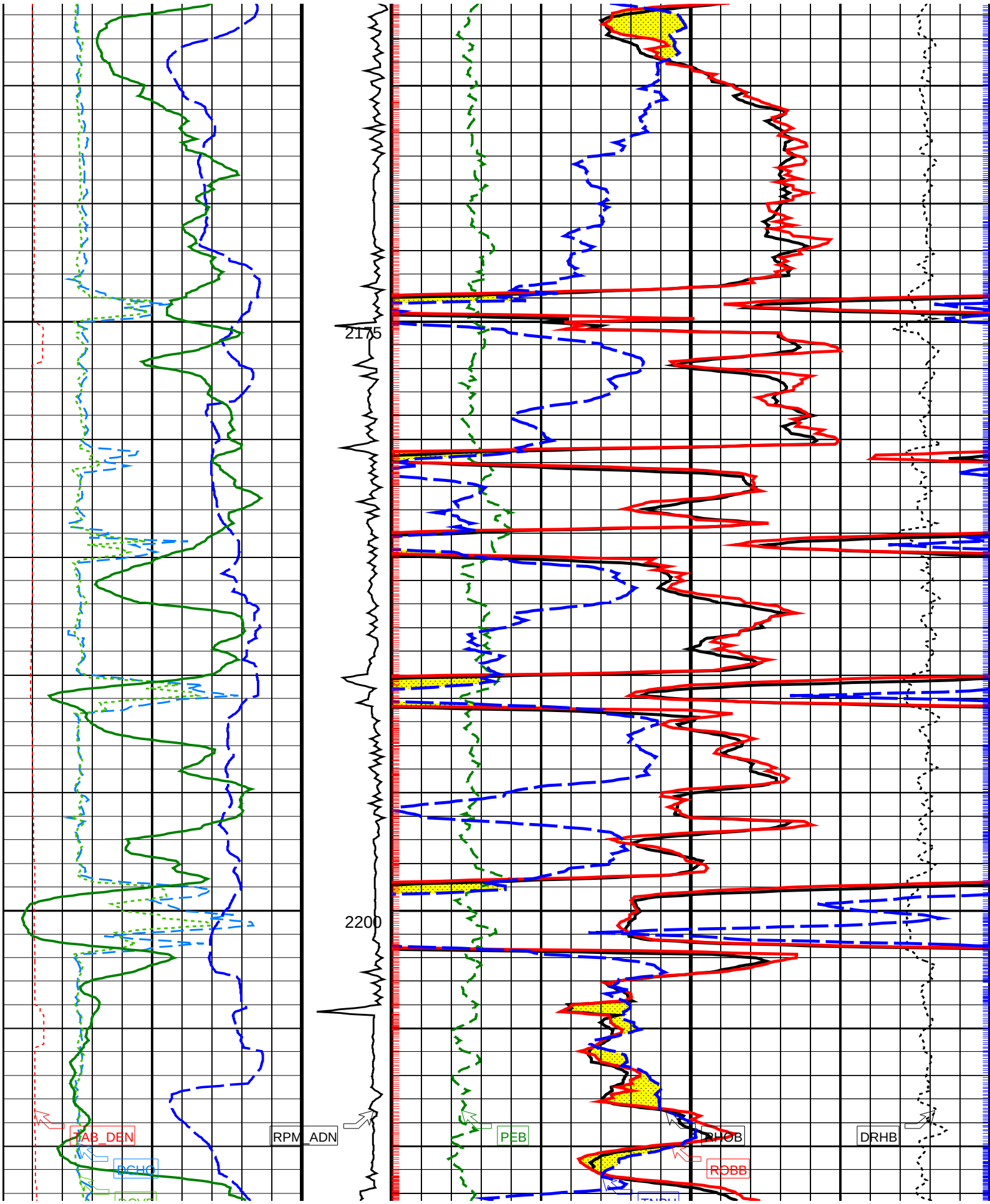
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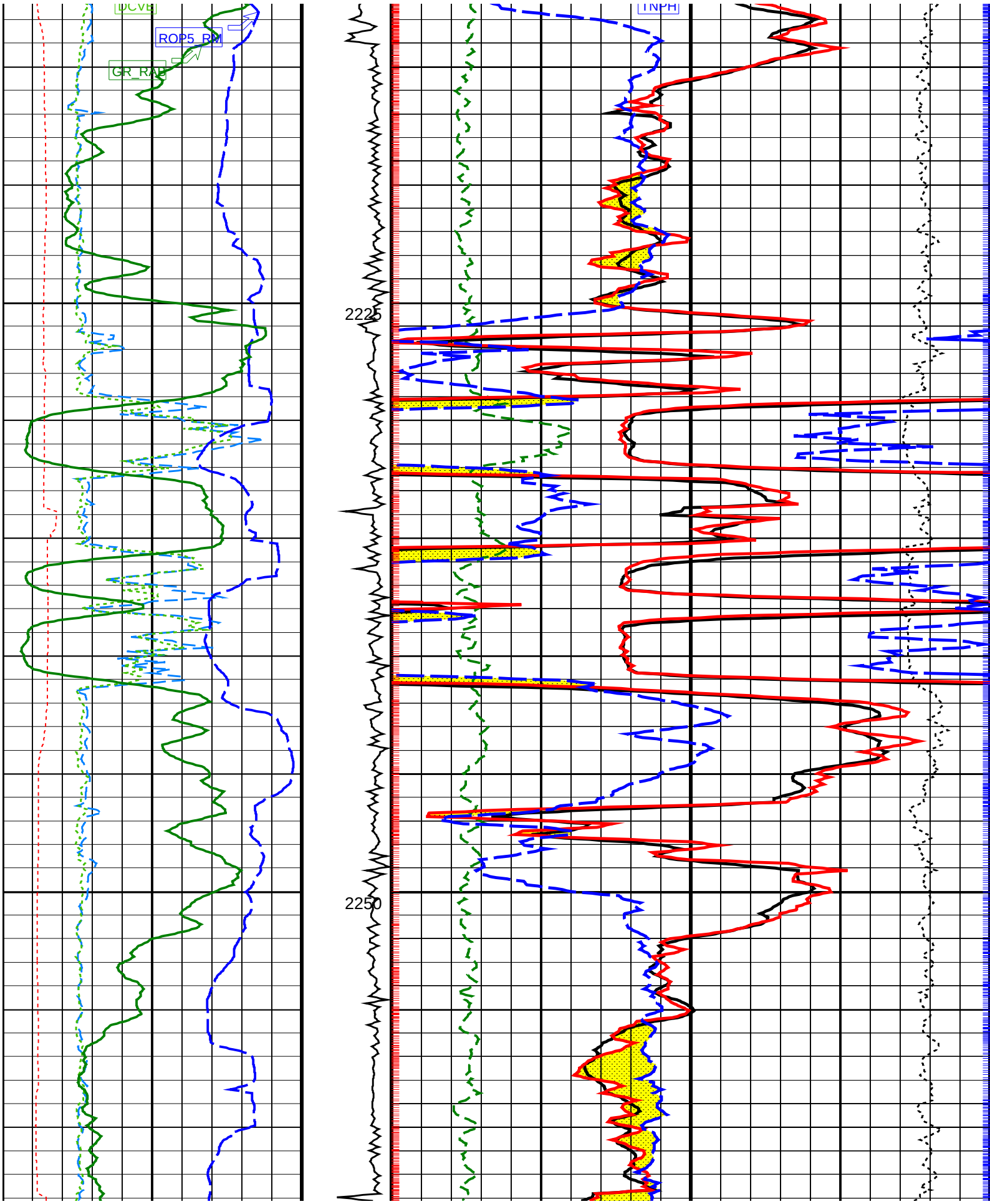
RHOB
DRHB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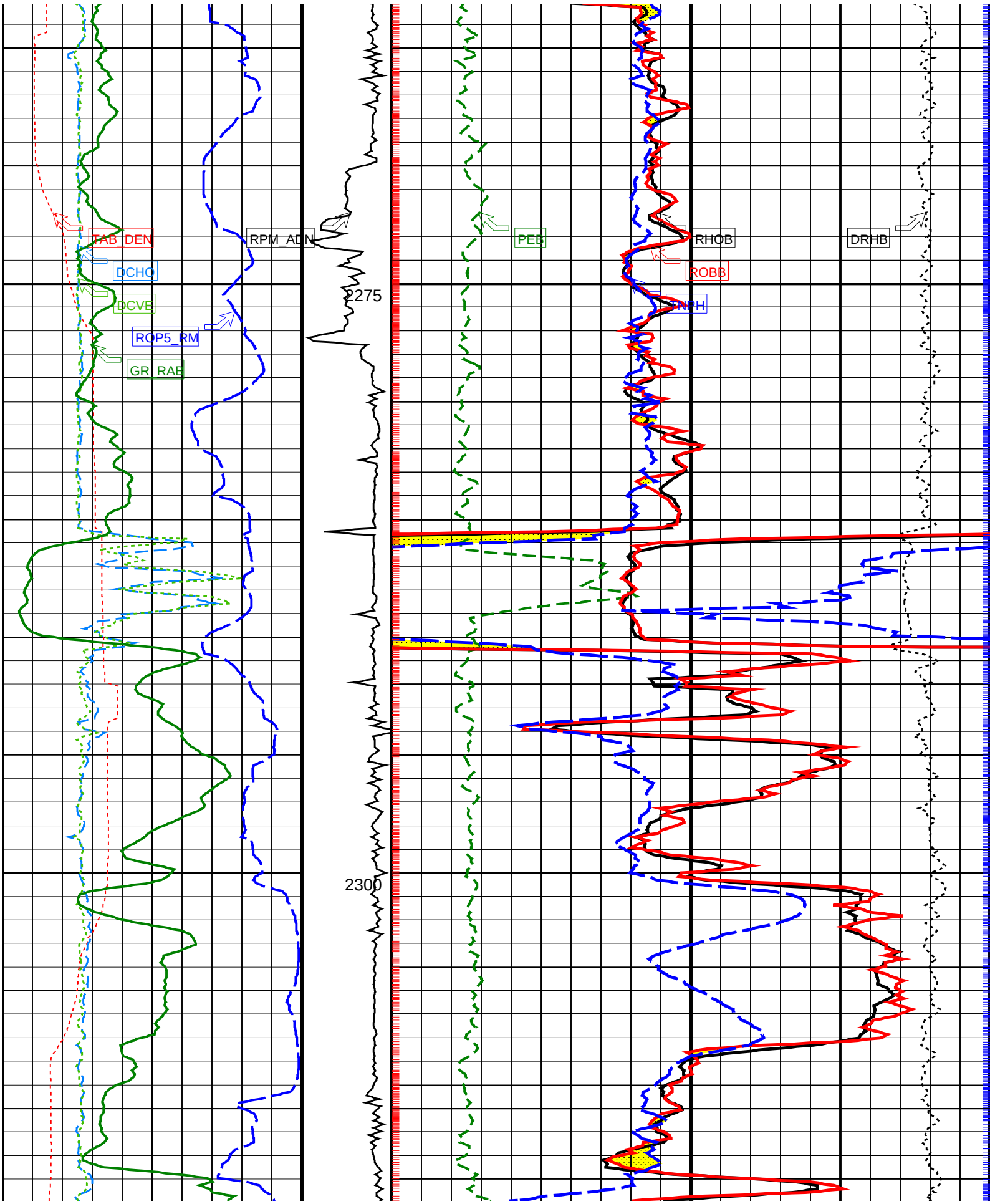
TNPH
2225
2250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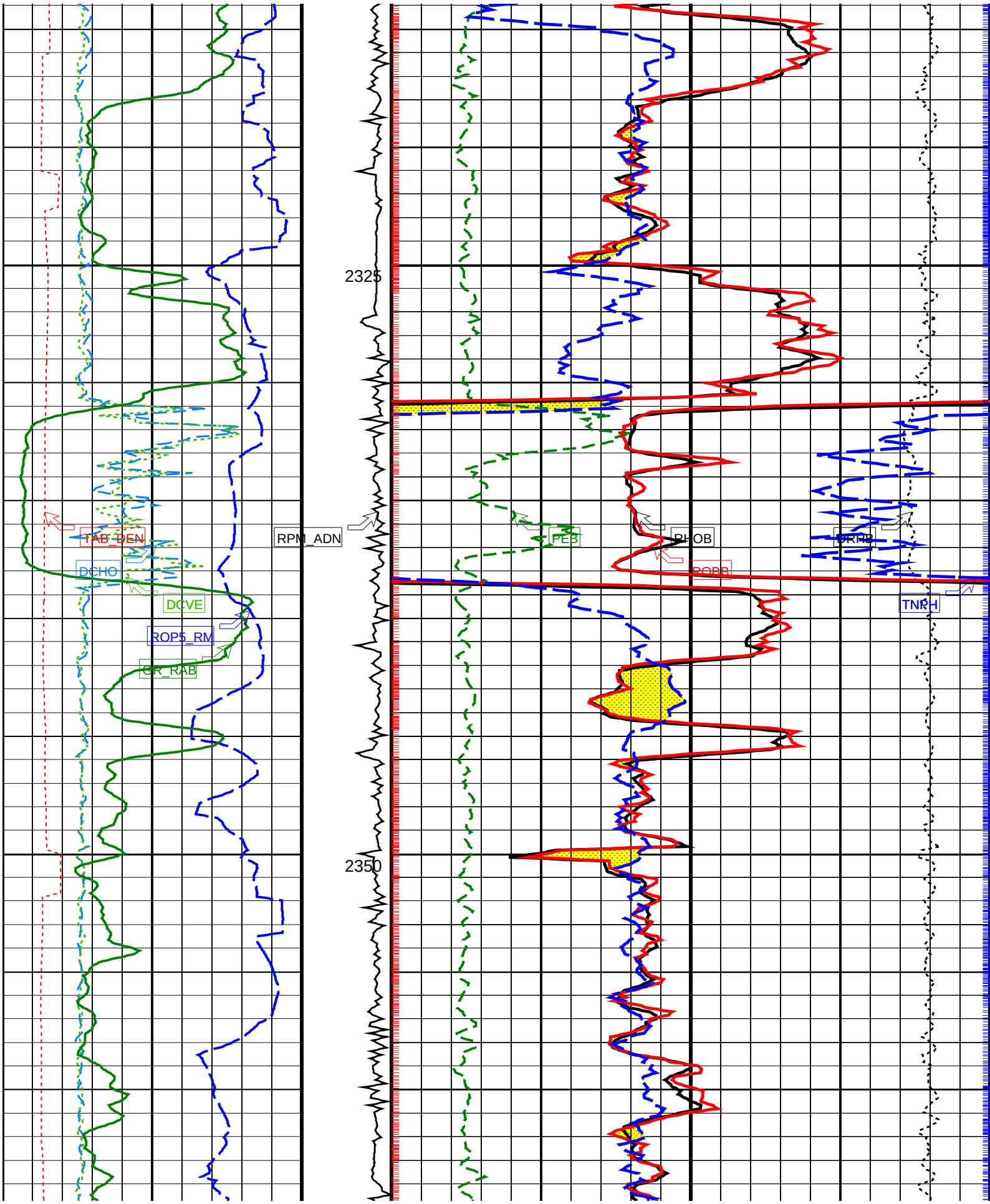
DCHQ
DCVB
ROP5_RM
GR_RAB
RPM_ADN
2275
2300
PEB
RHOB
ROBB
DRHB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DCVE
ROP5_RM
GR_RAB
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RHOB
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ROPB
TNRH
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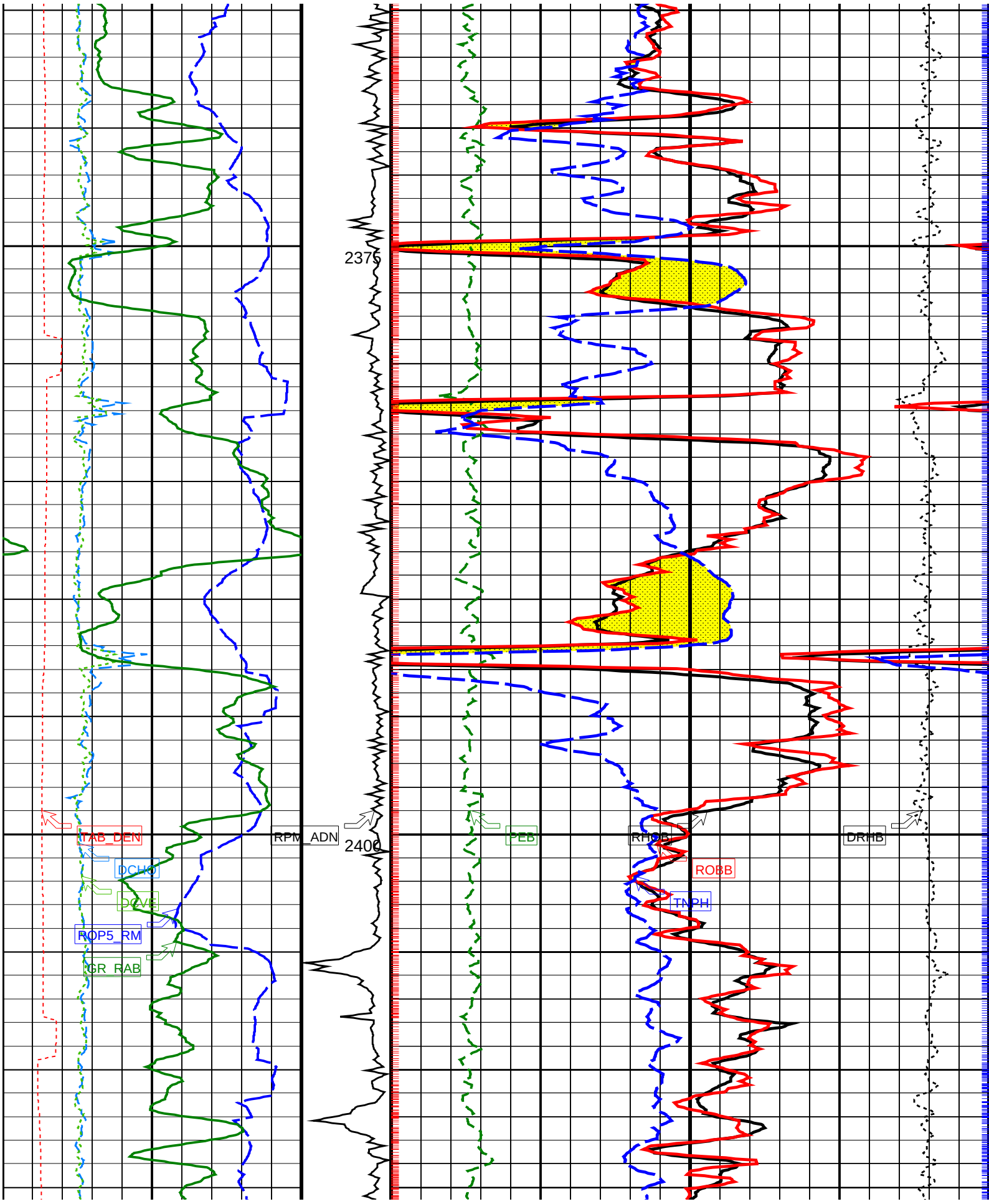
2350


2375
2400
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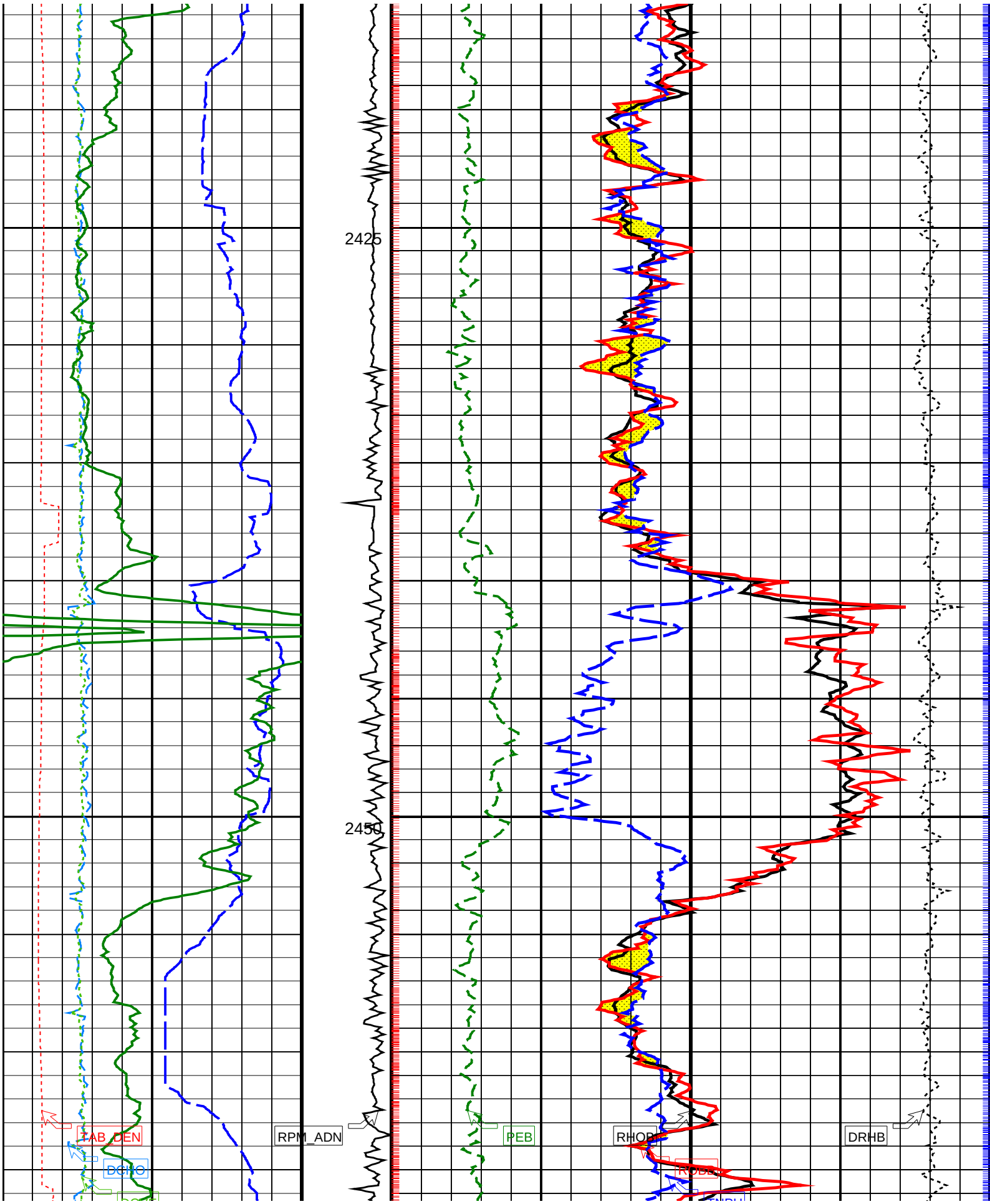
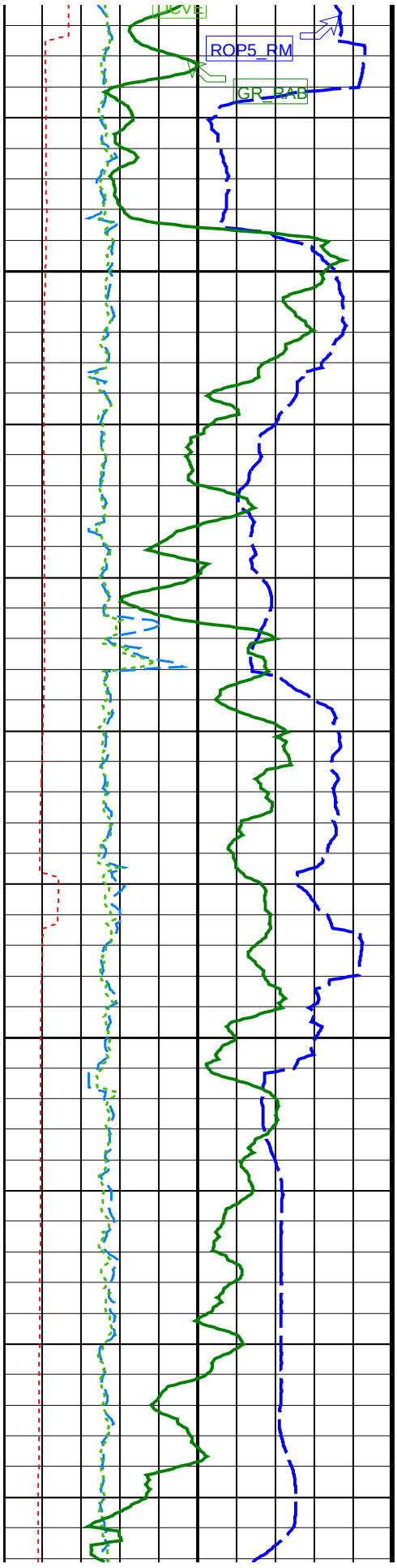
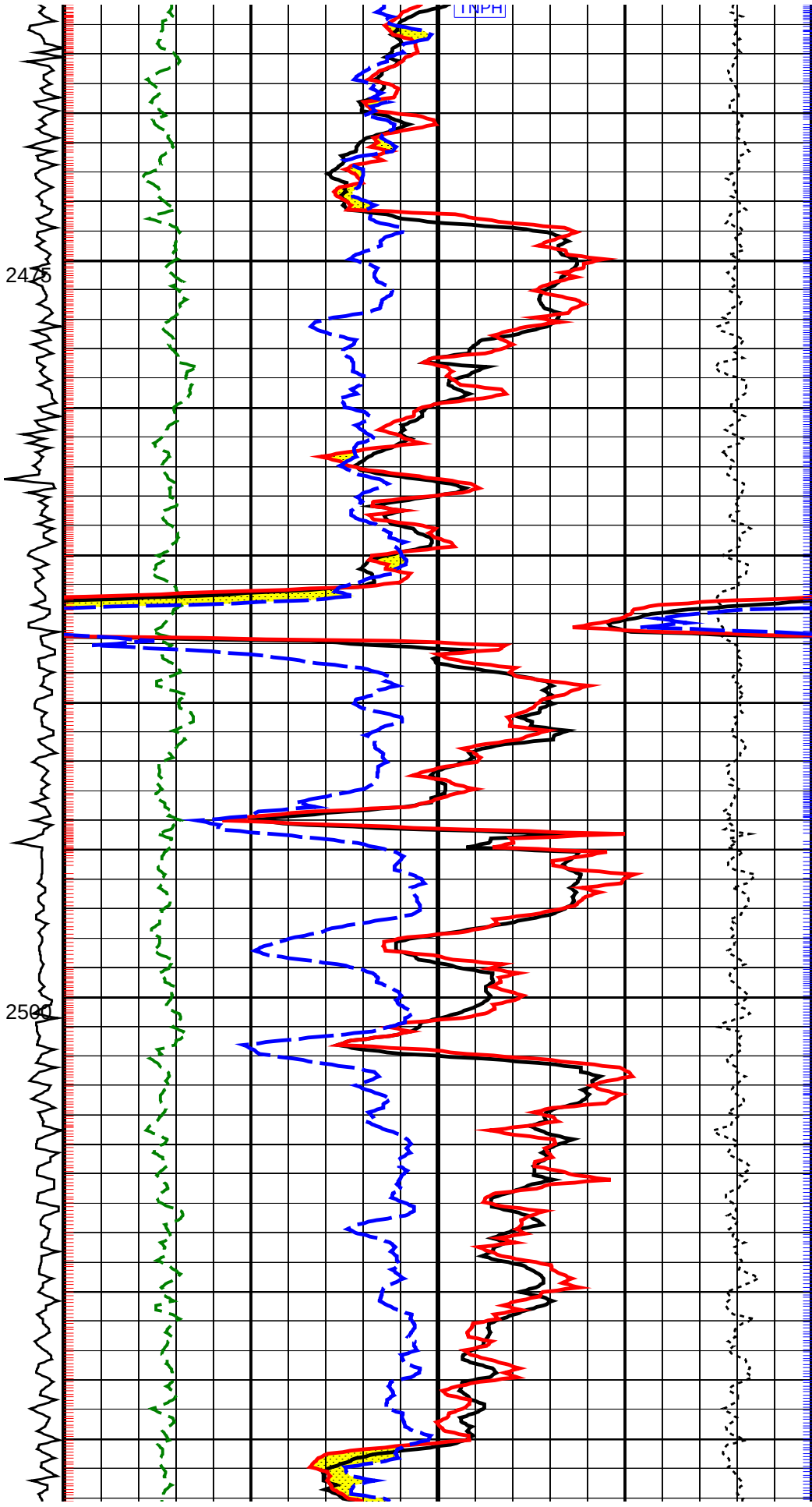
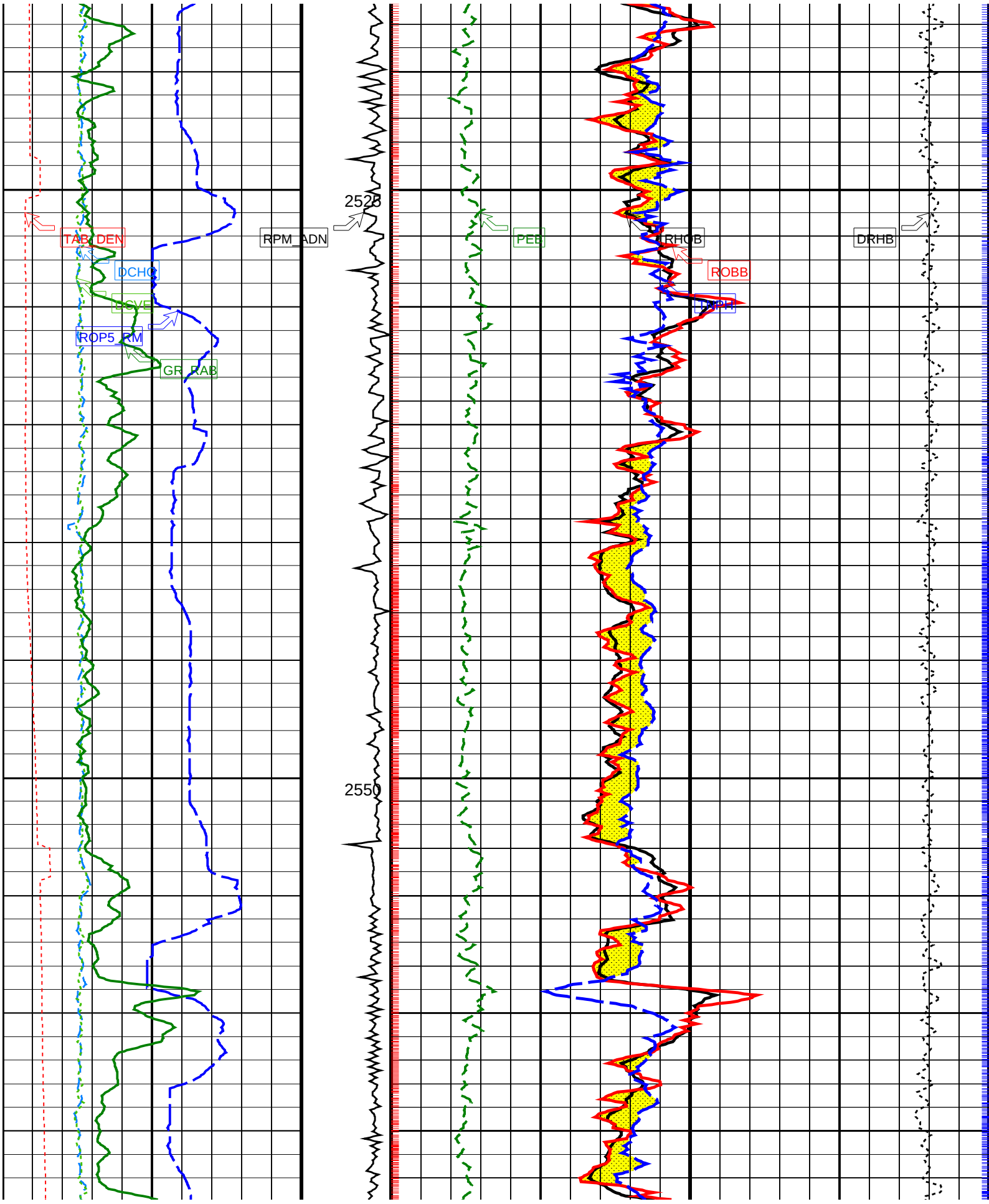
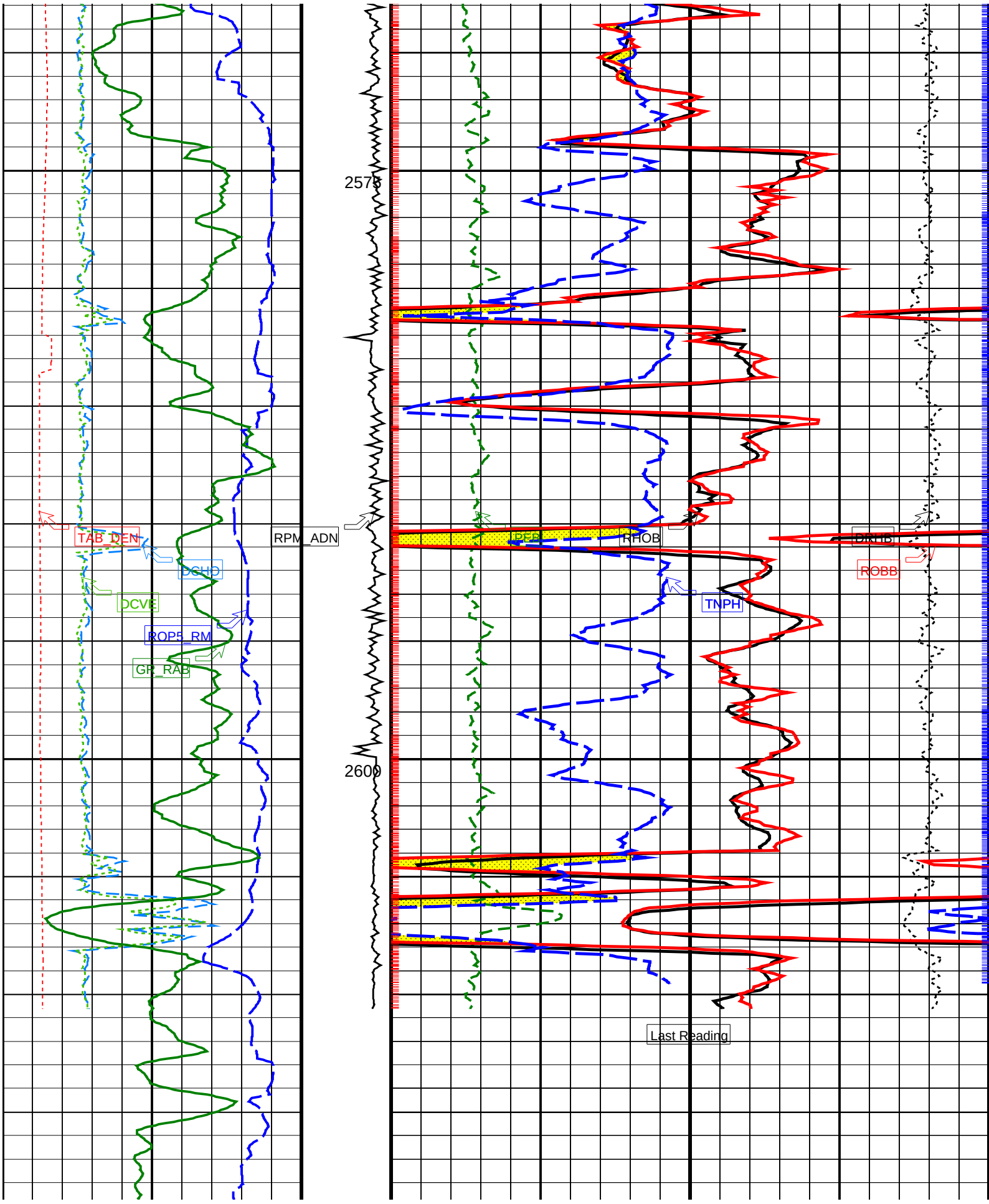
DCHO
DCVS
ROP5_RM
GR_RAB
PEB
RHOB
ROBB
TNPH
DRHB

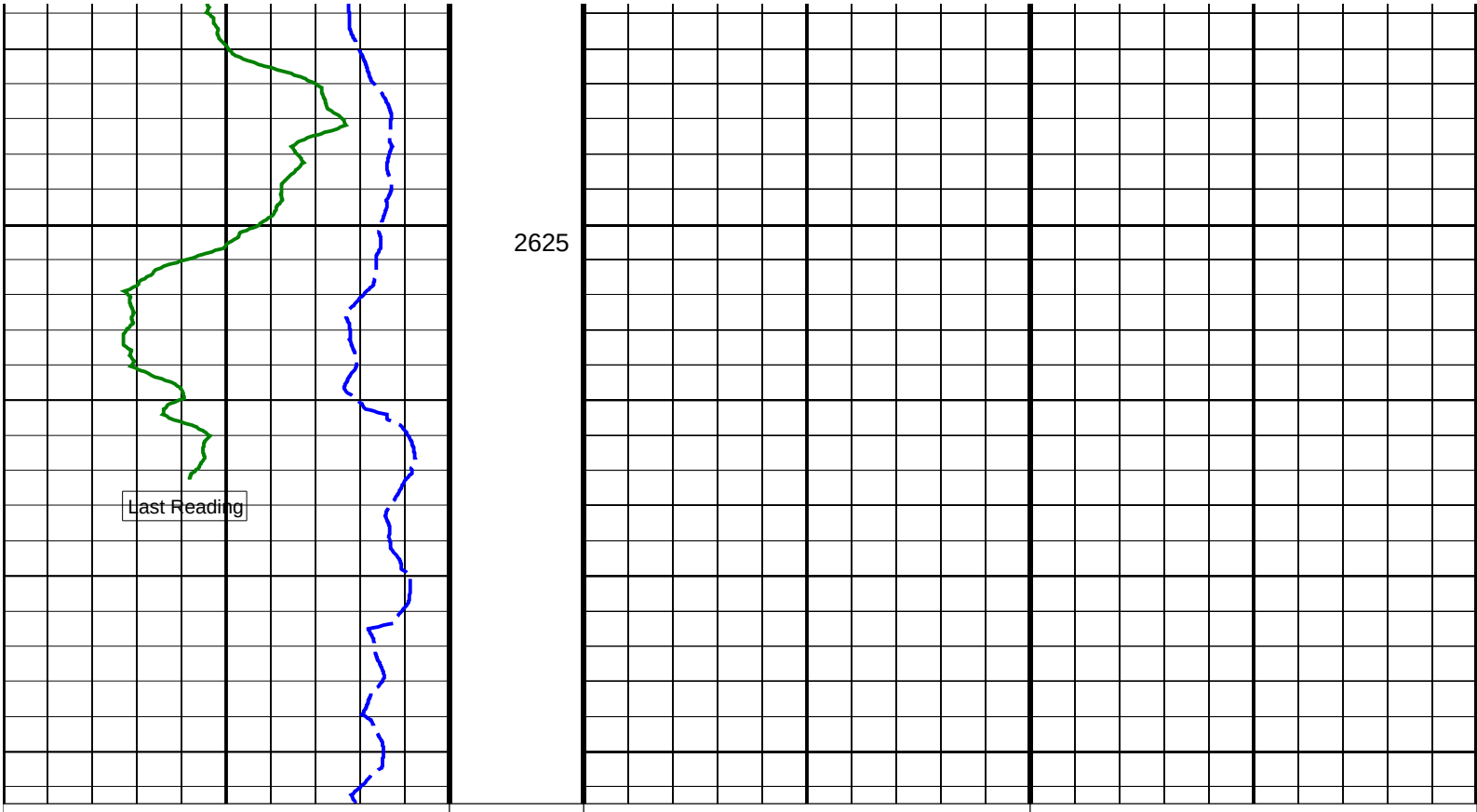

2425
2450
TAB_DEN
DCHO
RPM_ADN
PEB
RHOB
DRHB


TVDSS
ROP5_RM
GR_RAB


TNPH
2475
2500


TAB_DEN
DCHQ
ROP5_RM
GR_RAB
RPM_ADN
2525
2550
PEB
RHOB
ROBB
DRHB


2575
2600
TAB_DEN
DCHO
DCVE
ROP5_RM
GR_RAB
RPM_ADN
PEF
RHOB
TNPH
DRHB
ROBB
Last Reading



Density Time After Bit (TAB_DEN) 0 (HR) 10	ADN Rotational Speed (RPM_ADN) (RPM) 0 250	Photoelectric Factor, Bottom (PEB) 0 (---- 10
Bulk Density Correction, Bottom (DRHB) −0.75 (G/C3) 0.25		
Density Caliper, Horizontal (DCHO) 6 (IN) 16		Bulk Density (RHOB) 1.85 (G/C3) 2.85
Density Caliper, Vertical (DCVE) 6 (IN) 16		Bulk Density, Bottom (ROBB) 1.85 (G/C3) 2.85
RAB Gamma Ray (GR_RAB) 0 (GAPI) 200		Thermal Neutron Porosity (TNPH) 45 (PU) −15
Rate of Penetration, Averaged over Last 5ft (ROP5_RM) 200 (M/HR) 0		Gas Area From ADN/ROBB/DEPTH to ADN/TNPH/DEPTH

PIP SUMMARY

Neutron Ticks, 0.1 ft

Density Ticks, 0.1 ft

IDEAL Version: ID10_0C_04

IDF

RAB	id10_0c_04	MWD_10	id10_0c_04
ADN	id10_0c_04		

6.75−in. Azimuthal Density Neutron / Equipment Identification

Primary Equipment:

Tool Name and Serial Number	ADN6 − CA	0403
Collar Type and Serial Number	ADDC − AA	0403
Chassis Type and Serial Number	ADSE − EA	18
Stabilizer Type and Serial Number	Clamp−On	699198

Stabilizer Type and Serial Number		Clamp - CH	059196
Neutron Logging Source		NSR - M	202
Density Logging Source		GSR - J/Z	1994
Stabilizer Size		8.25 - in.	
Calibration Status		Valid	

Master: 21-Jun-2005 11:22

6.75-in. Azimuthal Density Neutron Calibration

Density: Magnesium Block

Phase	LS window 3 - Mg CPS	Value
Master		1052
250.0 (Minimum)	4125 (Nominal)	8000 (Maximum)

Phase	SS window 1 - Mg CPS	Value
Master		2361
700.0 (Minimum)	9350 (Nominal)	18000 (Maximum)

Phase	SS window 3 - Mg CPS	Value
Master		6156
2500 (Minimum)	23750 (Nominal)	45000 (Maximum)

Master: 21-Jun-2005 11:22

6.75-in. Azimuthal Density Neutron Calibration

Density: Aluminum Block

Phase	LS window 3 - Al CPS	Value
Master		163.3
50.00 (Minimum)	725.0 (Nominal)	1400 (Maximum)

Phase	SS window 1 - Al CPS	Value
Master		1238
500.0 (Minimum)	4250 (Nominal)	8000 (Maximum)

Phase	SS window 3 - Al CPS	Value
Master		3922
1500 (Minimum)	15750 (Nominal)	30000 (Maximum)

Master: 21-Jun-2005 11:22

6.75-in. Azimuthal Density Neutron Calibration

Density: Background

Phase	LS window 3 - Background CPS	Value
Master		33.84
15.00 (Minimum)	82.50 (Nominal)	150.0 (Maximum)

Phase	SS window 1 - Background CPS	Value
Master		106.5
40.00 (Minimum)	220.0 (Nominal)	400.0 (Maximum)

Phase	SS window 3 - Background CPS	Value
Master		474.2
150.0 (Minimum)	825.0 (Nominal)	1500 (Maximum)

Master: 21-Jun-2005 11:22

6.75-in. Azimuthal Density Neutron Calibration

Density: Water Block Check

Phase	Long spacing water density G/C3	Value
Master		1.030
1.024 (Minimum)	1.039 (Nominal)	1.054 (Maximum)

Phase	Short spacing water density G/C3	Value
Master		1.120
1.096 (Minimum)	1.126 (Nominal)	1.156 (Maximum)

Master: 21-Jun-2005 11:22

6.75-in. Azimuthal Density Neutron Calibration

Neutron: 3-Point Calibration

Phase	Far 1 tube 1 Air Point Measure CPS	Value
Master		17.01
15.00 (Minimum)	19.05 (Nominal)	21.00 (Maximum)

Phase	Far 1 tube 1 Rod Point Measure CPS	Value
Master		4.142
4.000 (Minimum)	4.857 (Nominal)	5.500 (Maximum)

Phase	Far 1 tube 1 H2O Point Measure CPS	Value
Master		2.060
1.900 (Minimum)	2.363 (Nominal)	2.700 (Maximum)

Phase	Far 1 tube 2 Air Point Measure CPS	Value
Master		18.12
16.00 (Minimum)	19.05 (Nominal)	22.00 (Maximum)

Phase	Far 1 tube 2 Rod Point Measure CPS	Value
Master		4.335
4.000 (Minimum)	4.857 (Nominal)	5.500 (Maximum)

Phase	Far 1 tube 2 H2O Point Measure CPS	Value
Master		2.137
1.900 (Minimum)	2.363 (Nominal)	2.800 (Maximum)

Phase	Far 1 tube 3 Air Point Measure CPS	Value
Master		17.15
15.00 (Minimum)	19.05 (Nominal)	21.00 (Maximum)

Phase	Far 1 tube 3 Rod Point Measure CPS	Value
Master		4.188
4.000 (Minimum)	4.857 (Nominal)	5.500 (Maximum)

Phase	Far 1 tube 3 H2O Point Measure CPS	Value
Master		2.066
1.900 (Minimum)	2.363 (Nominal)	2.700 (Maximum)

Phase	Far 2 tube 1 Air Point Measure CPS	Value
Master		17.52
15.00 (Minimum)	19.05 (Nominal)	21.00 (Maximum)

Phase	Far 2 tube 1 Rod Point Measure CPS	Value
Master		4.365
4.000 (Minimum)	4.857 (Nominal)	5.500 (Maximum)

Phase	Far 2 tube 1 H2O Point Measure CPS	Value
Master		2.173
1.900 (Minimum)	2.363 (Nominal)	2.700 (Maximum)

Phase	Far 2 tube 2 Air Point Measure CPS	Value
Master		18.07
16.00 (Minimum)	19.05 (Nominal)	22.00 (Maximum)

Phase	Far 2 tube 2 Rod Point Measure CPS	Value
Master		4.211
4.000 (Minimum)	4.857 (Nominal)	5.500 (Maximum)

Phase	Far 2 tube 2 H2O Point Measure CPS	Value
Master		1.982
1.900 (Minimum)	2.363 (Nominal)	2.800 (Maximum)

Phase	Far 2 tube 3 Air Point Measure CPS	Value
Master		17.03
	15.00 (Minimum) 19.05 (Nominal) 21.00 (Maximum)	

Phase	Far 2 tube 3 Rod Point Measure CPS	Value
Master		4.348
	4.000 (Minimum) 4.857 (Nominal) 5.500 (Maximum)	

Phase	Far 2 tube 3 H2O Point Measure CPS	Value
Master		2.060
	1.900 (Minimum) 2.363 (Nominal) 2.700 (Maximum)	

Phase	Near 1 tube 1 Air Point Measure CPS	Value
Master		458.8
	400.0 (Minimum) 487.5 (Nominal) 540.0 (Maximum)	

Phase	Near 1 tube 1 Rod Point Measure CPS	Value
Master		722.7
	610.0 (Minimum) 768.8 (Nominal) 850.0 (Maximum)	

Phase	Near 1 tube 1 H2O Point Measure CPS	Value
Master		319.9
	270.0 (Minimum) 343.7 (Nominal) 390.0 (Maximum)	

Phase	Near 2 tube 1 Air Point Measure CPS	Value
Master		454.0
	400.0 (Minimum) 487.5 (Nominal) 540.0 (Maximum)	

Phase	Near 2 tube 1 Rod Point Measure CPS	Value
Master		727.3
	610.0 (Minimum) 768.8 (Nominal) 850.0 (Maximum)	

Phase	Near 2 tube 1 H2O Point Measure CPS	Value
Master		320.0
	270.0 (Minimum) 343.7 (Nominal) 390.0 (Maximum)	

Master: 21−Jun−2005 11:22

6.75−in. Azimuthal Density Neutron Calibration

Neutron: Water Block Check

Phase	Far Neutron water porosity PU	Value
Master		92.83
	90.00 (Minimum) 100.0 (Nominal) 125.0 (Maximum)	

6.75−in. Resistivity At−the−Bit / Equipment Identification

Primary Equipment:

Tool Name and Serial Number	RAB6 − CA	191
Calibration Status	Valid	

Master: 29−Jul−2005 15:21

6.75−in. Resistivity At−the−Bit Calibration

Resistivity: Fixture

Phase	Ring/T1 factor ----	Value
Master		0.9949
	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	

Phase	Ring/T2 factor ----	Value
Master		0.9924
	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	

Phase	M0/T1 factor ----	Value
Master		1.006
	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	

Phase	M0/T2 factor ----	Value
Master		1.003
	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	

Phase	M2/T1 factor ----	Value
Master		1.007
	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	

Phase	M2/T2 factor ----	Value
Master		1.003
	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	

Phase	BTN shallow/T1 factor ----	Value
Master		1.002
	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	

Phase	BTN shallow/T2 factor ----	Value
Master		0.9996
	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	

Phase	BTN medium/T1 factor ----	Value
Master		0.9951
	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	

Phase	BTN medium/T2 factor ----	Value
Master		0.9922
	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	

Phase	BTN deep/T1 factor ----	Value
Master		1.012
	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	

Phase	BTN deep/T2 factor ----	Value
Master		1.009
	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	

Master: 29−Jul−2005 15:21

6.75−in. Resistivity At−the−Bit Calibration

Gamma Ray: Blanket

Phase	Gamma ray factor ----	Value

Master			0.9256
0.7500 (Minimum)	1.000 (Nominal)	1.250 (Maximum)	

6.75−in. Azimuthal Density Neutron / Equipment Identification

Primary Equipment:		
Tool Name and Serial Number	ADN6 − CA	FE55
Collar Type and Serial Number	ADDC − AA	FE55
Chassis Type and Serial Number	ADSE − EA	380
Stabilizer Type and Serial Number	IBS	
Neutron Logging Source	NSR − M	202
Density Logging Source	GSR − J/Z	1994
Stabilizer Size	8−3/16 − in.	
Calibration Status	Valid	

Master: 19−Jun−2005 14:46

6.75−in. Azimuthal Density Neutron Calibration

Density: Magnesium Block

Phase	LS window 3 − Mg CPS	Value	Phase	SS window 1 − Mg CPS	Value	Phase	SS window 3 − Mg CPS	Value
Master		1069	Master		2586	Master		6392
250.0 (Minimum)	4125 (Nominal) 8000 (Maximum)		700.0 (Minimum)	9350 (Nominal) 18000 (Maximum)		2500 (Minimum)	23750 (Nominal) 45000 (Maximum)	

Master: 19−Jun−2005 14:46

6.75−in. Azimuthal Density Neutron Calibration

Density: Aluminum Block

Phase	LS window 3 − Al CPS	Value	Phase	SS window 1 − Al CPS	Value	Phase	SS window 3 − Al CPS	Value
Master		160.3	Master		1306	Master		4004
50.00 (Minimum)	725.0 (Nominal) 1400 (Maximum)		500.0 (Minimum)	4250 (Nominal) 8000 (Maximum)		1500 (Minimum)	15750 (Nominal) 30000 (Maximum)	

Master: 19−Jun−2005 14:46

6.75−in. Azimuthal Density Neutron Calibration

Density: Background

Phase	LS window 3 − Background CPS	Value	Phase	SS window 1 − Background CPS	Value	Phase	SS window 3 − Background CPS	Value
Master		50.02	Master		127.9	Master		555.3
15.00 (Minimum)	82.50 (Nominal) 150.0 (Maximum)		40.00 (Minimum)	220.0 (Nominal) 400.0 (Maximum)		150.0 (Minimum)	825.0 (Nominal) 1500 (Maximum)	

Master: 19−Jun−2005 14:46

6.75−in. Azimuthal Density Neutron Calibration

Density: Water Block Check

Phase	Long spacing water density G/C3	Value	Phase	Short spacing water density G/C3	Value
Master		1.031	Master		1.130
1.024 (Minimum)	1.039 (Nominal) 1.054 (Maximum)		1.096 (Minimum)	1.126 (Nominal) 1.156 (Maximum)	

Master: 19−Jun−2005 14:46

6.75−in. Azimuthal Density Neutron Calibration

Neutron: 3−Point Calibration

Phase	Far 1 tube 1 Air Point Measure CPS	Value	Phase	Far 1 tube 1 Rod Point Measure CPS	Value	Phase	Far 1 tube 1 H2O Point Measure CPS	Value
Master		17.72	Master		4.474	Master		2.147
15.00 (Minimum)	19.05 (Nominal) 21.00 (Maximum)		4.000 (Minimum)	4.857 (Nominal) 5.500 (Maximum)		1.900 (Minimum)	2.363 (Nominal) 2.700 (Maximum)	
Phase	Far 1 tube 2 Air Point Measure CPS	Value	Phase	Far 1 tube 2 Rod Point Measure CPS	Value	Phase	Far 1 tube 2 H2O Point Measure CPS	Value
Master		18.93	Master		4.707	Master		2.299
16.00 (Minimum)	19.05 (Nominal) 22.00 (Maximum)		4.000 (Minimum)	4.857 (Nominal) 5.500 (Maximum)		1.900 (Minimum)	2.363 (Nominal) 2.800 (Maximum)	
Phase	Far 1 tube 3 Air Point Measure CPS	Value	Phase	Far 1 tube 3 Rod Point Measure CPS	Value	Phase	Far 1 tube 3 H2O Point Measure CPS	Value
Master		18.55	Master		4.486	Master		2.279

Phase	Far 2 tube 1 Air Point Measure CPS	Value
Master		17.65

15.00 (Minimum) 19.05 (Nominal) 21.00 (Maximum)

Phase	Far 2 tube 1 Rod Point Measure CPS	Value
Master		4.416

4.000 (Minimum) 4.857 (Nominal) 5.500 (Maximum)

Phase	Far 2 tube 1 H2O Point Measure CPS	Value
Master		2.151

1.900 (Minimum) 2.363 (Nominal) 2.700 (Maximum)

Phase	Far 2 tube 2 Air Point Measure CPS	Value
Master		18.97

16.00 (Minimum) 19.05 (Nominal) 22.00 (Maximum)

Phase	Far 2 tube 2 Rod Point Measure CPS	Value
Master		4.543

4.000 (Minimum) 4.857 (Nominal) 5.500 (Maximum)

Phase	Far 2 tube 2 H2O Point Measure CPS	Value
Master		2.222

1.900 (Minimum) 2.363 (Nominal) 2.800 (Maximum)

Phase	Far 2 tube 3 Air Point Measure CPS	Value
Master		18.19

15.00 (Minimum) 19.05 (Nominal) 21.00 (Maximum)

Phase	Far 2 tube 3 Rod Point Measure CPS	Value
Master		4.596

4.000 (Minimum) 4.857 (Nominal) 5.500 (Maximum)

Phase	Far 2 tube 3 H2O Point Measure CPS	Value
Master		2.253

1.900 (Minimum) 2.363 (Nominal) 2.700 (Maximum)

Phase	Near 1 tube 1 Air Point Measure CPS	Value
Master		455.2

400.0 (Minimum) 487.5 (Nominal) 540.0 (Maximum)

Phase	Near 1 tube 1 Rod Point Measure CPS	Value
Master		728.7

610.0 (Minimum) 768.8 (Nominal) 850.0 (Maximum)

Phase	Near 1 tube 1 H2O Point Measure CPS	Value
Master		326.1

270.0 (Minimum) 343.7 (Nominal) 390.0 (Maximum)

Phase	Near 2 tube 1 Air Point Measure CPS	Value
Master		474.0

400.0 (Minimum) 487.5 (Nominal) 540.0 (Maximum)

Phase	Near 2 tube 1 Rod Point Measure CPS	Value
Master		746.7

610.0 (Minimum) 768.8 (Nominal) 850.0 (Maximum)

Phase	Near 2 tube 1 H2O Point Measure CPS	Value
Master		342.4

270.0 (Minimum) 343.7 (Nominal) 390.0 (Maximum)

Master: 19−Jun−2005 14:46

6.75−in. Azimuthal Density Neutron Calibration

Neutron: Water Block Check

Phase	Far Neutron water porosity PU	Value
Master		94.31

90.00 (Minimum) 100.0 (Nominal) 125.0 (Maximum)

6.75−in. Resistivity At−the−Bit / Equipment Identification

Primary Equipment:

Tool Name and Serial Number	RAB6 − CA	147
Calibration Status	Valid	

Master: 29−Jul−2005 17:20

6.75−in. Resistivity At−the−Bit Calibration

Resistivity: Fixture

Phase	Ring/T1 factor ----	Value
Master		1.012

0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)

Phase	Ring/T2 factor ----	Value
Master		1.011

0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)

Phase	M0/T1 factor ----	Value
Master		1.002

0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)

Phase	M0/T2 factor ----	Value
Master		1.002

0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)

Phase	M2/T1 factor ----	Value
Master		0.9986

0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)

Phase	M2/T2 factor ----	Value
Master		0.9982

0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)

Phase	BTN shallow/T1 factor ----	Value
Master		1.009

0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)

Phase	BTN shallow/T2 factor ----	Value
Master		1.009

0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)

Phase	BTN medium/T1 factor ----	Value
Master		1.002

0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)

Phase	BTN medium/T2 factor ----	Value
Master	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	1.001

Phase	BTN deep/T1 factor ----	Value
Master	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	1.001

Phase	BTN deep/T2 factor ----	Value
Master	0.9750 (Minimum) 1.000 (Nominal) 1.025 (Maximum)	0.9999

Master: 29−Jul−2005 17:20

6.75−in. Resistivity At−the−Bit Calibration

Gamma Ray: Blanket

Phase	Gamma ray factor ----	Value
Master	0.7500 (Minimum) 1.000 (Nominal) 1.250 (Maximum)	0.9611

SCHLUMBERGER

Survey report 9-Aug-2005 16:39:27 Page 1 of 5

Client.....: ESSO Australia Pty. Ltd.
Field.....: Bream B

Well.....: BMB-B16
API number.....:
Engineer.....: J.Dolan, M.Y.Tan, D.Hastie

RIG:.....: ENSCO 102
STATE:.....: Victoria

Spud date.....: 05-Jul-2005
Last survey date.....: 09-Aug-05
Total accepted surveys...: 92
MD of first survey.....: 0.00 m
MD of last survey.....: 2641.00 m

----- Survey calculation methods-----
Method for positions.....: Minimum curvature
Method for DLS.....: Mason & Taylor

----- Depth reference -----
Permanent datum.....: Mean Sea Level
Depth reference.....: Driller's Depth
GL above permanent.....: -61.00 m
KB above permanent.....: Top Drive
DF above permanent.....: 47.17 m

----- Vertical section origin-----
Latitude (+N/S-).....: -7.80 m
Departure (+E/W-).....: -0.30 m

----- Platform reference point-----
Latitude (+N/S-).....:
Departure (+E/W-).....:

Azimuth from Vsect Origin to target: 119.19 degrees

----- Geomagnetic data -----
Magnetic model.....: BGGM version 2005
Magnetic date.....: 29-Jul-2005
Magnetic field strength..: 1203.00 HCNT
Magnetic dec (+E/W-).....: 13.10 degrees
Magnetic dip.....: -69.05 degrees

----- MWD survey Reference Criteria -----
Reference G.....: 1000.05 mGal
Reference H.....: 1203.00 HCNT
Reference Dip.....: -69.05 degrees
Tolerance of G.....: (+/-) 2.50 mGal
Tolerance of H.....: (+/-) 6.00 HCNT
Tolerance of Dip.....: (+/-) 0.45 degrees

----- Corrections -----
Magnetic dec (+E/W-).....: 13.10 degrees
Grid convergence (+E/W-).: -0.52 degrees
Total az corr (+E/W-).....: 13.62 degrees
(Total az corr = magnetic dec - grid conv)
Survey Correction Type ...:
I=Sag Corrected Inclination
M=Schlumberger Magnetic Correction
S=Shell Magnetic Correction
F=Failed Axis Correction
R=Magnetic Resonance Tool Correction
D=Dmag Magnetic Correction

Seq # -	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S- (m)	Displ +E/W- (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 100f)	Srvy tool type	Tool Corr (deg)
1	0.00	0.00	0.00	0.00	0.00	0.00	-7.80	-0.30	7.81	182.20	0.00	TIP	None
2	107.50	0.00	0.00	107.50	107.50	0.00	-7.80	-0.30	7.81	182.20	0.00	GYR	None
3	110.30	0.15	158.53	2.80	110.30	0.00	-7.80	-0.30	7.81	182.19	1.63	GYR	None
4	138.80	0.18	157.67	28.50	138.80	0.07	-7.88	-0.27	7.88	181.95	0.03	GYR	None
5	157.60	0.16	154.47	18.80	157.60	0.11	-7.93	-0.25	7.93	181.77	0.04	GYR	None
6	174.50	0.11	156.53	16.90	174.50	0.14	-7.97	-0.23	7.97	181.65	0.09	GYR	None
7	183.49	0.57	272.31	8.99	183.49	0.11	-7.97	-0.27	7.98	181.94	2.12	GYR	None
8	214.10	2.13	263.97	30.61	214.09	-0.49	-8.03	-0.99	8.09	187.02	1.56	GYR	None
9	244.30	4.13	267.49	30.20	244.24	-1.87	-8.13	-2.63	8.55	197.94	2.03	GYR	None
10	273.44	6.20	258.68	29.14	273.26	-3.96	-8.49	-5.22	9.97	211.61	2.31	GYR	None
11	302.32	6.79	248.99	28.88	301.96	-6.24	-9.41	-8.35	12.58	221.59	1.31	GYR	None
12	320.98	6.50	238.20	18.66	320.49	-7.46	-10.36	-10.27	14.59	224.77	2.09	MWD	None
13	360.36	6.56	225.35	39.38	359.62	-9.17	-13.11	-13.77	19.02	226.40	1.13	GYR	None
14	389.61	6.38	219.35	29.25	388.69	-9.92	-15.54	-15.99	22.30	225.81	0.73	GYR	None
15	418.79	6.26	225.03	29.18	417.69	-10.64	-17.92	-18.14	25.50	225.35	0.66	GYR	None
16	447.48	6.24	222.63	28.69	446.21	-11.43	-20.18	-20.30	28.62	225.18	0.28	GYR	None
17	476.58	6.16	224.05	29.10	475.14	-12.20	-22.46	-22.46	31.77	225.00	0.18	GYR	None

18	505.66	6.06	219.91	29.08	504.05	-12.88	-24.76	-24.53	34.85	224.73	0.47	GYR	None
19	534.65	6.06	217.45	28.99	532.88	-13.39	-27.15	-26.44	37.90	224.25	0.27	GYR	None
20	563.70	6.02	217.76	29.05	561.77	-13.83	-29.57	-28.31	40.94	223.75	0.05	GYR	None
21	592.73	5.72	226.27	29.03	590.65	-14.49	-31.77	-30.29	43.90	223.63	0.97	GYR	None
22	621.85	5.72	231.95	29.12	619.62	-15.47	-33.67	-32.48	46.78	223.97	0.59	GYR	None
23	650.71	5.56	228.28	28.86	648.34	-16.49	-35.49	-34.65	49.60	224.32	0.42	GYR	None
24	680.04	5.51	231.33	29.33	677.54	-17.48	-37.31	-36.81	52.41	224.61	0.31	GYR	None
25	697.53	5.50	228.98	17.49	694.95	-18.08	-38.39	-38.10	54.08	224.78	0.39	MWD	None
26	726.22	5.50	228.97	28.69	723.50	-19.01	-40.19	-40.17	56.82	224.99	0.00	MWD	None
27	755.02	5.47	224.63	28.80	752.17	-19.84	-42.07	-42.18	59.57	225.07	0.44	MWD	None
28	784.05	5.45	220.42	29.03	781.07	-20.48	-44.11	-44.04	62.33	224.96	0.42	MWD	None
29	812.94	5.55	224.13	28.89	809.83	-21.11	-46.15	-45.91	65.10	224.85	0.39	MWD	None
30	856.11	5.52	225.75	43.17	852.80	-22.24	-49.10	-48.85	69.26	224.85	0.11	MWD	None

Seq # -	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S- (m)	Displ +E/W- (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 100f)	Srvy tool type	Tool Corr (deg)
31	885.50	5.60	224.98	29.39	882.05	-23.03	-51.10	-50.87	72.11	224.87	0.11	MWD	None
32	914.67	5.60	223.80	29.17	911.08	-23.78	-53.14	-52.86	74.95	224.85	0.12	MWD	None
33	943.84	5.47	223.94	29.17	940.11	-24.49	-55.16	-54.81	77.77	224.82	0.14	MWD	None
34	972.77	5.37	223.05	28.93	968.91	-25.17	-57.15	-56.69	80.50	224.77	0.14	MWD	None
35	1001.99	5.46	223.36	29.22	998.00	-25.83	-59.16	-58.58	83.26	224.72	0.10	MWD	None
36	1030.57	5.41	224.95	28.58	1026.46	-26.53	-61.10	-60.47	85.96	224.70	0.17	MWD	None
37	1059.72	5.32	225.10	29.15	1055.48	-27.28	-63.03	-62.40	88.69	224.71	0.10	MWD	None
38	1088.71	5.11	226.63	28.99	1084.35	-28.03	-64.86	-64.29	91.32	224.75	0.26	MWD	None
39	1117.66	5.03	225.28	28.95	1113.18	-28.77	-66.64	-66.13	93.88	224.78	0.15	MWD	None
40	1146.60	5.09	226.31	28.94	1142.01	-29.50	-68.42	-67.96	96.43	224.81	0.11	MWD	None
41	1175.41	5.01	225.26	28.81	1170.71	-30.22	-70.19	-69.77	98.97	224.83	0.13	MWD	None
42	1204.65	4.90	227.98	29.24	1199.84	-30.98	-71.92	-71.61	101.49	224.87	0.27	MWD	None
43	1233.79	4.85	227.90	29.14	1228.87	-31.78	-73.58	-73.45	103.96	224.95	0.05	MWD	None
44	1262.27	5.07	228.33	28.48	1257.25	-32.57	-75.22	-75.28	106.42	225.02	0.24	MWD	None
45	1291.51	5.31	229.22	29.24	1286.37	-33.46	-76.97	-77.27	109.06	225.11	0.26	MWD	None
46	1320.64	5.99	219.17	29.13	1315.36	-34.19	-79.03	-79.25	111.92	225.08	1.25	MWD	None
47	1349.52	7.66	193.37	28.88	1344.04	-33.92	-82.07	-80.65	115.06	224.50	3.64	MWD	None
48	1378.46	10.94	165.80	28.94	1372.61	-31.51	-86.61	-80.42	118.19	222.88	5.73	MWD	None
49	1407.52	13.12	139.65	29.06	1401.05	-26.52	-91.80	-77.61	120.21	220.21	6.09	MWD	None
50	**1436.56**	**14.26**	**126.97**	**29.04**	**1429.27**	**-19.89**	**-96.46**	**-72.61**	**120.74**	**216.97**	**3.36**	**MWD**	**None**
51	1465.33	14.22	127.37	28.77	1457.16	-12.88	-100.74	-66.97	120.97	213.62	0.11	MWD	None
52	1494.32	13.91	123.06	28.99	1485.28	-5.88	-104.80	-61.22	121.37	210.29	1.15	MWD	None
53	1523.35	13.91	114.26	29.03	1513.46	1.08	-108.14	-55.12	121.38	207.01	2.22	MWD	None
54	1552.33	13.77	107.16	28.98	1541.60	7.93	-110.59	-48.64	120.82	203.74	1.79	MWD	None
55	1581.19	13.47	106.93	28.86	1569.65	14.57	-112.58	-42.15	120.21	200.52	0.32	MWD	None
56	1610.23	13.22	106.90	29.04	1597.90	21.12	-114.53	-35.73	119.98	197.33	0.26	MWD	None
57	1639.24	12.97	106.76	29.01	1626.16	27.54	-116.43	-29.44	120.10	194.19	0.26	MWD	None
58	1668.40	14.75	106.71	29.16	1654.47	34.36	-118.45	-22.75	120.61	190.87	1.86	MWD	None
59	1697.46	18.56	110.49	29.06	1682.31	42.55	-121.13	-14.88	122.04	187.00	4.15	MWD	None
60	1726.01	22.22	113.20	28.55	1709.06	52.41	-124.85	-5.65	124.98	182.59	4.03	MWD	None

Seq # -	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S- (m)	Displ +E/W- (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 100f)	Srvy tool type	Tool Corr (deg)
61	1755.12	25.46	114.56	29.11	1735.69	64.12	-129.62	5.10	129.72	177.75	3.44	MWD	None
62	1784.08	28.71	115.07	28.96	1761.47	77.27	-135.15	17.06	136.23	172.80	3.43	MWD	None
63	1813.12	32.21	113.25	29.04	1786.50	91.93	-141.17	30.50	144.42	167.81	3.80	MWD	None
64	1842.22	35.30	112.90	29.10	1810.69	108.01	-147.50	45.37	154.32	162.90	3.24	MWD	None
65	1871.31	38.11	113.30	29.09	1834.01	125.29	-154.32	61.36	166.08	158.32	2.95	MWD	None
66	1899.95	41.20	113.37	28.64	1856.05	143.47	-161.56	78.14	179.47	154.19	3.29	MWD	None
67	1929.05	45.21	113.03	29.10	1877.26	163.28	-169.41	96.45	194.94	150.35	4.21	MWD	None
68	1958.45	49.07	111.54	29.40	1897.26	184.67	-177.57	116.39	212.32	146.76	4.16	MWD	None
69	1987.31	52.44	109.37	28.86	1915.51	206.75	-185.37	137.33	230.70	143.47	3.98	MWD	None
70	2016.22	56.23	108.21	28.91	1932.37	229.85	-192.93	159.56	250.36	140.41	4.12	MWD	None
71	2044.75	58.13	107.85	28.53	1947.83	253.37	-200.35	182.36	270.91	137.69	2.06	MWD	None
72	2073.75	56.68	107.89	29.00	1963.45	277.33	-207.84	205.61	292.36	135.31	1.52	MWD	None
73	2102.65	56.17	107.47	28.90	1979.43	300.92	-215.16	228.55	313.89	133.27	0.65	MWD	None
74	2131.41	55.69	106.87	28.76	1995.54	324.22	-222.19	251.32	335.45	131.48	0.73	MWD	None
75	2160.35	55.85	106.48	28.94	2011.82	347.58	-229.06	274.24	357.31	129.87	0.38	MWD	None
76	2189.30	54.86	106.25	28.95	2028.28	370.80	-235.77	297.09	379.27	128.44	1.06	MWD	None
77	2218.83	53.99	105.47	29.53	2045.46	394.17	-242.33	320.19	401.56	127.12	1.11	MWD	None
78	2247.97	53.59	105.31	29.14	2062.68	417.01	-248.57	342.86	423.49	125.94	0.44	MWD	None
79	2277.03	54.85	105.22	29.06	2079.67	439.89	-254.78	365.60	445.62	124.87	1.32	MWD	None
80	2306.49	53.74	104.80	29.46	2096.86	463.08	-260.97	388.71	468.19	123.88	1.20	MWD	None
81	2335.48	53.21	104.61	28.99	2114.11	485.64	-266.89	411.24	490.25	122.98	0.58	MWD	None
82	2364.40	53.21	104.10	28.92	2131.43	508.03	-272.63	433.68	512.25	122.16	0.43	MWD	None

83	2393.21	51.92	103.86	28.81	2148.94	530.10	-278.16	455.88	534.04	121.39	1.38	MWD	None
84	2422.27	52.23	104.37	29.06	2166.81	552.23	-283.75	478.11	555.97	120.69	0.53	MWD	None
85	2451.33	52.61	104.69	29.06	2184.53	574.52	-289.53	500.40	578.12	120.05	0.48	MWD	None
86	2480.33	52.86	105.28	29.00	2202.09	596.89	-295.49	522.70	600.44	119.48	0.56	MWD	None
87	2509.25	51.86	105.68	28.92	2219.75	619.14	-301.60	544.77	622.68	118.97	1.11	MWD	None
88	2538.42	52.71	106.56	29.17	2237.59	641.61	-308.01	566.93	645.20	118.52	1.15	MWD	None
89	2567.49	53.16	106.46	29.07	2255.11	664.24	-314.60	589.17	667.91	118.10	0.48	MWD	None
90	2596.48	52.44	107.42	28.99	2272.64	686.81	-321.33	611.26	690.58	117.73	1.10	MWD	None

Seq # -	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S- (m)	Displ +E/W- (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 100f)	Srvy tool type	Tool Corr (deg)
91	2623.96	51.70	107.50	27.48	2289.53	708.03	-327.83	631.94	711.91	117.42	0.82	MWD	None
92	2641.00	51.70	107.50	17.04	2300.10	721.13	-331.86	644.69	725.09	117.24	0.00	Projection to TD	

Company: **ESSO Australia Pty. Ltd.**

Schlumberger

Well: **BMB−B16**

Field: **Bream B**

Rig: **ENSCO 102** **8.5 in. Section**

State: **Victoria**

GeoVISION Density Neutron
1:200 Measured Depth
Recorded Mode Log