

**Weatherford****MICRORESISTIVITY LOG**

COMPANY				SHAKESPEARE OIL COMPANY			
WELL				TEETER #1-11			
FIELD				WILDCAT			
PROVINCE/COUNTY				LOGAN			
COUNTRY/STATE				UNITED STATES / KANSAS			
LOCATION				2305' FSL & 630' FEL SE/4			
SEC	TWP	RGE	Other Services				
11	13S	32W	MPD/MDN				
API Number		15-109-21168		MAI/MFE			
Permit Number				MSS			
Permanent Datum G.L., Elevation 3130 feet							
Log Measured From KB							
Drilling Measured From K.B. @ 10 FEET							
Date	26-JUN-2013						
Run Number	ONE						
Service Order	3537768						
Depth Driller	4700.00			feet			
Depth Logger	4700.00			feet			
First Reading	4653.00			feet			
Last Reading	3700.00			feet			
Casing Driller	222.00			feet			
Casing Logger	223.00			feet			
Bit Size	7.880			inches			
Hole Fluid Type	CHEMICAL						
Density / Viscosity	9.30 lb/USg		54.00 CP				
PH / Fluid Loss	10.00		9.60 ml/30Min				
Sample Source	MUDPIT						
Rm @ Measured Temp	1.17 @ 85.0		ohm-m				
Rmf @ Measured Temp	0.94 @ 85.0		ohm-m				
Rmc @ Measured Temp	1.40 @ 85.0		ohm-m				
Source Rmf / Rmc	CALC	CALC					
Rm @ BHT	0.84 @118.0		ohm-m				
Time Since Circulation	4 HOURS						
Max Recorded Temp	118.00		deg F				
Equipment / Base	13096	LIB					
Recorded By	W. STAMBAUGH						
Witnessed By	TIM PRIEST						
IOB#	LB13-185						

BOREHOLE RECORD

Last Edited: 26-JUN-2013 04:45

Bit Size inches	Depth From feet	Depth To feet
7.875	223.00	4700.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	223.00	24.00

REMARKS

- SOFTWARE ISSUE: WLS 13.05.9583.
- MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION.
 - HARDWARE: DUAL BOWSPRING USED ON MDN.
 - 0.5 INCH STANDOFF USED ON MFE.
 - TWO 0.5 INCH STANDOFFS USED ON MSS.
 - 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 1900 CU. FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH CASING FROM TD TO SURFACE CASING: 1170 CU. FT.

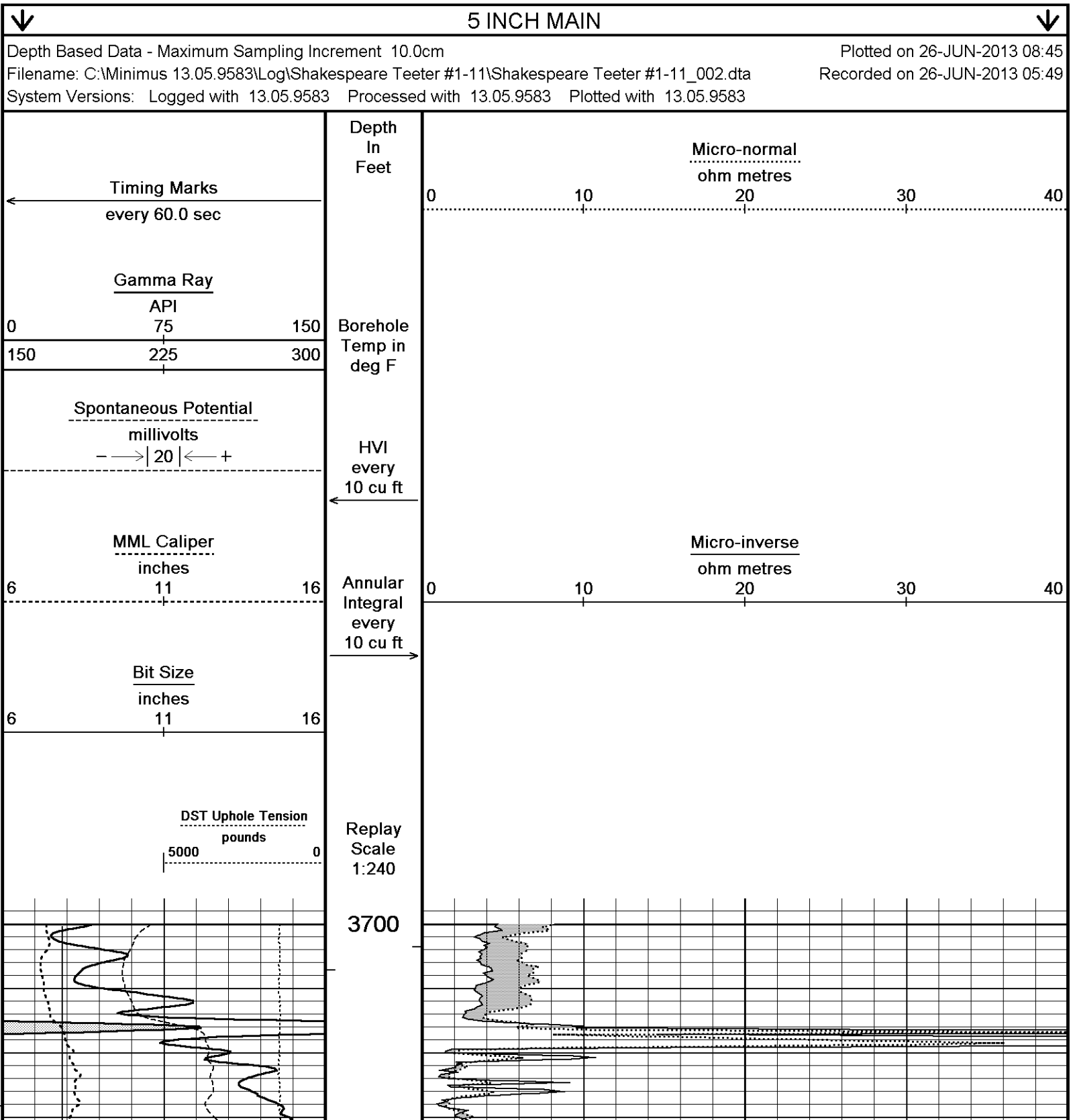
- SERVICE ORDER # 3537768.

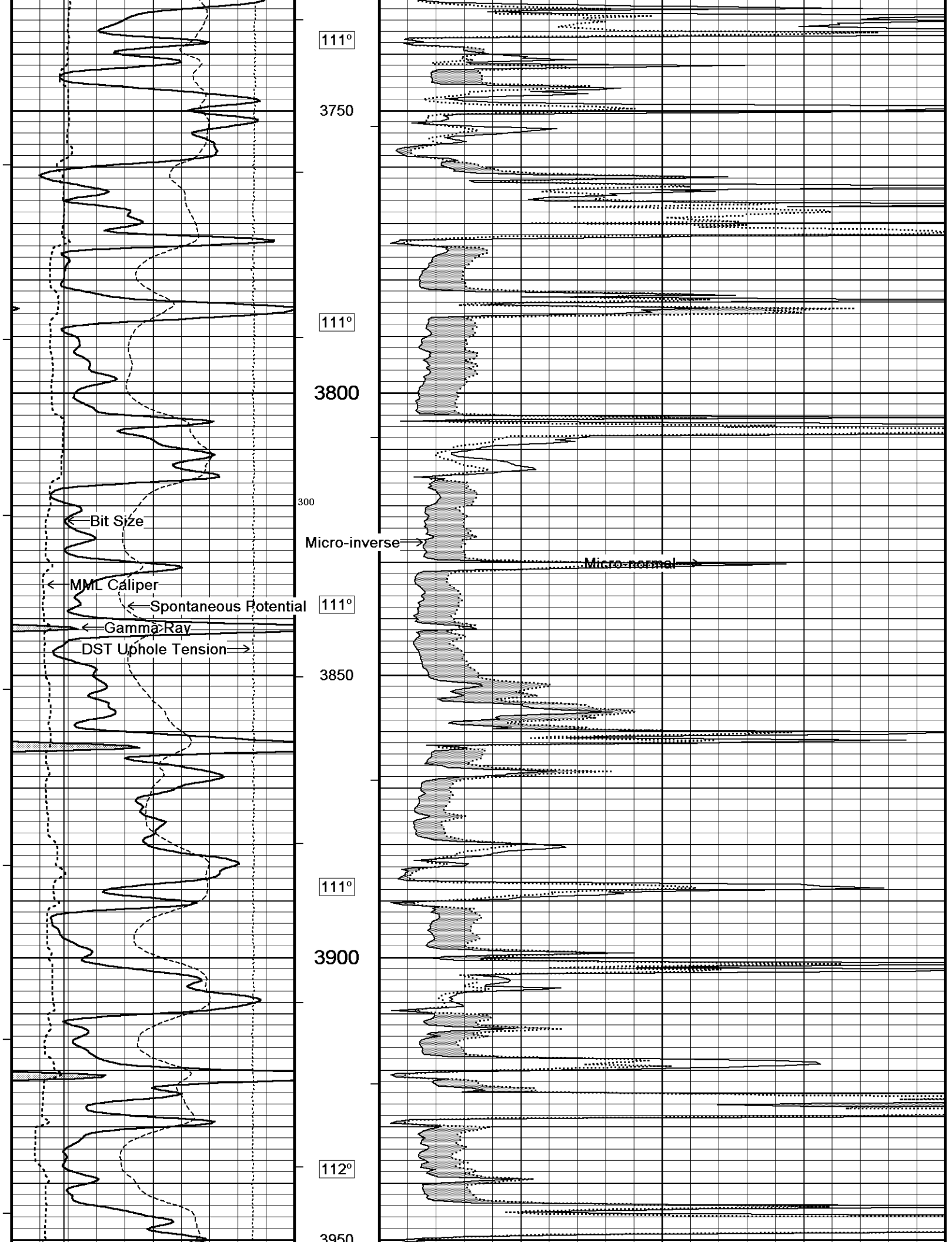
- RIG: HD DRILLING #2.

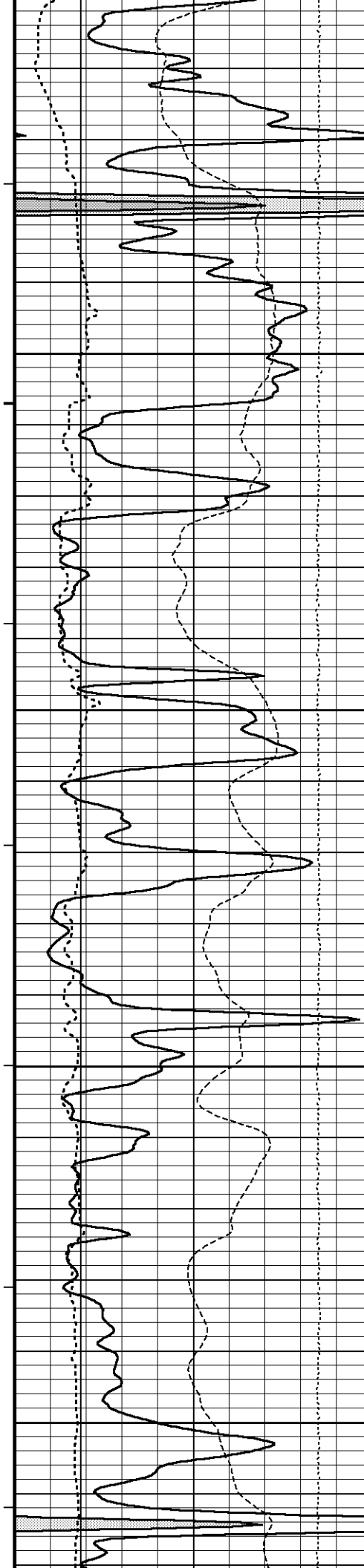
- ENGINEER: WILLIAM STAMBAUGH

- OPERATOR(S): K. RINEHART, D. CANADAY

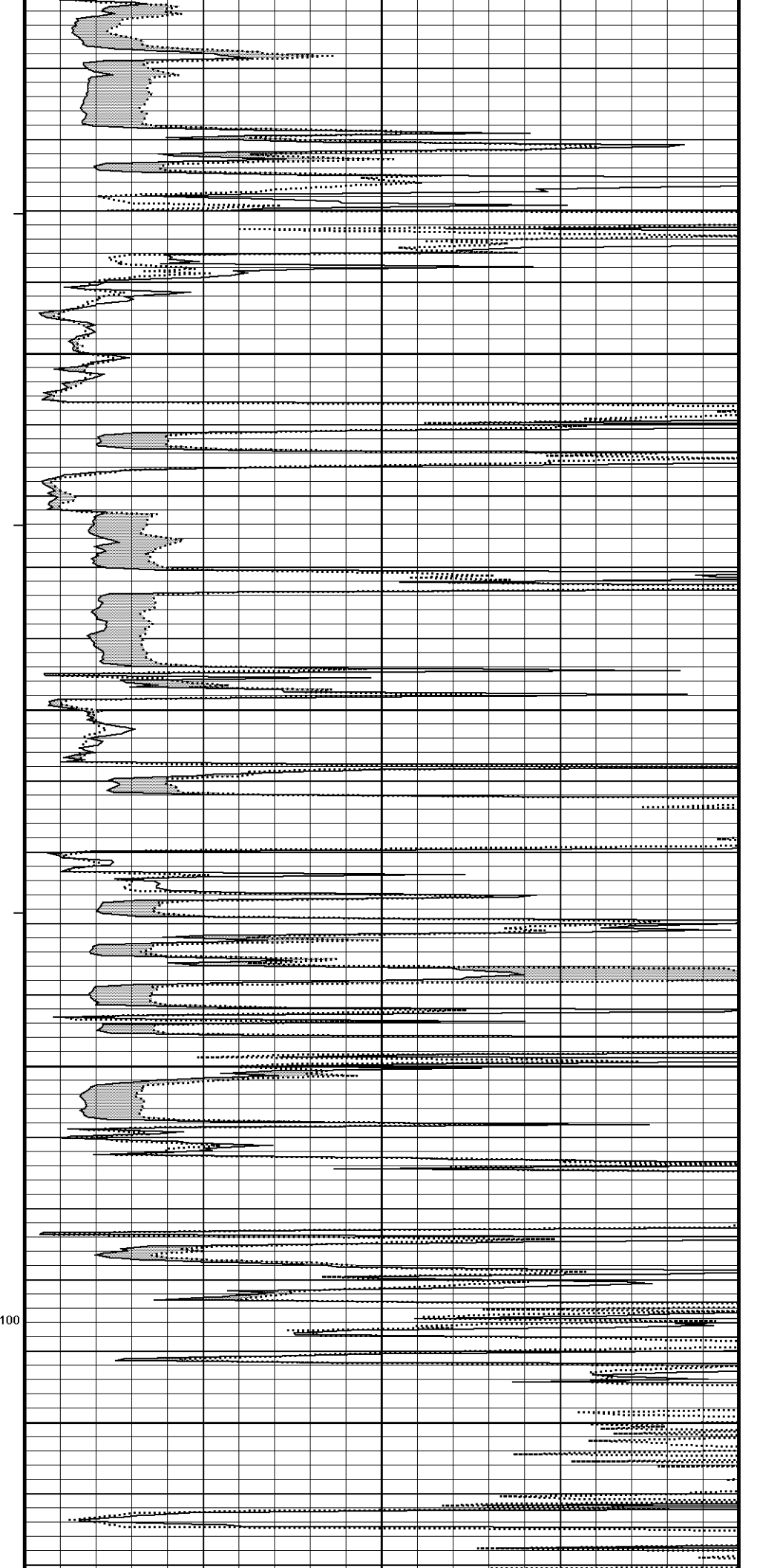
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.

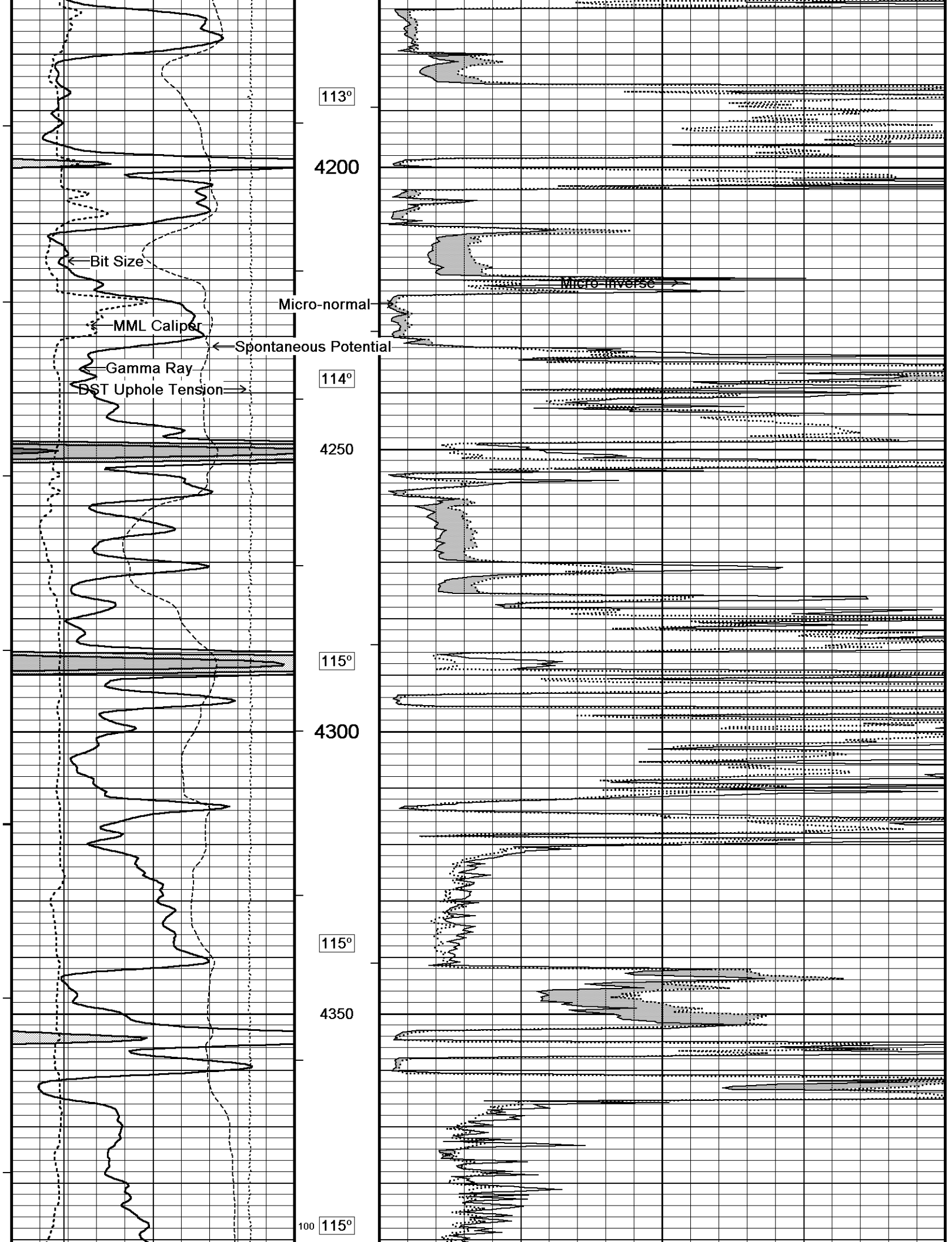


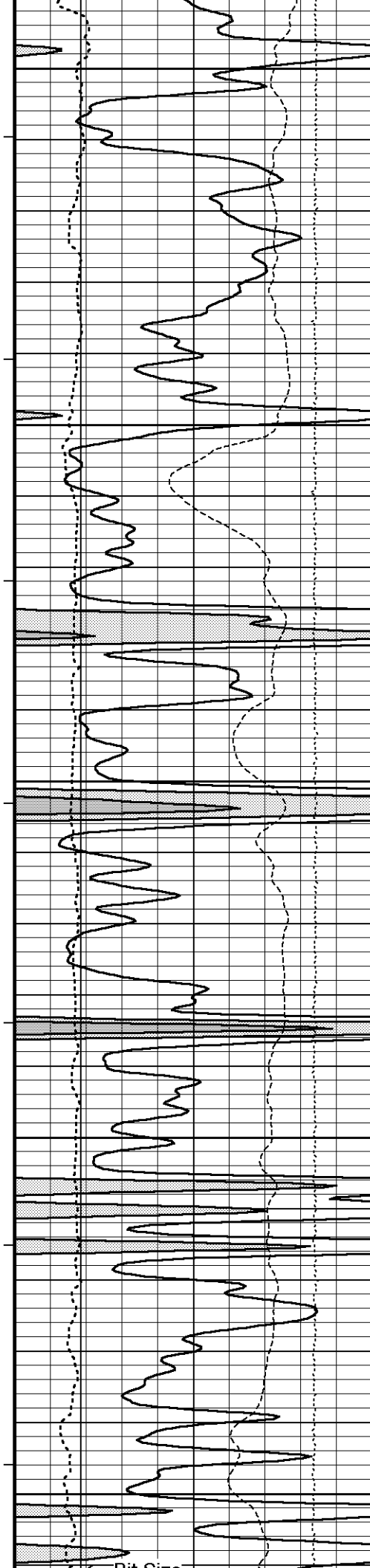




4000
4050
4100
4150







4400

116°

4450

116°

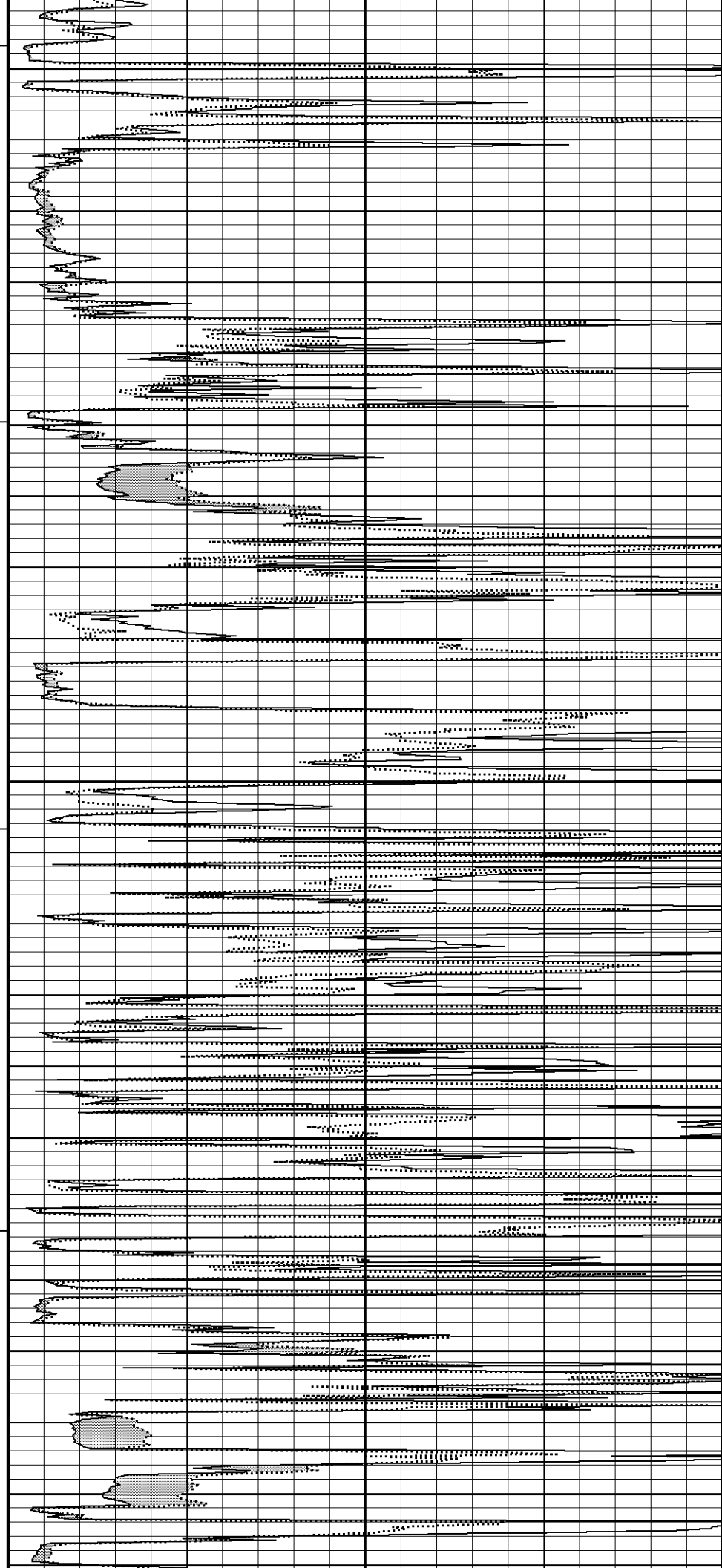
4500

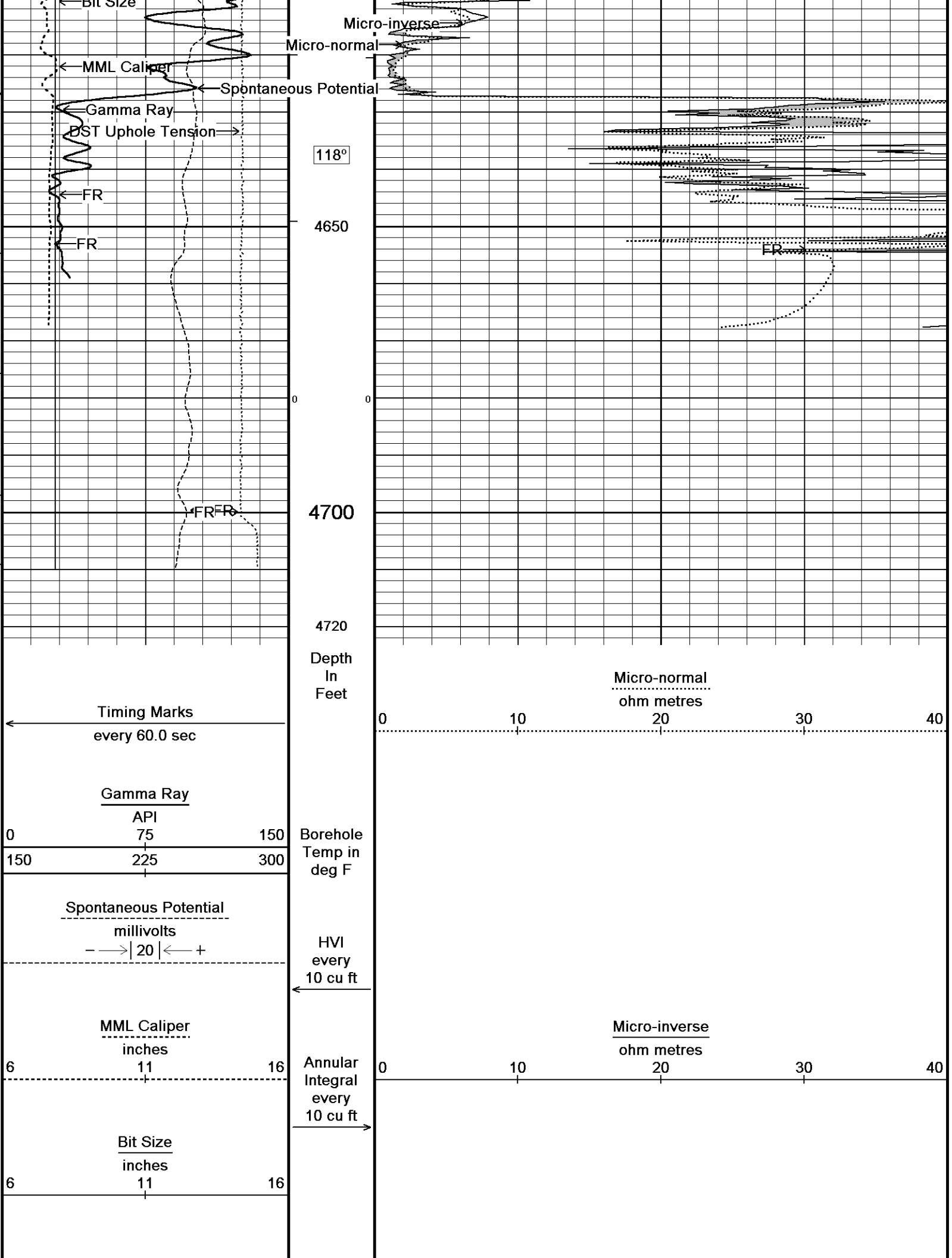
117°

4550

118°

4600





DST Uphole Tension
pounds

50000

Replay
Scale
1:240

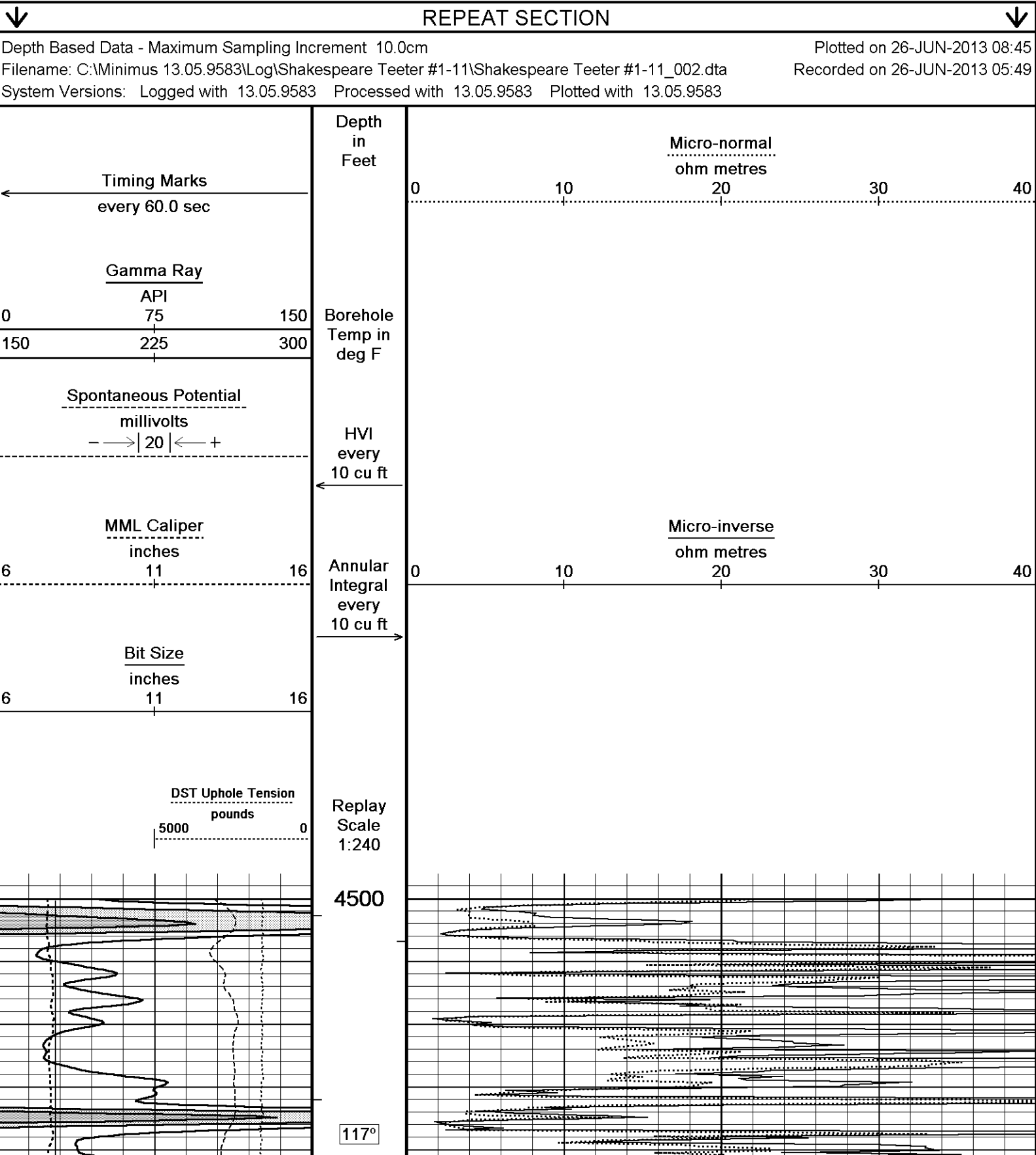
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.05.9583\Log\Shakespeare Teeter #1-11\Shakespeare Teeter #1-11_002.dta
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

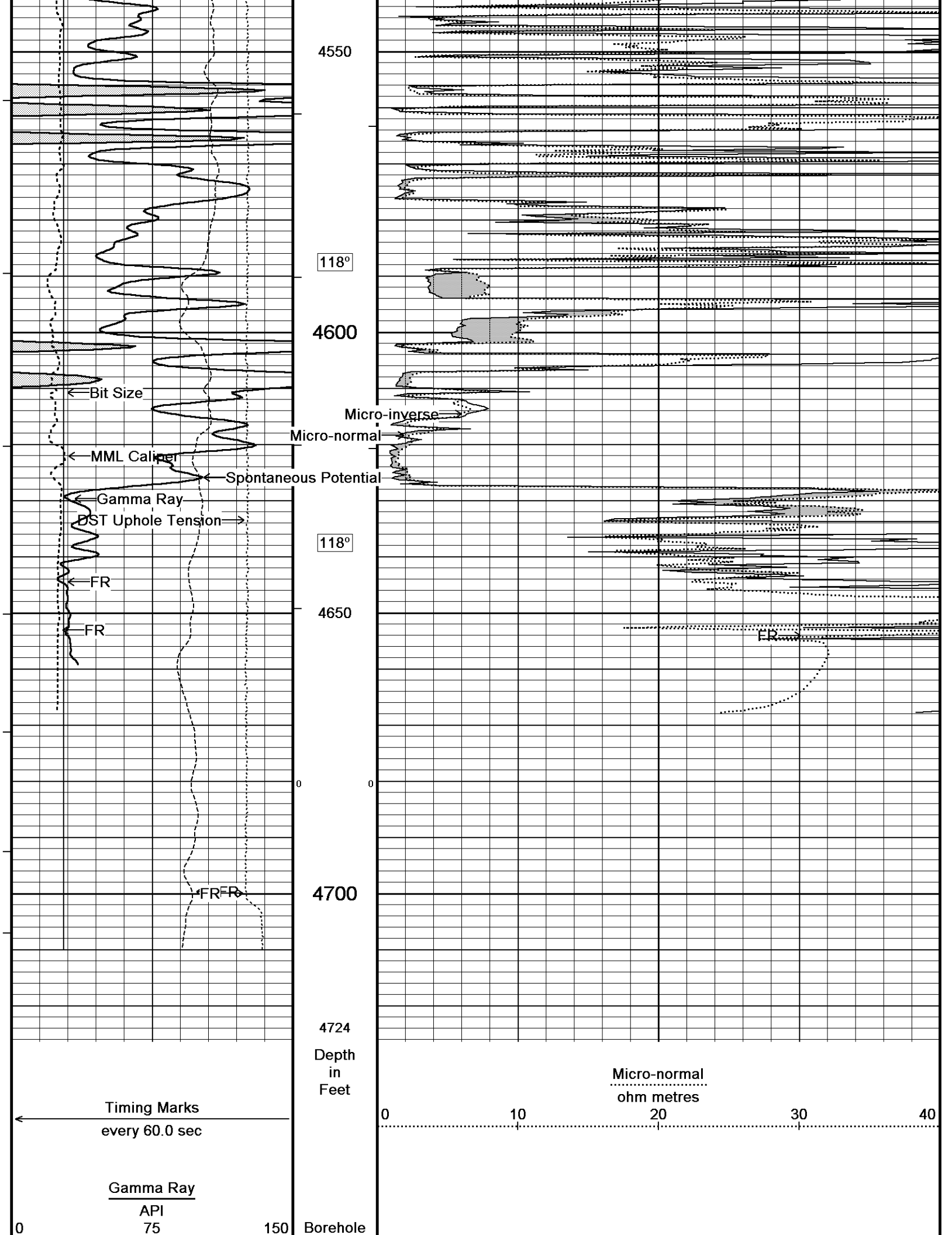
Plotted on 26-JUN-2013 08:45
Recorded on 26-JUN-2013 05:49

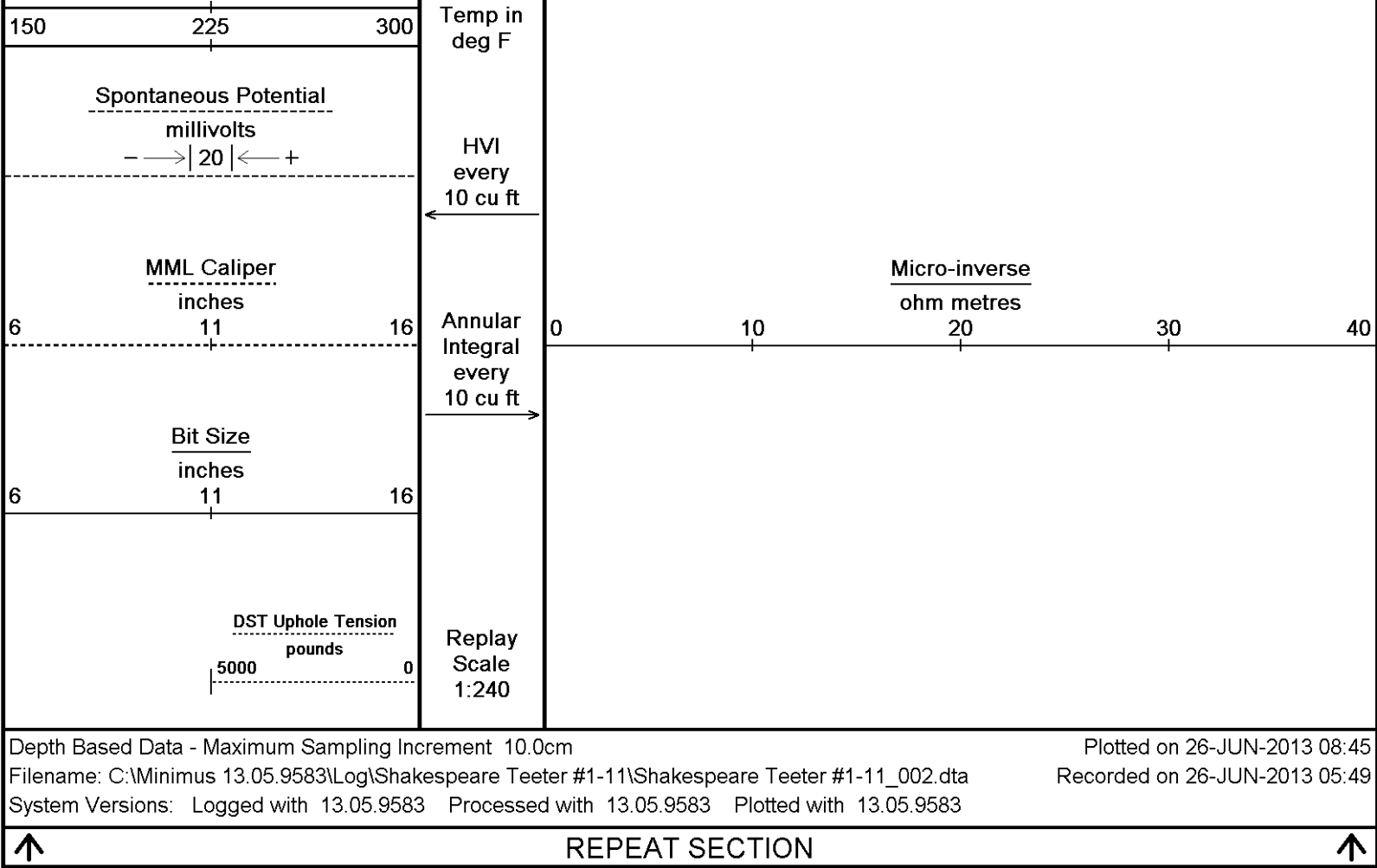
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5 INCH MAIN

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BEFORE SURVEY CALIBRATION			
C:\Minimus 13.05.9583\Log\Shakespeare Teeter #1-11\Shakespeare Teeter #1-11_002.dta			
General Constants All 000		Last Edited on 26-JUN-2013,04:46	
General Parameters			
Mud Resistivity	1.120	ohm-metres	
Mud Resistivity Temperature	89.000	degrees F	
Water Level	0.000	feet	
Borehole Fluid Processing	Wet Hole		
Hole/Annular Volume and Differential Caliper Parameters			
HVOL Method	Single Caliper		
HVOL Caliper 1	Density Caliper		
HVOL Caliper 2	N/A		
Annular Volume Diameter	5.500	inches	
Caliper for Differential Caliper	Density Caliper		
Rwa Parameters			
Porosity used	Base Density Porosity		
Resistivity used	Array Ind. Four Res Rt		
RWA Constant A	0.610		
RWA Constant M	2.150		
SW/APOR Tool Source	0.000		
Down-hole Tension Calibration SMS 0		Field Calibration on 26-JUN-2013 04:24	
Reading No	Measured	Calibrated (lbs)	
1	13930.99	0.00	
2	15329.61	471.80	
Gamma Calibration MCG-D.K 469		Field Calibration on 21-JUN-2013 10:11	
	Measured	Calibrated (API)	
Background	66	44	
Calibrator (Gross)	1145	769	

Calibrator (Net)		1079	725	
Gamma Constants MCG-D.K 469			Last Edited on 26-JUN-2013,01:00	
Gamma Calibrator Number	GRC38			
Mud Density	1.11	gm/cc		
Caliper Source for Processing	Density Caliper			
Tool Position	Eccentred			
Concentration of KCl		kppm		
K Mud Type	Chloride			
K Mud Concentration	0.00	%		
High Resolution Temperature Calibration MCG-D.K 469			Field Calibration on 28-MAY-2013,04:01	
	Measured	Calibrated(Deg F)		
Lower	50.00	50.00		
Upper	100.00	100.00		
High Resolution Temperature Constants MCG-D.K 469			Last Edited on 28-MAY-2013,04:01	
Pre-filter Length	11			
SP Calibration MCG-D.K 469			Field Calibration on 28-MAY-2013,04:01	
	Measured	Calibrated (mV)		
Reference 1	105.8	100.0		
Reference 2	-94.3	-100.0		
Caliper Calibration MML-A 3			Base Calibration on 05-JUN-2013 15:43 Field Calibration on 21-JUN-2013 10:00	
Base Calibration				
Reading No	Measured	Calibrator Size (in)		
1	14624	5.98		
2	17958	7.97		
3	21263	9.86		
4	25213	11.92		
5	0	0.00		
6	N/A	N/A		
Field Calibration				
	Measured Caliper (in)	Actual Caliper (in)		
	6.12	5.98		
Micro Normal and Micro Inverse Calibration MML-A 3			Base Calibration on 05-JUN-2013 15:36 Field Check on 21-JUN-2013 09:57	
Base Calibration				
Channel	Resistor 1	Measured Resistor 2	Calibrated (ohm-m) Resistor 1	Resistor 2
Micro Normal	12.2	60.2	5.0	25.0
Micro Inverse	15.7	78.3	5.0	25.0
Channel	Base Check (ohm-m)		Field Check (ohm-m)	
Micro Normal	63.0		63.0	
Micro Inverse	48.2		48.2	
Micro Normal and Micro Inverse Constants MML-A 3			Last Edited on 21-JUN-2013,09:54	
Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159			
Micro Normal K Factor	1.0000			
Micro Inverse K Factor	1.0000			
Standoff Offset	N/A inches			
Neutron Calibration MDN-A.B 66			Base Calibration on 22-MAY-2013 15:00 Field Check on 21-JUN-2013 10:22	
Base Calibration				
	Measured	Calibrated (cps)		
	Near Far	Near Far		
	3145 98	3714 110		
Ratio	32.215	33.764		
Field Calibrator at Base		Calibrated (cps)		
		1654 2365		
Ratio		0.699		

Field Check	Calibrated (cps)		
Ratio	1643	2364	
		0.695	
Neutron Constants MDN-A.B 66			Last Edited on 21-JUN-2013,10:12
Neutron Source Id	P0204NN		
Neutron Jig Number	5824NE		
Epithermal Neutron	No		
Caliper Source for Processing	Density Caliper		
Stand-off	0.00	inches	
Mud Density	1.00	gm/cc	
Limestone Sigma	7.10	cu	
Sandstone Sigma	4.26	cu	
Dolomite Sigma	4.70	cu	
Formation Pressure Source	None		
Formation Pressure	N/A	kpsi	
Temperature Source	Constant Value		
Temperature	68.00	degrees F	
Mud Salinity	0.00	kppm	
Salinity Correction	Not Applied		
Formation Fluid Salinity Source	None		
Formation Fluid Salinity	N/A	kppm	
Barite Mud Correction	Not Applied		
FE Calibration MFE-B.J 353			Base Calibration on 22-MAY-2013 08:22 Field Check on 21-JUN-2013 10:30
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	964.9	126.8	
Base Check		280.9	
Field Check		280.8	
FE Constants MFE-B.J 353			Last Edited on 21-JUN-2013,10:29
Running Mode	No Sleeve		
MFE K Factor	0.1268		
Caliper Source for FE correction	Bit Size		
Caliper Value for FE correction	N/A	inches	
Rm Source for FE correction	Temperature Corr		
Temp. for Rm Corr.	MCG External Temperature		
Stand-off	0.5	inches	
Sonic Constants MSS-C.K 368			Last Edited on 19-JUN-2013,16:37
Maximum Boundary Contrast	100.00	micro-sec/ft	
Fluid Transit Time	189.00	micro-sec/ft	
Limestone Transit Time	47.50	micro-sec/ft	
Sandstone Transit Time	55.50	micro-sec/ft	
Dolomite Transit Time	43.50	micro-sec/ft	
Sonic used for Porosities	3-5' Compensated		
Correction for Sonde Skew	Applied		
Cycle Stretch Algorithm	Applied		
MN3FT	0.00	micro-sec	
MX3FT	1500.00	micro-sec	
Hunt-Raymer Constant	83.13	micro-sec/ft	
Sonde Mode	Compensated		
Hole Type	Open Hole		
Sonde Parameters			
	Measured	Calibrated	
Offset	0.0000	0.0000	
Free Pipe	0.0000		
Peak Amplitude Source			
Waveform	Start Time (micro-sec)	Width (micro-sec)	Pre Gain
3'	N/A	N/A	N/A
			Start Gain
			Discriminator (mV)
			N/A

4'	N/A	N/A	N/A	N/A	N/A
5'	N/A	N/A	N/A	N/A	N/A
6'	N/A	N/A	N/A	N/A	N/A

Processed Fixed Gate Parameters

Waveform Used For Processing		N/A		
Start Time (micro-sec)	End Time (micro-sec)	Discriminator (mV)	Depth (ft)	
0.00	0.00	0.00	0.00	
0.00	0.00	0.00	0.00	
0.00	0.00	0.00	0.00	
0.00	0.00	0.00	0.00	
0.00	0.00	0.00	0.00	

Full Waveform Parameters

Use 3' Waveform to derive TR	No	
Use 4' Waveform to derive TR	No	
Use 5' Waveform to derive TR	No	
Use 6' Waveform to derive TR	No	
3' Waveform Discriminator Level	0.30	mV
4' Waveform Discriminator Level	0.30	mV
5' Waveform Discriminator Level	0.15	mV
6' Waveform Discriminator Level	0.15	mV
3' Waveform Filter		
4' Waveform Filter		
5' Waveform Filter		
6' Waveform Filter		
Semblance Level	0.50	
Semblance Window Width	120.00	micro-sec
Sonic 1 Despiker	100.00	micro-sec/ft
Sonic 2 Despiker	100.00	micro-sec/ft

Induction Calibration MAI-A.A 167

Base Calibration on 19-APR-2013,13:41
Field Check on 21-JUN-2013 10:32

Base Calibration

Test Loop Calibration	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	17.3	474.2	9.3	966.2
2	6.3	388.4	7.6	821.4
3	3.3	259.4	5.2	566.0
4	1.9	133.0	2.6	279.2

Array Temperature 76.8 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			13.4	3837.9
2			29.7	3475.3
3			29.2	3051.8
4			19.8	2081.1
Deep			18.7	2048.7
Medium			42.3	3989.2
Shallow			43.1	5051.0

Array Temperature 79.1 Deg F

Induction Constants MAI-A.A 167

Last Edited on 21-JUN-2013,10:30

Induction Model	RtAP-WBM	
Caliper for Borehole Corr.	Bit Size	
Hole Size for Borehole Correction	N/A	inches
Tool Centred	No	
Stand-off Type	Fins	
Stand-off	0.50	inches
Number of Fins on Stand-off	8.0000	
Stand-off Fin Angle	60.00	degrees
Stand-off Fin Width	0.5000	inches
Borehole Corr. Rm Source	Temperature Corr	
Temp. for Rm Corr.	MCG External Temperature	
Squasher Start	0.0020	mhos/metre

Squasher Offset		N/A		mhos/metre	
Borehole Normalisation					
DRM1	0.0000	DRC1		0.0000	
DRM2	0.0000	DRC2		0.0000	
MRM1	0.0000	MRC1		0.0000	
MRM2	0.0000	MRC2		0.0000	
SRM1	0.0000	SRC1		0.0000	
SRM2	0.0000	SRC2		0.0000	
Calibration Site Corrections					
Channel 1		0.00	mmhos/metre		
Channel 2		0.00	mmhos/metre		
Channel 3		0.00	mmhos/metre		
Channel 4		0.00	mmhos/metre		
Apparent Porosity and Water Saturation Constants					
Archie Constant (A)		1.00			
Cementation Exponent (M)		2.00			
Saturation Exponent (N)		2.00			
Saturation of Water for Apor		100.00	percent		
Resistivity of Water for Apor and Sw		0.05	ohm-m		
Resistivity of Mud Filtrate for Sw		0.00	ohm-m		
Source for Rt		0.00			
Source for Rxo		0.00			
High Resolution Temperature Calibration MAI-A.A 167				Field Calibration on 28-MAY-2013,04:23	
	Measured	Calibrated(Deg F)			
Lower	50.00	50.00			
Upper	75.00	75.00			
High Resolution Temperature Constants MAI-A.A 167				Last Edited on 28-MAY-2013,04:23	
Pre-filter Length	11				
Caliper Calibration MPD-B 64				Base Calibration on 21-MAY-2013 17:34 Field Calibration on 21-JUN-2013 09:49	
Base Calibration					
Reading No	Measured	Calibrator Size (in)			
1	14464	3.99			
2	23406	5.98			
3	32206	7.97			
4	40368	9.86			
5	50018	11.92			
6	N/A	N/A			
Field Calibration					
	Measured Caliper (in)	Actual Caliper (in)			
	6.00	5.98			
Photo Density Calibration MPD-B 64				Base Calibration on 21-MAY-2013 17:55 Field Check on 21-JUN-2013 09:53	
Density Calibration					
Base Calibration					
	Measured	Calibrated (sdu)			
	Near	Far	Near	Far	
Reference 1	60105	33685	59556	30836	
Reference 2	25286	2917	24941	2541	
Field Check at Base					
	1165.8	1353.6			
Field Check					
	1166.1	1344.8			
PE Calibration					
Base Calibration					
	WS	Measured	Calibrated		
		WH	Ratio		Ratio
Background	210	1037			
Reference 1	22619	59903	0.381		0.371
Reference 2	6846	25146	0.275		0.272

Field Check at Base
210.2 1037.2

Field Check
212.0 1039.0

Density Constants MPD-B 64

Last Edited on 26-JUN-2013,01:00

Density Source Id	18235B
Nylon Calibrator Number	DNCE695
Aluminium Calibrator Number	DACD698
Density Shoe Profile	8 inch
Caliper Source for Processing	Density Caliper
PE Correction to Density	Not Applied
Mud Density	1.11 gm/cc
Mud Density Z/A Multiplier	1.11
Mud Filtrate Density	1.00 gm/cc
Dry Hole Mud Filtrate Density	1.00 gm/cc
DNCT	0.00 gm/cc
CRCT	0.00 gm/cc
Density Z/A Correction	Hybrid

Matrix density (gm/cc)	Depth (m)
2.71	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Log\Shakespeare Teeter #1-11\Shakespeare Teeter #1-11_002.dta

3/8" Triple Cone Cable Head (MCB C A)
MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

Compact Comms Gamma
MCG-D.K 469 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

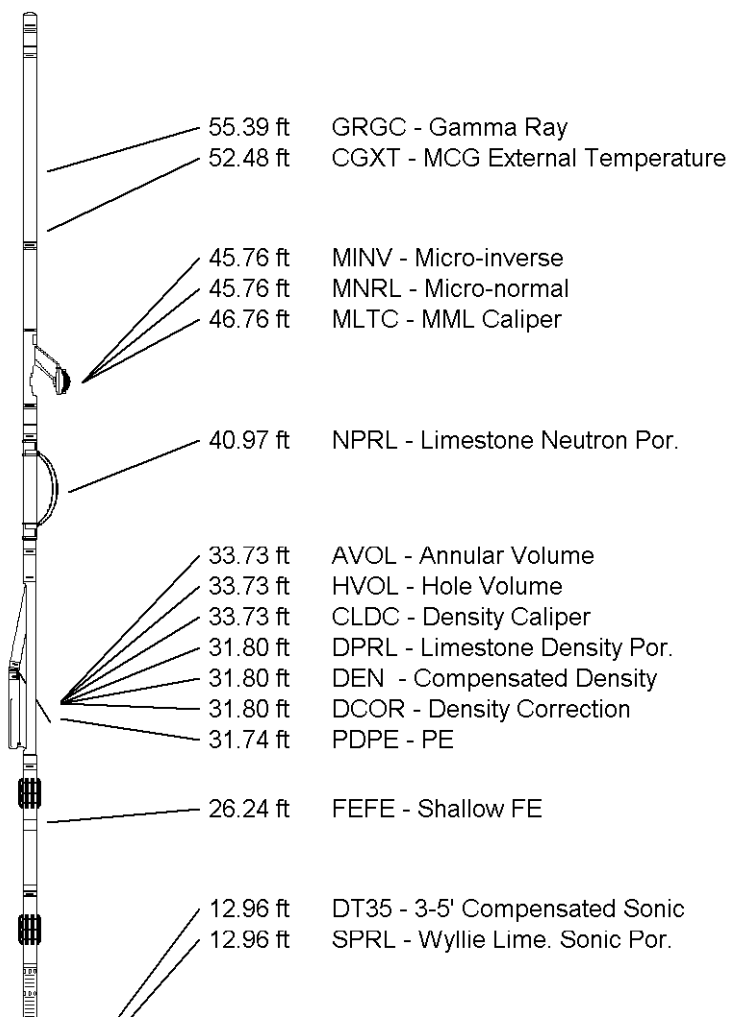
Compact Micro-log
MML-A 3 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

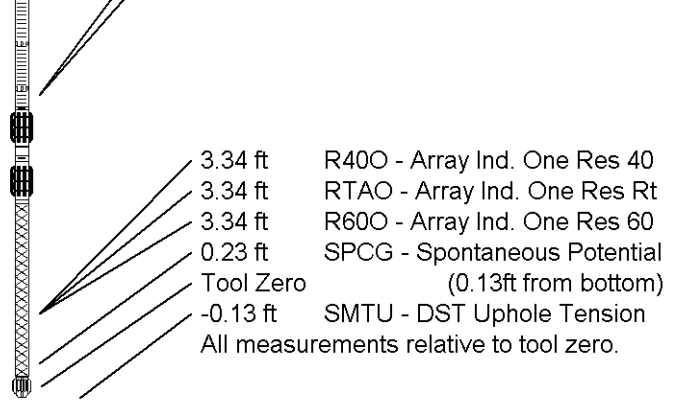
Compact Focussed Electric
MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Sonic
MSS-C.K 368 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in



Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 62.25 ft Weight: 471.8 lb



COMPANY	SHAKESPEARE OIL COMPANY
WELL	TEETER #1-11
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	UNITED STATES / KANSAS

Elevation Kelly Bushing	3004.00	feet	First Reading	4653.00	feet
Elevation Drill Floor	3003.00	feet	Depth Driller	4700.00	feet
Elevation Ground Level	2994.00	feet	Depth Logger	4700.00	feet



Weatherford®

MICRORESISTIVITY LOG