Schlumberger

Company: **JAMSTEC**

Well: **C0020A**
Field: **C0020**
Pref. **Aomori** Country: **Japan**

Natural GR Spectroscopy
HNGS Ratio
1:200

Pref. Aomori
Field: C0020
Location: Shimokita−oki
Well: C0020A
Company: JAMSTEC

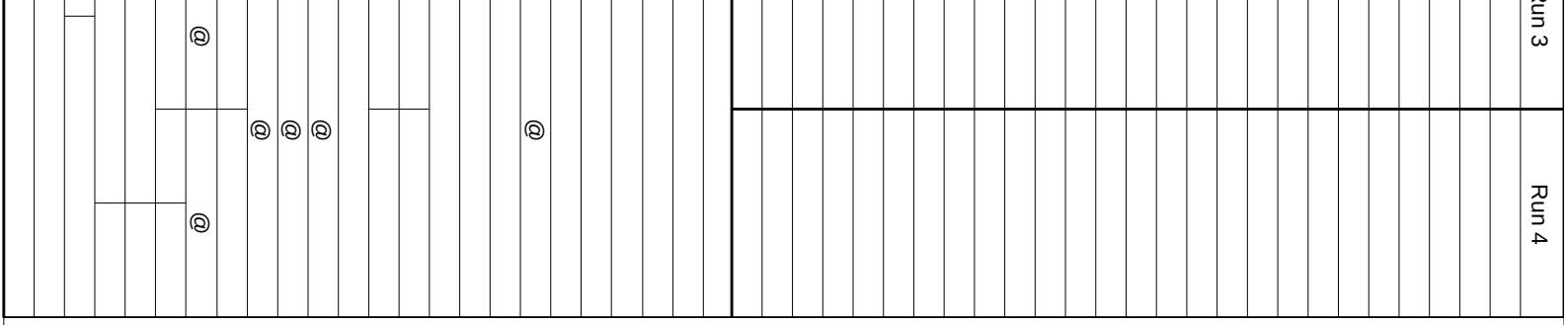
LOCATION

Shimokita−oki	Elev.: K.B.	28.50 m
X= 600698.8 M	G.L.	−1180.00 m
Y=4559060.5 M	D.F.	28.50 m
Permanent Datum: MSL	Elev.:	0.00 m
Log Measured From: Drilling Floor	28.50 m	above Perm. Datum
Drilling Measured From: Drilling Floor		

Pref.	Max. Well Deviation	Longitude	Latitude
Aomori	1.22 deg	142* 12.0328' E	41* 10.5983' N

	Run 1	Run 2	Run 3
Logging Date	9−Sep−2012		
Run Number	1		
Depth Driller	3674.5 m		
Schlumberger Depth	3672 m		
Bottom Log Interval	3672 m		
Top Log Interval	1691 m		
Casing Driller Size @ Depth	13.375 in @ 2461.5 m	@	@
Casing Schlumberger	2461 m		
Bit Size	10.625 in		
Type Fluid In Hole	KNPPmud		
MUD Density / Viscosity	1.11 g/cm3 / 102 s		
MUD Fluid Loss / PH	3.4 cm3 / 10.5		
MUD Source Of Sample	Flowline		
RM @ Measured Temperature	0.082 ohm.m @ 25 degC	@	@
RMF @ Measured Temperature	0.073 ohm.m @ 23 degC	@	@
RMC @ Measured Temperature	0.095 ohm.m @ 26 degC	@	@
Source RMF / RMC	Press / Press		
RM @ MRT / RMF @ MRT	0.055 @ 48 / 0.047 @ 48	@	@ / @
Maximum Recorded Temperatures	48 degC / 48 / 48		
Circulation Stopped / Time	9−Sep−2012 / 3:00		
Logger On Bottom / Time	10−Sep−2012 / 5:52		
Unit Number / Location	4803 / JPOP		
Recorded By	Liu Jie/Montague		
Witnessed By	Mr. Yoshinori Sanada/Mr. Kyaw Moe		

	Run 1	Run 2	Run 3
Logging Date			
Run Number			
Depth Driller			
Schlumberger Depth			
Bottom Log Interval			
Top Log Interval			
Casing Driller Size @ Depth	@		
Casing Schlumberger			
Bit Size			
Type Fluid In Hole			
MUD Density / Viscosity	/		
MUD Fluid Loss / PH	/		
MUD Source Of Sample			
RM @ Measured Temperature	@		
RMF @ Measured Temperature	@		
RMC @ Measured Temperature	@		
Source RMF / RMC	/		
RM @ MRT / RMF @ MRT	@	@	
Maximum Recorded Temperatures			
Circulation Stopped / Time			
Logger On Bottom / Time			
Unit Number / Location	/		
Recorded By			
Witnessed By			



DEPTH SUMMARY LISTING

Date Created: 15−SEP−2012 16:37:12

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−JA	Type:	CMTD−B/A	Type:	7−46ZV−XXS
Serial Number:	6790	Serial Number:	2986	Serial Number:	711011
Calibration Date:	23−May−2012	Calibration Date:	18−Aug−2012	Length:	8050 M
Calibrator Serial Number:	123	Calibrator Serial Number:	973		
Calibration Cable Type:	7−46ZV−XXS	Number of Calibration Points:	10	Conveyance Method:	Wireline
Wheel Correction 1:	−3	Calibration RMS:	12	Rig Type:	Offshore Floater with WMC
Wheel Correction 2:	−2	Calibration Peak Error:	20		

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	86.00 M
Rig Up Length At Bottom:	85.90 M
Rig Up Length Correction:	0.10 M
Stretch Correction:	2.20 M
Tool Zero Check At Surface:	0.50 M

Depth Control Remarks

1. All schlumberger depth control policies applied.
2. IDW used as primary depth control and Z−chart as secondary.
3. WMC engaged at 100m going in and disengaged at 100m coming out. 8 Tons on compensator.
4.
5.
6.

OTHER SERVICES1

OS1: FMI−DSI−EMS−PPC
OS2: CMR+−PPC
OS3: MDT
OS4: ZVSP
OS5:

REMARKS: RUN NUMBER 1

− Logging objective: formation evaluation.
− All wellsite information provided by client.
− Tool string combined as per tool sketch.
− Maximum borehole temperature reading 47.8 recorded from thermometer in LEH−QT.
− Maximum borehole deviation reading 1.22 recorded from GPIT in Run2.
− Logging speed reduced to 900ft/hr as weak NSR−F used due to JP government regulation.

− Reduced activity flags count in Before Calibration summary.
− Caliper check in casing 12.5 in
− First run at TD seemed to drag and hang. Multiple attempts to push down and then pulled main pass from deepest point reached.
− Repeat pass to cover 3210−3110 as requested.
− GR was logged to upper CSG which is 1691m.
− Wiper trip planned after CMR+ run and before MDT.
− ECRD run in place of mechanical weakponit for every run.

RUN 1			RUN 2		
SERVICE ORDER #:			SERVICE ORDER #:		
PROGRAM VERSION:		19C1−222	PROGRAM VERSION:		
FLUID LEVEL:		0 m	FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

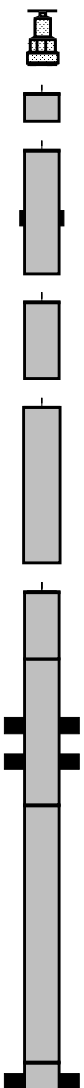
EQUIPMENT DESCRIPTION

RUN 1

SURFACE EQUIPMENT

GSR−U/Y
NCT−B
CNB−AB
NCS−VB
GSR−U
WITM (EDTS)−A

DOWNHOLE EQUIPMENT



LEH−QT 23.89
LEH−QT

AH−369 23.01

EDTC−B 22.57
EDTH−B 8466
EDTC−B 8470
EDTG−A/B 77415
0.5 IN Standoff

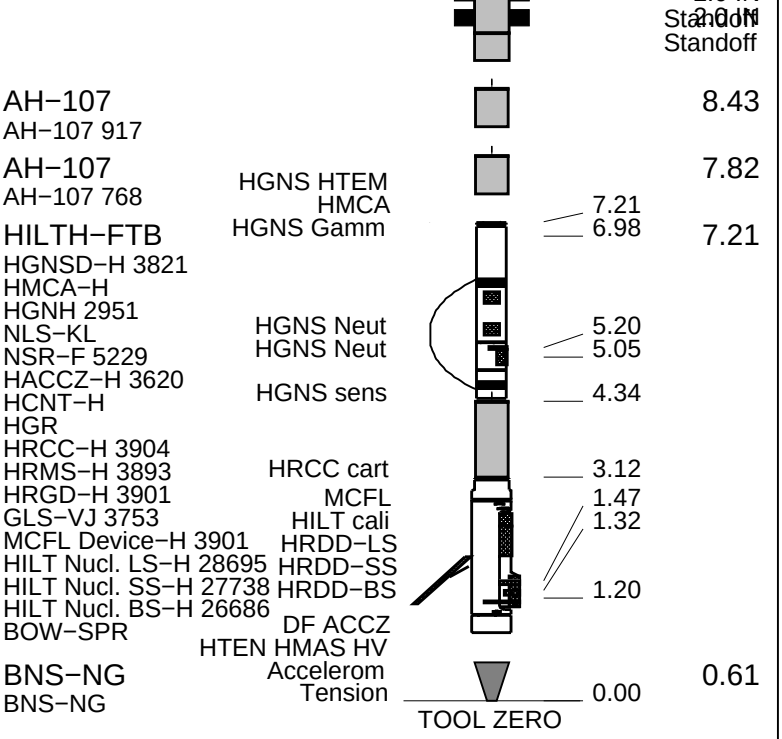
SPA−A 20.59
SPA−A 9933

HNGS−BA 19.37
HNGS−BA 309
HNSH−BA 314

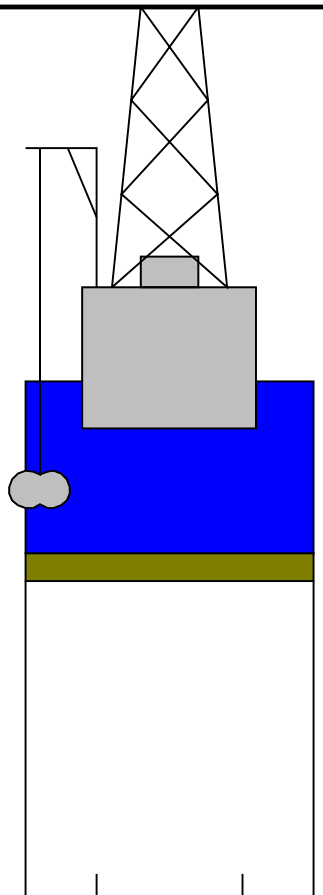
HNGC−B 16.87
HNGH−A 4058
HNGC−B 573

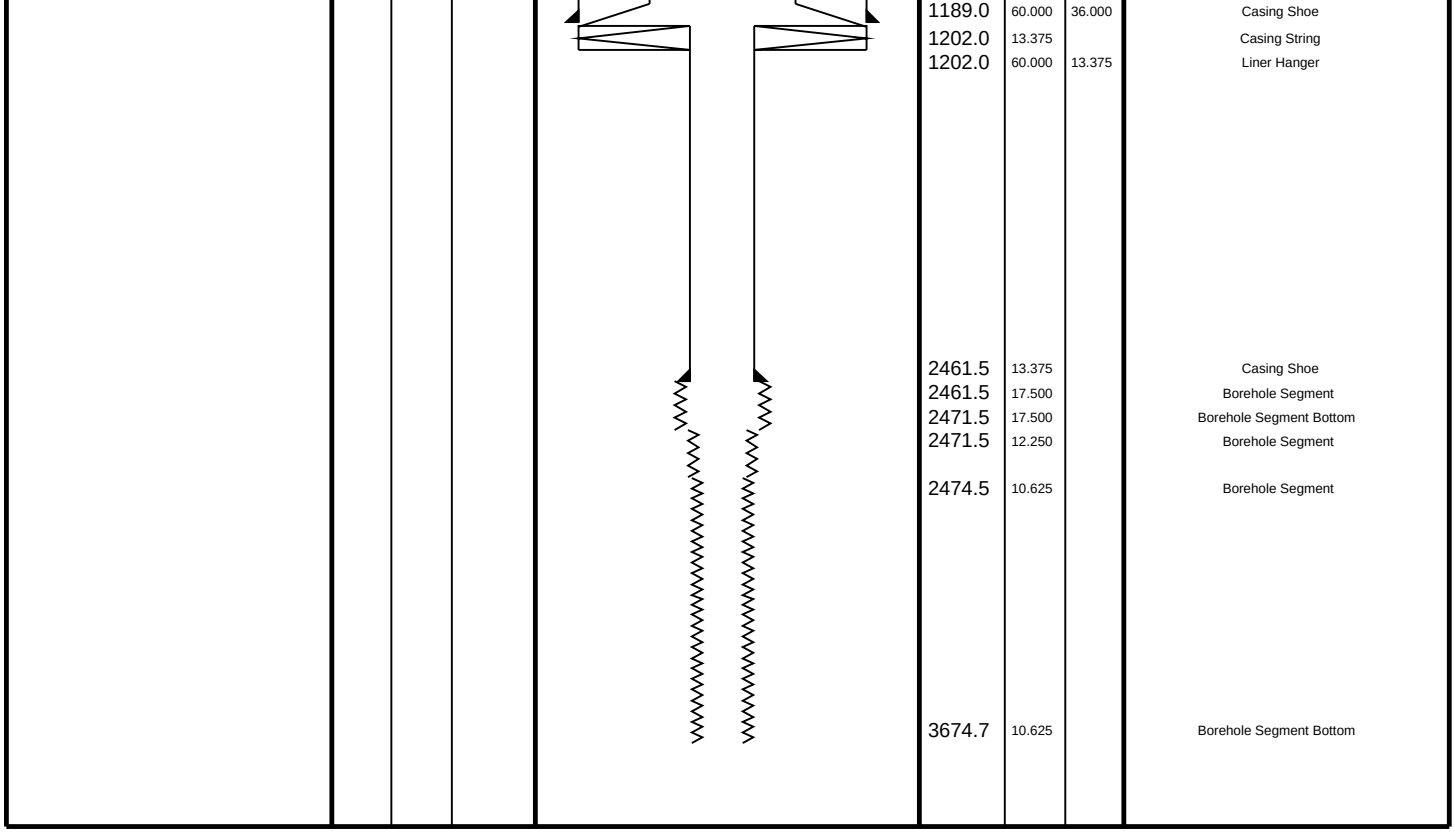
HRLT−B 15.80
HRUH−B 857
HRUC−B 857
HRLS−B 855
HRLH−B 872
HRLC−B 866
AH−270 873
2.0 IN Standoff
2.0 IN Standoff
2.0 IN

RUN 2



MAXIMUM STRING DIAMETER 7.63 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN METERS

Production String	(in) OD	(in) ID	(m) MD	Well Schematic	(m) MD	(in) OD	(in) ID	Casing String
Derrick Floor Elevation			28.5					
Mean Sea Level			0.0					
Seismic Gun depth below MSL			5.0					
					0.0	60.000	36.000	Casing String, Marine Riser
Bell Nipple Guide, Subsea BOP	60.000	36.000	1189.0					



1189.0	60.000	36.000	Casing Shoe
1202.0	13.375		Casing String
1202.0	60.000	13.375	Liner Hanger
2461.5	13.375		Casing Shoe
2461.5	17.500		Borehole Segment
2471.5	17.500		Borehole Segment Bottom
2471.5	12.250		Borehole Segment
2474.5	10.625		Borehole Segment
3674.7	10.625		Borehole Segment Bottom

Schlumberger

Main Log
1:200

MAXIS Field Log

Company: JAMSTEC **Well: C0020A**

Input DLIS Files

DEFAULT	**TLD_MCFL_CNL_HRLA_013LUP**	**FN:18**	**PRODUCER**	**10−Sep−2012 05:42**	**3671.3 M**	**2425.1 M**

Output DLIS Files

DEFAULT	**TLD_MCFL_CNL_HRLA_015PUP**	**FN:22**	**PRODUCER**	**10−Sep−2012 10:32**	**3673.6 M**	**2404.9 M**
CLIENT	**TLD_MCFL_CNL_HRLA_015PUC**	**FN:23**	**CUSTOMER**	**10−Sep−2012 10:32**	**3673.6 M**	**2404.9 M**
BACKUP	**TLD_MCFL_CNL_HRLA_015PUP**	**FN:24**	**PRODUCER**	**10−Sep−2012 10:32**	**3673.6 M**	**2404.9 M**

OP System Version: 19C1−222

HILTH−FTB	**19C1−222**	**HRLT−B**	**19C1−222**
HNGS−B	**HFF_5303_OP19.1_NUCL**	**HNGS−BA**	**HFF_5303_OP19.1_NUCL**

HNGC−B	HFE−5203−OP19.1−NUCL	HNGS−BA	HFE−5203−OP19.1−NUCL
SPA−A	19C1−222	EDTC−B	19C1−222

PIP SUMMARY

Time Mark Every 60 S

Area2
From HTHO to HFK

HNGS Spectroscopy Gamma Ray (HSGR)
0 (GAPI) 150

HNGS Thorium (HTHO)
−20 (PPM) 20

Area1
From HCGR to HSGR

HNGS Thorium / Potassium Ratio (HTPR)
0.1 (−−−−) 1000

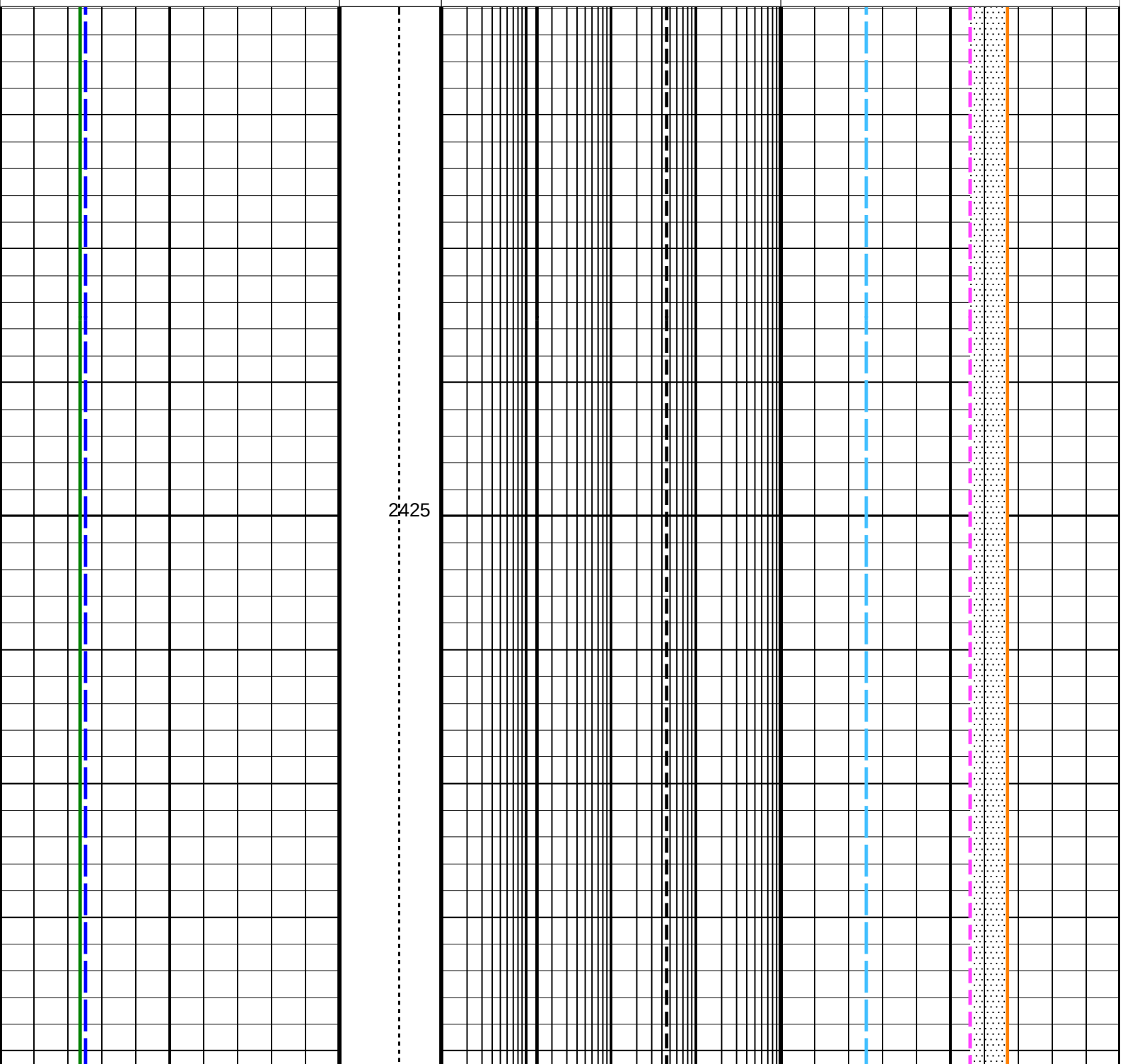
HNGS Uranium (HURA)
−5 (PPM) 15

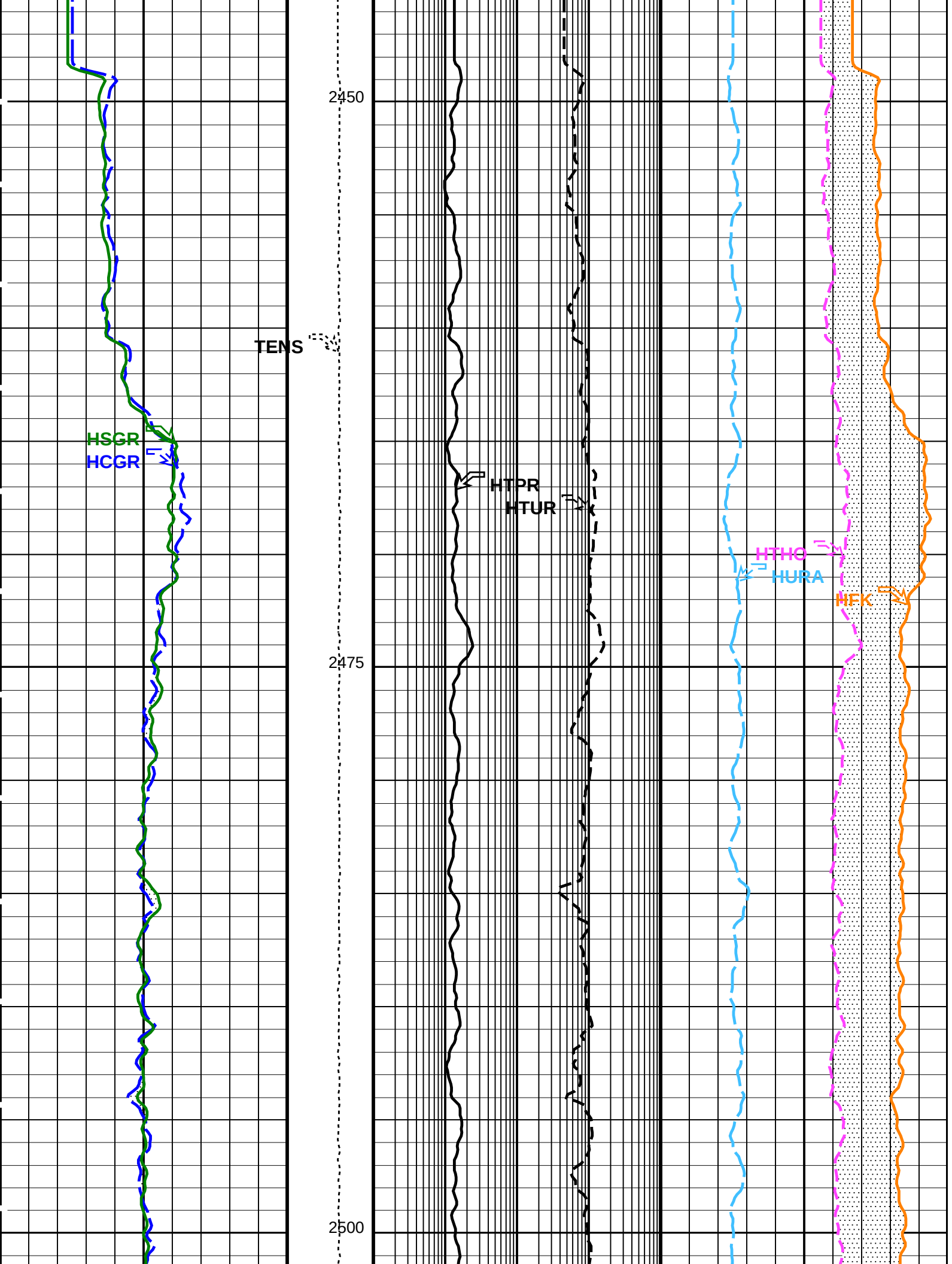
HNGS Computed Gamma Ray (HCGR)
0 (GAPI) 150

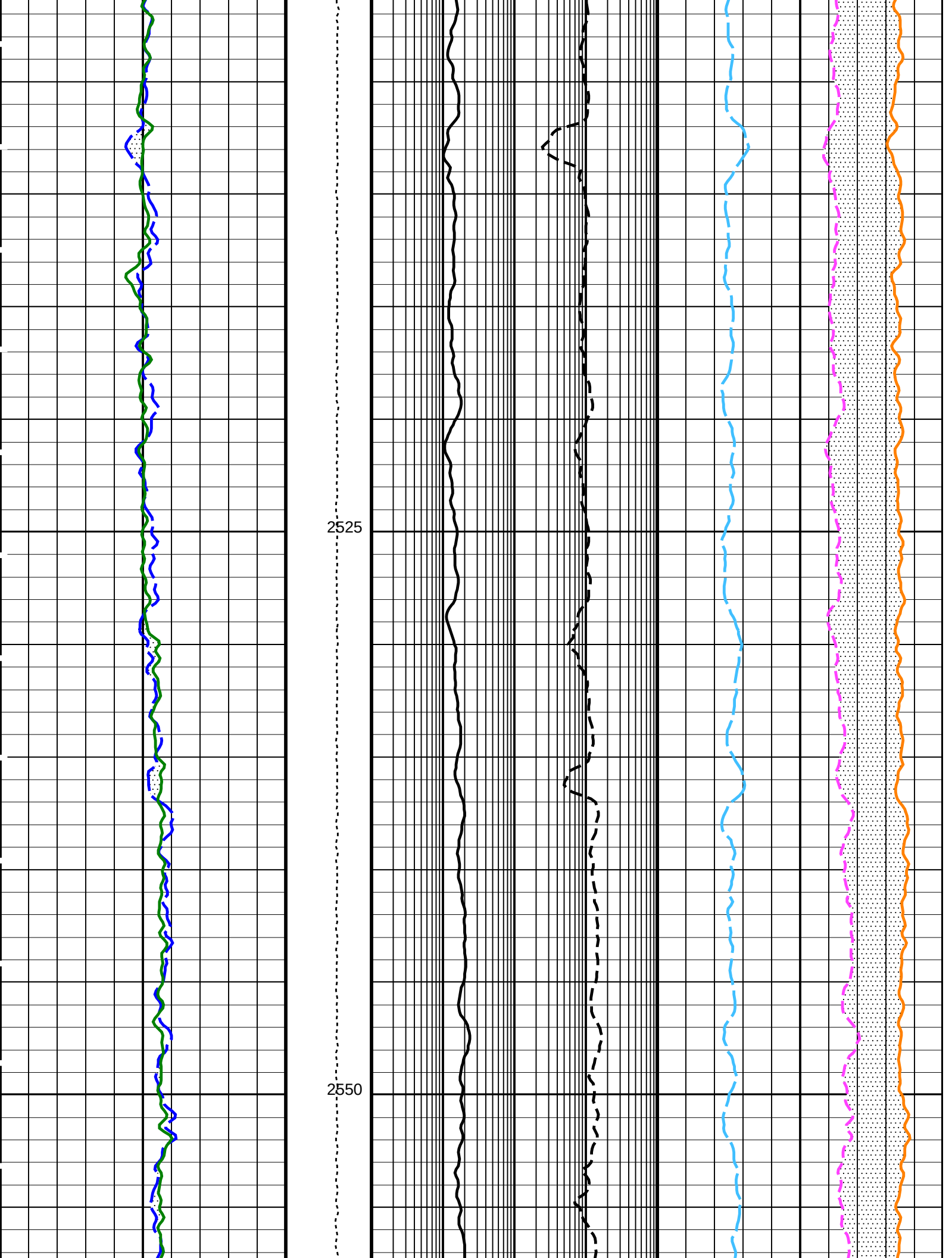
Tension (TENS) (LBF)
10000 0

HNGS Thorium / Uranium Ratio (HTUR)
0.01 (−−−−) 100

HNGS Potassium (HFK)
−0.05 (V/V) 0.05




2450
TENS
HSGR
HCGR
HTPR
HTUR
HTHO
HURA
HFK
2475
2500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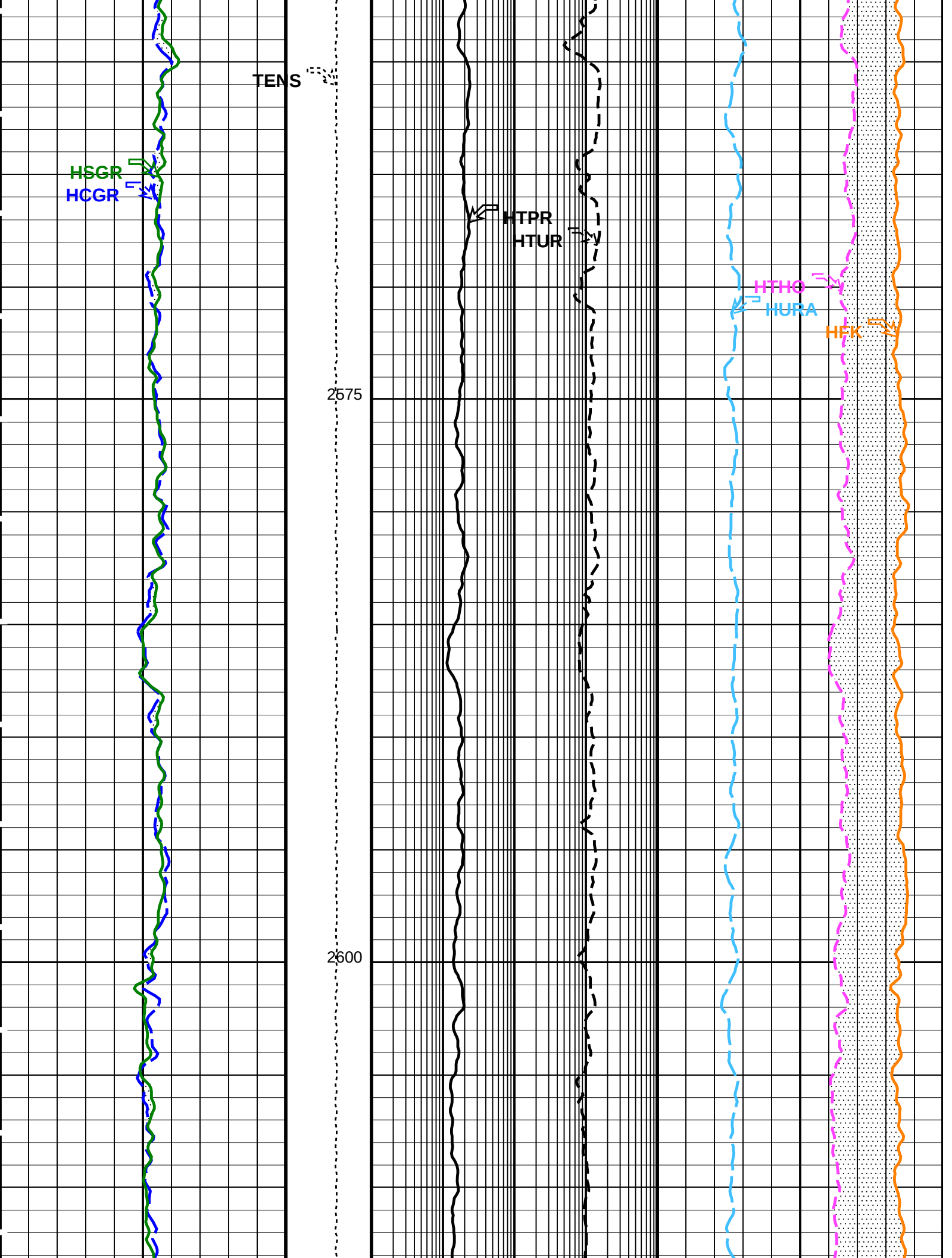
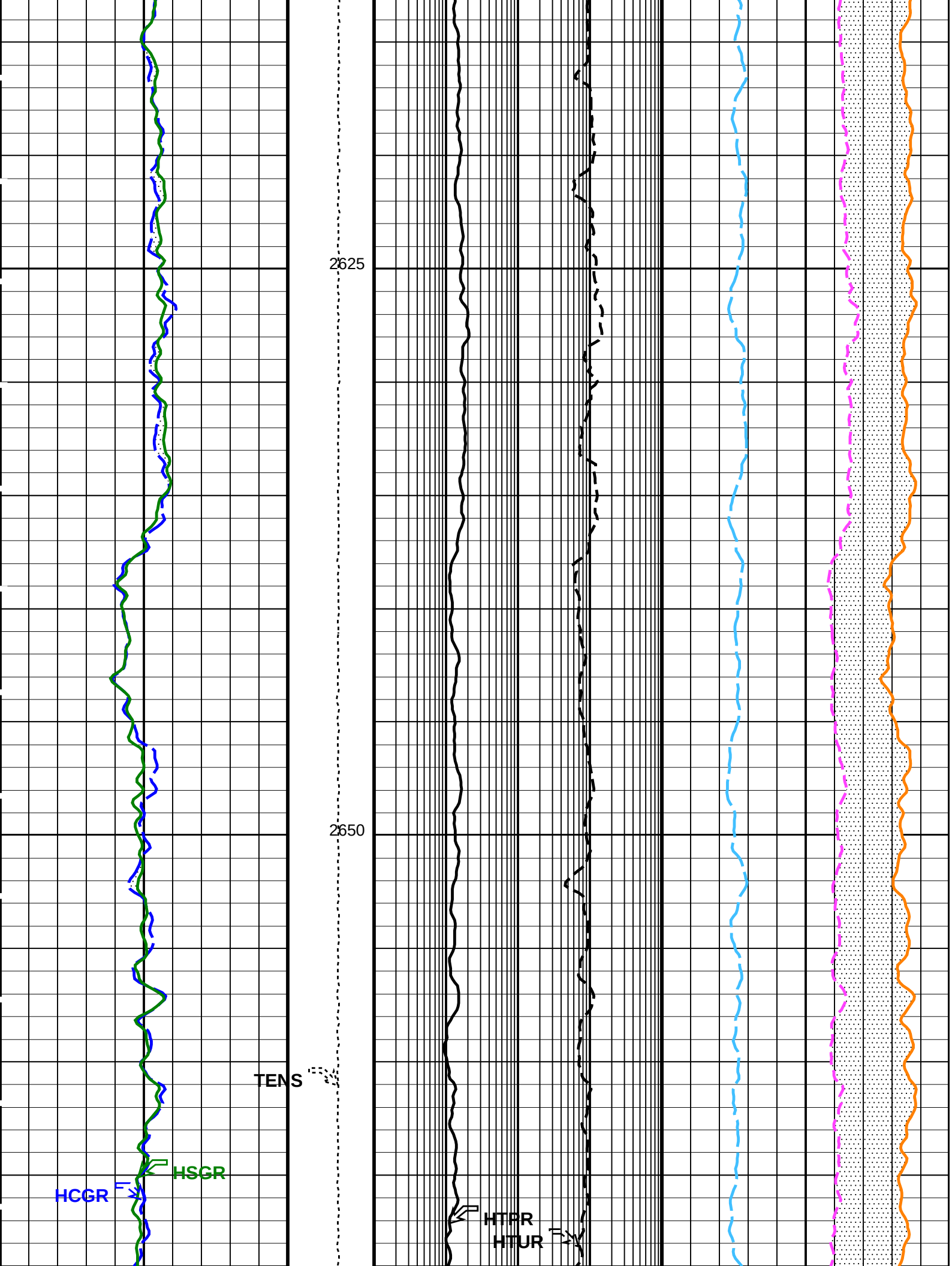
2550


TENS
HSGR
HCGR
HTPR
HTUR
HTHO
HURA
HFK
2575
2600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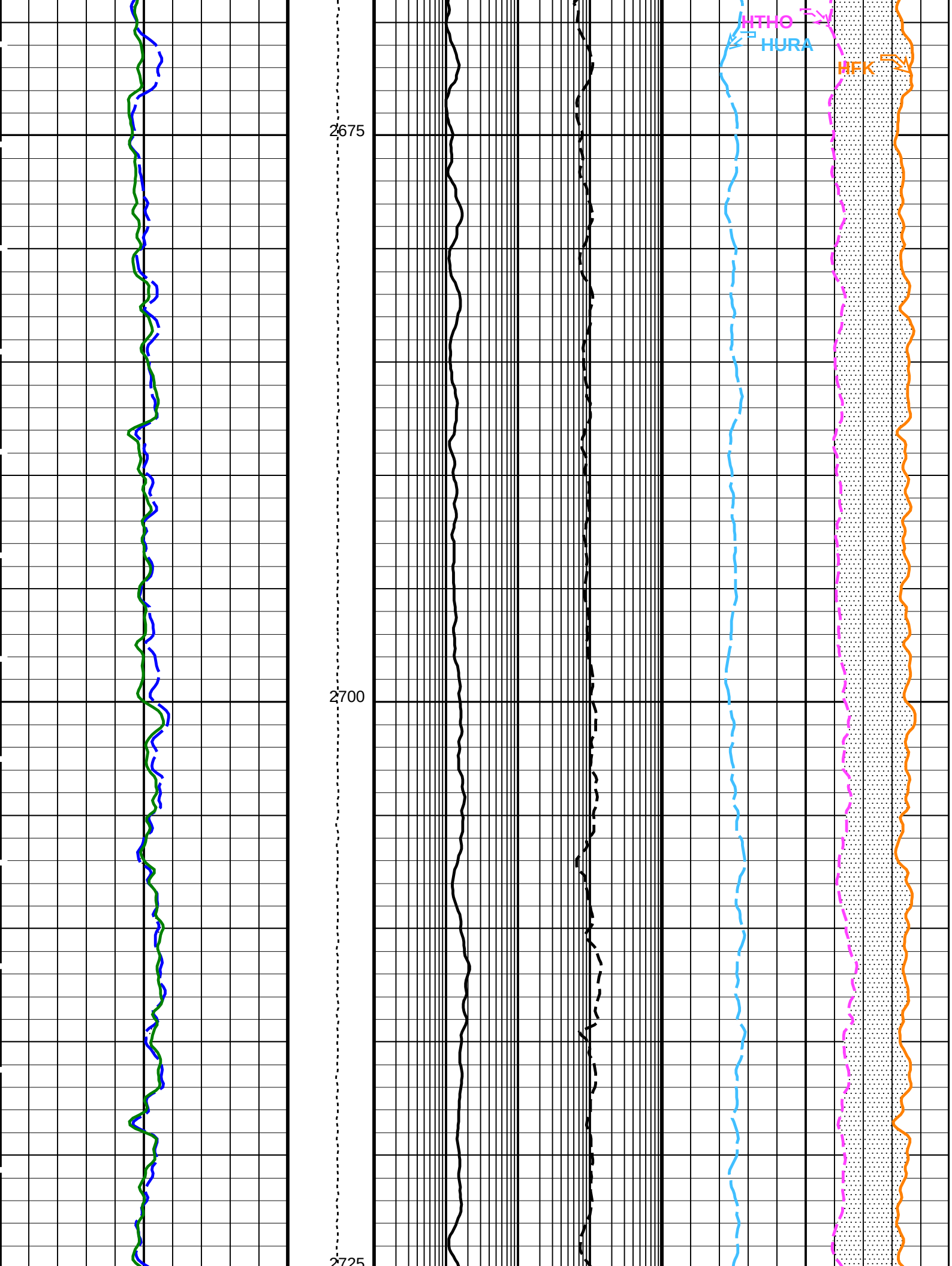
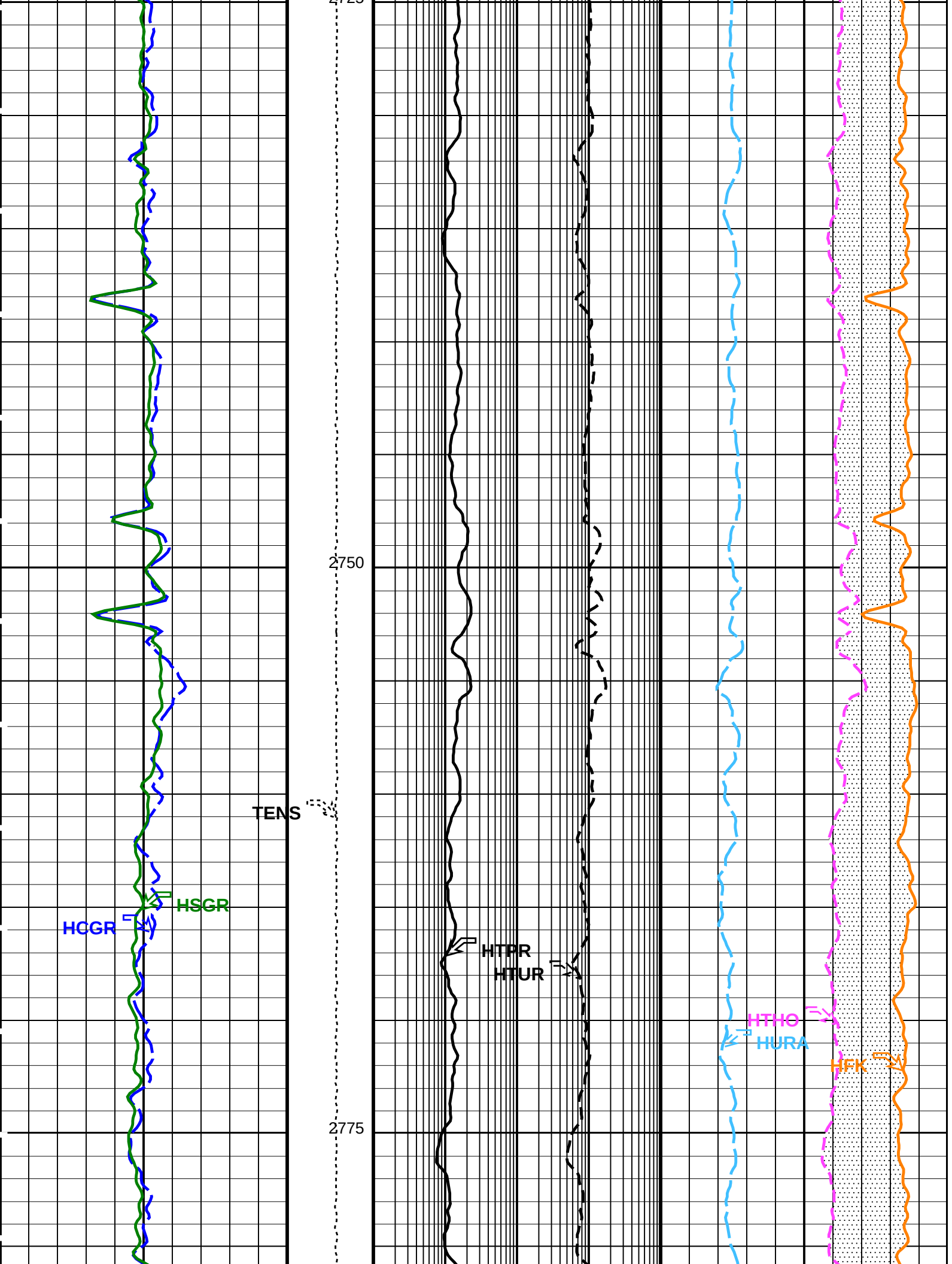
TENS
HSGR
HCGR
HTPR
HTUR


HTHO
HURA
HFK
2675
2700
2725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HCGR
HTPR
HTUR
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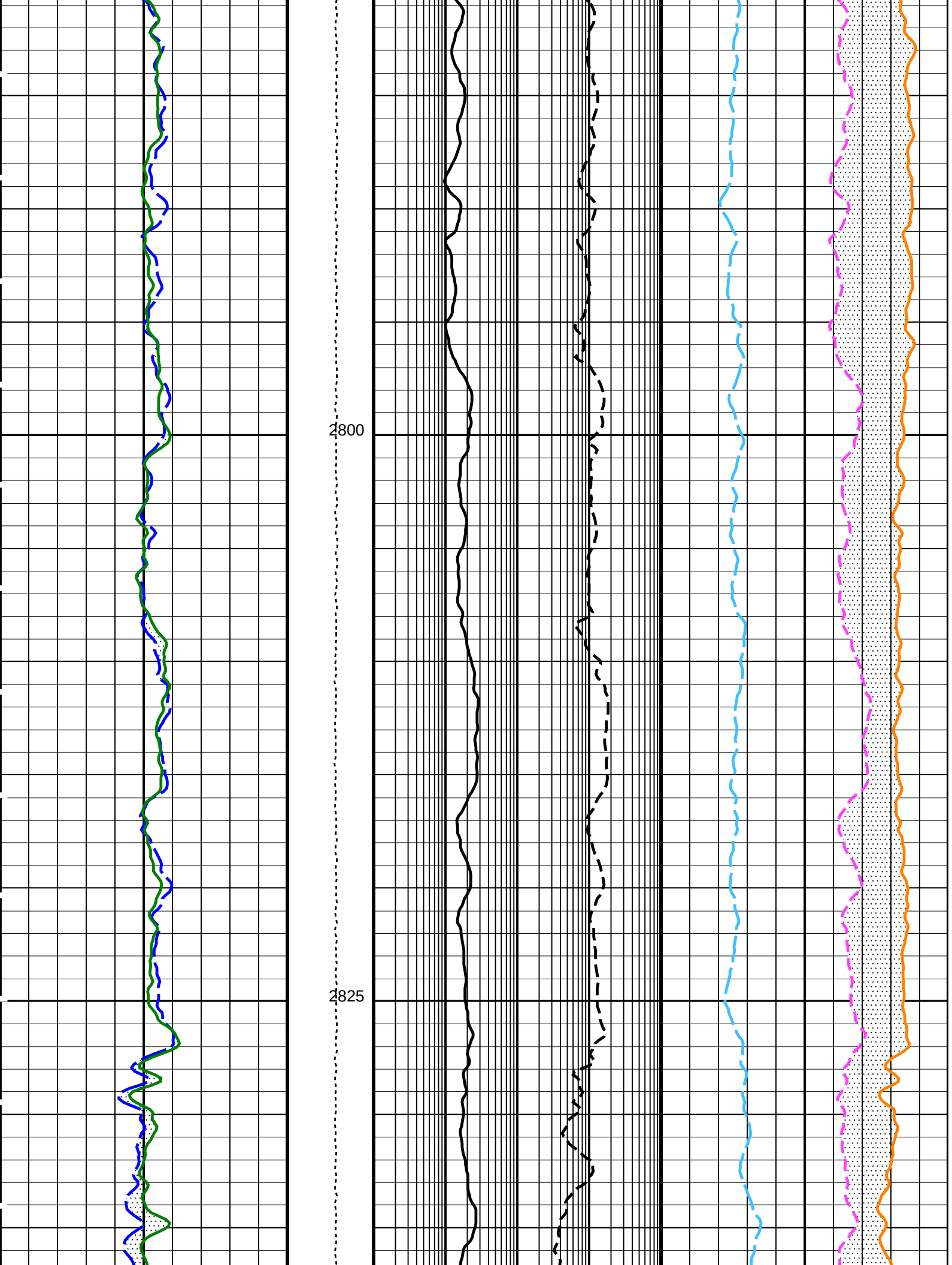
HURA
HFK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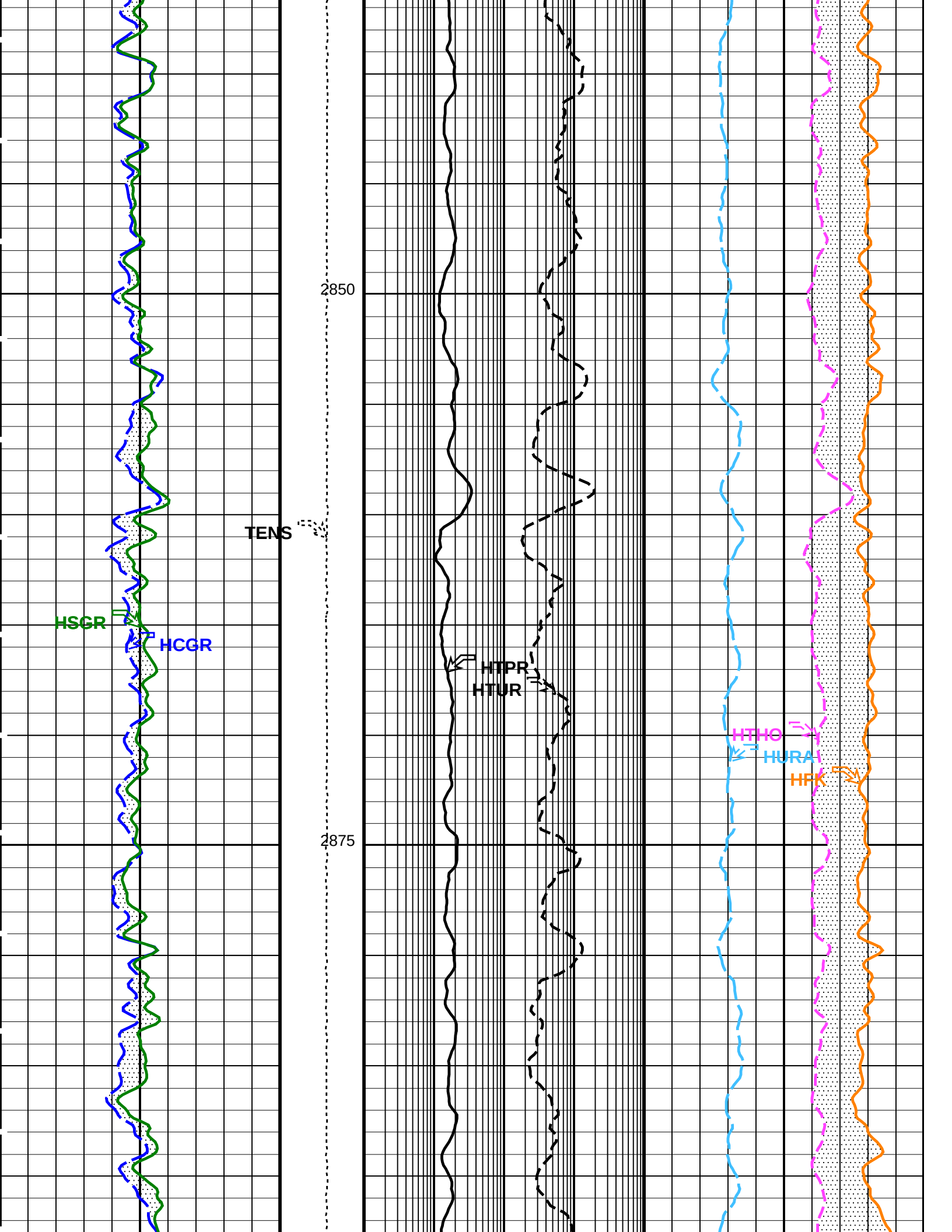
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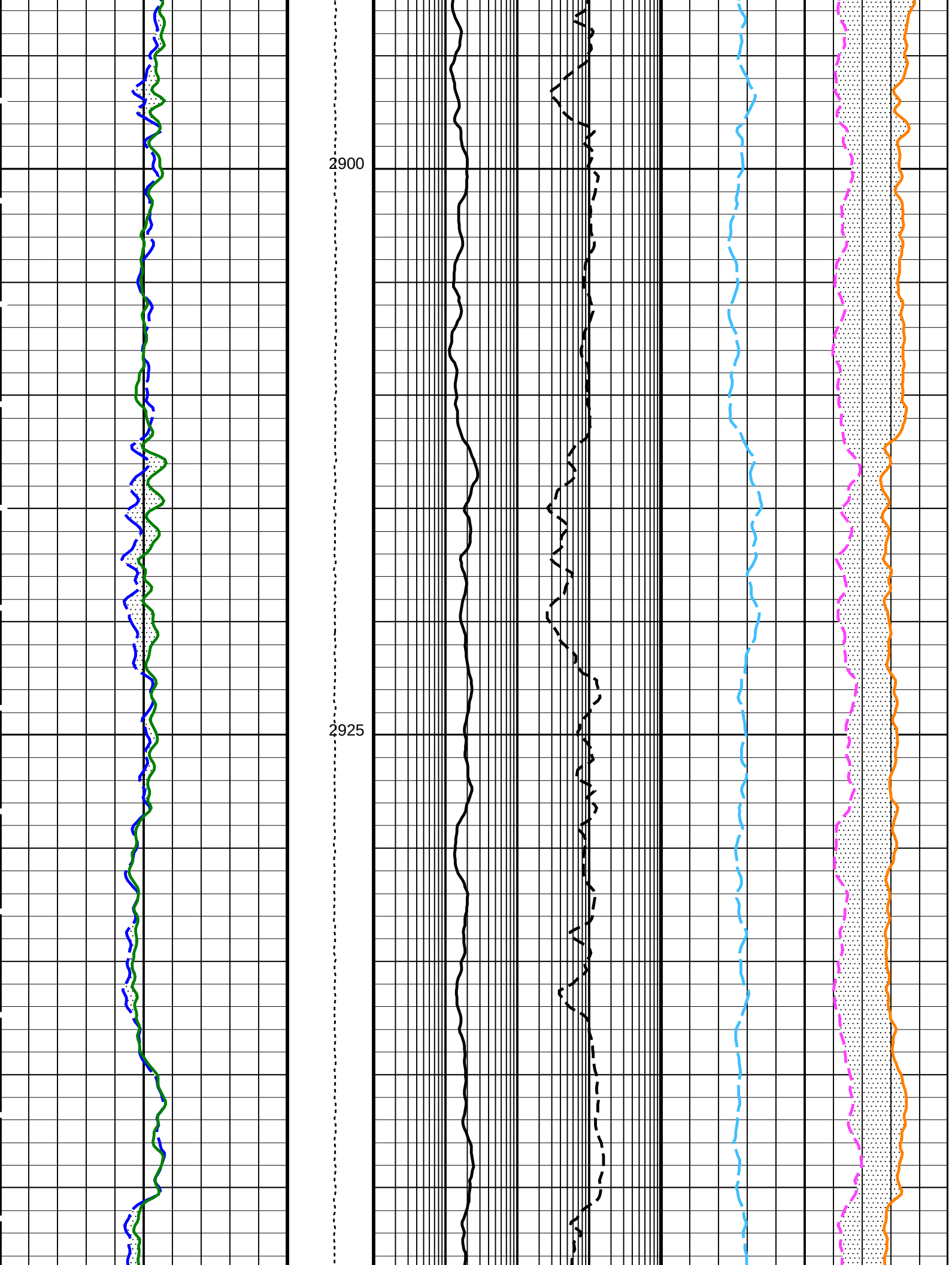
HTUR
HTHO
HURA
HFK
2875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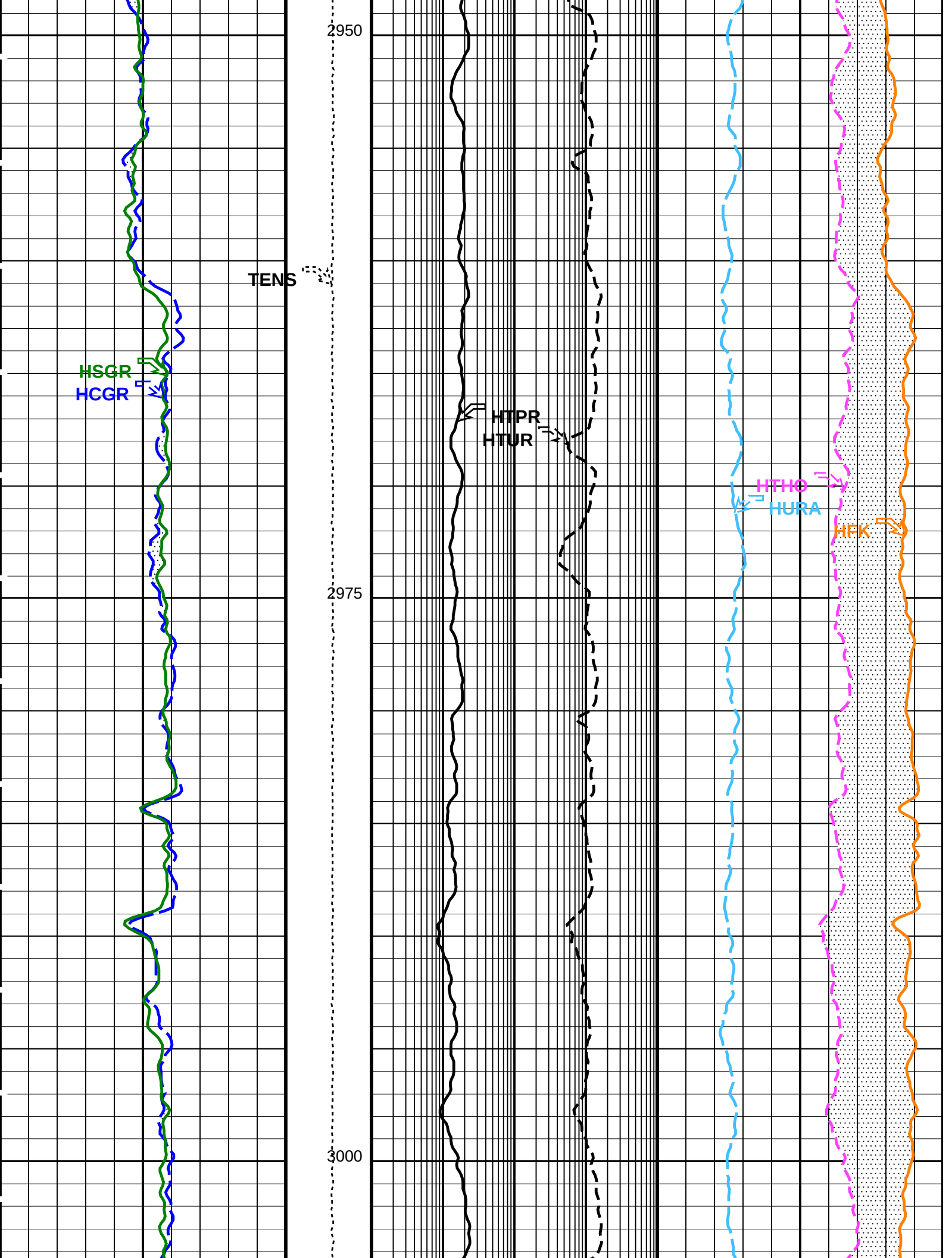
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HTUR
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HFK
2975
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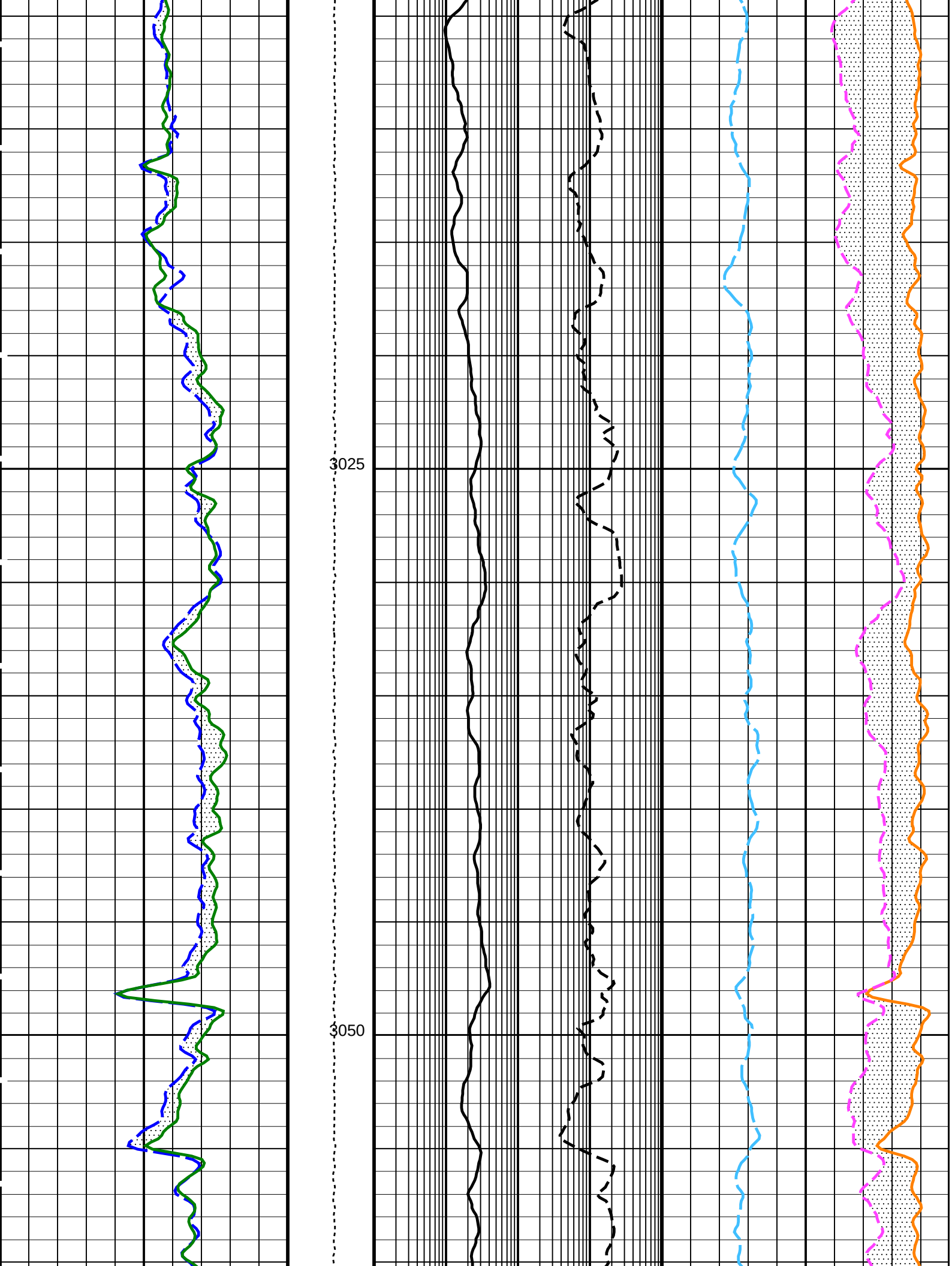
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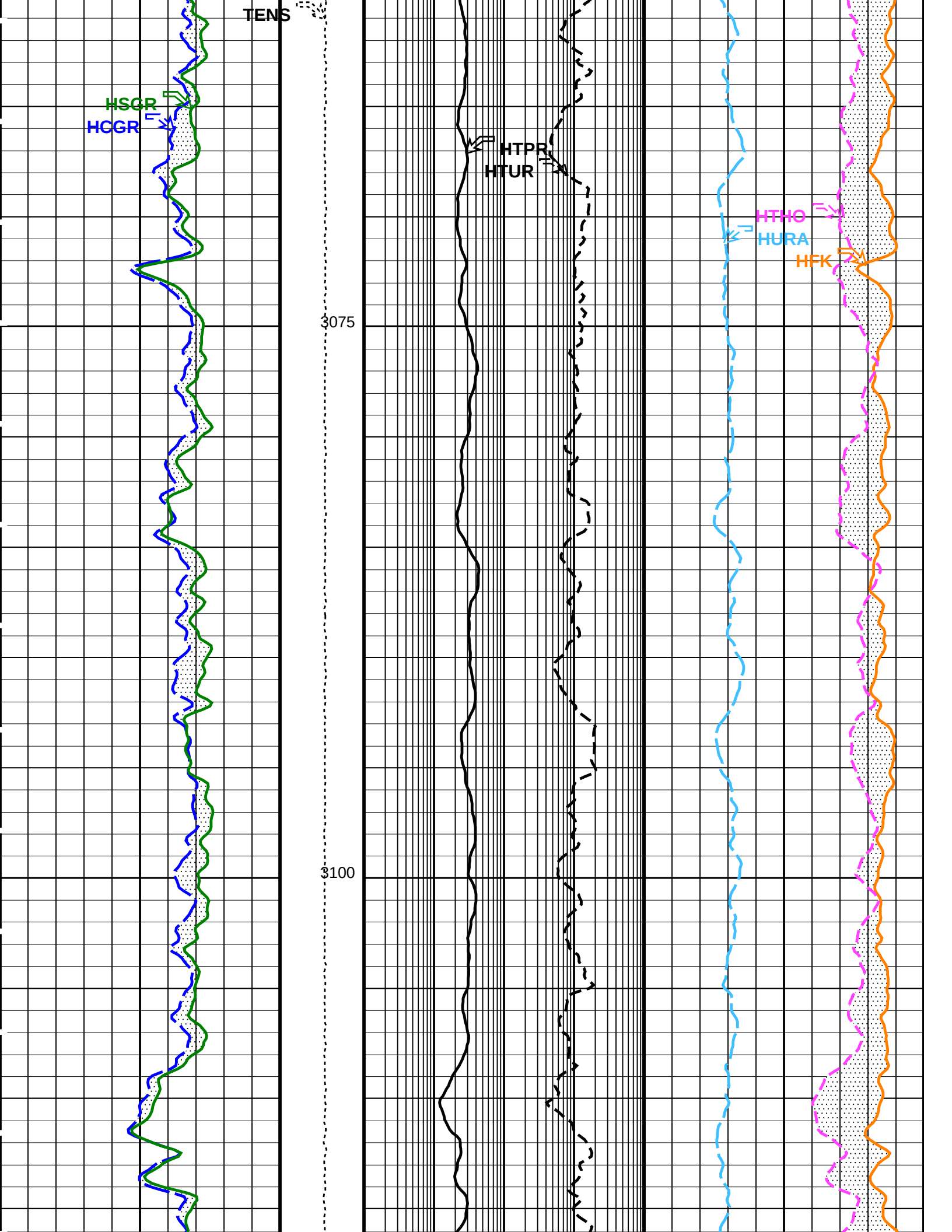
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HFK
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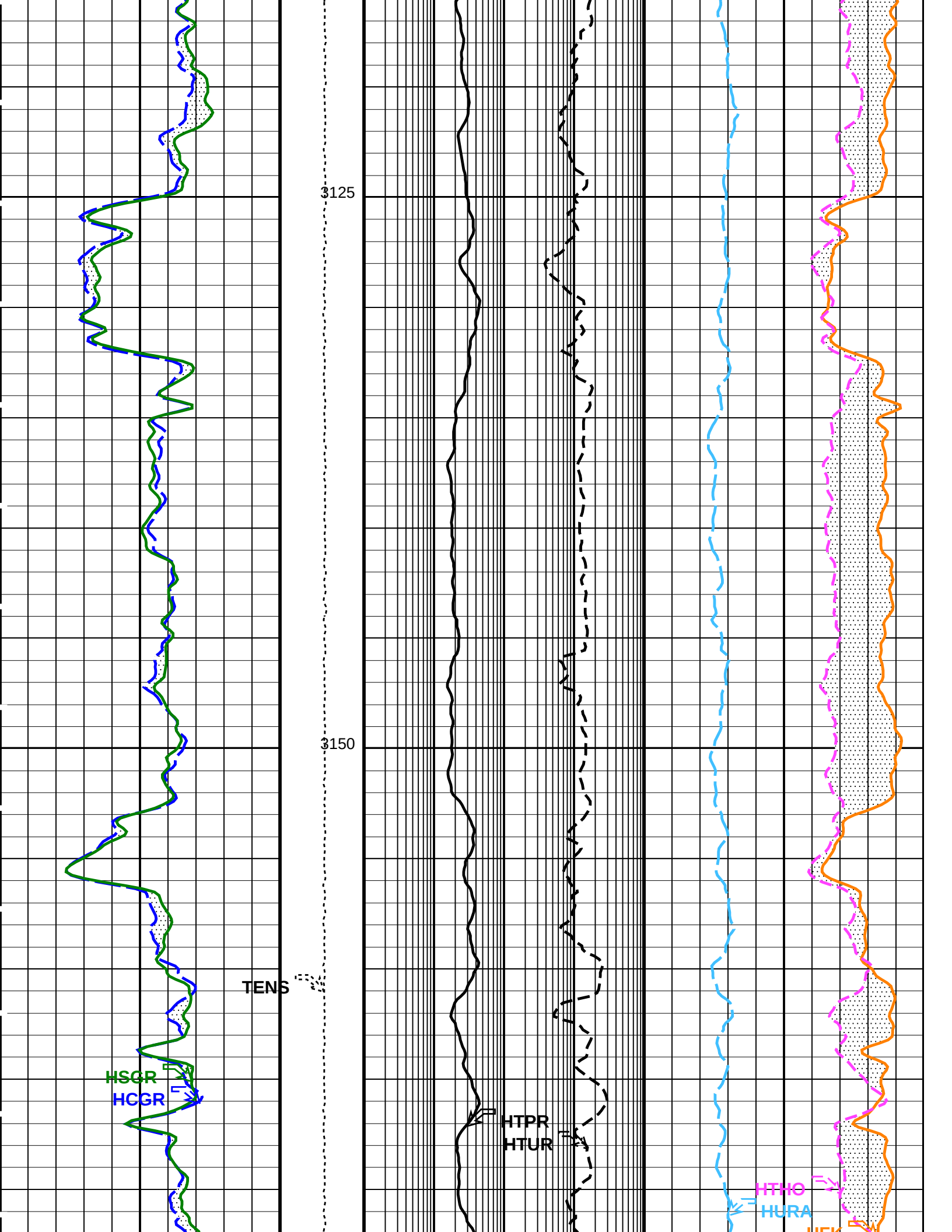
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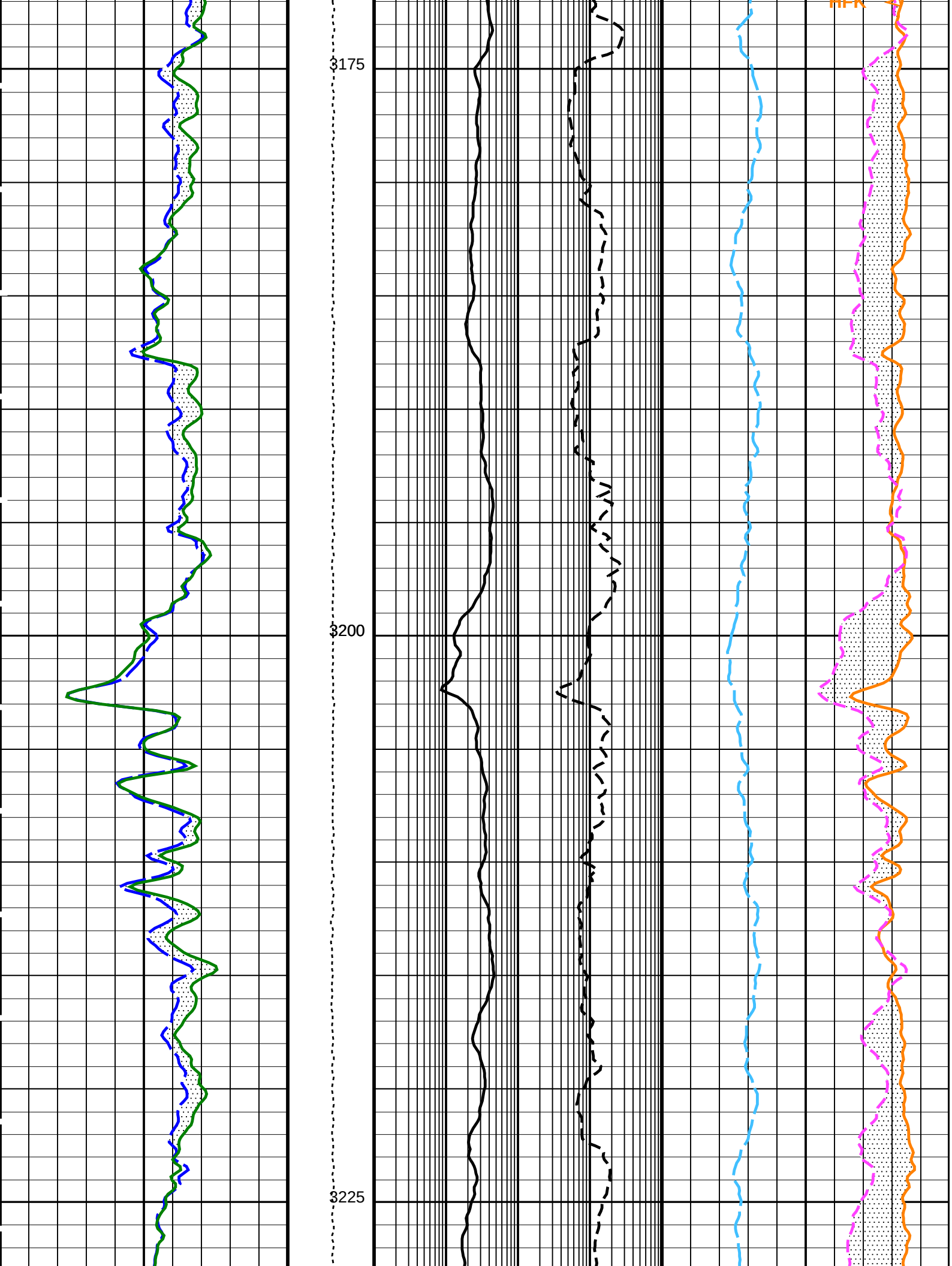
HTUR
HTHO
HURA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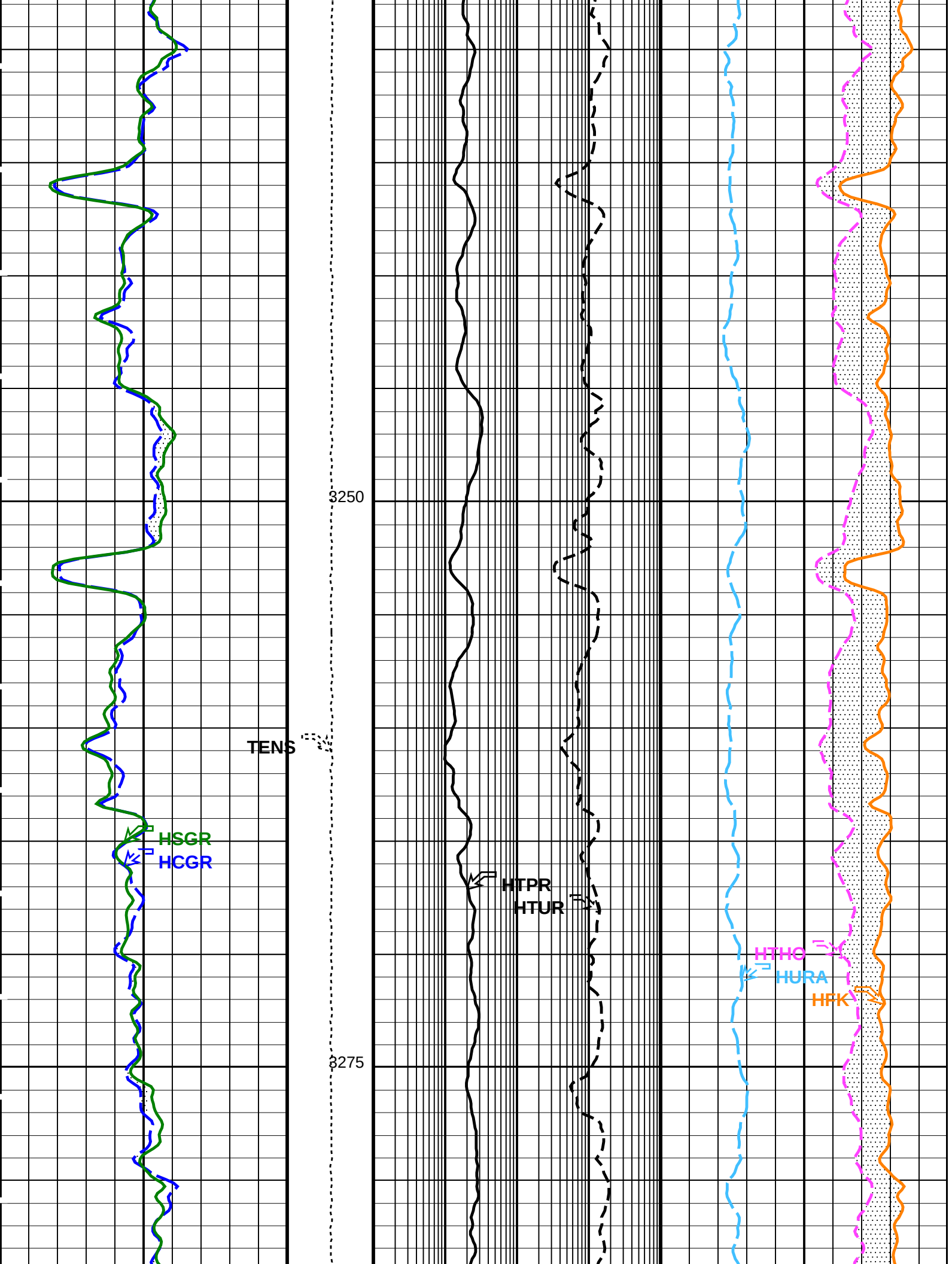
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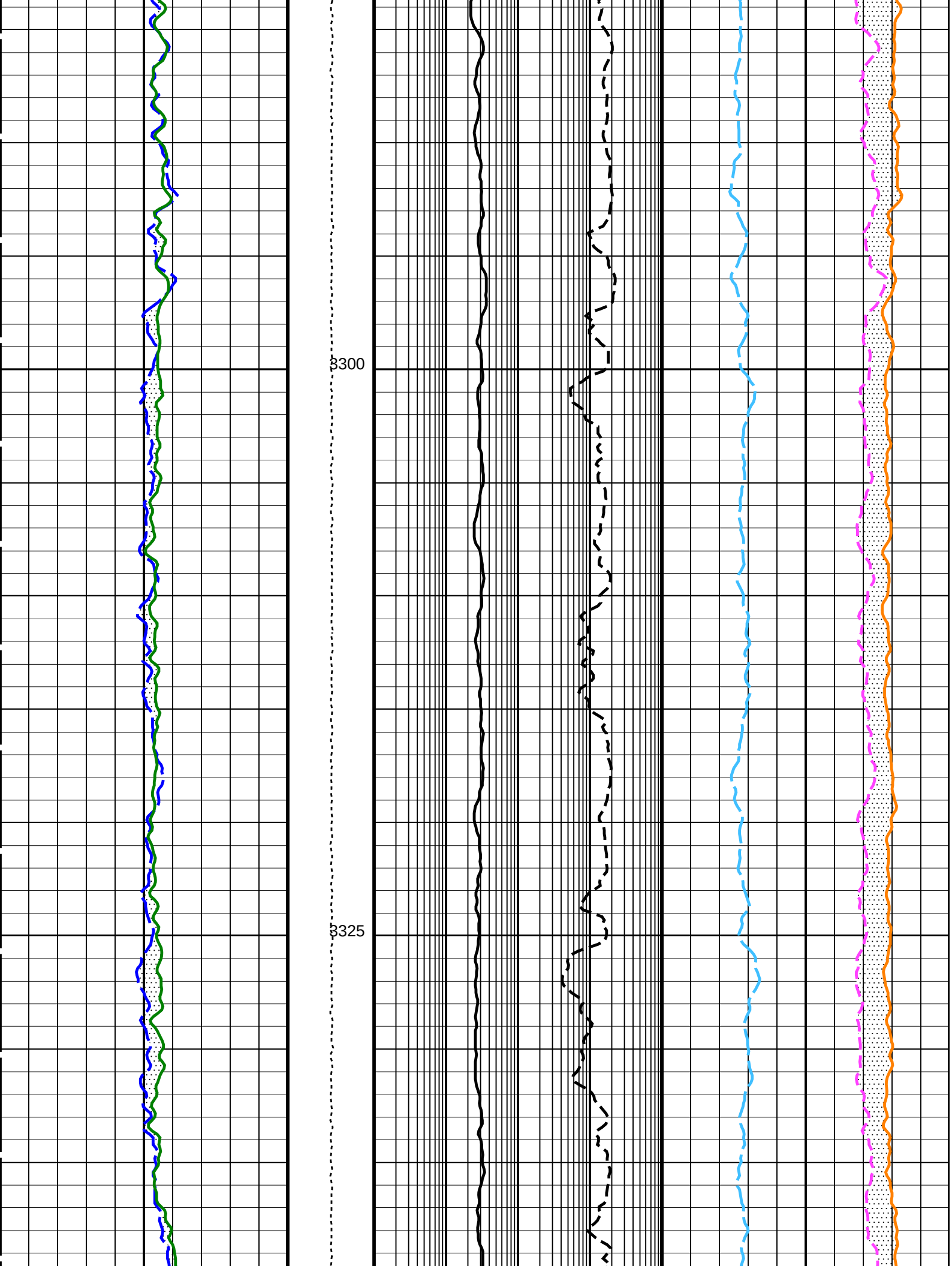
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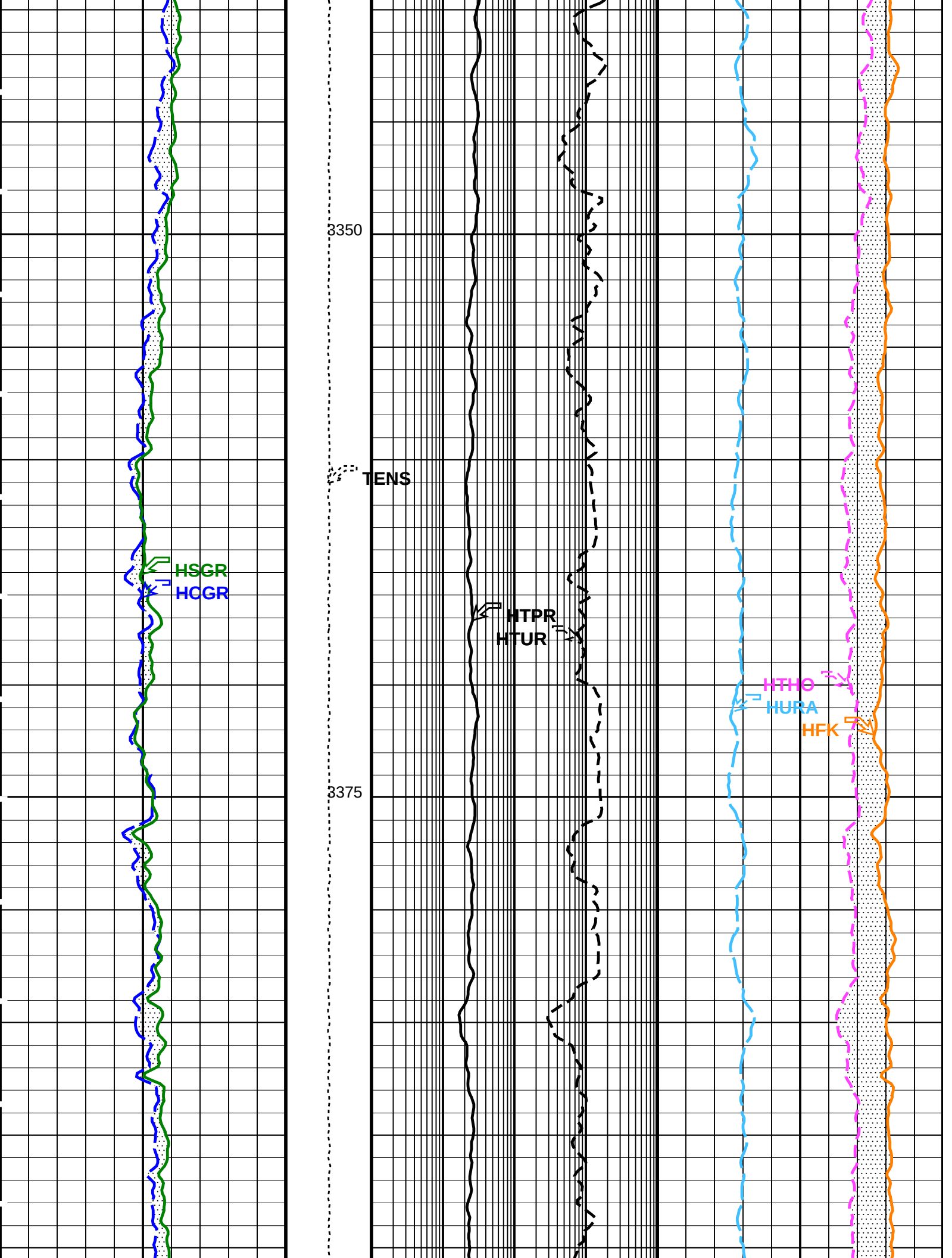
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HTUR
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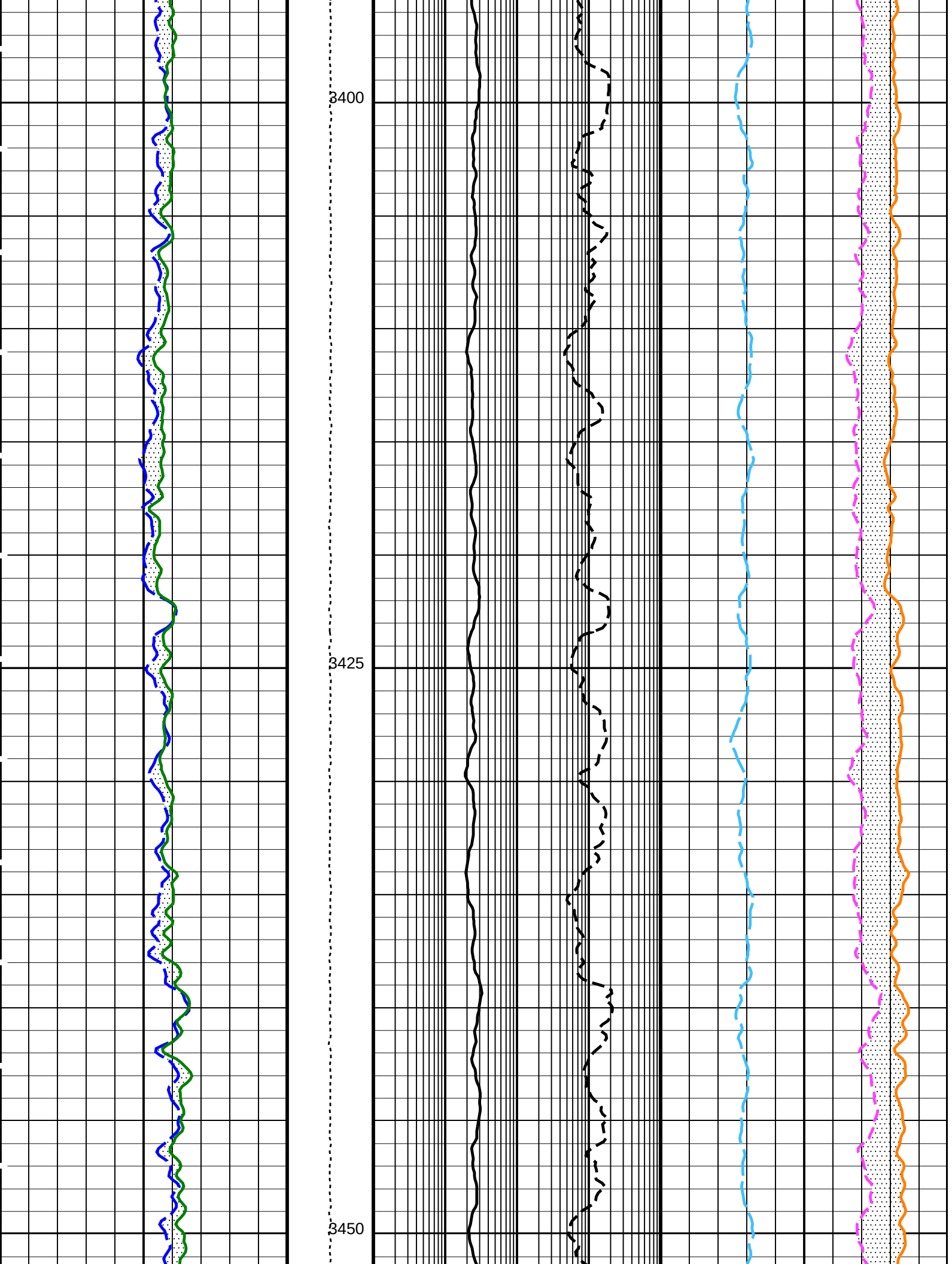
HFK
3375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3425
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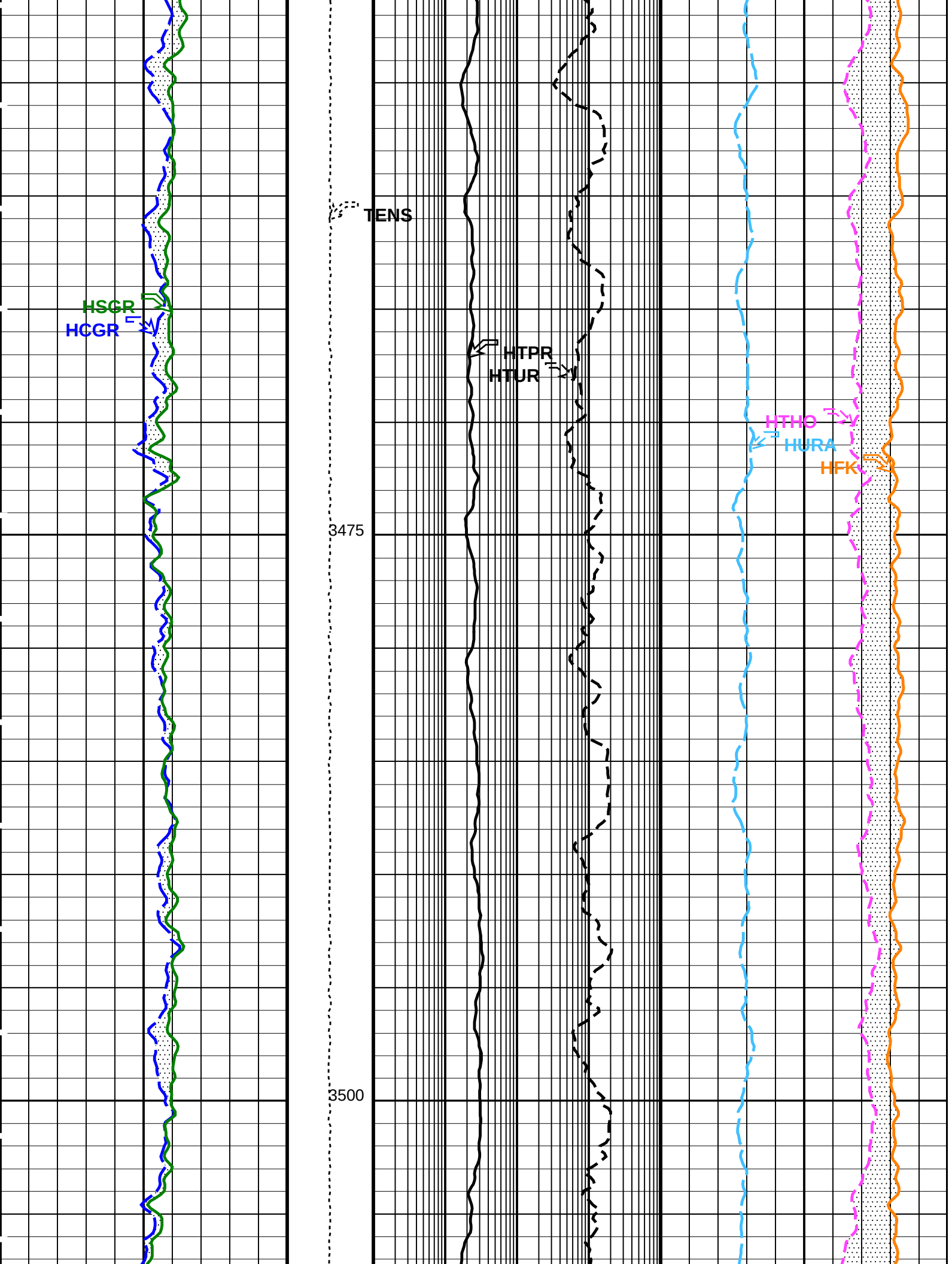
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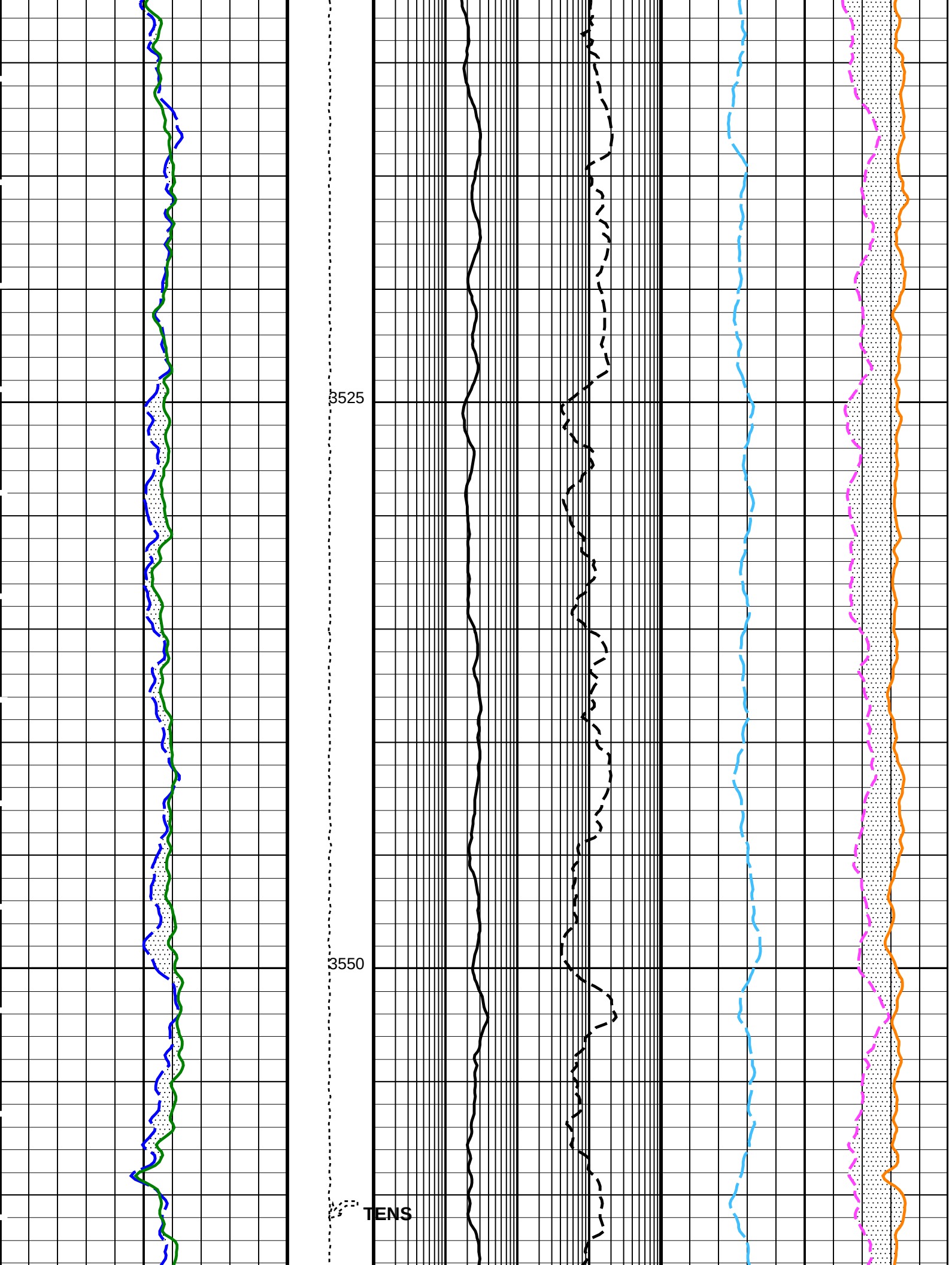
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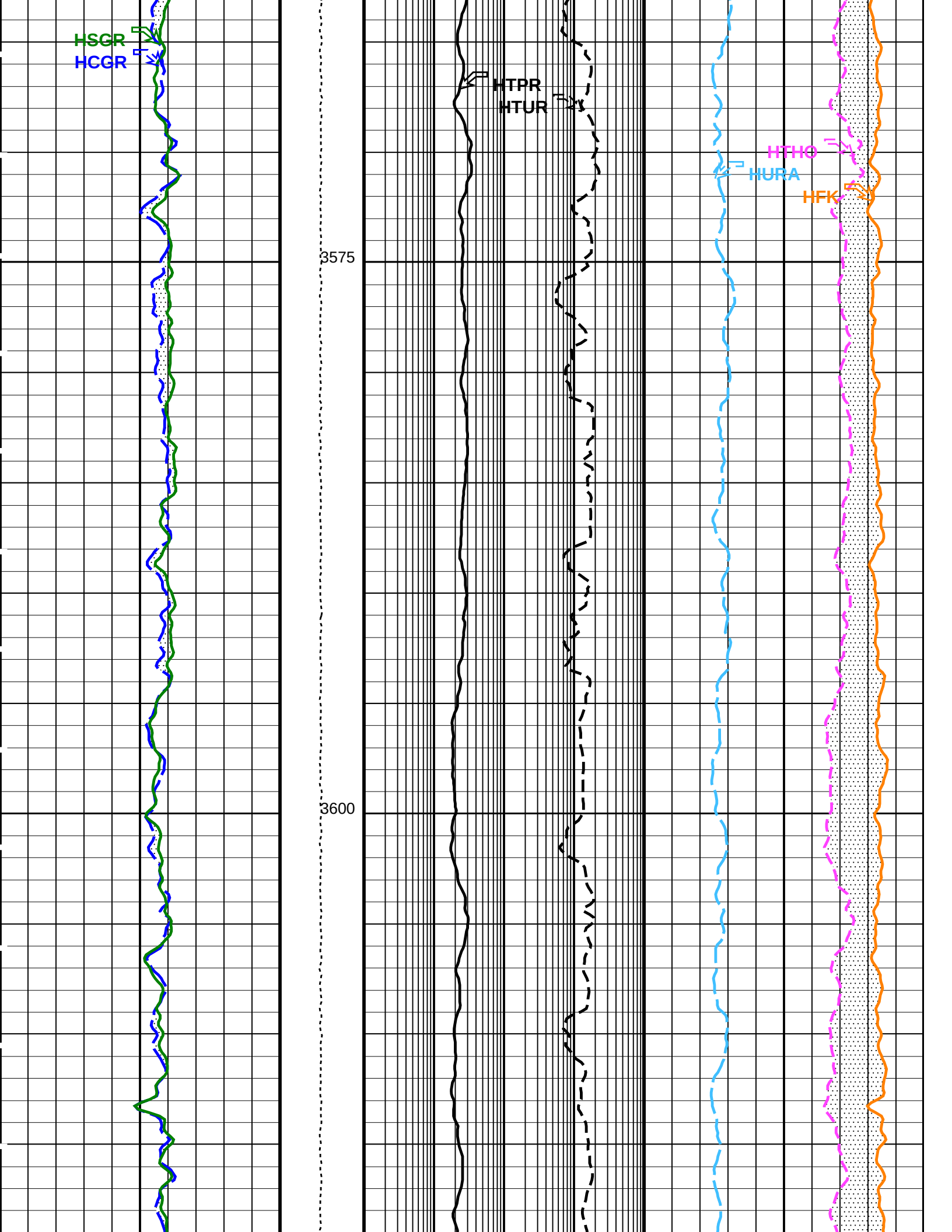
3550
TENS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HCGR
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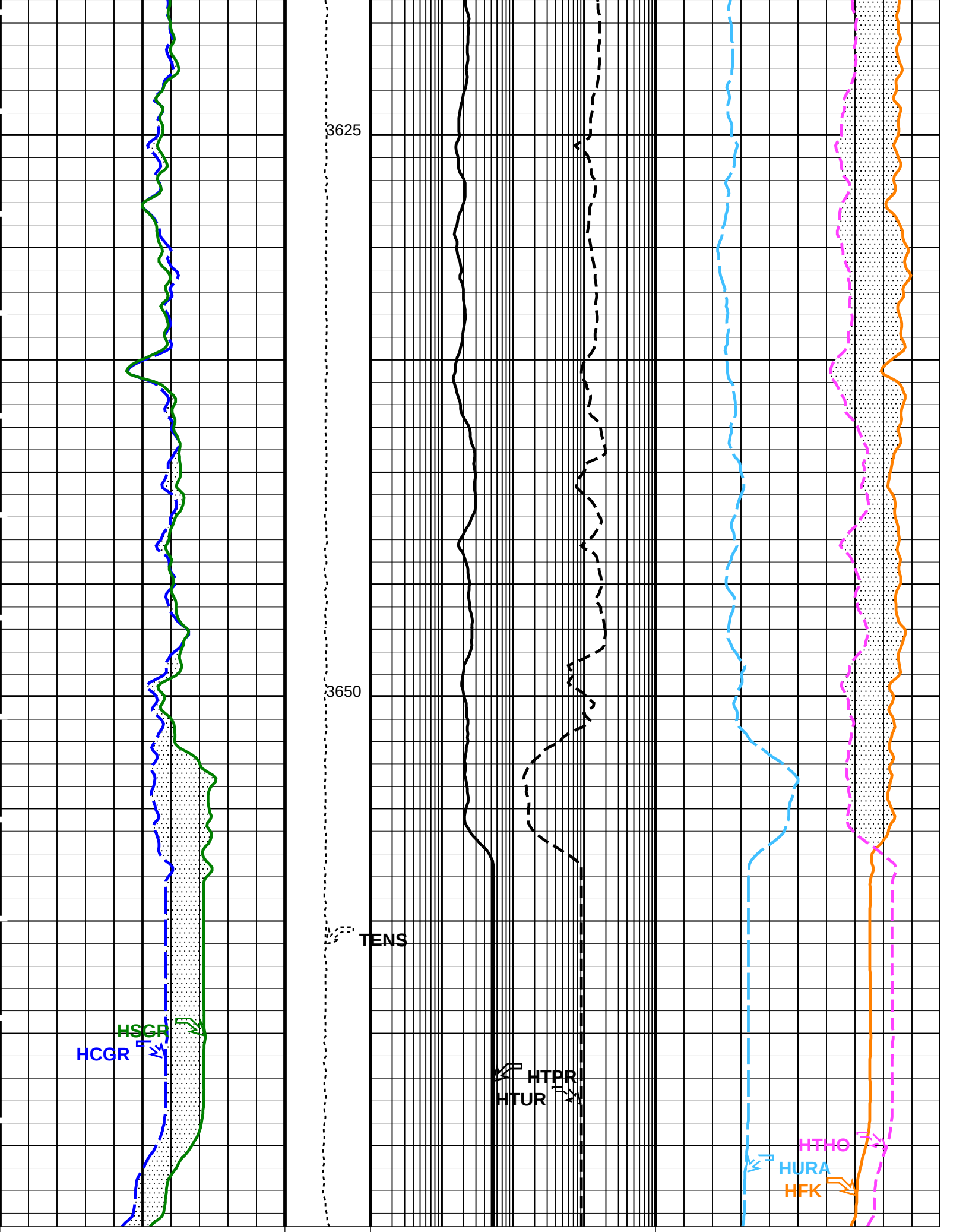
HTHO
HURA
HFK
3575
3600

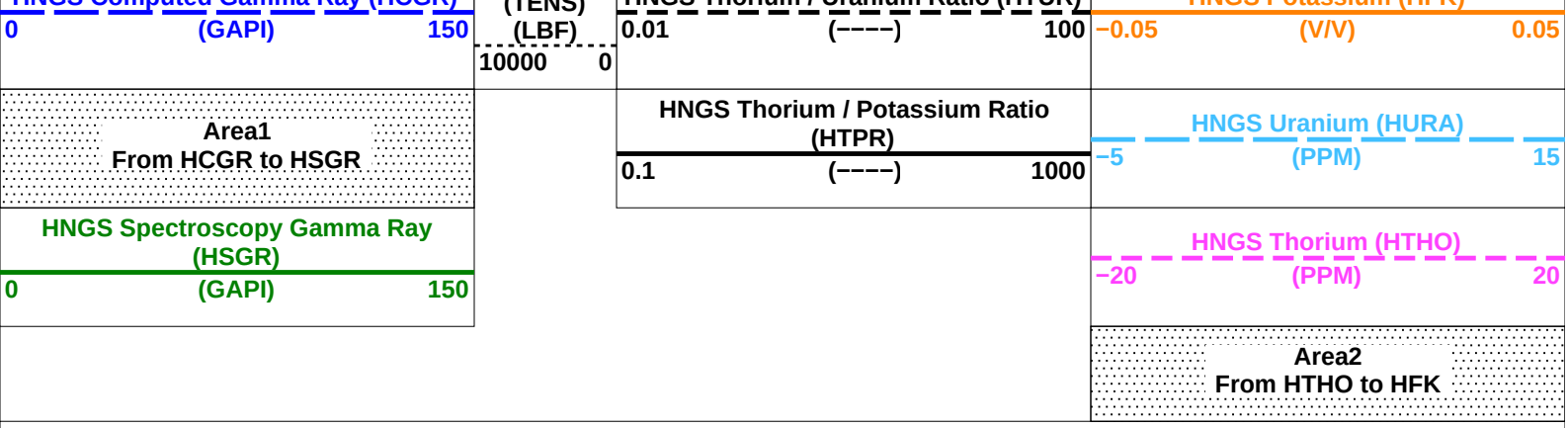


HNGS Computed Gamma Ray (HCGR)

Tension (TENS)

HNGS Thorium / Uranium Ratio (HTUR)

HNGS Potassium (HFK)



PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	HILTH−FTB: High resolution Integrated Logging Tool−DTS		
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
	HRLT−B: High Resolution Laterolog Array − B		
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
	HNGS−BA: Hostile Natural Gamma Ray Sonde		
BAR1	HNGS Detector 1 Barite Constant	1	
BAR2	HNGS Detector 2 Barite Constant	1	
BHK	HNGS Borehole Potassium Correction Concentration	0	
BHS	Borehole Status	OPEN	
CSD1	Inner Casing Outer Diameter	0	IN
CSD2	Outer Casing Outer Diameter	0	IN
CSW1	Inner Casing Weight	0	LB/F
CSW2	Outer Casing Weight	0	LB/F
DBCC	HNGS Barite Constant Correction Flag	NONE	
GCSE	Generalized Caliper Selection	HCAL	
H1P	HNGS Detector 1 Allow/Disallow In Processing	ALLOW	
H2P	HNGS Detector 2 Allow/Disallow In Processing	ALLOW	
HABK	HNGS Borehole Potassium Running Average	0.0239045	
HALF	HNGS Alpha Filter Length	60	IN
HCRB	HNGS Apply Borehole Potassium Correction	NONE	
HMWM	Mud Weighting Material	NATU	
HNPE	HNGS Processing Enable	YES	
S1BI	HNGS Detector 1 Calibration Bismuth Count Rate	−999.25	CPS
S2BI	HNGS Detector 2 Calibration Bismuth Count Rate	−999.25	CPS
SGRC	HNGS Standard Gamma−Ray Correction Flag	YES	
TPOS	Tool Position	ECCE	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	1.00615	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	0.990799	
	EDTC−B: Enhanced DTS Cartridge		
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
	System and Miscellaneous		
BS	Bit Size	10.625	IN
DO	Depth Offset for Playback	2.2	M
DORL	Depth Offset for Repeat Analysis	2.3	M
PP	Playback Processing	NORMAL	

Format: HNGSRatios **Vertical Scale: 1:200** **Graphics File Created: 10−Sep−2012 10:32**

OP System Version: 19C1−222

HILTH−FTB	19C1−222	HRLT−B	19C1−222
HNGC−B	HFE−5203−OP19.1−NUCL	HNGS−BA	HFE−5203−OP19.1−NUCL
SPA−A	19C1−222	EDTC−B	19C1−222

Input DLIS Files

DEFAULT	TLD_MCFL_CNL_HRLA_013LUP	FN:18	PRODUCER	10−Sep−2012 05:42	3671.3 M	2425.1 M

Output DLIS Files

DEFAULT	TLD_MCFL_CNL_HRLA_015PUP	FN:22	PRODUCER	10−Sep−2012 10:32

CLIENT	TLD_MCFL_CNL_HRLA_015PUC	FN:23	CUSTOMER	10−Sep−2012 10:32		
BACKUP	TLD_MCFL_CNL_HRLA_015PUP	FN:24	PRODUCER	10−Sep−2012 10:32		

Schlumberger

Repeat Analysis
1:200

MAXIS Field Log

Company: JAMSTEC **Well: C0020A**

Input DLIS Files

DEFAULT	TLD_MCFL_CNL_HRLA_016LUP	FN:25	PRODUCER	10−Sep−2012 11:01	3246.1 M	1636.0 M
DEFAULT	TLD_MCFL_CNL_HRLA_015PUP	FN:22	PRODUCER	10−Sep−2012 10:32	3673.6 M	2405.9 M

Output DLIS Files

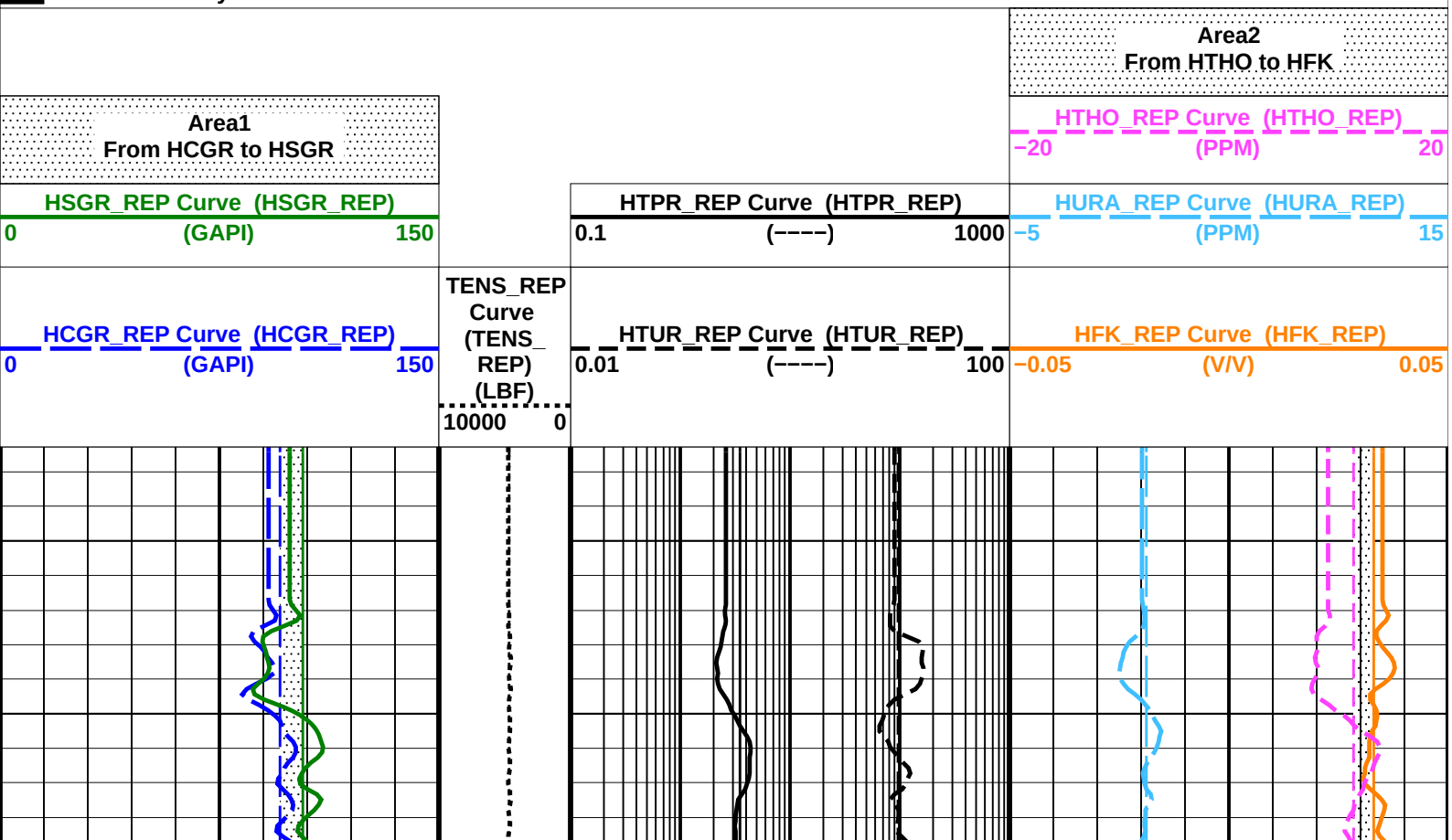
DEFAULT	TLD_MCFL_CNL_HRLA_019PUP	FN:34	PRODUCER	10−Sep−2012 12:57	3220.1 M	3078.3 M
CLIENT	TLD_MCFL_CNL_HRLA_019PUC	FN:35	CUSTOMER	10−Sep−2012 12:57	3220.1 M	3078.3 M
BACKUP	TLD_MCFL_CNL_HRLA_019PUP	FN:36	PRODUCER	10−Sep−2012 12:57	3220.1 M	3078.3 M

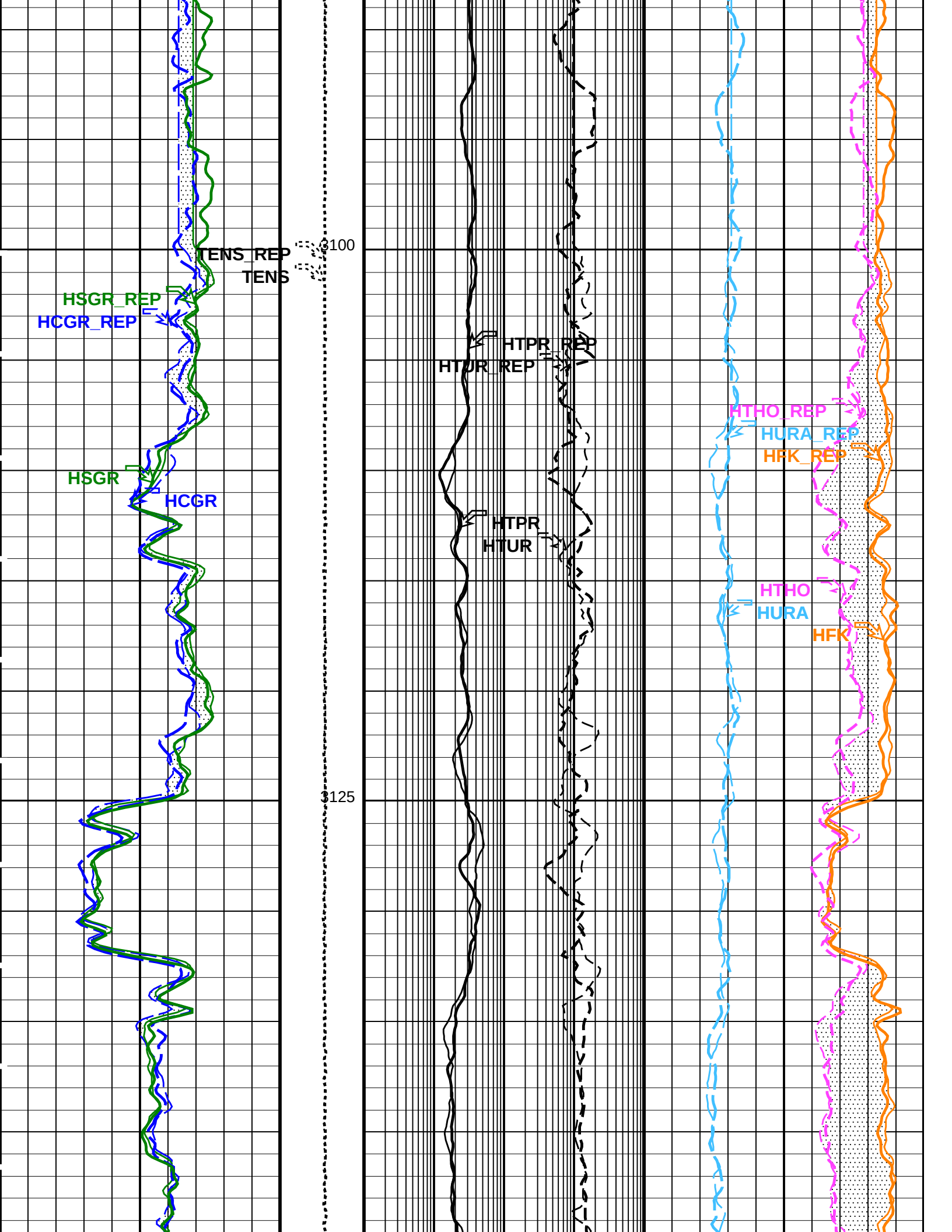
OP System Version: 19C1−222

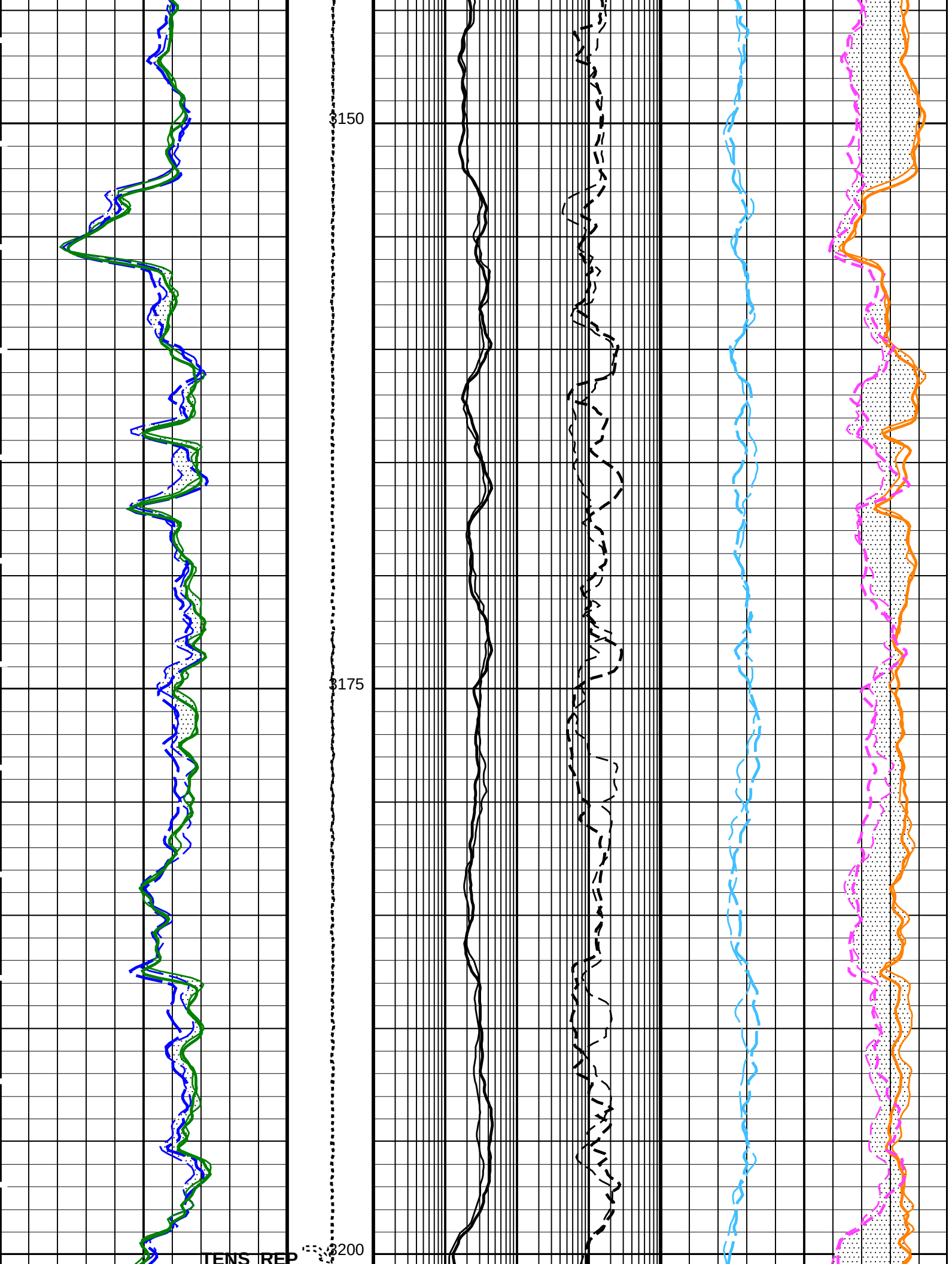
HILTH−FTB	19C1−222	HRLT−B	19C1−222
HNGC−B	HFE−5203−OP19.1−NUCL	HNGS−BA	HFE−5203−OP19.1−NUCL
SPA−A	19C1−222	EDTC−B	19C1−222

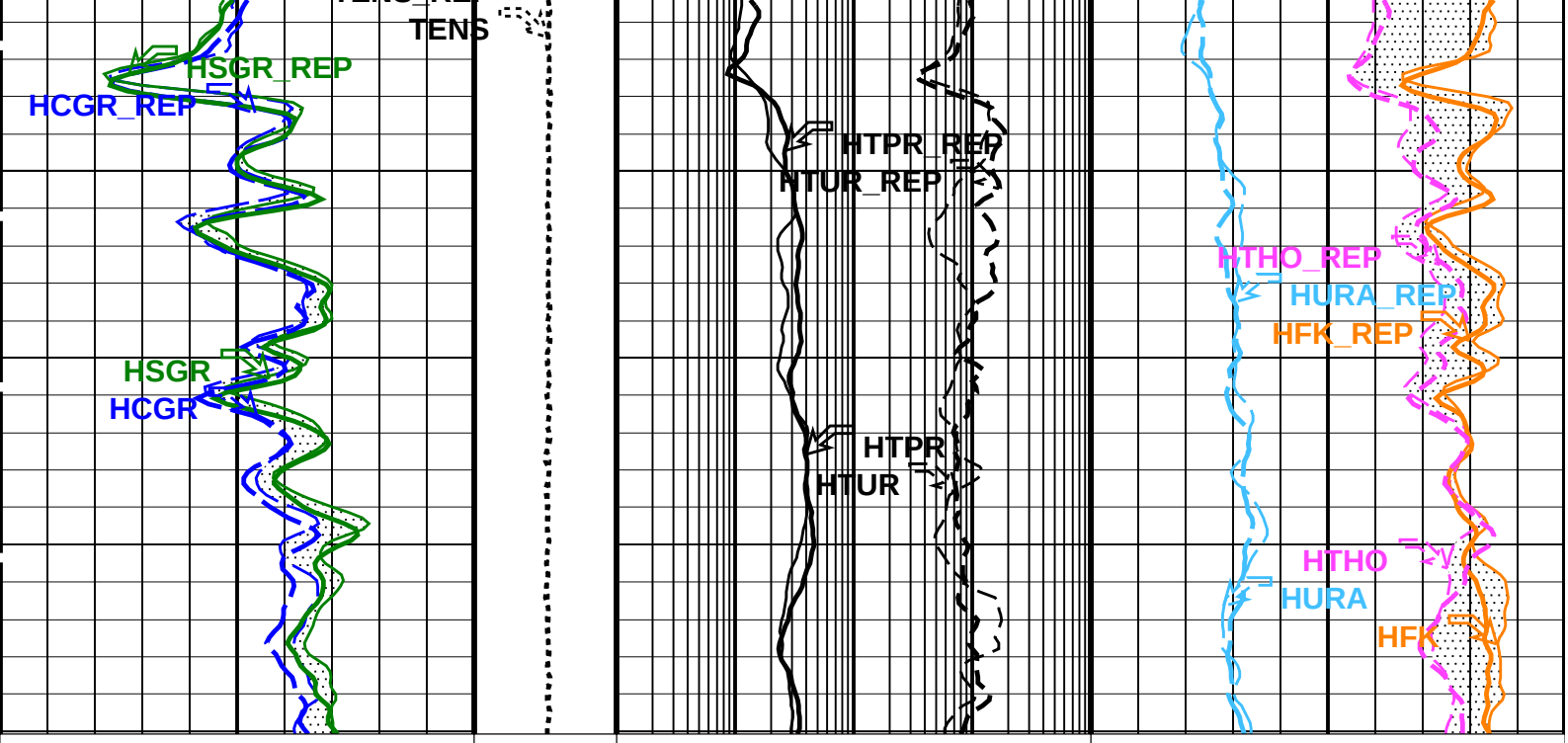
PIP SUMMARY

Time Mark Every 60 S




TENS_REP
TENS
3100
HSGR_REP
HCGR_REP
HTPR_REP
HTUR_REP
HTHO_REP
HURA_REP
HFK_REP
HSGR
HCGR
HTPR
HTUR
HTHO
HURA
HFK
3125


3150
3175
3200
TENS_REP



HCGR_REP Curve (HCGR_REP)
0 (GAPI) 150

TENS_REP Curve (TENS_REP) (LBF)
10000 0

HTUR_REP Curve (HTUR_REP)
0.01 (----) 100

HFK_REP Curve (HFK_REP)
−0.05 (V/V) 0.05

HSGR_REP Curve (HSGR_REP)
0 (GAPI) 150

HTPR_REP Curve (HTPR_REP)
0.1 (----) 1000

HURA_REP Curve (HURA_REP)
−5 (PPM) 15

HTHO_REP Curve (HTHO_REP)
−20 (PPM) 20

Area1
From HCGR to HSGR

Area2
From HTHO to HFK

PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	HILTH−FTB: High resolution Integrated Logging Tool−DTS		
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
	HRLT−B: High Resolution Laterolog Array − B		
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
	HNGS−BA: Hostile Natural Gamma Ray Sonde		
BAR1	HNGS Detector 1 Barite Constant	1	
BAR2	HNGS Detector 2 Barite Constant	1	
BHK	HNGS Borehole Potassium Correction Concentration	0	
BHS	Borehole Status	OPEN	
CSD1	Inner Casing Outer Diameter	0	IN
CSD2	Outer Casing Outer Diameter	0	IN
CSW1	Inner Casing Weight	0	LB/F
CSW2	Outer Casing Weight	0	LB/F
DBCC	HNGS Barite Constant Correction Flag	NONE	
GCSE	Generalized Caliper Selection	HCAL	
H1P	HNGS Detector 1 Allow/Disallow In Processing	ALLOW	
H2P	HNGS Detector 2 Allow/Disallow In Processing	ALLOW	
HABK	HNGS Borehole Potassium Running Average	0.0880778	
HALF	HNGS Alpha Filter Length	60	IN
HCRB	HNGS Apply Borehole Potassium Correction	NONE	
HMWM	Mud Weighting Material	NATU	
HNPE	HNGS Processing Enable	YES	
S1BI	HNGS Detector 1 Calibration Bismuth Count Rate	−999.25	CPS
S2BI	HNGS Detector 2 Calibration Bismuth Count Rate	−999.25	CPS
SGRC	HNGS Standard Gamma−Ray Correction Flag	YES	

TPOS	Tool Position	ECCE	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	0.992772	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	0.980376	
	EDTC−B: Enhanced DTS Cartridge		
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
	System and Miscellaneous		
BS	Bit Size	10.625	IN
DO	Depth Offset for Playback	0.2	M
DORL	Depth Offset for Repeat Analysis	0.0	M
PP	Playback Processing	NORMAL	

Format: HNGSRatios_REP **Vertical Scale: 1:200** **Graphics File Created: 10−Sep−2012 12:57**

OP System Version: 19C1−222

HILTH−FTB	19C1−222	HRLT−B	19C1−222
HNGC−B	HFE−5203−OP19.1−NUCL	HNGS−BA	HFE−5203−OP19.1−NUCL
SPA−A	19C1−222	EDTC−B	19C1−222

Input DLIS Files

DEFAULT	TLD_MCFL_CNL_HRLA_016LUP	FN:25	PRODUCER	10−Sep−2012 11:01	3246.1 M	1636.0 M
DEFAULT	TLD_MCFL_CNL_HRLA_015PUP	FN:22	PRODUCER	10−Sep−2012 10:32	3673.6 M	2405.9 M

Output DLIS Files

DEFAULT	TLD_MCFL_CNL_HRLA_019PUP	FN:34	PRODUCER	10−Sep−2012 12:57
CLIENT	TLD_MCFL_CNL_HRLA_019PUC	FN:35	CUSTOMER	10−Sep−2012 12:57
BACKUP	TLD_MCFL_CNL_HRLA_019PUP	FN:36	PRODUCER	10−Sep−2012 12:57

Schlumberger

Calibration Report

MAXIS Field Log

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Stab Measurement Summary							
Before: 10−Sep−2012 1:32							
BS Window Ratio	0.7437	N/A	0.7445	N/A	N/A	N/A	
BS Window Sum	27440	N/A	27400	N/A	N/A	N/A	CPS
SS Window Ratio	0.4887	N/A	0.4893	N/A	N/A	N/A	
SS Window Sum	11390	N/A	11370	N/A	N/A	N/A	CPS
LS Window Ratio	0.3012	N/A	0.3024	N/A	N/A	N/A	
LS Window Sum	1273	N/A	1275	N/A	N/A	N/A	CPS
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Photo−multiplier High Voltages Calibrations							
Before: 10−Sep−2012 1:32							
BS PM High Voltage (Command)	1250	N/A	1248	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1430	N/A	1430	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1268	N/A	1267	N/A	N/A	N/A	V
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Crystal Quality Resolutions Calibration							
Before: 10−Sep−2012 1:32							
BS Crystal Resolution	10.62	N/A	10.61	N/A	N/A	N/A	%
SS Crystal Resolution	8.716	N/A	8.852	N/A	N/A	N/A	%
LS Crystal Resolution	8.049	N/A	8.168	N/A	N/A	N/A	%
High resolution Integrated Logging Tool−DTS Wellsite Calibration − MCFL Calibration							

Before: 10−Sep−2012 1:34

Raw B0 Resistivity	3875	N/A	3863	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3793	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3835	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool−DTS Wellsite Calibration − HILT Caliper Calibration
Before: 4−Sep−2012 16:25

HILT Caliper Zero Measurement	8.000	N/A	7.973	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.18	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Detector Calibration
Before: 4−Sep−2012 16:07 After: Calibration not done

Gamma Ray Background	30.00	N/A	4.349	N/A	N/A	N/A	GAPI
Gamma Ray (Jig − Bkgd)	165.0	N/A	176.5	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Zero Measurement
Master: 6−Jul−2012 15:01 Before: 10−Sep−2012 1:29 After: 10−Sep−2012 14:40

CNTC Background	27.48	27.48	27.24	27.67	0.4300	4.122	CPS
CFTC Background	29.17	29.17	27.02	26.74	−0.2864	4.376	CPS

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Ratio Measurement
Master: 6−Jul−2012 15:01

Thermal Near Corr. (Tank)	5800	2645	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	1108	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.388	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Accelerometer Calibration
Before: 10−Sep−2012 1:28

Z−Axis Acceleration	9.810	N/A	9.765	N/A	N/A	N/A	M/S2

High resolution Integrated Logging Tool−DTS Master Calibration − Inversion results
Master: 18−Aug−2012 12:28

Rho Aluminum	2.596	2.595	−−	−−	−−	−−	G/C3
Rho Magnesium	1.686	1.689	−−	−−	−−	−−	G/C3
Pe Aluminum	2.570	2.520	−−	−−	−−	−−	
Pe Magnesium	2.650	2.635	−−	−−	−−	−−	

High resolution Integrated Logging Tool−DTS Master Calibration − Deviation Summary
Master: 18−Aug−2012 12:28

BS Average Deviation	0	0.3647	−−	−−	−−	−−	%
BS Max Deviation	0	1.386	−−	−−	−−	−−	%
SS Average Deviation	0	0.6524	−−	−−	−−	−−	%
SS Max Deviation	0	2.044	−−	−−	−−	−−	%
LS Average Deviation	0	0.7838	−−	−−	−−	−−	%
LS Max Deviation	0	2.044	−−	−−	−−	−−	%

High Resolution Laterolog Array − B Wellsite Calibration − HRLT M01
Before: 10−Sep−2012 1:27 After: 10−Sep−2012 14:39

HRLT M0−M1 Voltage Plus − 0	0	N/A	−318.5	−317.9	0.6151	9.681	UV
HRLT M0−M1 Voltage Plus − 1	0	N/A	−332.3	−331.6	0.6586	9.681	UV
HRLT M0−M1 Voltage Plus − 2	0	N/A	−321.8	−322.3	−0.5164	9.681	UV
HRLT M0−M1 Voltage Plus − 3	0	N/A	−327.8	−327.4	0.3868	9.681	UV
HRLT M0−M1 Voltage Plus − 4	0	N/A	−320.0	−319.7	0.3028	9.681	UV
HRLT M0−M1 Voltage Plus − 5	0	N/A	−325.1	−324.9	0.2282	9.681	UV
HRLT M0−M1 Voltage Plus − 6	0	N/A	322.7	322.2	−0.5252	9.681	UV
HRLT M0−M1 Voltage Plus − 7	0	N/A	−322.7	−322.7	0	9.681	UV

High Resolution Laterolog Array − B Wellsite Calibration − HRLT M12
Before: 10−Sep−2012 1:27 After: 10−Sep−2012 14:39

HRLT M1−M2 Voltage Plus − 0	0	N/A	1755	1752	−3.067	53.42	UV
HRLT M1−M2 Voltage Plus − 1	0	N/A	1833	1829	−3.863	53.42	UV
HRLT M1−M2 Voltage Plus − 2	0	N/A	1770	1773	2.578	53.42	UV
HRLT M1−M2 Voltage Plus − 3	0	N/A	1804	1802	−1.836	53.42	UV
HRLT M1−M2 Voltage Plus − 4	0	N/A	1762	1760	−1.483	53.42	UV
HRLT M1−M2 Voltage Plus − 5	0	N/A	1792	1790	−1.285	53.42	UV
HRLT M1−M2 Voltage Plus − 6	0	N/A	−1787	−1784	2.869	53.42	UV
HRLT M1−M2 Voltage Plus − 7	0	N/A	1781	1781	0	53.42	UV

High Resolution Laterolog Array − B Wellsite Calibration − HRLT M23
Before: 10−Sep−2012 1:27 After: 10−Sep−2012 14:39

HRLT M2−M3 Voltage Plus − 0	0	N/A	1732	1729	−3.139	53.42	UV
HRLT M2−M3 Voltage Plus − 1	0	N/A	1815	1811	−3.616	53.42	UV
HRLT M2−M3 Voltage Plus − 2	0	N/A	1755	1758	2.903	53.42	UV
HRLT M2−M3 Voltage Plus − 3	0	N/A	1794	1792	−2.173	53.42	UV
HRLT M2−M3 Voltage Plus − 4	0	N/A	1748	1747	−1.014	53.42	UV
HRLT M2−M3 Voltage Plus − 5	0	N/A	1779	1778	−0.8226	53.42	UV
HRLT M2−M3 Voltage Plus − 6	0	N/A	−1758	−1754	3.537	53.42	UV
HRLT M2−M3 Voltage Plus − 7	0	N/A	1781	1781	0	53.42	UV

High Resolution Laterolog Array − B Wellsite Calibration − HRLT V34
Before: 10−Sep−2012 1:27 After: 10−Sep−2012 14:39

HRLT A3−A4 Voltage Plus − 0	0	N/A	68480	68350	−128.6	2100	UV

HRLT A3−A4 Voltage Plus − 0	0	N/A	68480	68350	−128.6	2100	UV
HRLT A3−A4 Voltage Plus − 1	0	N/A	72050	71930	−121.6	2100	UV
HRLT A3−A4 Voltage Plus − 2	0	N/A	69880	70010	122.4	2100	UV
HRLT A3−A4 Voltage Plus − 3	0	N/A	71500	71440	−61.48	2100	UV
HRLT A3−A4 Voltage Plus − 4	0	N/A	69490	69440	−44.79	2100	UV
HRLT A3−A4 Voltage Plus − 5	0	N/A	70680	70630	−46.59	2100	UV
HRLT A3−A4 Voltage Plus − 6	0	N/A	−68820	−68720	103.1	2100	UV
HRLT A3−A4 Voltage Plus − 7	0	N/A	70000	70000	0	2100	UV

High Resolution Laterolog Array − B Wellsite Calibration − HRLT V45
Before: 10−Sep−2012 1:27 After: 10−Sep−2012 14:39

HRLT A4−A5 Voltage Plus − 0	0	N/A	68670	68550	−121.7	2100	UV
HRLT A4−A5 Voltage Plus − 1	0	N/A	72320	72160	−156.4	2100	UV
HRLT A4−A5 Voltage Plus − 2	0	N/A	70130	70250	121.6	2100	UV
HRLT A4−A5 Voltage Plus − 3	0	N/A	71730	71670	−59.21	2100	UV
HRLT A4−A5 Voltage Plus − 4	0	N/A	69690	69640	−48.80	2100	UV
HRLT A4−A5 Voltage Plus − 5	0	N/A	70870	70840	−33.01	2100	UV
HRLT A4−A5 Voltage Plus − 6	0	N/A	−69070	−68980	97.95	2100	UV
HRLT A4−A5 Voltage Plus − 7	0	N/A	70000	70000	0	2100	UV

High Resolution Laterolog Array − B Wellsite Calibration − HRLT V56
Before: 10−Sep−2012 1:27 After: 10−Sep−2012 14:39

HRLT A5−A6 Voltage Plus − 0	0	N/A	68430	68300	−128.0	2100	UV
HRLT A5−A6 Voltage Plus − 1	0	N/A	72180	72010	−166.4	2100	UV
HRLT A5−A6 Voltage Plus − 2	0	N/A	69950	70070	122.4	2100	UV
HRLT A5−A6 Voltage Plus − 3	0	N/A	71520	71450	−63.00	2100	UV
HRLT A5−A6 Voltage Plus − 4	0	N/A	69440	69400	−46.80	2100	UV
HRLT A5−A6 Voltage Plus − 5	0	N/A	70620	70580	−39.48	2100	UV
HRLT A5−A6 Voltage Plus − 6	0	N/A	−68940	−68840	98.81	2100	UV
HRLT A5−A6 Voltage Plus − 7	0	N/A	70000	70000	0	2100	UV

High Resolution Laterolog Array − B Wellsite Calibration − HRLT VTP
Before: 10−Sep−2012 1:27 After: 10−Sep−2012 14:39

HRLT Torpedo−M0 Voltage − 0	0	N/A	−68060	−67930	129.4	2100	UV
HRLT Torpedo−M0 Voltage − 1	0	N/A	−71910	−71770	144.3	2100	UV
HRLT Torpedo−M0 Voltage − 2	0	N/A	−69760	−69870	−111.8	2100	UV
HRLT Torpedo−M0 Voltage − 3	0	N/A	−71440	−71350	88.98	2100	UV
HRLT Torpedo−M0 Voltage − 4	0	N/A	−69480	−69410	61.92	2100	UV
HRLT Torpedo−M0 Voltage − 5	0	N/A	−70670	−70610	55.64	2100	UV
HRLT Torpedo−M0 Voltage − 6	0	N/A	68660	68530	−124.5	2100	UV
HRLT Torpedo−M0 Voltage − 7	0	N/A	−70000	−70000	0	2100	UV

High Resolution Laterolog Array − B Wellsite Calibration − HRLT VBD
Before: 10−Sep−2012 1:27 After: 10−Sep−2012 14:39

HRLT Bridle#9−M0 Voltage − 0	0	N/A	−68100	−67980	116.8	2100	UV
HRLT Bridle#9−M0 Voltage − 1	0	N/A	−72090	−71940	146.9	2100	UV
HRLT Bridle#9−M0 Voltage − 2	0	N/A	−69930	−70040	−114.2	2100	UV
HRLT Bridle#9−M0 Voltage − 3	0	N/A	−71570	−71500	67.99	2100	UV
HRLT Bridle#9−M0 Voltage − 4	0	N/A	−69550	−69510	44.68	2100	UV
HRLT Bridle#9−M0 Voltage − 5	0	N/A	−70730	−70680	49.45	2100	UV
HRLT Bridle#9−M0 Voltage − 6	0	N/A	68830	68710	−118.7	2100	UV
HRLT Bridle#9−M0 Voltage − 7	0	N/A	−70000	−70000	0	2100	UV

High Resolution Laterolog Array − B Wellsite Calibration − HRLT ISO
Before: 10−Sep−2012 1:27 After: 10−Sep−2012 14:39

HRLT Source Current Plus − 0	0	N/A	284.1	283.7	−0.3859	8.520	UA
HRLT Source Current Plus − 1	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus − 2	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus − 3	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus − 4	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus − 5	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus − 6	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus − 7	0	N/A	281.1	281.1	0	8.520	UA

High Resolution Laterolog Array − B Wellsite Calibration − HRLT MV
Before: 10−Sep−2012 1:27 After: 10−Sep−2012 14:39

HRLT Vertical Voltage Pl − 0	0	N/A	−320.7	−319.9	0.8388	9.681	UV
HRLT Vertical Voltage Pl − 1	0	N/A	−327.1	−326.2	0.9191	9.681	UV
HRLT Vertical Voltage Pl − 2	0	N/A	−315.7	−315.9	−0.2195	9.681	UV
HRLT Vertical Voltage Pl − 3	0	N/A	−320.3	−319.7	0.6447	9.681	UV
HRLT Vertical Voltage Pl − 4	0	N/A	−309.7	−309.3	0.4538	9.681	UV
HRLT Vertical Voltage Pl − 5	0	N/A	−330.0	−329.5	0.4847	9.681	UV
HRLT Vertical Voltage Pl − 6	0	N/A	330.4	329.6	−0.7355	9.681	UV
HRLT Vertical Voltage Pl − 7	0	N/A	−322.7	−322.7	0	9.681	UV

Hostile Natural Gamma Ray Sonde Wellsite Calibration − Detector 1 Check
Master: 26−Jul−2012 16:07 Before: 10−Sep−2012 1:31 After: 10−Sep−2012 14:44

Na 511 Peak Loc	40.00	38.55	38.56	38.60	0.03584	1.000	
Na 511 Peak Res	15.50	14.93	14.81	14.76	−0.05429	2.000	%
High Voltage	1150	1063	1053	1065	11.39	N/A	V
Na 1785 Peak Loc	142.6	139.0	139.2	138.6	−0.5731	7.000	
Na 1785 Peak Res	8.500	8.686	7.444	7.603	0.1590	2.000	%

Temperature	15.50	31.24	27.32	30.59	3.268	N/A	DEGC
Na Count Rate	45.00	35.45	34.94	32.38	−2.553	8.000	CPS

Hostile Natural Gamma Ray Sonde Wellsite Calibration − Detector 2 Check
Master: 26−Jul−2012 16:07 Before: 10−Sep−2012 1:31 After: 10−Sep−2012 14:44

Na 511 Peak Loc	40.00	38.67	38.61	38.63	0.02083	1.000	
Na 511 Peak Res	15.50	15.39	15.14	14.92	−0.2206	2.000	%
High Voltage	1150	1086	1076	1088	11.15	N/A	V
Na 1785 Peak Loc	142.6	138.0	138.3	138.3	0.08160	7.000	
Na 1785 Peak Res	8.500	9.003	8.077	7.447	−0.6299	2.000	%
Temperature	15.50	31.26	27.40	32.47	5.069	N/A	DEGC
Na Count Rate	45.00	35.54	35.02	32.47	−2.546	8.000	CPS

Hostile Natural Gamma Ray Sonde Wellsite Calibration − Ratio Of Detector 1 To Detector 2
Master: 26−Jul−2012 16:07 Before: 10−Sep−2012 1:31 After: 10−Sep−2012 14:44

Coincidence Count Rate Ratio	1.000	0.9952	0.9972	0.9963	−0.0008773	0.05000	

Hostile Natural Gamma Ray Sonde Master Calibration − Detector 1 Calibration
Master: 26−Jul−2012 16:02

Na 511 Peak Set Point	40.00	40.00	−−	−−	−−	−−	
Th Peak Loc	209.6	208.3	−−	−−	−−	−−	
Th Peak Res	7.000	7.367	−−	−−	−−	−−	%
Background Count Rate	142.5	120.1	−−	−−	−−	−−	CPS
Gain Ratio	1.000	1.028	−−	−−	−−	−−	

Hostile Natural Gamma Ray Sonde Master Calibration − Detector 2 Calibration
Master: 26−Jul−2012 16:02

Na 511 Peak Set Point	40.00	40.00	−−	−−	−−	−−	
Th Peak Loc	209.6	207.5	−−	−−	−−	−−	
Th Peak Res	7.000	7.217	−−	−−	−−	−−	%
Background Count Rate	142.5	119.6	−−	−−	−−	−−	CPS
Gain Ratio	1.000	1.021	−−	−−	−−	−−	

Enhanced DTS Cartridge Wellsite Calibration − EDTC Accelerometer Calibration
Before: 10−Sep−2012 1:29

EDTC Z−Axis Acceleration	9.810	N/A	9.786	N/A	N/A	N/A	M/S2

Enhanced DTS Cartridge Wellsite Calibration − Detector Calibration
Before: 10−Sep−2012 1:29 After: 10−Sep−2012 14:39

Gamma Ray (Jig − Bkg)	163.5	N/A	163.5	161.6	−1.927	14.87	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	163.1	−1.944	15.00	GAPI

The GLS−VJ source activity is acceptable.

The HGNS Neutron Master Calibration was done with the following parameters :

NCT−B Water Temperature 26.0 DEGC.
Thermal Housing Size 3.374 IN.
NSR−F serial number 5229

High resolution Integrated Logging Tool−DTS / Equipment Identification

Primary Equipment:		
HILT high−Resolution Mechanical Sonde	HRMS − H	3893
HILT Rxo Gamma−ray Device	HRGD − H	3901
HILT Micro Cylindrically Focused Log Dev	MCFL − H	3901
GR Logging Source	GLS − VJ	3753
HILT High Res. Control Cartridge	HRCC − H	3904
HILT Gamma−Ray Neutron Sonde−DTS	HGNS − H	3821
HGNS Gamma−Ray Device	HGR −	
HGNS Neutron Detector with Alpha Source	HCNT − H	
Auxiliary Equipment:		
Neutron Calibration Tank	NCT − B	
Gamma Source Radioactive	GSR − U/Y	
HGNS Housing	HGNH −	2951

High resolution Integrated Logging Tool−DTS Wellsite Calibration
Stab Measurement Summary

Phase	BS Window Ratio	Value	Phase	SS Window Ratio	Value	Phase	LS Window Ratio	Value
Before		0.7445	Before		0.4893	Before		0.3024

0.7065 (Minimum)	0.7437 (Nominal)	0.7809 (Maximum)	0.4643 (Minimum)	0.4887 (Nominal)	0.5132 (Maximum)	0.2862 (Minimum)	0.3012 (Nominal)	0.3163 (Maximum)

Phase	BS Window Sum CPS	Value	Phase	SS Window Sum CPS	Value	Phase	LS Window Sum CPS	Value
Before		27400	Before		11370	Before		1275
26070 (Minimum)	27440 (Nominal)	28810 (Maximum)	10820 (Minimum)	11390 (Nominal)	11960 (Maximum)	1210 (Minimum)	1273 (Nominal)	1337 (Maximum)

Before: 10−Sep−2012 1:32

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Photo−multiplier High Voltages Calibrations

Phase	BS PM High Voltage (Command) V	Value	Phase	SS PM High Voltage (Command) V	Value	Phase	LS PM High Voltage (Command) V	Value
Before		1248	Before		1430	Before		1267
1150 (Minimum)	1250 (Nominal)	1350 (Maximum)	1330 (Minimum)	1430 (Nominal)	1530 (Maximum)	1168 (Minimum)	1268 (Nominal)	1368 (Maximum)

Before: 10−Sep−2012 1:32

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Crystal Quality Resolutions Calibration

Phase	BS Crystal Resolution %	Value	Phase	SS Crystal Resolution %	Value	Phase	LS Crystal Resolution %	Value
Before		10.61	Before		8.852	Before		8.168
9.625 (Minimum)	10.62 (Nominal)	11.62 (Maximum)	7.716 (Minimum)	8.716 (Nominal)	9.716 (Maximum)	7.049 (Minimum)	8.049 (Nominal)	9.049 (Maximum)

Before: 10−Sep−2012 1:32

High resolution Integrated Logging Tool−DTS Wellsite Calibration

MCFL Calibration

Phase	Raw B0 Resistivity OHMM	Value	Phase	Raw B1 Resistivity OHMM	Value	Phase	Raw B2 Resistivity OHMM	Value
Before		3863	Before		3793	Before		3835
3565 (Minimum)	3875 (Nominal)	4185 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)

Before: 10−Sep−2012 1:34

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HILT Caliper Calibration

Phase	HILT Caliper Zero Measurement IN	Value	Phase	HILT Caliper Plus Measurement IN	Value
Before		7.973	Before		12.18
6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)	9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)

Before: 4−Sep−2012 16:25

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig − Bkgd) GAPI	Value
Before		4.349	Before		176.5
After	NOT DONE	N/A	After	NOT DONE	N/A
0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)	157.1 (Minimum)	165.0 (Nominal)	206.3 (Maximum)

Before: 4−Sep−2012 16:07 After: Calibration not done

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		27.48	Master		29.17
Before		27.24	Before		27.02
After		27.67	After		26.74
5.000 (Minimum)	27.48 (Nominal)	40.00 (Maximum)	5.000 (Minimum)	29.17 (Nominal)	40.00 (Maximum)

Master: 6−Jul−2012 15:01 Before: 10−Sep−2012 1:29

After: 10−Sep−2012 14:40

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Ratio Measurement

Phase	Thermal Near Corr. (Tank) CPS	Value	Phase	Thermal Far Corr. (Tank) CPS	Value	Phase	CNTC/CFTC (Tank)	Value
Master	EXCEEDS LIMIT	2645	Master	EXCEEDS LIMIT	1108	Master		2.388

4700 (Minimum)	5800 (Nominal)	6900 (Maximum)	1900 (Minimum)	2400 (Nominal)	2900 (Maximum)	2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)

Master: 6−Jul−2012 15:01

High resolution Integrated Logging Tool−DTS
Wellsite Calibration
Accelerometer Calibration

Phase	Z−Axis Acceleration M/S2			Value
Before				9.765
	9.610 (Minimum)	9.810 (Nominal)	10.01 (Maximum)	

Before: 10−Sep−2012 1:28

High resolution Integrated Logging Tool−DTS Master Calibration
Inversion results

Phase	Rho Aluminum G/C3			Value	Phase	Rho Magnesium G/C3			Value
Master				2.595	Master				1.689
	2.586 (Minimum)	2.596 (Nominal)	2.606 (Maximum)			1.676 (Minimum)	1.686 (Nominal)	1.696 (Maximum)	
Phase	Pe Aluminum			Value	Phase	Pe Magnesium			Value
Master				2.520	Master				2.635
	2.470 (Minimum)	2.570 (Nominal)	2.670 (Maximum)			2.550 (Minimum)	2.650 (Nominal)	2.750 (Maximum)	

Master: 18−Aug−2012 12:28

High resolution Integrated Logging Tool−DTS Master Calibration
Deviation Summary

Phase	BS Average Deviation %			Value	Phase	SS Average Deviation %			Value	Phase	LS Average Deviation %			Value
Master				0.3647	Master				0.6524	Master				0.7838
	−0.6000 (Minimum)	0 (Nominal)	0.6000 (Maximum)			−1.000 (Minimum)	0 (Nominal)	1.000 (Maximum)			−1.500 (Minimum)	0 (Nominal)	1.500 (Maximum)	
Phase	BS Max Deviation %			Value	Phase	SS Max Deviation %			Value	Phase	LS Max Deviation %			Value
Master				1.386	Master				2.044	Master				2.044
	−1.600 (Minimum)	0 (Nominal)	1.600 (Maximum)			−2.500 (Minimum)	0 (Nominal)	2.500 (Maximum)			−3.500 (Minimum)	0 (Nominal)	3.500 (Maximum)	

Master: 18−Aug−2012 12:28

High resolution Integrated Logging Tool−DTS Master Calibration
Zero Measurement

Phase	CNTC Background CPS			Value	Phase	CFTC Background CPS			Value
Master				27.48	Master				29.17
	5.000 (Minimum)	27.48 (Nominal)	40.00 (Maximum)			5.000 (Minimum)	29.17 (Nominal)	40.00 (Maximum)	

Master: 6−Jul−2012 15:01

High resolution Integrated Logging Tool−DTS Master Calibration
Tank Measurement

Phase	Thermal Near Corr. (Tank) CPS			Value	Phase	Thermal Far Corr. (Tank) CPS			Value	Phase	CNTC/CFTC (Tank)			Value
Master	EXCEEDS LIMIT			2645	Master	EXCEEDS LIMIT			1108	Master				2.388
	4700 (Minimum)	5800 (Nominal)	6900 (Maximum)			1900 (Minimum)	2400 (Nominal)	2900 (Maximum)			2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)	

Master: 6−Jul−2012 15:01

High Resolution Laterolog Array − B / Equipment Identification

Primary Equipment:		
HRLT Sonde	HRLS − B	855
Auxiliary Equipment:		
HRLT lower Housing	HRLH − B	872
HRLT Lower Cartridge	HRLC − B	866
HRLT upper Housing	HRUH − B	857
HRLT Upper Cartridge	HRUC − B	857

High Resolution Laterolog Array − B Wellsite Calibration

HRLT M01

Idx	Phase	HRLT M0−M1 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−318.5	−322.7	−280.7	−379.7
	After		−317.9			
1	Before		−332.3	−322.7	−280.7	−379.7
	After		−331.6			
2	Before		−321.8	−322.7	−280.7	−379.7
	After		−322.3			
3	Before		−327.8	−322.7	−280.7	−379.7
	After		−327.4			
4	Before		−320.0	−322.7	−280.7	−379.7
	After		−319.7			
5	Before		−325.1	−322.7	−280.7	−379.7
	After		−324.9			
6	Before		322.7	322.7	379.7	280.7
	After		322.2			
7	Before		−322.7	−322.7	−280.7	−379.7
	After		−322.7			
		(Minimum) (Nominal) (Maximum)				

Before: 10−Sep−2012 1:27

After: 10−Sep−2012 14:39

High Resolution Laterolog Array − B Wellsite Calibration

HRLT M12

Idx	Phase	HRLT M1−M2 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		1755	1781	2095	1549
	After		1752			
1	Before		1833	1781	2095	1549
	After		1829			
2	Before		1770	1781	2095	1549
	After		1773			
3	Before		1804	1781	2095	1549
	After		1802			
4	Before		1762	1781	2095	1549
	After		1760			
5	Before		1792	1781	2095	1549
	After		1790			
6	Before		−1787	−1781	−1549	−2095
	After		−1784			
7	Before		1781	1781	2095	1549
	After		1781			
		(Minimum) (Nominal) (Maximum)				

Before: 10−Sep−2012 1:27

After: 10−Sep−2012 14:39

High Resolution Laterolog Array − B Wellsite Calibration

HRLT M23

Idx	Phase	HRLT M2−M3 Voltage Plus UV	Value	Nominal	Maximum	Minimum
	Before		1732			

Idx	Phase		Value	Nominal	Maximum	Minimum
0	After		1729	1781	2095	1549
1	Before		1815	1781	2095	1549
	After		1811			
2	Before		1755	1781	2095	1549
	After		1758			
3	Before		1794	1781	2095	1549
	After		1792			
4	Before		1748	1781	2095	1549
	After		1747			
5	Before		1779	1781	2095	1549
	After		1778			
6	Before		−1758	−1781	−1549	−2095
	After		−1754			
7	Before		1781	1781	2095	1549
	After		1781			
		(Minimum) (Nominal) (Maximum)				

Before: 10−Sep−2012 1:27

After: 10−Sep−2012 14:39

High Resolution Laterolog Array − B Wellsite Calibration

HRLT V34

Idx	Phase	HRLT A3−A4 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		68480	70000	82360	60900
	After		68350			
1	Before		72050	70000	82360	60900
	After		71930			
2	Before		69880	70000	82360	60900
	After		70010			
3	Before		71500	70000	82360	60900
	After		71440			
4	Before		69490	70000	82360	60900
	After		69440			
5	Before		70680	70000	82360	60900
	After		70630			
6	Before		−68820	−70000	−60900	−82360
	After		−68720			
7	Before		70000	70000	82360	60900
	After		70000			
		(Minimum) (Nominal) (Maximum)				

Before: 10−Sep−2012 1:27

After: 10−Sep−2012 14:39

High Resolution Laterolog Array − B Wellsite Calibration

HRLT V45

Idx	Phase	HRLT A4−A5 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		68670	70000	82360	60900
	After		68550			
	Before		72320			

1	After	72160	70000	82360	60900
2	Before	70130	70000	82360	60900
	After	70250			
3	Before	71730	70000	82360	60900
	After	71670			
4	Before	69690	70000	82360	60900
	After	69640			
5	Before	70870	70000	82360	60900
	After	70840			
6	Before	−69070	−70000	−60900	−82360
	After	−68980			
7	Before	70000	70000	82360	60900
	After	70000			
	(Minimum) (Nominal) (Maximum)				

Before: 10−Sep−2012 1:27

After: 10−Sep−2012 14:39

High Resolution Laterolog Array − B Wellsite Calibration

HRLT V56

Idx	Phase	HRLT A5−A6 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		68430	70000	82360	60900
	After		68300			
1	Before		72180	70000	82360	60900
	After		72010			
2	Before		69950	70000	82360	60900
	After		70070			
3	Before		71520	70000	82360	60900
	After		71450			
4	Before		69440	70000	82360	60900
	After		69400			
5	Before		70620	70000	82360	60900
	After		70580			
6	Before		−68940	−70000	−60900	−82360
	After		−68840			
7	Before		70000	70000	82360	60900
	After		70000			
	(Minimum) (Nominal) (Maximum)					

Before: 10−Sep−2012 1:27

After: 10−Sep−2012 14:39

High Resolution Laterolog Array − B Wellsite Calibration

HRLT VTP

Idx	Phase	HRLT Torpedo−M0 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−68060	−70000	−60900	−82360
	After		−67930			
1	Before		−71910	−70000	−60900	−82360
	After		−71770			
	Before		−69760			

2	After	−69870	−70000	−60900	−82360
3	Before	−71440	−70000	−60900	−82360
	After	−71350			
4	Before	−69480	−70000	−60900	−82360
	After	−69410			
5	Before	−70670	−70000	−60900	−82360
	After	−70610			
6	Before	68660	70000	82360	60900
	After	68530			
7	Before	−70000	−70000	−60900	−82360
	After	−70000			
	(Minimum) (Nominal) (Maximum)				

Before: 10−Sep−2012 1:27

After: 10−Sep−2012 14:39

High Resolution Laterolog Array − B Wellsite Calibration

HRLT VBD

Idx	Phase	HRLT Bridle#9−M0 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−68100	−70000	−60900	−82360
	After		−67980			
1	Before		−72090	−70000	−60900	−82360
	After		−71940			
2	Before		−69930	−70000	−60900	−82360
	After		−70040			
3	Before		−71570	−70000	−60900	−82360
	After		−71500			
4	Before		−69550	−70000	−60900	−82360
	After		−69510			
5	Before		−70730	−70000	−60900	−82360
	After		−70680			
6	Before		68830	70000	82360	60900
	After		68710			
7	Before		−70000	−70000	−60900	−82360
	After		−70000			
	(Minimum) (Nominal) (Maximum)					

Before: 10−Sep−2012 1:27

After: 10−Sep−2012 14:39

High Resolution Laterolog Array − B Wellsite Calibration

HRLT ISO

Idx	Phase	HRLT Source Current Plus UA	Value	Nominal	Maximum	Minimum
0	Before		284.1	284.0	334.1	247.0
	After		283.7			
1	Before		281.1	281.1	330.7	244.4
	After		281.1			
2	Before		281.1	281.1	330.7	244.4
	After		281.1			
	Before		281.1			

3	Before	281.1	281.1	330.7	244.4
	After	281.1			
4	Before	281.1	281.1	330.7	244.4
	After	281.1			
5	Before	281.1	281.1	330.7	244.4
	After	281.1			
6	Before	281.1	281.1	330.7	244.4
	After	281.1			
7	Before	281.1	281.1	330.7	244.4
	After	281.1			
	(Minimum) (Nominal) (Maximum)				

Before: 10−Sep−2012 1:27

After: 10−Sep−2012 14:39

High Resolution Laterolog Array − B Wellsite Calibration

HRLT MV

Idx	Phase	HRLT Vertical Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−320.7	−322.7	−280.7	−379.7
	After		−319.9			
1	Before		−327.1	−322.7	−280.7	−379.7
	After		−326.2			
2	Before		−315.7	−322.7	−280.7	−379.7
	After		−315.9			
3	Before		−320.3	−322.7	−280.7	−379.7
	After		−319.7			
4	Before		−309.7	−322.7	−280.7	−379.7
	After		−309.3			
5	Before		−330.0	−322.7	−280.7	−379.7
	After		−329.5			
6	Before		330.4	322.7	379.7	280.7
	After		329.6			
7	Before		−322.7	−322.7	−280.7	−379.7
	After		−322.7			
	(Minimum) (Nominal) (Maximum)					

Before: 10−Sep−2012 1:27

After: 10−Sep−2012 14:39

Hostile Natural Gamma Ray Cartridge − B / Equipment Identification

Primary Equipment:		
HNGC Cartridge	HNGC − B	573
Auxiliary Equipment:		
HNGC Housing	HNGH − A	4058

Hostile Natural Gamma Ray Sonde / Equipment Identification

Primary Equipment:		
HNGS Sonde	HNGS − BA	309
Auxiliary Equipment:		
HNGS Sonde Housing	HNSH − BA	314

Gamma Source Radioactive	GSR − U

Hostile Natural Gamma Ray Sonde Wellsite Calibration

Detector 1 Check

Phase	Na 511 Peak Loc	Value
Master		38.55
Before		38.56
After		38.60
	37.50 (Minimum) 40.00 (Nominal) 43.50 (Maximum)	

Phase	Na 511 Peak Res %	Value
Master		14.93
Before		14.81
After		14.76
	12.00 (Minimum) 15.50 (Nominal) 19.00 (Maximum)	

Phase	High Voltage V	Value
Master		1063
Before		1053
After		1065
	850.0 (Minimum) 1150 (Nominal) 1600 (Maximum)	

Phase	Na 1785 Peak Loc	Value
Master		139.0
Before		139.2
After		138.6
	135.0 (Minimum) 142.6 (Nominal) 150.3 (Maximum)	

Phase	Na 1785 Peak Res %	Value
Master		8.686
Before		7.444
After		7.603
	7.000 (Minimum) 8.500 (Nominal) 11.00 (Maximum)	

Phase	Temperature DEGC	Value
Master		31.24
Before		27.32
After		30.59
	−28.89 (Minimum) 15.50 (Nominal) 60.00 (Maximum)	

Phase	Na Count Rate CPS	Value
Master		35.45
Before		34.94
After		32.38
	10.00 (Minimum) 45.00 (Nominal) 100.0 (Maximum)	

Master: 26−Jul−2012 16:07 Before: 10−Sep−2012 1:31 After: 10−Sep−2012 14:44

Hostile Natural Gamma Ray Sonde Wellsite Calibration

Detector 2 Check

Phase	Na 511 Peak Loc	Value
Master		38.67
Before		**38.61**
After		38.63
	37.50 (Minimum) 40.00 (Nominal) 43.50 (Maximum)	

Phase	Na 511 Peak Res %	Value
Master		15.39
Before		**15.14**
After		14.92
	12.00 (Minimum) 15.50 (Nominal) 19.00 (Maximum)	

Phase	High Voltage V	Value
Master		1086
Before		**1076**
After		1088
	850.0 (Minimum) 1150 (Nominal) 1600 (Maximum)	

Phase	Na 1785 Peak Loc	Value
Master		138.0
Before		138.3
After		138.3
	135.0 (Minimum) 142.6 (Nominal) 150.3 (Maximum)	

Phase	Na 1785 Peak Res %	Value
Master		9.003
Before		8.077
After		7.447
	7.000 (Minimum) 8.500 (Nominal) 11.00 (Maximum)	

Phase	Temperature DEGC	Value
Master		31.26
Before		27.40
After		32.47
	−28.89 (Minimum) 15.50 (Nominal) 60.00 (Maximum)	

Phase	Na Count Rate CPS	Value
Master		35.54
Before		35.02
After		32.47
	10.00 (Minimum) 45.00 (Nominal) 100.0 (Maximum)	

Master: 26−Jul−2012 16:07 Before: 10−Sep−2012 1:31 After: 10−Sep−2012 14:44

Hostile Natural Gamma Ray Sonde Wellsite Calibration

Ratio Of Detector 1 To Detector 2

Phase	Coincidence Count Rate Ratio	Value
Master		0.9952
Before		0.9972
After		0.9963
	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	

Master: 26−Jul−2012 16:07
Before: 10−Sep−2012 1:31
After: 10−Sep−2012 14:44

Hostile Natural Gamma Ray Sonde Master Calibration

Detector 1 Calibration

Phase	Na 511 Peak Set Point	Value
Master		40.00
	38.00 (Minimum) 40.00 (Nominal) 43.00 (Maximum)	

Phase	Th Peak Loc	Value
Master		208.3
	201.0 (Minimum) 209.6 (Nominal) 218.3 (Maximum)	

Phase	Th Peak Res %	Value
Master		7.367
	5.000 (Minimum) 7.000 (Nominal) 9.000 (Maximum)	

Phase	Background Count Rate CPS	Value
Master		120.1
	10.00 (Minimum) 142.5 (Nominal) 265.0 (Maximum)	

Phase	Gain Ratio	Value
Master		1.028
	0.9400 (Minimum) 1.000 (Nominal) 1.060 (Maximum)	

Master: 26−Jul−2012 16:02

Hostile Natural Gamma Ray Sonde Master Calibration

Detector 2 Calibration

Phase	Na 511 Peak Set Point	Value
Master		40.00
	38.00 (Minimum) 40.00 (Nominal) 43.00 (Maximum)	

Phase	Th Peak Loc	Value
Master		207.5
	201.0 (Minimum) 209.6 (Nominal) 218.3 (Maximum)	

Phase	Th Peak Res %	Value
Master		7.217
	5.000 (Minimum) 7.000 (Nominal) 9.000 (Maximum)	

Phase	Background Count Rate CPS	Value
Master		119.6
	10.00 (Minimum) 142.5 (Nominal) 265.0 (Maximum)	

Phase	Gain Ratio	Value
Master		1.021
	0.9400 (Minimum) 1.000 (Nominal) 1.060 (Maximum)	

Master: 26−Jul−2012 16:02

Enhanced DTS Cartridge / Equipment Identification

Primary Equipment:

EDTC Gamma Ray Detector	EDTG − A/B	77415
Enhanced DTS Cartridge	EDTC − B	8470

Auxiliary Equipment:

EDTC Housing	EDTH − B	8466

Enhanced DTS Cartridge Wellsite Calibration

EDTC Accelerometer Calibration

Phase	EDTC Z−Axis Acceleration M/S2	Value
Before		9.786
	9.610 (Minimum) 9.810 (Nominal) 10.01 (Maximum)	

Before: 10−Sep−2012 1:29

Enhanced DTS Cartridge Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value
Before		2.743
After		4.343
	0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)	

Phase	Gamma Ray (Jig − Bkg) GAPI	Value
Before		163.5
After		161.6
	148.7 (Minimum) 163.5 (Nominal) 178.4 (Maximum)	

Phase	Gamma Ray (Calibrated) GAPI	Value
Before		165.0
After		163.1
	150.0 (Minimum) 165.0 (Nominal) 180.0 (Maximum)	

Before: 10−Sep−2012 1:29 After: 10−Sep−2012 14:39

Company: **JAMSTEC**

Schlumberger

Well: **C0020A**

Field: **C0020**

Pref.	**Aomori**
Country:	**Japan**
	Natural GR Spectroscopy HNGS Ratio 1:200