



Weatherford

MICRORESISTIVITY LOG

COMPANY				SHAKESPEARE OIL CO., INC.			
WELL				JANZEN #5-36			
FIELD				CAPSTONE EAST			
PROVINCE/COUNTY				SCOTT			
COUNTRY/STATE				U.S.A. / KANSAS			
LOCATION				400' FSL & 650' FWL			
SEC 36	TWP 16S	RGE 34W	Other Services		MAI/MFE		
Latitude		MPD/MDN					
Longitude		MSS					
API Number		15-171-21042					
Permanent Datum GL, Elevation 3104 feet							
Log Measured From KB							
Drilling Measured From KB				Elevations: KB 3114.00 DF 3112.00 GL 3104.00			
Date	05-APR-2014						
Run Number	ONE						
Service Order	3487-83878012						
Depth Driller	4866.00			feet			
Depth Logger	4865.00			feet			
First Reading	4819.00			feet			
Last Reading	3800.00			feet			
Casing Driller	268.00			feet			
Casing Logger	264.00			feet			
Bit Size	7.875			inches			
Hole Fluid Type	CHEMICAL						
Density / Viscosity	9.20 lb/USg		50.00 CP				
PH / Fluid Loss	10.00		8.80 ml/30Min				
Sample Source	FLOWLINE						
Rm @ Measured Temp	0.38 @ 81.0		ohm-m				
Rmf @ Measured Temp	0.30 @ 81.0		ohm-m				
Rmc @ Measured Temp	0.46 @ 81.0		ohm-m				
Source Rmf / Rmc	CALC	CALC					
Rm @ BHT	0.28 @ 110.0		ohm-m				
Time Since Circulation	5 HOURS						
Max Recorded Temp	110.00		deg F				
Equipment / Base	13244	LIB					
Recorded By	ADAM SILL						
Witnessed By	TIM PRIEST						
JOB #	LB14-101						

BOREHOLE RECORD				Last Edited: 05-APR-2014 03:46
Bit Size inches		Depth From feet		Depth To feet
7.875		268.00		4866.00
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	268.00	24.00

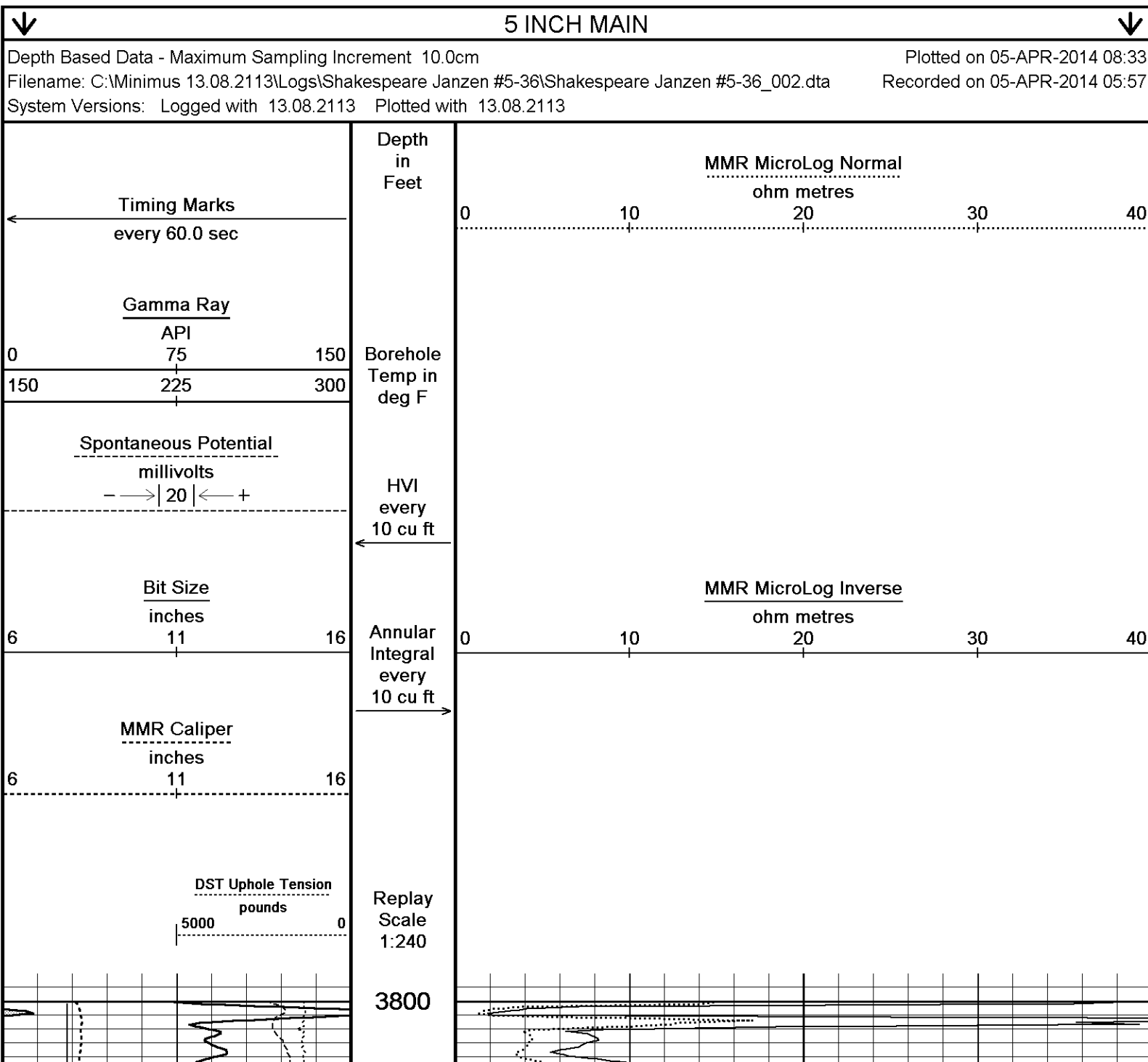
REMARKS
- SOFTWARE ISSUE: WLS 13.08.2113.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. TWO 0.5 INCH STANDOFFS USED ON MSS. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- 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: 2169 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO 3800 FEET: 193 CU.FT.

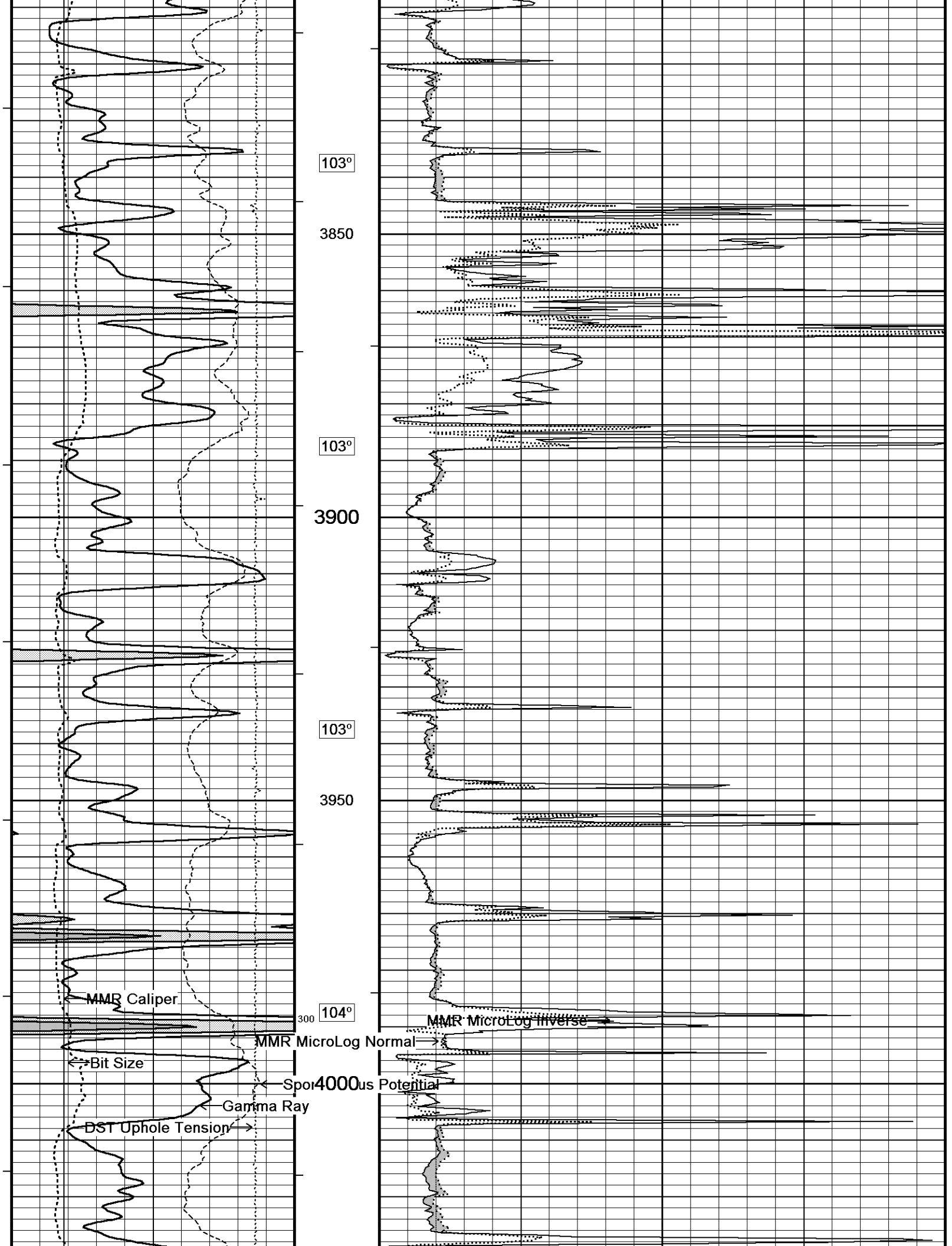
- RIG: H-D DRILLING #2.

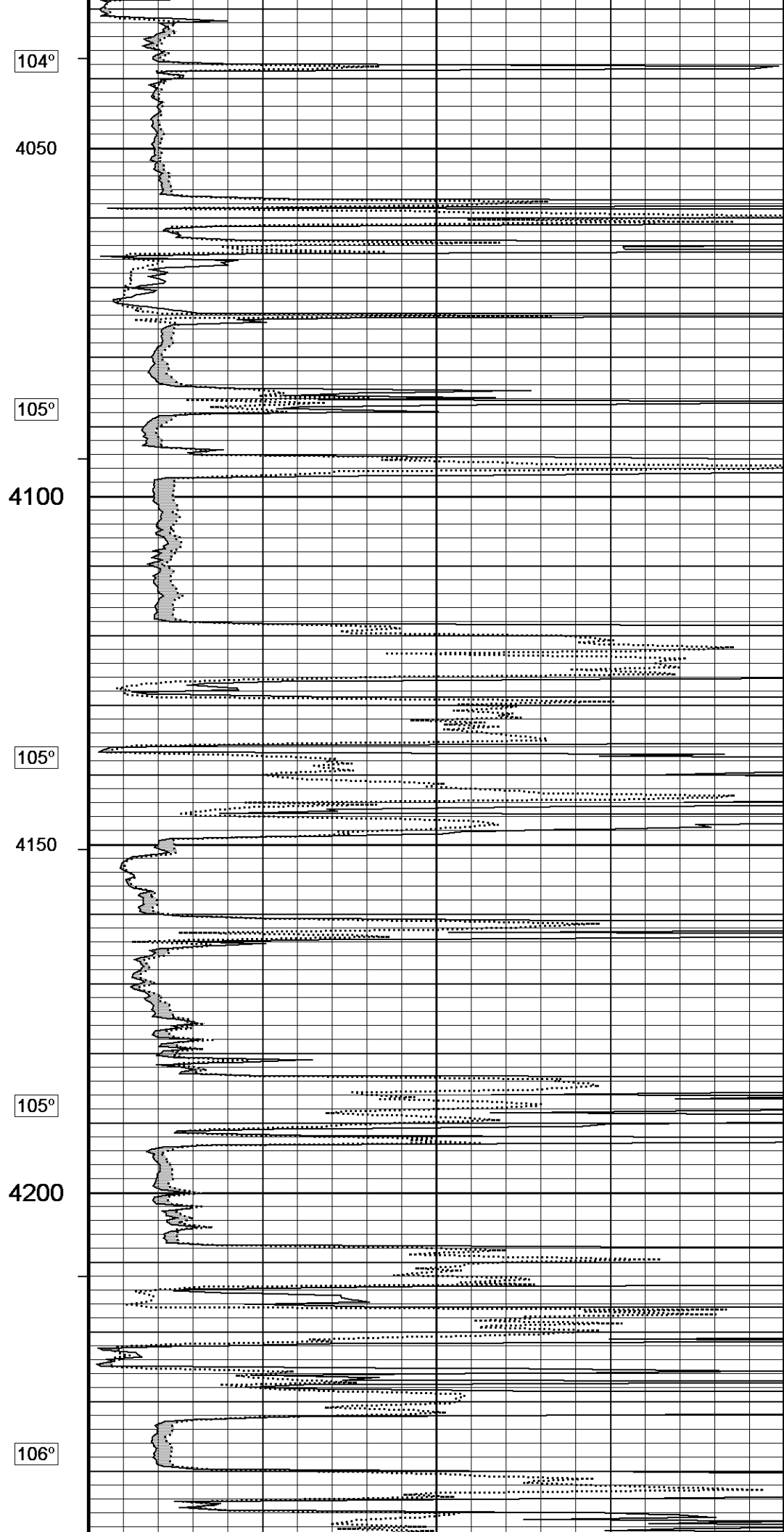
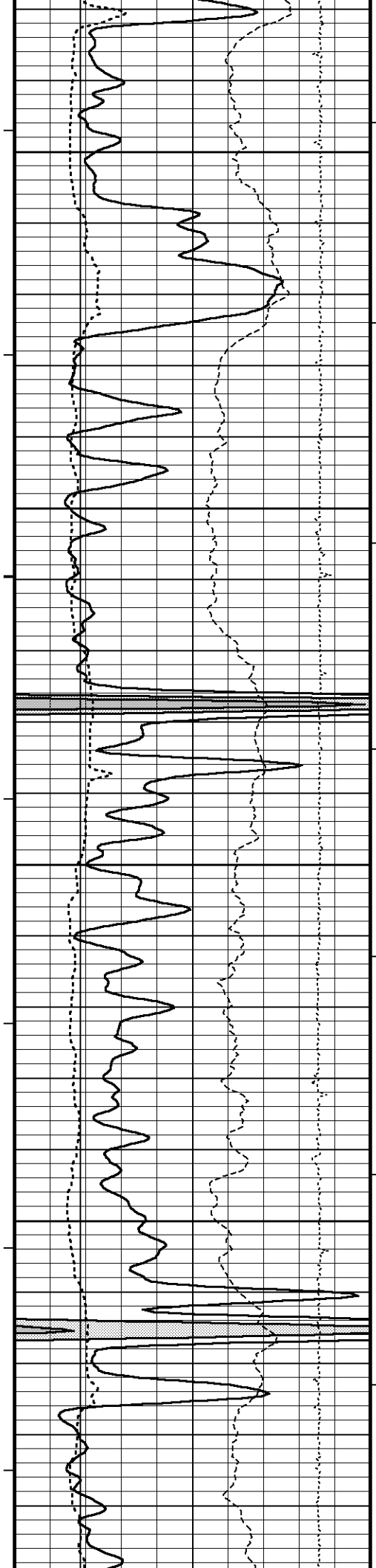
- ENGINEER: A. SILL.

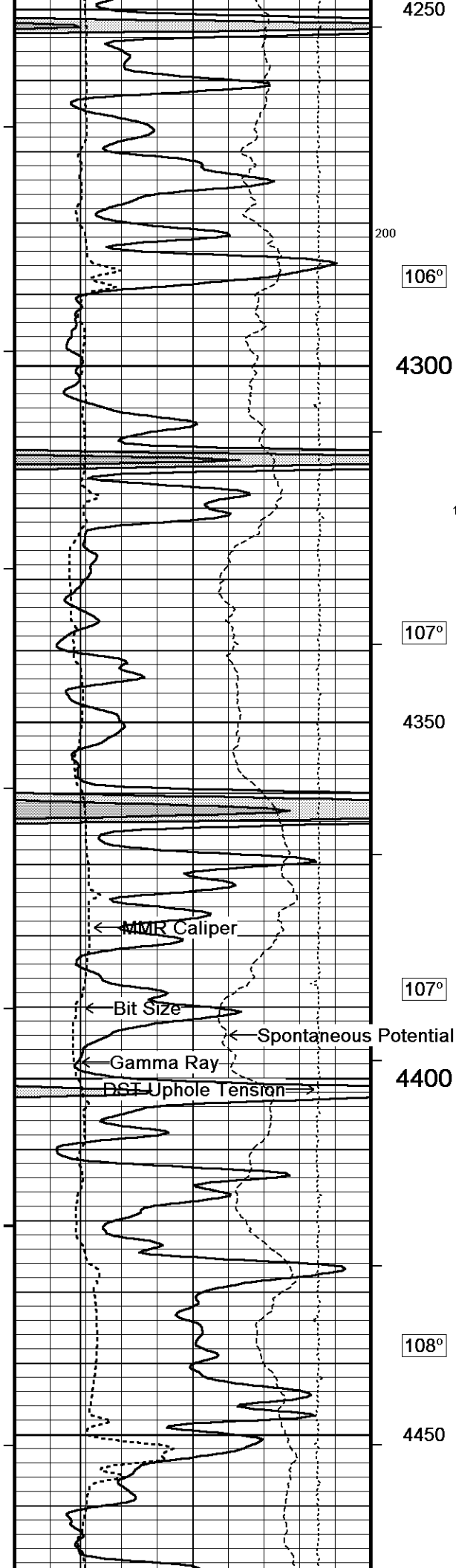
- OPERATOR: J. LaPOINT.

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.









4250

200

106°

4300

100

107°

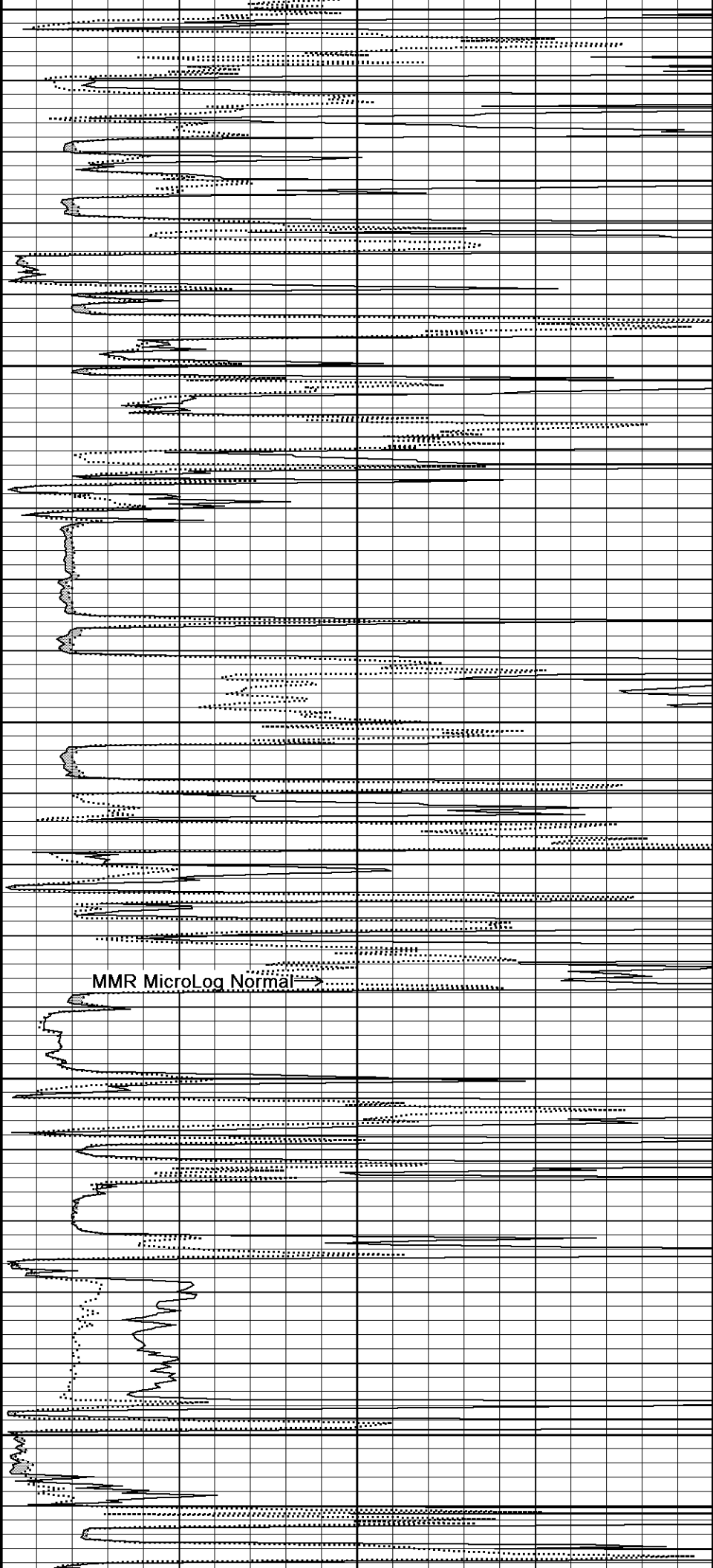
4350

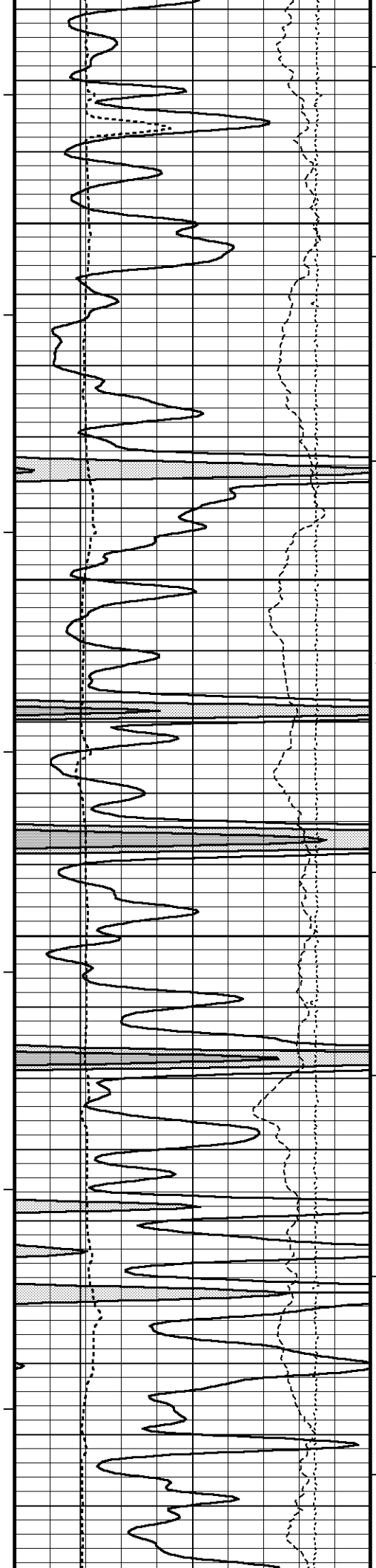
107°

4400

108°

4450





109°

4500

109°

4550

100

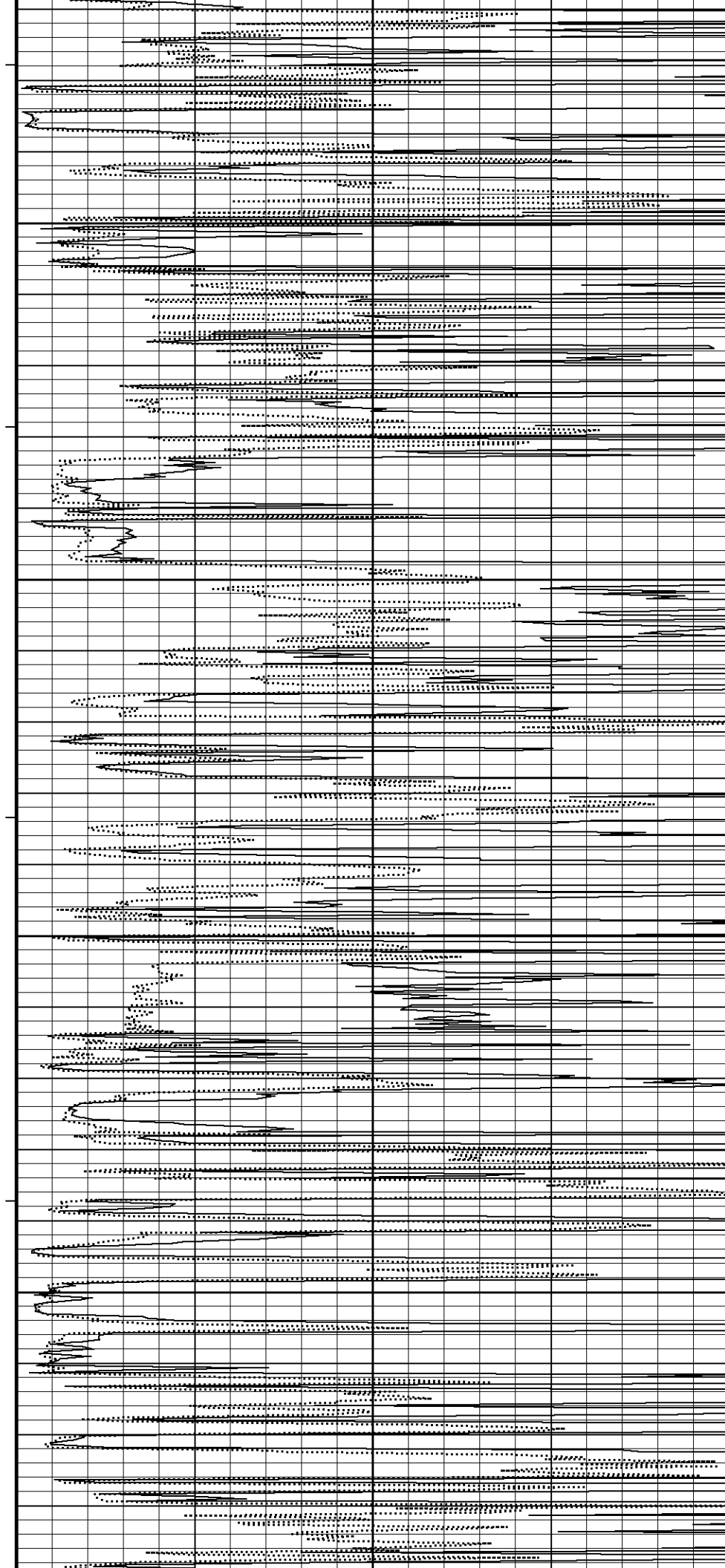
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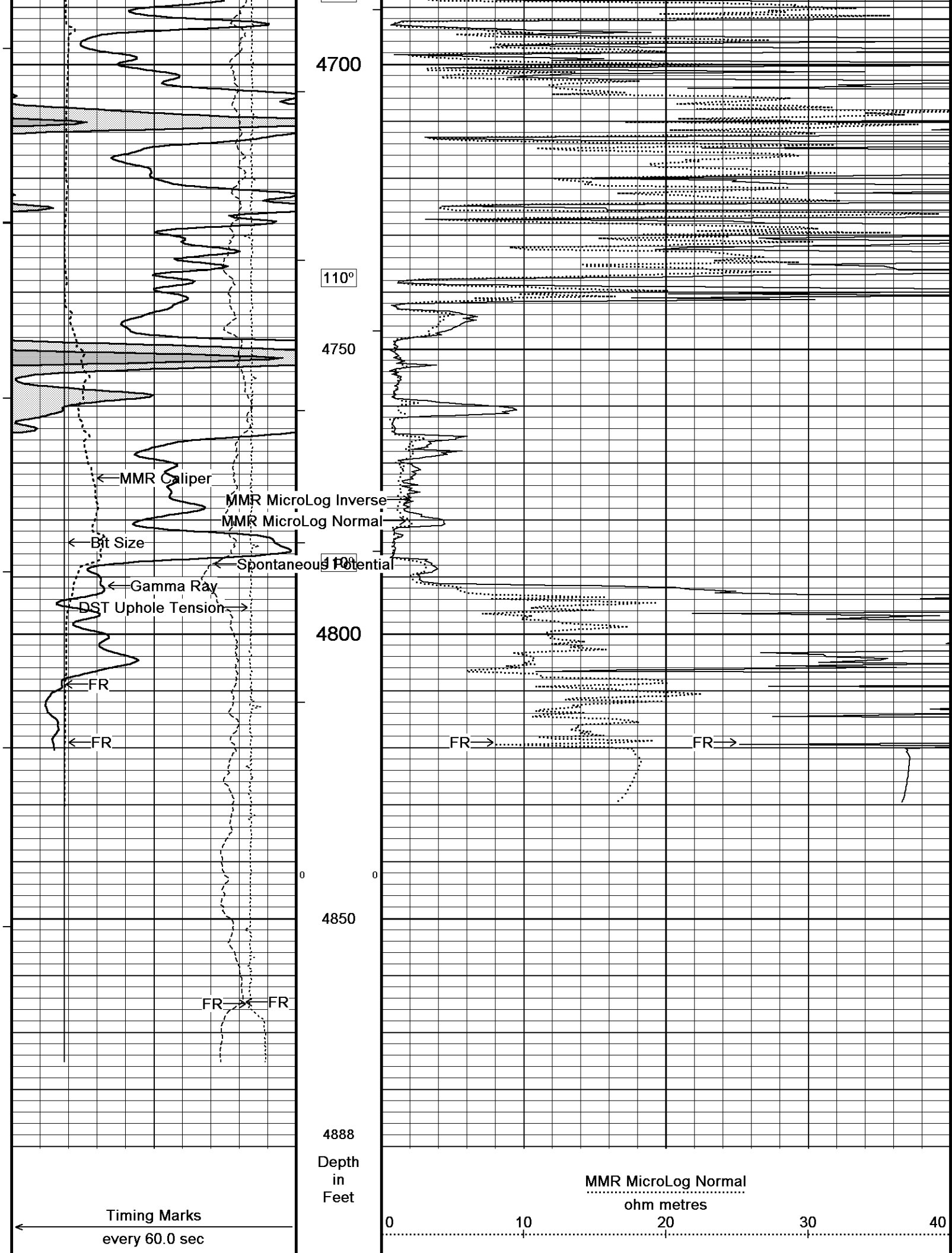
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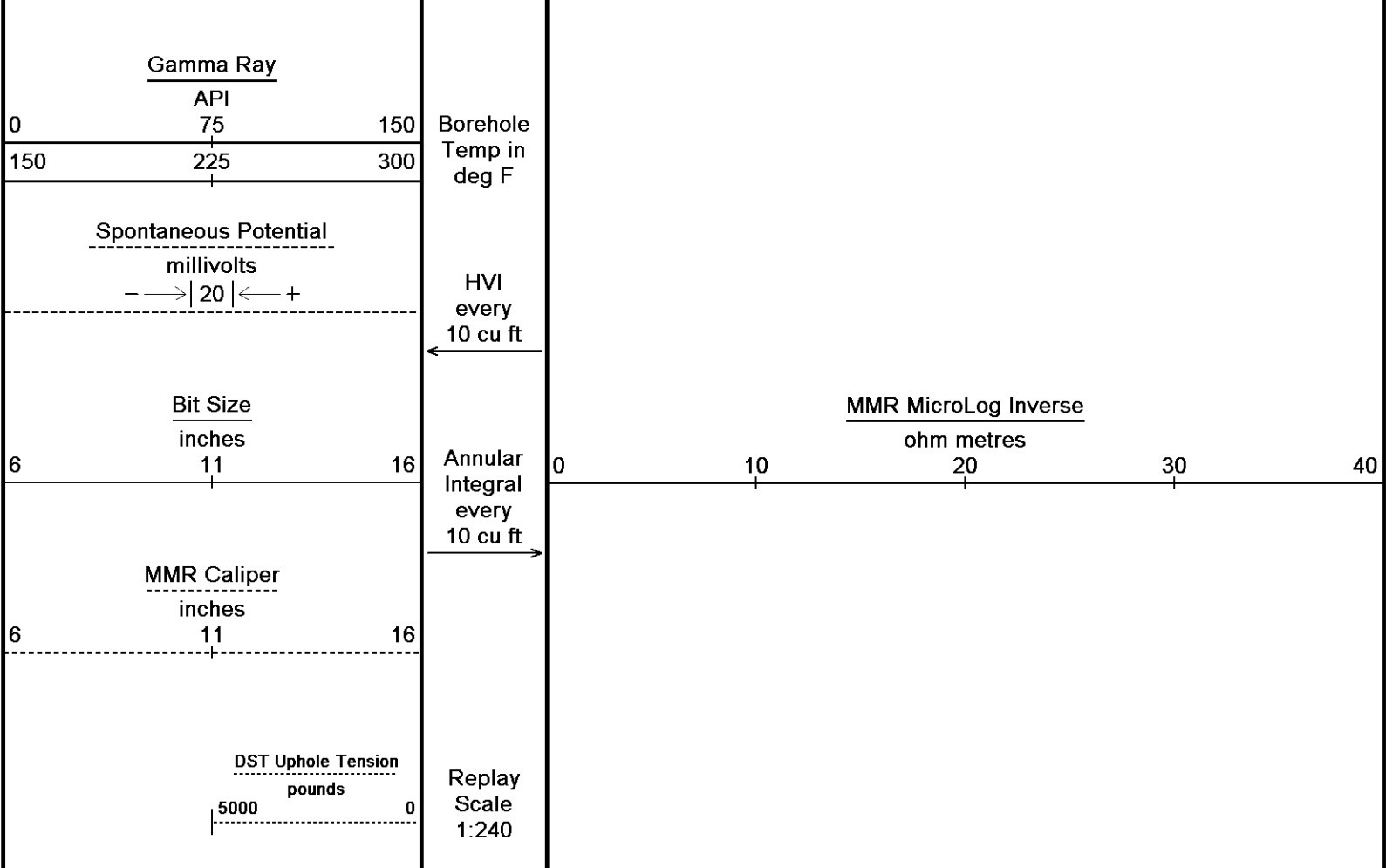
110°

4650

111°







Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 05-APR-2014 08:33

Filename: C:\Minimus 13.08.2113\Logs\Shakespeare Janzen #5-36\Shakespeare Janzen #5-36_002.dta

Recorded on 05-APR-2014 05:57

System Versions: Logged with 13.08.2113 Plotted with 13.08.2113

↑

5 INCH MAIN

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REPEAT SECTION

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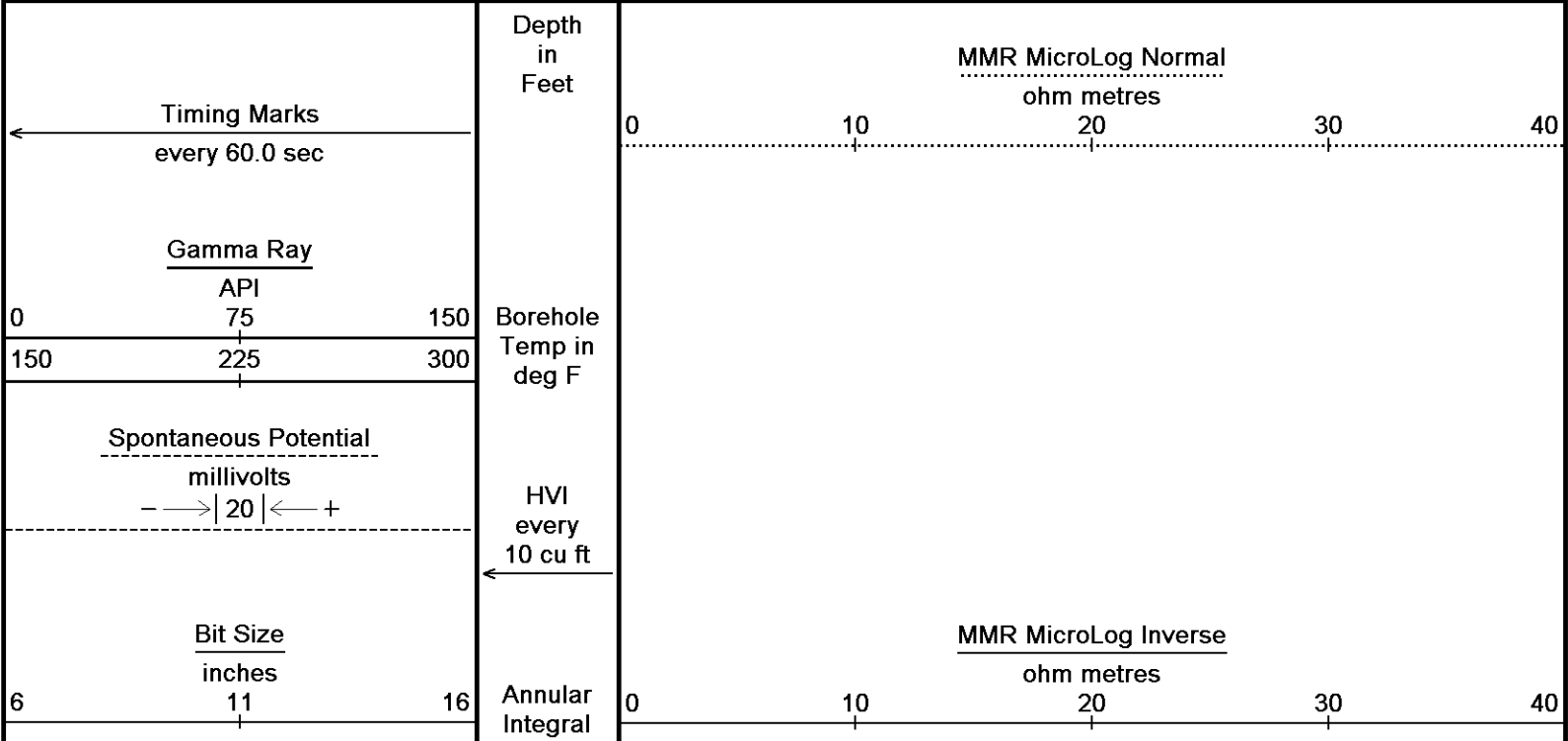
Depth Based Data - Maximum Sampling Increment 10.0cm

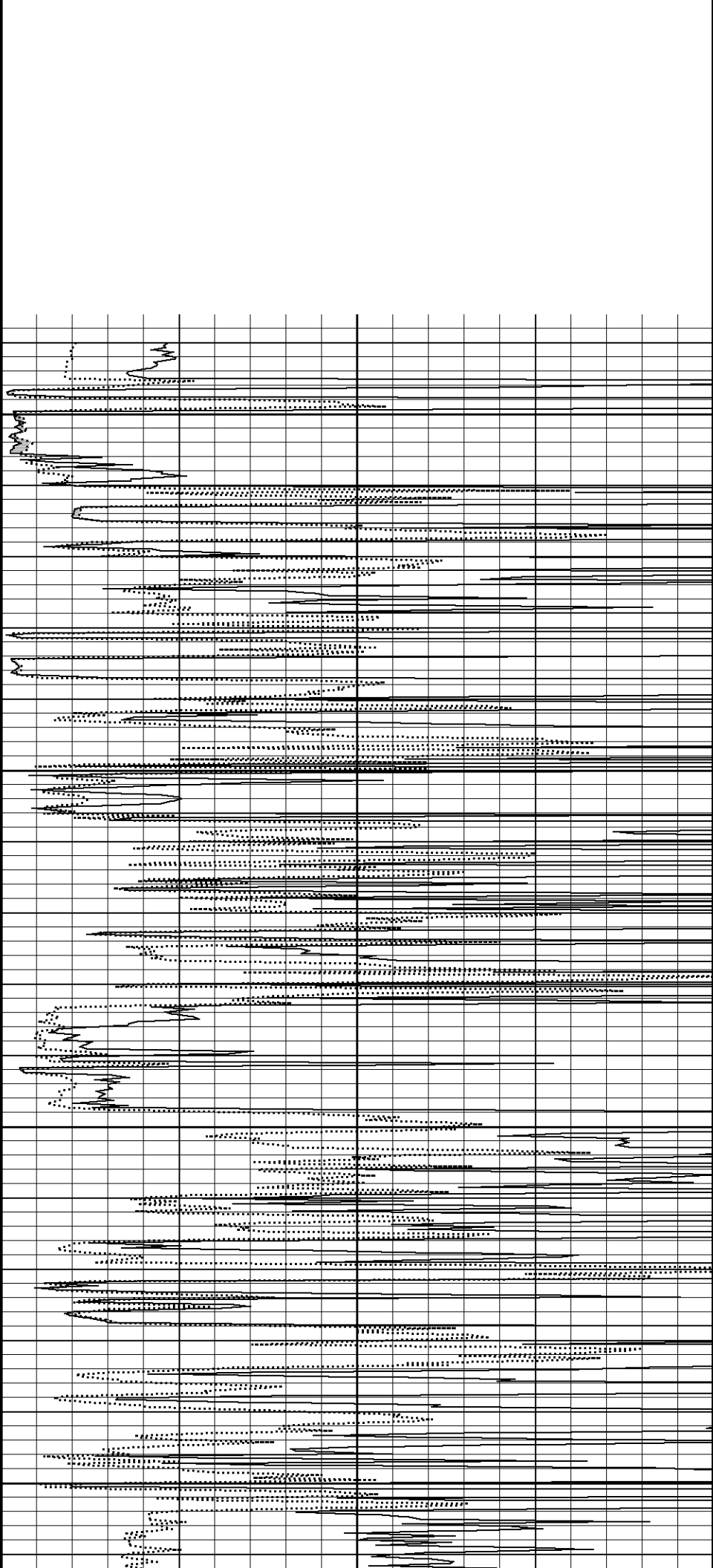
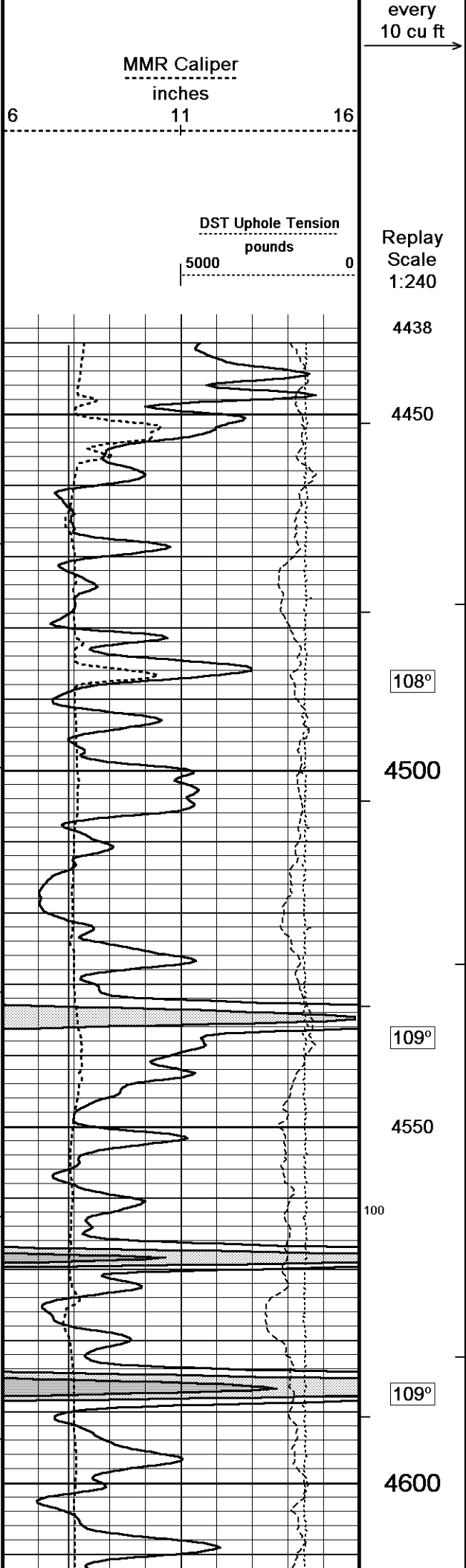
Plotted on 05-APR-2014 08:33

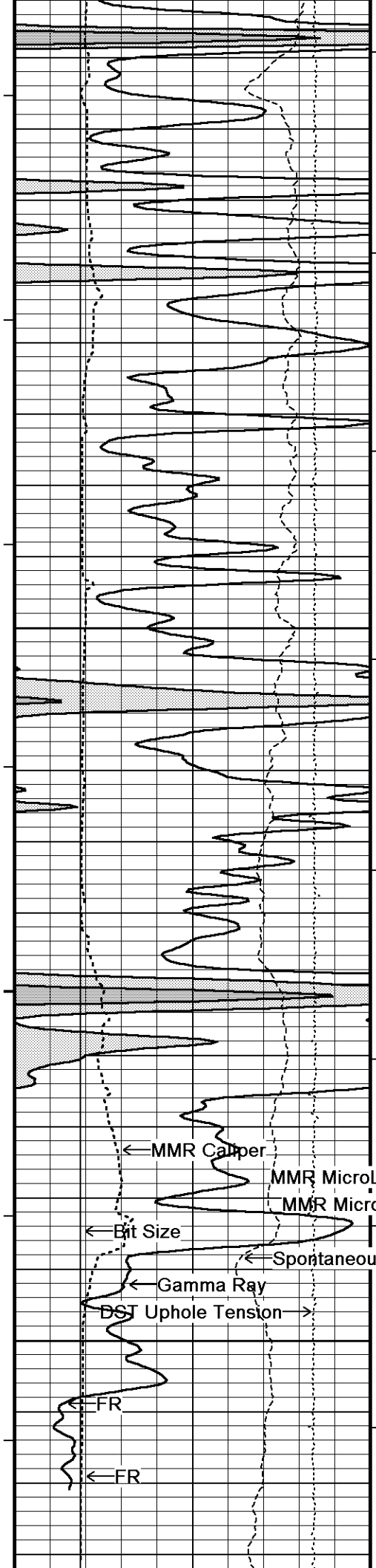
Filename: C:\Minimus 13.08.2113\Logs\Shakespeare Janzen #5-36\Shakespeare Janzen #5-36_001.dta

Recorded on 05-APR-2014 05:33

System Versions: Logged with 13.08.2113 Plotted with 13.08.2113







110°

4650

110°

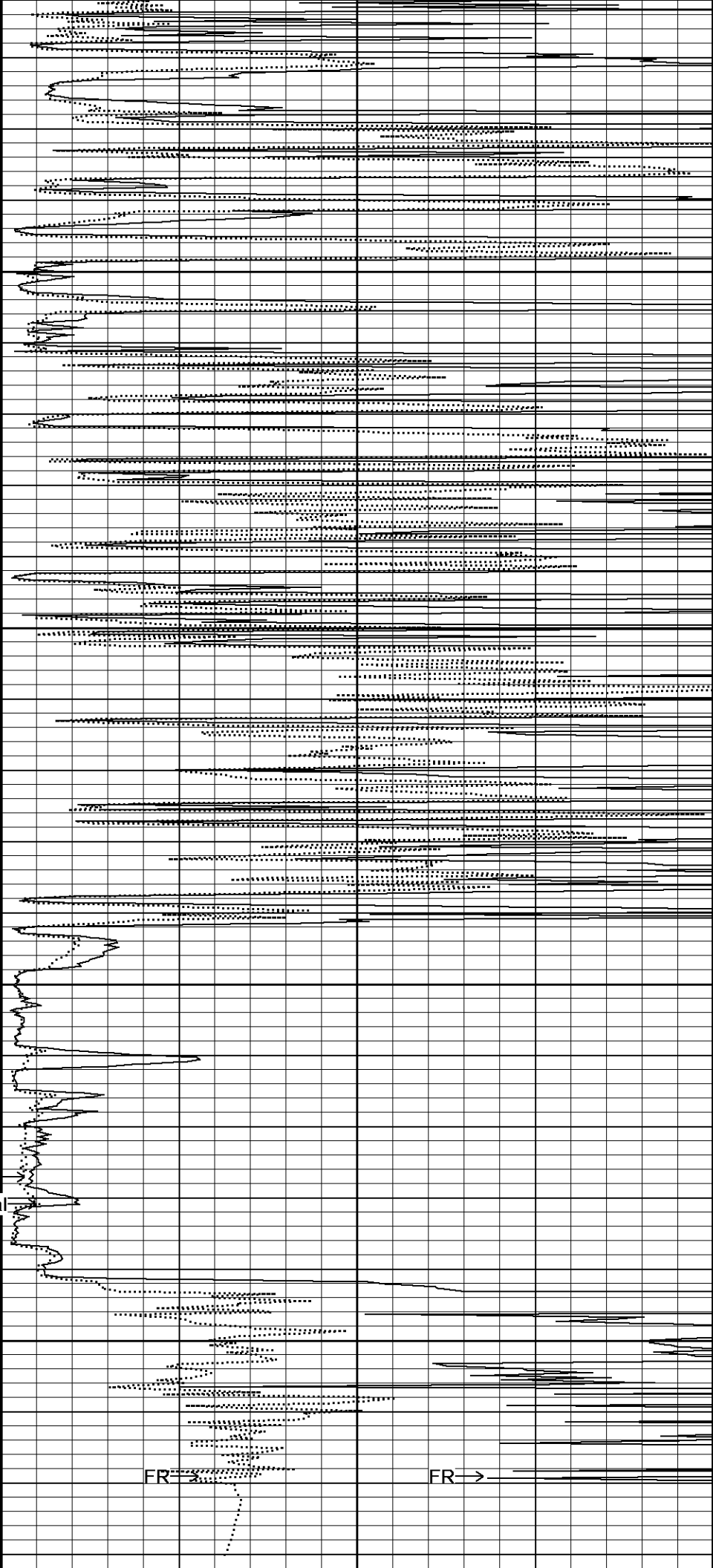
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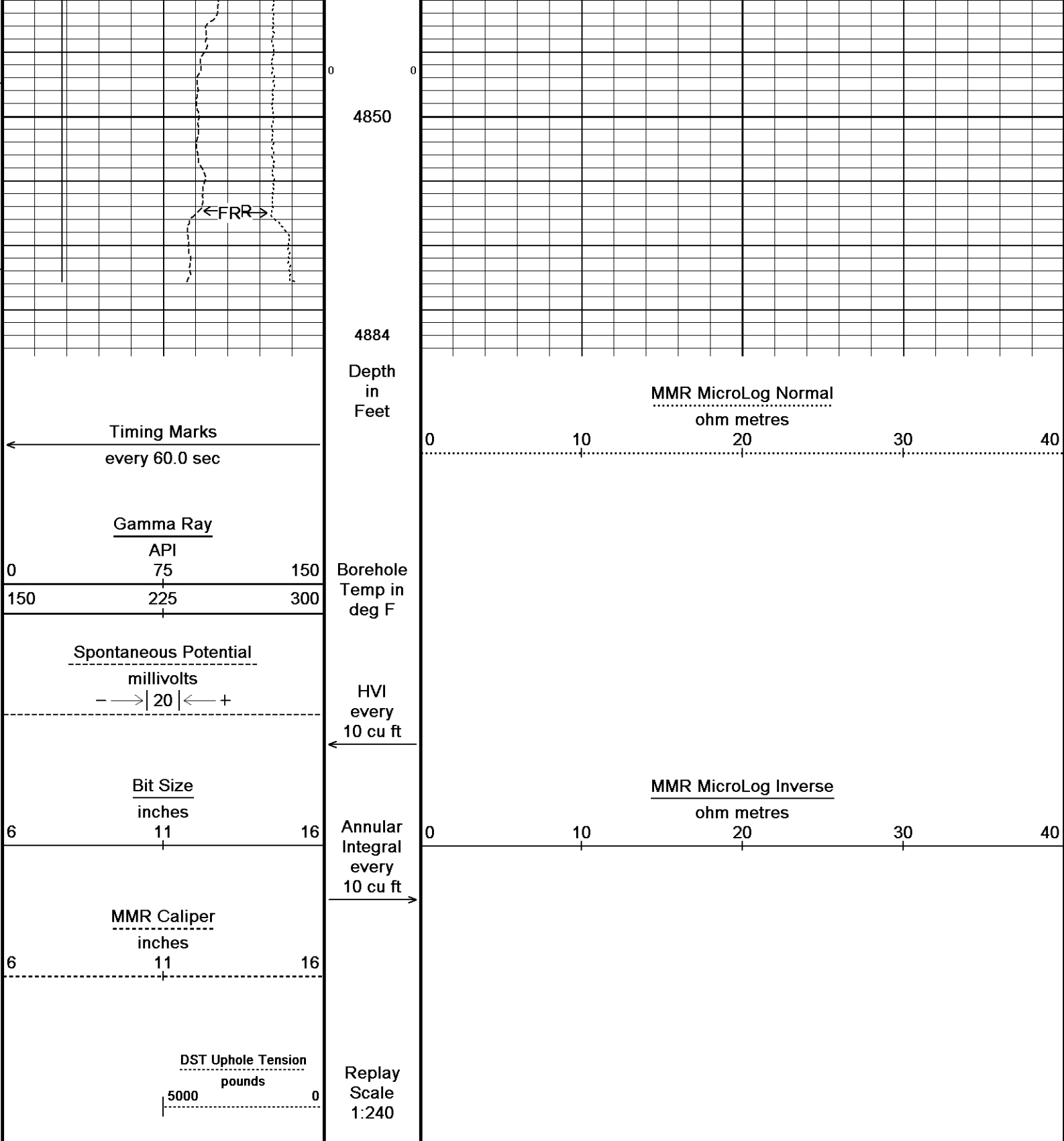
109°

4750

108°

4800





Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.08.2113\Logs\Shakespeare Janzen #5-36\Shakespeare Janzen #5-36_001.dta
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113

Plotted on 05-APR-2014 08:33
Recorded on 05-APR-2014 05:33

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION
C:\Minimus 13.08.2113\Logs\Shakespeare Janzen #5-36\Shakespeare Janzen #5-36_002.dta

General Constants All 000
Last Edited on 05-APR-2014,05:06

General Parameters

Mud Resistivity	0.380	ohm-metres
Mud Resistivity Temperature	81.000	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. One 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 18-MAR-2014 09:04
Reading No	Measured	Calibrated (lbs)	
1	15374.81	0.00	
2	15847.36	399.00	

Gamma Calibration MCG-C 150			Field Calibration on 04-APR-2014 11:36
	Measured	Calibrated (API)	
Background	70	48	
Calibrator (Gross)	1142	773	
Calibrator (Net)	1071	725	

Gamma Constants MCG-C 150			Last Edited on 05-APR-2014,03:48
Gamma Calibrator Number	GRC038		
Mud Density	1.10	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl		kppm	
K Mud Type	Chloride		
K Mud Concentration	0.00	%	

SP Calibration MCG-C 150			Field Calibration on 10-MAR-2014 13:42
	Measured	Calibrated (mV)	
Reference 1	99.9	99.0	
Reference 2	-97.7	-98.8	

High Resolution Temperature Calibration MCG-C 150			Field Calibration on 08-MAR-2014,10:59
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	

High Resolution Temperature Constants MCG-C 150			Last Edited on 04-APR-2014,15:47
Pre-filter Length	11		

Caliper Calibration MMR-C.A 248			Base Calibration on 24-MAR-2014 11:12 Field Calibration on 01-APR-2014 09:23
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	13253	5.96	
2	16528	7.97	
3	19726	9.95	
4	23473	11.91	
5	0	0.00	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	8.00	7.97	

Micro Normal and Micro Inverse Calibration MMR-C A 248			Base Calibration on 24-MAR-2014 11:03
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Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	10.1	49.8	5.1	25.6
Micro Inverse	9.9	49.5	3.4	16.9
Channel	Base Check (ohm-m)		Field Check (ohm-m)	
Micro Normal	93.6		93.6	
Micro Inverse	62.2		62.2	

Micro Normal and Micro Inverse Constants MMR-C.A 248

Last Edited on 23-JAN-2014,17:04

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159		
Micro Normal K Factor	0.5110		
Micro Inverse K Factor	0.3380		
Standoff Offset	0.0000	inches	

Neutron Calibration MDN-B.J 387

Base Calibration on 21-JAN-2014 13:56

Field Check on 04-APR-2014 11:42

Base Calibration					
Ratio	Measured		Calibrated (cps)		
	Near	Far	Near	Far	
	2848	86	3714	110	
	32.942		33.764		
Field Calibrator at Base					
Ratio			Calibrated (cps)		
			1737	2564	
			0.677		
Field Check					
Ratio			Calibrated (cps)		
			1718	2552	
			0.674		

Neutron Constants MDN-B.J 387

Last Edited on 05-APR-2014,03:48

Neutron Source Id	P58125B	
Neutron Jig Number	5824NE	
Epithermal Neutron		
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-A.A 55

Base Calibration on 24-MAR-2014 10:21

Field Check on 04-APR-2014 11:19

Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	951.2	126.8
Base Check		281.7
Field Check		281.6

FE Constants MFE-A.A 55

Last Edited on 05-APR-2014,03:48

Running Mode	No Sleeve		
MFE K Factor	0.1268		
Caliper Source for FE correction	Density Caliper		
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-A.A 73

Last Edited on 05-APR-2014,03:47

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 Sonic	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	
MN3FT	N/A	micro-sec
MX3FT	N/A	micro-sec
Hunt-Raymer Constant	83.13	micro-sec/ft

Sonde Mode	Compensated
Hole Type	Open Hole

Sonde Parameters

	Measured	Calibrated
Offset	N/A	0.0000
Free Pipe	N/A	N/A
Peak Amplitude Source		N/A

Waveform	Start Time (micro-sec)	Width (micro-sec)	Pre Gain	Start Gain	Discriminator (mV)
3'	N/A	N/A	N/A	N/A	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)
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

Full Waveform Parameters

Use 3' Waveform to derive TR	N/A
Use 4' Waveform to derive TR	N/A
Use 5' Waveform to derive TR	N/A
Use 6' Waveform to derive TR	N/A
3' Waveform Discriminator Level	N/A mV
4' Waveform Discriminator Level	N/A mV
5' Waveform Discriminator Level	N/A mV
6' Waveform Discriminator Level	N/A mV
3' Waveform Filter	N/A
4' Waveform Filter	N/A
5' Waveform Filter	N/A
6' Waveform Filter	N/A
Semblance Level	N/A
Semblance Window Width	N/A micro-sec
Sonic 1 Despiker	N/A N/A
Sonic 2 Despiker	N/A N/A

Induction Calibration MAI-A.A 5

Base Calibration on 21-JAN-2014,09:50
Field Check on 03-APR-2014 14:51

Base Calibration

Test Loop Calibration	Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High
1	16.3	470.8	9.3	966.2
2	5.6	376.1	7.6	821.4
3	2.6	266.1	5.2	566.0
4	1.6	130.0	2.6	279.2

4	1.0	130.0	2.0	279.2
Array Temperature		71.1	Deg F	
Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	13.7	3863.6	13.6	3863.5
2	31.5	3592.9	31.4	3592.8
3	29.7	2973.4	29.7	2973.5
4	20.8	2127.8	20.8	2127.8
Deep	18.3	1913.7	18.4	1913.7
Medium	43.0	3863.9	43.0	3864.1
Shallow	46.8	5375.4	46.7	5375.3
Array Temperature		47.7	47.5	Deg F

Induction Constants MAI-A.A 5

Last Edited on 05-APR-2014,03:47

Induction Model		RtAP-WBM	
Caliper for Borehole Corr.		Density Caliper	
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		45.00	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 5

Field Calibration on 21-JAN-2014,15:43

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00

High Resolution Temperature Constants MAI-A.A 5

Last Edited on 04-APR-2014,15:47

Pre-filter Length	11
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Caliper Calibration MPD-D.A 480

Base Calibration on 02-APR-2014 14:28

Field Calibration on 02-APR-2014 14:29

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	17565	3.99
2	27501	5.98
3	37544	7.97

4	47406	9.86
5	58484	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.94	7.97

Photo Density Calibration MPD-D.A 480

Base Calibration on 02-APR-2014 14:48
Field Check on 02-APR-2014 14:55

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Background	1280	1474		
Reference 1	56490	26296	59556	30836
Reference 2	23070	2655	24941	2541

Field Check at Base

1280.1	1473.9
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Field Check

1276.2	1470.6
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PE Calibration

Base Calibration	WS	Measured		Calibrated
		WH	Ratio	Ratio
Background	244	1141		
Reference 1	23700	56281	0.425	0.371
Reference 2	6865	22924	0.304	0.272

Field Check at Base

243.9	1141.4
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Field Check

239.9	1140.2
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Density Constants MPD-D.A 480

Last Edited on 04-APR-2014,15:46

Density Source Id	P50557B
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	1.10 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

DOWNHOLE EQUIPMENT

C:\Minimus 13.08.2113\Logs\Shakespeare Janzen #5-36\Shakespeare Janzen #5-36_002.dta

CBH-C, Cablehead, 11 pin
CBH-C 0 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in



Compact Gamma Gamma

56.02 # CRCC Gamma Ray

Compact Commins Gamma
MCG-C 150 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-C.A 248 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron
MDN-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

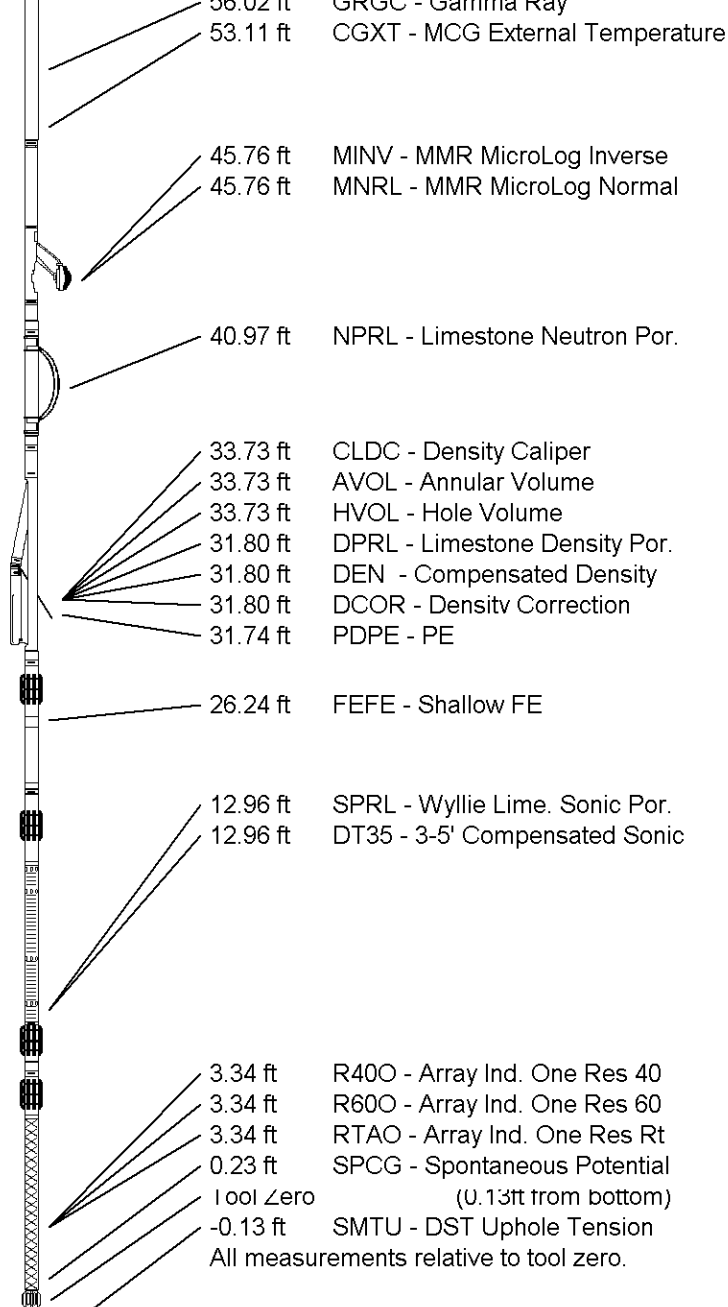
Compact Density/Caliper
MPD-D.A 480 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Sonic
MSS-A.A 73 LG: 12.52 ft WT: 72.8 lb OD: 2.240 in

Compact Induction
MAI-A.A 5 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 63.70 ft Weight: 480.6 lb



COMPANY SHAKESPEARE OIL CO., INC.
WELL JANZEN #5-36
FIELD CAPSTONE EAST
PROVINCE/COUNTY SCOTT
COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	3114.00	feet	First Reading	4819.00	feet
Elevation Drill Floor	3112.00	feet	Depth Driller	4866.00	feet
Elevation Ground Level	3104.00	feet	Depth Logger	4865.00	feet



Weatherford®

MICRORESISTIVITY LOG

