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**OTHER SERVICES1**

OS1: DITE  
OS2: HLDS  
OS3: HNGS  
OS4: FMS/DSI  
OS5:

**OTHER SERVICES2**

OS1:  
OS2:  
OS3:  
OS4:  
OS5:

**REMARKS: RUN NUMBER 1**

Logging tools deployed inside drillpipe with wireline.  
BHA consisted of RCB Drilling Bit and collars with mechanical bit release.  
HLDS caliper calibration used 12 inch and 15.19" diameter rings as reference to improve large hole size accuracy.  
Depths referenced from drill floor which is 11m above sea level.

**REMARKS: RUN NUMBER 2**

RUN 1

SERVICE ORDER #: \_\_\_\_\_  
PROGRAM VERSION: 17C0-154  
FLUID LEVEL: \_\_\_\_\_

RUN 2

SERVICE ORDER #: \_\_\_\_\_  
PROGRAM VERSION: \_\_\_\_\_  
FLUID LEVEL: \_\_\_\_\_

LOGGED INTERVAL	START	STOP

LOGGED INTERVAL	START	STOP

**EQUIPMENT DESCRIPTION**


RUN 1


**SURFACE EQUIPMENT**

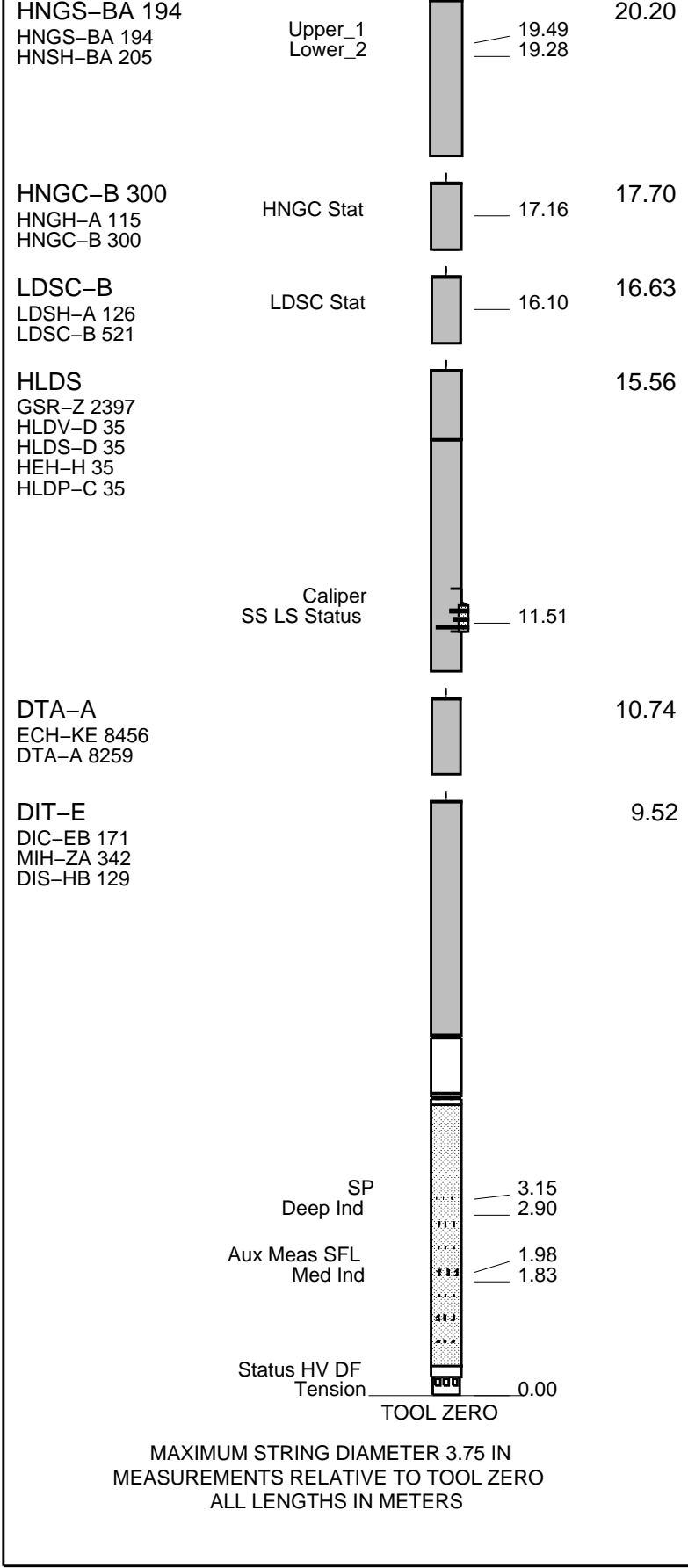
GSR-U 616008  
WITM (DTS)-A

RUN 2

**DOWNHOLE EQUIPMENT**

LEH-QT  22.00  
LEH-QT 301

DTC-H  21.11  
ECH-KC 1777 CTEM \_\_\_\_\_ 20.83  
DTCH0-A 8798 TelStatus \_\_\_\_\_ 20.20  
ToolStatu \_\_\_\_\_



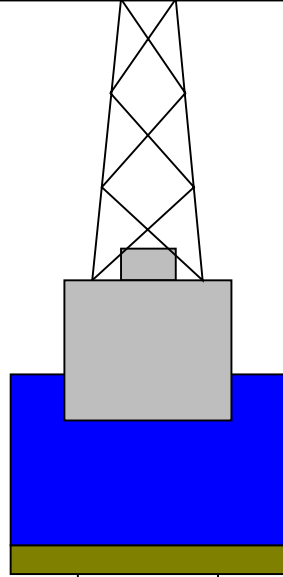
Production String	(in)	(M)	Well Schematic	(M)	(in)	Casing String
	OD	ID		MD	MD	

Kelly Bushing Elevation  
Derrick Floor Elevation

11.0  
11.0

Mean Sea Level

0.0



3275 4.20

Sea Floor



3275 9.875

3257 3.80

Borehole Segment

Open Hole

3599

### Output DLIS Files

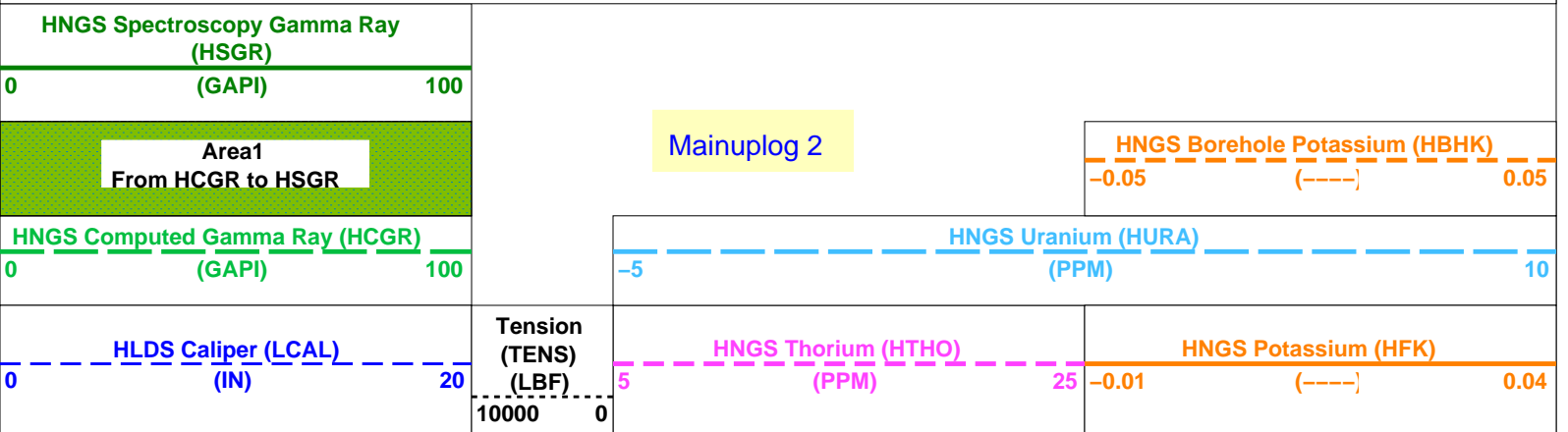
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BACKUPDLISDATA	PI_LDL_NGS_007LUP	FN:10	PRODUCER	05-Oct-2009 17:24	3593.6 M	3230.9 M

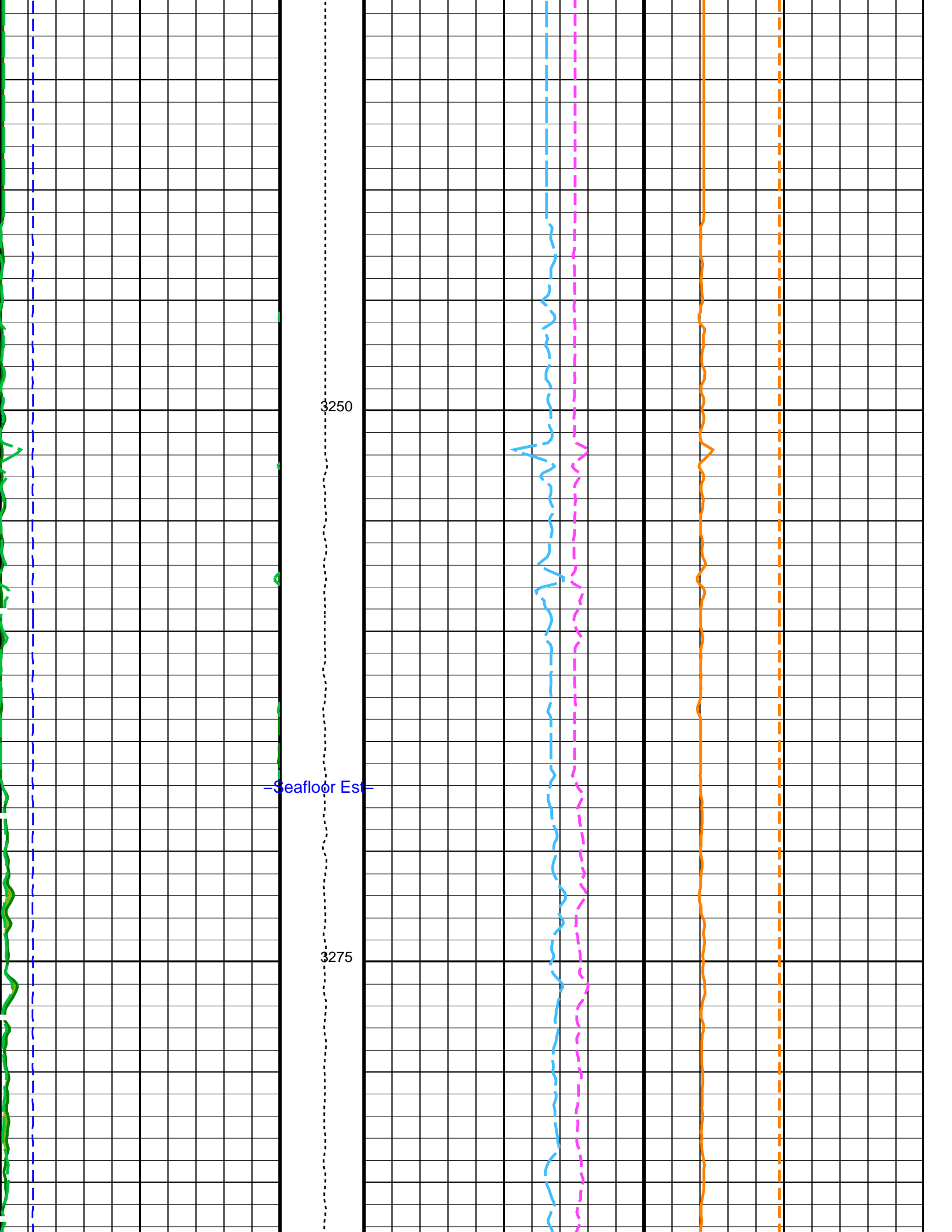
### OP System Version: 17C0-154

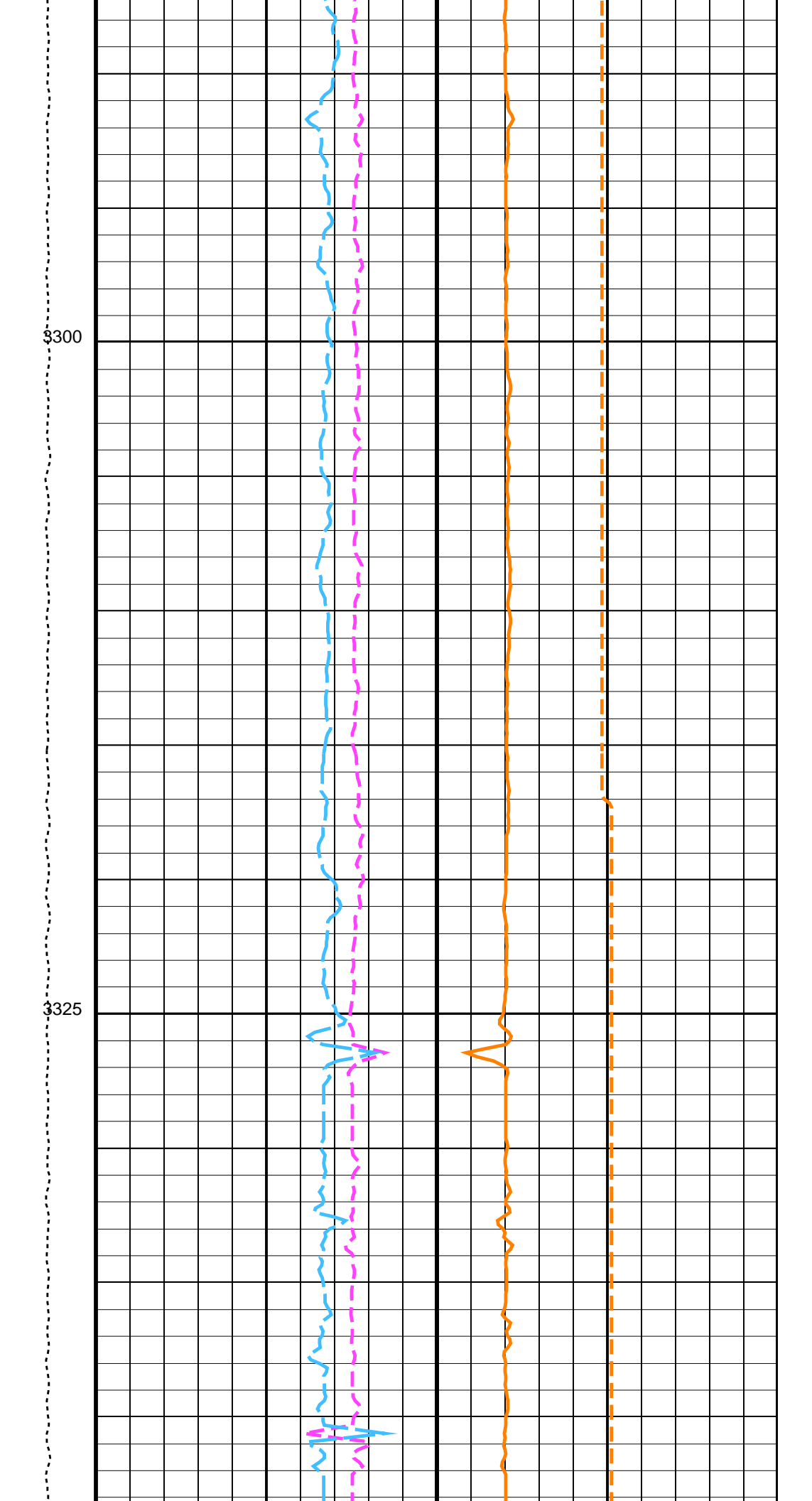
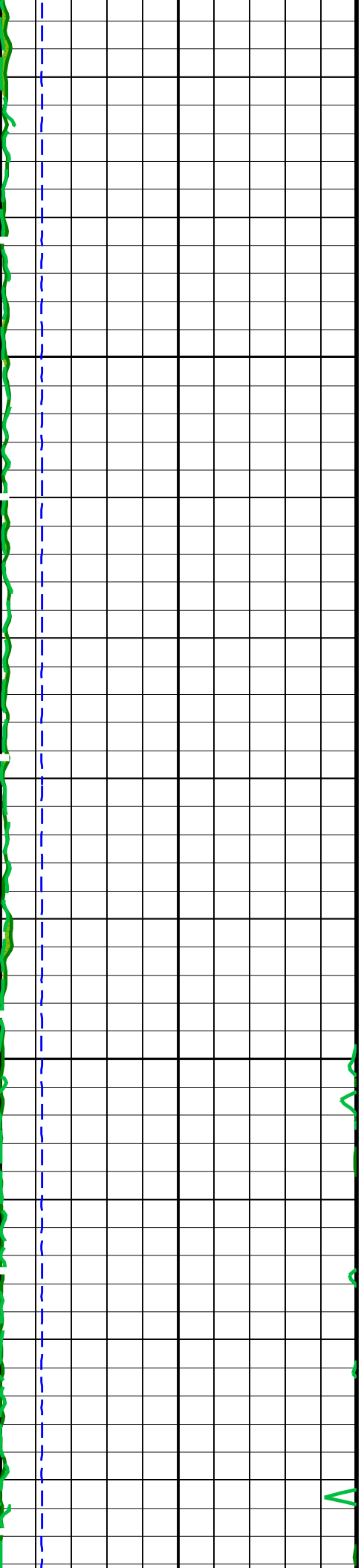
DIT-E	17C0-154	DTA-A	17C0-154
HLDS	17C0-154	LDSC-B	17C0-154
HNGC-B	17C0-154	HNGS-BA	17C0-154
DTC-H	17C0-154		

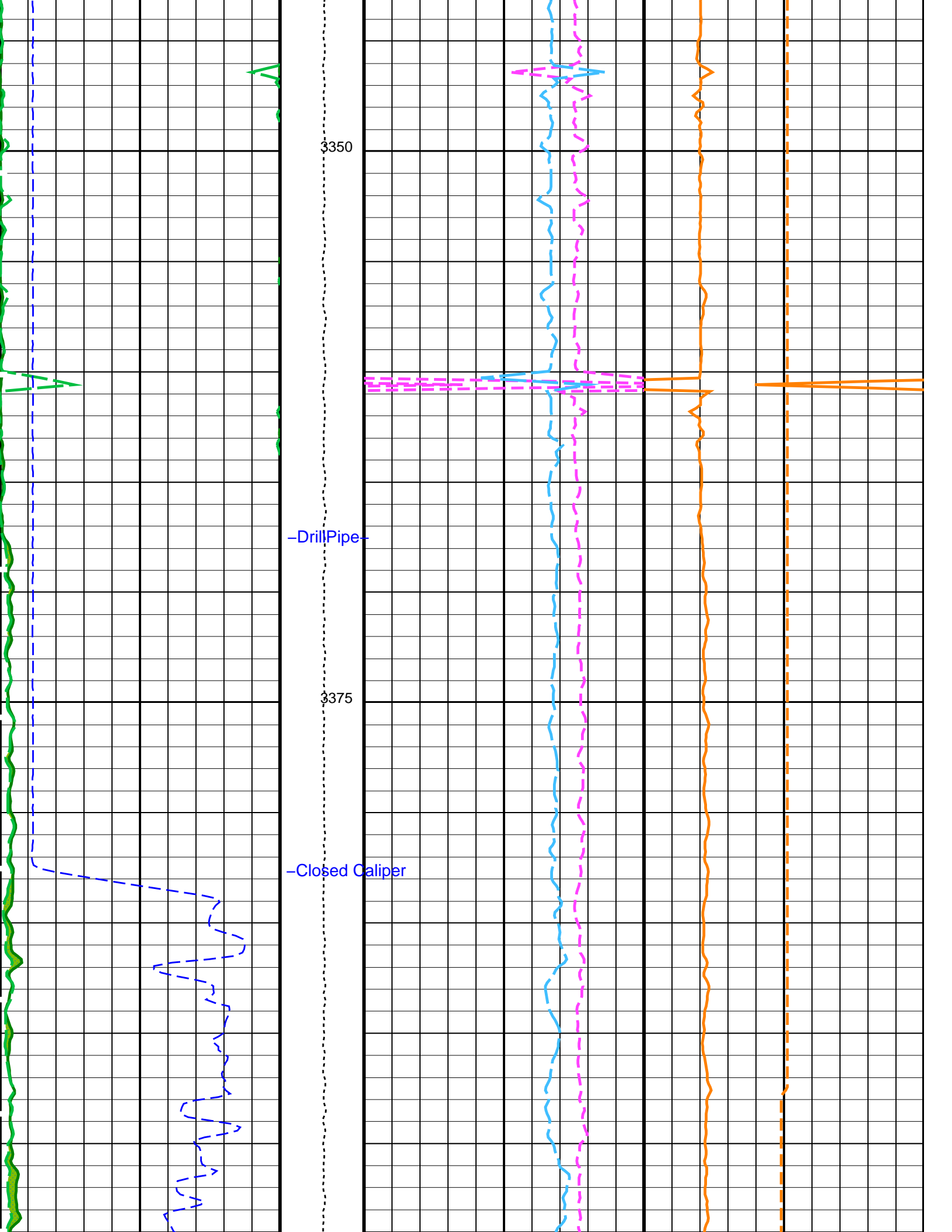
### PIP SUMMARY

Time Mark Every 60 S

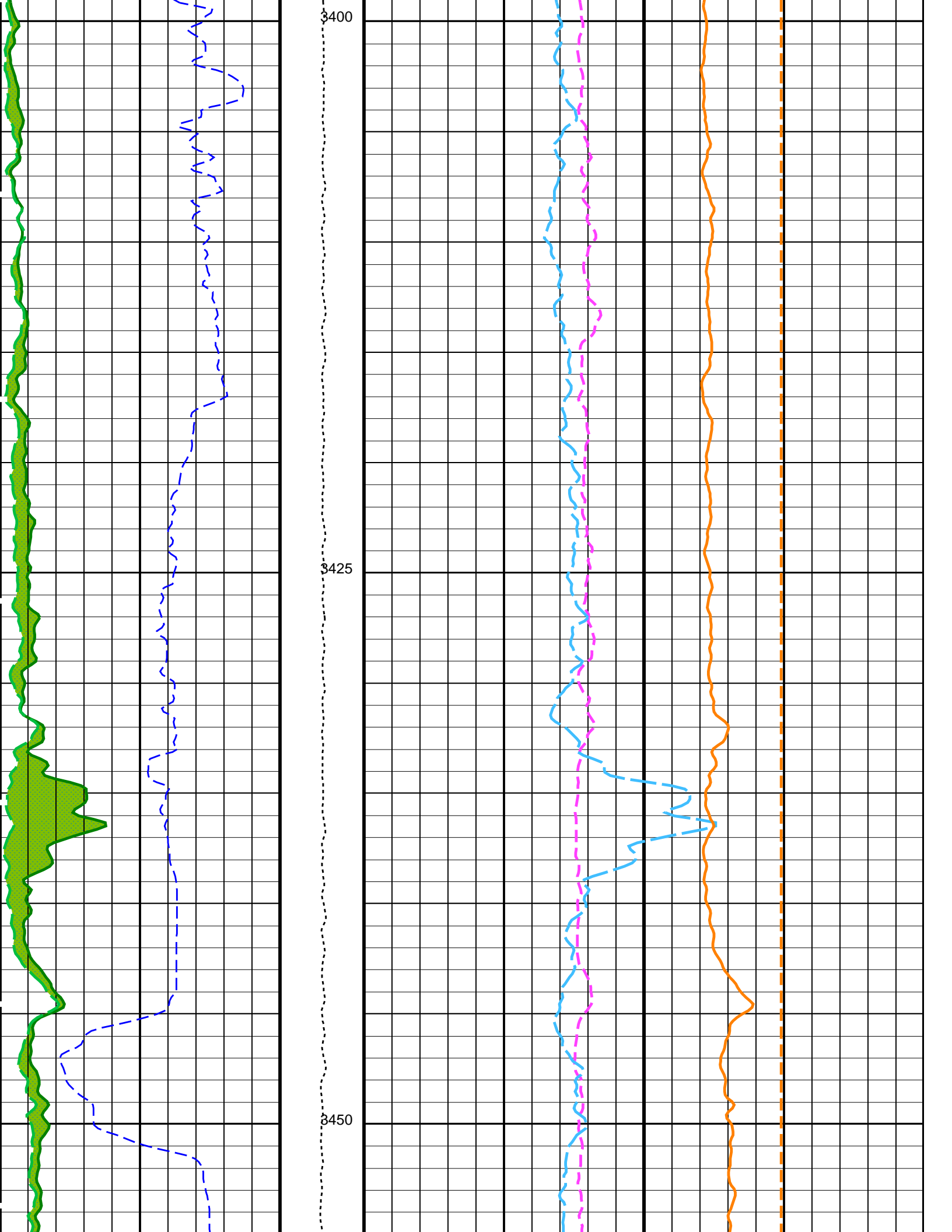


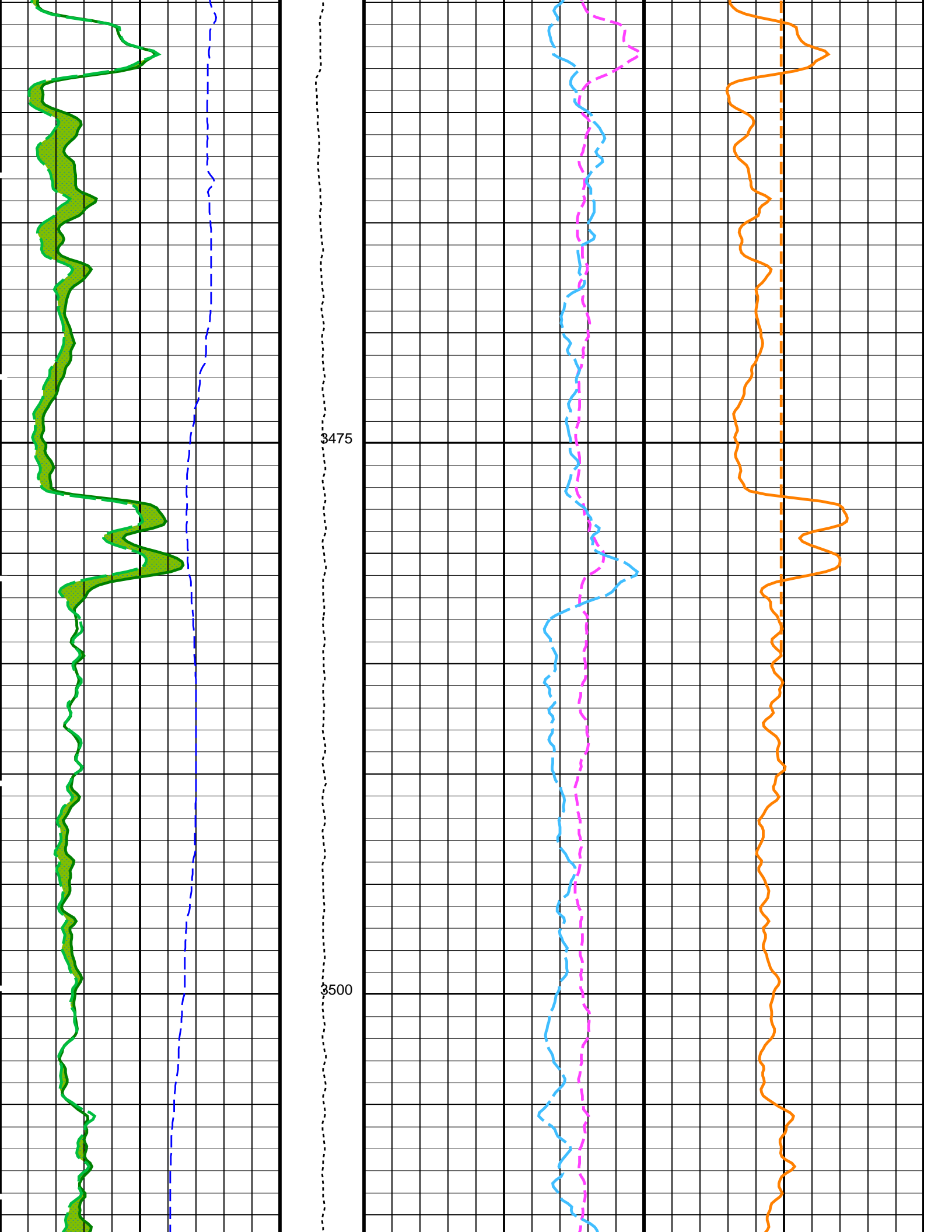


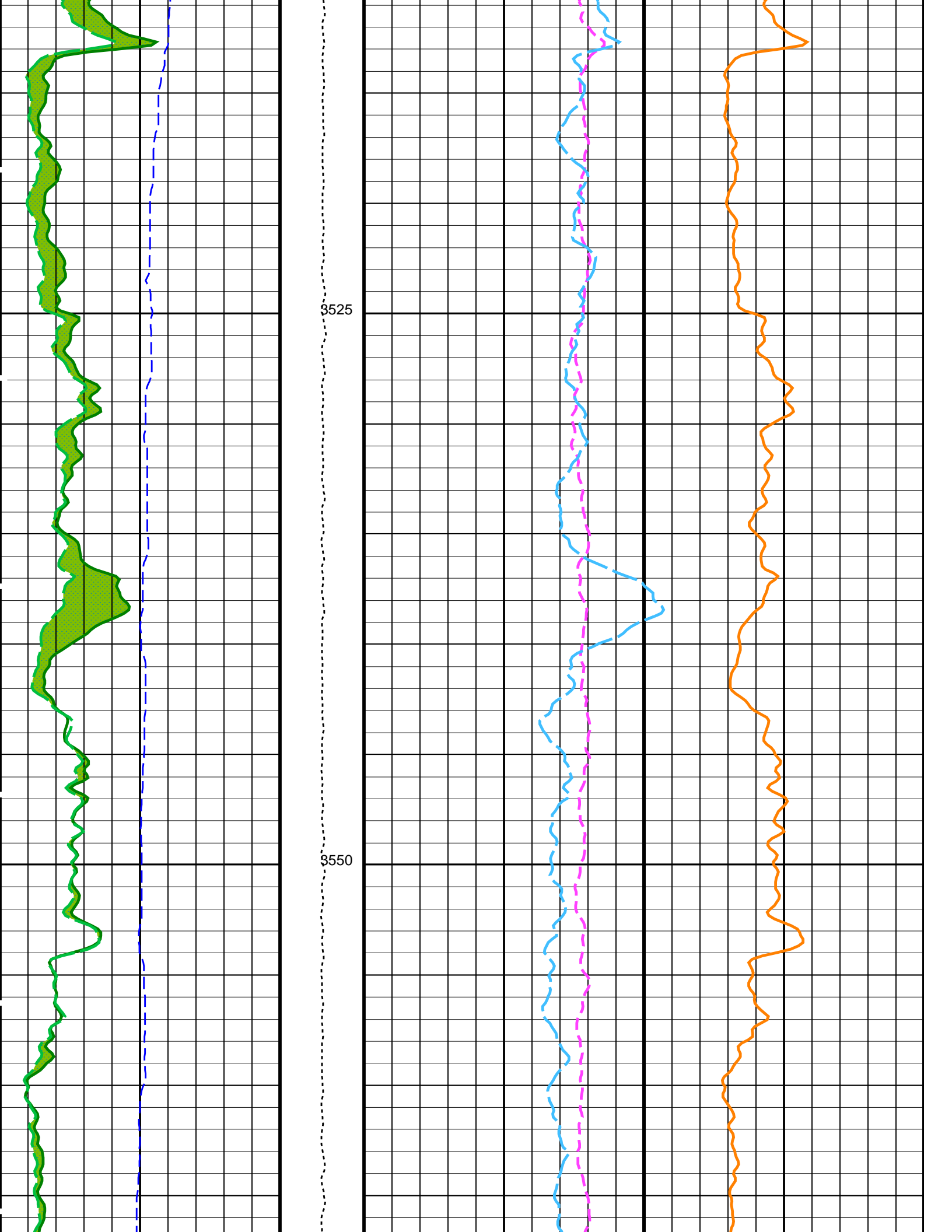


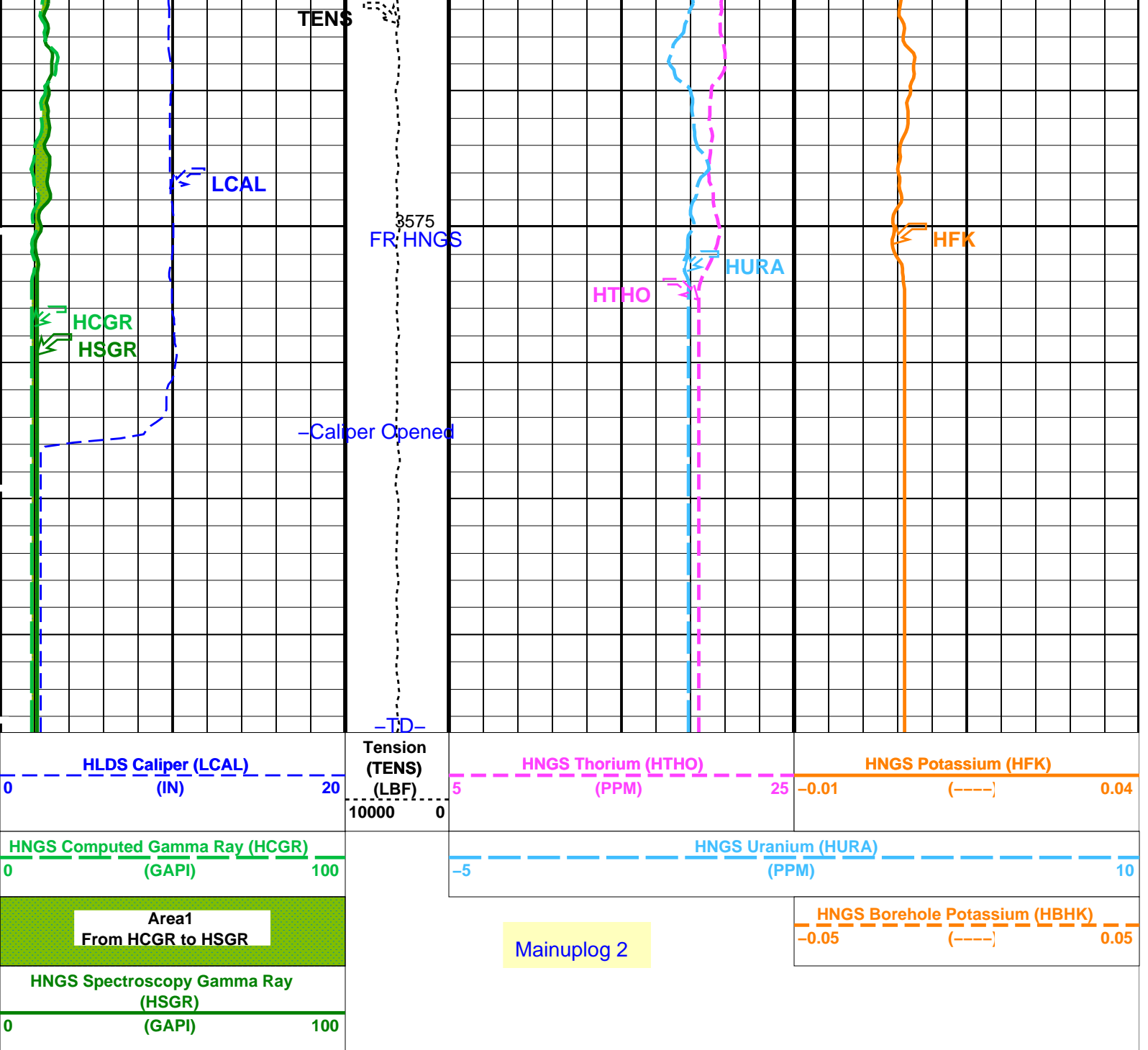












PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
DIT-E: Dual Induction - E		
BHS	Borehole Status	OPEN
BHT	Bottom Hole Temperature (used in calculations)	45 DEG
DGF2	Deep 20 kHz Gain Factor	0.979119
DPH2	Deep 20 kHz Phase Shift	0.0159963 DEG
DRE2	Deep Real 20 kHz Sonde Error Correction	17.0457 MM/M
DSR2	Deep Sigma Reference (20 kHz)	1843 MM/M
DXE2	Deep Quad 20 kHz Sonde Error Correction	136.154 MM/M
GCSE	Generalized Caliper Selection	BS
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	0.01 DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE
IFRS	DIT-E Induction Frequency Selector	20
IPHA	DIT-E Phasor Processing Mode	ALL
IPRO	DIT-E Induction Processing Selector	PHASOR
ISSBAR	Barite Mud Switch	NOBARITE

ITEN	DIT-E Temperature Enable	ENABLE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MGF2	Medium 20 kHz Gain Factor	0.974788	
MPH2	Medium 20 kHz Phase Shift	-0.199528	DEG
MRE2	Medium Real 20 kHz Sonde Error Correction	11.3259	MM/M
MSR2	Medium Sigma Reference (20 kHz)	3250	MM/M
MXE2	Medium Quad 20 kHz Sonde Error Correction	172.606	MM/M
SBR	Shoulder Bed Resistivity Factor	1	OHMM
SFCR	SFL Channel Ratio	1000	
SFLE	SFL Enable	ENABLE	
SHT	Surface Hole Temperature	68	DEGF
SPAЕ	DIT-E SPARC Processing Enable	ENABLE	
SPNV	SP Next Value	0	MV

HLDS: Hostile Litho-Density Sonde

CLCL	HLDS LS Control Loop Controller Mode	AUTO_DEFAULT	
CLCS	HLDS SS Control Loop Controller Mode	AUTO_DEFAULT	
CLLS	HLDS Mode Loop Long Spacing	AUTO	
CLSS	HLDS Mode Loop Short Spacing	AUTO	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
FD	Fluid Density	1	G/C3
LATC	HLDS Activation Correction	ON	
LLDL	HLDS LS Low Level Discriminator DAC	14000	
LLDS	HLDS SS Low Level Discriminator DAC	14000	
LLML	HLDS LS Low Level Discriminator Mode	AUTO	
LLMS	HLDS SS Low Level Discriminator Mode	AUTO	
MDEN	Matrix Density	2.71	G/C3
PHVL	HLDS Long Spacing High Voltage Setting	1000	V
PHVS	HLDS Short Spacing High Voltage Setting	1000	V
PSDL	HLDS LS Pulse Shape Compensation DAC	30000	
PSDS	HLDS SS Pulse Shape Compensation DAC	30000	
PSML	HLDS LS Pulse Shape Compensation Mode	AUTO	
PSMS	HLDS SS Pulse Shape Compensation Mode	AUTO	

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	
BHT	Bottom Hole Temperature (used in calculations)	45	DEGF
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	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GRRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
H1P	HNGS Detector 1 Allow/Disallow In Processing	ALLOW	
H2P	HNGS Detector 2 Allow/Disallow In Processing	ALLOW	
HABK	HNGS Borehole Potassium Running Average	-0.000849183	
HALF	HNGS Alpha Filter Length	60	IN
HCRB	HNGS Apply Borehole Potassium Correction	NONE	
HMWM	Mud Weighting Material	NATU	
HNPE	HNGS Processing Enable	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
S1BI	HNGS Detector 1 Calibration Bismuth Count Rate	1.3	CPS
S2BI	HNGS Detector 2 Calibration Bismuth Count Rate	1.3	CPS
SGRC	HNGS Standard Gamma-Ray Correction Flag	YES	
SHT	Surface Hole Temperature	68	DEGF
TPOS	Tool Position	ECCE	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	1.01745	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	0.986824	

System and Miscellaneous

ALDTPCHAN	Name of alternate depth channel	SpeedCorrectedDepth	
BS	Bit Size	9.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	0.000	IN
CWEI	Casing Weight	0.00	LB/F
DFD	Drilling Fluid Density	1.26	G/C3
FLEV	Fluid Level	-50000.00	M
MST	Mud Sample Temperature	-50000.00	DEGC
PBVSADP	Use alternate depth channel for playback	NO	
RMFS	Resistivity of Mud Filtrate Sample	-50000.0000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	11811	FT
TDD	Total Depth - Driller	-50000.00	M
TDL	Total Depth - Logger	-50000.00	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

DIT-E	17C0-154	DTA-A	17C0-154
HLDS	17C0-154	LDSC-B	17C0-154
HNGC-B	17C0-154	HNGS-BA	17C0-154
DTC-H	17C0-154		

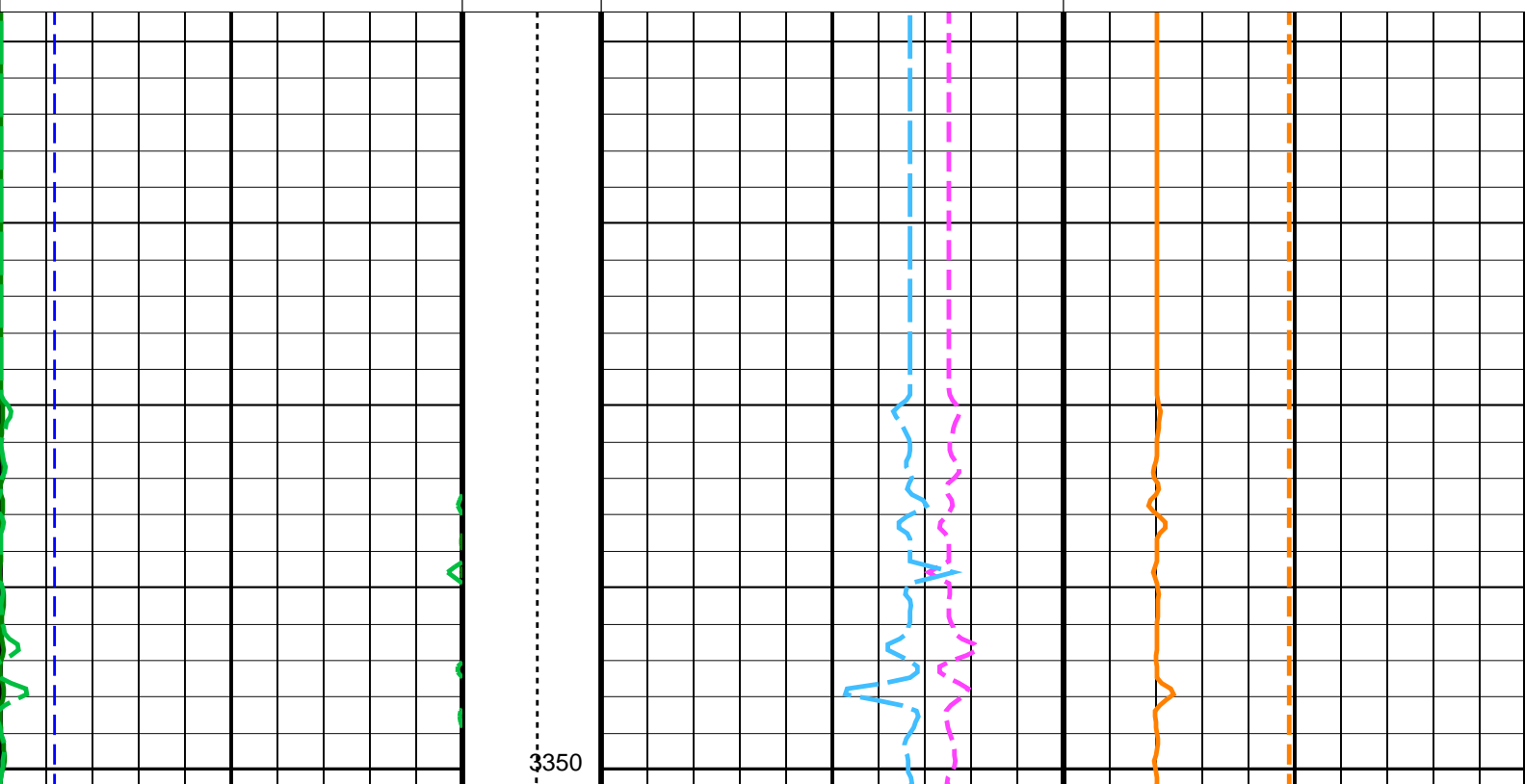
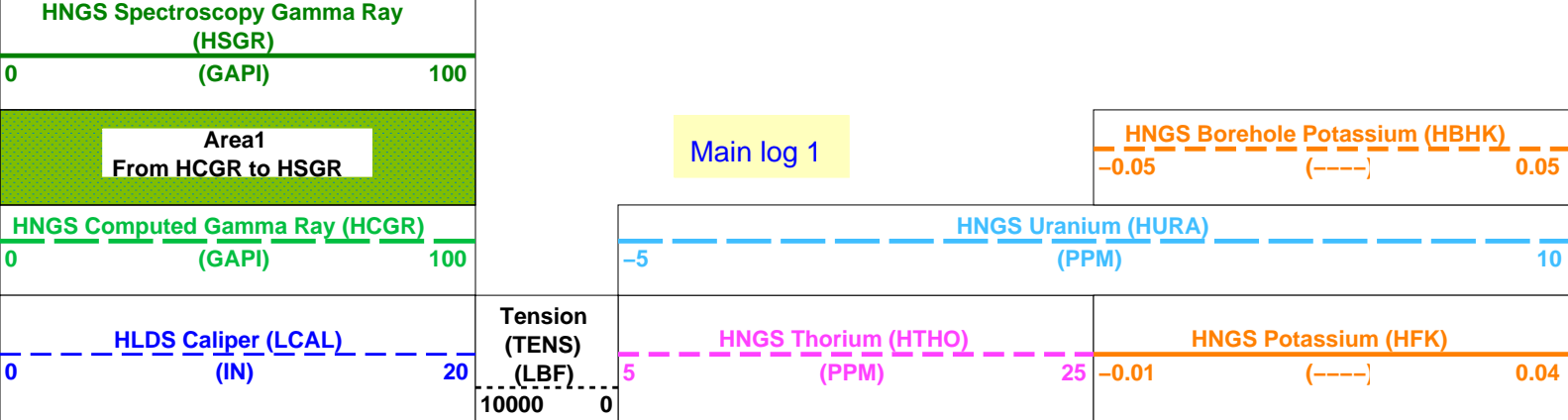
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BACKUPDLISDATA	PI_LDL_NGS_007LUP	FN:10	PRODUCER	05-Oct-2009 17:24	

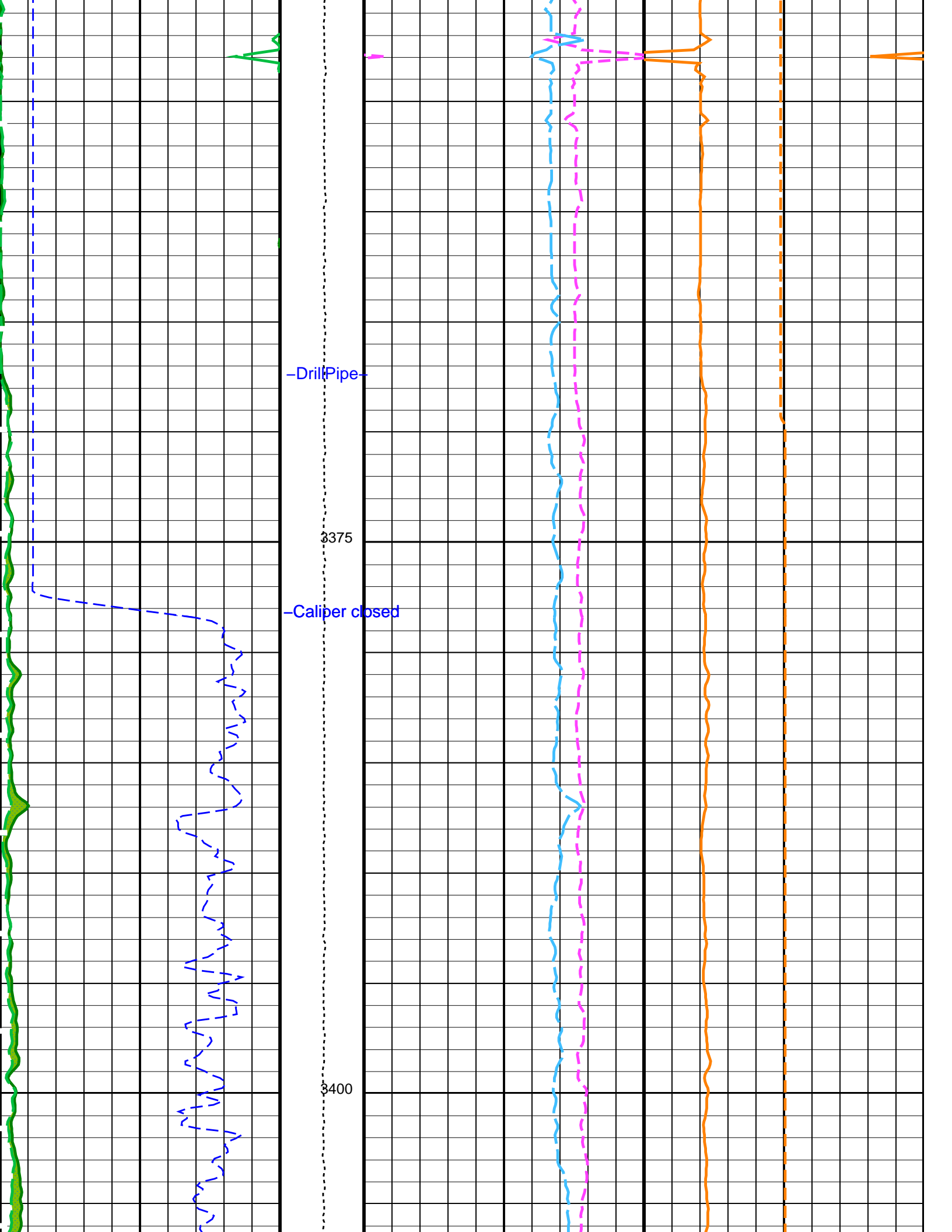
Output DLIS Files					
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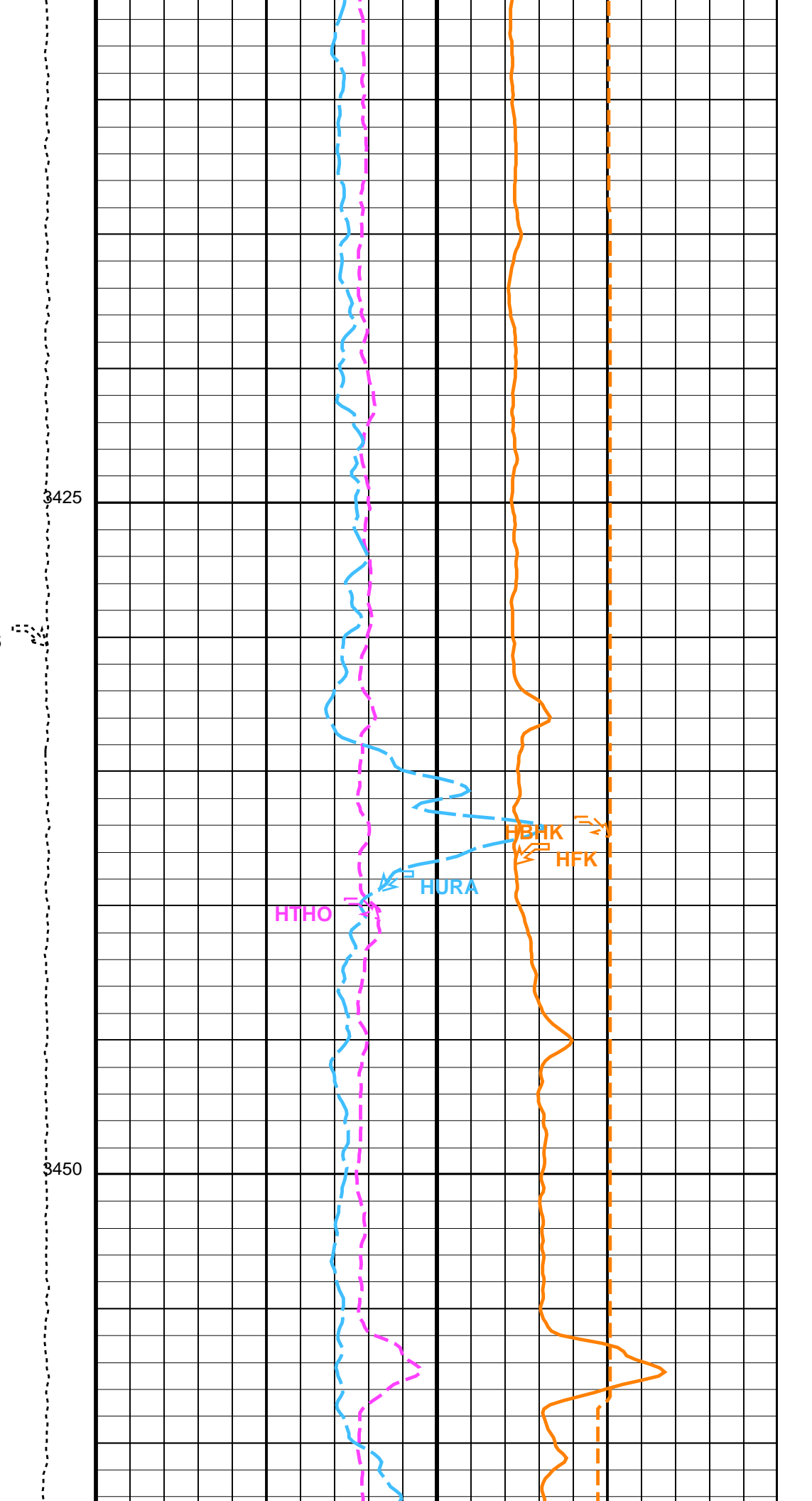
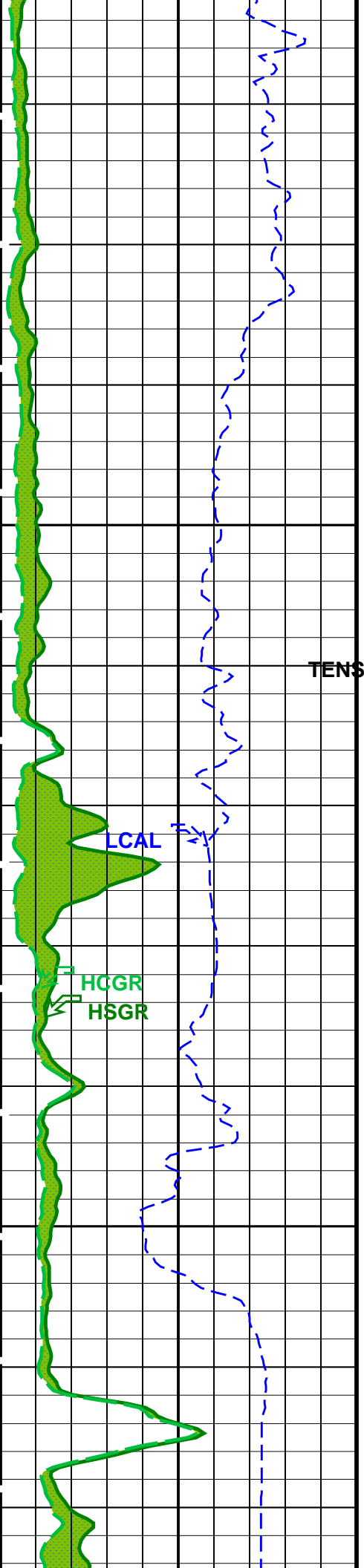
OP System Version: 17C0-154					
DIT-E	17C0-154	DTA-A	17C0-154		
HLDS	17C0-154	LDSC-B	17C0-154		
HNGC-B	17C0-154	HNGS-BA	17C0-154		
DTC-H	17C0-154				

**PIP SUMMARY**

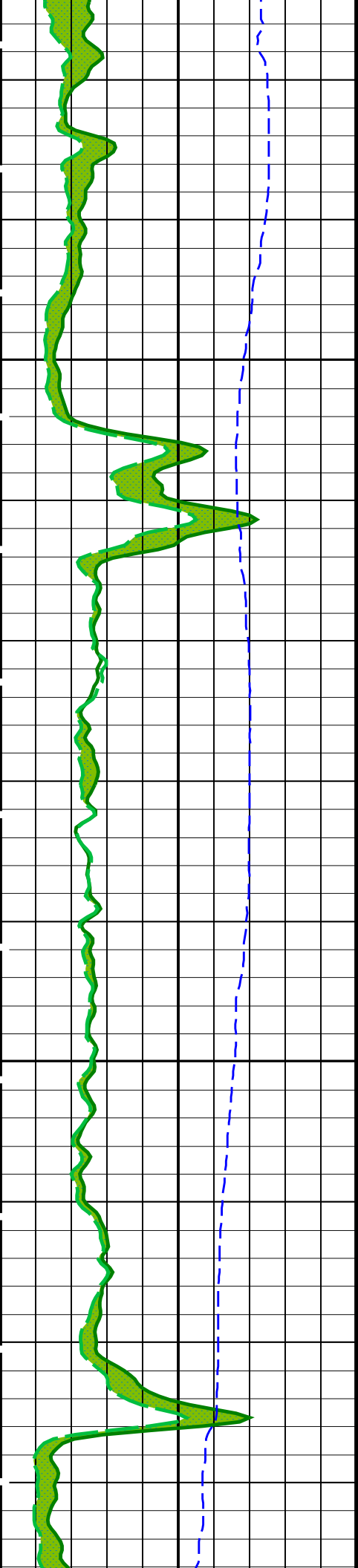
Time Mark Every 60 S





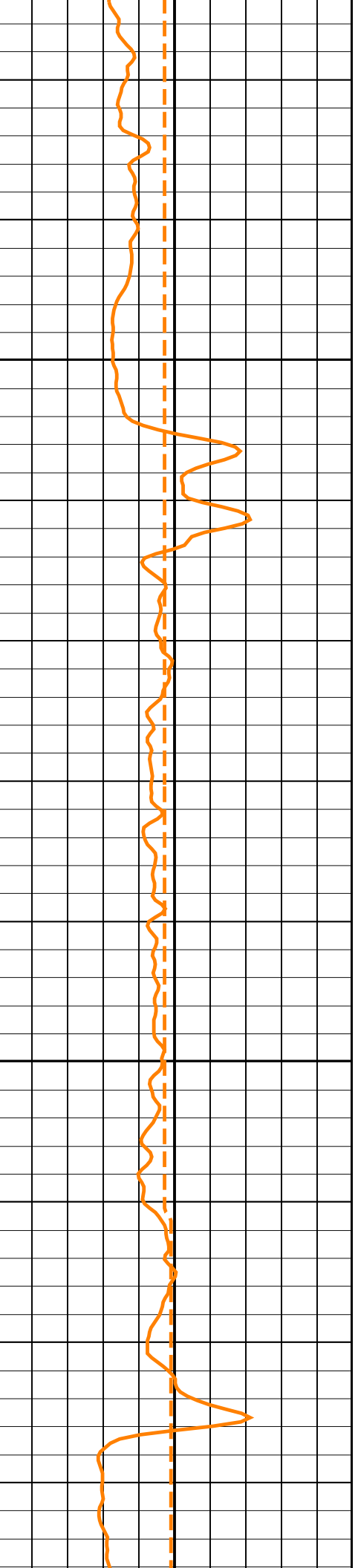
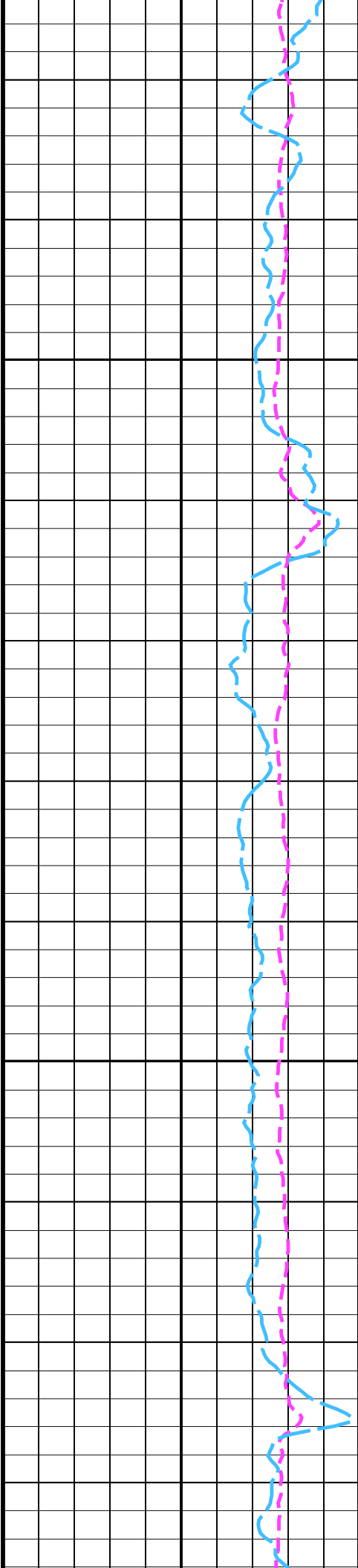


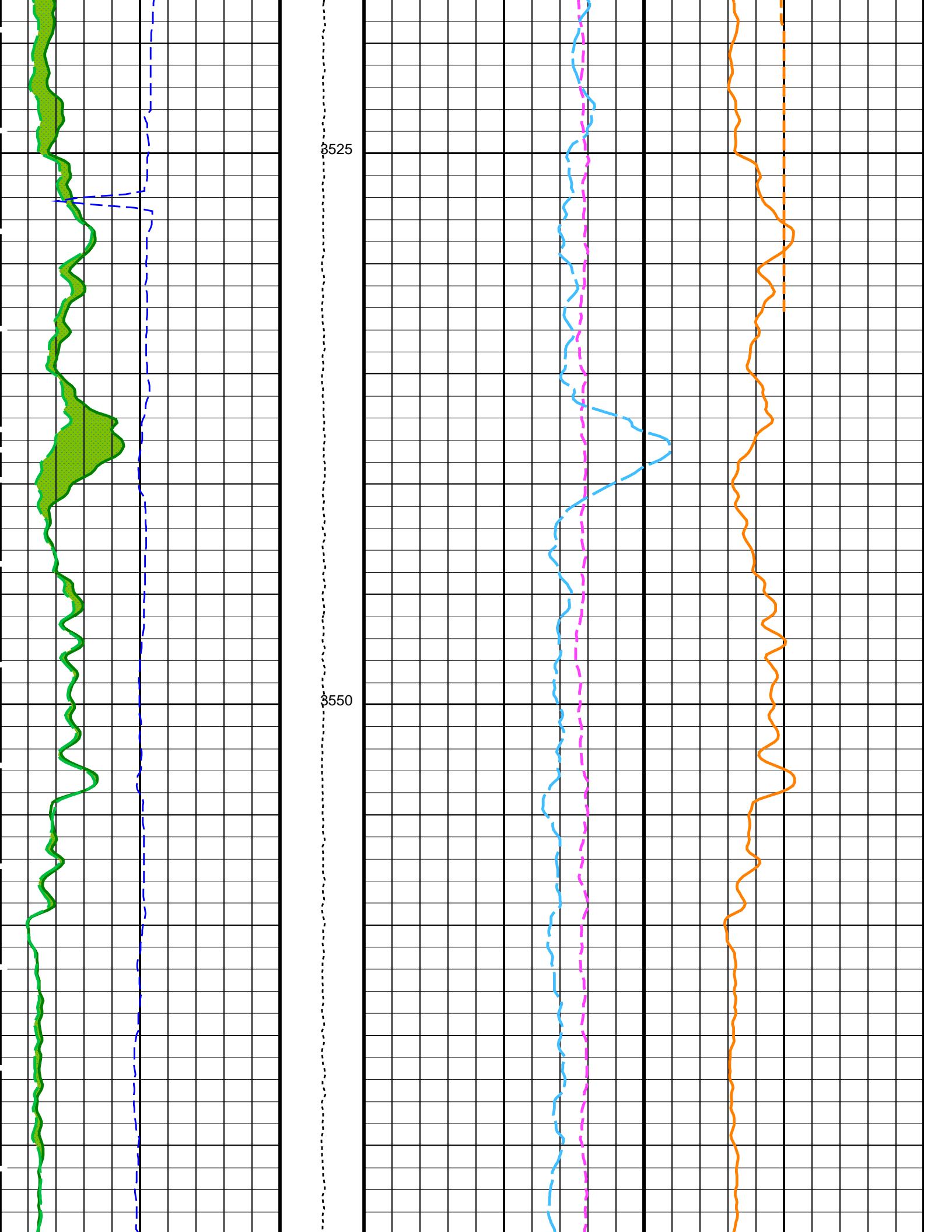


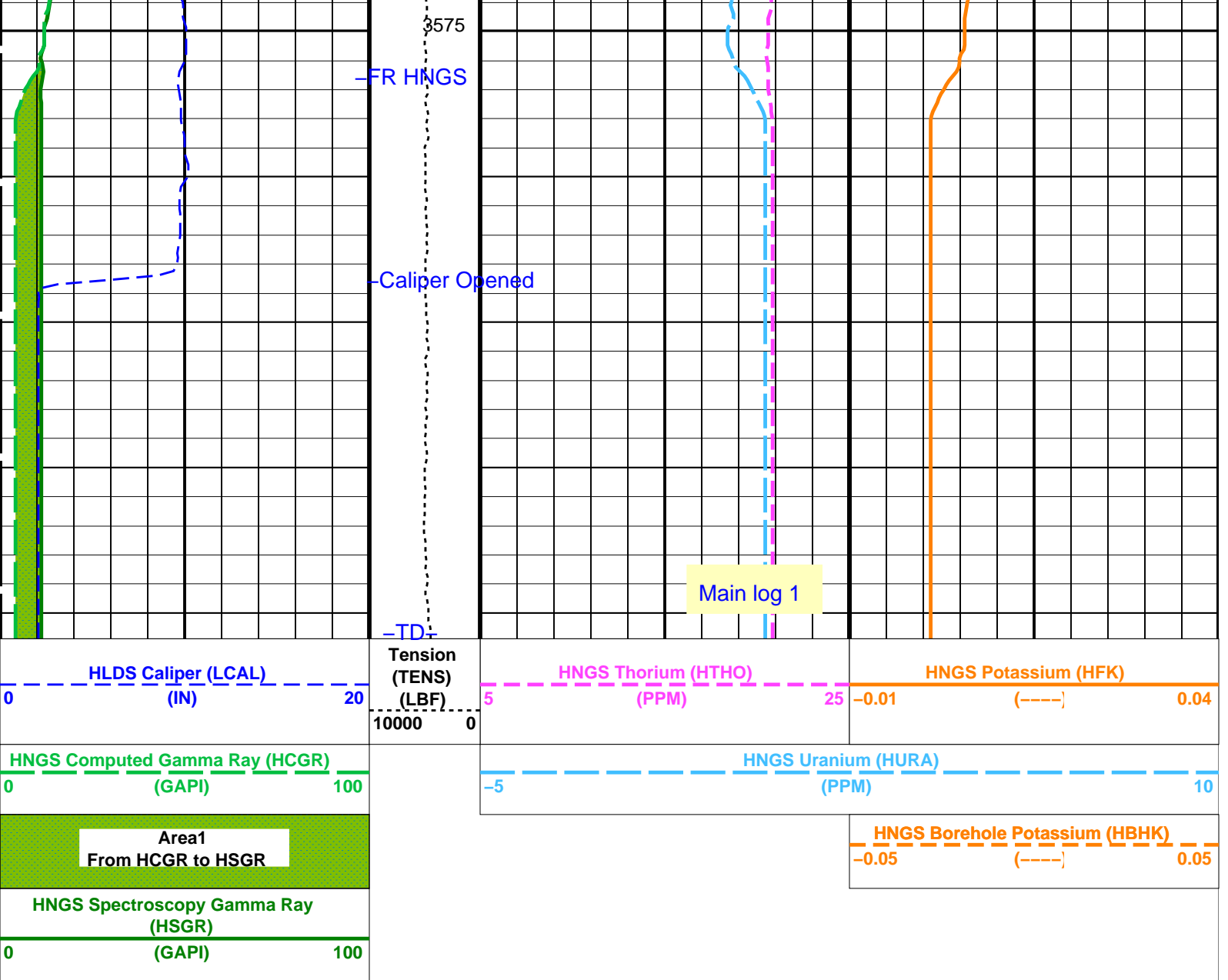


3475

3500







PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
DIT-E: Dual Induction - E			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	45	DEGF
DGF2	Deep 20 kHz Gain Factor	0.979119	
DPH2	Deep 20 kHz Phase Shift	0.0159963	DEG
DRE2	Deep Real 20 kHz Sonde Error Correction	17.0457	MM/M
DSR2	Deep Sigma Reference (20 kHz)	1843	MM/M
DXE2	Deep Quad 20 kHz Sonde Error Correction	136.154	MM/M
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
IFRS	DIT-E Induction Frequency Selector	20	
IPHA	DIT-E Phasor Processing Mode	ALL	
IPRO	DIT-E Induction Processing Selector	PHASOR	
ISSBAR	Barite Mud Switch	NOBARITE	
ITEN	DIT-E Temperature Enable	ENABLE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MGF2	Medium 20 kHz Gain Factor	0.974788	
MPH2	Medium 20 kHz Phase Shift	-0.199528	DEG
MRE2	Medium Real 20 kHz Sonde Error Correction	11.3259	MM/M
MSR2	Medium Sigma Reference (20 kHz)	3250	MM/M
MXE2	Medium Quad 20 kHz Sonde Error Correction	172.606	MM/M
SBR	Shoulder Bed Resistivity Factor	1	OHMM

SFCR	SFL Channel Ratio	1000	
SFLE	SFL Enable	ENABLE	
SHT	Surface Hole Temperature	68	DEGF
SPAE	DIT-E SPARC Processing Enable	ENABLE	
SPNV	SP Next Value	0	MV

HLDS: Hostile Litho-Density Sonde

CLCL	HLDS LS Control Loop Controller Mode	AUTO_DEFAULT	
CLCS	HLDS SS Control Loop Controller Mode	AUTO_DEFAULT	
CLLS	HLDS Mode Loop Long Spacing	AUTO	
CLSS	HLDS Mode Loop Short Spacing	AUTO	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
FD	Fluid Density	1	G/C3
LATC	HLDS Activation Correction	ON	
LLDL	HLDS LS Low Level Discriminator DAC	14000	
LLDS	HLDS SS Low Level Discriminator DAC	14000	
LLML	HLDS LS Low Level Discriminator Mode	AUTO	
LLMS	HLDS SS Low Level Discriminator Mode	AUTO	
MDEN	Matrix Density	2.71	G/C3
PHVL	HLDS Long Spacing High Voltage Setting	1000	V
PHVS	HLDS Short Spacing High Voltage Setting	1000	V
PSDL	HLDS LS Pulse Shape Compensation DAC	30000	
PSDS	HLDS SS Pulse Shape Compensation DAC	30000	
PSML	HLDS LS Pulse Shape Compensation Mode	AUTO	
PSMS	HLDS SS Pulse Shape Compensation Mode	AUTO	

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	
BHT	Bottom Hole Temperature (used in calculations)	45	DEGF
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	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
H1P	HNGS Detector 1 Allow/Disallow In Processing	ALLOW	
H2P	HNGS Detector 2 Allow/Disallow In Processing	ALLOW	
HABK	HNGS Borehole Potassium Running Average	-0.000875068	
HALF	HNGS Alpha Filter Length	60	IN
HCRB	HNGS Apply Borehole Potassium Correction	NONE	
HMWM	Mud Weighting Material	NATU	
HNPE	HNGS Processing Enable	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
S1BI	HNGS Detector 1 Calibration Bismuth Count Rate	1.3	CPS
S2BI	HNGS Detector 2 Calibration Bismuth Count Rate	1.3	CPS
SGRC	HNGS Standard Gamma-Ray Correction Flag	YES	
SHT	Surface Hole Temperature	68	DEGF
TPOS	Tool Position	ECCE	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	1.27313	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	1.08009	

System and Miscellaneous

ALTDPCCHAN	Name of alternate depth channel	SpeedCorrectedDepth	
BS	Bit Size	9.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	0.000	IN
CWEI	Casing Weight	0.00	LB/F
DFD	Drilling Fluid Density	1.26	G/C3
FLEV	Fluid Level	-50000.00	M
MST	Mud Sample Temperature	-50000.00	DEGC
PBVSADP	Use alternate depth channel for playback	NO	
RMFS	Resistivity of Mud Filtrate Sample	-50000.0000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	11811	FT
TDD	Total Depth - Driller	-50000.00	M
TDL	Total Depth - Logger	-50000.00	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

Format: HNGSYields    Vertical Scale: 1:200    Graphics File Created: 06-Oct-2009 00:59

OP System Version: 17C0-154

DIT-E	17C0-154	DTA-A	17C0-154
HLDS	17C0-154	LDSC-B	17C0-154
HNGC-B	17C0-154	HNGS-BA	17C0-154
DTC-H	17C0-154		

# Output DLIS Files

DEFAULT	PI_LDL_NGS_006LUP	FN:7	PRODUCER	06-Oct-2009 00:59
BACKUPDLISDATA	PI_LDL_NGS_006LUP	FN:8	PRODUCER	05-Oct-2009 16:00

## Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
<b>Hostile Litho-Density Sonde Wellsite Calibration – Background Measurement</b>							
Master: 18-Sep-2009 2:55 Before: 18-Sep-2009 5:19 After: 6-Oct-2009 5:12							
SS Cs Resolution Bkg	9.000	8.452	8.363	8.426	0.06246	1.800	%
LS Cs Resolution Bkg	9.000	8.580	8.651	8.599	-0.05205	1.800	%
LSW1 Background	100.0	76.04	75.16	74.56	-0.5994	0.03000	CPS
LSW2 Background	100.0	69.08	67.85	68.84	0.9836	0.03000	CPS
LSW3 Background	200.0	155.5	152.7	154.5	1.819	0.03000	CPS
LSW4 Background	250.0	187.6	187.4	187.2	-0.1870	0.03000	CPS
LSW5 Background	600.0	426.9	426.3	426.5	0.2204	0.03000	CPS
SSW1 Background	100.0	74.38	73.61	74.87	1.256	0.03000	CPS
SSW2 Background	200.0	130.0	127.5	128.7	1.249	0.03000	CPS
SSW3 Background	500.0	340.0	341.3	343.6	2.380	0.03000	CPS
SSW4 Background	270.0	181.2	184.1	184.1	-0.01787	0.03000	CPS
SSW5 Background	200.0	132.4	130.8	132.1	1.332	0.03000	CPS
<b>Hostile Litho-Density Sonde Wellsite Calibration – Aluminum Measurement</b>							
Master: 18-Sep-2009 4:05							
LSW1 Aluminum	600.0	539.9	N/A	N/A	N/A	N/A	CPS
LSW2 Aluminum	900.0	806.6	N/A	N/A	N/A	N/A	CPS
LSW3 Aluminum	1100	986.0	N/A	N/A	N/A	N/A	CPS
LSW4 Aluminum	580.0	501.1	N/A	N/A	N/A	N/A	CPS
LSW5 Aluminum	570.0	458.2	N/A	N/A	N/A	N/A	CPS
SSW1 Aluminum	2800	2369	N/A	N/A	N/A	N/A	CPS
SSW2 Aluminum	8000	6795	N/A	N/A	N/A	N/A	CPS
SSW3 Aluminum	11600	9808	N/A	N/A	N/A	N/A	CPS
SSW4 Aluminum	5000	4129	N/A	N/A	N/A	N/A	CPS
SSW5 Aluminum	660.0	554.7	N/A	N/A	N/A	N/A	CPS
<b>Hostile Litho-Density Sonde Wellsite Calibration – Lithology Measurement</b>							
Master: 18-Sep-2009 3:57							
LSW1 Iron	400.0	366.5	N/A	N/A	N/A	N/A	CPS
LSW2 Iron	730.0	642.8	N/A	N/A	N/A	N/A	CPS
LSW3 Iron	1000	862.0	N/A	N/A	N/A	N/A	CPS
LSW4 Iron	520.0	447.6	N/A	N/A	N/A	N/A	CPS
LSW5 Iron	470.0	414.9	N/A	N/A	N/A	N/A	CPS
SSW1 Iron	2100	1749	N/A	N/A	N/A	N/A	CPS
SSW2 Iron	6800	5618	N/A	N/A	N/A	N/A	CPS
SSW3 Iron	10800	8869	N/A	N/A	N/A	N/A	CPS
SSW4 Iron	4600	3733	N/A	N/A	N/A	N/A	CPS
SSW5 Iron	580.0	484.8	N/A	N/A	N/A	N/A	CPS
<b>Hostile Litho-Density Sonde Wellsite Calibration – Caliper Calibration</b>							
Before: 18-Sep-2009 5:08							
HLDS Caliper Small Ring	12.00	N/A	14.59	N/A	N/A	N/A	IN
HLDS Caliper Large Ring	15.19	N/A	18.14	N/A	N/A	N/A	IN
<b>Hostile Natural Gamma Ray Sonde Wellsite Calibration – Detector 1 Check</b>							
Master: 5-Sep-2009 7:01 Before: 13-Sep-2009 22:15 After: 6-Oct-2009 5:15							
Na 511 Peak Loc	40.00	39.55	39.60	39.55	-0.04499	1.000	
Na 511 Peak Res	15.50	15.65	16.19	16.19	-0.001600	2.000	%
High Voltage	1150	1146	1180	1180	-0.04395	N/A	V
Na 1785 Peak Loc	142.6	142.8	142.7	141.7	-1.018	7.000	
Na 1785 Peak Res	8.500	7.849	8.372	8.356	-0.01615	2.000	%
Temperature	15.50	14.91	32.53	30.76	-1.774	N/A	DEGC
Na Count Rate	45.00	36.92	35.51	35.28	-0.2280	8.000	CPS
<b>Hostile Natural Gamma Ray Sonde Wellsite Calibration – Detector 2 Check</b>							
Master: 5-Sep-2009 7:01 Before: 13-Sep-2009 22:15 After: 6-Oct-2009 5:15							
Na 511 Peak Loc	40.00	39.62	39.55	39.54	-0.007183	1.000	
Na 511 Peak Res	15.50	15.06	16.55	16.18	-0.3718	2.000	%
High Voltage	1150	1080	1113	1113	-0.2059	N/A	V
Na 1785 Peak Loc	142.6	141.3	142.3	141.9	-0.4169	7.000	
Na 1785 Peak Res	8.500	8.437	9.484	8.502	-0.9824	2.000	%
Temperature	15.50	15.08	32.86	32.67	-0.1886	N/A	DEGC
Na Count Rate	45.00	36.97	36.00	35.45	-0.5474	8.000	CPS

Coincidence Count Rate Ratio	1.000	0.9992	0.9853	0.9952	0.009893	0.05000
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Hostile Natural Gamma Ray Sonde Master Calibration – Detector 1 Calibration

Master: 5-Sep-2009 7:01

Na 511 Peak Set Point	40.00	41.00	--	--	--	--	
Th Peak Loc	209.6	210.4	--	--	--	--	
Th Peak Res	7.000	6.417	--	--	--	--	%
Background Count Rate	142.5	18.75	--	--	--	--	CPS
Gain Ratio	1.000	1.012	--	--	--	--	

Hostile Natural Gamma Ray Sonde Master Calibration – Detector 2 Calibration

Master: 5-Sep-2009 7:01

Na 511 Peak Set Point	40.00	41.00	--	--	--	--	
Th Peak Loc	209.6	209.5	--	--	--	--	
Th Peak Res	7.000	7.001	--	--	--	--	%
Background Count Rate	142.5	18.87	--	--	--	--	CPS
Gain Ratio	1.000	1.006	--	--	--	--	

Dual Induction – E / Equipment Identification

Primary Equipment:

Dual Induction Sonde	DIS – HB	129
Dual Induction Cartridge	DIC – EB	171

Auxiliary Equipment:

Mass Isolated Housing	MIH – ZA	342
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Hostile Litho–Density Sonde / Equipment Identification

Primary Equipment:

Hostile Litho Density Sonde	HLDS – D	35
Hostile Litho Density High Voltage	HLDV – D	35
Gamma Source Radioactive	GSR – Z	2397

Auxiliary Equipment:

Hostile Litho Density Pad	HLDP – C	35
Hostile Litho Density High Voltage Housi	HEH – H	35

Litho–Density Spectroscopy Cartridge – B / Equipment Identification

Primary Equipment:

LDSC Cartridge	LDSC – B	521
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Auxiliary Equipment:

LDSC Housing	LDSH – A	126
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Hostile Natural Gamma Ray Cartridge – B / Equipment Identification

Primary Equipment:

HNGC Cartridge	HNGC – B	300
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Auxiliary Equipment:

HNGC Housing	HNGH – A	115
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Hostile Natural Gamma Ray Sonde / Equipment Identification

Primary Equipment:

HNGS Sonde	HNGS – BA	194
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Auxiliary Equipment:

HNGS Sonde Housing	HNSH – BA	205
Gamma Source Radioactive	GSR – U	616008

Hostile Natural Gamma Ray Sonde Wellsite Calibration

Detector 1 Check

Phase	Na 511 Peak Loc	Value	Phase	Na 511 Peak Res %	Value	Phase	High Voltage V	Value	
Master		39.55	Master		15.65	Master		1146	
Before		39.60	Before		16.19	Before		1180	
After		39.55	After		16.19	After		1180	
	37.50 (Minimum)	40.00 (Nominal)	43.50 (Maximum)	12.00 (Minimum)	15.50 (Nominal)	19.00 (Maximum)	900.0 (Minimum)	1150 (Nominal)	1600 (Maximum)
Phase	Na 1785 Peak Loc	Value	Phase	Na 1785 Peak Res %	Value	Phase	Temperature DEGC	Value	
Master		142.8	Master		7.849	Master		14.91	
Before		142.7	Before		8.372	Before		32.53	
After		141.7	After		8.356	After		30.76	
	135.0 (Minimum)	142.6 (Nominal)	150.3 (Maximum)	7.000 (Minimum)	8.500 (Nominal)	11.00 (Maximum)	-28.89 (Minimum)	15.50 (Nominal)	60.00 (Maximum)
Phase	Na Count Rate CPS	Value							
Master		36.92							
Before		35.51							
After		35.28							
	10.00 (Minimum)	45.00 (Nominal)	100.0 (Maximum)						
Master: 5-Sep-2009 7:01			Before: 13-Sep-2009 22:15			After: 6-Oct-2009 5:15			

Hostile Natural Gamma Ray Sonde Wellsite Calibration

Detector 2 Check

Phase	Na 511 Peak Loc	Value	Phase	Na 511 Peak Res %	Value	Phase	High Voltage V	Value	
Master		39.62	Master		15.06	Master		1080	
Before		39.55	Before		16.55	Before		1113	
After		39.54	After		16.18	After		1113	
	37.50 (Minimum)	40.00 (Nominal)	43.50 (Maximum)	12.00 (Minimum)	15.50 (Nominal)	19.00 (Maximum)	900.0 (Minimum)	1150 (Nominal)	1600 (Maximum)
Phase	Na 1785 Peak Loc	Value	Phase	Na 1785 Peak Res %	Value	Phase	Temperature DEGC	Value	
Master		141.3	Master		8.437	Master		15.08	
Before		142.3	Before		9.484	Before		32.86	
After		141.9	After		8.502	After		32.67	
	135.0 (Minimum)	142.6 (Nominal)	150.3 (Maximum)	7.000 (Minimum)	8.500 (Nominal)	11.00 (Maximum)	-28.89 (Minimum)	15.50 (Nominal)	60.00 (Maximum)
Phase	Na Count Rate CPS	Value							
Master		36.97							
Before		36.00							
After		35.45							
	10.00 (Minimum)	45.00 (Nominal)	100.0 (Maximum)						
Master: 5-Sep-2009 7:01			Before: 13-Sep-2009 22:15			After: 6-Oct-2009 5:15			

Hostile Natural Gamma Ray Sonde Wellsite Calibration			
Ratio Of Detector 1 To Detector 2			
Phase	Coincidence Count Rate Ratio	Value	
Master		0.9992	
Before		0.9853	
After		0.9952	
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)
Master: 5-Sep-2009 7:01			
Before: 13-Sep-2009 22:15			
After: 6-Oct-2009 5:15			

Hostile Natural Gamma Ray Sonde Master Calibration

Detector 1 Calibration

Phase	Na 511 Peak Set Point	Value	Phase	Th Peak Loc	Value	Phase	Th Peak Res %	Value
Master		41.00	Master		210.4	Master		6.417
	38.00 (Minimum)      40.00 (Nominal)      43.00 (Maximum)			201.0 (Minimum)      209.6 (Nominal)      218.3 (Maximum)			5.000 (Minimum)      7.000 (Nominal)      9.000 (Maximum)	
Phase	Background Count Rate CPS	Value	Phase	Gain Ratio	Value			
Master		18.75	Master		1.012			
	10.00 (Minimum)      142.5 (Nominal)      265.0 (Maximum)			0.9400 (Minimum)      1.000 (Nominal)      1.060 (Maximum)				

Master: 5-Sep-2009 7:01

Hostile Natural Gamma Ray Sonde Master Calibration								
Detector 2 Calibration								
Phase	Na 511 Peak Set Point	Value	Phase	Th Peak Loc	Value	Phase	Th Peak Res %	Value
Master		41.00	Master		209.5	Master		7.001
	38.00 (Minimum)      40.00 (Nominal)      43.00 (Maximum)			201.0 (Minimum)      209.6 (Nominal)      218.3 (Maximum)			5.000 (Minimum)      7.000 (Nominal)      9.000 (Maximum)	
Phase	Background Count Rate CPS	Value	Phase	Gain Ratio	Value			
Master		18.87	Master		1.006			
	10.00 (Minimum)      142.5 (Nominal)      265.0 (Maximum)			0.9400 (Minimum)      1.000 (Nominal)      1.060 (Maximum)				

Master: 5-Sep-2009 7:01

#### DTS Telemetry Tool / Equipment Identification

Primary Equipment:

DTC-H Auxiliary Cartridge	DTCH - A	8798
DTC-H Telemetry Cartridge	DTCH - A	8798

Auxiliary Equipment:

DTCH Telemetry Cartridge Housing	ECH - KC	1777
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Company: **Lamont Doherty**

**Schlumberger**

Well: **Expedition 324 Site U1348A**

Field: **Shatsky Rise**

Rig: **JOIDES Resolution**

Ocean: **Pacific**

Natural Gamma Ray  
Spectroscopy (HNGS)