Schlumberger

Company: **ESSO Australia Pty Ltd**

8.5 in. Section

Well: **FTA A9b**
Field: **Fortescue**
Rig: **ISDL 175** State: **Victoria**

Rig: ISDL 175
Field: Fortescue
Location: Bass Strait
Well: FTA A9b
Company: ESSO Australia Pty Ltd

VISION Resistivity
1:200 True Vertical Depth
Recorded Mode Log

Location			Elevation		
Total depth:	3746.0 m		K.B.	Top Drive	
Spud date:	15−Aug−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 611,590.35 m	Longitude	Latitude
07ASQ0019	Y = N 5,748,242.36 m	E 148° 16' 41.061"	S 38° 24' 25.534"

Depth logged:	1545.5 m To 3735.6 m	Mag decl:	13.209 deg.	Other services:	
Date logged:	21−Aug−07 To 25−Aug−07	Mag dip:	−68.861 deg.	See Remarks	

Bore hole record			Casing record			
Hole size	from	to	Size	Density	from	to
8.5 in.	1581.0 m	3746.0 m	10.75 in.	40.5 lb/ft	19.9 m	1389.0 m

Mud record			Borehole deviation record			
Type	from	to	Min	Max	from	to
Accolade SBM	1581.0 m	3746.0 m	49.25 deg.	53.16 deg.	1581.0 m	3746.0 m

Surface equipment		Software record			
Unit	Esso Office Unit	IDEAL Wis	ID12_0c_12		
Depth system	PDA	SPM	hspm_12_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	3746.0
Top interval logged	m	1545.5
Bottom interval logged	m	3735.6
Begin log: time		07:57
Begin log: date		21−Aug−07
End log: time		00:32
End log: date		25−Aug−07
Mud data		
Depth	m	3713.0
Type		Accolade SBM
Mud weight	ppg	10.7
Solids	%	15.7
Chlorides	mg/L	46,066
Rm	ohm.m@°C	1000
Rmf	ohm.m@°C	n/a
Rmc	ohm.m@°C	n/a

Potassium	%	n/a									
Environmental data											
GR											
Mud weight	ppg	10.7									
Bit size	in.	8.5									
Resistivity											
Neutron porosity											
Hole Size	in.	8.5									
Mud weight	ppg	10.7									
Temperature	°C	93									
Mud salinity	ppk	57.5									
Formation salinity		n/a									
Recording rate 1	SEC	5 (ADN, SON)									
Recording rate 2	SEC	6 (ARC)									
Filtering GR		3 pts									
Filtering density		3 pts									
Filtering Neutron		3 pts									
Company representative		G. Doty	G. Campbell								
Schlumberger D&M Personnel		M. Y. Tan	C. Skiba	C. Hibberson	C. Soper	M. How					

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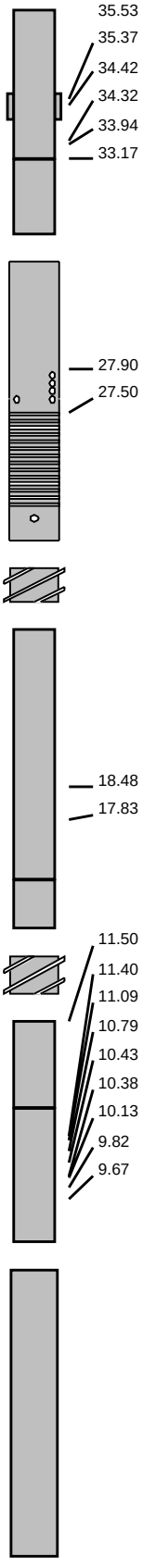
OTHER SERVICES FOR RUN2	OTHER SERVICES FOR RUN	OTHER SERVICES FOR RUN
Directional Drilling Directional Surveys Annular Pressure & Temperature Shock & Vibrations		
REMARKS: RUN NUMBER 2	REMARKS: RUN NUMBER	REMARKS: RUN NUMBER
Depth is referenced to Driller's Depth. Gamma ray is corrected to mud weight, 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. POOH due to reaching TD of FTA A9b.		

EQUIPMENT DESCRIPTION

RUN2	RUN	RUN

DOWNHOLE EQUIPMENT



6−3/4'' adnVISION* — 37.14
DHS: V8.3A02
Blade OD: 8−1/4''
S/N: 373

Neutron F	35.53
Neutron N	35.37
Density S	34.42
Density L	34.32
UltraSonic	33.94
R−O Port	33.17

6−3/4'' sonicVISION'' — 31.16
DHS: V6.6B04
S/N: 649

Delta−T	27.90
R−O port	27.50

8−3/8'' ILS — 23.71
S/N: OSS060187F

6−3/4'' Telescope* — 22.82
MDC: FA27
MEC: 373
MDI: 1565
MVC: 282

D&I	18.48
MVC	17.83

8−3/8'' ILS — 14.82
S/N: OSS0701135

6−3/4'' arcVISION* — 13.82
DHS: V9.3B13
S/N: FY68

R−O Port	11.50
T5	11.40
T3	11.09
T1	10.79
Gamma Ray	10.43
Receiver	10.38
T2	10.13
T4	9.82
ARC APRS	9.67

6−3/4'' PowerDrive Xceed* — 7.91
S/N: 162

8−1/2'' Reed−Hycalog PDC Bit — 0.25
S/N: 214577

	0.00

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)	93.000000
BSAL_RM	Mud Salinity (RM)	57.508289
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)	10.700000
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)	3746.000000
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	8.980860
A14A	ARC Air Cal Attenuation From T1 at 400 KHz	8.986440
A22A	ARC Air Cal Attenuation From T2 at 2 MHz	5.964700
A24A	ARC Air Cal Attenuation From T2 at 400 KHz	5.966310
A32A	ARC Air Cal Attenuation From T3 at 2 MHz	5.607090
A34A	ARC Air Cal Attenuation From T3 at 400 KHz	5.602970
A42A	ARC Air Cal Attenuation From T4 at 2 MHz	3.871990
A44A	ARC Air Cal Attenuation From T4 at 400 KHz	3.869330
A52A	ARC Air Cal Attenuation From T5 at 2 MHz	4.157310
A54A	ARC Air Cal Attenuation From T5 at 400 KHz	4.162690
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	1.039250
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	FY68
AZMF	Formation DIP Azimuth	0.000000
BH_COMPUTE	Borehole Inversion Computation Option	YES
CALG	ARC Gamma Ray Cal Gain Factor	1.039250
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	1.019090
P14A	ARC Air Cal Phase-Shift From T1 at 400 KHz	-0.350909
P22A	ARC Air Cal Phase-Shift From T2 at 2 MHz	-0.927967
P24A	ARC Air Cal Phase-Shift From T2 at 400 KHz	0.284876
P32A	ARC Air Cal Phase-Shift From T3 at 2 MHz	0.923579
P34A	ARC Air Cal Phase-Shift From T3 at 400 KHz	-0.322901
P42A	ARC Air Cal Phase-Shift From T4 at 2 MHz	-0.977645
P44A	ARC Air Cal Phase-Shift From T4 at 400 KHz	0.287438
P52A	ARC Air Cal Phase-Shift From T5 at 2 MHz	0.906331
P54A	ARC Air Cal Phase-Shift From T5 at 400 KHz	-0.357818
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)	Default
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	48.272999
DTIK_SEL	ADN: Density Tick Channel Name	LSAZ
DTMUD	Delta-T for Mud	212.289993
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	0.000000
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_11

IDF

Format: VISION Resistivity 2MHz **Vertical Scale: 1:200** **Graphics File Created: 29-Aug-2007 17:35**

	ARC Phase-Shift Resistivity 40-in. at 2 MHz (P40H)	ARC Attenuation Resistivity 40-in. at 2 MHz (A40H)
	0.2 (OHMM) 2000	0.2 (OHMM) 2000
	ARC Phase-Shift Resistivity 34-in. at 2 MHz (P34H)	ARC Attenuation Resistivity 34-in. at 2 MHz (A34H)
	0.2 (OHMM) 2000	0.2 (OHMM) 2000
Rate of Penetration, Averaged over Last 5ft (ROP5_RM)	ARC Phase-Shift Resistivity 28-in. at 2 MHz (P28H)	ARC Attenuation Resistivity 28-in. at 2 MHz (A28H)
200 (M/HR) 0	0.2 (OHMM) 2000	0.2 (OHMM) 2000

ARC Resistivity Time After Bit (TAB_ARC_RES)
0 (HR) 10

ARC Gamma Ray (GR_ARC)
0 (GAPI) 200

ARC Phase−Shift Resistivity 22−in. at 2 MHz (P22H)
0.2 (OHMM) 2000

ARC Attenuation Resistivity 22−in. at 2 MHz (A22H)
0.2 (OHMM) 2000

ARC Phase−Shift Resistivity 16−in. at 2 MHz (P16H)
0.2 (OHMM) 2000

ARC Attenuation Resistivity 16−in. at 2 MHz (A16H)
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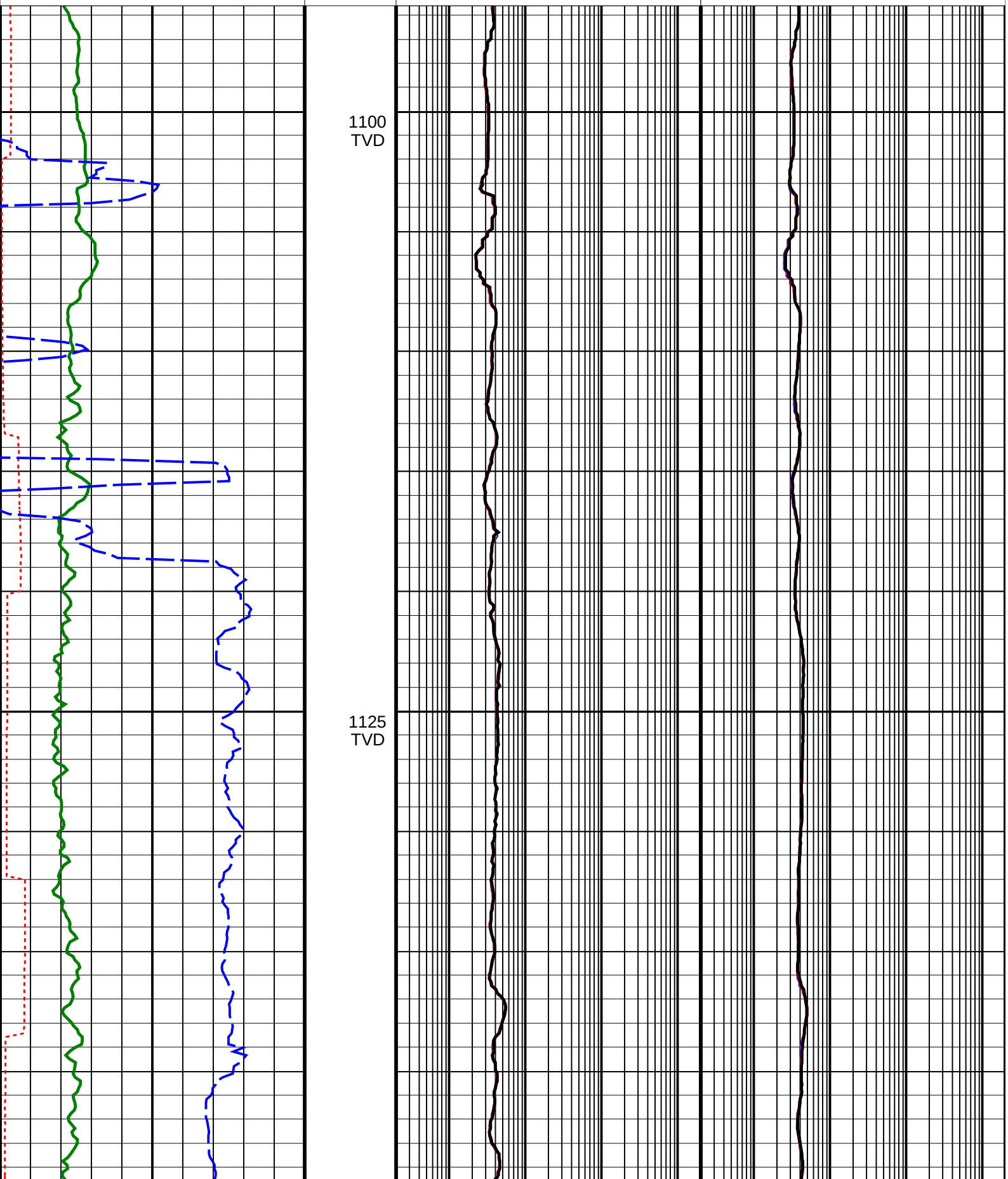

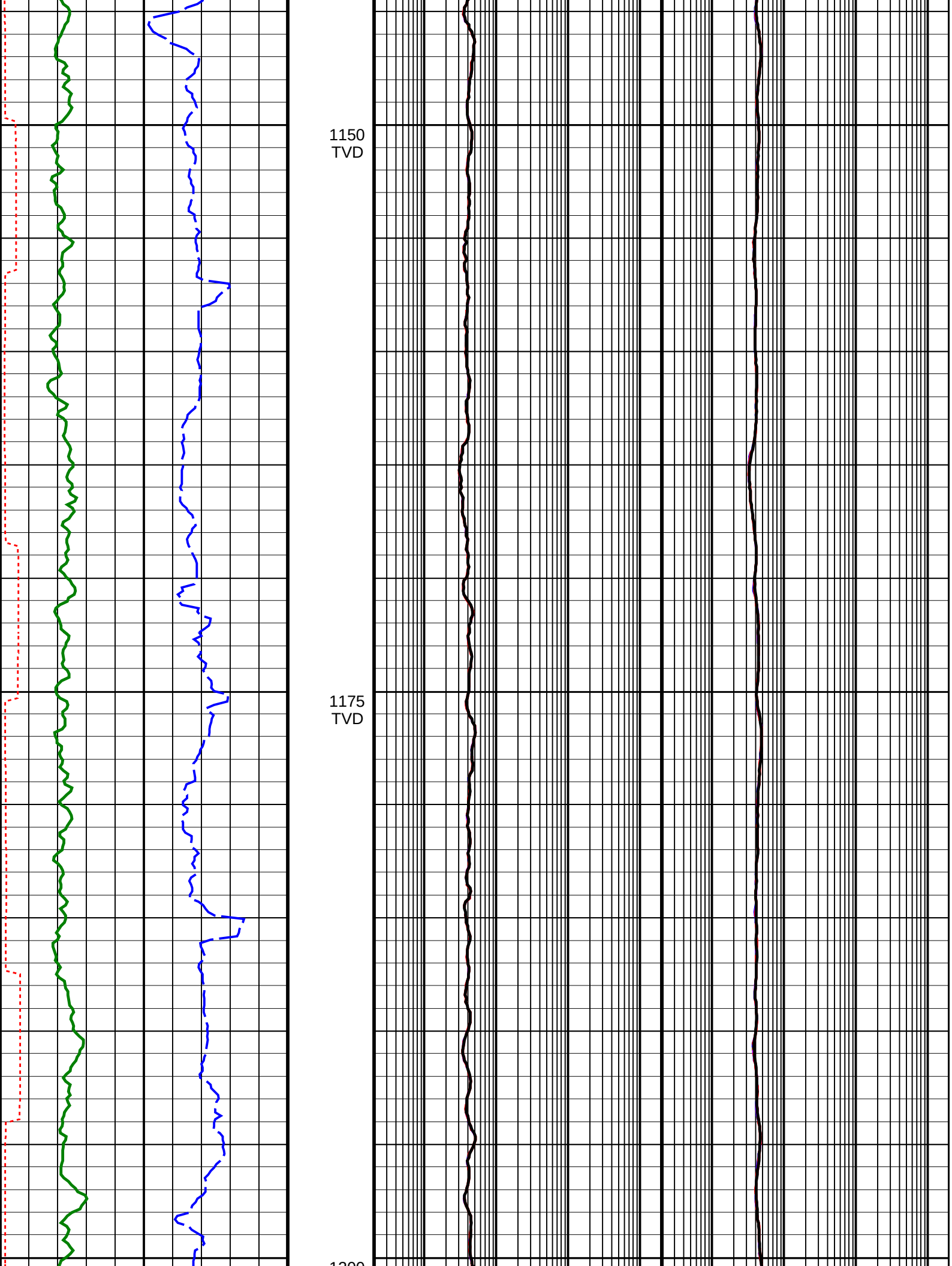
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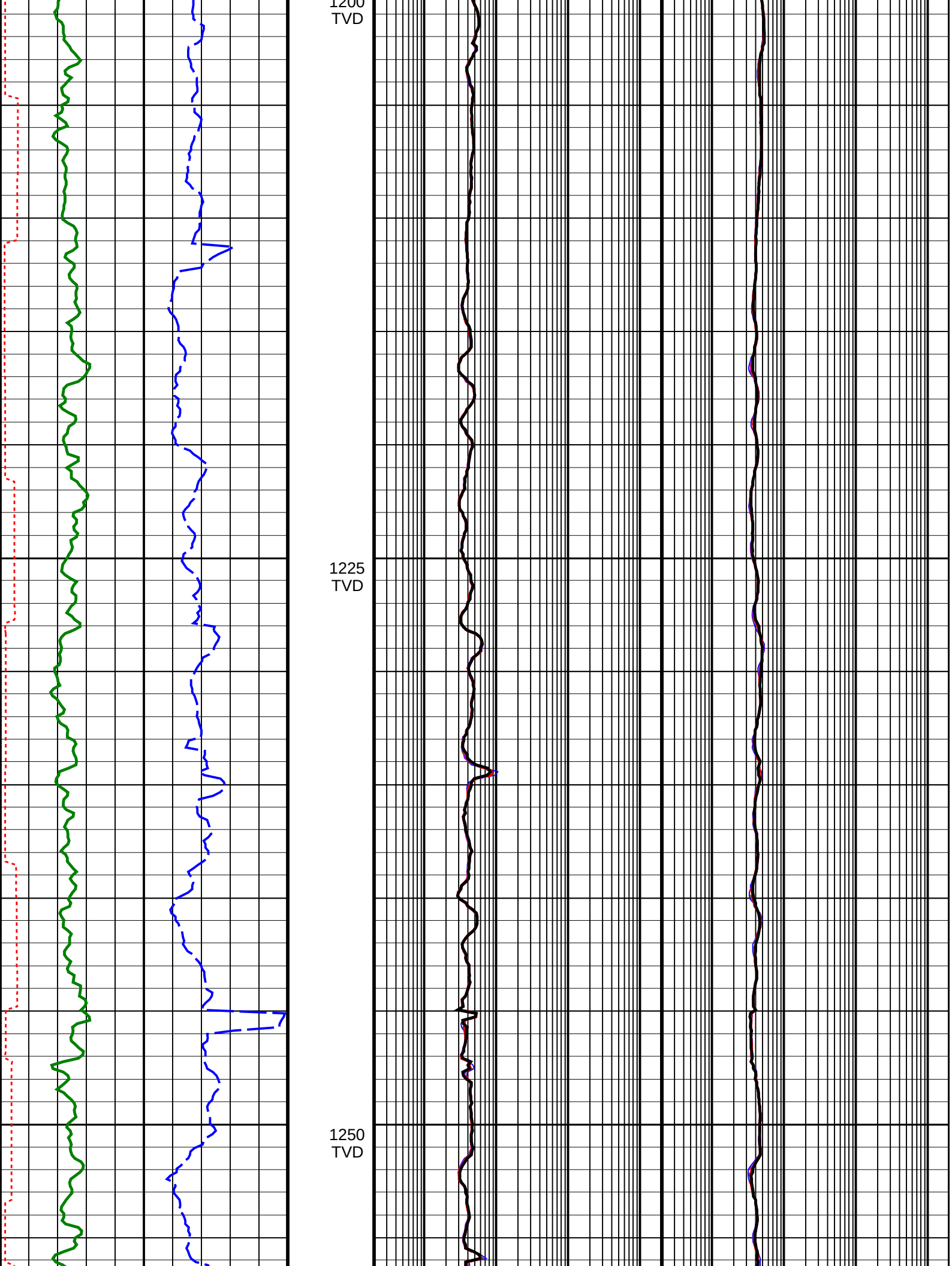
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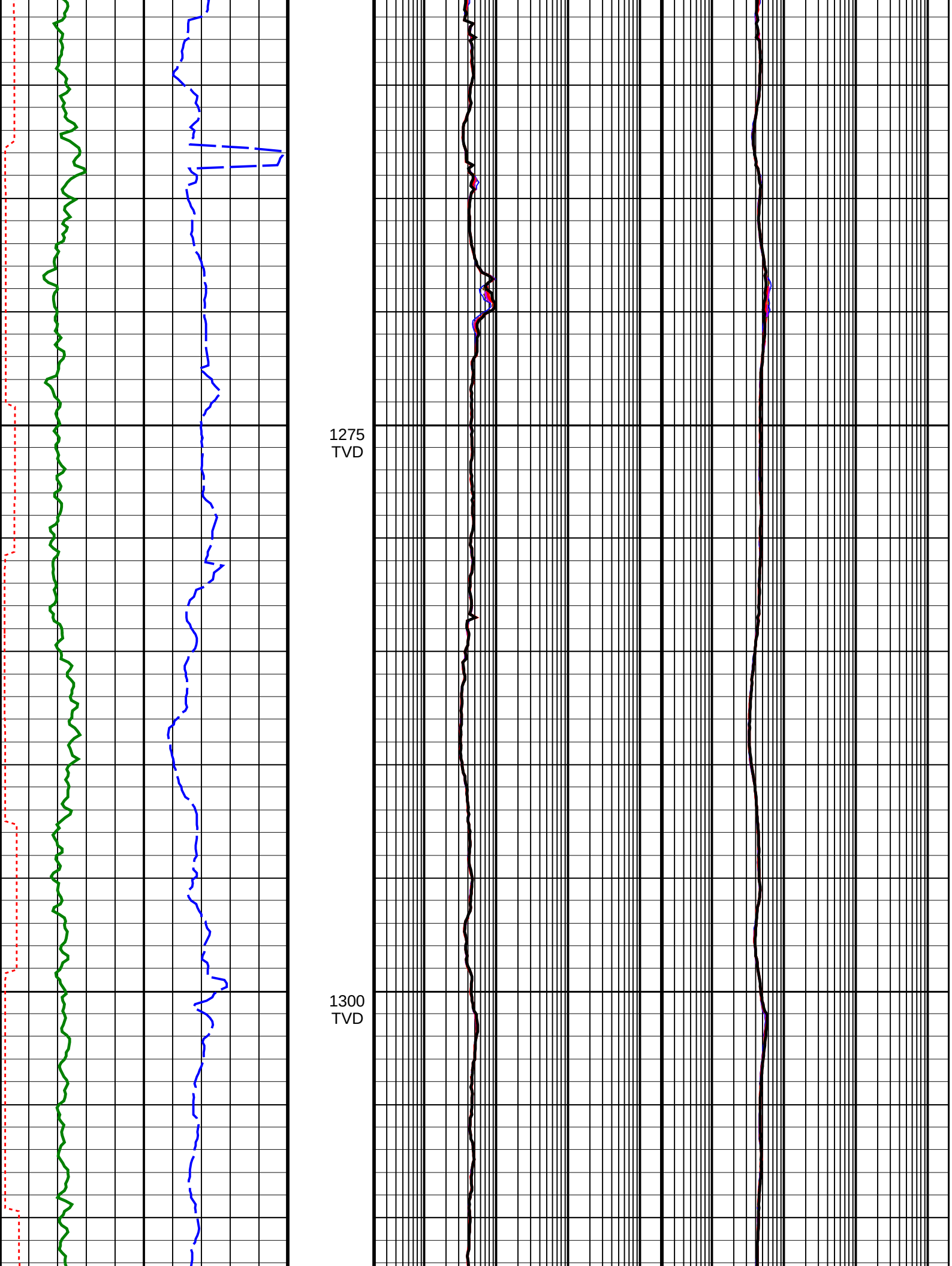
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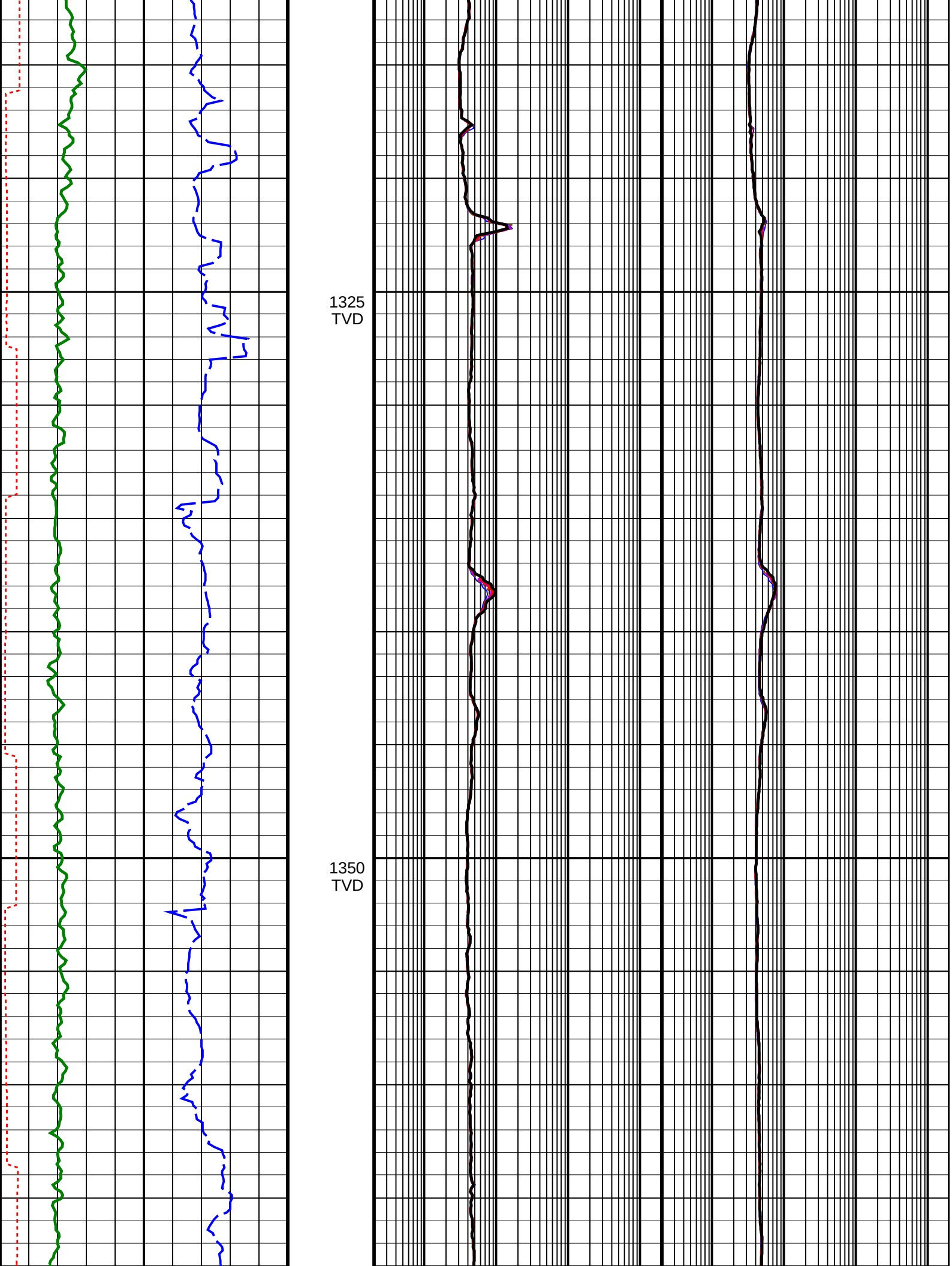
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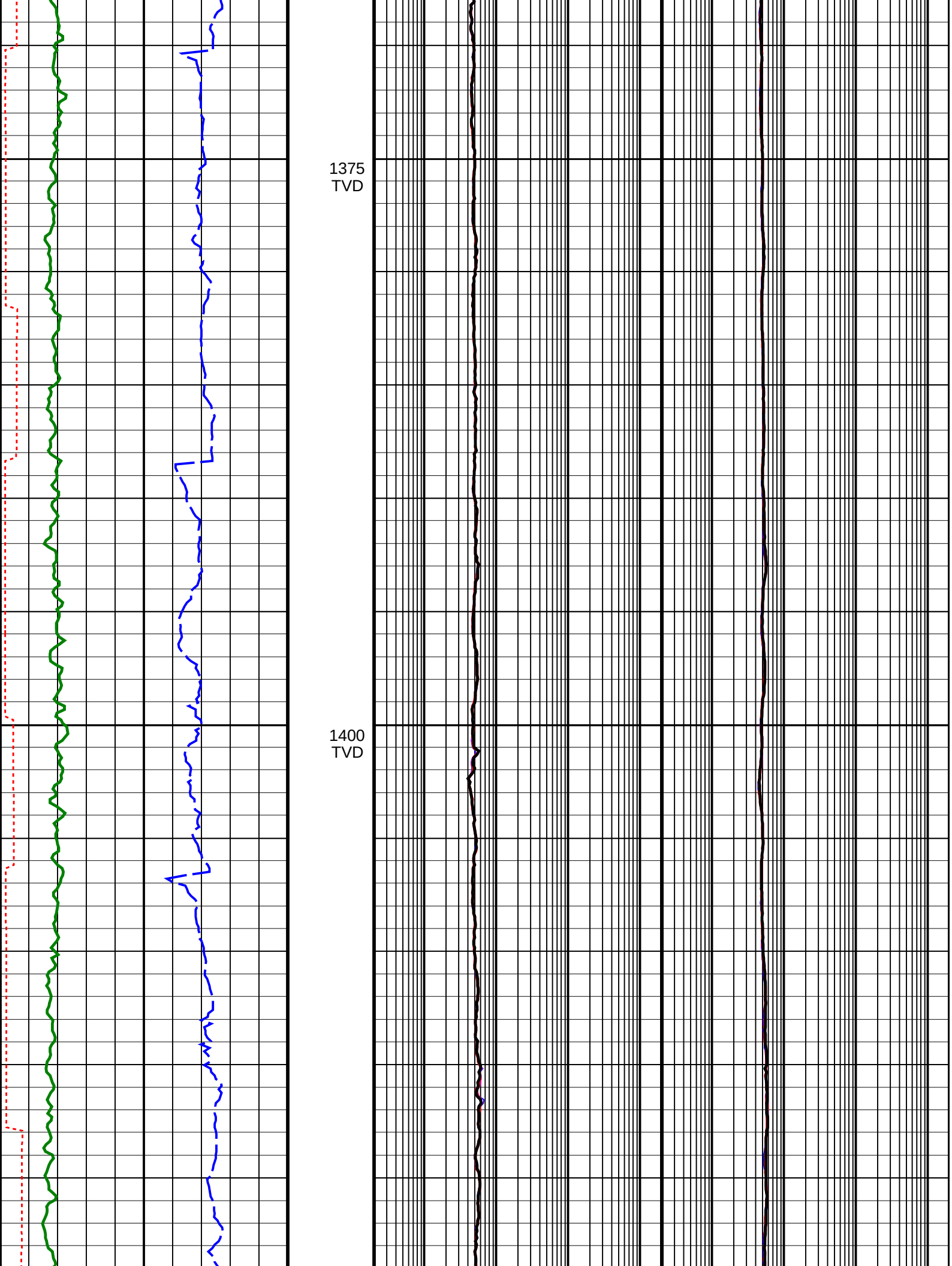
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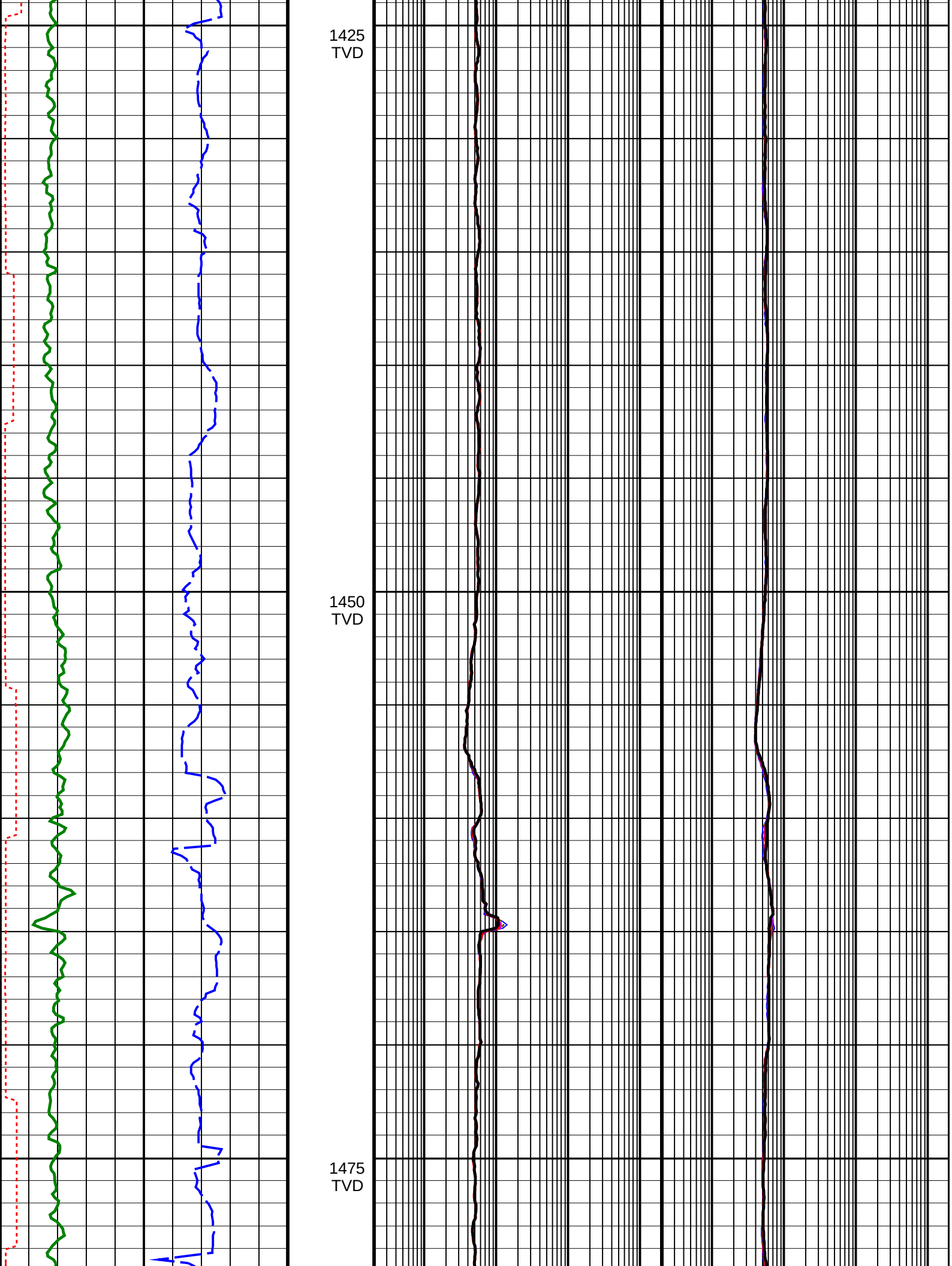
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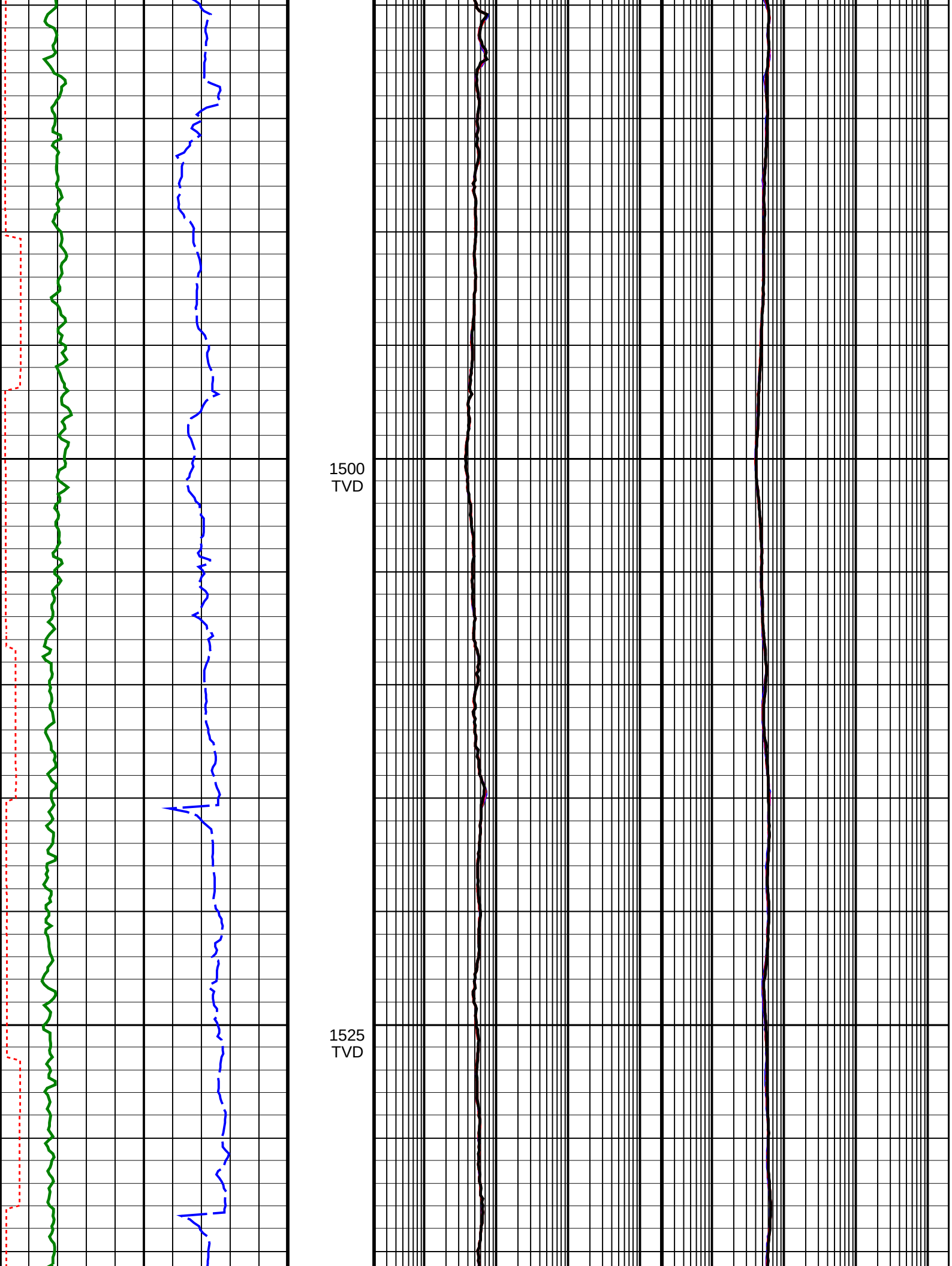
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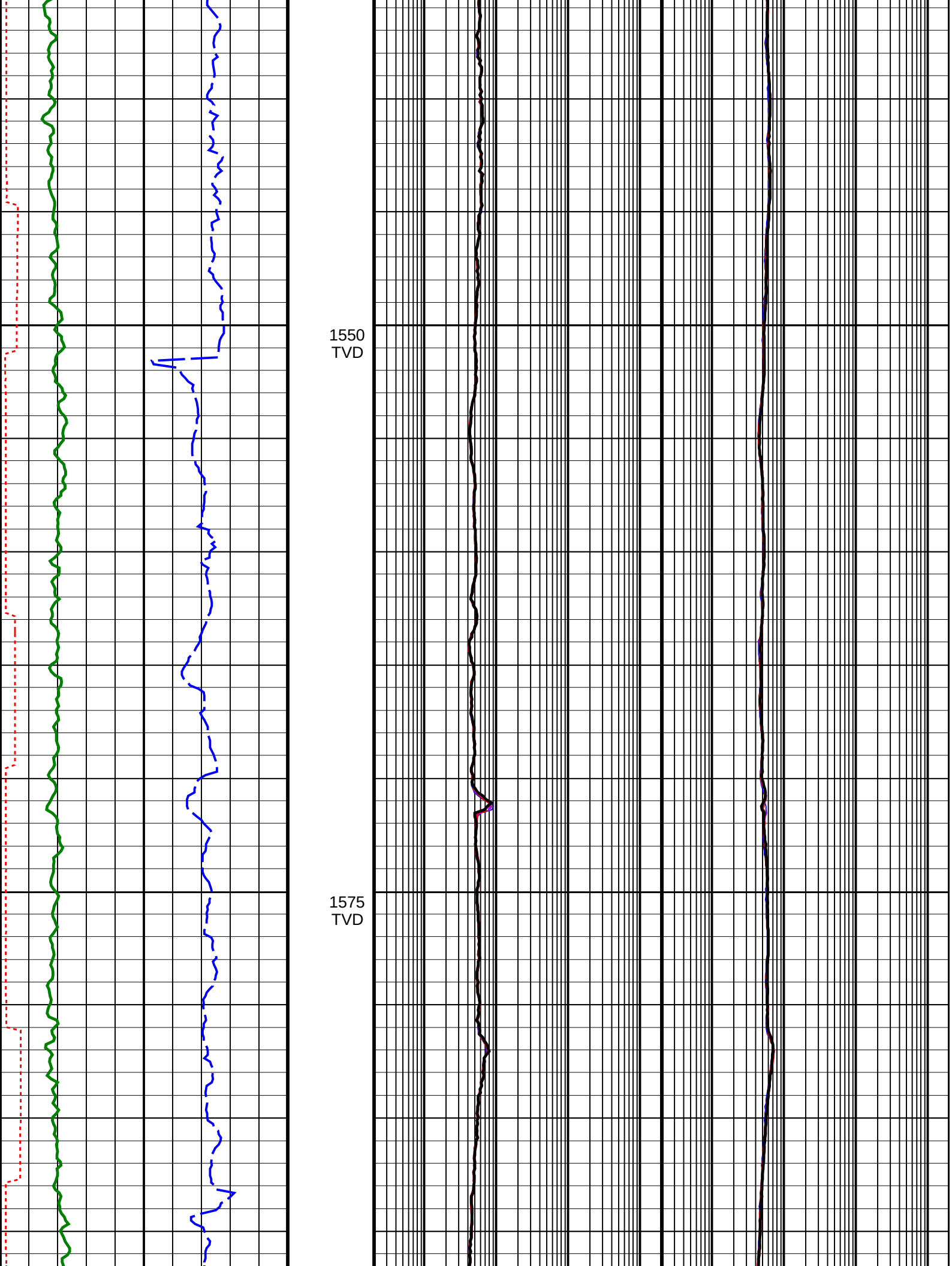
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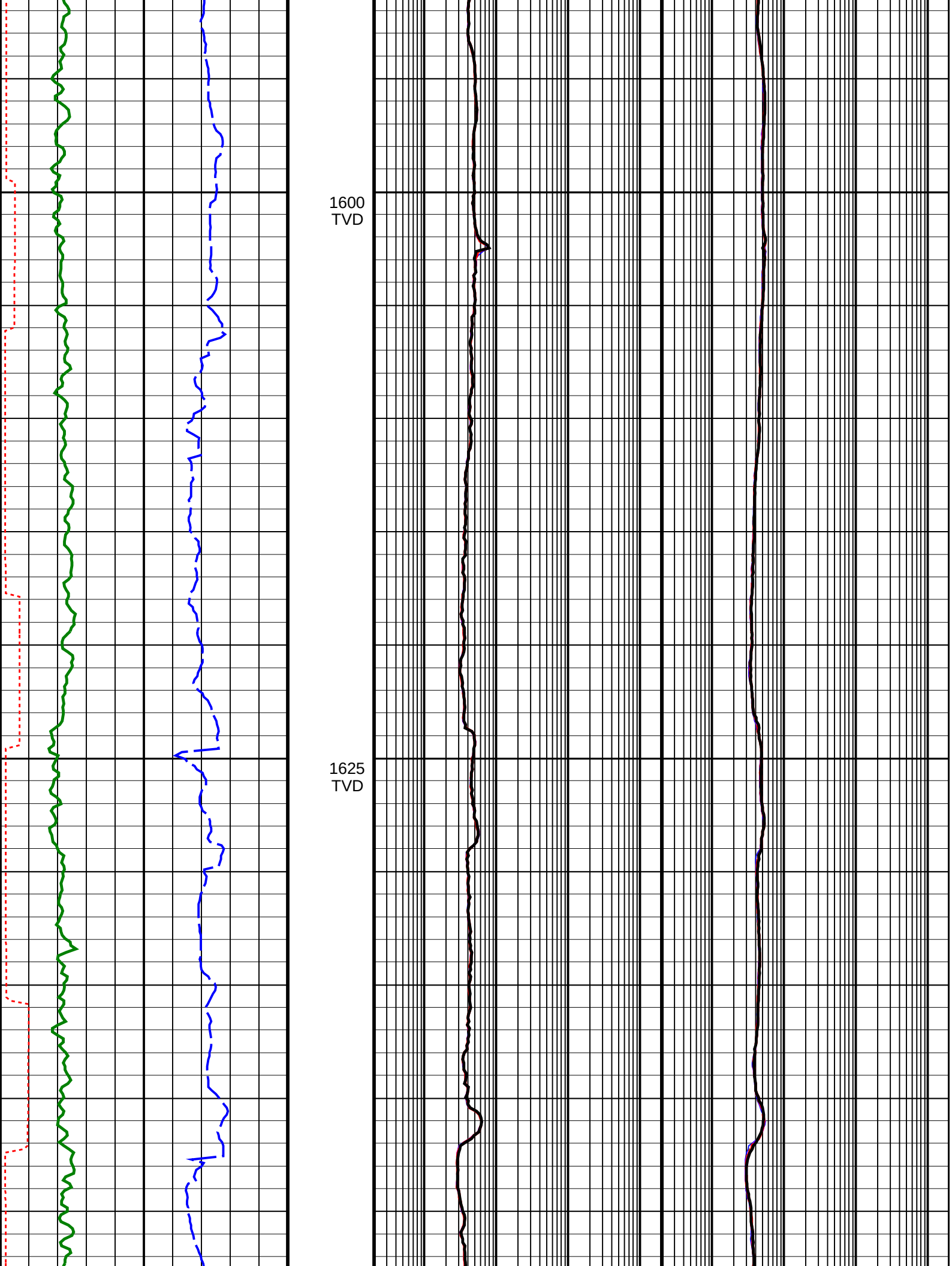
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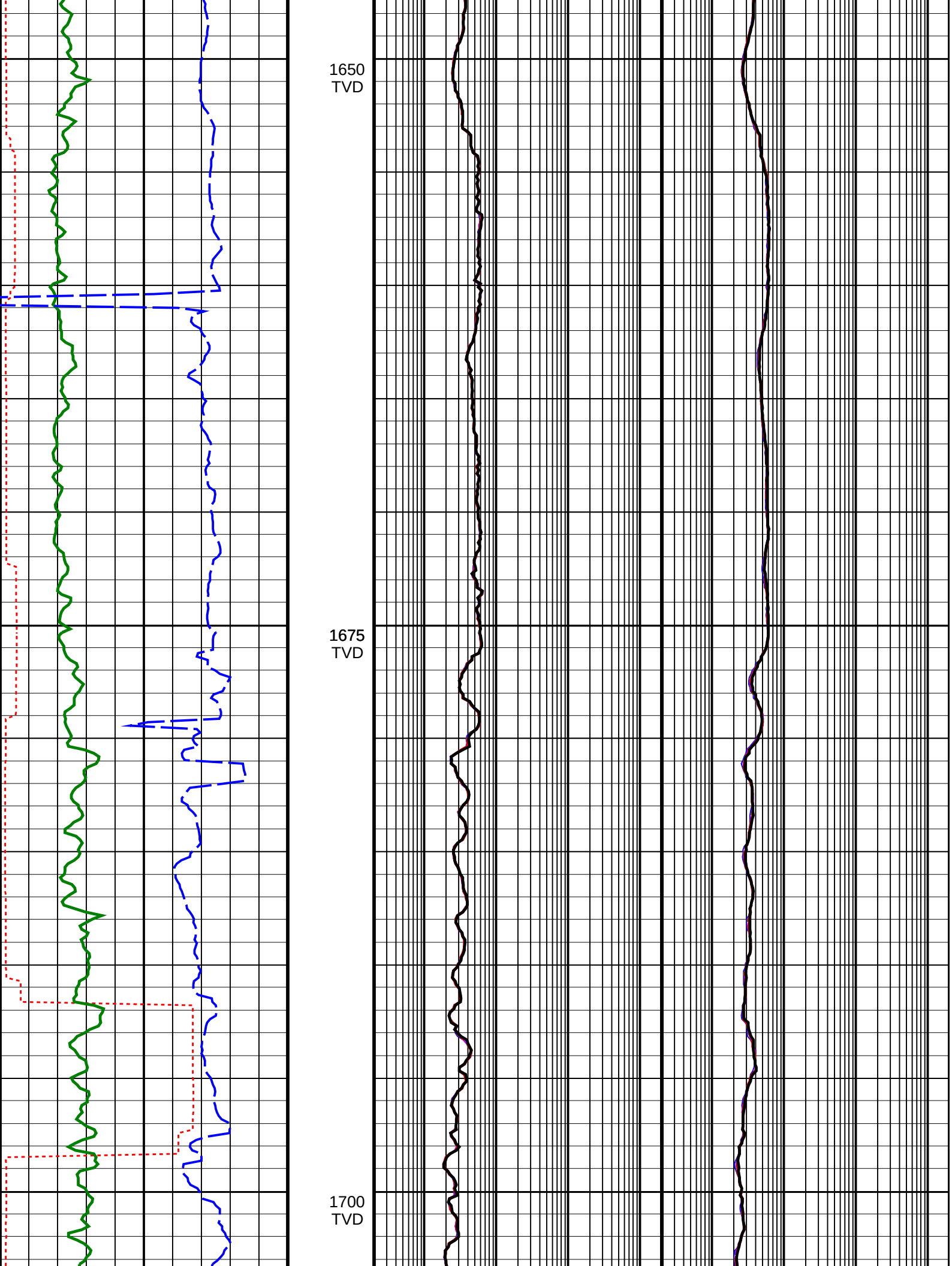
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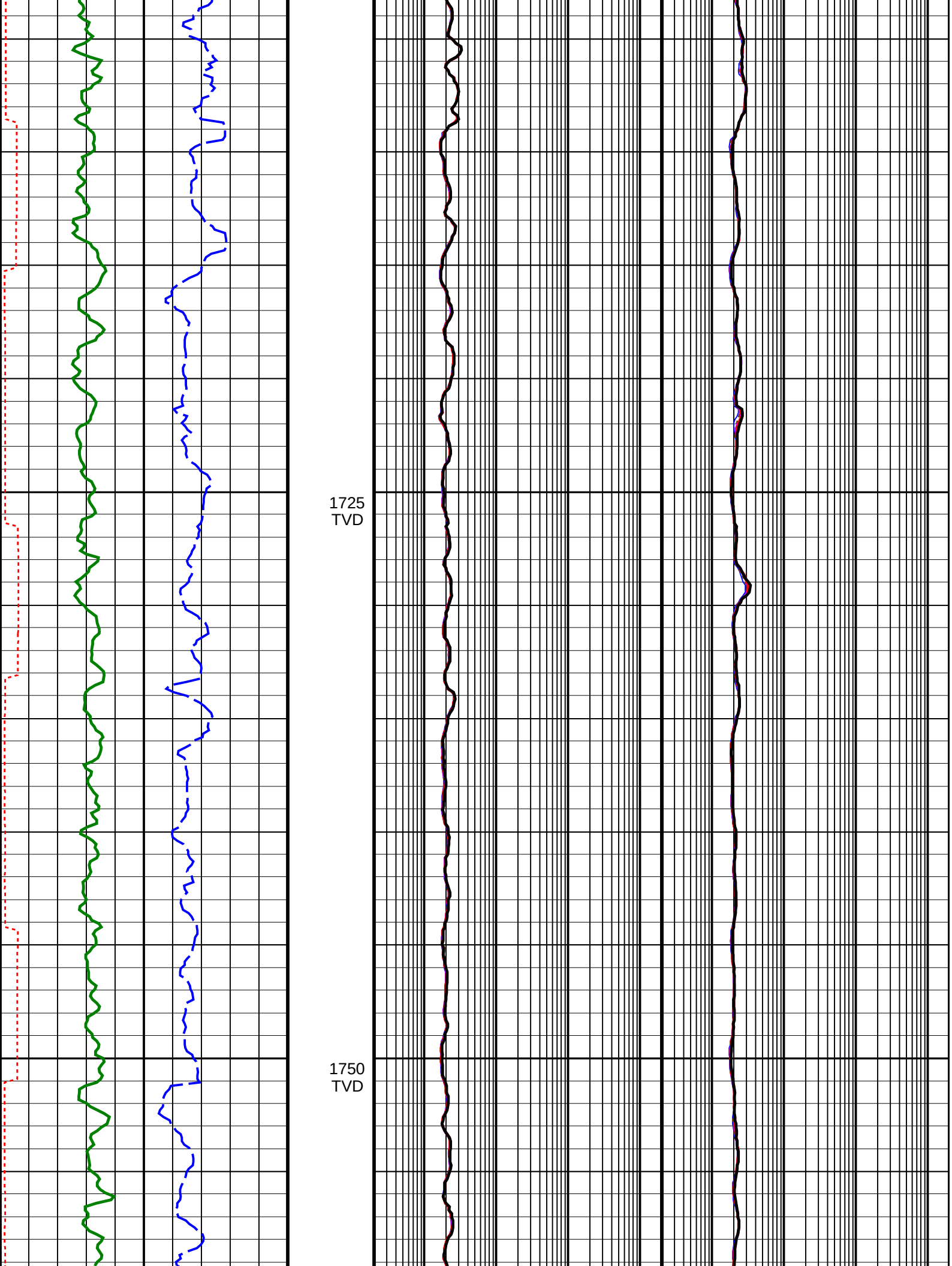
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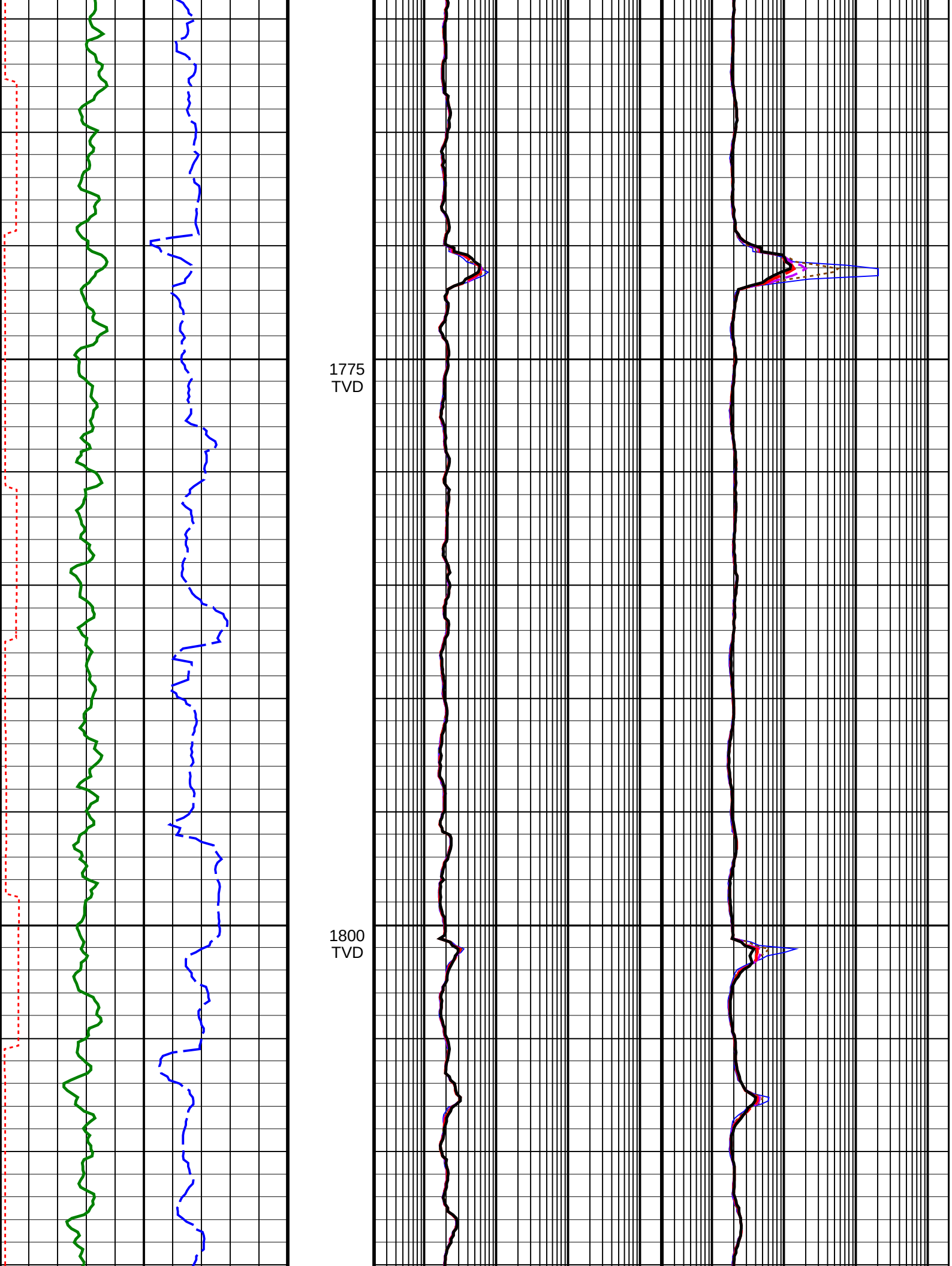
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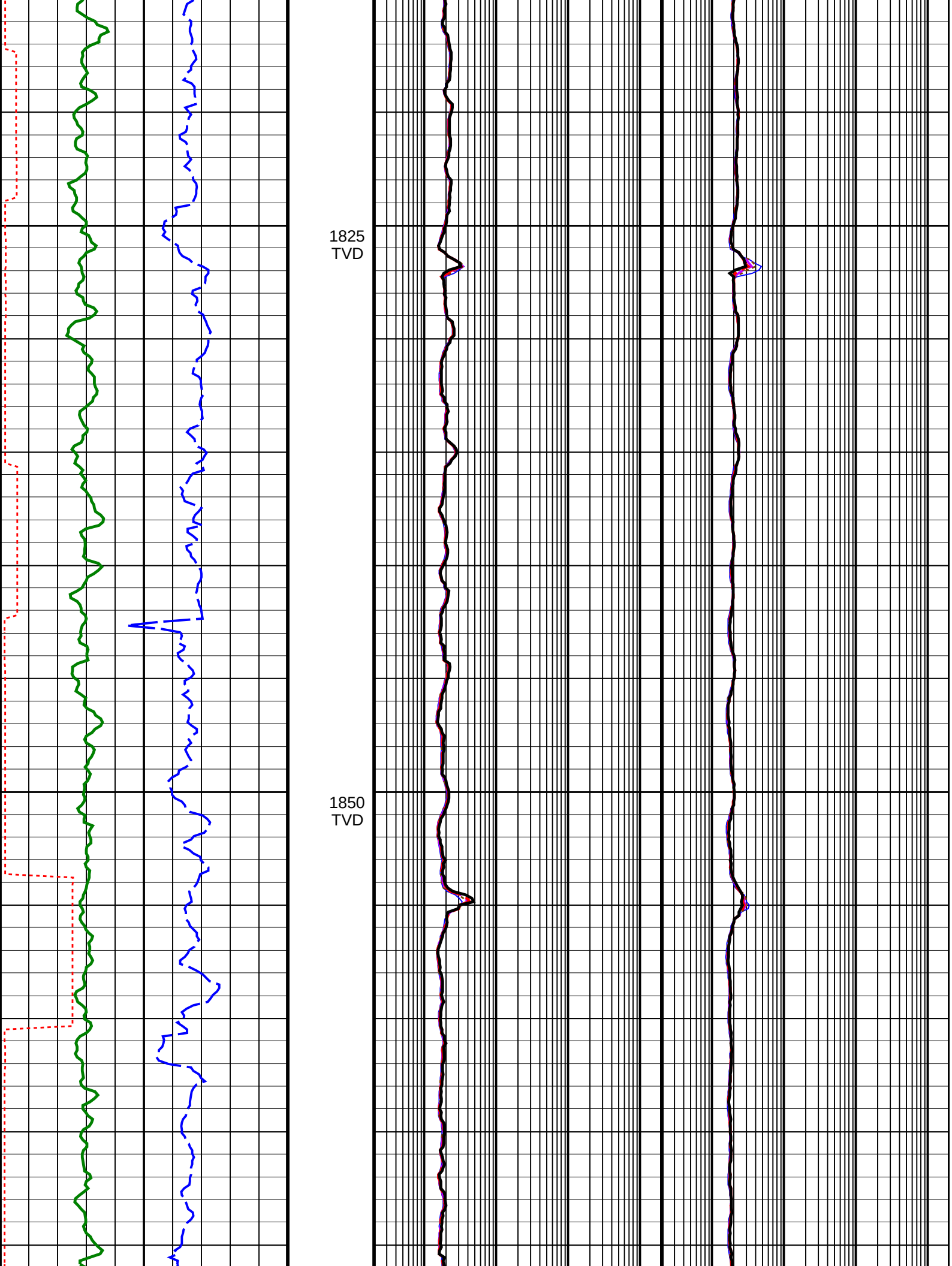
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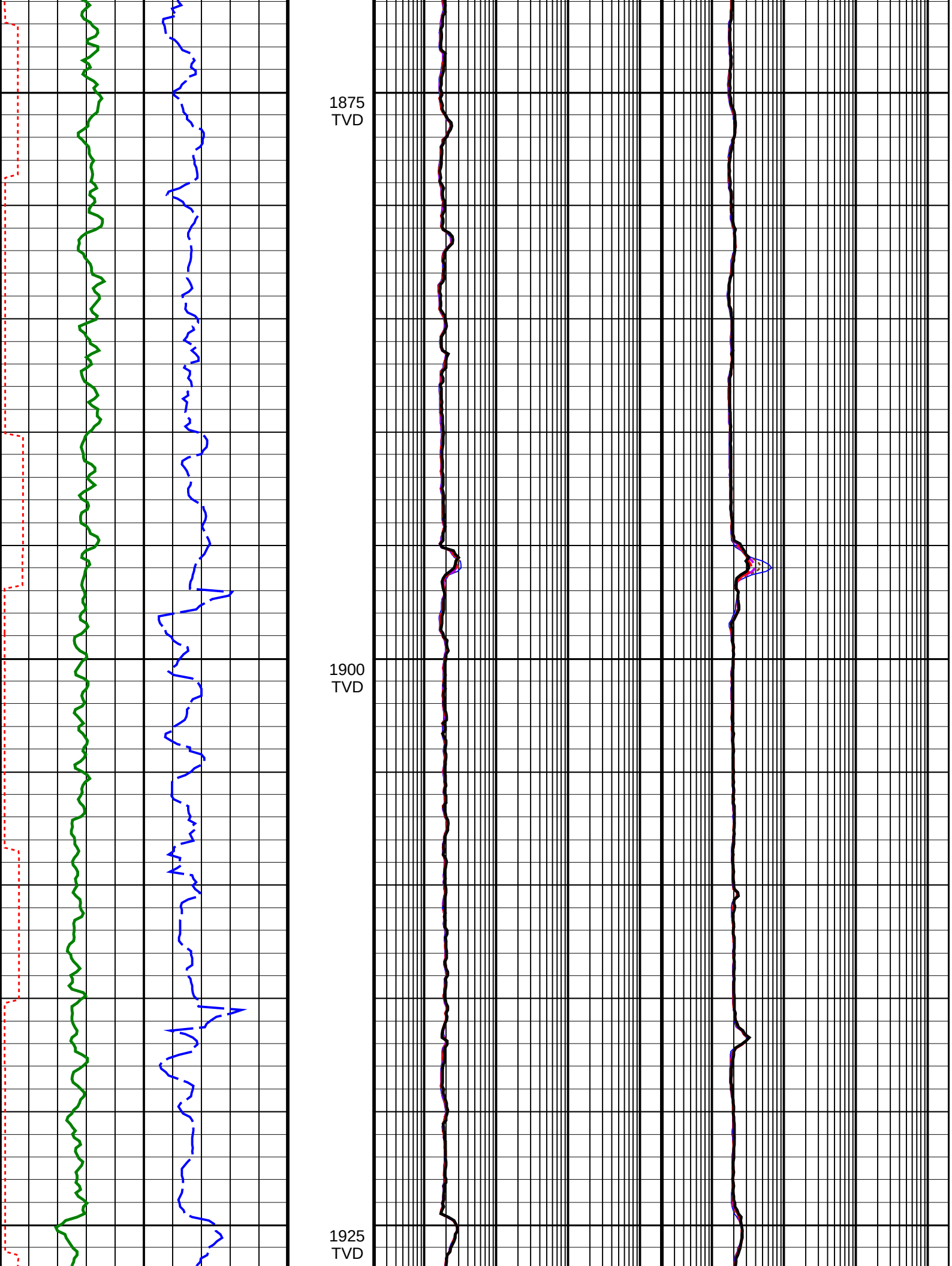
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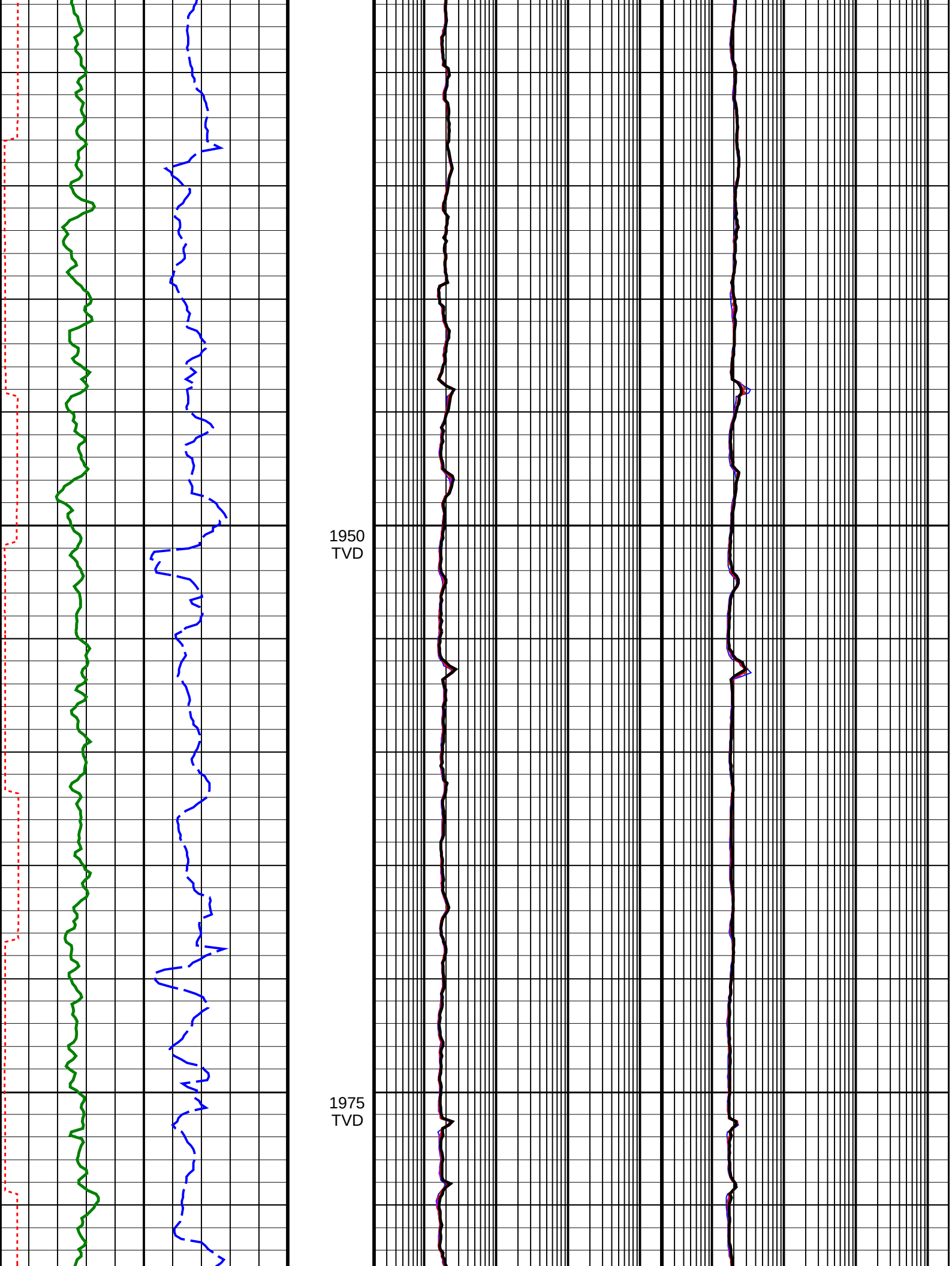
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1975
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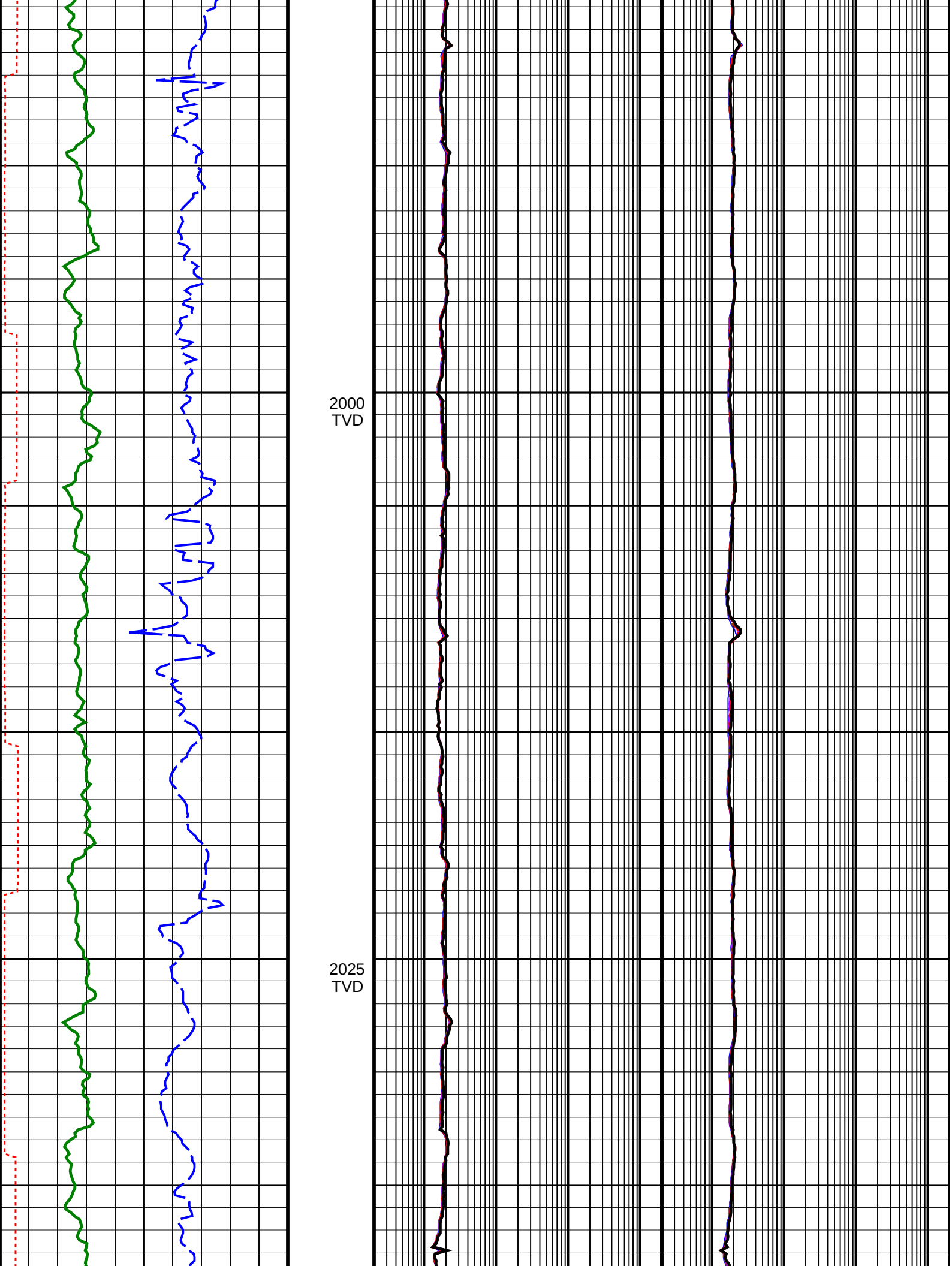
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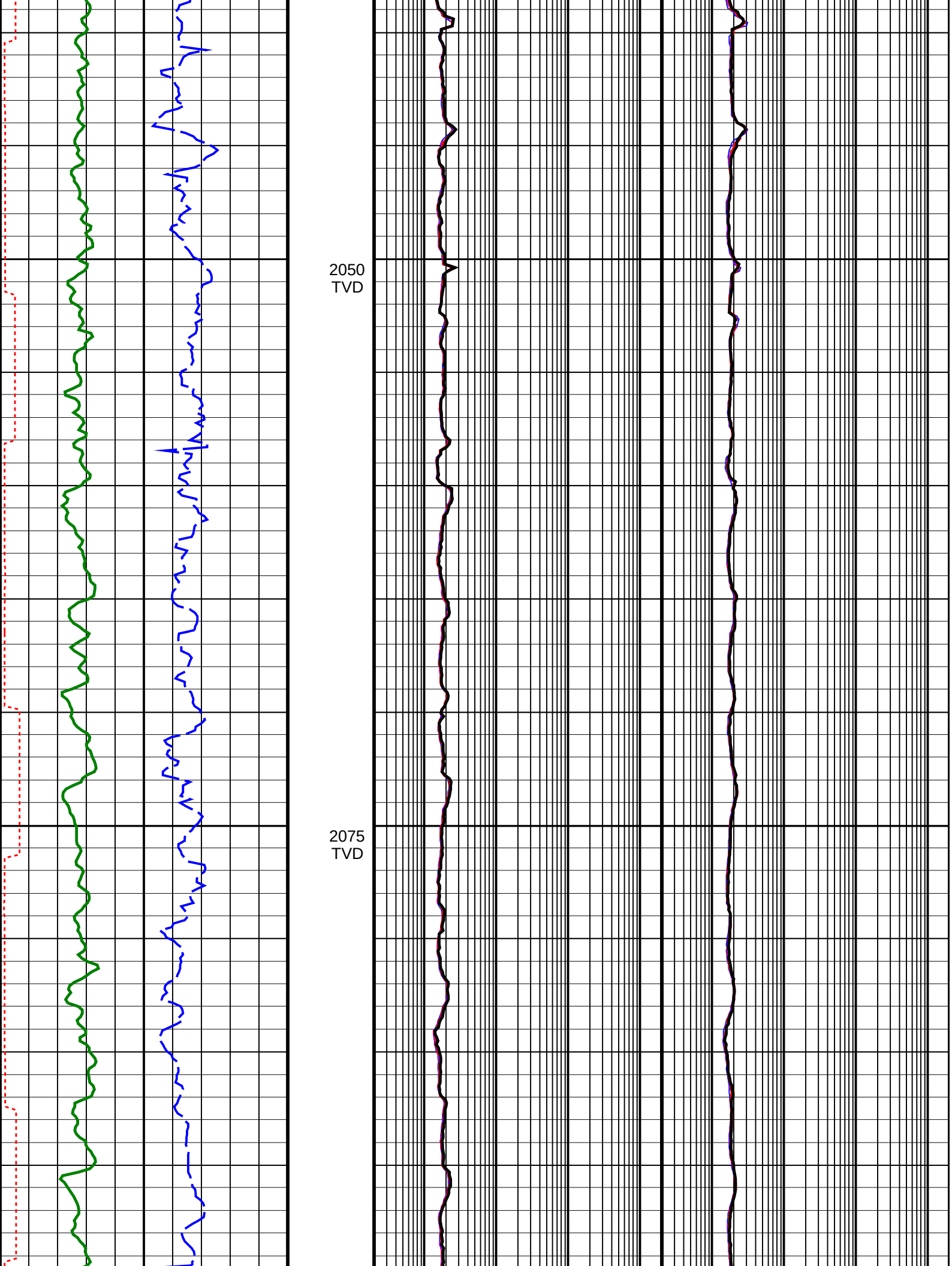
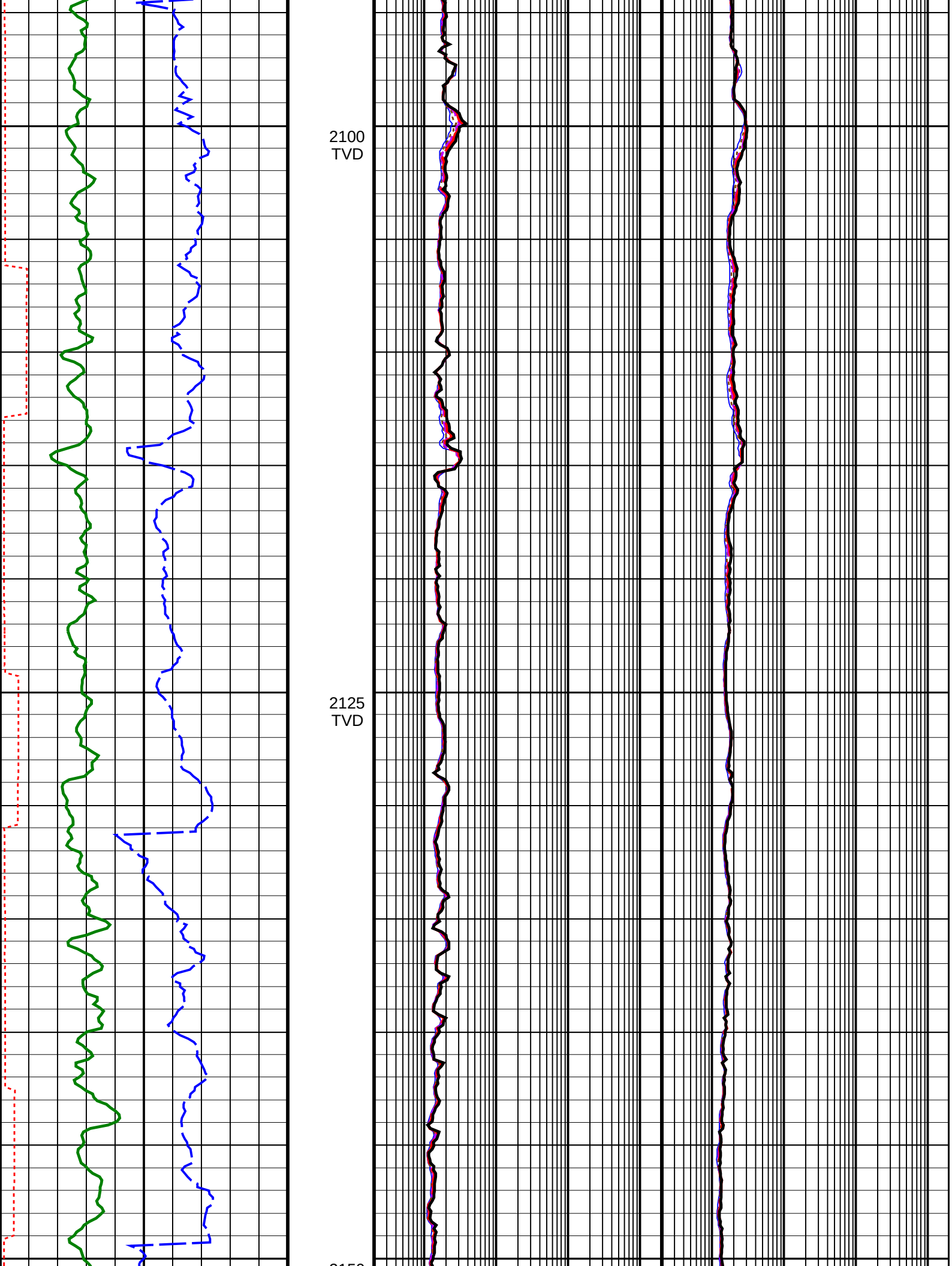
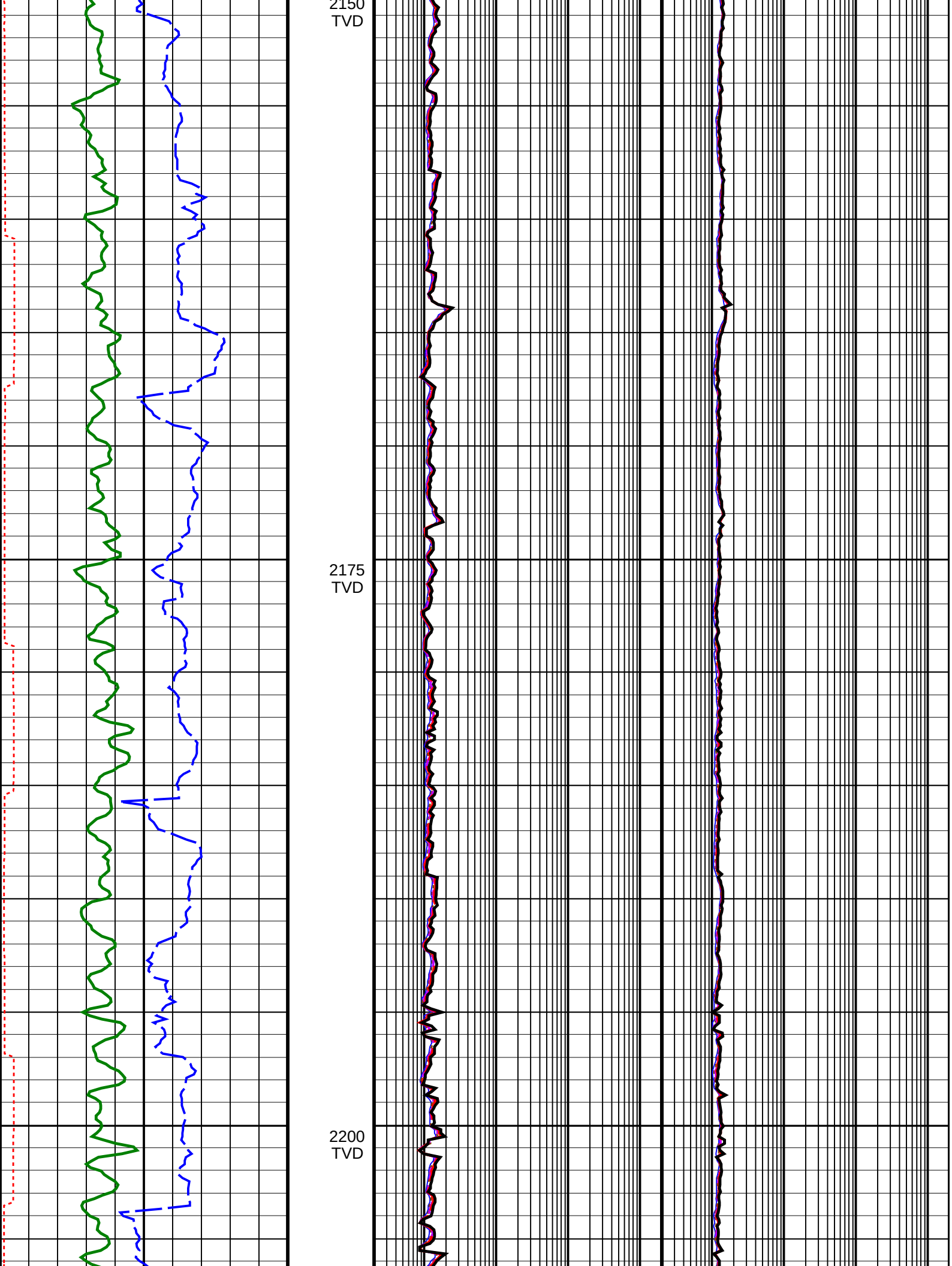
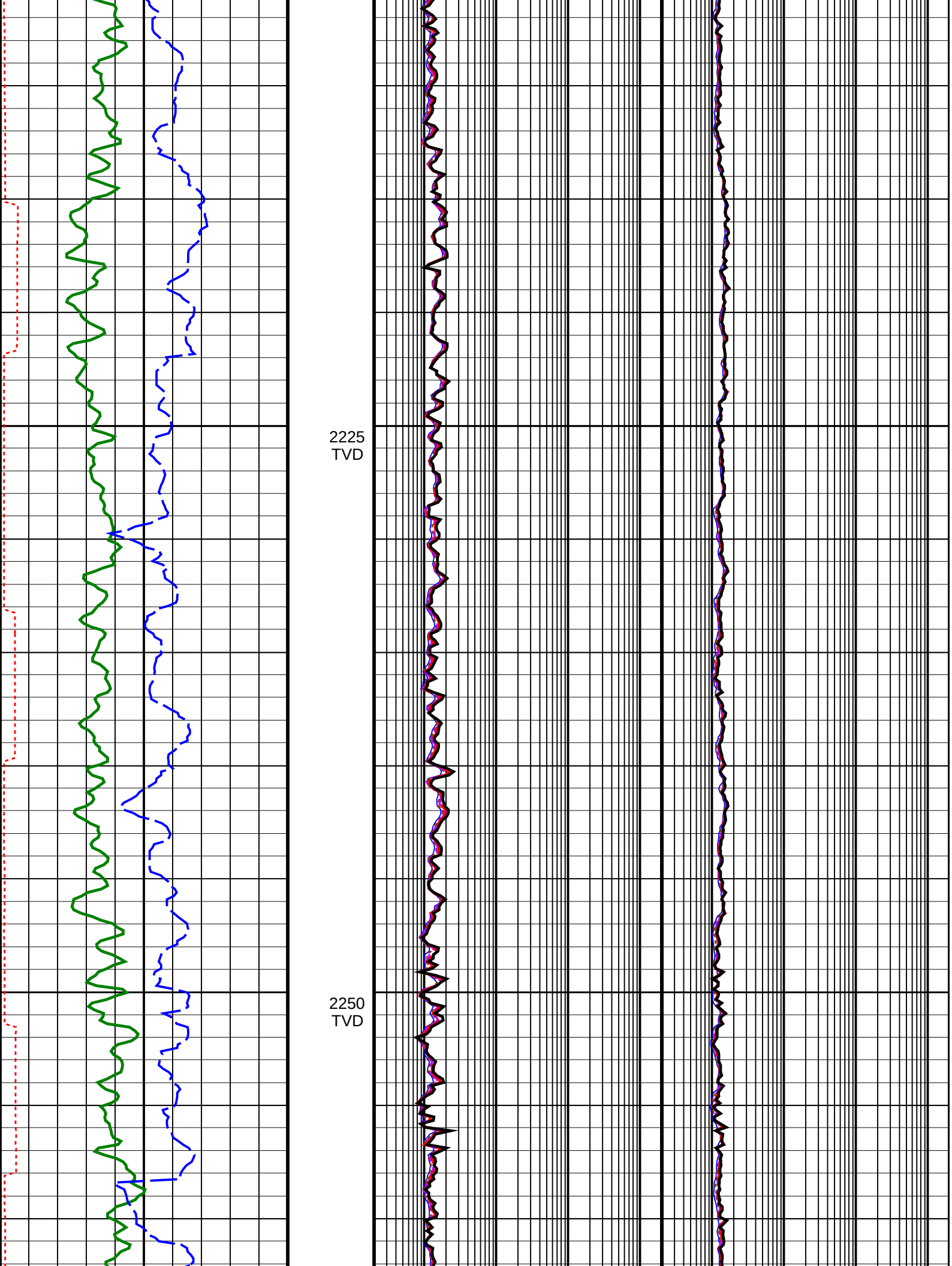
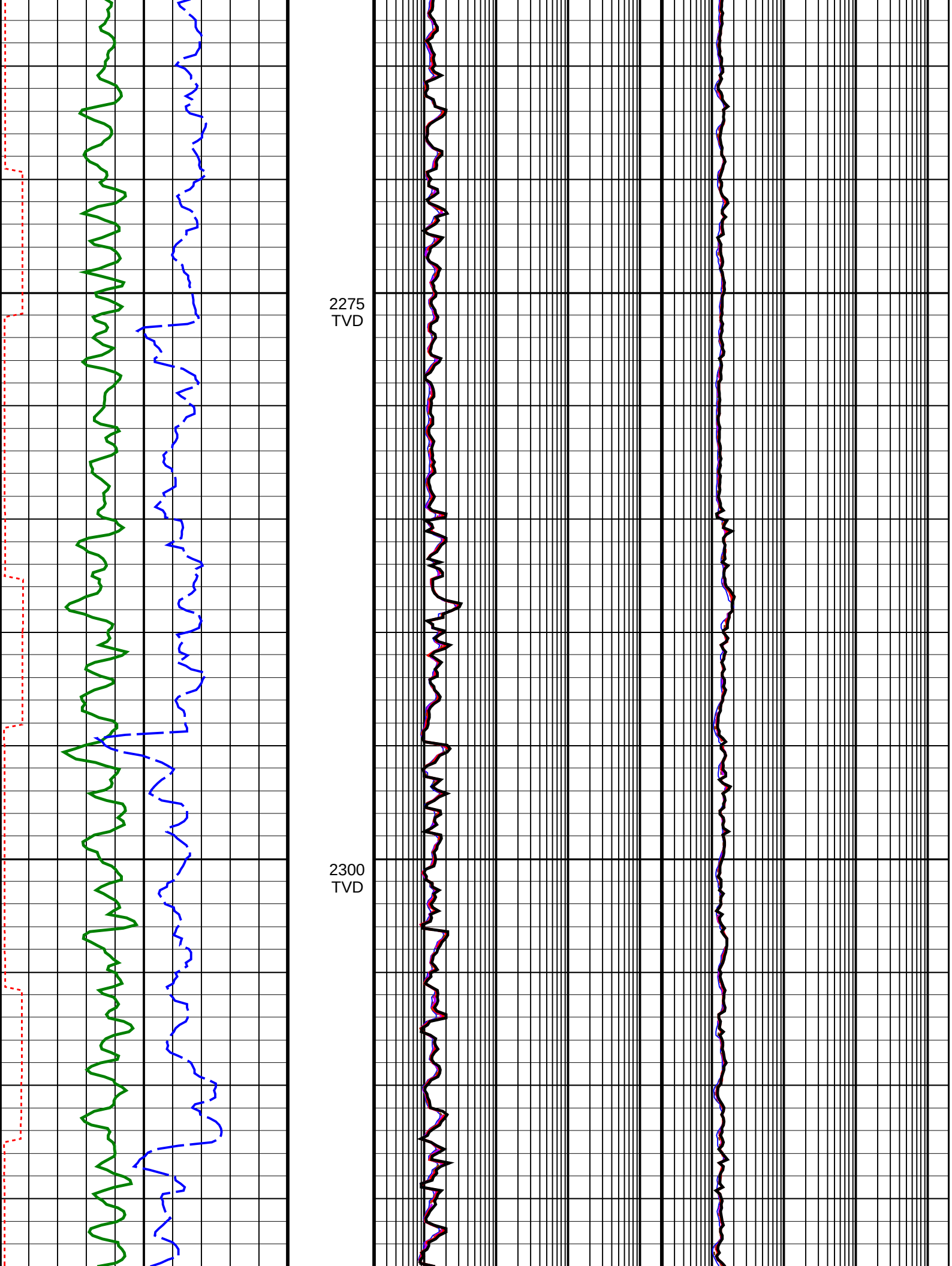
TVD
2025
TVD

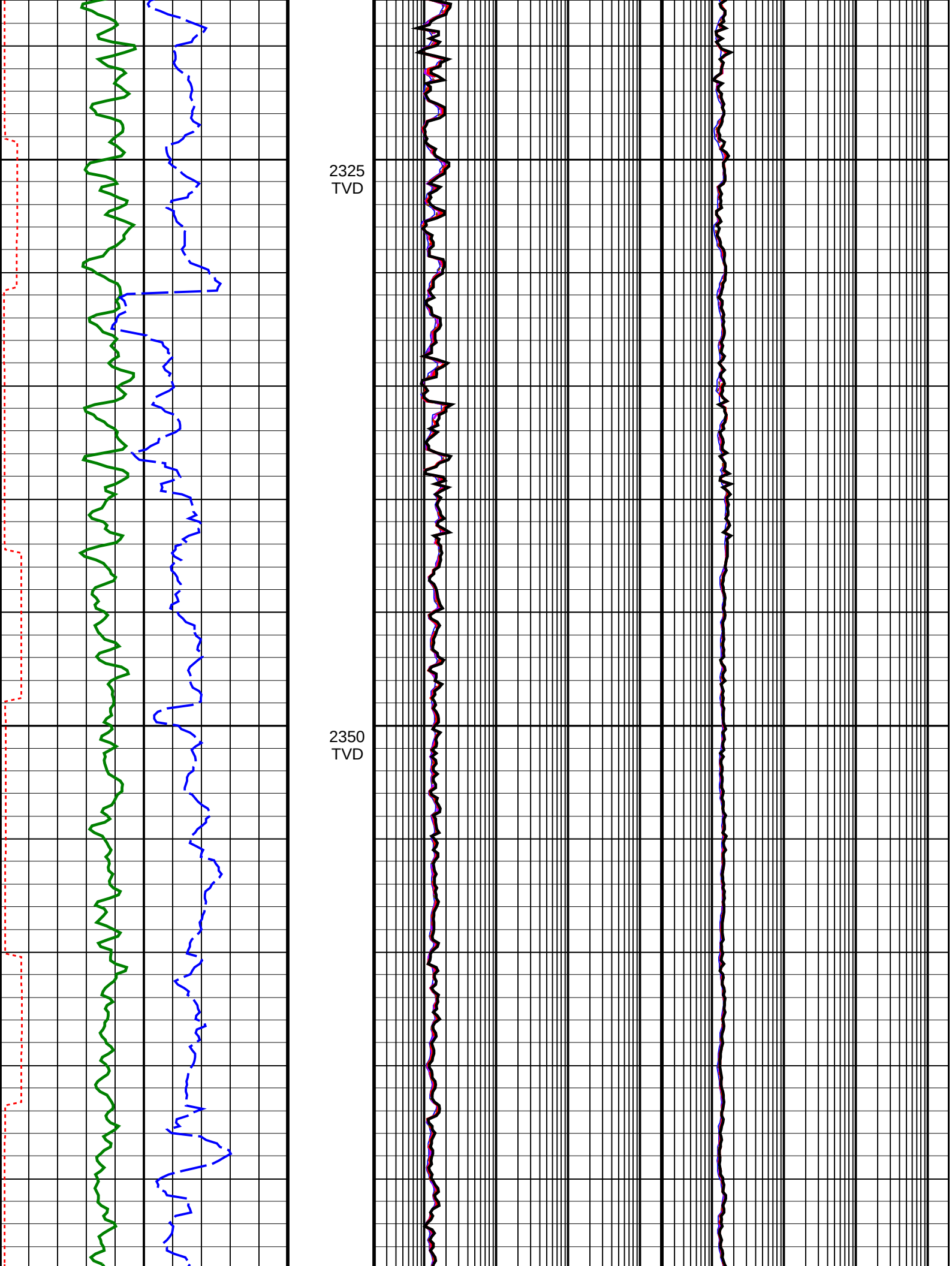

2050
TVD
2075
TVD

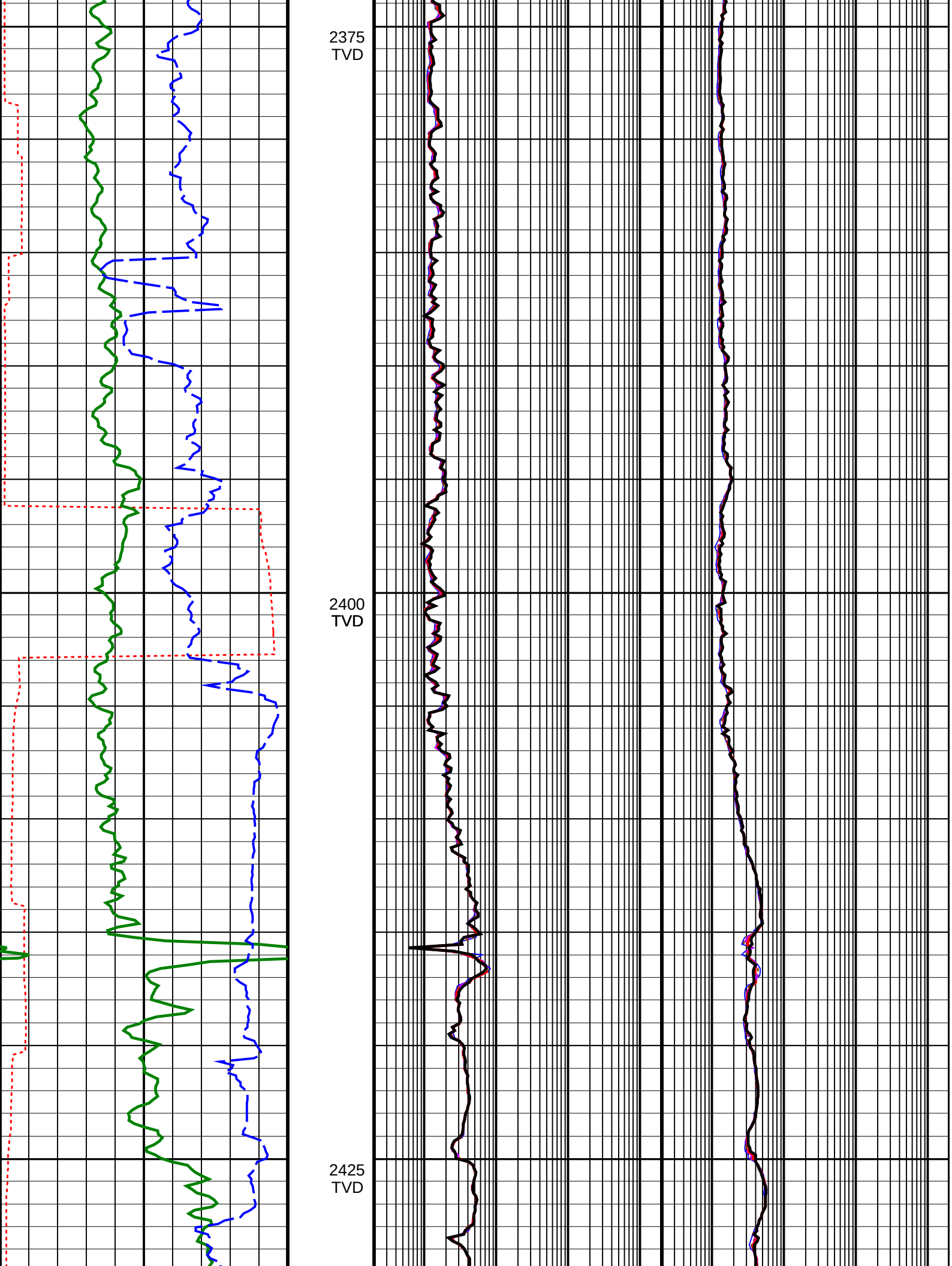

2100
TVD
2125
TVD

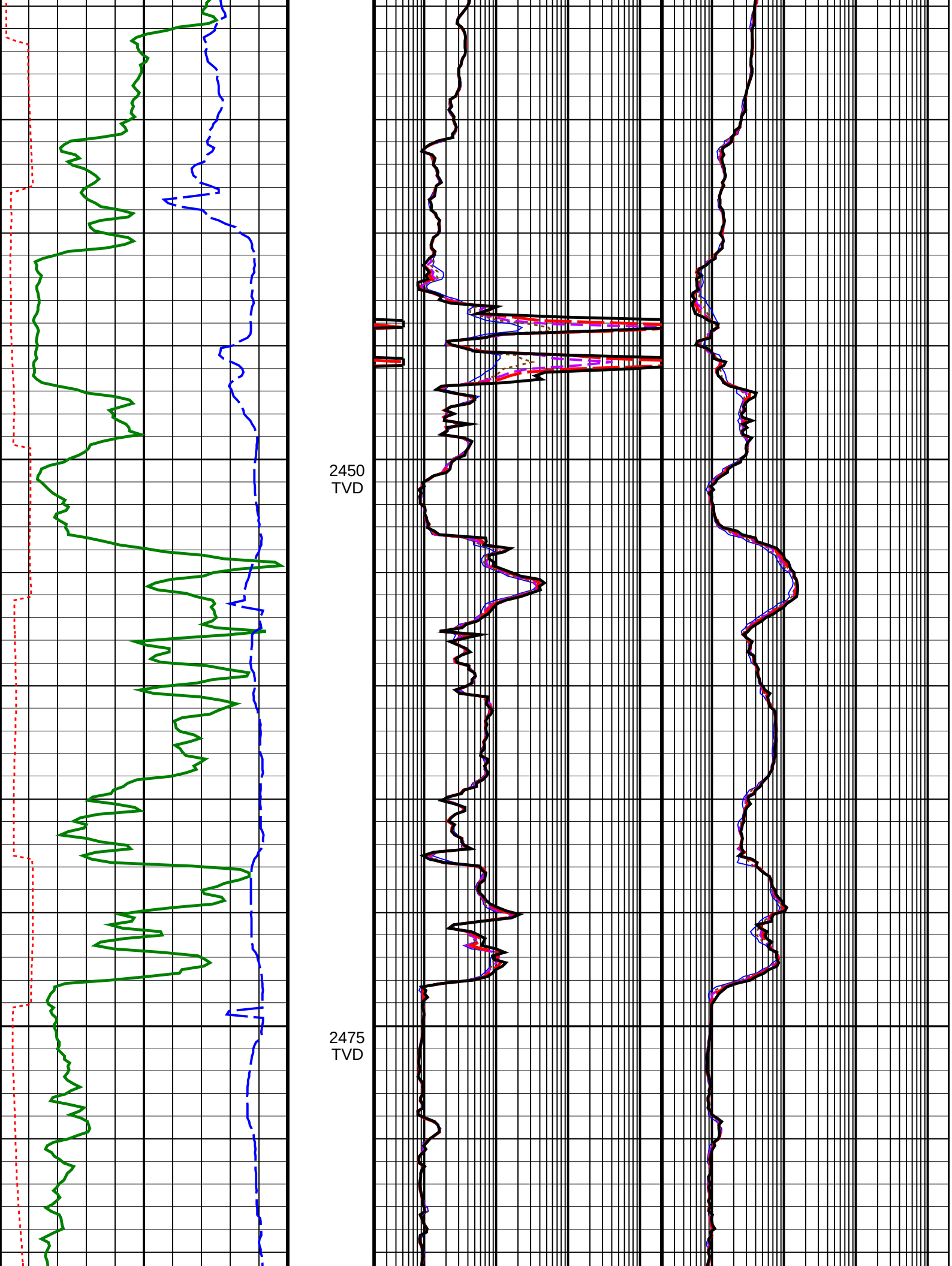

2150
TVD
2175
TVD
2200
TVD

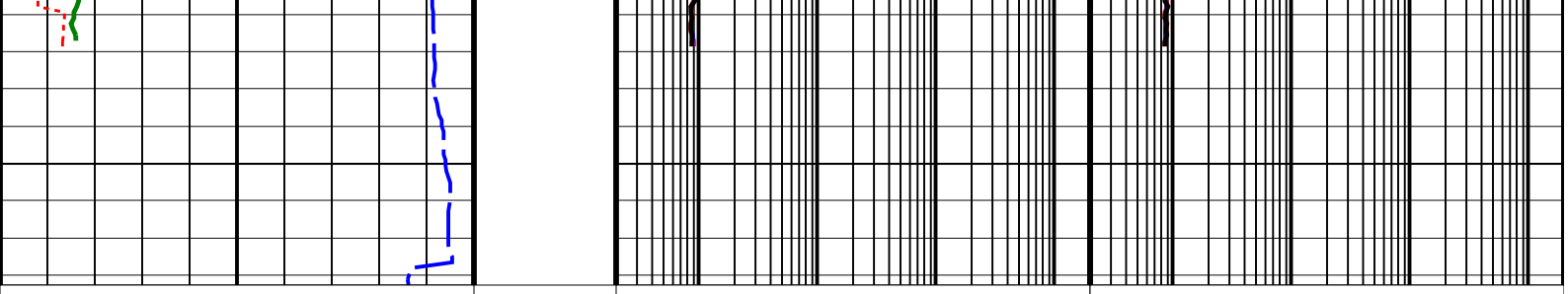

2225
TVD
2250
TVD


2275
TVD
2300
TVD


2325
TVD
2350
TVD


2375
TVD
2400
TVD
2425
TVD


2450
TVD
2475
TVD



ARC Gamma Ray (GR_ARC) 0 (GAPI) 200	ARC Phase−Shift Resistivity 16−in. at 2 MHz (P16H) 0.2 (OHMM) 2000	ARC Attenuation Resistivity 16−in. at 2 MHz (A16H) 0.2 (OHMM) 2000
ARC Resistivity Time After Bit (TAB_ARC_RES) 0 (HR) 10	ARC Phase−Shift Resistivity 22−in. at 2 MHz (P22H) 0.2 (OHMM) 2000	ARC Attenuation Resistivity 22−in. at 2 MHz (A22H) 0.2 (OHMM) 2000
Rate of Penetration, Averaged over Last 5ft (ROP5_RM) 200 (M/HR) 0	ARC Phase−Shift Resistivity 28−in. at 2 MHz (P28H) 0.2 (OHMM) 2000	ARC Attenuation Resistivity 28−in. at 2 MHz (A28H) 0.2 (OHMM) 2000
	ARC Phase−Shift Resistivity 34−in. at 2 MHz (P34H) 0.2 (OHMM) 2000	ARC Attenuation Resistivity 34−in. at 2 MHz (A34H) 0.2 (OHMM) 2000
	ARC Phase−Shift Resistivity 40−in. at 2 MHz (P40H) 0.2 (OHMM) 2000	ARC Attenuation Resistivity 40−in. at 2 MHz (A40H) 0.2 (OHMM) 2000

IDEAL Version: ID12_0C_11

IDF

6.75−in. Azimuthal Density Neutron / Equipment Identification

Primary Equipment:

Tool Name and Serial Number	ADN6 − CA	373
Collar Type and Serial Number	ADDC − AA	
Chassis Type and Serial Number	ADSE − EA	
Stabilizer Type and Serial Number	IBS	
Neutron Logging Source	NSR − M	181
Density Logging Source	GSR − J/Z	2152
Stabilizer Size	8.25 − in.	
Calibration Status	Valid	

Master: 6−Jul−2007 23:40

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		1234	Master		3101	Master		7425
250.0 (Minimum)	4125 (Nominal)	8000 (Maximum)	700.0 (Minimum)	9350 (Nominal)	18000 (Maximum)	2500 (Minimum)	23750 (Nominal)	45000 (Maximum)

Master: 6−Jul−2007 23:40

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		183.8	Master		1555	Master		4633
50.00 (Minimum)	725.0 (Nominal)	1400 (Maximum)	500.0 (Minimum)	4250 (Nominal)	8000 (Maximum)	1500 (Minimum)	15750 (Nominal)	30000 (Maximum)

Master: 6−Jul−2007 23:40

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		50.04	Master		117.0	Master		519.0
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: 6−Jul−2007 23:40

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	1.024 (Minimum) / 1.039 (Nominal) / 1.054 (Maximum)	1.040	Master	1.096 (Minimum) / 1.126 (Nominal) / 1.156 (Maximum)	1.151

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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	13.30 (Minimum) / 19.05 (Nominal) / 24.70 (Maximum)	17.64	Master	3.400 (Minimum) / 4.857 (Nominal) / 6.200 (Maximum)	4.361	Master	1.600 (Minimum) / 2.363 (Nominal) / 3.100 (Maximum)	2.045
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	13.30 (Minimum) / 19.05 (Nominal) / 24.70 (Maximum)	18.63	Master	3.400 (Minimum) / 4.857 (Nominal) / 6.200 (Maximum)	4.548	Master	1.600 (Minimum) / 2.363 (Nominal) / 3.100 (Maximum)	2.193
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	13.30 (Minimum) / 19.05 (Nominal) / 24.70 (Maximum)	17.55	Master	3.400 (Minimum) / 4.857 (Nominal) / 6.200 (Maximum)	4.417	Master	1.600 (Minimum) / 2.363 (Nominal) / 3.100 (Maximum)	2.165
Phase	Far 2 tube 1 Air Point Measure CPS	Value	Phase	Far 2 tube 1 Rod Point Measure CPS	Value	Phase	Far 2 tube 1 H2O Point Measure CPS	Value
Master	13.30 (Minimum) / 19.05 (Nominal) / 24.70 (Maximum)	17.33	Master	3.400 (Minimum) / 4.857 (Nominal) / 6.200 (Maximum)	4.720	Master	1.600 (Minimum) / 2.363 (Nominal) / 3.100 (Maximum)	2.210
Phase	Far 2 tube 2 Air Point Measure CPS	Value	Phase	Far 2 tube 2 Rod Point Measure CPS	Value	Phase	Far 2 tube 2 H2O Point Measure CPS	Value
Master	13.30 (Minimum) / 19.05 (Nominal) / 24.70 (Maximum)	18.63	Master	3.400 (Minimum) / 4.857 (Nominal) / 6.200 (Maximum)	4.693	Master	1.600 (Minimum) / 2.363 (Nominal) / 3.100 (Maximum)	2.260
Phase	Far 2 tube 3 Air Point Measure CPS	Value	Phase	Far 2 tube 3 Rod Point Measure CPS	Value	Phase	Far 2 tube 3 H2O Point Measure CPS	Value
Master	13.30 (Minimum) / 19.05 (Nominal) / 24.70 (Maximum)	17.85	Master	3.400 (Minimum) / 4.857 (Nominal) / 6.200 (Maximum)	4.397	Master	1.600 (Minimum) / 2.363 (Nominal) / 3.100 (Maximum)	2.199
Phase	Near 1 tube 1 Air Point Measure CPS	Value	Phase	Near 1 tube 1 Rod Point Measure CPS	Value	Phase	Near 1 tube 1 H2O Point Measure CPS	Value
Master	345.0 (Minimum) / 487.5 (Nominal) / 595.0 (Maximum)	478.6	Master	535.0 (Minimum) / 768.8 (Nominal) / 925.0 (Maximum)	763.5	Master	230.0 (Minimum) / 343.7 (Nominal) / 430.0 (Maximum)	336.3
Phase	Near 2 tube 1 Air Point Measure CPS	Value	Phase	Near 2 tube 1 Rod Point Measure CPS	Value	Phase	Near 2 tube 1 H2O Point Measure CPS	Value
Master	345.0 (Minimum) / 487.5 (Nominal) / 595.0 (Maximum)	484.6	Master	535.0 (Minimum) / 768.8 (Nominal) / 925.0 (Maximum)	758.4	Master	230.0 (Minimum) / 343.7 (Nominal) / 430.0 (Maximum)	337.5

Master: 6−Jul−2007 23:40

6.75−in. Azimuthal Density Neutron Calibration

Neutron: Water Block Check

Phase	Far Neutron water porosity PU	Value
Master	90.00 (Minimum) / 100.0 (Nominal) / 125.0 (Maximum)	99.51

6.75−in. Array Resistivity Compensated / Equipment Identification

Primary Equipment:

Tool Name and Serial Number	ARC6 − BA	460
ARC675 Calibration Status	Valid	

Master: 6−Jul−2007 11:12

6.75−in. Array Resistivity Compensated Calibration

Resistivity: Air

Phase	Phase−Shift T1	Value
Master		1.019
−3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)

Phase	Phase−Shift T2	Value
Master		−0.9280
−3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)

Phase	Phase−Shift T3	Value
Master		0.9236
−3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)

Phase	Phase−Shift T4	Value
Master		−0.9776
−3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)

Phase	Phase−Shift T5	Value
Master		0.9063
−3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)

Phase	Phase−Shift T1 at 400KHz	Value
Master		−0.3509
−3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)

Phase	Phase−Shift T2 at 400KHz	Value
Master		0.2849
−3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)

Phase	Phase−Shift T3 at 400KHz	Value
Master		−0.3229
−3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)

Phase	Phase−Shift T4 at 400KHz	Value
Master		0.2874
−3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)

Phase	Phase−Shift T5 at 400KHz	Value
Master		−0.3578
−3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)

Master: 6−Jul−2007 11:12

6.75−in. Array Resistivity Compensated Calibration

Resistivity: Air

Phase	Attenuation T1	Value
Master		8.981
6.500 (Minimum)	8.500 (Nominal)	10.50 (Maximum)

Phase	Attenuation T2	Value
Master		5.965
4.500 (Minimum)	6.500 (Nominal)	8.500 (Maximum)

Phase	Attenuation T3	Value
Master		5.607
2.500 (Minimum)	4.500 (Nominal)	6.500 (Maximum)

Phase	Attenuation T4	Value
Master		3.872
2.600 (Minimum)	4.600 (Nominal)	6.600 (Maximum)

Phase	Attenuation T5	Value
Master		4.157
1.600 (Minimum)	3.600 (Nominal)	5.600 (Maximum)

Phase	Attenuation T1 at 400KHz	Value
Master		8.986
6.500 (Minimum)	8.500 (Nominal)	10.50 (Maximum)

Phase	Attenuation T2 at 400KHz	Value
Master		5.966
4.500 (Minimum)	6.500 (Nominal)	8.500 (Maximum)

Phase	Attenuation T3 at 400KHz	Value
Master		5.603
2.500 (Minimum)	4.500 (Nominal)	6.500 (Maximum)

Phase	Attenuation T4 at 400KHz	Value
Master		3.869
2.600 (Minimum)	4.600 (Nominal)	6.600 (Maximum)

Phase	Attenuation T5 at 400KHz	Value
Master		4.163
1.600 (Minimum)	3.600 (Nominal)	5.600 (Maximum)

Master: 6−Jul−2007 11:59

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		4.988
2.780 (Minimum)	4.800 (Nominal)	6.000 (Maximum)

SCHLUMBERGER

Survey report 29-Aug-2007 17:51:47 Page 1 of 4

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

Well.....................: FTA A9b
API number...............:
Engineer.................: MYT/CH/CS

RIG:.....................: ISDL 175
STATE:...................: Victoria

----- 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.......:    -69.00 m
KB above permanent.......:    Top Drive

Spud date................: 15-Aug-07
Last survey date.........: 29-Aug-07
Total accepted surveys...: 88
MD of first survey.......:  1391.00 m
MD of last survey........:  3746.00 m

----- Geomagnetic data ----------------------
Magnetic model...........: BGGM version 2007
Magnetic date............: 15-Aug-2007
Magnetic field strength..:    1199.46 HCNT
Magnetic dec (+E/W-).....:      13.21 degrees
Magnetic dip.............:     -68.86 degrees

----- MWD survey Reference Criteria ---------
Reference G..............:    1000.04 mGal
```

KB above permanent.....: Top Drive
DF above permanent.....: 42.50 m

----- Vertical section origin----------
Latitude (+N/S-).....: -2.00 m
Departure (+E/W-).....: 2.24 m

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

Azimuth from Vsect Origin to target: 166.15 degrees

Reference G.....: 1000.04 mGal
Reference H.....: 1199.46 HCNT
Reference Dip.....: -68.86 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	1391.00	57.26	189.80	0.00	1006.42	724.28	-784.59	-146.28	798.11	190.56	0.00	TIP	None
2	1395.50	56.52	188.54	4.50	1008.88	727.75	-788.31	-146.88	801.88	190.55	8.73	GYR	None
3	1405.70	57.13	185.07	10.20	1014.46	735.74	-796.79	-147.89	810.40	190.52	8.87	GYR	None
4	1410.15	57.12	185.58	4.45	1016.88	739.27	-800.51	-148.24	814.12	190.49	2.93	GYR	None
5	1440.10	57.19	179.49	29.95	1033.13	763.39	-825.63	-149.35	839.03	190.25	5.21	GYR	None
6	1466.10	54.87	178.36	26.00	1047.66	784.42	-847.18	-148.95	860.18	189.97	2.93	GYR	None
7	1485.40	52.97	175.01	19.30	1059.03	799.75	-862.75	-148.05	875.36	189.74	5.22	GYR	None
8	1505.40	52.50	170.13	20.00	1071.14	815.56	-878.53	-146.00	890.57	189.44	5.96	GYR	None
9	1530.80	51.90	168.37	25.40	1086.71	835.60	-898.24	-142.25	909.44	189.00	1.82	GYR	None
10	1550.60	51.50	168.28	19.80	1098.98	851.12	-913.46	-139.11	923.99	188.66	0.63	GYR	None
11	1564.95	51.16	168.45	14.35	1107.95	862.32	-924.43	-136.85	934.51	188.42	0.78	PUP	None
12	1593.30	50.17	168.48	28.35	1125.92	884.23	-945.92	-132.47	955.15	187.97	1.06	PUP	None
13	1621.71	50.05	166.75	28.41	1144.14	906.02	-967.21	-127.79	975.61	187.53	1.43	PUP	None
14	1650.61	49.25	165.08	28.90	1162.85	928.04	-988.57	-122.43	996.12	187.06	1.59	PUP	None
15	1679.24	49.93	162.42	28.63	1181.41	949.82	-1009.49	-116.33	1016.17	186.57	2.27	PUP	None
16	1707.31	51.98	160.05	28.07	1199.09	971.53	-1030.13	-109.31	1035.91	186.06	2.99	PUP	None
17	1735.98	53.13	156.95	28.67	1216.53	994.09	-1051.30	-100.97	1056.14	185.49	2.89	PUP	None
18	1764.43	53.16	154.58	28.45	1233.59	1016.48	-1072.06	-91.63	1075.96	184.89	2.03	PUP	None
19	1793.28	52.50	153.99	28.85	1251.02	1038.97	-1092.77	-81.65	1095.81	184.27	0.86	PUP	None
20	1821.77	50.97	154.49	28.49	1268.67	1060.86	-1112.91	-71.93	1115.24	183.70	1.69	PUP	None
21	1849.83	50.44	154.56	28.06	1286.44	1082.13	-1132.52	-62.59	1134.25	183.16	0.58	PUP	None
22	1877.48	50.75	154.34	27.65	1303.99	1103.05	-1151.79	-53.37	1153.03	182.65	0.39	PUP	None
23	1905.89	51.30	153.13	28.41	1321.86	1124.62	-1171.60	-43.60	1172.41	182.13	1.17	PUP	None
24	1934.47	50.53	152.72	28.58	1339.88	1146.21	-1191.35	-33.50	1191.82	181.61	0.89	PUP	None
25	1963.14	50.86	153.66	28.67	1358.04	1167.83	-1211.15	-23.50	1211.38	181.11	0.85	PUP	None
26	1991.60	50.93	152.39	28.46	1375.99	1189.34	-1230.83	-13.48	1230.91	180.63	1.06	PUP	None
27	2019.95	50.02	151.80	28.35	1394.03	1210.55	-1250.16	-3.25	1250.16	180.15	1.09	PUP	None
28	2048.43	50.25	152.25	28.48	1412.29	1231.75	-1269.46	7.01	1269.48	179.68	0.44	PUP	None
29	2076.87	50.61	152.51	28.44	1430.40	1253.05	-1288.89	17.17	1289.00	179.24	0.44	PUP	None
30	2105.24	50.21	151.98	28.37	1448.48	1274.27	-1308.23	27.35	1308.52	178.80	0.61	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	2133.88	50.49	152.25	28.64	1466.76	1295.66	-1327.73	37.66	1328.26	178.38	0.37	PUP	None
32	2161.97	50.61	151.95	28.09	1484.61	1316.70	-1346.89	47.81	1347.74	177.97	0.28	PUP	None
33	2190.45	50.34	152.03	28.48	1502.73	1338.00	-1366.29	58.13	1367.53	177.56	0.30	PUP	None
34	2219.15	50.36	152.00	28.70	1521.05	1359.43	-1385.80	68.50	1387.49	177.17	0.03	PUP	None
35	2247.45	50.83	151.97	28.30	1539.01	1380.63	-1405.11	78.77	1407.31	176.79	0.51	PUP	None
36	2275.68	50.35	151.56	28.23	1556.93	1401.76	-1424.32	89.09	1427.11	176.42	0.62	PUP	None
37	2304.24	49.92	152.29	28.56	1575.24	1423.01	-1443.66	99.41	1447.08	176.06	0.75	PUP	None
38	2332.69	50.24	152.55	28.45	1593.50	1444.20	-1463.00	109.51	1467.10	175.72	0.40	PUP	None
39	2361.45	50.40	152.55	28.76	1611.86	1465.72	-1482.65	119.71	1487.47	175.38	0.17	PUP	None
40	2390.06	50.52	152.43	28.61	1630.07	1487.16	-1502.22	129.90	1507.82	175.06	0.16	PUP	None
41	2419.00	50.35	152.30	28.94	1648.51	1508.83	-1521.98	140.25	1528.43	174.74	0.21	PUP	None
42	2447.71	50.15	152.71	28.71	1666.87	1530.28	-1541.56	150.44	1548.88	174.43	0.40	PUP	None
43	2476.11	50.35	152.71	28.40	1685.03	1551.51	-1560.97	160.45	1569.19	174.13	0.21	PUP	None
44	2504.23	50.14	152.17	28.12	1703.01	1572.52	-1580.13	170.45	1589.30	173.84	0.50	PUP	None
45	2532.22	50.27	152.37	27.99	1720.92	1593.39	-1599.17	180.46	1609.32	173.56	0.22	PUP	None
46	2560.17	50.22	153.20	27.95	1738.80	1614.30	-1618.28	190.29	1629.42	173.29	0.70	PUP	None
47	2588.65	50.02	152.83	28.48	1757.06	1635.58	-1637.75	200.20	1649.94	173.03	0.37	PUP	None
48	2616.70	49.87	152.56	28.05	1775.11	1656.46	-1656.83	210.05	1670.09	172.77	0.28	PUP	None
49	2645.11	50.39	152.68	28.41	1793.32	1677.66	-1676.19	220.08	1690.58	172.52	0.57	PUP	None
50	2673.81	50.13	153.10	28.70	1811.67	1699.14	-1695.83	230.14	1711.38	172.27	0.44	PUP	None
51	2702.36	49.76	153.18	28.55	1830.04	1720.43	-1715.33	240.01	1732.04	172.03	0.40	PUP	None
52	2730.45	50.49	152.89	28.09	1848.05	1741.43	-1734.54	249.79	1752.44	171.81	0.82	PUP	None
53	2758.87	49.72	153.61	28.42	1866.28	1762.68	-1754.01	259.60	1773.12	171.58	1.01	PUP	None
54	2787.31	50.01	153.70	28.44	1884.62	1783.91	-1773.50	269.25	1793.82	171.37	0.32	PUP	None
55	2815.54	50.27	154.24	28.23	1902.71	1805.09	-1792.97	278.76	1814.51	171.16	0.53	PUP	None
56	2843.71	49.97	153.55	28.17	1920.77	1826.21	-1812.38	288.27	1835.16	170.96	0.66	PUP	None
57	2870.87	50.40	153.49	27.16	1938.16	1846.57	-1831.05	297.57	1855.08	170.77	0.49	PUP	None
58	2898.99	50.90	152.48	28.12	1955.99	1867.74	-1850.42	307.45	1875.79	170.57	1.01	PUP	None
59	2926.96	50.29	152.82	27.97	1973.75	1888.76	-1869.62	317.38	1896.37	170.37	0.72	PUP	None

59	2926.96	50.29	152.82	27.97	1973.75	1888.76	-1869.62	317.38	1896.37	170.37	0.72	PUP	None
60	2955.05	50.59	152.90	28.09	1991.64	1909.83	-1888.89	327.26	1917.03	170.17	0.33	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	2984.07	50.78	152.44	29.02	2010.02	1931.67	-1908.84	337.57	1938.46	169.97	0.42	PUP	None
62	3012.59	50.74	152.25	28.52	2028.06	1953.12	-1928.40	347.82	1959.52	169.78	0.16	PUP	None
63	3040.88	50.62	153.05	28.29	2045.99	1974.40	-1947.84	357.87	1980.44	169.59	0.68	PUP	None
64	3069.76	51.15	152.81	28.88	2064.21	1996.21	-1967.79	368.07	2001.92	169.41	0.59	PUP	None
65	3097.97	50.44	152.91	28.21	2082.04	2017.49	-1987.25	378.04	2022.89	169.23	0.77	PUP	None
66	3127.12	50.57	152.75	29.15	2100.58	2039.38	-2007.26	388.31	2044.47	169.05	0.19	PUP	None
67	3155.30	50.47	153.18	28.18	2118.50	2060.55	-2026.63	398.20	2065.38	168.88	0.37	PUP	None
68	3184.13	50.50	152.96	28.83	2136.84	2082.22	-2046.46	408.27	2086.79	168.72	0.18	PUP	None
69	3213.06	50.46	152.82	28.93	2155.25	2103.94	-2066.33	418.44	2108.27	168.55	0.12	PUP	None
70	3241.26	50.87	152.80	28.20	2173.13	2125.16	-2085.73	428.41	2129.27	168.39	0.44	PUP	None
71	3269.92	50.80	152.65	28.66	2191.23	2146.78	-2105.48	438.59	2150.67	168.23	0.14	PUP	None
72	3299.21	50.53	152.99	29.29	2209.79	2168.82	-2125.63	448.94	2172.52	168.07	0.39	PUP	None
73	3327.58	50.79	153.09	28.37	2227.78	2190.19	-2145.19	458.89	2193.72	167.93	0.29	PUP	None
74	3356.24	50.41	153.01	28.66	2245.97	2211.76	-2164.93	468.93	2215.13	167.78	0.41	PUP	None
75	3384.82	50.52	152.47	28.58	2264.16	2233.20	-2184.52	479.02	2236.43	167.63	0.46	PUP	None
76	3413.39	51.31	152.51	28.57	2282.17	2254.75	-2204.19	489.26	2257.84	167.48	0.84	PUP	None
77	3442.33	50.42	152.03	28.94	2300.44	2276.54	-2224.06	499.71	2279.51	167.34	1.02	PUP	None
78	3471.14	50.92	152.85	28.81	2318.70	2298.19	-2243.82	510.02	2301.05	167.19	0.85	PUP	None
79	3499.59	50.60	152.96	28.45	2336.69	2319.64	-2263.43	520.05	2322.41	167.06	0.35	PUP	None
80	3527.61	50.89	153.65	28.02	2354.42	2340.79	-2282.82	529.80	2343.49	166.93	0.66	PUP	None
81	3556.38	50.20	153.74	28.77	2372.71	2362.48	-2302.73	539.65	2365.12	166.81	0.73	PUP	None
82	3584.17	50.55	153.39	27.79	2390.43	2383.37	-2321.90	549.17	2385.96	166.69	0.48	PUP	None
83	3611.78	50.47	153.61	27.61	2407.99	2404.16	-2340.97	558.68	2406.71	166.58	0.21	PUP	None
84	3640.27	50.51	152.95	28.49	2426.11	2425.59	-2360.60	568.57	2428.11	166.46	0.55	PUP	None
85	3668.34	50.44	152.85	28.07	2443.98	2446.67	-2379.87	578.43	2449.16	166.34	0.11	PUP	None
86	3696.75	50.01	153.08	28.41	2462.15	2467.93	-2399.32	588.35	2470.41	166.22	0.50	PUP	None
87	3726.16	50.34	152.87	29.41	2480.99	2489.92	-2419.44	598.62	2492.40	166.10	0.38	PUP	None
88	3746.00	50.83	153.19	19.84	2493.59	2504.85	-2433.10	605.57	2507.33	166.02	0.84	Projection to TD	

Company: **ESSO Australia Pty Ltd**

Schlumberger

Well: **FTA A9b**

Field: **Fortescue**

Rig: **ISDL 175** **8.5 in. Section**

State: **Victoria**

VISION Resistivity
1:200 True Vertical Depth
Recorded Mode Log