Schlumberger

Company: **ESSO Australia Pty Ltd**

8.5 in. Section

Well: **FTA A28B**

Field: **Fortescue**

Rig: **ISDL 175** State: **Victoria**

Rig: ISDL 175 Field: Fortescue Location: Bass Strait Well: FTA A28B Company: ESSO Australia Pty Ltd

VISION Service
1:200 Measured Depth
Recorded Mode Log

Location

		Elevation		
Total depth:	4028.0 m		K.B.	Top Drive
Spud date:	13−Apr−07		G.L.	−69.0 m
Runs:	2 To 2		D.F.	42.5 m

Permanent datum:	Mean Sea Level	Elev.:	0.0 m
Log measured from:	Drill Floor	42.5 m	above Perm. datum
Depth reference:	Driller's Depth		

Service Order No.	X = E 611600.97 m	Longitude	Latitude
07ASQ0014	Y = N 5748243.96 m	E 148º 16' 41.498''	S 38º 24' 25.477''

Depth logged:	1545.4 m To 4017.6 m	Mag decl:	13.21 deg.	Other services:	
Date logged:	19−Apr−07 To 25−Apr−07	Mag dip:	−68.87 deg.	See Remarks	

Bore hole record

Hole size	from	to
8.5 in.	1505.0 m	4028.0 m

Casing record

Size	Density	from	to
10.75 in.	40.5 lb/ft	20.5 m	1505.5 m

Mud record

Type	from	to
Accolade SBM	1505.0 m	4028.0 m

Borehole deviation record

Min	Max	from	to
62.19 deg.	64.06 deg.	1510.00 m	1623.06 m
53.66 deg.	59.71 deg.	1651.67 m	1765.83 m
54.04 deg.	59.17 deg.	1795.02 m	4028.00 m

Surface equipment

Unit	Esso Office Cabin
Depth system	PDA

Software record

IDEAL Wis	ID12_0c_09		
SPM	hspm12_0c_04		
LWD	See Remarks		
MWD	See Remarks		

Bit Run Summary

Run number		2
Bit size	in.	8.5
Bit start depth	m	1581.0
Bit end depth	m	4028.0
Top interval logged	m	1545.4
Bottom interval logged	m	4017.6
Begin log: time		17:13
Begin log: date		19−Apr−07
End log: time		02:55
End log: date		25−Apr−07
Mud data		
Depth	m	3943.0
Type		Accolade SBM
Mud weight	ppg	10.0
Solids	%	10.8
Chlorides	mg/L	64432
Rm	ohm.m@ºC	n/a
Rmf	ohm.m@ºC	n/a
Rmc	ohm.m@ºC	n/a

Potassium	%	n/a									
Environmental data											
GR											
Mud weight	ppg	10.0									
Bit size	in.	8.5									
Resistivity											
Neutron porosity											
Hole Size	in.	8.5									
Mud weight	ppg	10.0									
Temperature	ºC	101.0									
Mud salinity	ppk	64.4									
Formation salinity		n/a									
Recording rate 1	SEC	5s (ADN)									
Recording rate 2	SEC	6s (ARC)									
Filtering GR		3 pts									
Filtering density		3 pts									
Filtering Neutron		3 pts									
Company representative		G.Smith	R.Spence	M.Turner							
Schlumberger D&M Personnel		M.Y.Tan	M.Amarasena	A.Kohli	C.Soper	L.Muskett					

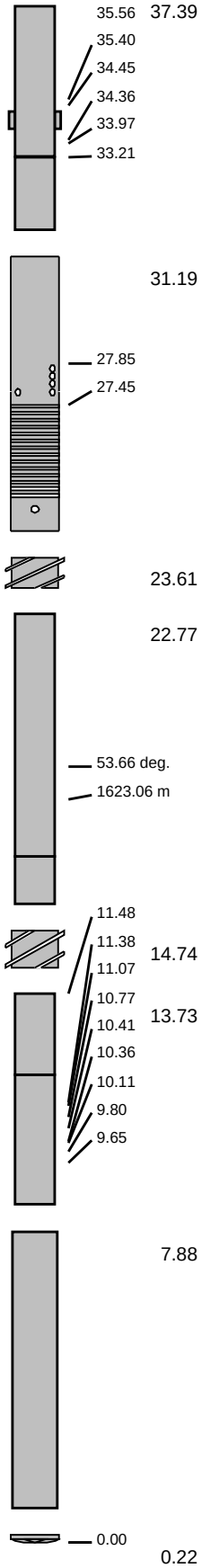
OTHER SERVICES FOR RUN 2	OTHER SERVICES FOR RUN	OTHER SERVICES FOR RUN
Directional Drilling Directional Surveys Annular Pressure & Temperature Shock & Vibrations		

REMARKS: RUN NUMBER 2	REMARKS: RUN NUMBER	REMARKS: RUN NUMBER
Gamma ray is corrected for mud weight, tool size and bit size. Resistivity is borehole compensated and environmentally corrected. Neutron Porosity is corrected for the effects of borehole size (bit size), temperature, mud salinity, and mud hydrogen index (a factor of mud weight, mud temperature and pressure). Neutron porosity is calculated using a limestone matrix density of 2.71 g/cm3. Delta−T is borehole compensated. sonicVISION* recorded mode data was acquired at 1s record rate while tripping out. POOH due to reaching TD of FTA A28B.		

EQUIPMENT DESCRIPTION

RUN 2	RUN	RUN

DOWNHOLE EQUIPMENT



6−3/4'' adnVISION* 37.39
DHS: V8.3A02
Blade OD: 8−1/4''
S/N: AD41

6−3/4'' sonicVISION* 31.19
DHS: V6.6b04
S/N: 42256

8−3/8'' ILS 23.61
S/N: OSS061160

6−3/4'' TeleScope* 22.77
MDC: FA27
MEC: 280
MDI: 2102
MVC: 114

D&I 53.66 deg.
MVC 1623.06 m

8−3/8'' ILS 14.74
S/N: OSS070113

6−3/4'' arcVISION* 13.73
DHS: V9.3b13
S/N: 1191

6−3/4'' PowerDrive Xceed* 7.88
S/N: 162

8−1/2'' Reed−Hycalog PDC Bit 0.22
S/N: 214577

Maximum string diameter 8−1/2 in.

All lengths in Meters

Variable Name	Variable Description	Run Name & Value
Run Number		2
General Information		
BHT_RM	Bottom Hole Temperature (RM)	100.999999
BSAL_RM	Mud Salinity (RM)	64.432945
BS_RM	Bit Size (RM)	8.500000
COEF_M	User Defined FEXP in Clean Sand	1.650000
C_WS	Overpressure correction to Sw and M	1.000000
FEXP	Formation Factor Exponent(RM)	2.000000
FNUM	Formation Factor Enumerator(RM)	1.000000
FPHI_RM	Formation Factor Porosity Source (RM)	XPLOT
MST_RM	Mud Sample temperature (RM)	75.000000
MW_RM	Mud Weight (RM)	10.000000
OBMF_RM	Oil Based Mud (RM)	YES
RHOF_RM	Mud Filtrate Density (RM)	1.000000
RHOM_RM	Matrix density (RM)	2.710000
RMS_RM	Resistivity of Mud Sample (RM)	1000.000000
RWA_COMP_M	Rwa computation model	BASIC
RWA_DEN_AD	Rwa Density Input ADN	ROBB
RWA_DEN_CD	Rwa Density Input CDN	RHOB
RWA_DEN_IN	Rwa Density Input	ROBB
RWA_FORM_M	Rwa computation formation model	CLASTIC
RWA_RES_IN	Rwa computation resistivity input	P34H
RWS_RM	Resistivity of Connate Water (RM)	1.000000
SHT_RM	Surface Hole Temperature (RM)	10.000000
TD_RM	Total Measured Depth (RM)	4028.000000
TWS_RM	Temperature of Connate Water (RM)	75.000000
VF_ILLI	Fraction of illite in shales	0.500000
VF_KAOL	Fraction of kaolinite in shales	0.500000
VF_MONT	Fraction of montmorillonite in shales	0.000000
XPDM_RM	Cross plot density porosity multiplier	0.675000
XPNM_RM	Cross plot neutron porosity multiplier	0.325000
ARC		
LWD_RM/STATION_FILE/PARAMETERStation	Time-frame file name	Station
A12A	ARC Air Cal Attenuation From T1 at 2 MHz	8.454500
A14A	ARC Air Cal Attenuation From T1 at 400 KHz	8.429340
A22A	ARC Air Cal Attenuation From T2 at 2 MHz	6.486760
A24A	ARC Air Cal Attenuation From T2 at 400 KHz	6.520790
A32A	ARC Air Cal Attenuation From T3 at 2 MHz	5.081880
A34A	ARC Air Cal Attenuation From T3 at 400 KHz	5.049710
A42A	**ARC Air Cal Attenuation From T4 at 2 MHz**	**4.393790**
A44A	**ARC Air Cal Attenuation From T4 at 400 KHz**	**4.422380**
A52A	ARC Air Cal Attenuation From T5 at 2 MHz	3.632990
A54A	ARC Air Cal Attenuation From T5 at 400 KHz	3.610050
ABNT	Abnormal Transmitter Indicator	No_Tx_Failed
ADHS	ARC Down Hole Software Version	No_Tx_Failed
ANISO_COMP	Anisotropy Computation Option	YES
APICG	ARC5 Gamma Ray Gain Factor	1.063480
APIG	ARC Gamma Ray API Gain Factor	-1.000000
ATMP_ARC	ARC Select Temperature Channel	Annulus_Temp
ATRN	ARC Tool Run Number	2
ATSN	ARC Tool Serial Number	Annulus_Temp
AZMF	Formation DIP Azimuth	0.000000
BH_COMPUTE	Borehole Inversion Computation Option	YES
CALG	ARC Gamma Ray Cal Gain Factor	1.063480
CALI_SLCT_	ARC Caliper Selection	BITSIZE
CDPTH_ARC	Process Start Depth	100.000000
DIELEC_COM	Dielectric Computation Option	YES
DIPF	Formation DIP Angle	0.000000
ERRCT	Percentage Error Cutoff	4.500000
GRSH	GR Shale (Invasion Computation Cutoff)	1000.000000
HIGH_BLEND	High Resistivity Threshold for Blending	2.000000
INCLIN_B0	ARC Bias Constant (mg)	0.000000
INCLIN_B1	ARC Bias First-order Coefficient (mg/degC)	0.000000
INCLIN_B2	ARC Bias Secod-order Coeeficient (mg/degC)	0.000000
INCLIN_B3	ARC Bias Third-order Coeeficient (mg/degC)	0.000000
INCLIN_C0	ARC Current Scale Factor Constant (mA/g)	1.000000
INCLIN_C1	ARC Scale First-order Coeeficient (mA/g/degC)	0.000000
INCLIN_C2	ARC Scale Second-order Coeeficient (mA/g/degC)	0.000000
INCLIN_C3	ARC Scale Third-order Coeeficient (mA/g/degC)	0.000000
INVAS_COMP	Invasion Computation Option	YES
JSD_ARC	ARC Acquisition start date	YES
KPER	Potassium Concentration (RM)	0.000000
LOW_BLEND	Low Resistivity Threshold for Blending	1.000000
MSWS	ARC Wizard Model Switch Window	5.000000
MULTIEFFEC	Multi Effect Option	YES
P12A	ARC Air Cal Phase-Shift From T1 at 2 MHz	1.807390
P14A	ARC Air Cal Phase-Shift From T1 at 400 KHz	-0.316562
P22A	ARC Air Cal Phase-Shift From T2 at 2 MHz	-1.724300
P24A	ARC Air Cal Phase-Shift From T2 at 400 KHz	0.225322
P32A	ARC Air Cal Phase-Shift From T3 at 2 MHz	1.742660
P34A	ARC Air Cal Phase-Shift From T3 at 400 KHz	-0.284950
P42A	ARC Air Cal Phase-Shift From T4 at 2 MHz	-1.764980
P44A	ARC Air Cal Phase-Shift From T4 at 400 KHz	0.212175
P52A	ARC Air Cal Phase-Shift From T5 at 2 MHz	1.721960
P54A	ARC Air Cal Phase-Shift From T5 at 400 KHz	-0.301446
POFFSET_AR	ARC: Pressure Offset	0.000000
PRTD	Preferred Resistivity Log for Rt Display while Multi-Effects	P34B
PSOF_ADJ_T	ARC: User Input Phase offset	0.000000

RESTIK	ARC resistivity tick source	Phase
SHIG	ARC High Shock Risk Level	0.500000
SHT_RM	Ground Level Temperature (Mud-Line When Offshore) (RM)	50.000000
SMED	ARC Medium Shock Risk Level	0.330000
SMIN	ARC Minimum Shock Risk Level	0.160000
SUPD	ARC Real Time Shock Update Rate	30.000000
TCODE_ARC	ARC Tool File Code	30.000000
TSIZ_ARC	ARC Tool Size	6.750000
UNIFORM_CO	Uniform Rock Option	YES
VERS_ARC	ARC Down hole software version Number	9.300000
WRK	Way to Report Potassium Concentration (RM)	K_by_Wgt_%

ISONIC

FP_SD	First Sample delay	400.00
STC_CF	Center frequency of Filter	13.00
STC_BW	Bandwidth (kHz)	6.25 kHz
STC_RWI	Receiver waveform ignored	None
PM_TOFF	Tool Time offset from surface system	0.00
DT_COH	Delta-T Coherence Cutoff Value	0.70
PPC_PF	Porosity Formula	Raymer-Hunt
PPC_PS	Sonic Porosity Source	DTRA
PPC_MDT	Matrix Delta-T	47.60
PPC_FDT	Fluid Delta-T	189.00

ADN

ADN_CHASSI	ADN Chassis Type String	ADN
ADN_COLLAR	ADN Collar Type String	ADN
ADN_STAB_S	ADN Stabilizer Type String	ADN
ALPHA_COMP	Perform Density Enhanced Vertical Resolution process ?	YES
ALPHA_COMP	Perform Neutron Enhanced Vertical Resolution process ?	YES
AVE_ADN	ADN/Array Channels: perform averaging(RM) :	YES
A_DHS	ADN Down Hole Software Version String	YES
CHI_RM	Caliper High limit from BS (RM)	3.000000
CLO_RM	Caliper Low limit from BS (RM)	0.000000
DEVI	Well Section Deviation	52.294998
DTIK_SEL	ADN: Density Tick Channel Name	LSAZ
DTMUD	Delta-T for Mud	220.610001
DYN_IMG_CO	Generate Dynamic Normalized Image?	YES
ECC_CORR_A	Perform Eccentering Correction for TNPH?	YES
ENVCOR	Neutron Quadrant Processing: Environmental Correction?	YES
EVRL	EVR Process averaging number of samples (RM)	49
FCD	Future Casing (Outer) Diameter	7.000000
GCSE	Generalized Caliper Selection	BS
HPS	ADSE-EB (High Pressure Inconel Chassis)?	NO
IBS	Intergal Blade Stabilizer Collar?	YES
IDQT	Image Derived Quality Threshold	1.000000
IHVS	Integrated Hole Volume Start Value(RM)	0.000000
IMAGE_MAX_	**Image SOA (Quadrant) Right Scale**	**2.500000**
IMAGE_MAX_	**Image PEF(Segment) Right Scale**	**6.000000**
IMAGE_MAX_	Image RHOB(Segment) Right Scale	2.650000
IMAGE_MIN_	Image SOA (Quadrant) Left Scale	0.000000
IMAGE_MIN_	Image PEF(Segment) Left Scale	2.000000
IMAGE_MIN_	Image RHOB(Segment) Left Scale	2.050000
JSD_ADN	ADN Acquisition start date	2.050000
LITHO_TYPE	Lithology (RM)	LIME
N1FTU_6_RM	ADN: Neutron Bank 1 Far Tubes used :	1-2-3
N2FTU_6_RM	ADN: Neutron Bank 2 Far Tubes used :	1-2-3
NNTU_RM	ADN Neutron Near Banks Used	1-2
NTIK_SEL	ADN: Neutron Tick Channel Name	FR11
SOCNL	Standoff Distance of the CNL Tool	1.000000
SSIZ_ADN	ADN Stabilizer Size	8.250000
STOH	ADN Density Top of Hole Sector (Left Boundary):	SECTOR_0
TRPM_RM	Average Tool Rotational Speed	20.000000
USMIN_RM	ADN:Minimum Ultrasonic standoff (RM)	0.180000
USWF_RM	ADN:Process Ultrasonic Waveform?	YES
VERS_ADN	ADN Downhole Software Version	8.300000
WSDI	Window Size of Dynamic Normalization Image	15.000000

IDEAL Version: ID12_0C_09

IDF

ADN **id12_0c_01**

Format: VISION Service RM Log **Vertical Scale: 1:200** **Graphics File Created: 27-Apr-2007 16:09**

PIP SUMMARY

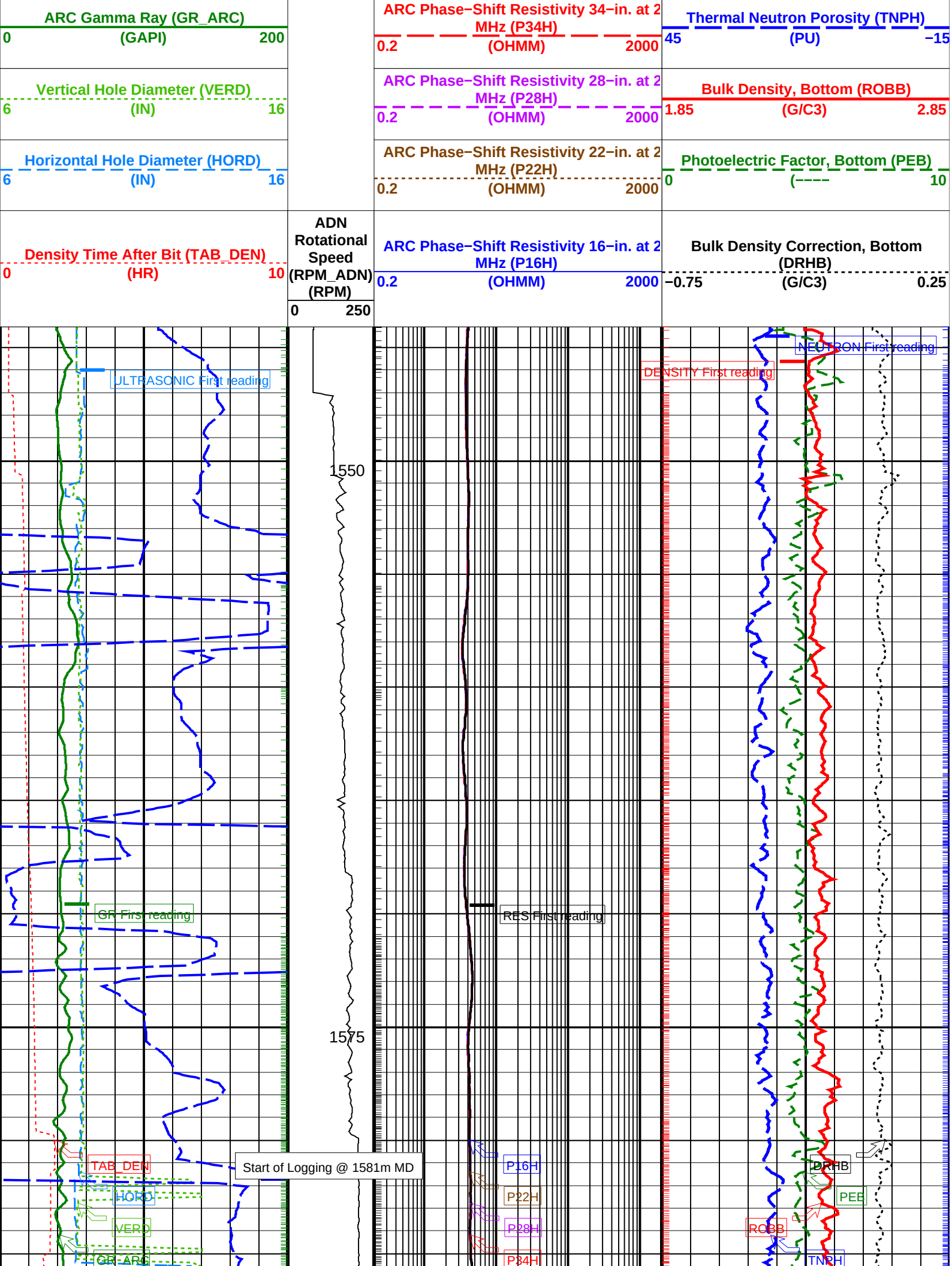
Density Samples ⊢

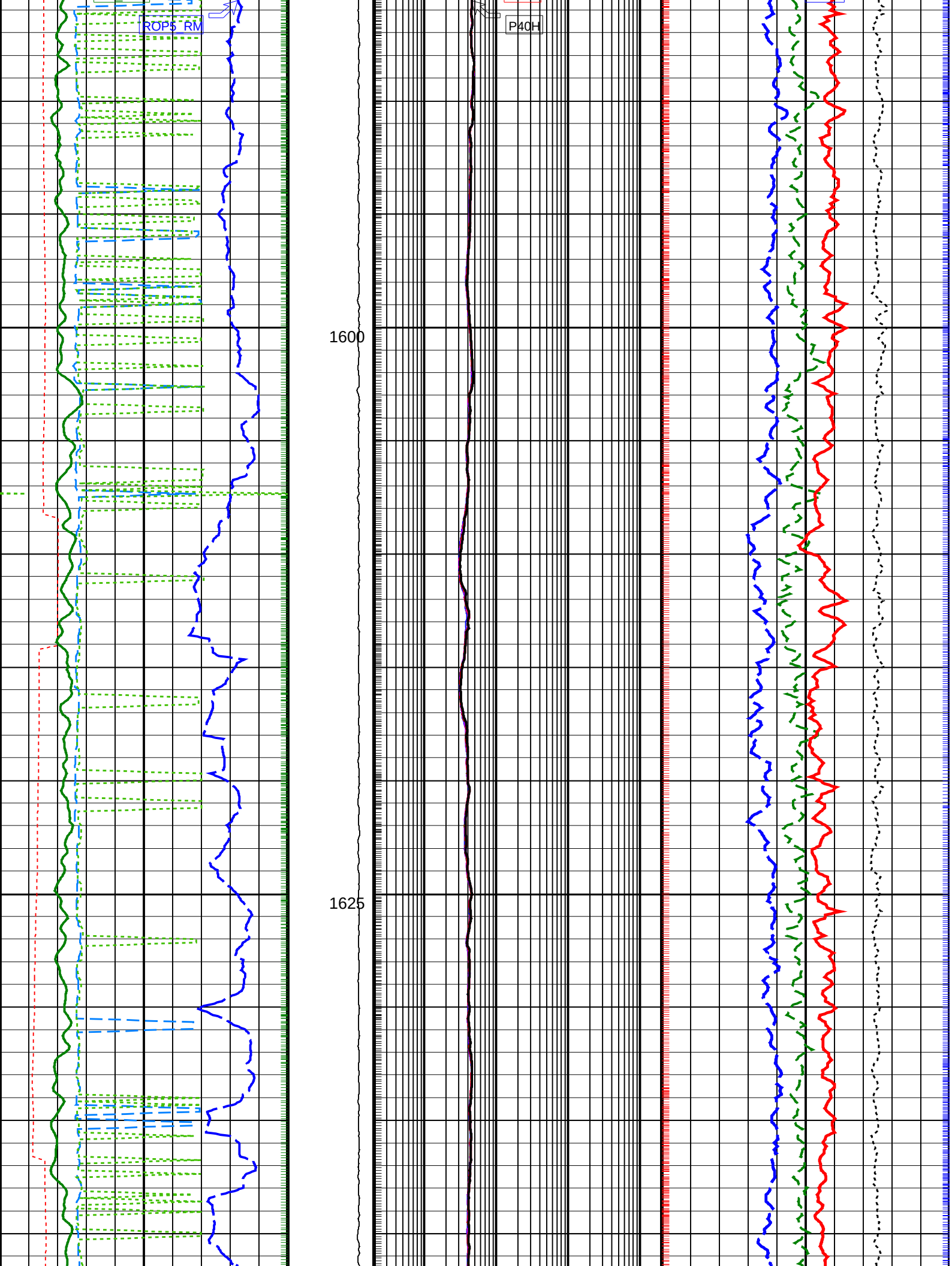
Neutron Samples ⊣

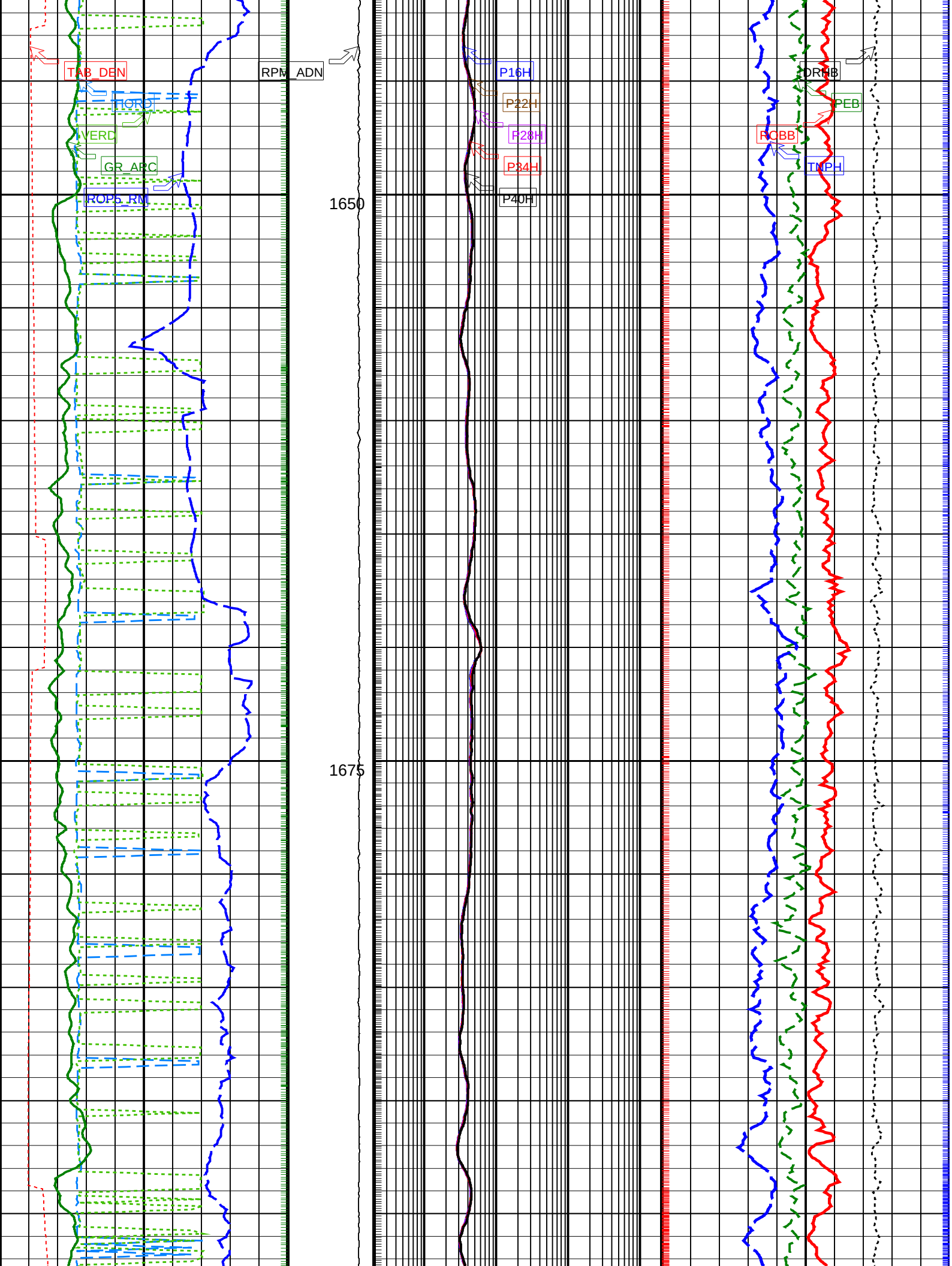
⊣ **ARC Gamma Ray Samples**

⊢ **ARC Resistivity Samples**

Rate of Penetration, Averaged over Last 5ft (ROP5_RM)			ARC Phase-Shift Resistivity 40-in. at 2 MHz (P40H)		
200	(M/HR)	0	0.2	(OHMM)	2000


ARC Gamma Ray (GR_ARC)
0
(GAPI)
200
Vertical Hole Diameter (VERD)
6
(IN)
16
Horizontal Hole Diameter (HORD)
6
(IN)
16
Density Time After Bit (TAB_DEN)
0
(HR)
10
ARC Phase−Shift Resistivity 34−in. at 2 MHz (P34H)
0.2
(OHMM)
2000
ARC Phase−Shift Resistivity 28−in. at 2 MHz (P28H)
0.2
(OHMM)
2000
ARC Phase−Shift Resistivity 22−in. at 2 MHz (P22H)
0.2
(OHMM)
2000
ADN Rotational Speed (RPM_ADN) (RPM)
0
250
ARC Phase−Shift Resistivity 16−in. at 2 MHz (P16H)
0.2
(OHMM)
2000
Thermal Neutron Porosity (TNPH)
45
(PU)
−15
Bulk Density, Bottom (ROBB)
1.85
(G/C3)
2.85
Photoelectric Factor, Bottom (PEB)
0
(−−−−
10
Bulk Density Correction, Bottom (DRHB)
−0.75
(G/C3)
0.25
ULTRASONIC First reading
GR First reading
RES First reading
DENSITY First reading
NEUTRON First reading
1550
1575
Start of Logging @ 1581m MD
TAB_DEN
HORD
VERD
GR_ARC
P16H
P22H
P28H
P34H
DRHB
PEB
ROBB
TNPH


ROP5_RM
P40H
1600
1625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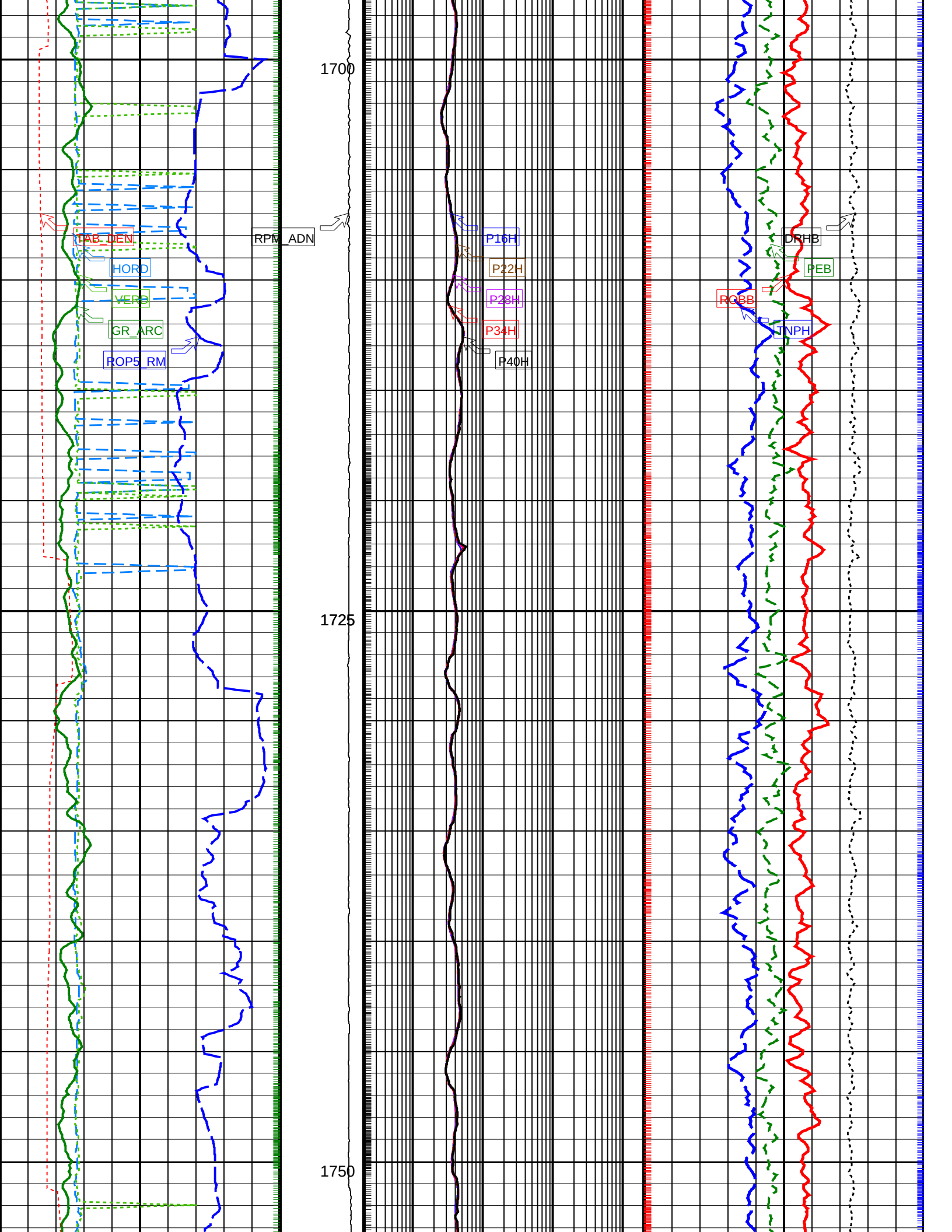
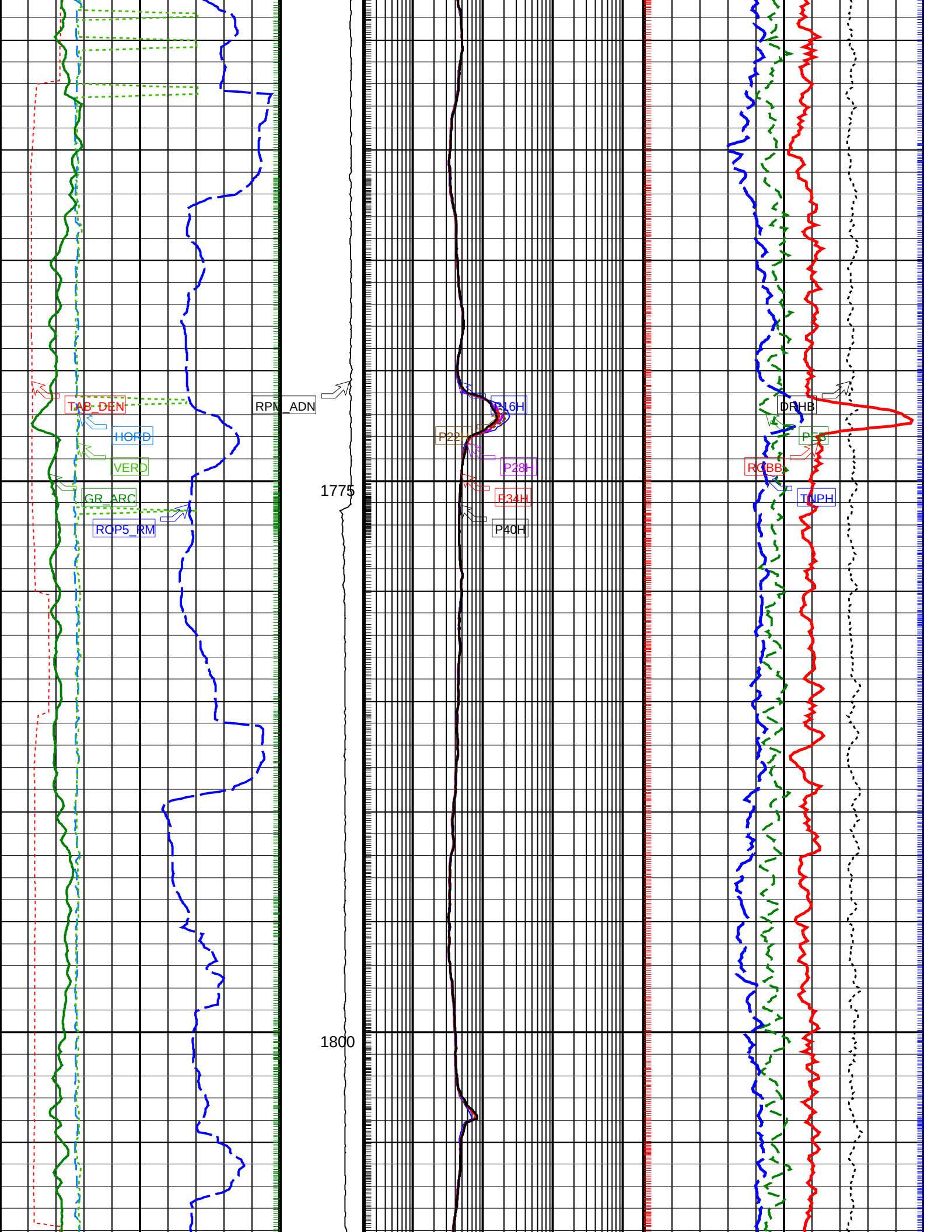
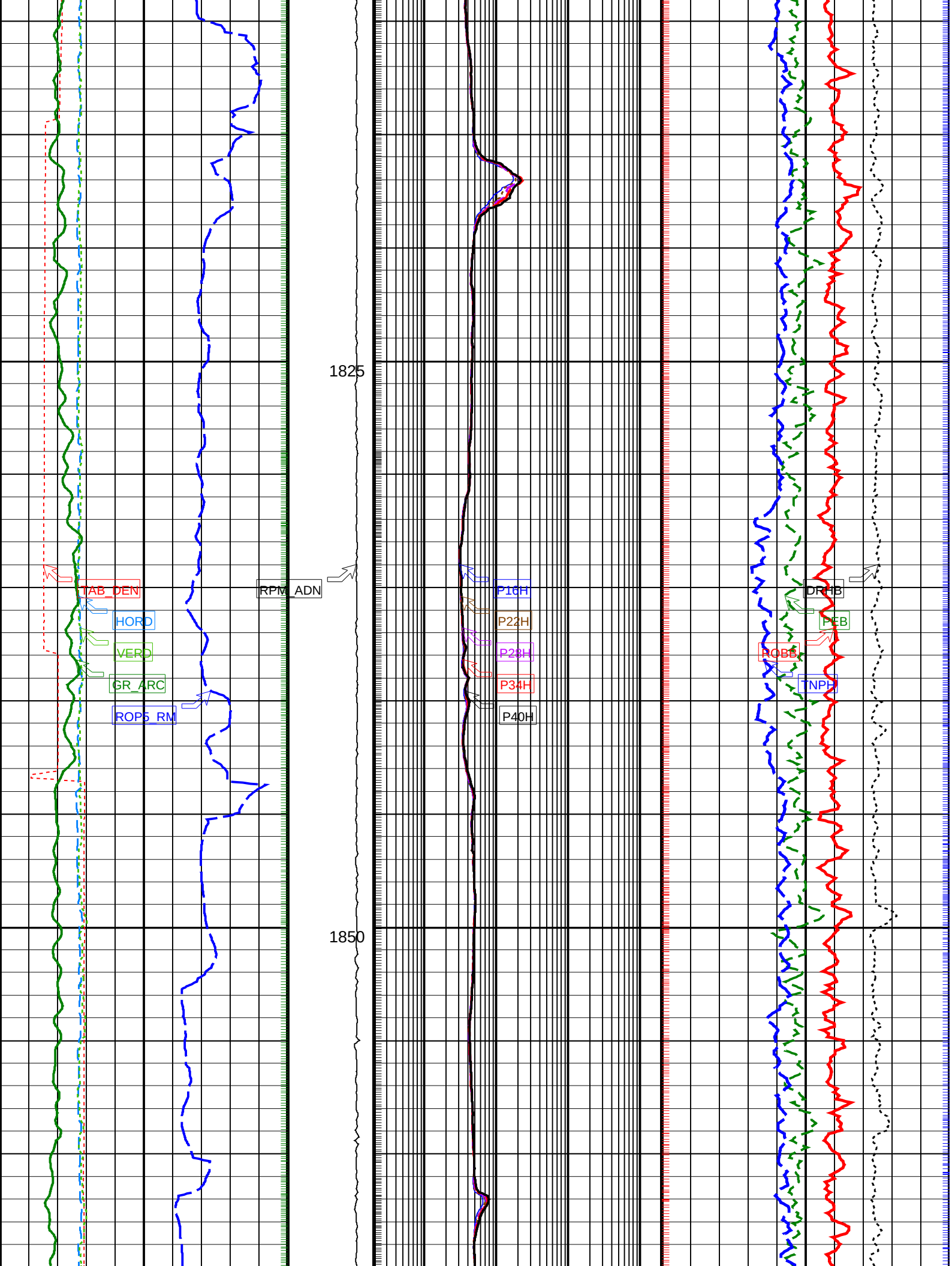
RPM_ADN
P16H
DRHB
TIORD
P22H
PEB
VERD
P28H
RHOBB
GR_ARC
P34H
TNPH
TROP5_RM
P40H
1650
1675


1700
1725
1750
TAB_DEN
HORD
VERD
GR_ARC
ROP5_RM
RPM_ADN
P16H
P22H
P28H
P34H
P40H
DRHB
PEB
RQBB
TNPH


TAB_DEN
HORD
VERD
GR_ARC
ROP5_RM
RPM_ADN
P16H
P22H
P28H
P34H
P40H
DRHB
PEB
RHOB
TNPH
1775
1800


1825
1850
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VERD
GR_ARC
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RPM_ADN
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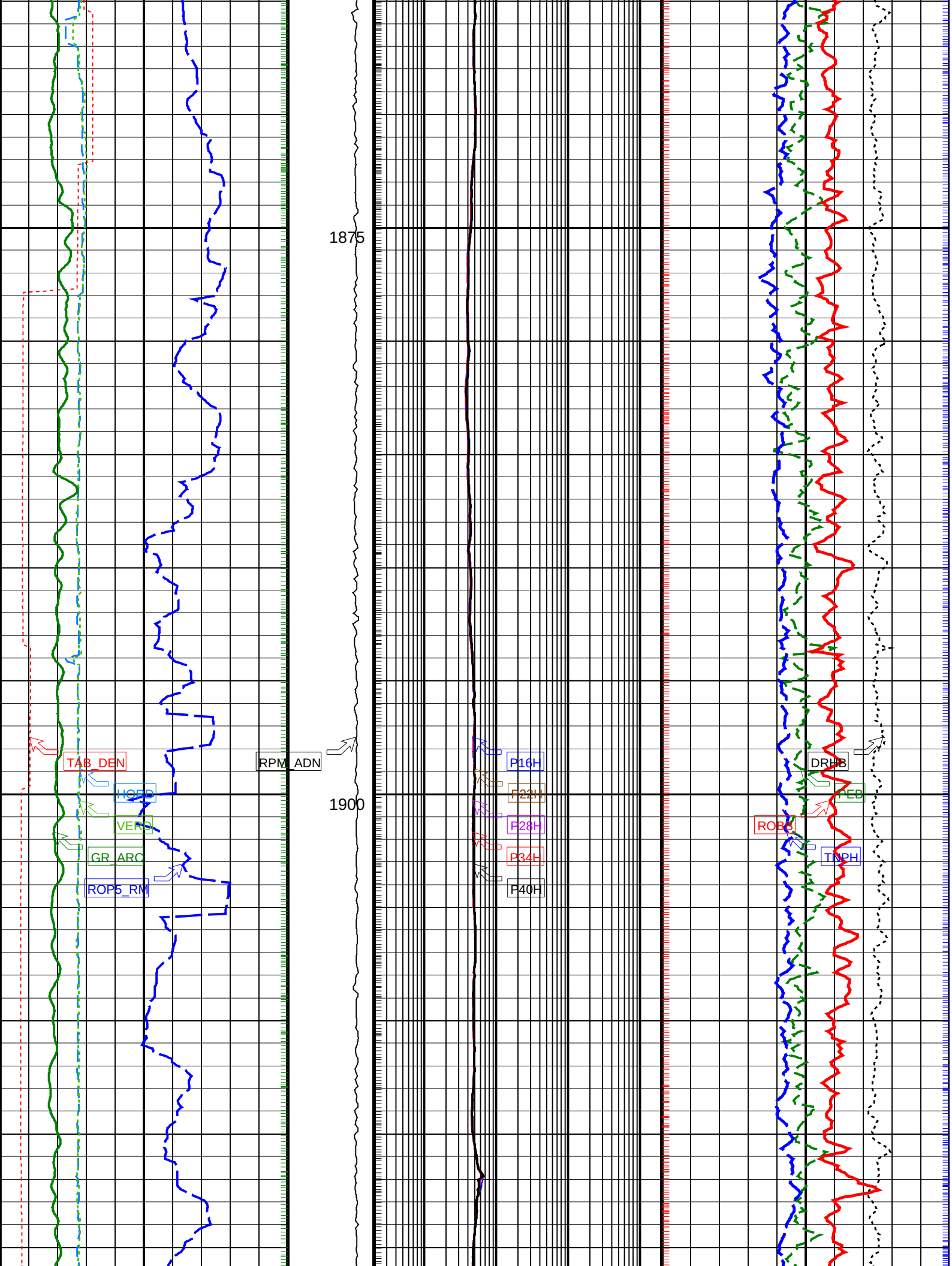
P22H
P28H
P34H
P40H
DRHB
PEB
ROBB
TNPH


1875
1900
TAB_DEN
HORD
VERD
GR_ARC
ROP5_RM
RPM_ADN
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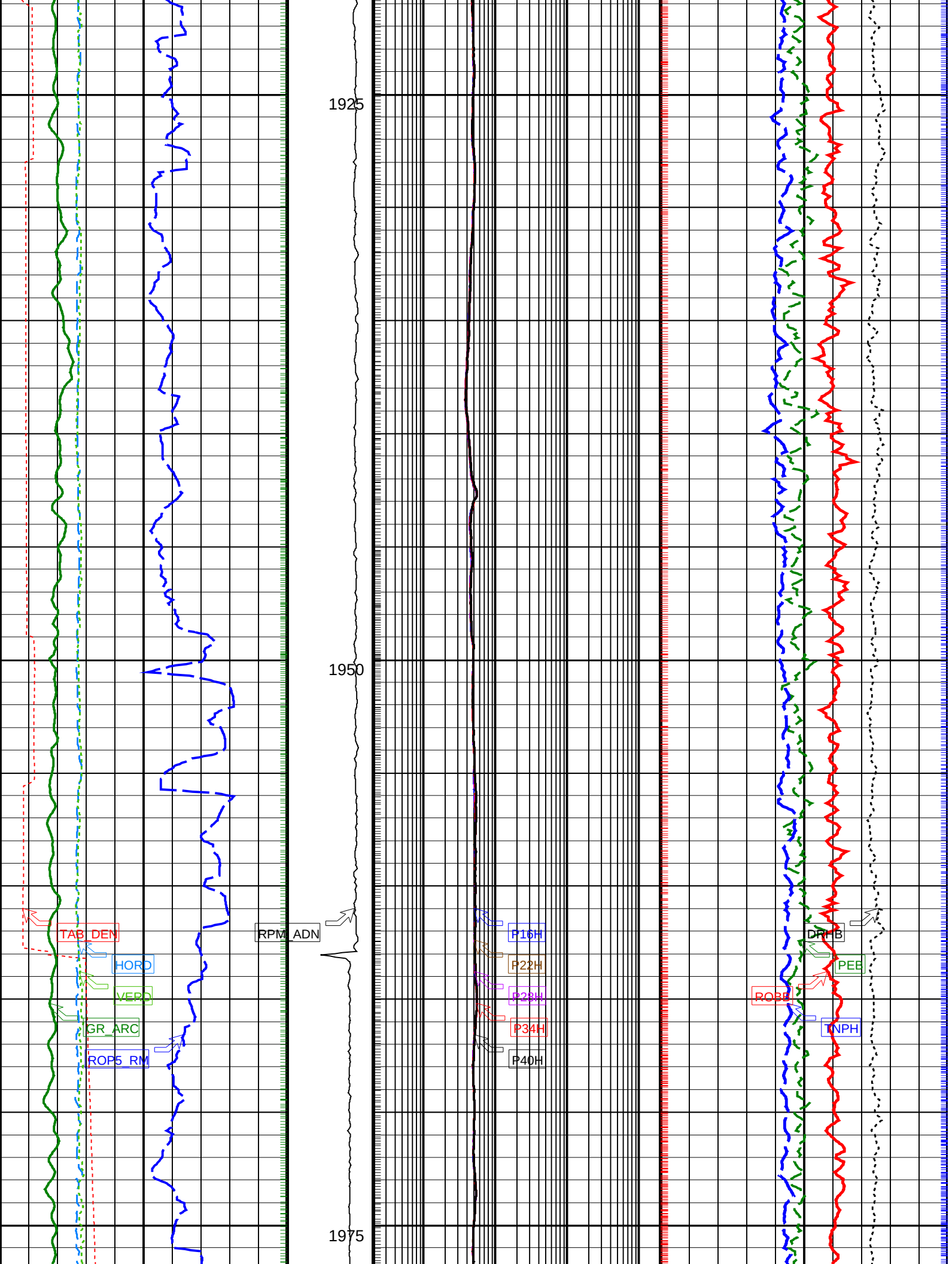
P22H
P28H
P34H
P40H
DRHB
PEB
ROPB
TNPH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1950
1975
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VERD
GR_ARC
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RPM_ADN
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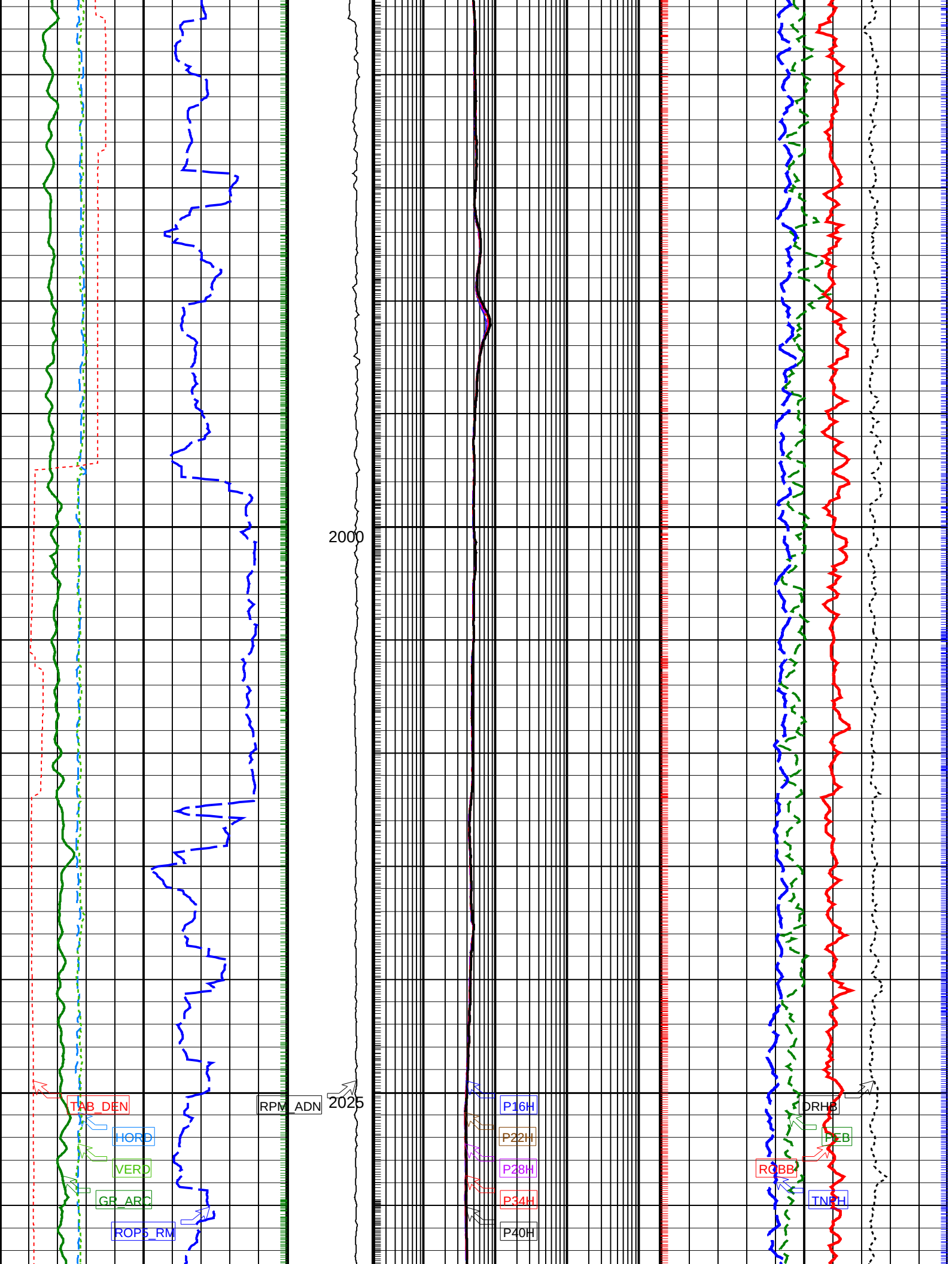
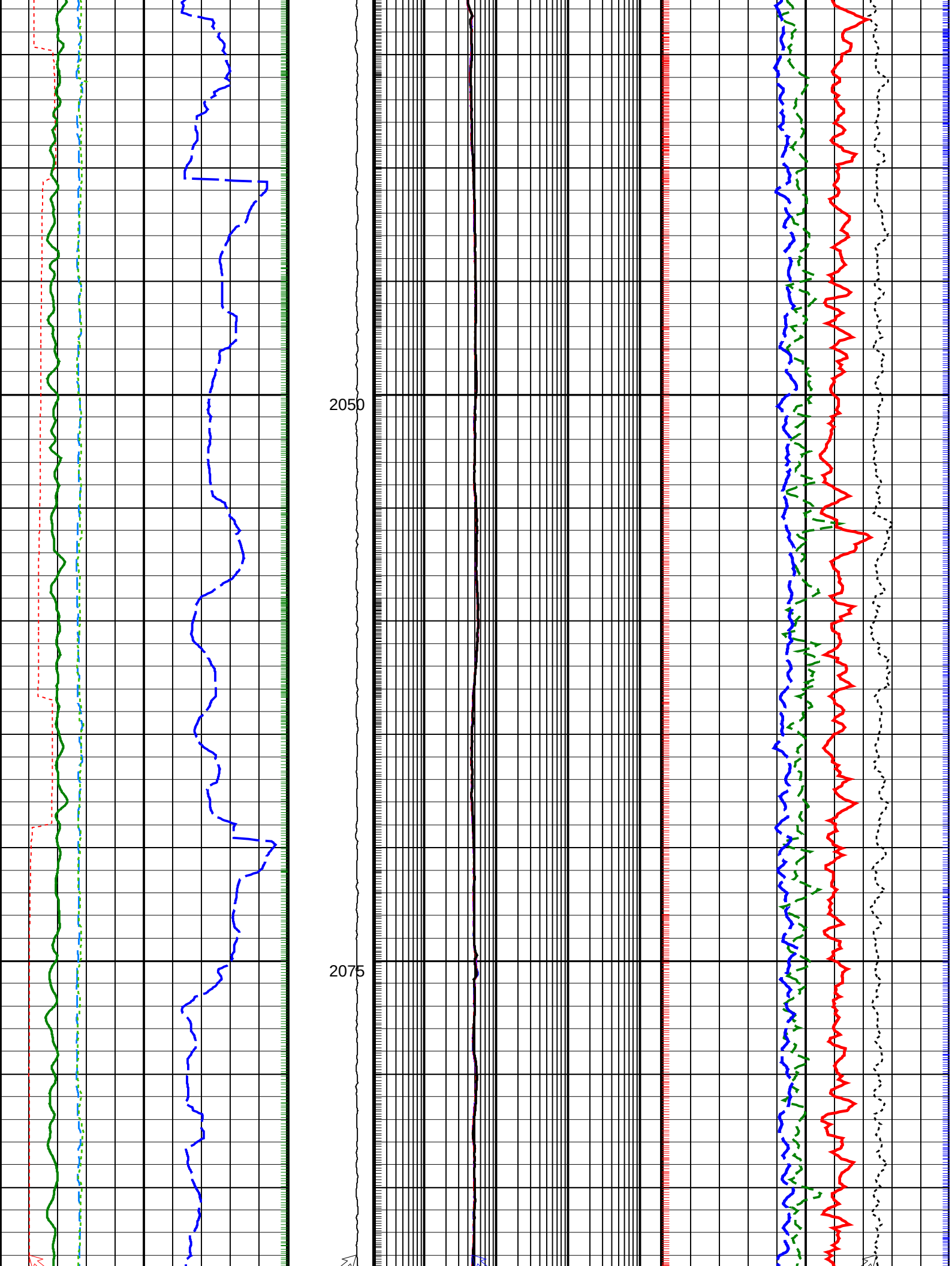
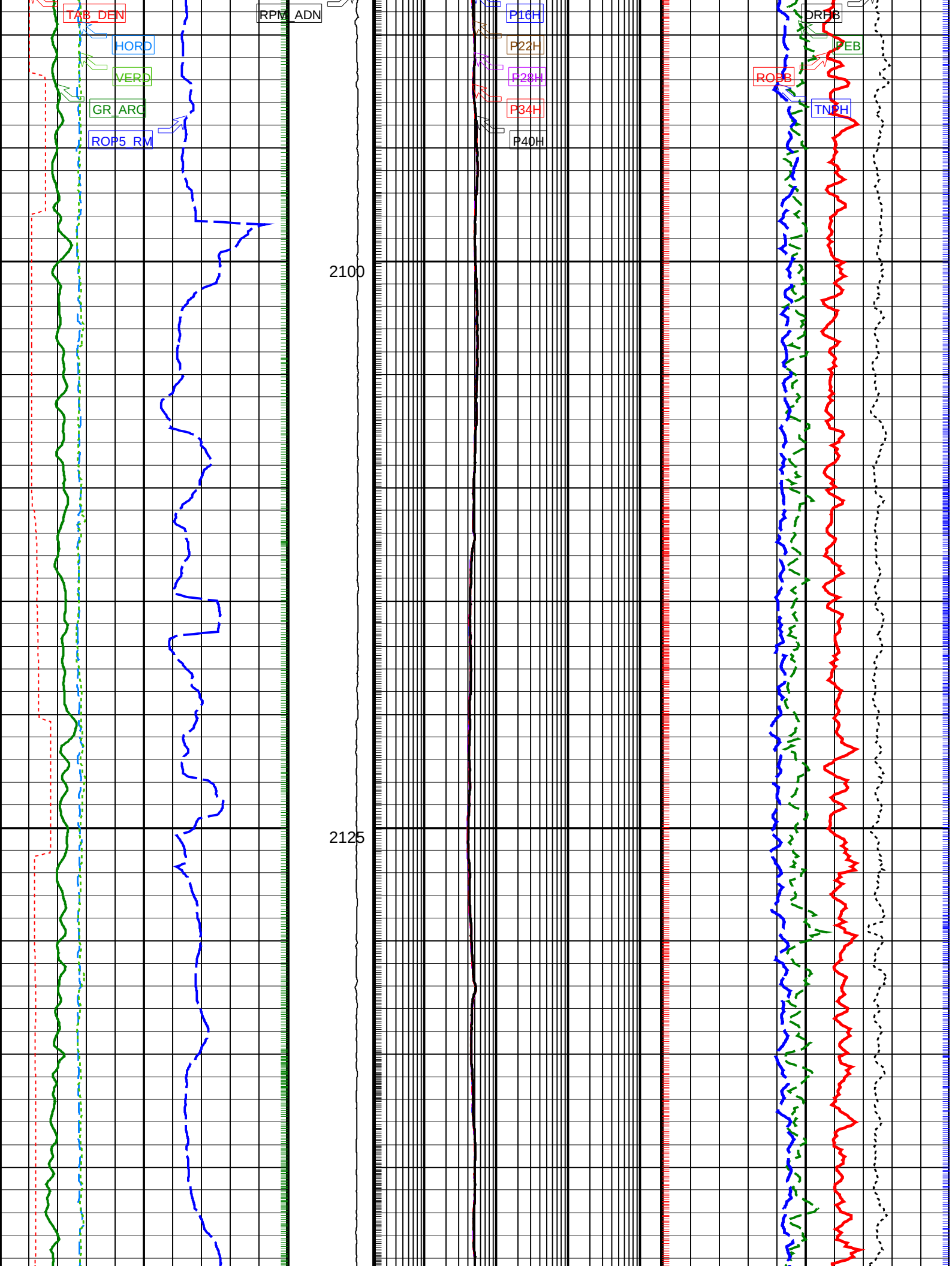
P22H
P28H
P34H
P40H
DRHB
PEB
ROBB
TNPH


2000
2025
TAB_DEN
HORD
VERD
GR_ARC
ROP5_RM
RPM_ADN
P16H
P22H
P28H
P34H
P40H
ORHB
PEB
RGBB
TNPH


2050
2075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HORD
VERD
GR_ARC
ROP5_RM
P16H
P22H
P28H
P34H
P40H
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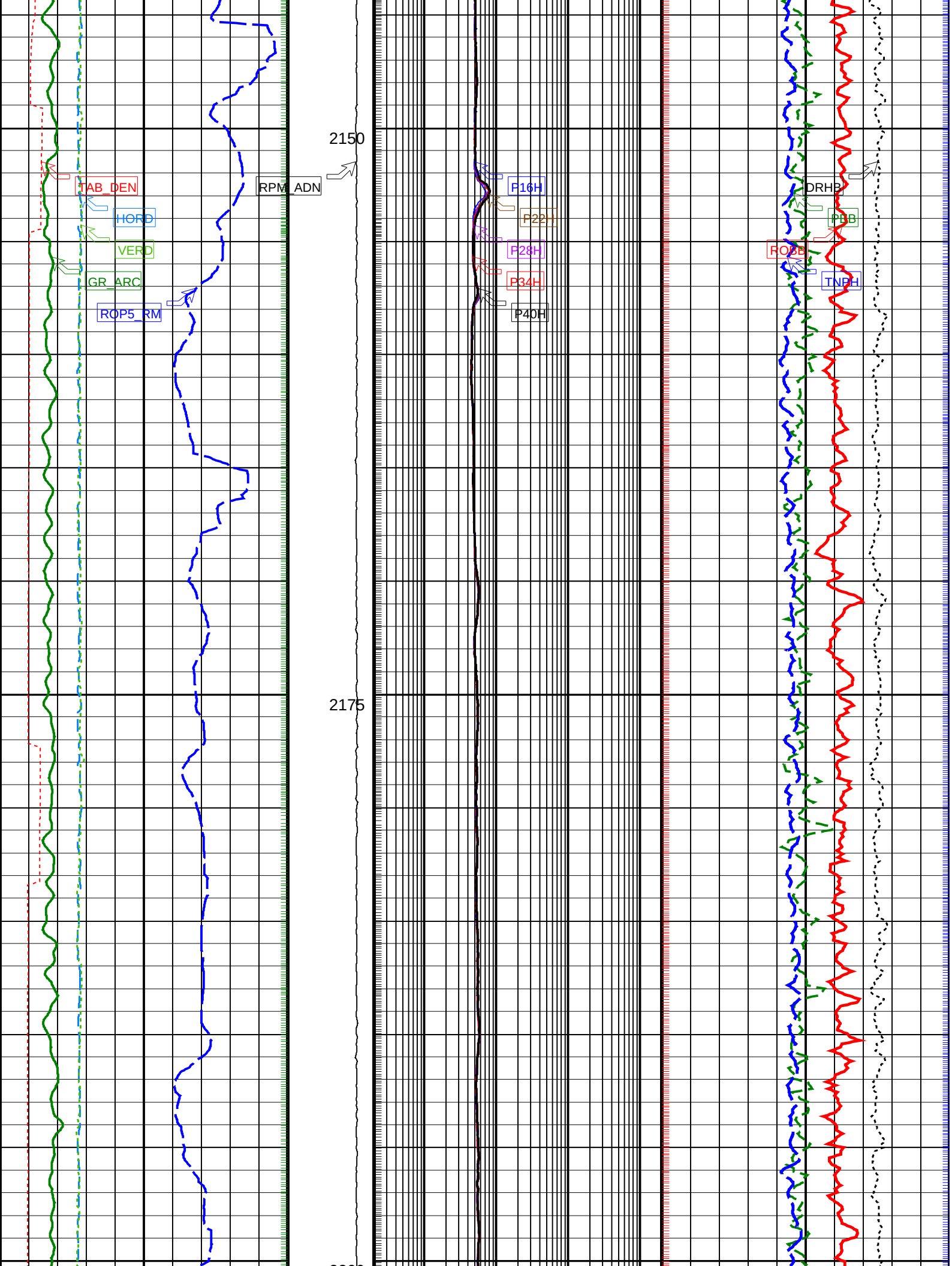
PEB
ROPB
TNPH
2100
2125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2175
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VERD
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RPM_ADN
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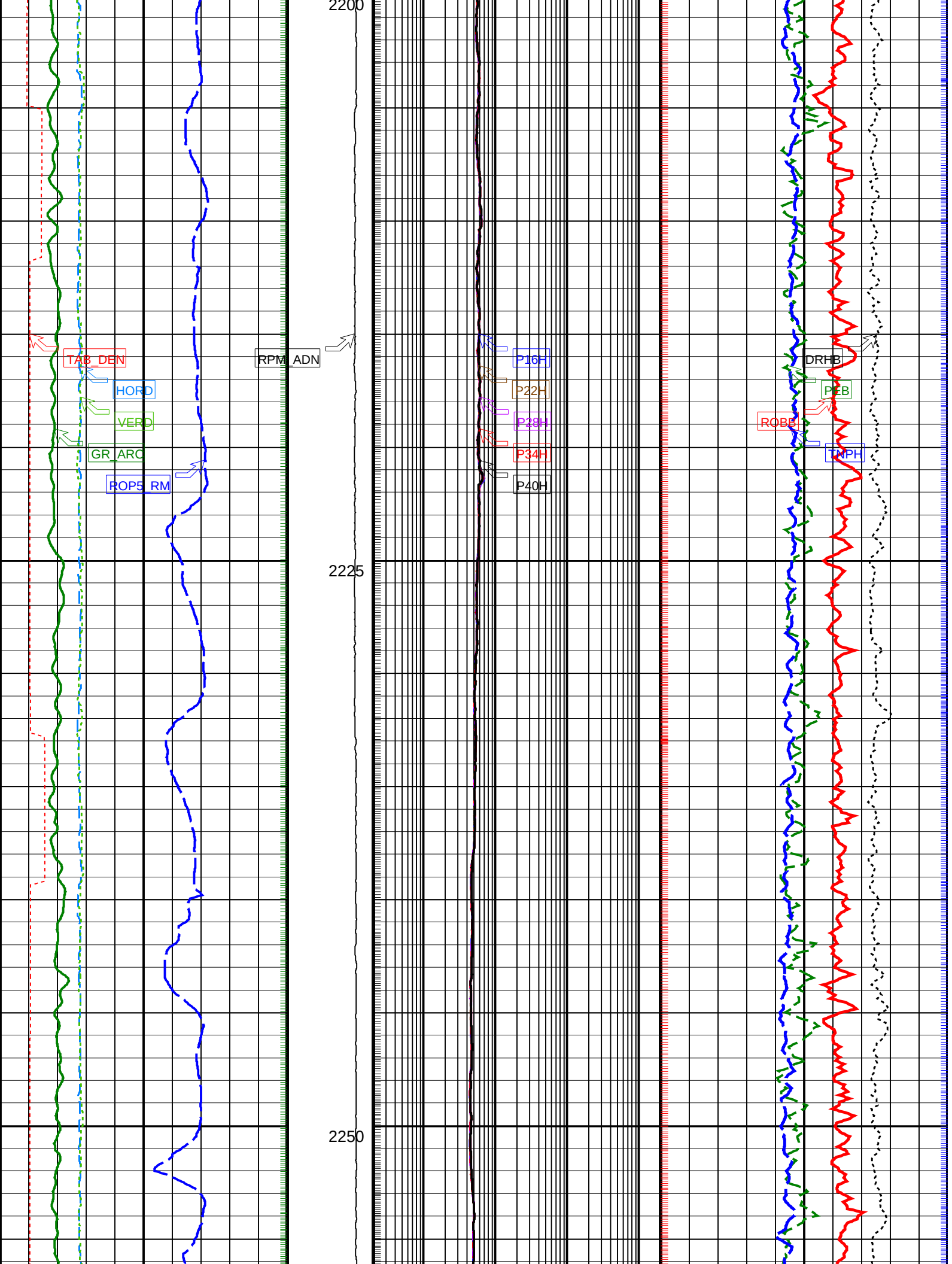
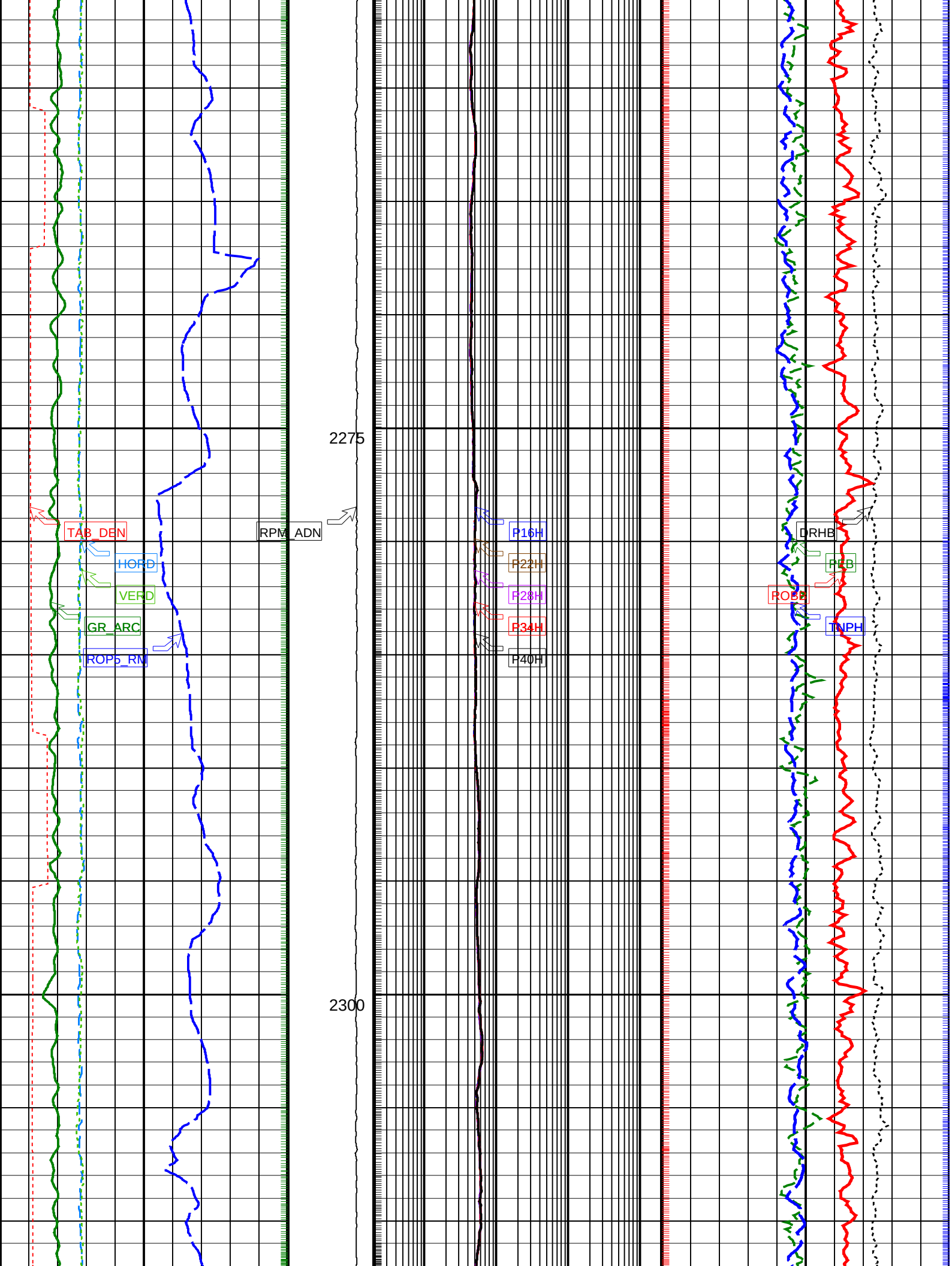
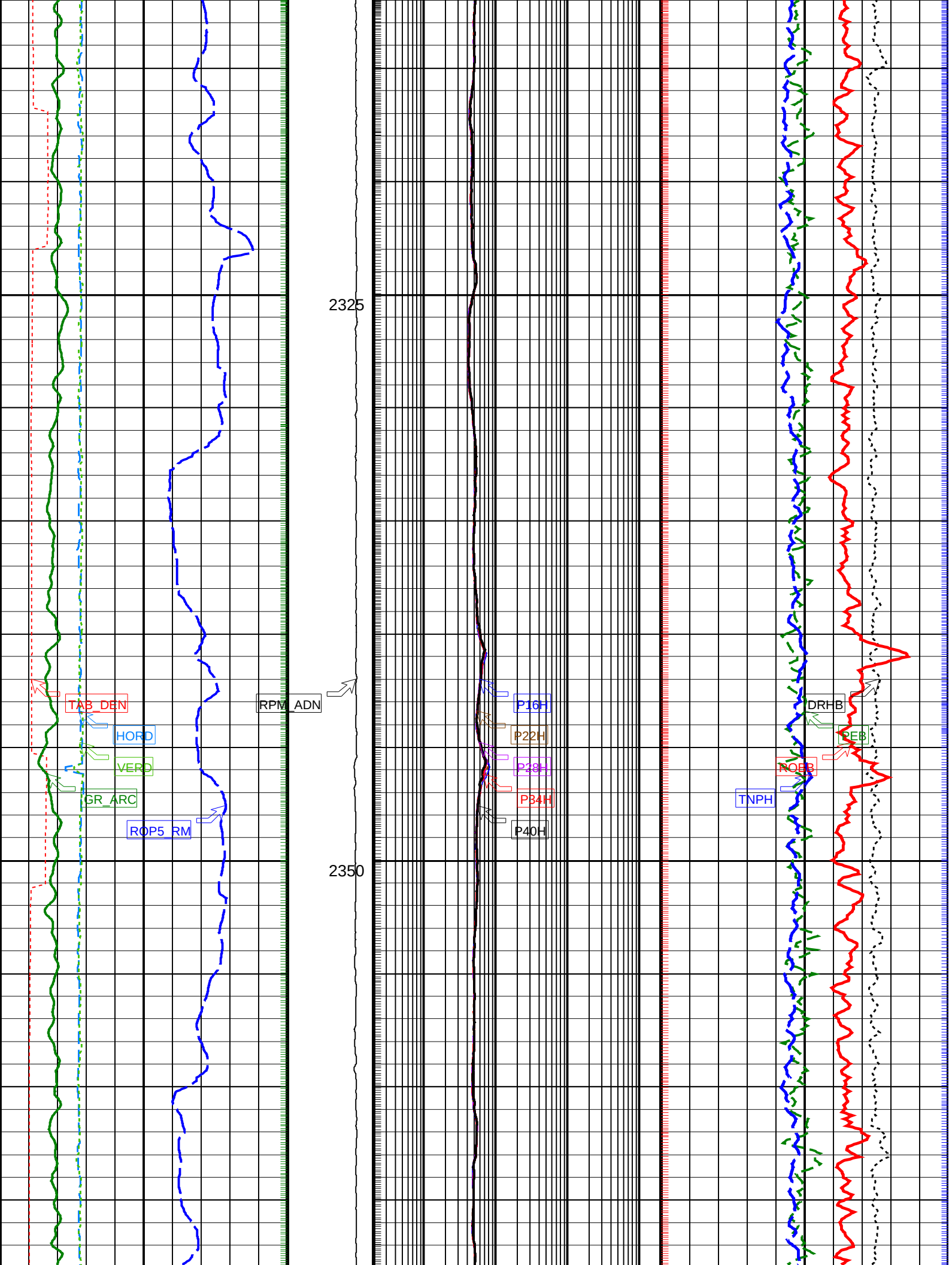
P22H
P28H
P34H
P40H
DRHB
PEB
ROPB
TNPH


2200
TAB_DEN
HORD
VERD
GR_ARC
ROP5_RM
RPM_ADN
P16H
P22H
P28H
P34H
P40H
DRHB
PEB
ROBB
TNPH
2225
2250


2275
2300
TAB_DEN
HORD
VERD
GR_ARC
ROP5_RM
RPM_ADN
P16H
P22H
P28H
P34H
P40H
DRHB
PEB
ROBB
TNPH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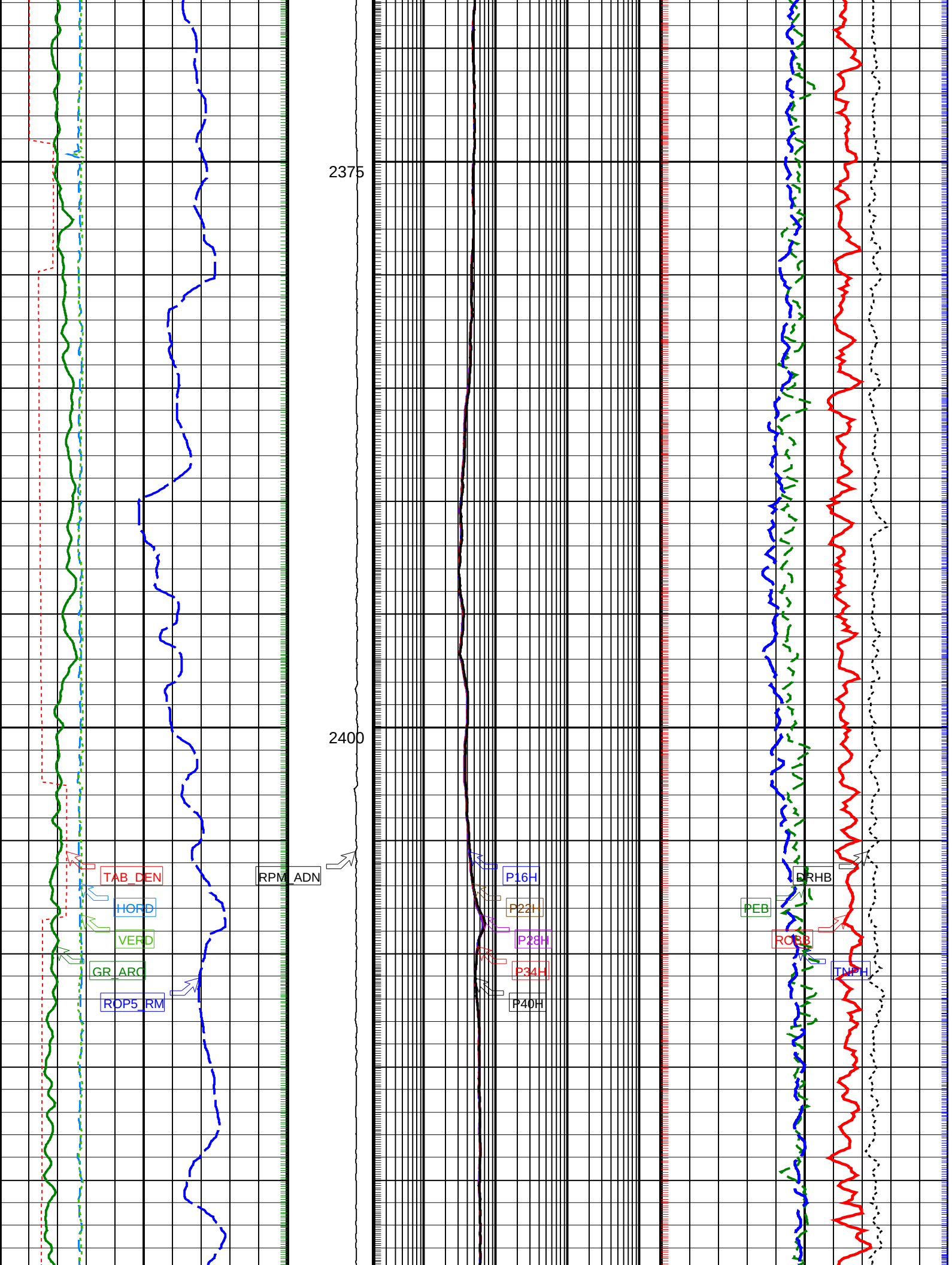
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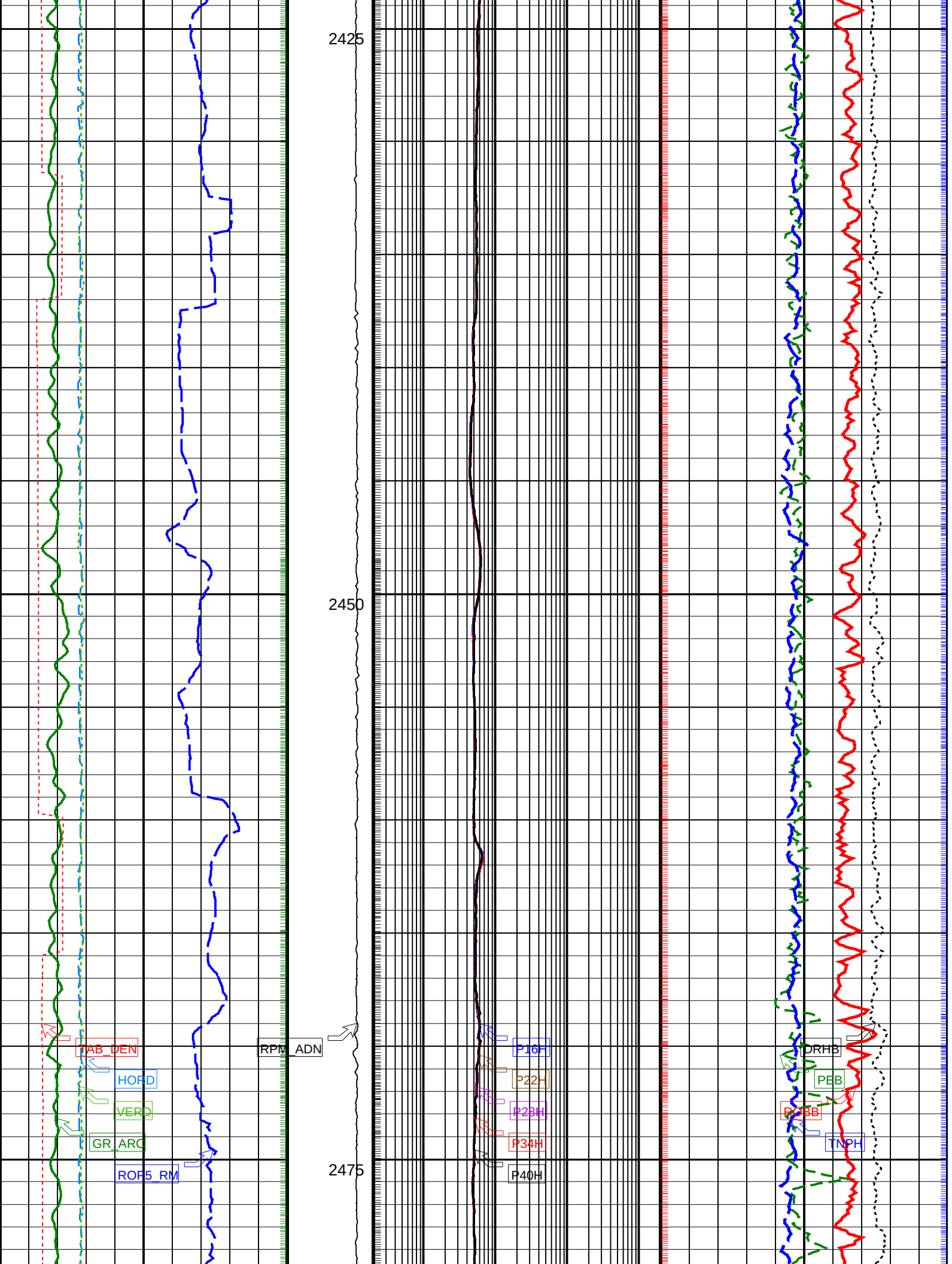
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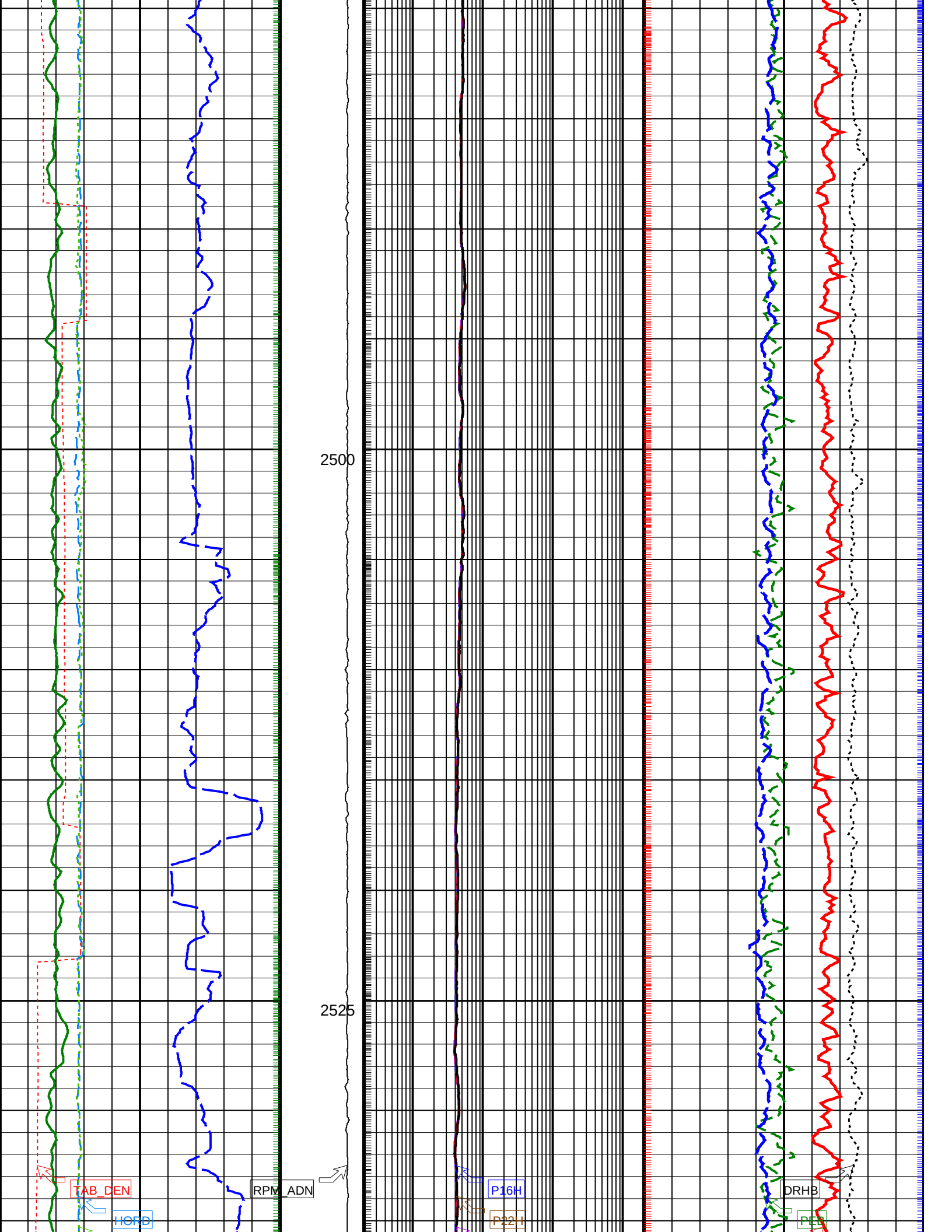
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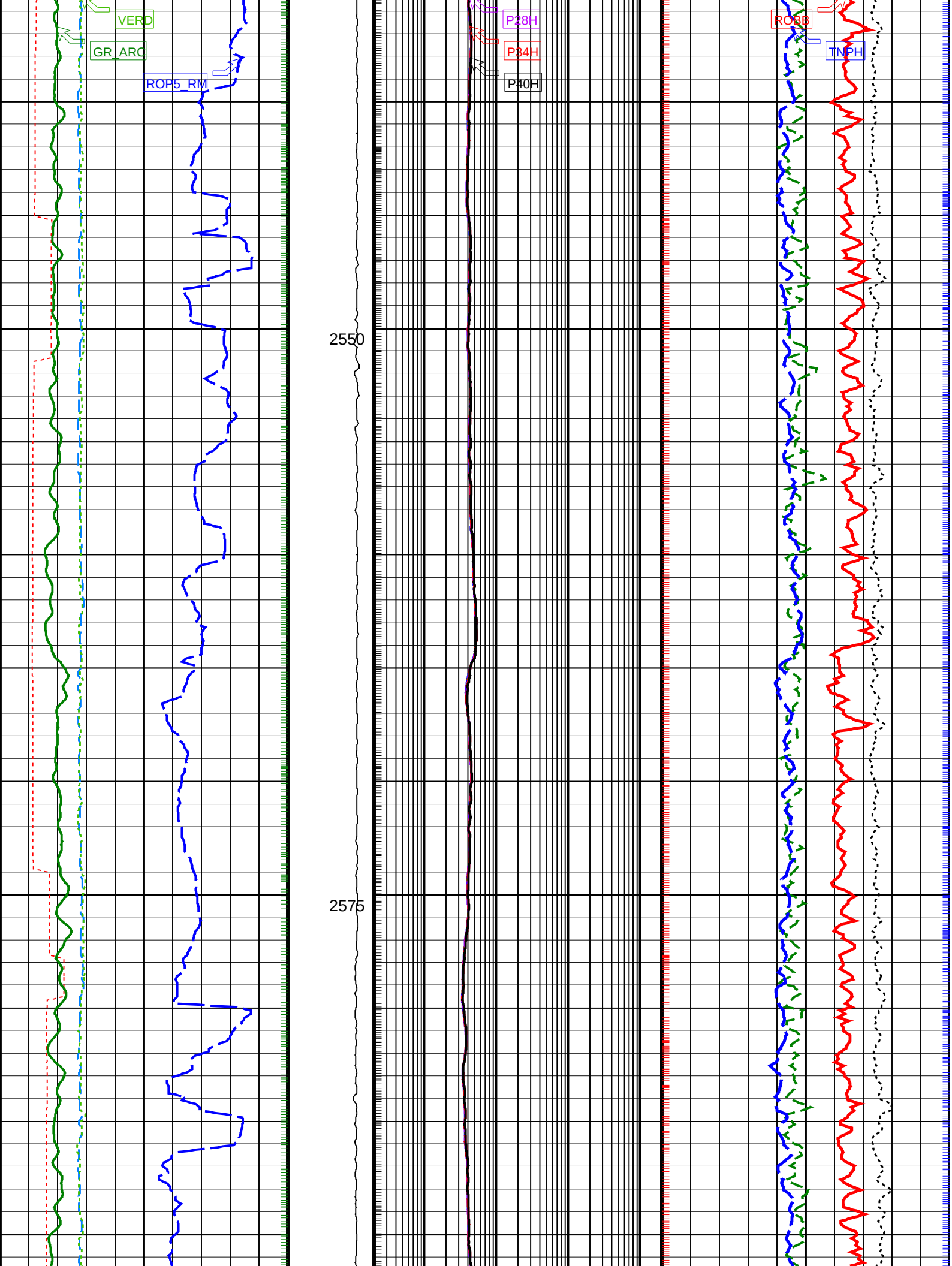
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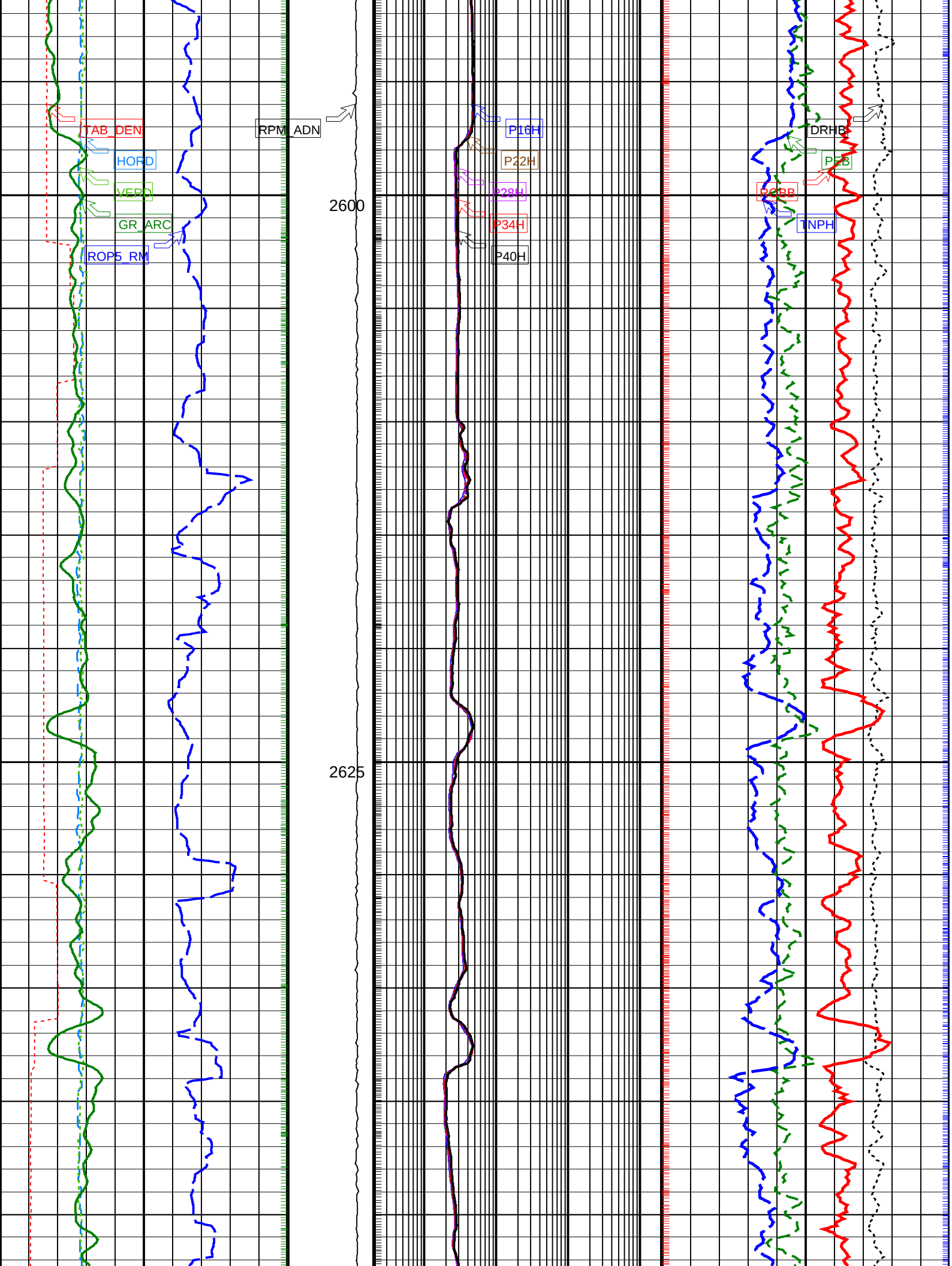
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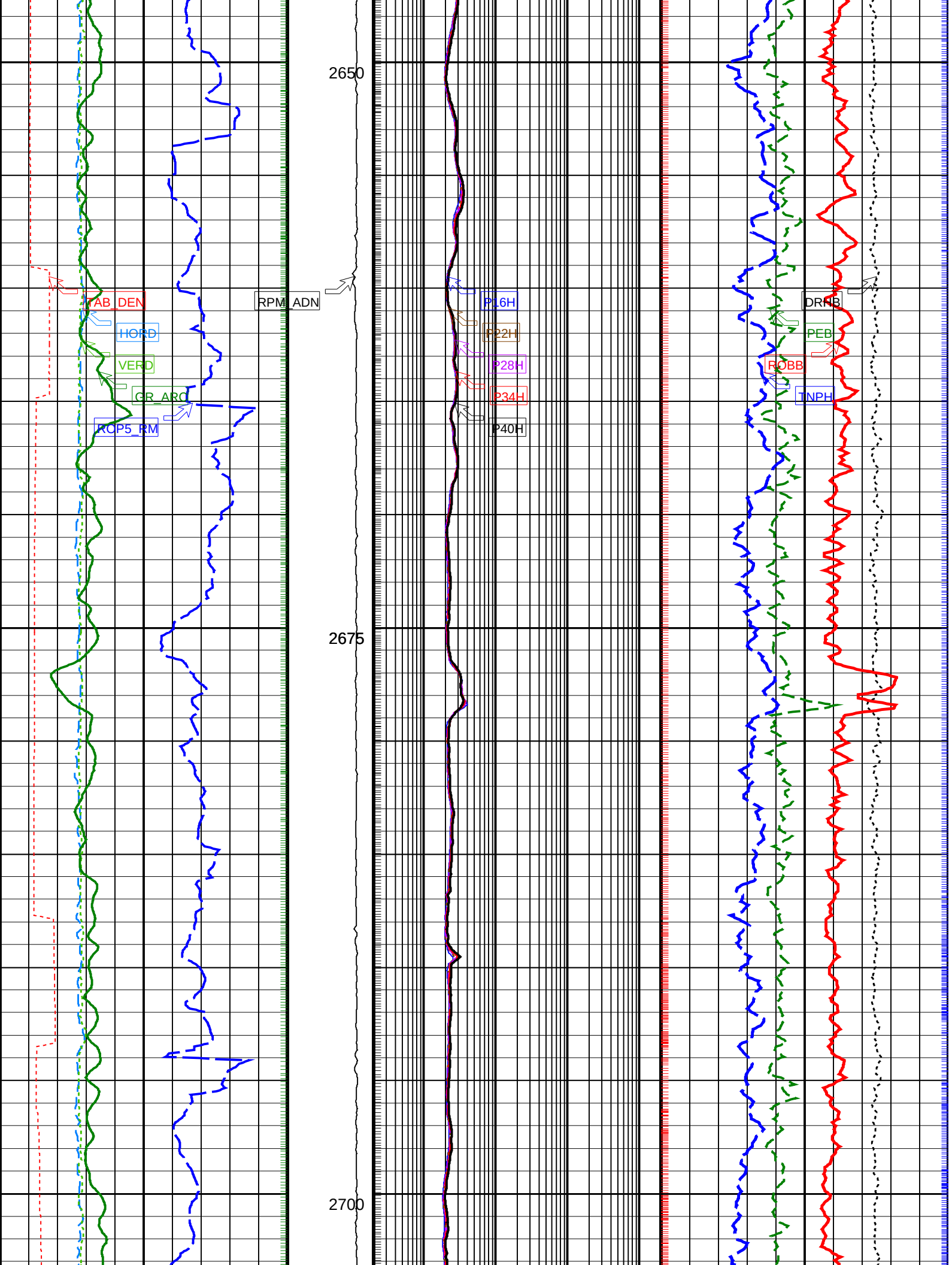
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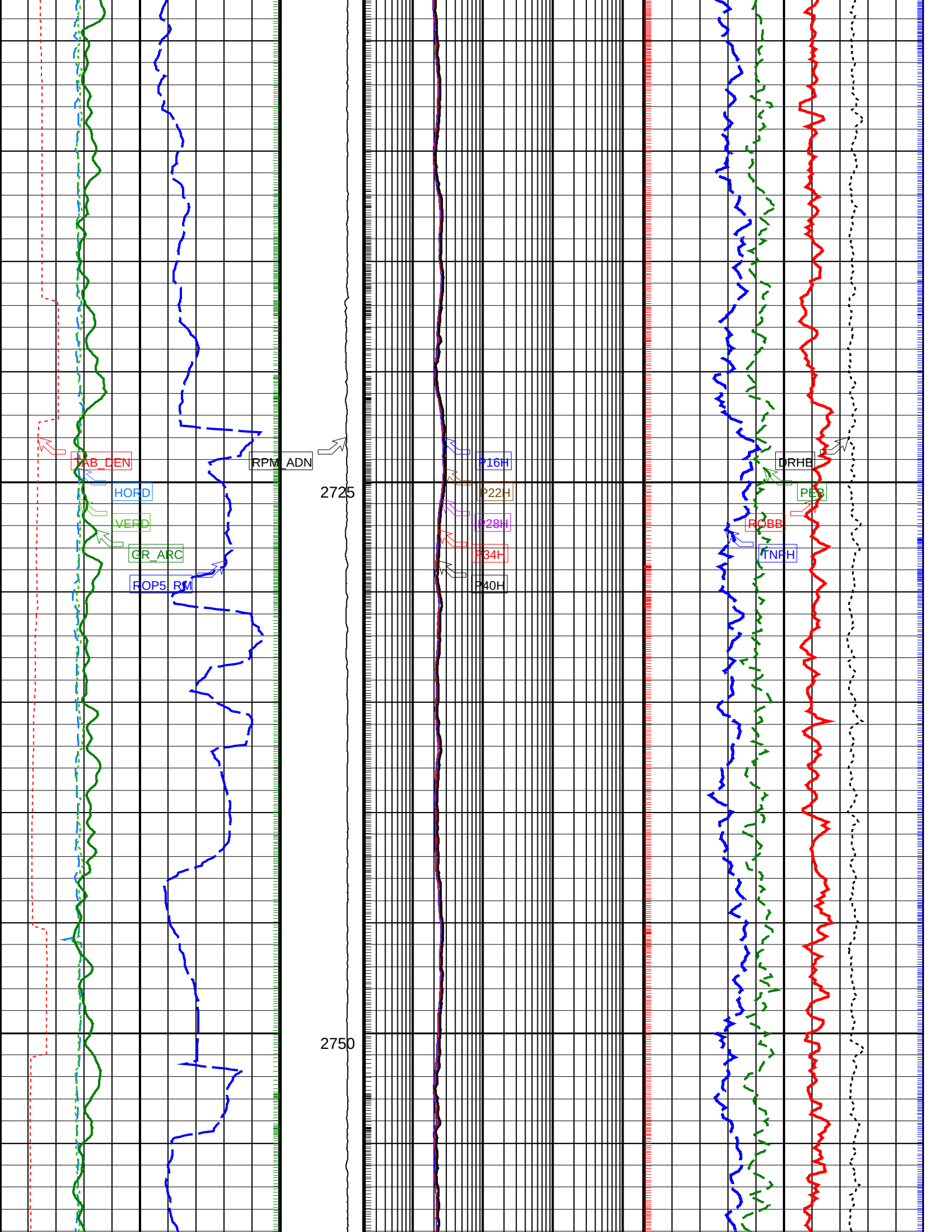
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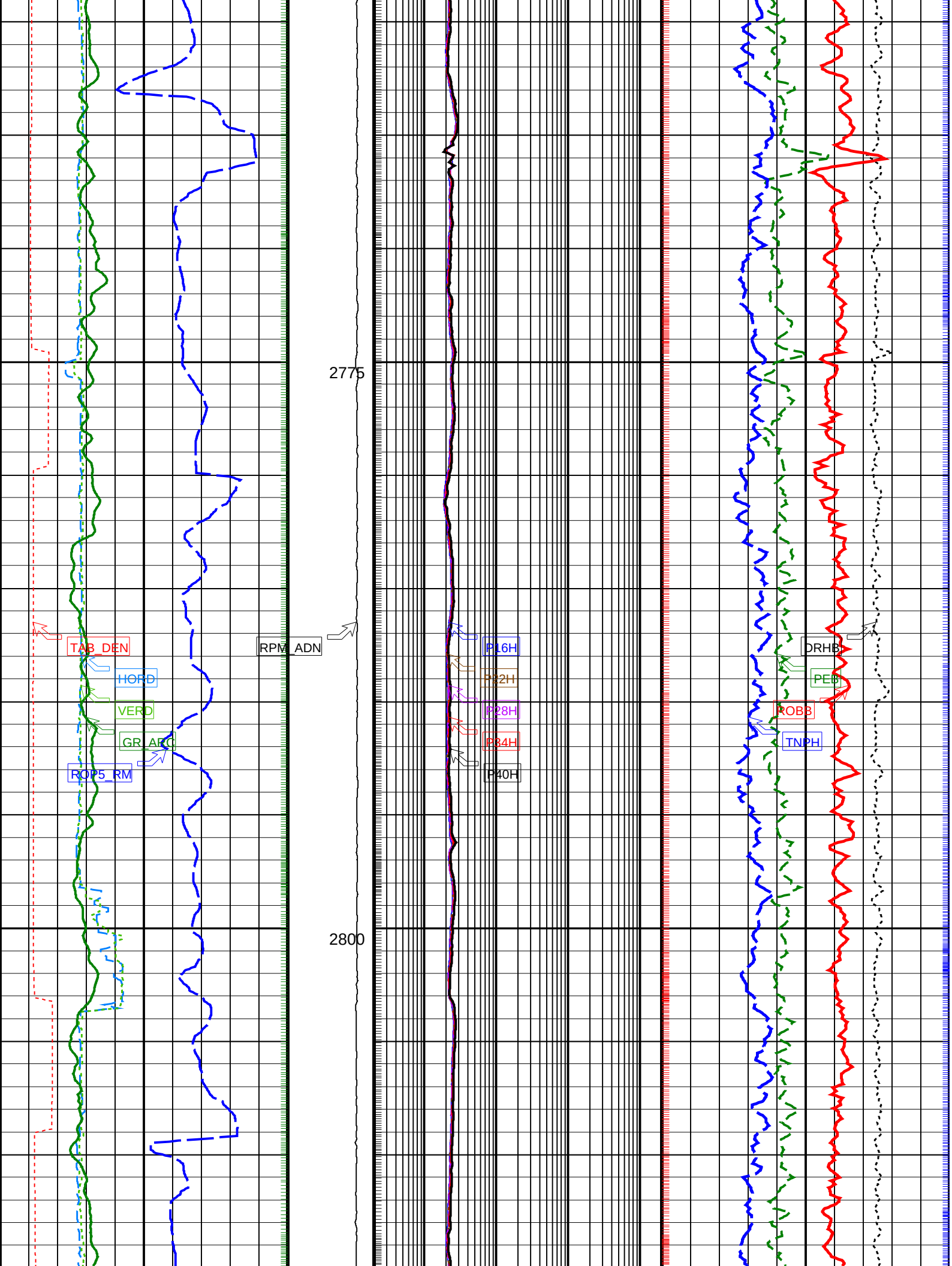
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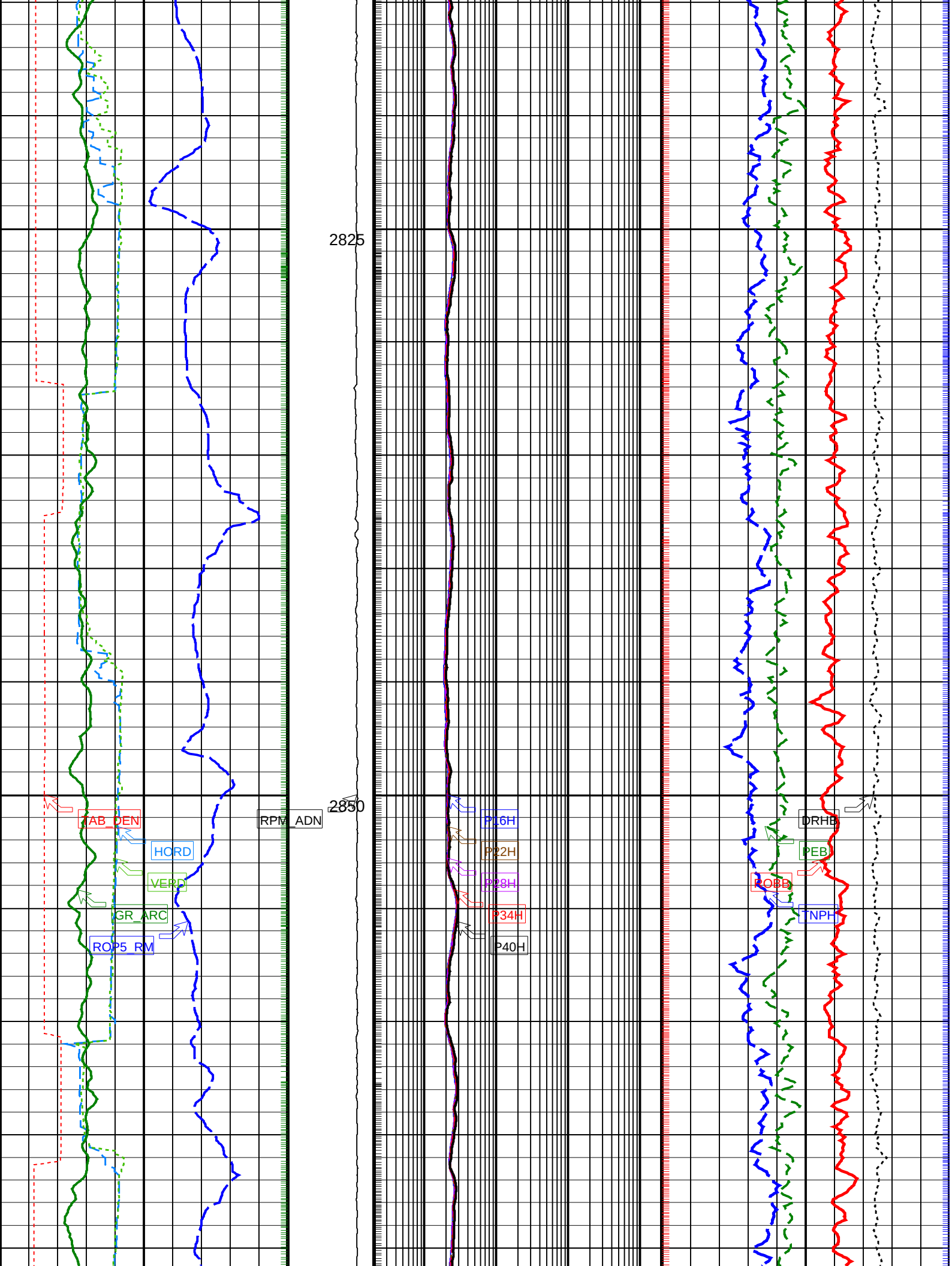
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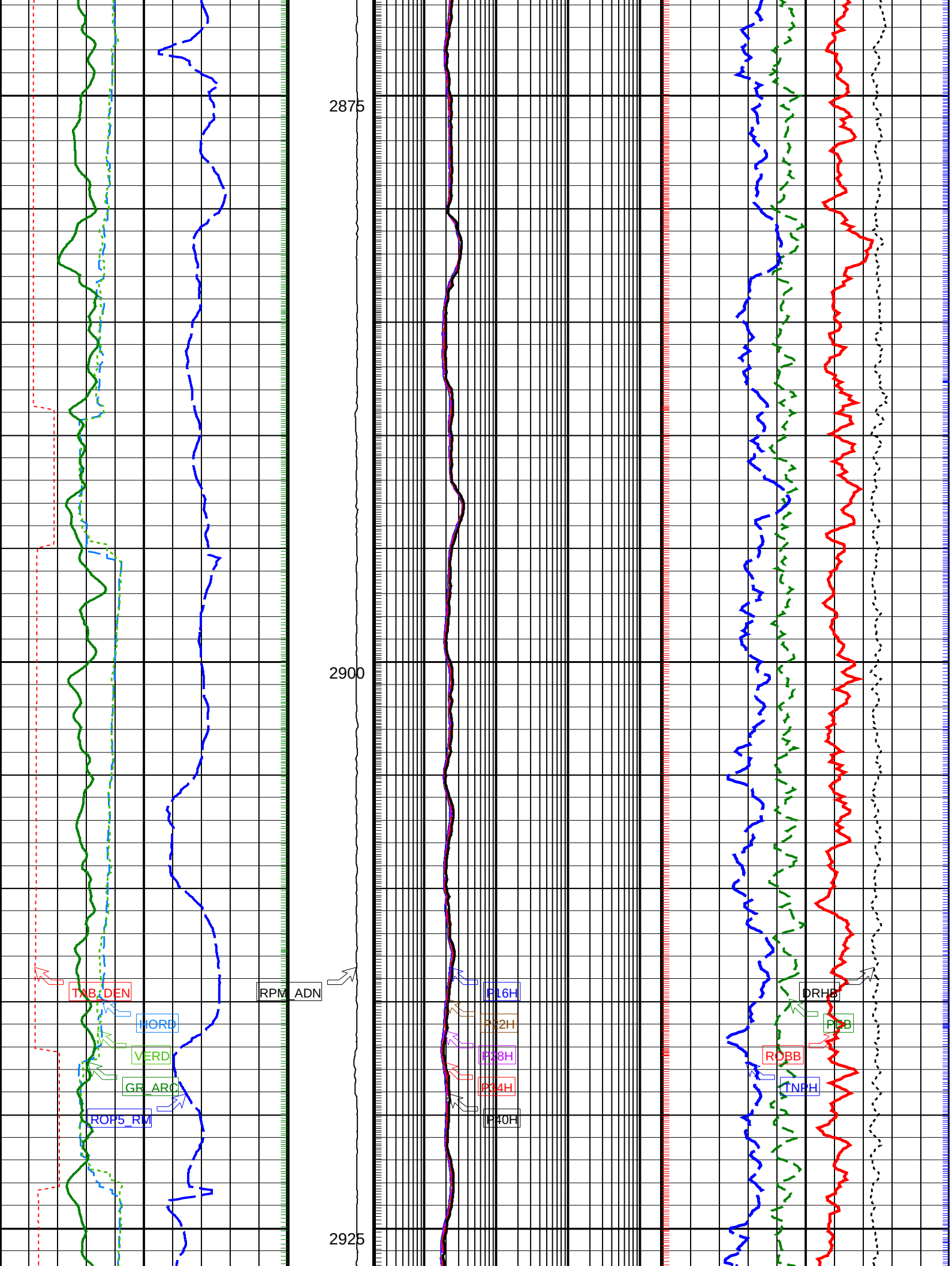
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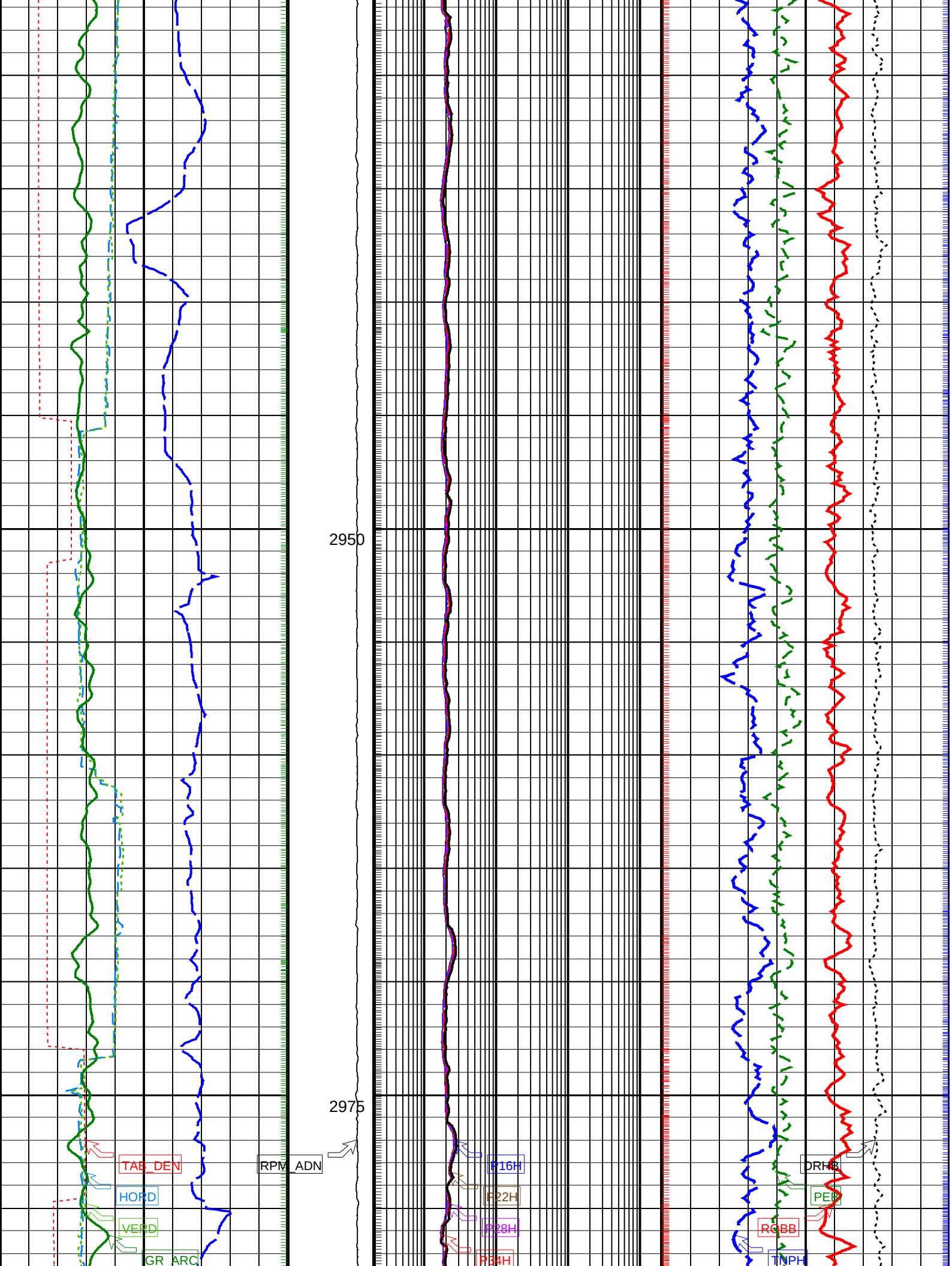
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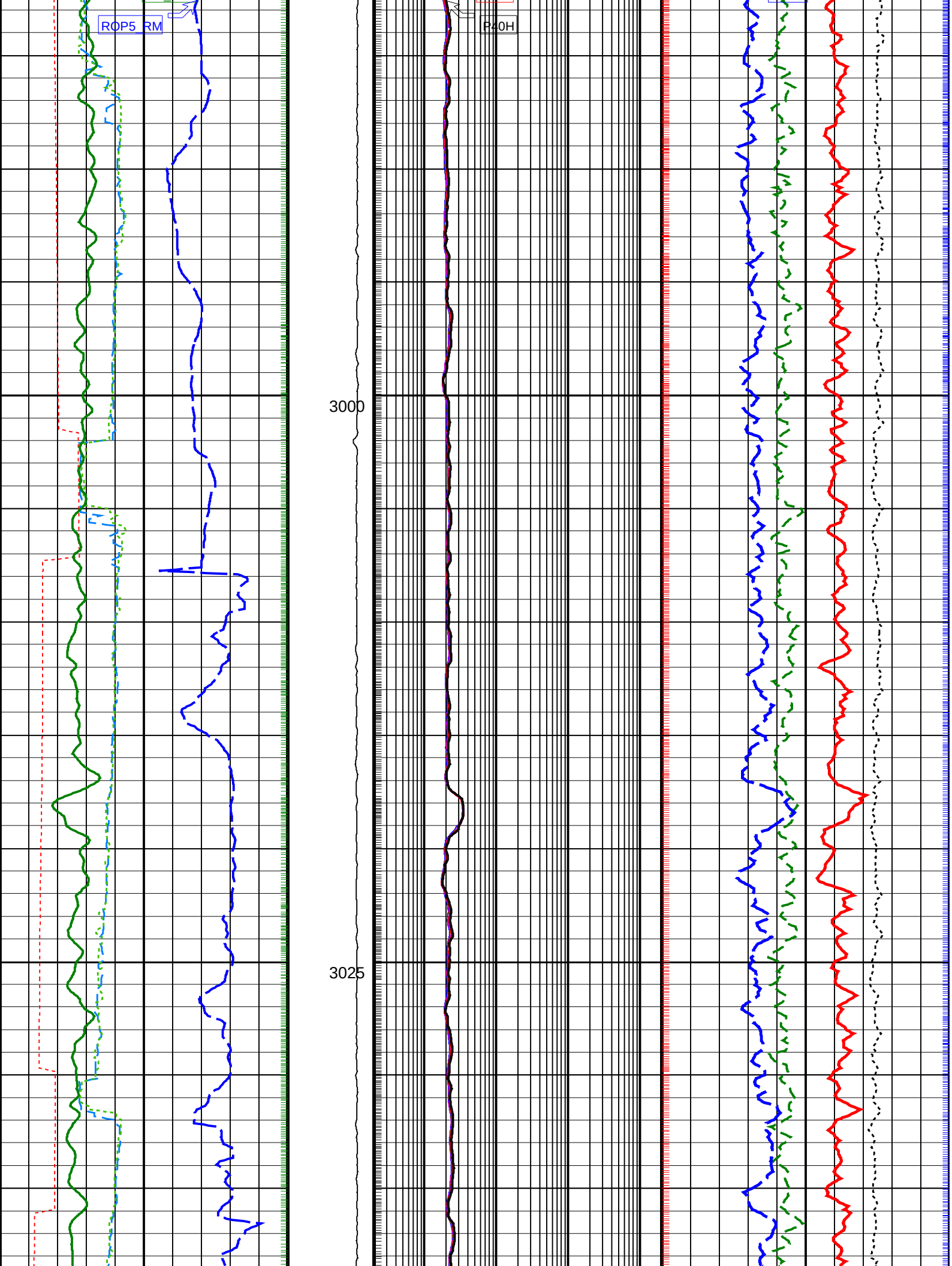
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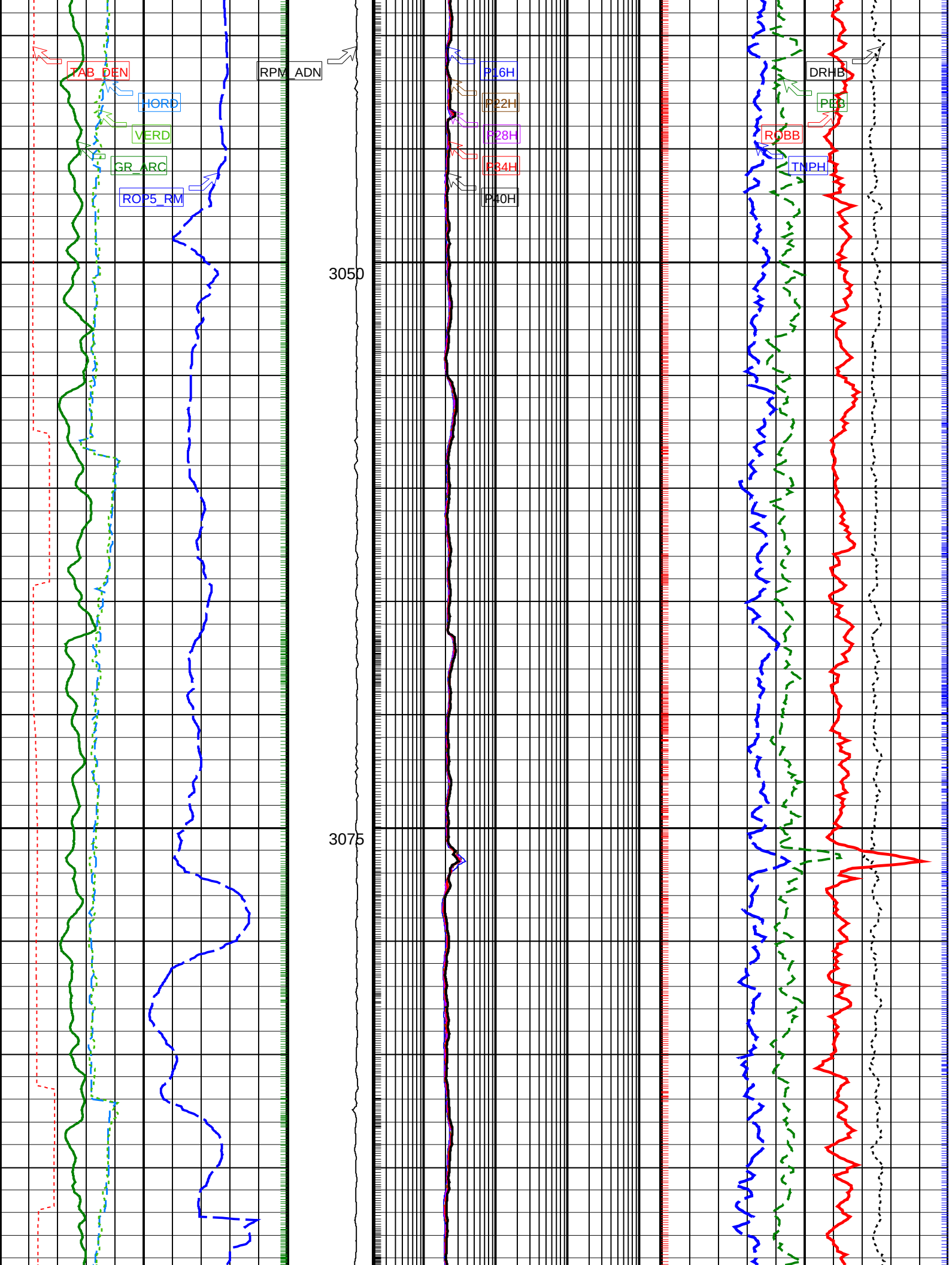
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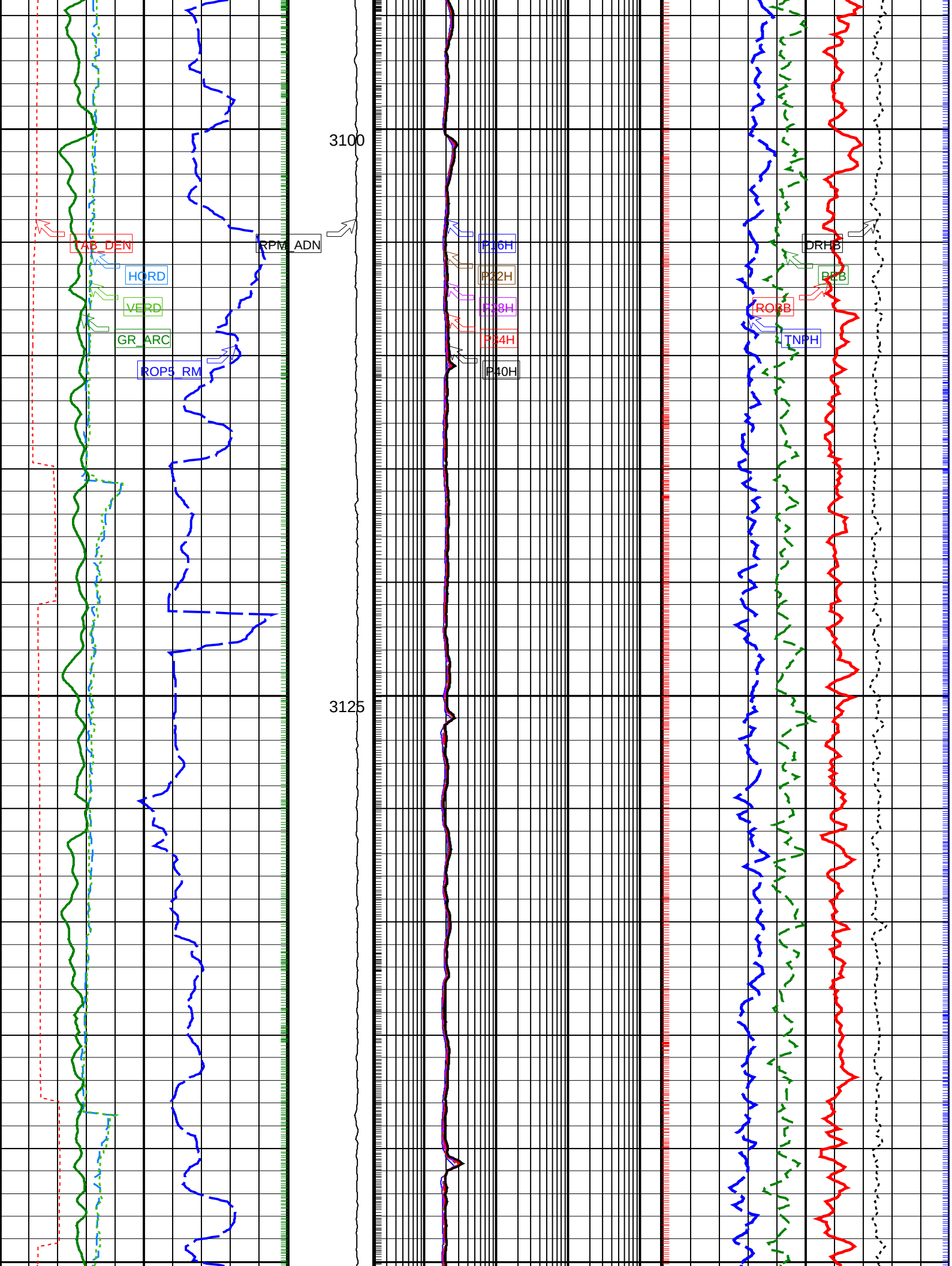
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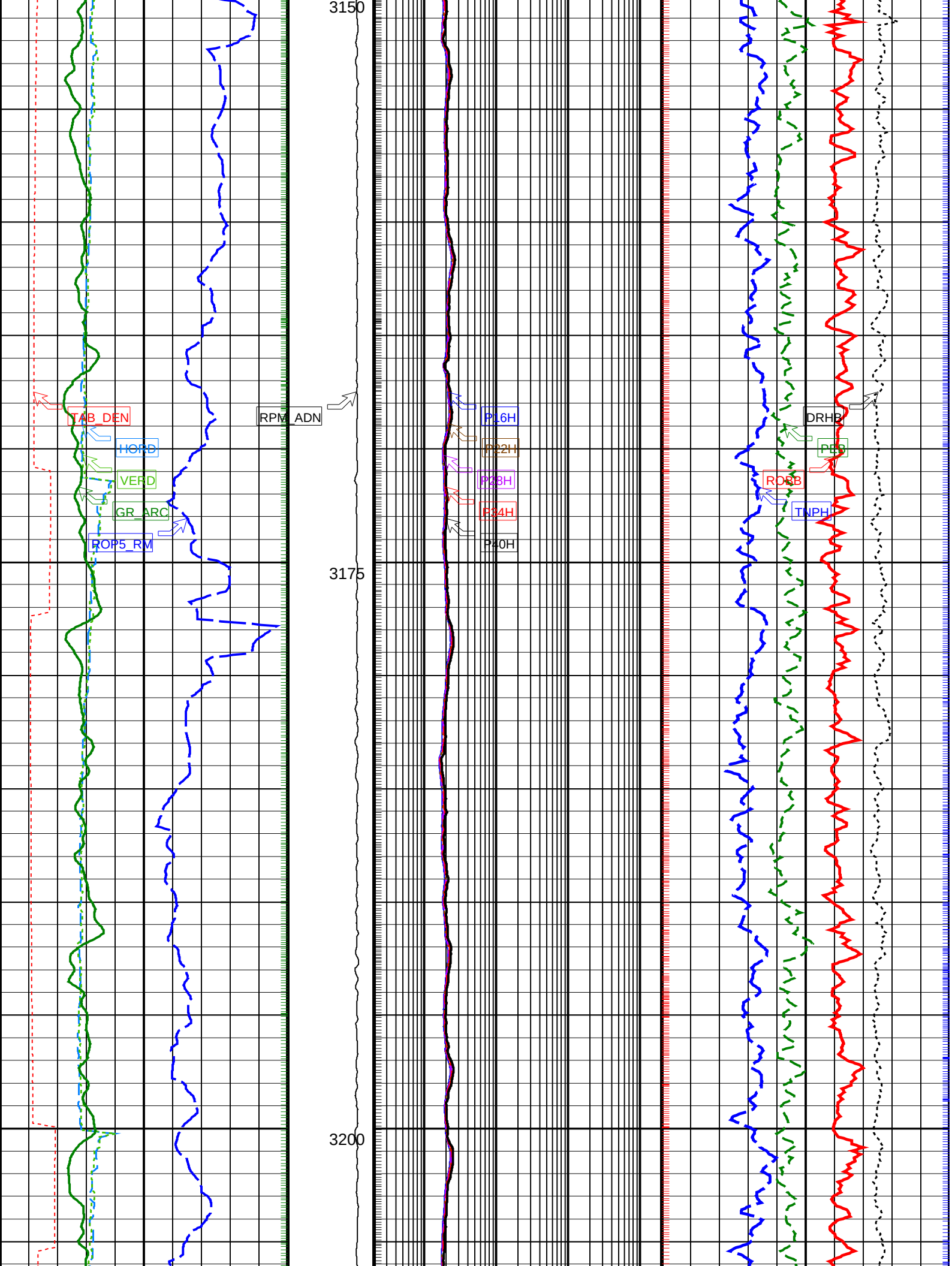
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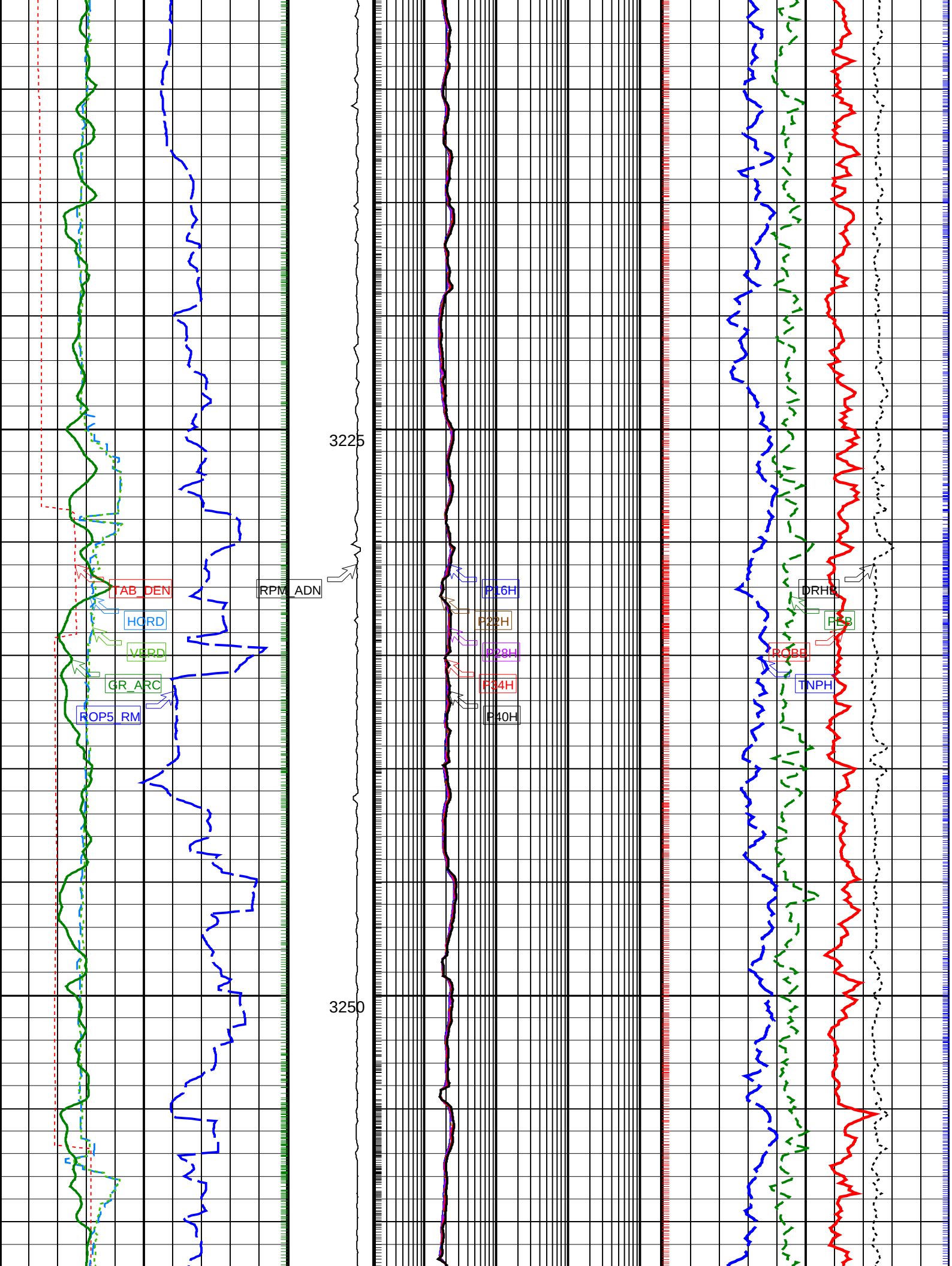
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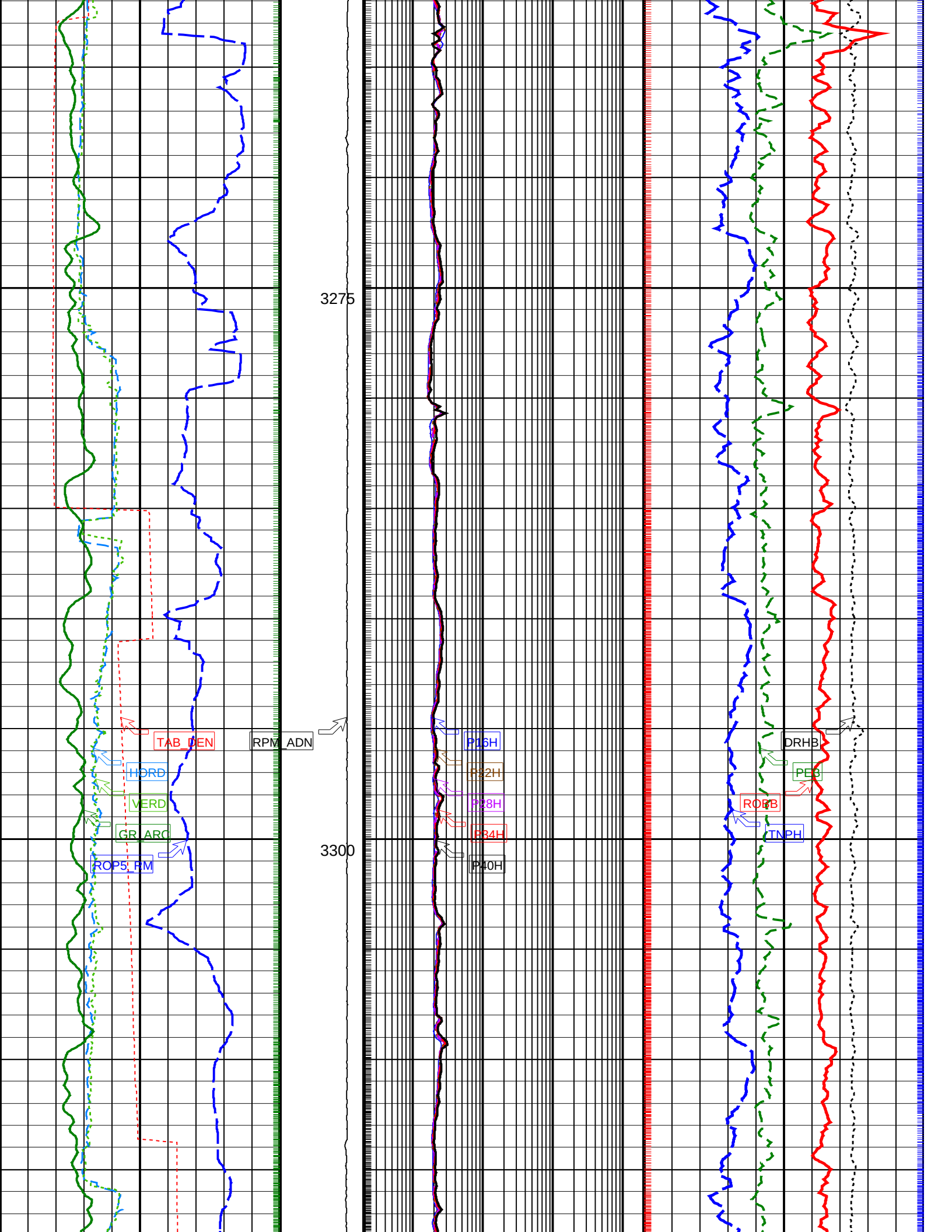
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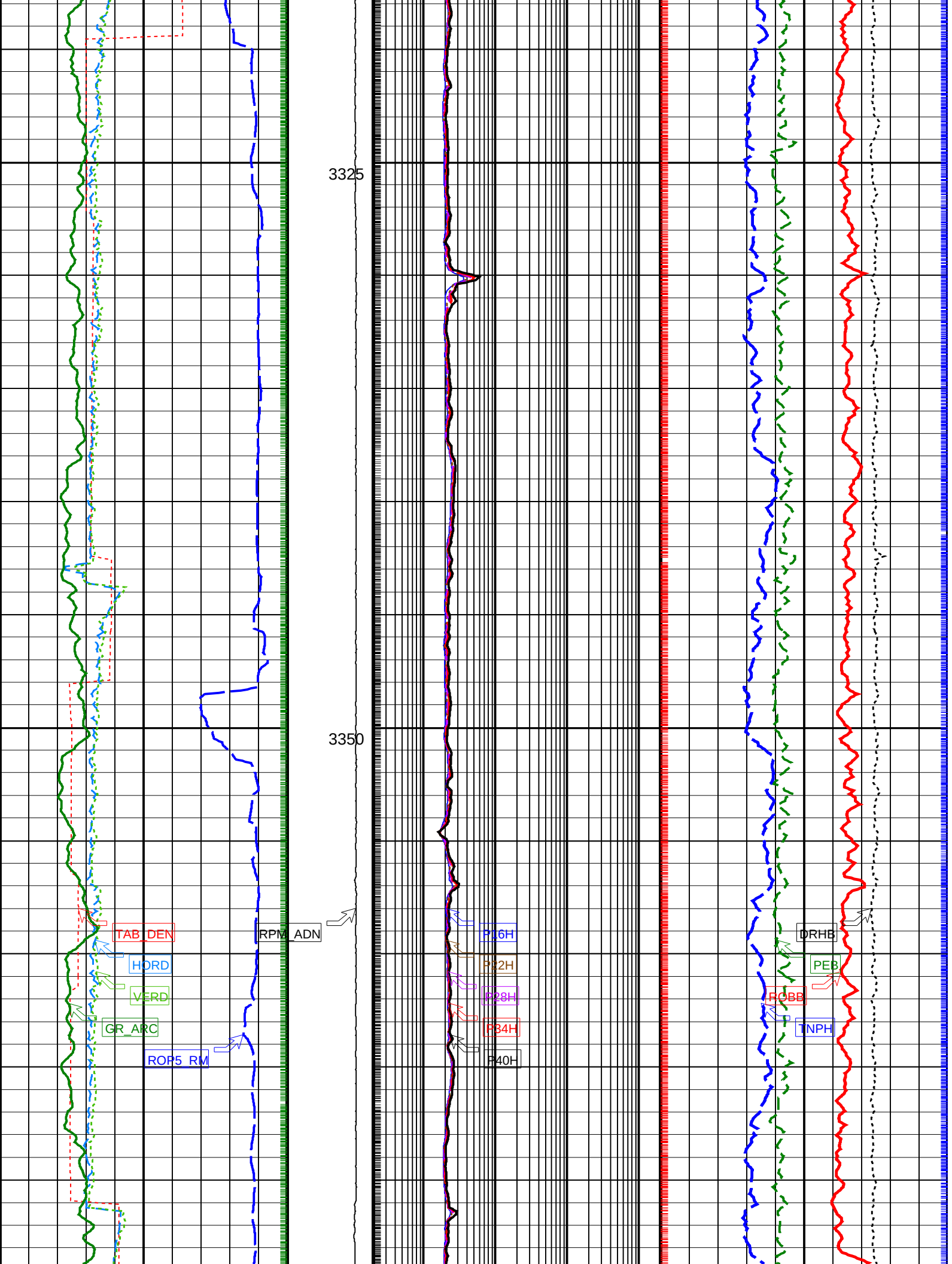
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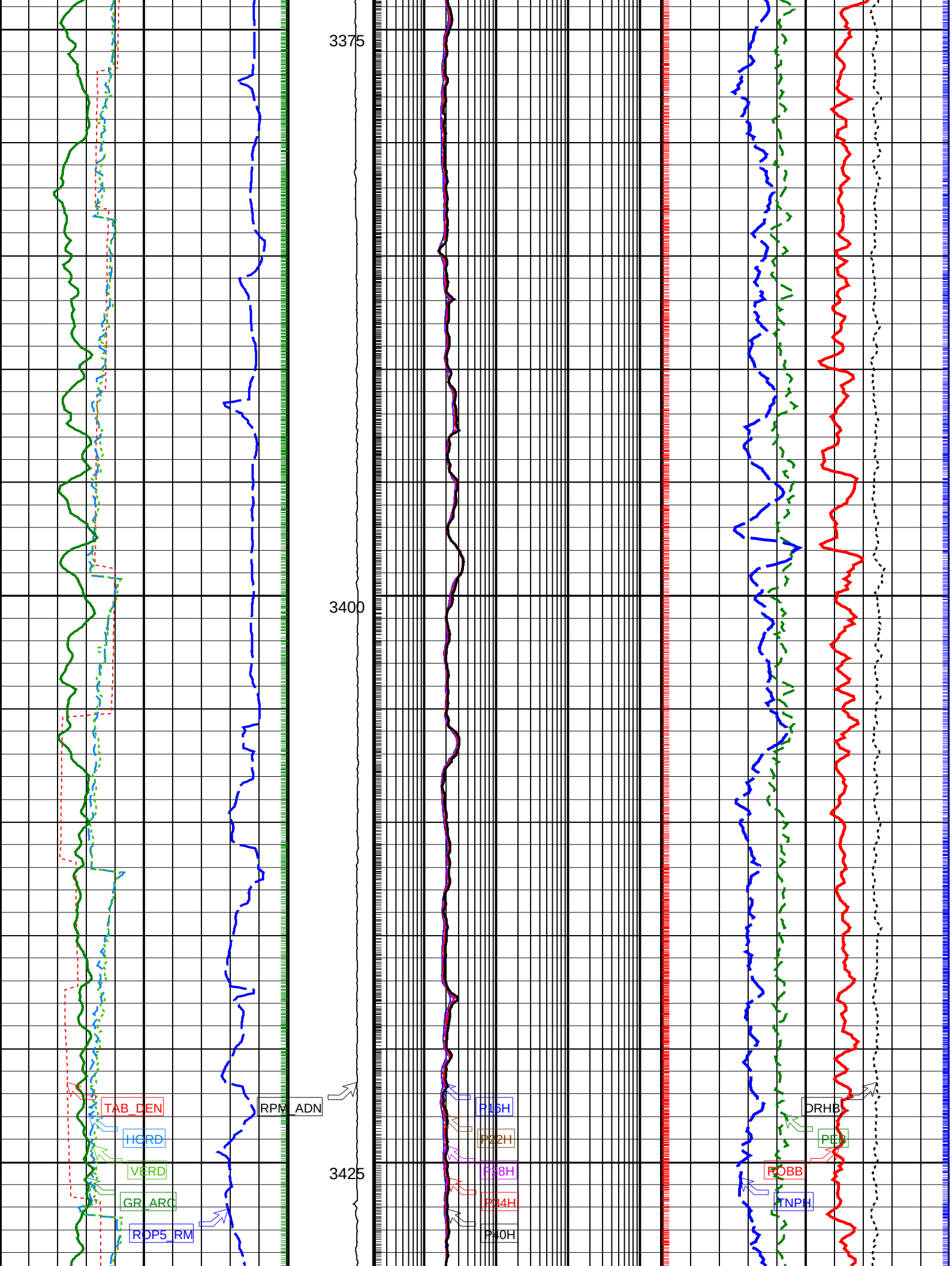
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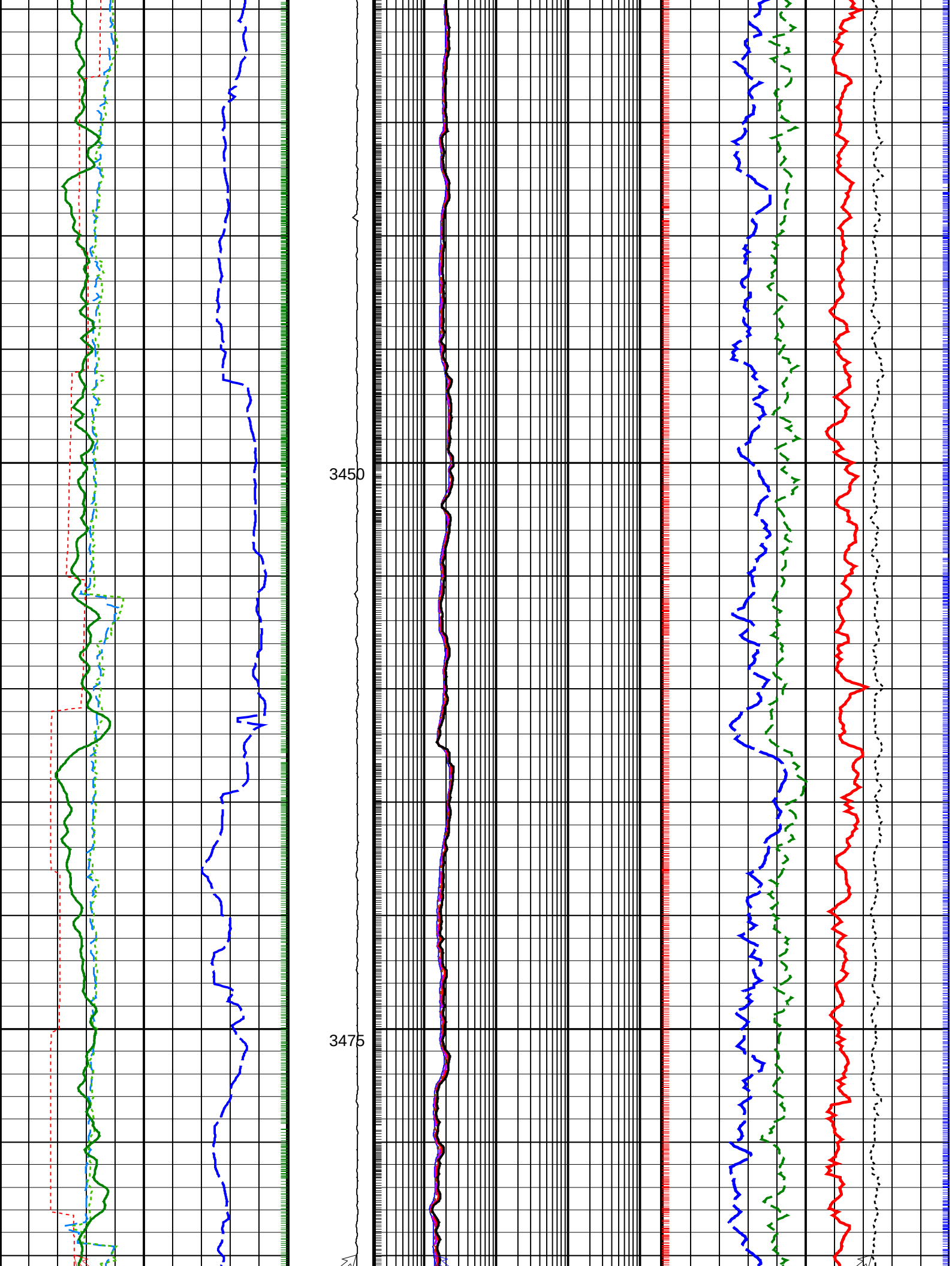
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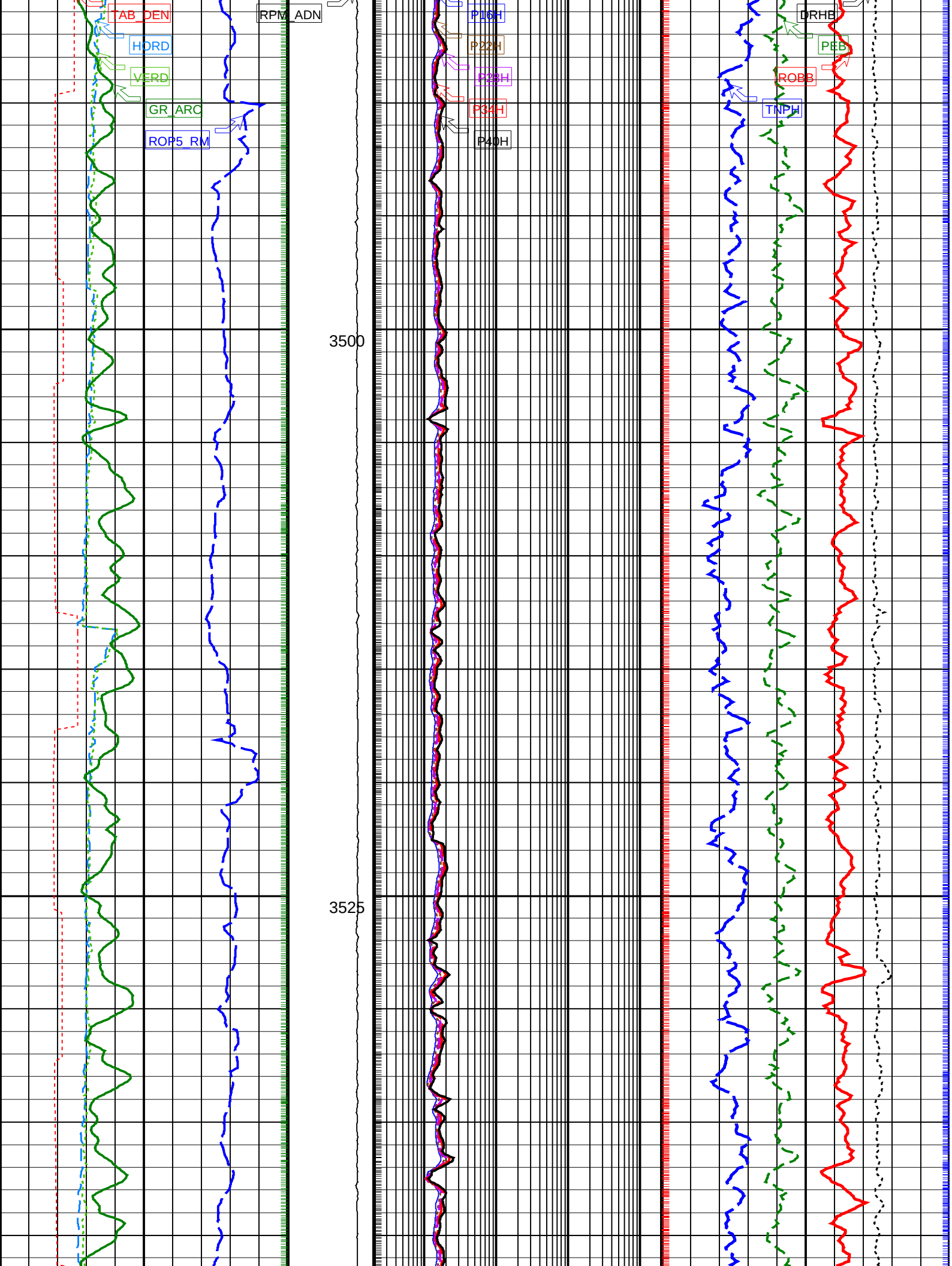
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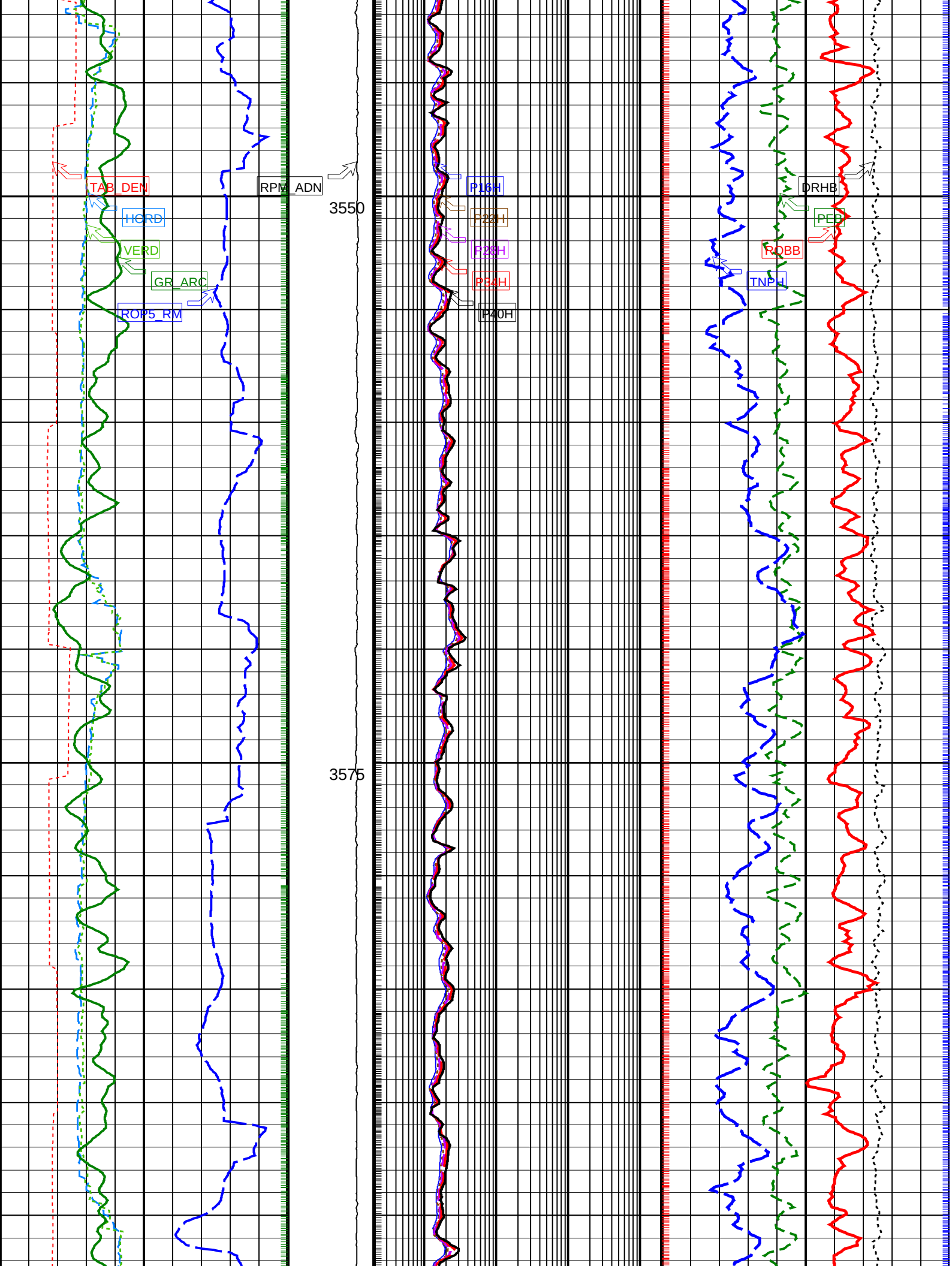
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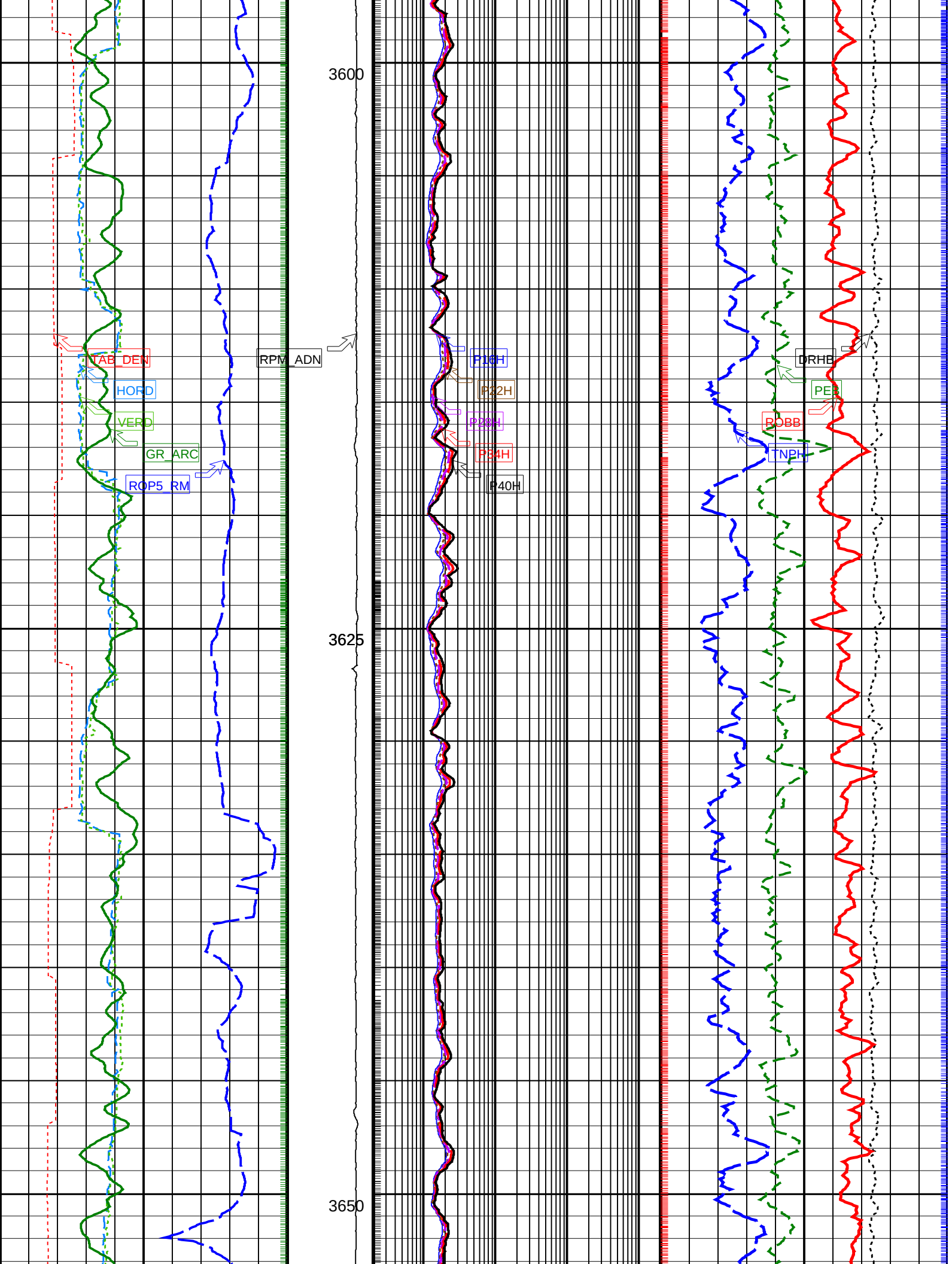
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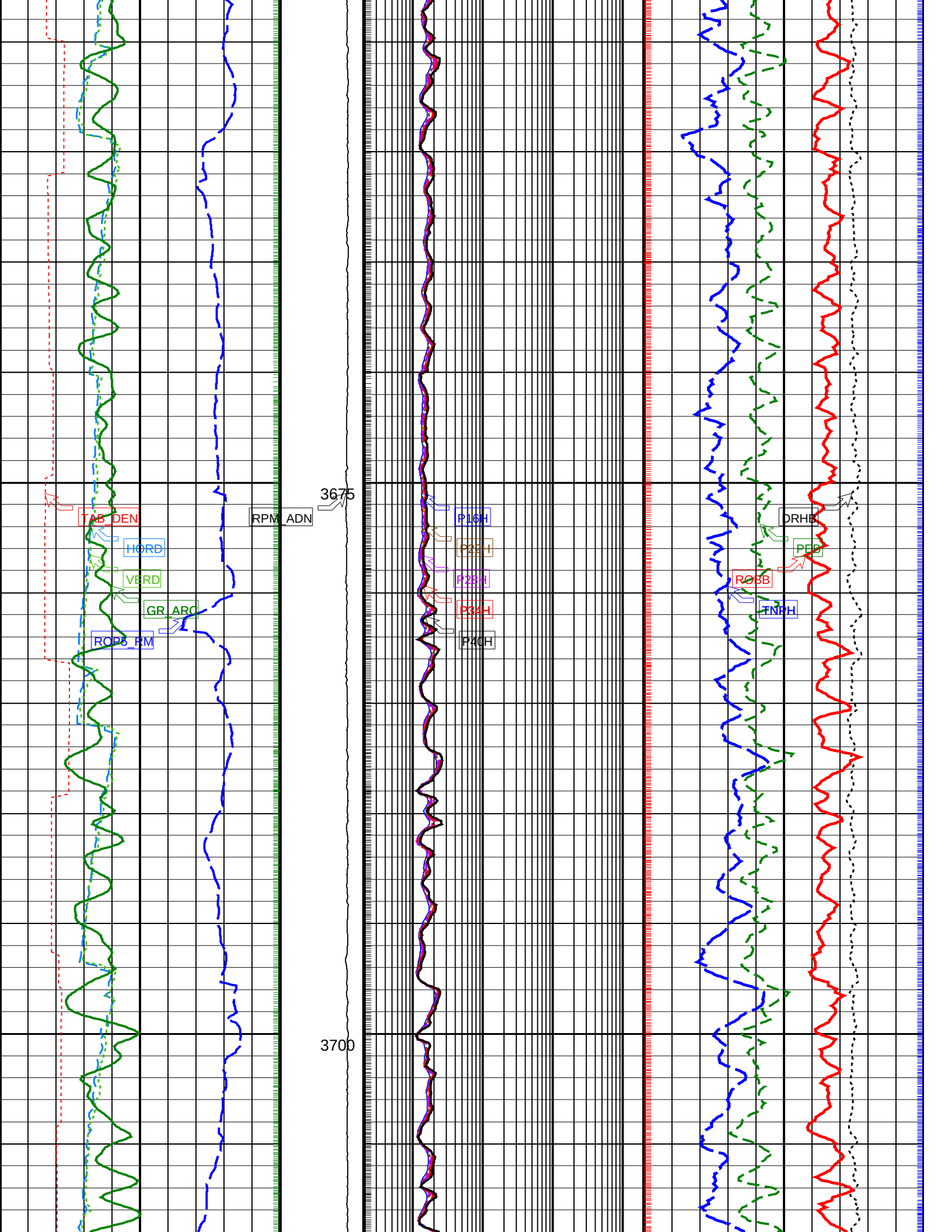
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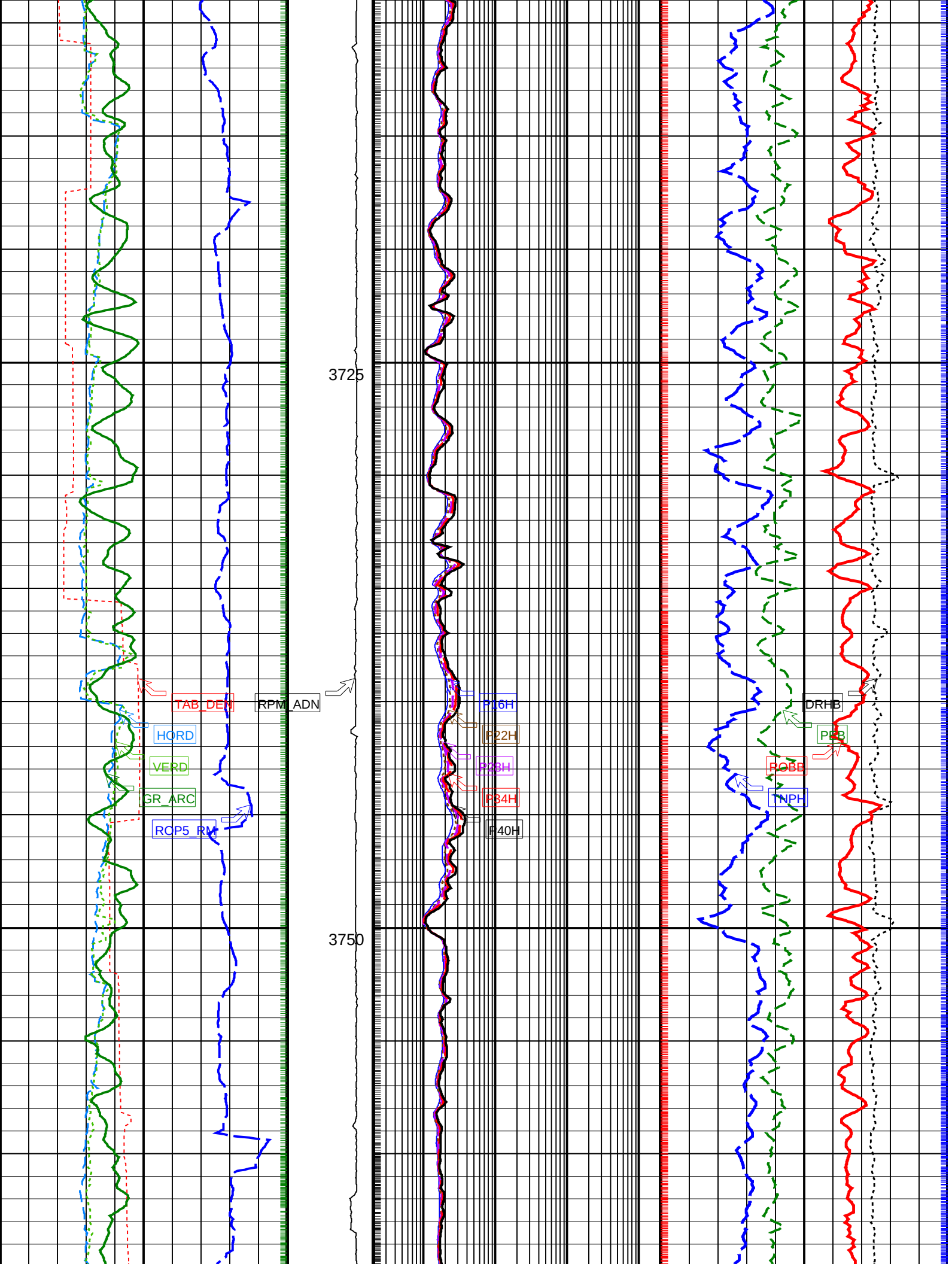
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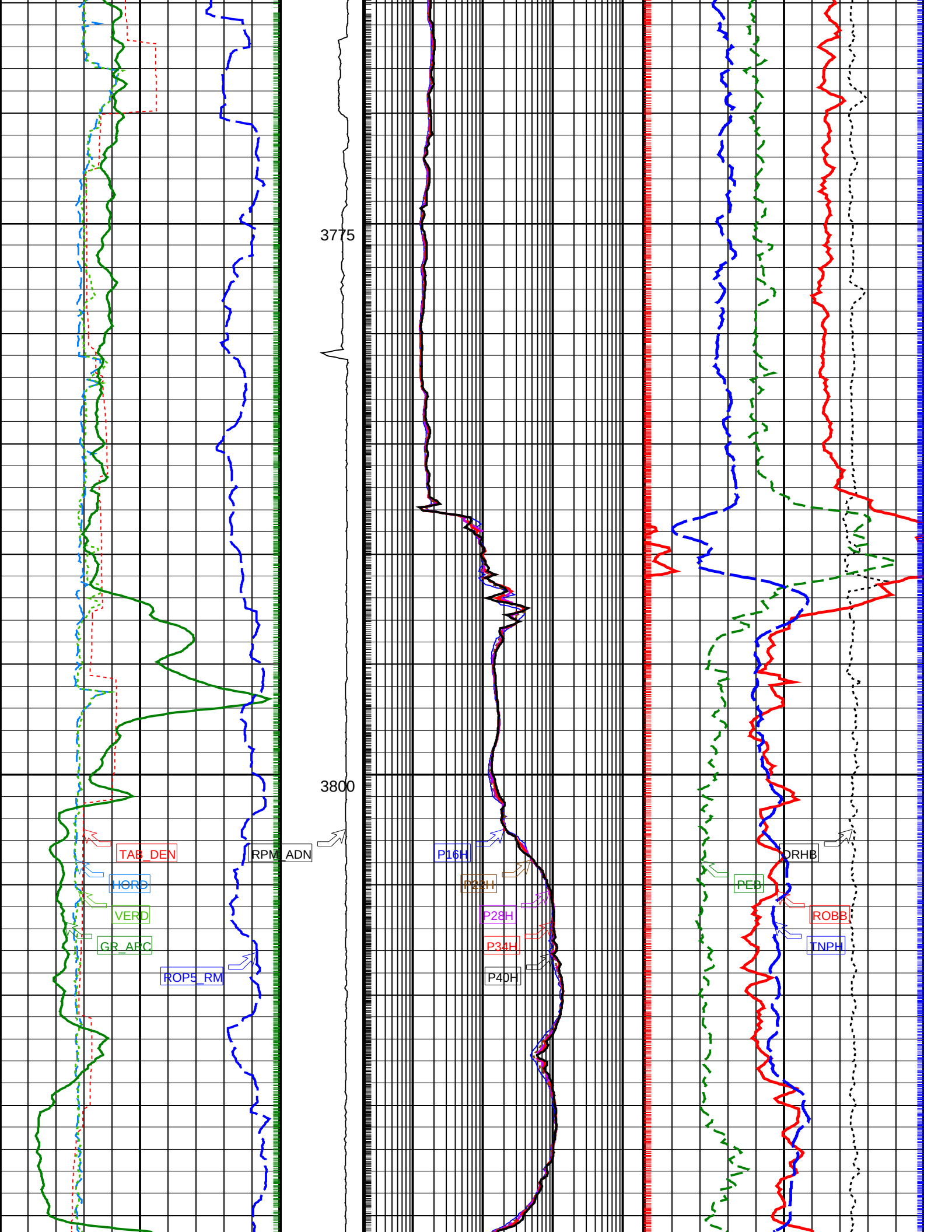
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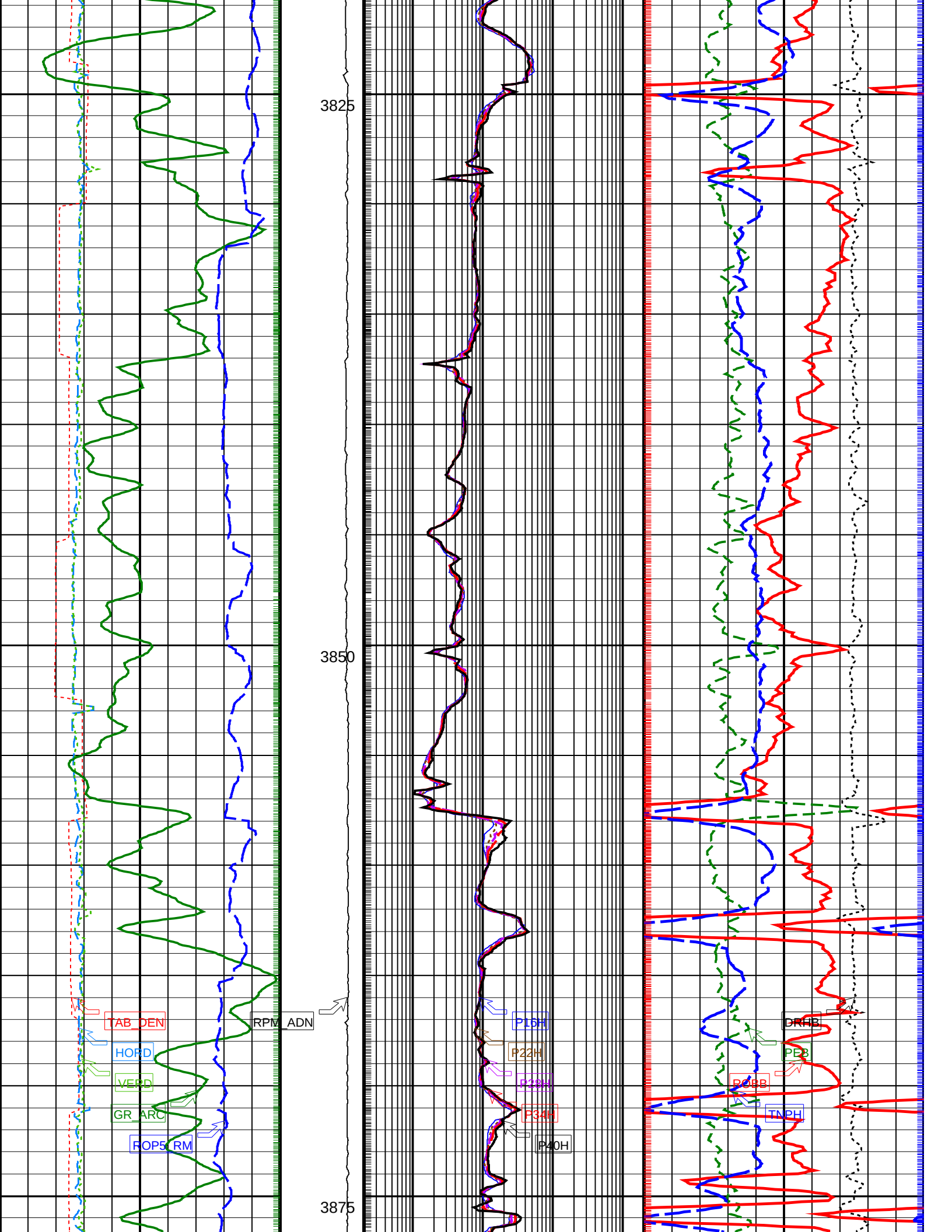
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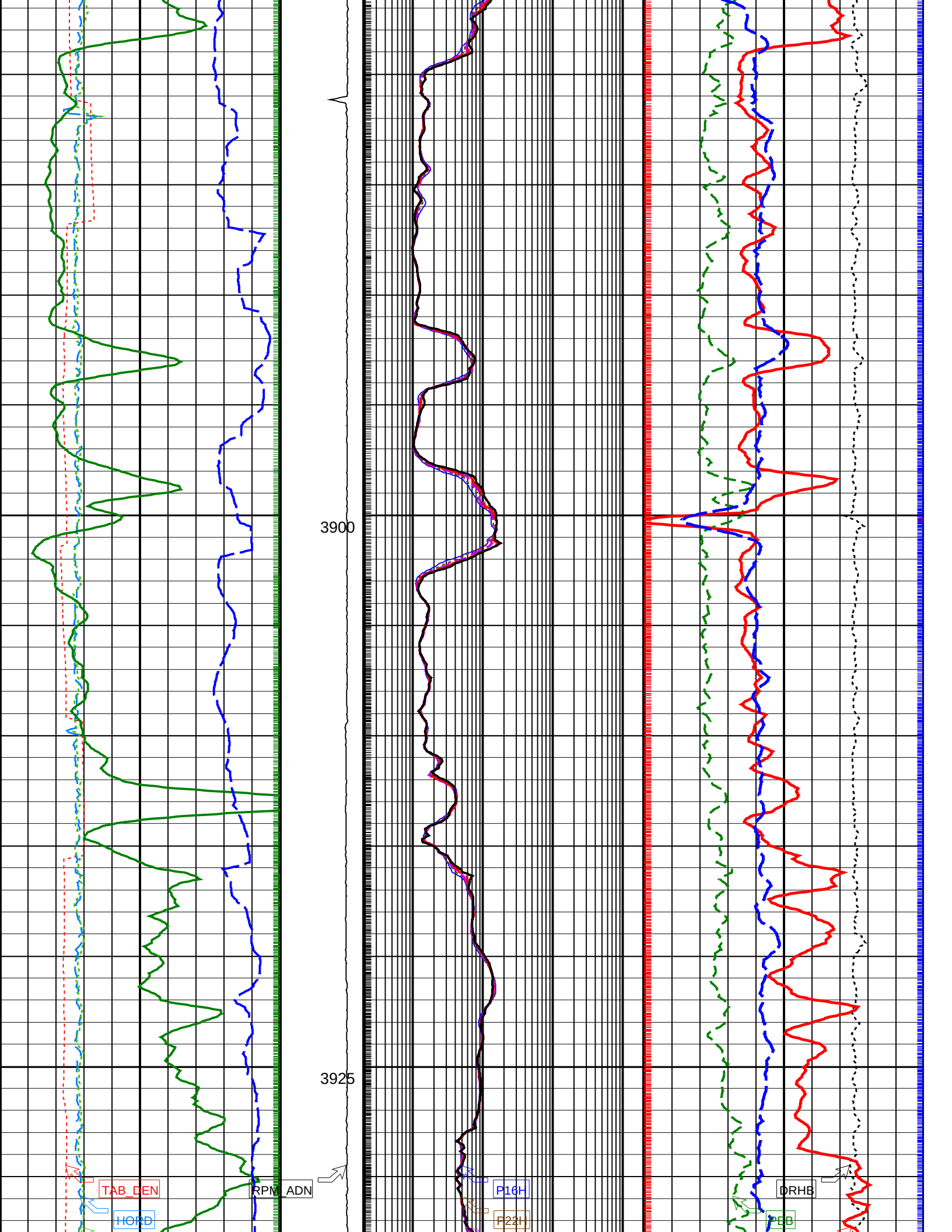
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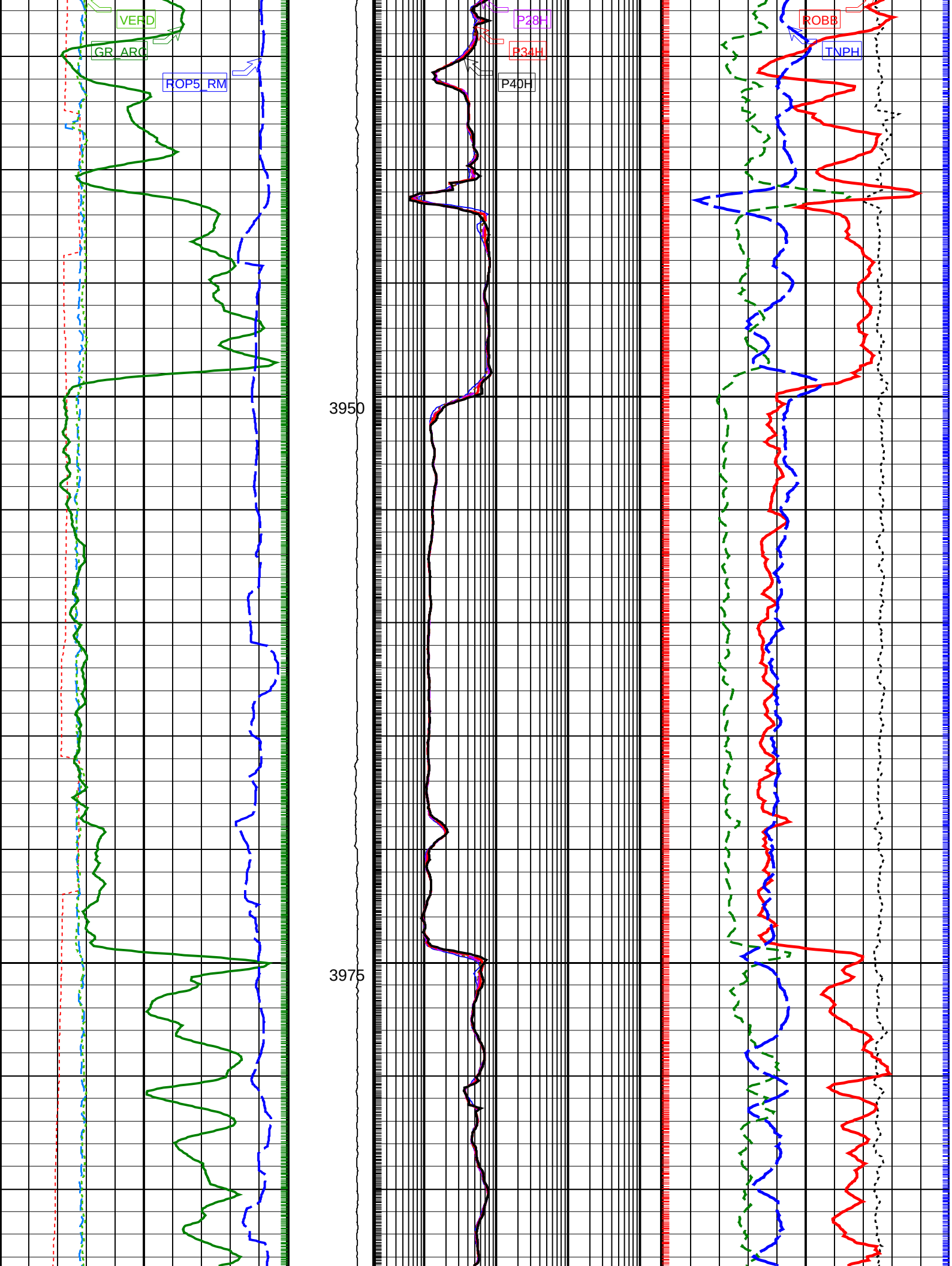
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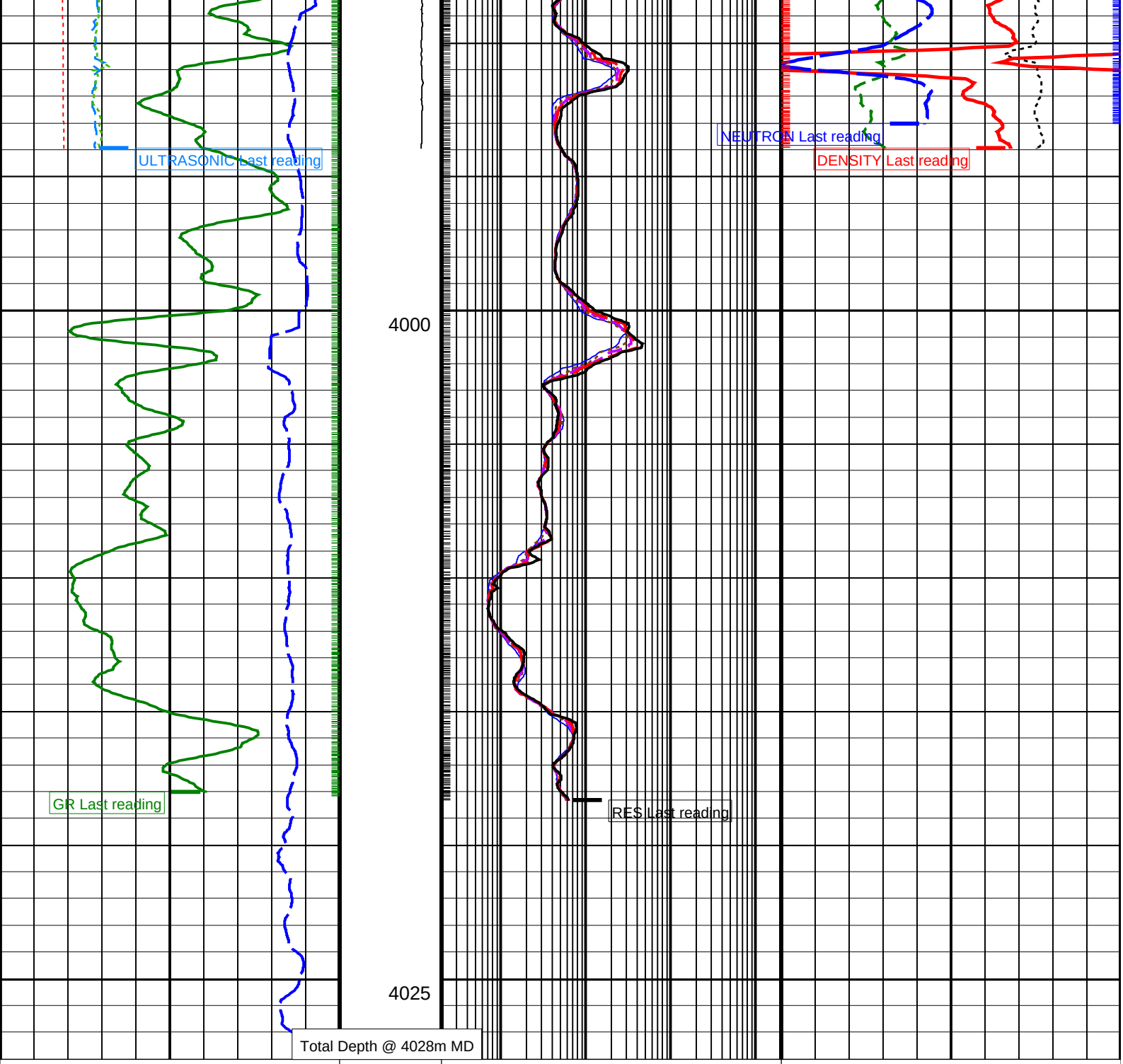

Density Time After Bit (TAB_DEN) 0 (HR) 10	ADN Rotational Speed (RPM_ADN) (RPM) 0 250	ARC Phase−Shift Resistivity 16−in. at 2 MHz (P16H) 0.2 (OHMM) 2000
Horizontal Hole Diameter (HORD) 6 (IN) 16		ARC Phase−Shift Resistivity 22−in. at 2 MHz (P22H) 0.2 (OHMM) 2000
Vertical Hole Diameter (VERD) 6 (IN) 16		ARC Phase−Shift Resistivity 28−in. at 2 MHz (P28H) 0.2 (OHMM) 2000
ARC Gamma Ray (GR_ARC) 0 (GAPI) 200		ARC Phase−Shift Resistivity 34−in. at 2 MHz (P34H) 0.2 (OHMM) 2000
Rate of Penetration, Averaged over Last 5ft (ROP5_RM)		ARC Phase−Shift Resistivity 40−in. at 2 MHz (P40H)

Bulk Density Correction, Bottom (DRHB) −0.75 (G/C3) 0.25
Photoelectric Factor, Bottom (PEB) 0 (−−−− 10
Bulk Density, Bottom (ROBB) 1.85 (G/C3) 2.85
Thermal Neutron Porosity (TNPH) 45 (PU) −15

200	(M/HR)	0

0.2	(OHMM)	2000

PIP SUMMARY

Density Samples

Neutron Samples

ARC Gamma Ray Samples

ARC Resistivity Samples

IDEAL Version: ID12_0C_09

IDF

ADN **id12_0c_01**

6.75−in. Azimuthal Density Neutron / Equipment Identification

Primary Equipment:		
Tool Name and Serial Number	ADN6 − CA	437
Collar Type and Serial Number	ADDC − AA	AD41
Chassis Type and Serial Number	ADSE − EA	
Stabilizer Type and Serial Number	IBS	437
Neutron Logging Source	NSR − M	181
Density Logging Source	GSR − J/Z	2152
Stabilizer Size	8.25 − in.	
Calibration Status	Valid	

Master: 20−Feb−2007 3:30

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		1259	Master		3103	Master		7754
250.0 (Minimum)	4125 (Nominal) 8000 (Maximum)		700.0 (Minimum)	9350 (Nominal) 18000 (Maximum)		2500 (Minimum)	23750 (Nominal) 45000 (Maximum)	

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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		190.4	Master		1607	Master		4949
50.00 (Minimum)	725.0 (Nominal) 1400 (Maximum)		500.0 (Minimum)	4250 (Nominal) 8000 (Maximum)		1500 (Minimum)	15750 (Nominal) 30000 (Maximum)	

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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		46.94	Master		131.0	Master		564.8
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: 20−Feb−2007 3:30

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		1.039	Master		1.122
1.024 (Minimum)	1.039 (Nominal) 1.054 (Maximum)		1.096 (Minimum)	1.126 (Nominal) 1.156 (Maximum)	

Master: 20−Feb−2007 3:30

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		23.02	Master		5.714	Master		2.773
13.30 (Minimum)	19.05 (Nominal) 24.70 (Maximum)		3.400 (Minimum)	4.857 (Nominal) 6.200 (Maximum)		1.600 (Minimum)	2.363 (Nominal) 3.100 (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		23.92	Master		6.001	Master		2.900
13.30 (Minimum)	19.05 (Nominal) 24.70 (Maximum)		3.400 (Minimum)	4.857 (Nominal) 6.200 (Maximum)		1.600 (Minimum)	2.363 (Nominal) 3.100 (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

Phase	Far 2 tube 1 Air Point Measure CPS	Value
Master		23.52
	13.30 (Minimum) 19.05 (Nominal) 24.70 (Maximum)	

Phase	Far 2 tube 1 Rod Point Measure CPS	Value
Master		5.817
	3.400 (Minimum) 4.857 (Nominal) 6.200 (Maximum)	

Phase	Far 2 tube 1 H2O Point Measure CPS	Value
Master		2.808
	1.600 (Minimum) 2.363 (Nominal) 3.100 (Maximum)	

Phase	Far 2 tube 1 Air Point Measure CPS	Value
Master		23.11
	13.30 (Minimum) 19.05 (Nominal) 24.70 (Maximum)	

Phase	Far 2 tube 1 Rod Point Measure CPS	Value
Master		5.779
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Phase	Far 2 tube 1 H2O Point Measure CPS	Value
Master		2.778
	1.600 (Minimum) 2.363 (Nominal) 3.100 (Maximum)	

Phase	Far 2 tube 2 Air Point Measure CPS	Value
Master		24.46
	13.30 (Minimum) 19.05 (Nominal) 24.70 (Maximum)	

Phase	Far 2 tube 2 Rod Point Measure CPS	Value
Master		5.871
	3.400 (Minimum) 4.857 (Nominal) 6.200 (Maximum)	

Phase	Far 2 tube 2 H2O Point Measure CPS	Value
Master		2.868
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Phase	Far 2 tube 3 Air Point Measure CPS	Value
Master		22.59
	13.30 (Minimum) 19.05 (Nominal) 24.70 (Maximum)	

Phase	Far 2 tube 3 Rod Point Measure CPS	Value
Master		5.775
	3.400 (Minimum) 4.857 (Nominal) 6.200 (Maximum)	

Phase	Far 2 tube 3 H2O Point Measure CPS	Value
Master		2.763
	1.600 (Minimum) 2.363 (Nominal) 3.100 (Maximum)	

Phase	Near 1 tube 1 Air Point Measure CPS	Value
Master		564.2
	345.0 (Minimum) 487.5 (Nominal) 595.0 (Maximum)	

Phase	Near 1 tube 1 Rod Point Measure CPS	Value
Master		891.3
	535.0 (Minimum) 768.8 (Nominal) 925.0 (Maximum)	

Phase	Near 1 tube 1 H2O Point Measure CPS	Value
Master		392.5
	230.0 (Minimum) 343.7 (Nominal) 430.0 (Maximum)	

Phase	Near 2 tube 1 Air Point Measure CPS	Value
Master		564.5
	345.0 (Minimum) 487.5 (Nominal) 595.0 (Maximum)	

Phase	Near 2 tube 1 Rod Point Measure CPS	Value
Master		882.6
	535.0 (Minimum) 768.8 (Nominal) 925.0 (Maximum)	

Phase	Near 2 tube 1 H2O Point Measure CPS	Value
Master		389.4
	230.0 (Minimum) 343.7 (Nominal) 430.0 (Maximum)	

Master: 20−Feb−2007 3:30

6.75−in. Azimuthal Density Neutron Calibration

Neutron: Water Block Check

Phase	Far Neutron water porosity PU	Value
Master		96.65
	90.00 (Minimum) 100.0 (Nominal) 125.0 (Maximum)	

6.75−in. Array Resistivity Compensated / Equipment Identification

Primary Equipment:

Tool Name and Serial Number	ARC6 − BA	1708
ARC675 Calibration Status	Valid	

Master: 20−Feb−2007 12:55

6.75−in. Array Resistivity Compensated Calibration

Resistivity: Air

Phase	Phase−Shift T1	Value
Master		1.807
	−3.900 (Minimum) 0.1000 (Nominal) 4.100 (Maximum)	

Phase	Phase−Shift T2	Value
Master		−1.724
	−3.900 (Minimum) 0.1000 (Nominal) 4.100 (Maximum)	

Phase	Phase−Shift T3	Value
Master		1.743
	−3.900 (Minimum) 0.1000 (Nominal) 4.100 (Maximum)	

Phase	Phase−Shift T4	Value
Master		−1.765
	−3.900 (Minimum) 0.1000 (Nominal) 4.100 (Maximum)	

Phase	Phase−Shift T5	Value
Master		1.722
	−3.900 (Minimum) 0.1000 (Nominal) 4.100 (Maximum)	

Phase	Phase−Shift T1 at 400KHz	Value
Master		−0.3166
	−3.900 (Minimum) 0.1000 (Nominal) 4.100 (Maximum)	

Phase	Phase−Shift T2 at 400KHz	Value
Master		0.2253
	−3.900 (Minimum) 0.1000 (Nominal) 4.100 (Maximum)	

Phase	Phase−Shift T3 at 400KHz	Value
Master		−0.2849
	−3.900 (Minimum) 0.1000 (Nominal) 4.100 (Maximum)	

Phase	Phase−Shift T4 at 400KHz	Value
Master		0.2122
	−3.900 (Minimum) 0.1000 (Nominal) 4.100 (Maximum)	

Phase	Phase−Shift T5 at 400KHz	Value
Master		−0.3014
	−3.900 (Minimum) 0.1000 (Nominal) 4.100 (Maximum)	

Master: 20−Feb−2007 12:55

6.75−in. Array Resistivity Compensated Calibration

Resistivity: Air

Phase	Attenuation T1	Value
Master		8.455
6.500 (Minimum)	8.500 (Nominal)	10.50 (Maximum)

Phase	Attenuation T2	Value
Master		6.487
4.500 (Minimum)	6.500 (Nominal)	8.500 (Maximum)

Phase	Attenuation T3	Value
Master		5.082
2.500 (Minimum)	4.500 (Nominal)	6.500 (Maximum)

Phase	Attenuation T4	Value
Master		4.394
2.600 (Minimum)	4.600 (Nominal)	6.600 (Maximum)

Phase	Attenuation T5	Value
Master		3.633
1.600 (Minimum)	3.600 (Nominal)	5.600 (Maximum)

Phase	Attenuation T1 at 400KHz	Value
Master		8.429
6.500 (Minimum)	8.500 (Nominal)	10.50 (Maximum)

Phase	Attenuation T2 at 400KHz	Value
Master		6.521
4.500 (Minimum)	6.500 (Nominal)	8.500 (Maximum)

Phase	Attenuation T3 at 400KHz	Value
Master		5.050
2.500 (Minimum)	4.500 (Nominal)	6.500 (Maximum)

Phase	Attenuation T4 at 400KHz	Value
Master		4.422
2.600 (Minimum)	4.600 (Nominal)	6.600 (Maximum)

Phase	Attenuation T5 at 400KHz	Value
Master		3.610
1.600 (Minimum)	3.600 (Nominal)	5.600 (Maximum)

Master: 20−Feb−2007 10:26

6.75−in. Array Resistivity Compensated Calibration

Gamma Ray: Blanket

Phase	Gamma ray factor (equals Calibration Gain multiplied by API Gain Factor) CPS	Value
Master		5.105
2.780 (Minimum)	4.800 (Nominal)	6.000 (Maximum)

SCHLUMBERGER

Survey report 25−Apr−2007 13:17:23 Page 1 of 5

Client.....: ESSO Australia Pty Ltd
Field.....: Fortescue

Well.....: FTA A28B
API number.....:
Engineer.....: MYT/MA/AK

RIG:.....: Australia
STATE:.....: Victoria

Spud date.....: 13−Apr−07
Last survey date.....: 25−Apr−07
Total accepted surveys...: 91
MD of first survey.....: 1510.00 m
MD of last survey.....: 4028.00 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.....: -62.50 m
KB above permanent.....: Top Drive
DF above permanent.....: 42.50 m

----- Vertical section origin----------------
Latitude (+N/S-).....: -0.40 m
Departure (+E/W-).....: 12.86 m

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

Azimuth from Vsect Origin to target: 58.12 degrees

----- Geomagnetic data ----------------------
Magnetic model.....: BGGM version 2006
Magnetic date.....: 15−Apr−2007
Magnetic field strength..: 1199.32 HCNT
Magnetic dec (+E/W-).....: 13.21 degrees
Magnetic dip.....: -68.87 degrees

----- MWD survey Reference Criteria ---------
Reference G.....: 1000.04 mGal
Reference H.....: 1199.32 HCNT
Reference Dip.....: -68.87 degrees
Tolerance of G.....: (+/-) 2.50 mGal
Tolerance of H.....: (+/-) 6.00 HCNT
Tolerance of Dip.....: (+/-) 0.45 degrees

----- Corrections ---------------------------
Magnetic dec (+E/W-).....: 13.21 degrees
Grid convergence (+E/W-).: -0.79 degrees
Total az corr (+E/W-).....: 14.00 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	1510.00	62.19	59.13	0.00	1137.42	785.12	434.79	666.78	796.01	56.89	0.00	TIP	None
2	1532.89	63.05	52.43	22.89	1147.96	805.41	446.22	683.57	816.32	56.86	8.00	PUP	None
3	1565.93	63.72	46.74	33.04	1162.77	834.61	465.36	706.04	845.61	56.61	4.73	PUP	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)
4	1594.65	64.06	45.15	28.72	1175.41	859.82	483.29	724.58	870.97	56.30	1.56	PUP	None
5	1623.06	62.22	45.19	28.41	1188.24	884.52	501.16	742.55	895.85	55.98	1.97	PUP	None
6	1651.67	59.71	44.94	28.61	1202.13	908.88	518.82	760.26	920.42	55.69	2.68	PUP	None
7	1680.34	57.23	45.49	28.67	1217.12	932.70	536.04	777.60	944.46	55.42	2.68	PUP	None
8	1708.57	55.48	47.73	28.23	1232.76	955.72	552.18	794.67	967.68	55.21	2.76	PUP	None
9	1737.32	54.25	50.31	28.75	1249.31	978.94	567.60	812.42	991.06	55.06	2.59	PUP	None
10	1765.83	53.66	50.95	28.51	1266.08	1001.79	582.23	830.24	1014.04	54.96	0.84	PUP	None
11	1795.02	54.04	51.81	29.19	1283.30	1025.20	596.94	848.65	1037.57	54.88	0.83	PUP	None
12	1823.97	54.63	52.48	28.95	1300.18	1048.59	611.37	867.22	1061.06	54.82	0.85	PUP	None
13	1852.37	55.57	52.62	28.40	1316.43	1071.77	625.53	885.71	1084.33	54.77	1.02	PUP	None
14	1880.93	56.37	52.61	28.56	1332.41	1095.33	639.90	904.52	1107.99	54.72	0.85	PUP	None
15	1908.73	57.50	52.51	27.80	1347.58	1118.52	654.07	923.02	1131.27	54.68	1.24	PUP	None
16	1935.76	58.29	52.40	27.03	1361.95	1141.30	668.02	941.17	1154.15	54.63	0.90	PUP	None
17	1964.37	58.67	53.97	28.61	1376.91	1165.60	682.63	960.70	1178.53	54.60	1.48	PUP	None
18	1992.89	58.15	55.87	28.52	1391.85	1189.85	696.59	980.58	1202.82	54.61	1.82	PUP	None
19	2021.31	58.18	58.06	28.42	1406.84	1213.99	709.76	1000.82	1226.94	54.66	2.00	PUP	None
20	2049.29	58.56	60.27	27.98	1421.51	1237.81	721.96	1021.27	1250.69	54.74	2.09	PUP	None
21	2078.38	59.17	60.77	29.09	1436.55	1262.69	734.22	1042.95	1275.47	54.86	0.78	PUP	None
22	2106.64	58.35	61.54	28.26	1451.21	1286.81	745.88	1064.11	1299.48	54.97	1.13	PUP	None
23	2134.81	59.28	61.44	28.17	1465.80	1310.87	757.38	1085.29	1323.43	55.09	1.01	PUP	None
24	2163.43	59.12	61.37	28.62	1480.45	1335.42	769.14	1106.87	1347.87	55.21	0.18	PUP	None
25	2191.50	58.93	61.28	28.07	1494.90	1359.44	780.69	1127.99	1371.80	55.31	0.22	PUP	None
26	2219.28	57.20	61.04	27.78	1509.59	1382.99	792.06	1148.64	1395.25	55.41	1.91	PUP	None
27	2247.24	57.74	61.80	27.96	1524.63	1406.52	803.34	1169.34	1418.70	55.51	0.91	PUP	None
28	2275.30	57.91	61.86	28.06	1539.57	1430.22	814.55	1190.28	1442.31	55.61	0.19	PUP	None
29	2303.33	58.49	61.03	28.03	1554.34	1454.00	825.94	1211.20	1466.01	55.71	0.99	PUP	None
30	2331.05	58.42	61.27	27.72	1568.84	1477.59	837.34	1231.89	1489.53	55.80	0.24	PUP	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	2359.97	58.25	60.44	28.92	1584.02	1502.18	849.33	1253.39	1514.05	55.88	0.77	PUP	None
32	2388.94	58.33	61.36	28.97	1599.25	1526.80	861.31	1274.92	1538.60	55.96	0.83	PUP	None
33	2417.09	58.35	61.82	28.15	1614.03	1550.71	872.71	1296.00	1562.45	56.04	0.42	PUP	None
34	2446.23	58.18	61.23	29.14	1629.35	1575.45	884.53	1317.78	1587.12	56.13	0.55	PUP	None
35	2474.29	58.26	61.62	28.06	1644.13	1599.27	895.94	1338.73	1610.87	56.21	0.37	PUP	None
36	2503.07	58.11	61.86	28.78	1659.31	1623.67	907.52	1360.27	1635.21	56.29	0.27	PUP	None
37	2531.61	58.18	61.17	28.54	1674.37	1647.87	919.08	1381.58	1659.36	56.37	0.63	PUP	None
38	2559.83	58.07	59.75	28.22	1689.27	1671.81	930.89	1402.43	1683.26	56.42	1.31	PUP	None
39	2588.54	58.21	61.04	28.71	1704.43	1696.18	942.94	1423.63	1707.59	56.48	1.17	PUP	None
40	**2616.81**	**58.89**	**61.12**	**28.27**	**1719.18**	**1720.26**	**954.60**	**1444.74**	**1731.63**	**56.55**	**0.74**	**PUP**	**None**
41	2645.21	58.81	60.83	28.40	1733.87	1744.54	966.39	1465.99	1755.86	56.61	0.28	PUP	None
42	2674.23	58.35	61.39	29.02	1748.99	1769.27	978.36	1487.67	1780.55	56.67	0.70	PUP	None
43	2702.69	58.22	60.77	28.46	1763.96	1793.45	990.07	1508.86	1804.69	56.73	0.58	PUP	None
44	2731.35	58.30	60.90	28.66	1779.03	1817.79	1001.94	1530.15	1829.00	56.78	0.15	PUP	None
45	2760.12	57.87	60.16	28.77	1794.24	1842.19	1013.96	1551.41	1853.37	56.83	0.81	PUP	None
46	2789.62	58.03	60.62	29.51	1809.90	1867.19	1026.32	1573.15	1878.33	56.88	0.44	PUP	None
47	2818.05	58.21	61.00	28.42	1824.91	1891.29	1038.09	1594.22	1902.41	56.93	0.40	PUP	None
48	2846.69	58.07	59.97	28.64	1840.03	1915.60	1050.07	1615.39	1926.69	56.97	0.94	PUP	None
49	2875.22	58.01	60.80	28.53	1855.13	1939.78	1062.03	1636.43	1950.85	57.02	0.76	PUP	None
50	2903.25	58.13	61.37	28.03	1869.96	1963.54	1073.53	1657.26	1974.58	57.07	0.54	PUP	None
51	2931.79	58.05	60.69	28.54	1885.04	1987.73	1085.27	1678.45	1998.75	57.11	0.62	PUP	None
52	2960.30	57.98	60.21	28.51	1900.14	2011.90	1097.19	1699.49	2022.89	57.15	0.44	PUP	None
53	2987.61	58.21	60.42	27.31	1914.58	2035.06	1108.67	1719.63	2046.04	57.19	0.32	PUP	None
54	3016.45	58.09	60.85	28.84	1929.80	2059.54	1120.69	1740.98	2070.50	57.23	0.41	PUP	None
55	3044.54	58.17	59.96	28.09	1944.63	2083.37	1132.47	1761.72	2094.31	57.27	0.82	PUP	None
56	3072.56	57.94	60.59	28.02	1959.45	2107.13	1144.26	1782.37	2118.06	57.30	0.63	PUP	None
57	3101.48	58.29	60.53	28.92	1974.73	2131.67	1156.33	1803.76	2142.58	57.34	0.37	PUP	None
58	3129.80	58.12	60.29	28.32	1989.65	2155.72	1168.21	1824.69	2166.61	57.37	0.29	PUP	None
59	3157.71	58.34	60.16	27.91	2004.35	2179.43	1180.00	1845.28	2190.31	57.40	0.27	PUP	None
60	3185.72	58.32	60.83	28.01	2019.05	2203.25	1191.74	1866.03	2214.11	57.44	0.62	PUP	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	3214.45	58.11	61.54	28.73	2034.19	2227.63	1203.51	1887.43	2238.48	57.48	0.68	PUP	None
62	3243.42	58.11	60.81	28.97	2049.49	2252.20	1215.37	1908.98	2263.03	57.52	0.65	PUP	None
63	3271.41	58.20	60.46	27.99	2064.26	2275.95	1227.03	1929.70	2286.77	57.55	0.34	PUP	None
64	3300.01	58.20	61.96	28.60	2079.33	2300.22	1238.73	1951.00	2311.03	57.59	1.36	PUP	None
65	3328.86	58.32	61.14	28.85	2094.51	2324.71	1250.42	1972.57	2335.51	57.63	0.75	PUP	None
66	3357.36	58.12	60.84	28.50	2109.52	2348.91	1262.17	1993.76	2359.69	57.66	0.35	PUP	None
67	3385.22	58.09	60.22	27.86	2124.24	2372.54	1273.81	2014.35	2383.32	57.69	0.58	PUP	None
68	3413.51	58.15	60.96	28.29	2139.18	2396.54	1285.60	2035.28	2407.31	57.72	0.68	PUP	None
69	3440.34	57.96	60.58	26.83	2153.37	2419.28	1296.72	2055.15	2430.04	57.75	0.43	PUP	None
70	3470.33	58.24	60.94	29.99	2169.22	2444.72	1309.16	2077.36	2455.47	57.78	0.42	PUP	None
71	3498.71	58.04	60.79	28.38	2184.20	2468.79	1320.89	2098.42	2479.54	57.81	0.25	PUP	None
72	3527.31	58.16	60.95	28.60	2199.32	2493.05	1332.71	2119.63	2503.78	57.84	0.19	PUP	None
73	3556.12	58.03	61.21	28.81	2214.54	2517.47	1344.54	2141.03	2528.20	57.87	0.27	PUP	None
74	3584.85	58.29	61.34	28.73	2229.70	2541.84	1356.27	2162.44	2552.57	57.90	0.30	PUP	None
75	3613.02	58.08	60.68	28.16	2244.54	2565.74	1367.87	2183.37	2576.46	57.93	0.65	PUP	None
76	3640.33	58.36	60.58	27.32	2258.93	2588.94	1379.26	2203.61	2599.66	57.96	0.33	PUP	None

77	3669.16	57.96	60.17	28.83	2274.14	2613.41	1391.36	2224.90	2624.13	57.98	0.56	PUP	None
78	3697.29	58.09	60.45	28.13	2289.04	2637.26	1403.18	2245.63	2647.97	58.00	0.29	PUP	None
79	3725.12	58.19	61.52	27.83	2303.73	2660.87	1414.65	2266.30	2671.58	58.03	1.00	PUP	None
80	3725.78	58.21	61.55	0.66	2304.08	2661.43	1414.91	2266.79	2672.14	58.03	1.50	PUP	None
81	3753.30	58.25	61.69	27.51	2318.56	2684.77	1426.03	2287.37	2695.48	58.06	0.14	PUP	None
82	3782.00	58.25	60.97	28.71	2333.67	2709.15	1437.74	2308.79	2719.85	58.09	0.65	PUP	None
83	3810.68	58.04	60.10	28.68	2348.80	2733.48	1449.73	2330.00	2744.19	58.11	0.82	PUP	None
84	3838.68	57.89	60.77	28.00	2363.66	2757.20	1461.44	2350.64	2767.91	58.13	0.64	PUP	None
85	3867.47	57.98	60.06	28.79	2378.94	2781.58	1473.48	2371.86	2792.29	58.15	0.64	PUP	None
86	3895.71	58.50	60.53	28.24	2393.81	2805.57	1485.38	2392.72	2816.28	58.17	0.71	PUP	None
87	3923.87	58.32	61.41	28.16	2408.56	2829.53	1497.02	2413.69	2840.24	58.19	0.83	PUP	None
88	3952.47	58.33	61.49	28.60	2423.57	2853.83	1508.65	2435.07	2864.54	58.22	0.07	PUP	None
89	3980.39	58.05	60.35	27.92	2438.29	2877.53	1520.18	2455.80	2888.24	58.24	1.10	PUP	None
90	4009.51	58.01	60.88	29.12	2453.71	2902.21	1532.31	2477.33	2912.92	58.26	0.47	PUP	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	4028.00	57.98	61.22	18.49	2463.51	2917.86	1539.90	2491.05	2928.58	58.28	0.48	Projection to TD	

Company: **ESSO Australia Pty Ltd**

Schlumberger

Well: **FTA A28B**

Field: **Fortescue**

Rig: **ISDL 175**

8.5 in. Section

State: **Victoria**

VISION Service

1:200 Measured Depth

Recorded Mode Log