



Weatherford[®]

MICRORESISTIVITY LOG

COMPANY		GRAND MESA OPERATING COMPANY			
WELL		GLENNIS #2-27			
FIELD		WILDCAT			
PROVINCE/COUNTY		GOVE			
COUNTRY/STATE		U.S.A. / KANSAS			
LOCATION		1931' FSL & 1945' FEL			
SEC	TWP	RGE	Other Services		MAI/MFE
27	13S	31W	MPD/MDN		
API Number		15-063-22041			
Permit Number					
Permanent Datum GL, Elevation 2834 feet					Elevations: feet KB 2839.00 DF 2837.00 GL 2834.00
Log Measured From KB					
Drilling Measured From KB					
Date	05-OCT-2012				
Run Number	ONE				
Depth Driller	4622.00				feet
Depth Logger	4622.00				feet
First Reading	4589.00				feet
Last Reading	3622.00				feet
Casing Driller	222.00				feet
Casing Logger	219.00				feet
Bit Size	7.875				inches
Hole Fluid Type	CHEMICAL				
Density / Viscosity	9.20 g/cc		62.00 CP		
PH / Fluid Loss	10.50		7.20 ml/30Min		
Sample Source	MUDPIT				
Rm @ Measured Temp	0.63 @ 84.0				ohm-m
Rmf @ Measured Temp	0.50 @ 84.0				ohm-m
Rmc @ Measured Temp	0.76 @ 84.0				ohm-m
Source Rmf / Rmc	CALC	CALC	CALC		
Rm @ BHT	0.46 @ 117.0				ohm-m
Time Since Circulation	5 HOURS				
Max Recorded Temp	117.00				deg F
Equipment Name	COMPACT				
Equipment / Base	13025	LIB			
Recorded By	ADAM SILL				
Witnessed By	MENT MATSON				
S.O. # / JOB #	3534666				LB12-266

BOREHOLE RECORD

Last Edited: 01-JAN-2003 00:06

Bit Size inches	Depth From feet	Depth To feet
7.875	222.00	4622.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	222.00	24.00

REMARKS

- SOFTWARE ISSUE: WLS 13.02.6600.
- MCG, MML, MDN, MPD, MFE, MAI RAN IN COMBINATION.
 - HARDWARE: DUAL BOWSPRING USED ON MDN.
 - 0.5 INCH STANDOFF USED ON MFE.
 - 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: 1862 CU. FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO 3622 FEET: 205 CU. FT.
- SERVICE ORDER # 3534666

- RIG: MURFIN #24.
- ENGINEER: A. SILL.
- OPERATOR(S): R. VENEGAS.

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.

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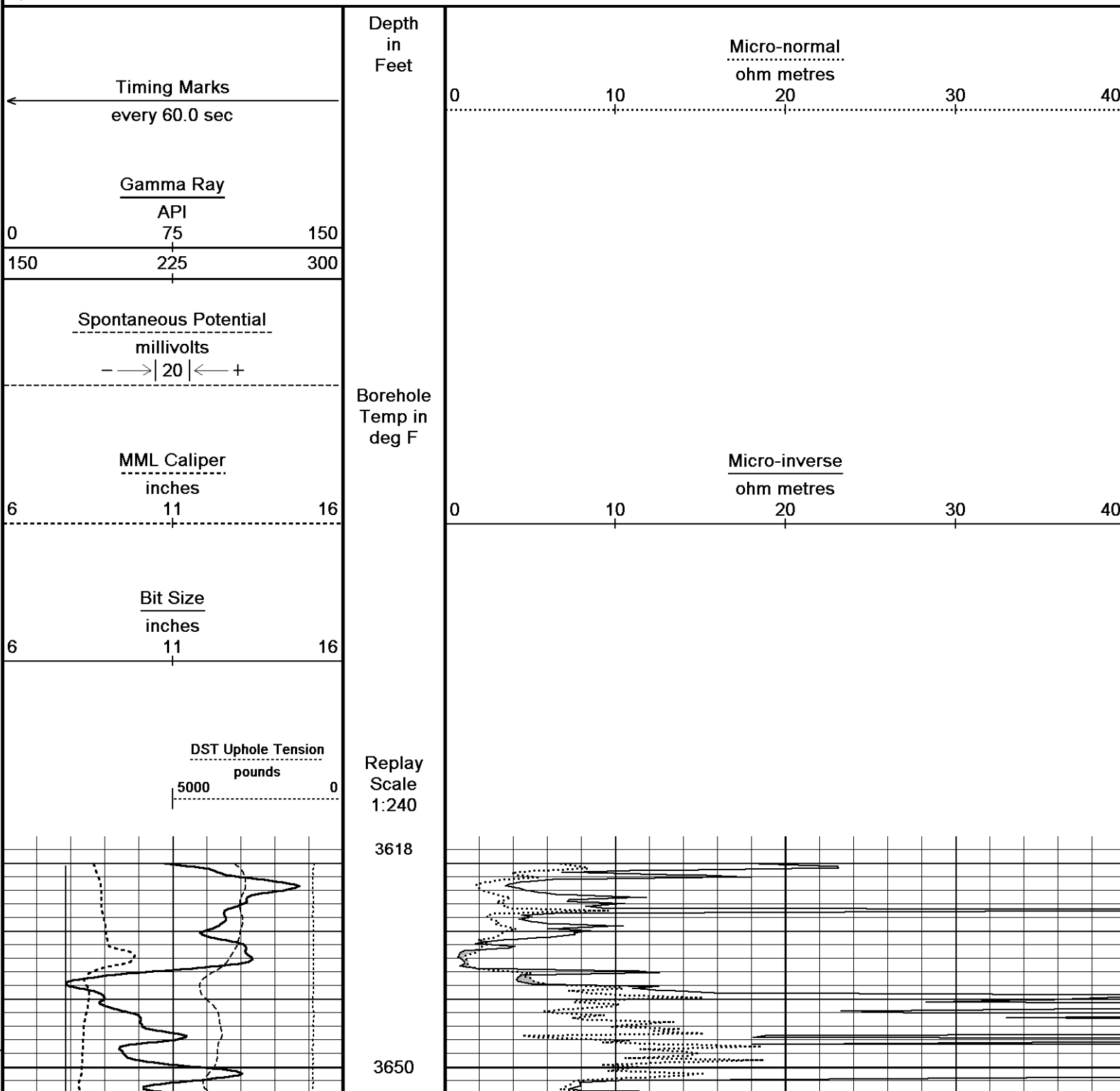
Depth Based Data - Maximum Sampling Increment 10.0cm

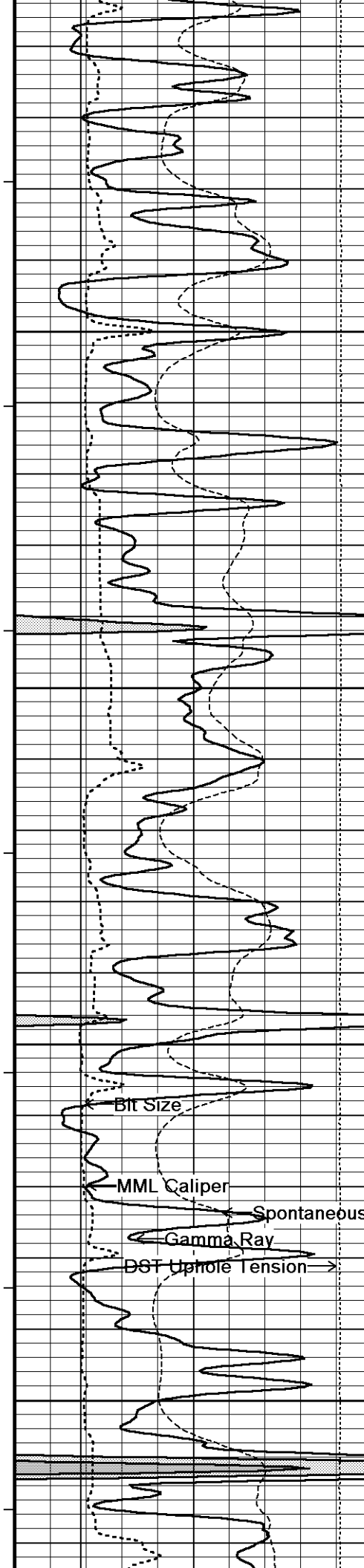
Plotted on 05-OCT-2012 23:12

Filename: C:\Minimus 13.02.6600\Data\Grand Mesa Glennis #2...\Grand Mesa Glennis #2-27 Splice.dta

Recorded on 05-OCT-2012 20:00

System Versions: Plotted with 13.02.6600





110°

3700

110°

3750

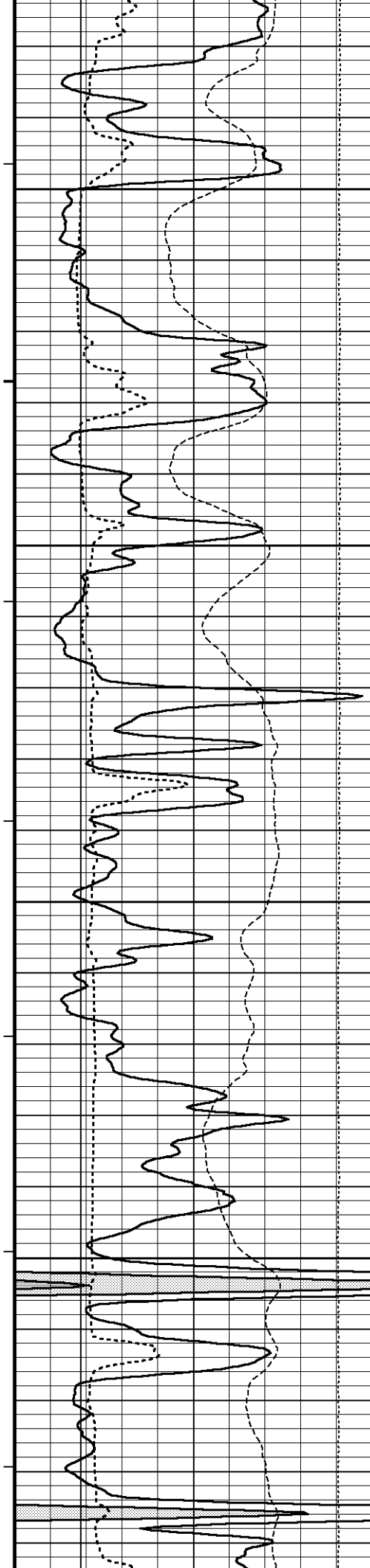
111°

3800

111°

3850

Micro-inverse
Micro-normal



111°

3900

112°

3950

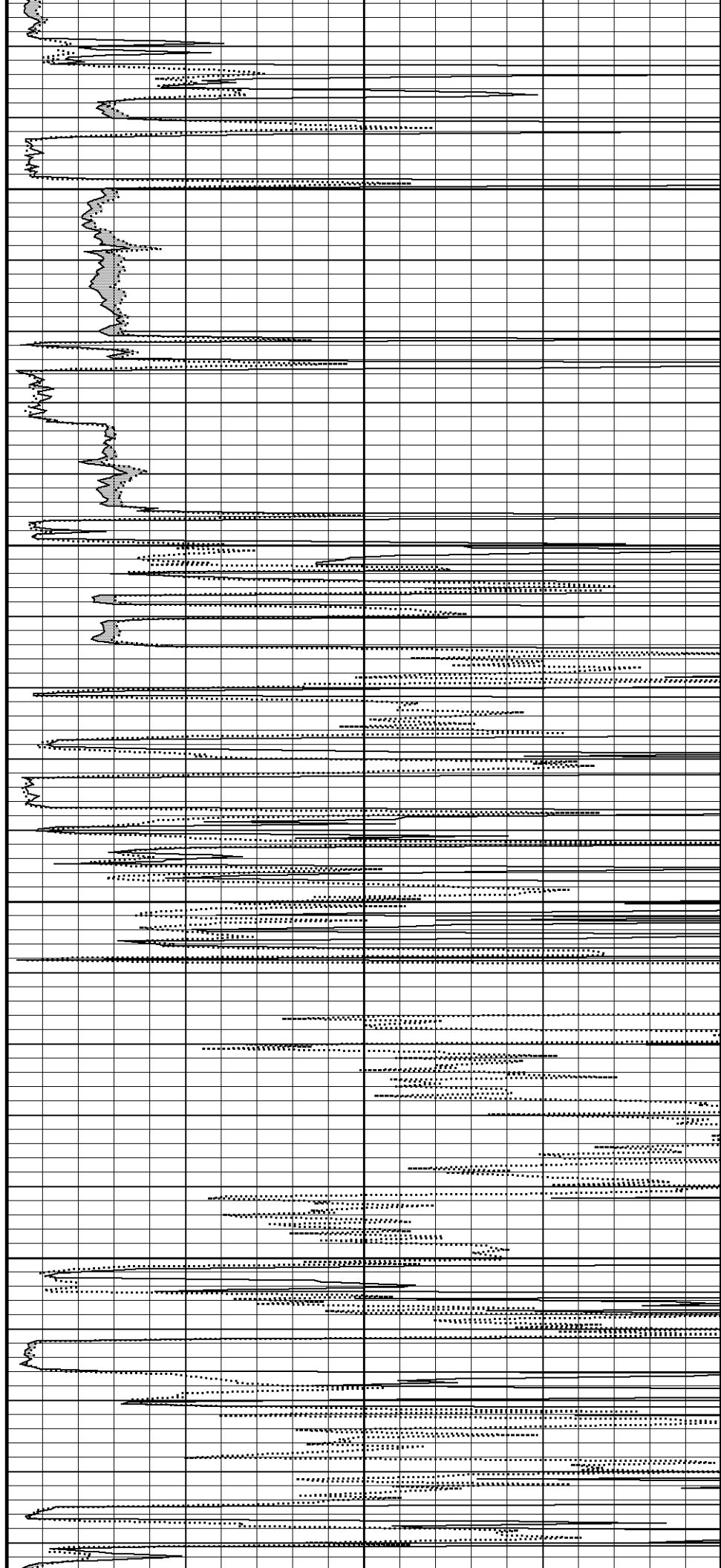
112°

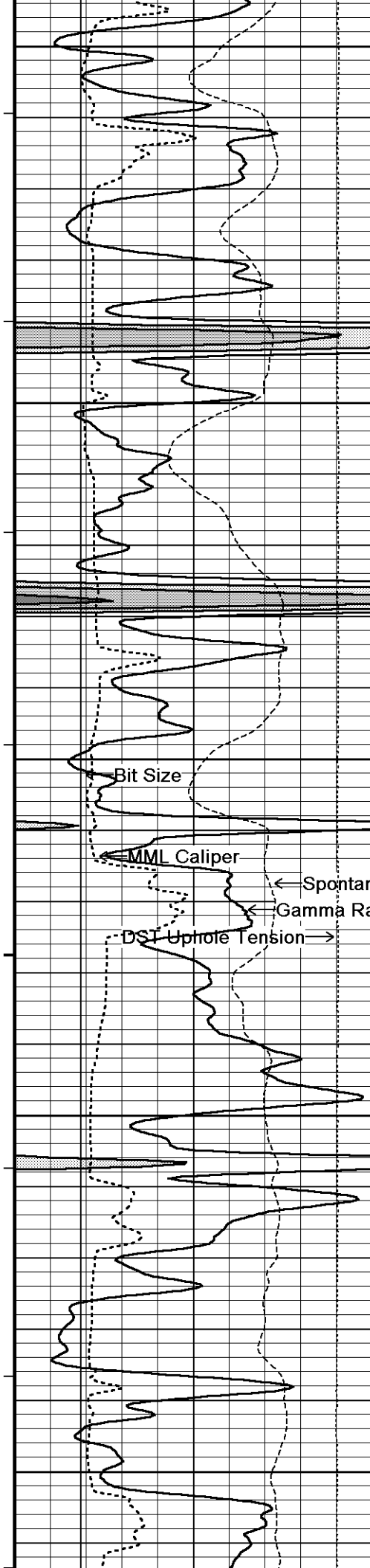
4000

112°

4050

112°





4100

112°

4150

113°

4200

Micro-inverse →

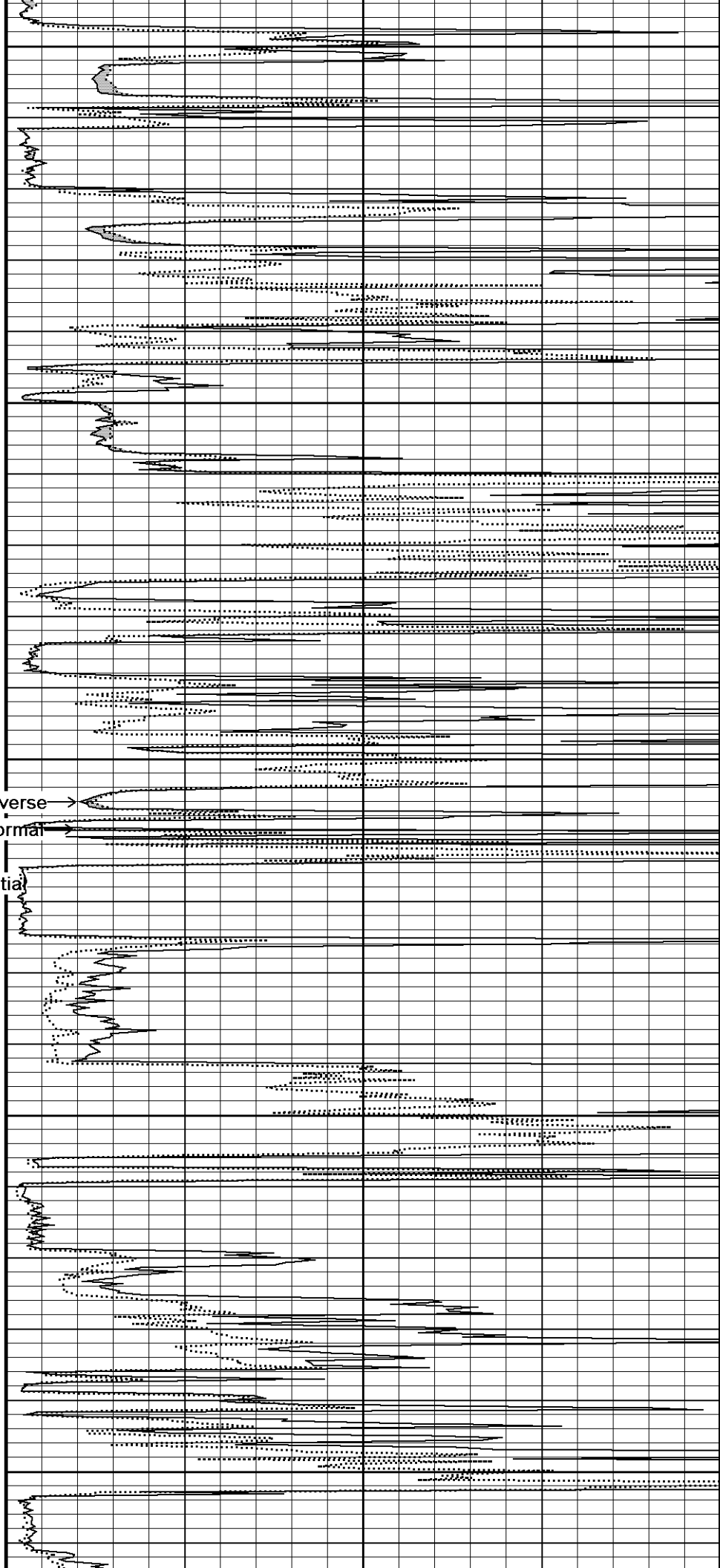
Micro-normal →

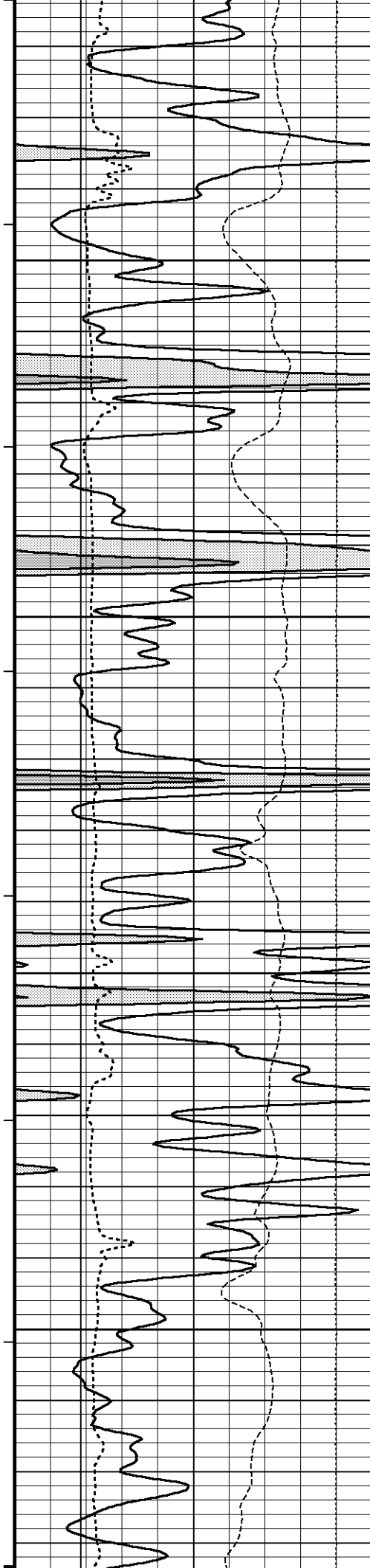
113°

4250

113°

4300





114°

4350

114°

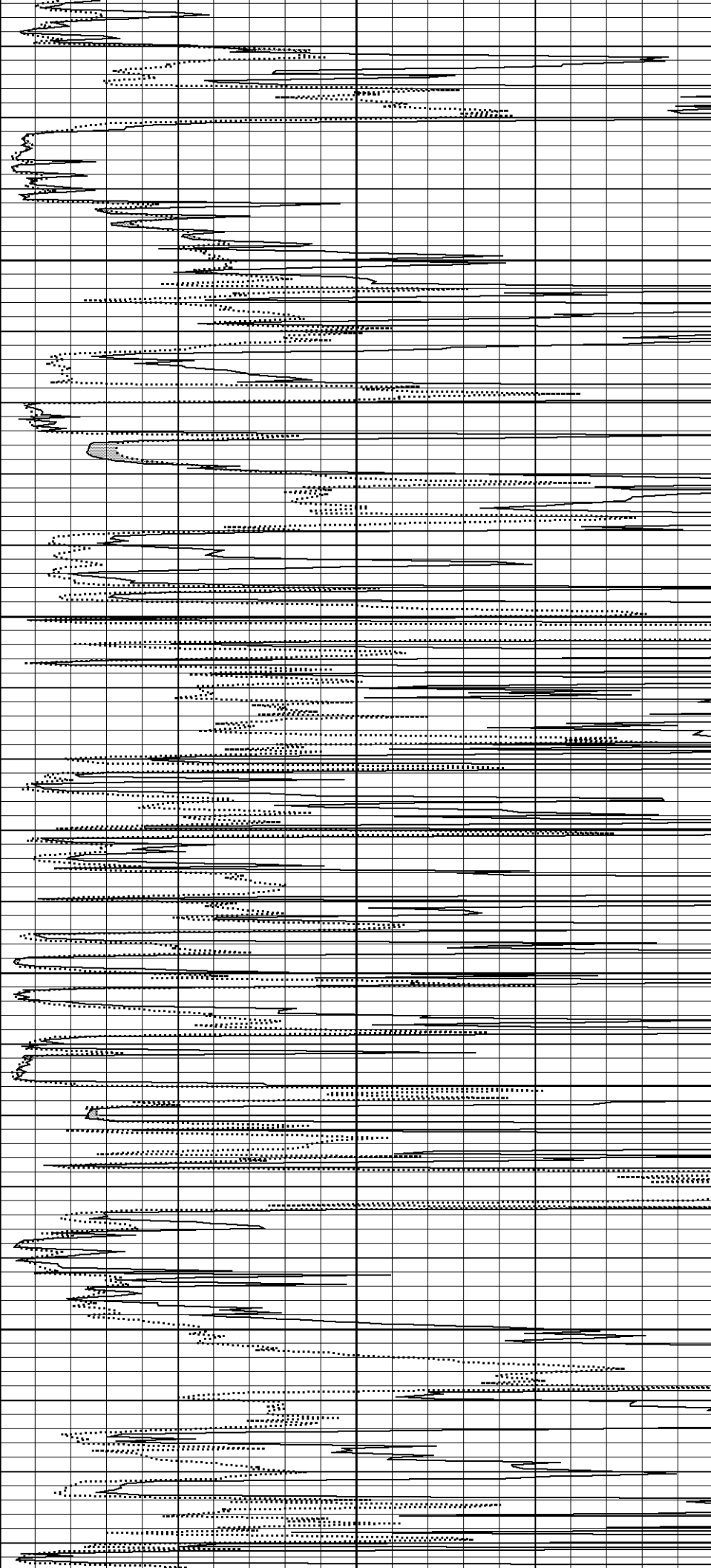
4400

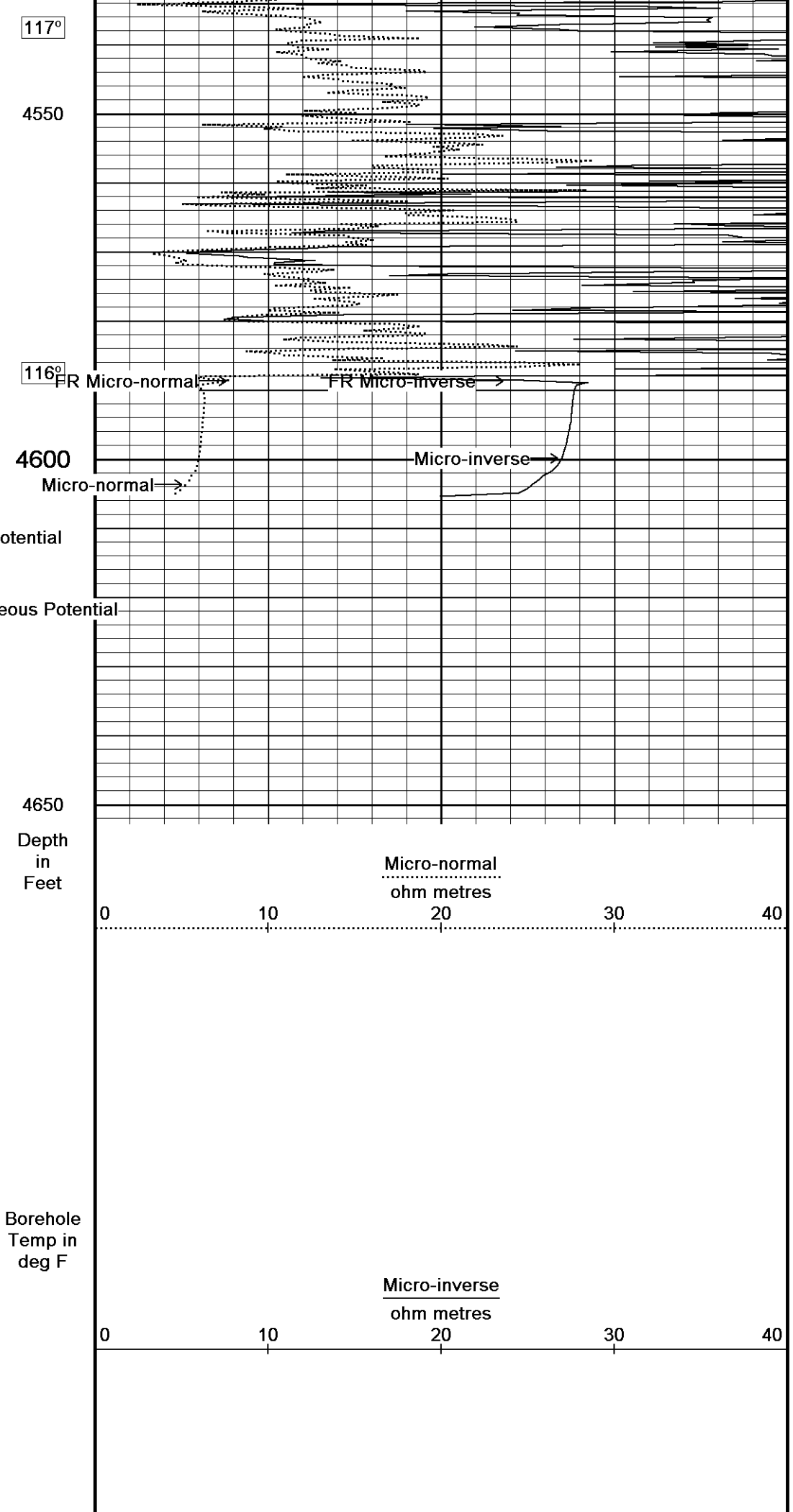
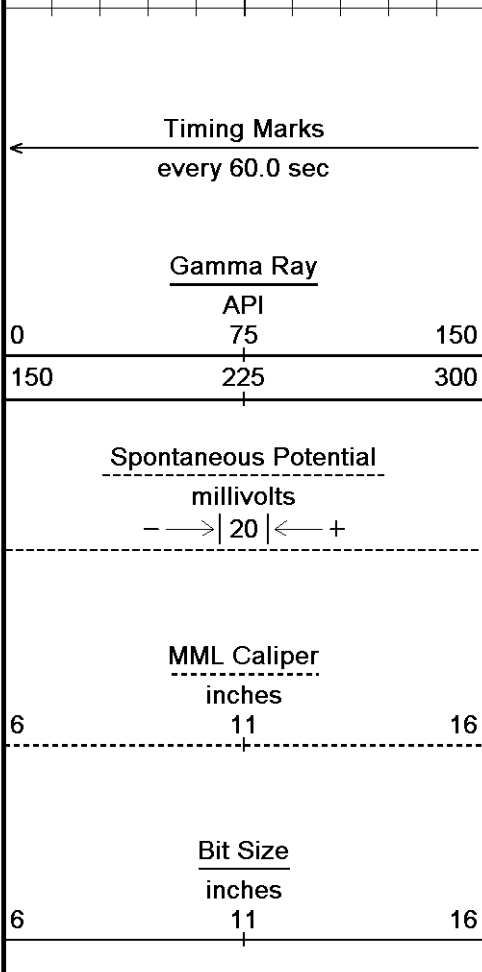
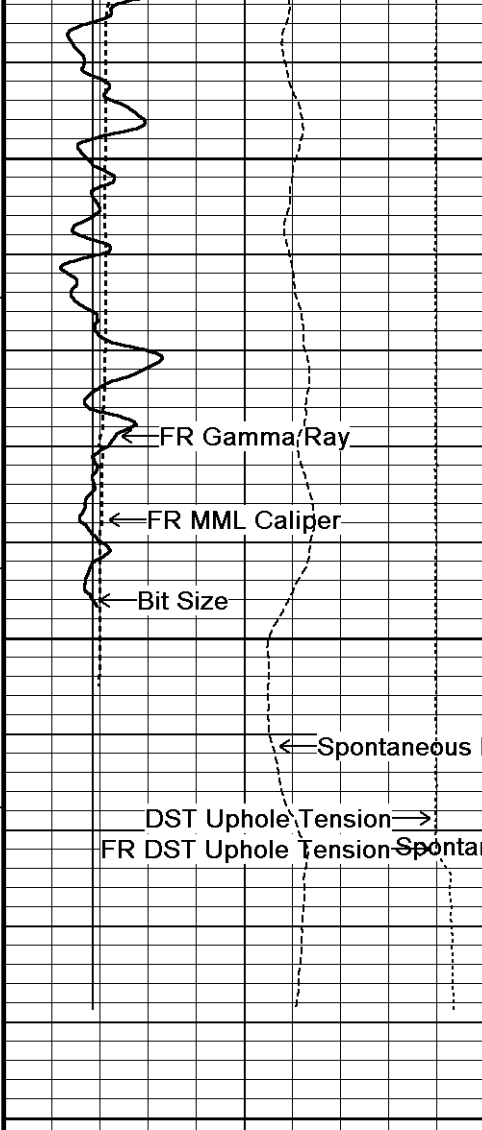
115°

4450

117°

4500





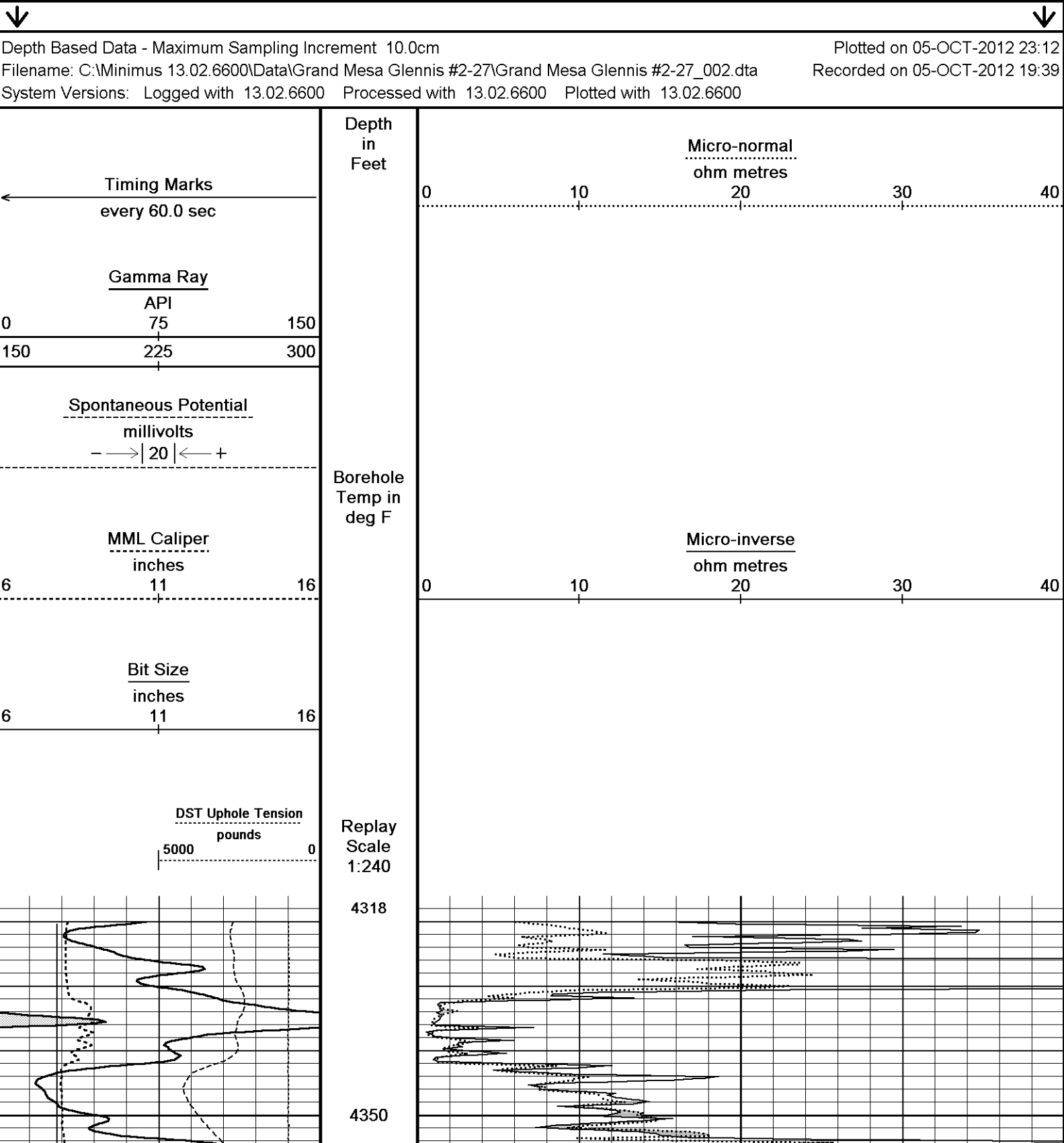
DST Uphole Tension
pounds

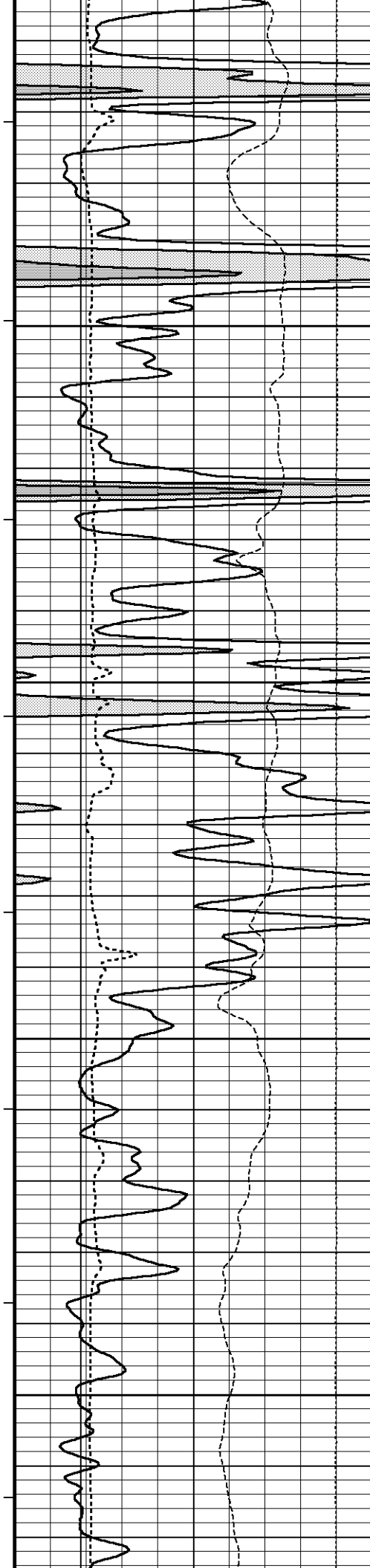
50000

Replay
Scale
1:240

Depth Based Data - Maximum Sampling Increment 10.0cmPlotted on 05-OCT-2012 23:12
Filename: C:\Minimus 13.02.6600\Data\Grand Mesa Glennis #2...\Grand Mesa Glennis #2-27 Splice.dtaRecorded on 05-OCT-2012 20:00
System Versions: Plotted with 13.02.6600

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114°

4400

114°

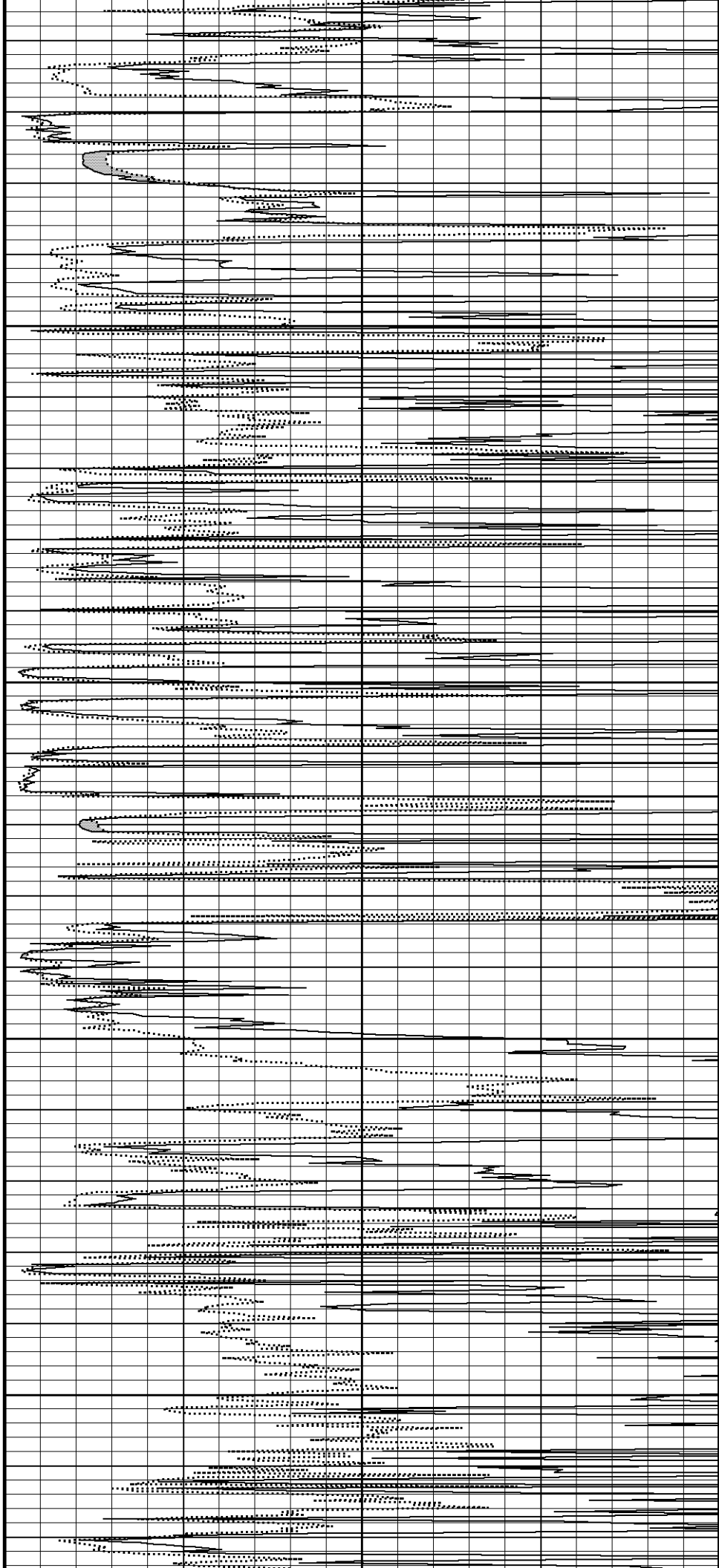
4450

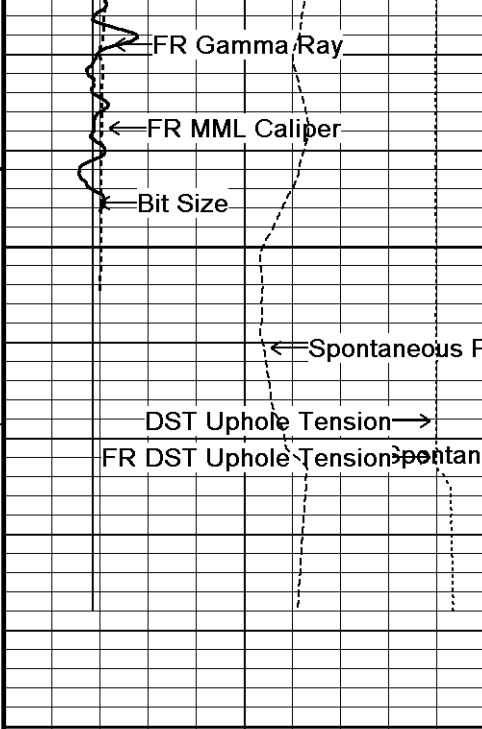
116°

4500

117°

4550





116°

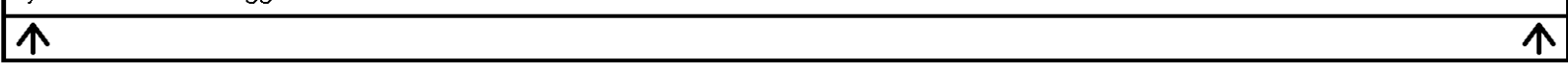
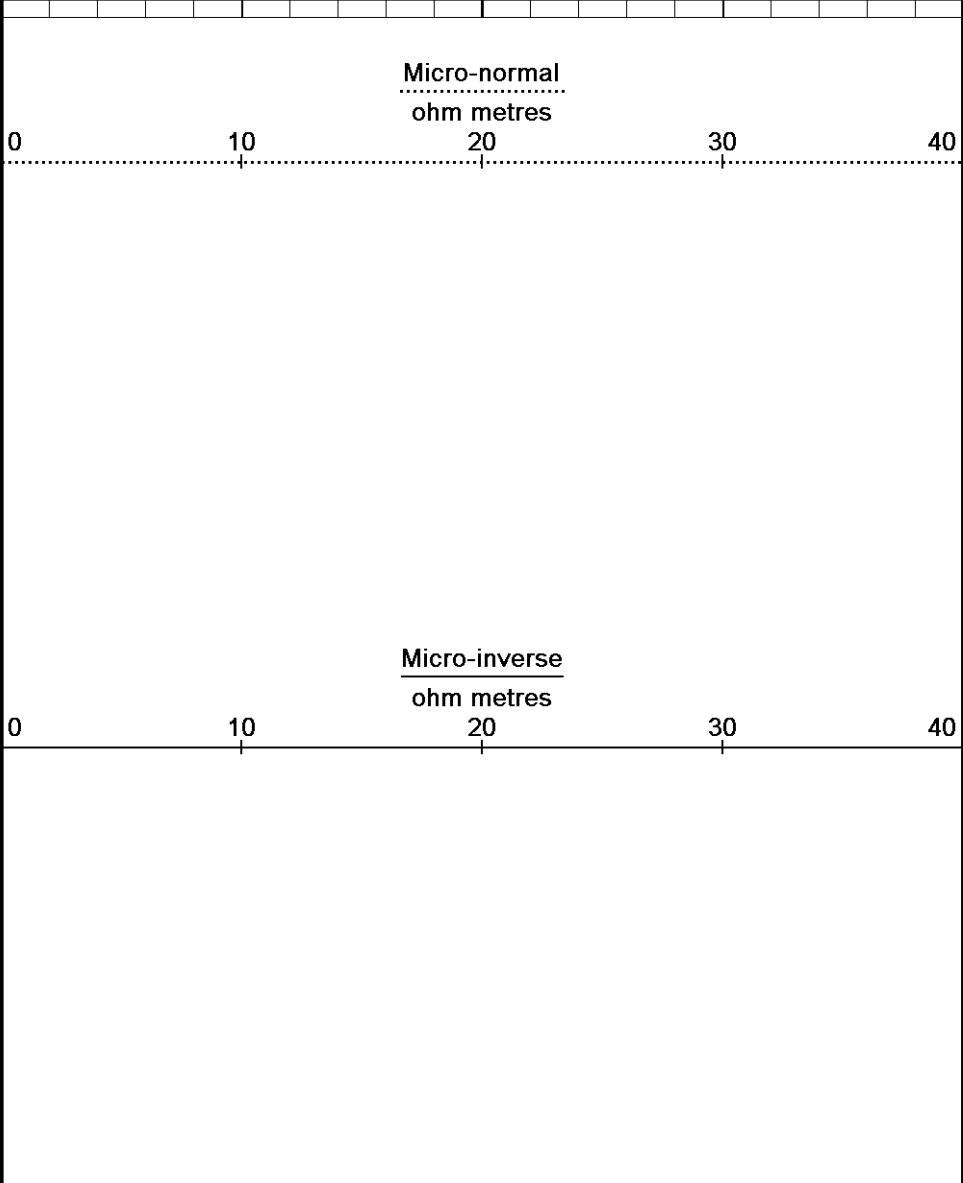
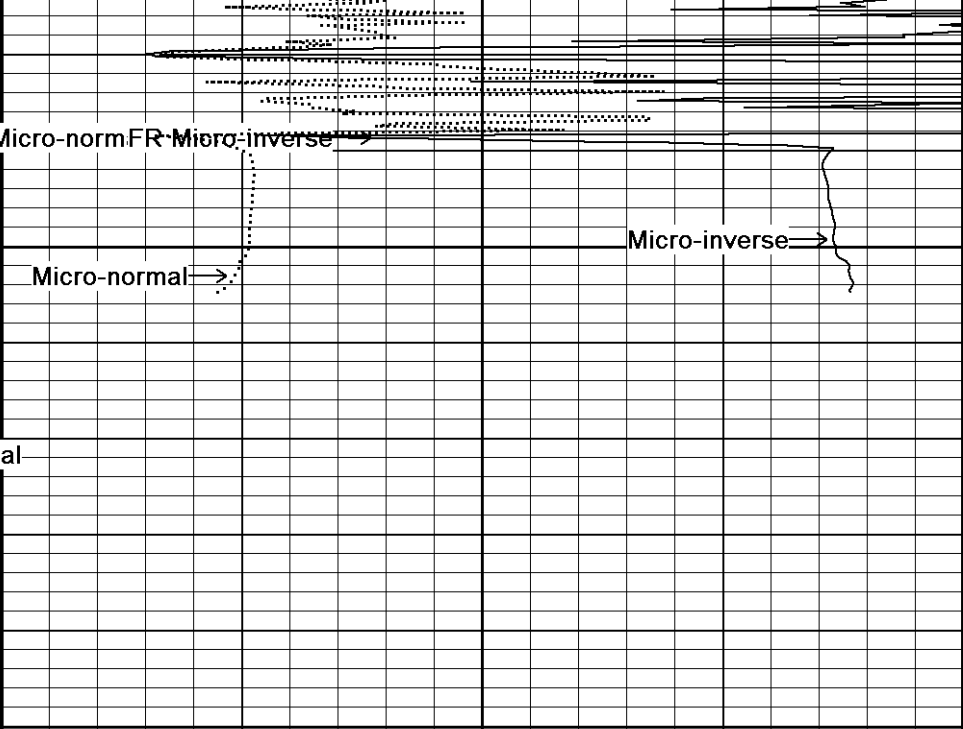
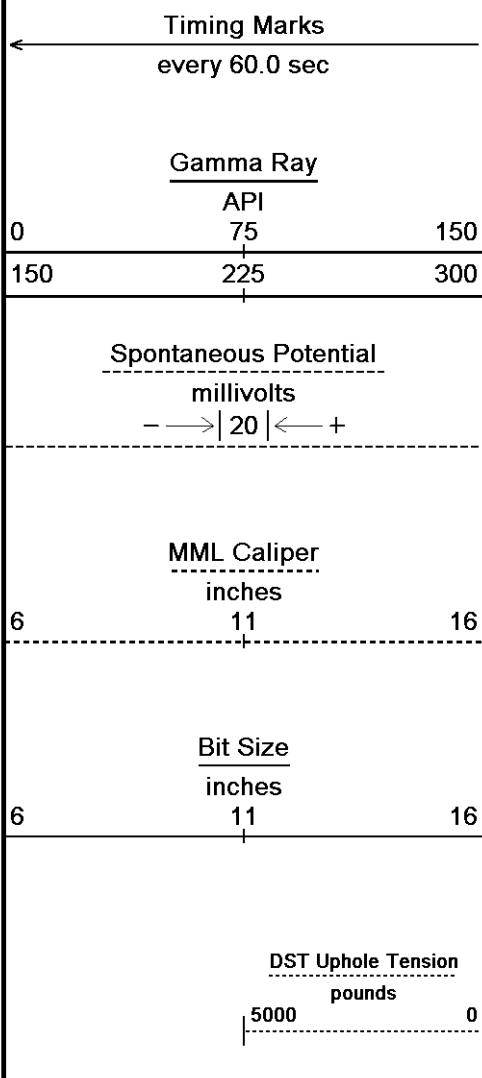
4600

4650

Depth
in
Feet

Borehole
Temp in
deg F

Replay
Scale
1:240



BEFORE SURVEY CALIBRATION

C:\Minimus 13.02.6600\Data\Grand Mesa Glennis #2-27\Grand Mesa Glennis #2-27 Splice.dta

General Constants All 000

Last Edited on 05-OCT-2012,19:15

General Parameters

Mud Resistivity	0.630	ohm-metres
Mud Resistivity Temperature	84.000	degrees F
Water Level	0.000	feet
Density/Neutron 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

Down-hole Tension Calibration SMS 0

Field Calibration on 05-OCT-2012 18:53

Reading No	Measured	Calibrated (lbs)
1	-2307.27	0.00
2	-2305.09	400.00

Gamma Calibration MCG-C 84

Field Calibration on 02-OCT-2012 14:55

	Measured	Calibrated (API)
Background	71	49
Calibrator (Gross)	1136	774
Calibrator (Net)	1064	725

Gamma Constants MCG-C 84

Last Edited on 01-JAN-2003,00:09

Gamma Calibrator Number	GRC38	
Mud Density	1.10	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

SP Calibration MCG-C 84

Field Calibration on 01-OCT-2012,10:14

	Measured	Calibrated (mV)
Reference 1	100.0	100.0
Reference 2	-100.0	-100.0

High Resolution Temperature Calibration MCG-C 84

Field Calibration on 01-OCT-2012,10:14

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	100.00	100.00

High Resolution Temperature Constants MCG-C 84

Last Edited on

Pre-filter Length	11
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Caliper Calibration MML-A 16

Base Calibration on 07-SEP-2012 10:01

Field Calibration on 20-SEP-2012 14:10

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13823	5.98
2	16876	7.97
3	20058	9.86
4	23883	11.92
5	0	0.00
6	N/A	N/A

Field Calibration	Measured Caliper (in) 5.93	Actual Caliper (in) 5.98
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Micro Normal and Micro Inverse Calibration MML-A 16				Base Calibration on 07-SEP-2012 10:10 Field Check on 20-SEP-2012 14:11
Base Calibration				
		Measured	Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.1	60.2	5.0	25.0
Micro Inverse	15.6	78.3	5.0	25.0
Channel	Base Check (ohm-m)		Field Check (ohm-m)	
Micro Normal	62.9		62.9	
Micro Inverse	48.2		48.2	

Micro Normal and Micro Inverse Constants MML-A 16				Last Edited on 01-JAN-2003,00:09
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-B.J 387					Base Calibration on 03-OCT-2012 16:16	
					Field Check on 03-OCT-2012 16:32	
Base Calibration						
		Measured		Calibrated (cps)		
	Near	Far		Near	Far	
	2923	89		3714	110	
Ratio	32.740			33.764		
Field Calibrator at Base					Calibrated (cps)	
				1702	2509	
Ratio				0.678		
Field Check					Calibrated (cps)	
				1694	2505	
Ratio				0.676		

Neutron Constants MDN-B.J 387			Last Edited on 01-JAN-2003,00:09		
Neutron Source Id	P58125B				
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	Constant Value				
Formation Pressure	0.00	kpsi			
Temperature Source	Constant Value				
Temperature	68.00	degrees F			
Mud Salinity	0.00	kppm			
Salinity Correction	Not Applied				
Formation Fluid Salinity Source	Constant Value				
Formation Fluid Salinity	0.00	kppm			
Barite Mud Correction	Not Applied				

FE Calibration MFE-A.A 55			Base Calibration on 01-OCT-2012 09:28 Field Check on 01-OCT-2012 09:33
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	953.9	126.8	
Base Check		280.7	
Field Check		280.8	

FE Constants MFE-A.A 55				Last Edited on 01-JAN-2003,00:08
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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

Induction Calibration MAI-A.A 178

Base Calibration on 18-APR-2011,13:49
Field Check on 03-OCT-2012 15:31

Base Calibration

Test Loop Calibration	Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High
1	17.6	484.7	9.3	966.2
2	6.2	391.4	7.6	821.4
3	4.0	264.5	5.2	566.0
4	2.3	135.1	2.6	279.2
Array Temperature	77.0		Deg F	

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	13.7	3764.4	13.7	3764.2
2	30.0	3467.5	30.0	3467.3
3	27.4	3013.9	27.4	3013.8
4	18.8	2064.8	18.8	2064.8
Deep	16.0	1995.0	16.0	1995.2
Medium	40.3	3954.7	40.3	3954.5
Shallow	46.0	5083.0	46.0	5082.4
Array Temperature	94.4		94.8 Deg F	

Induction Constants MAI-A.A 178

Last Edited on 01-JAN-2003,00:08

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 178

Field Calibration on 03-MAR-2011,09:58

	Measured	Calibrated(Deg F)
Lower	1.00	33.80
Upper	11.00	51.80

High Resolution Temperature Constants MAI-A.A 178

Last Edited on

Pre-filter Length	11
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Caliper Calibration MPD-B 59

Base Calibration on 31-DEC-2002 23:12

Field Calibration on 31-DEC-2002 23:13

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	17177	3.99
2	25648	5.98
3	34313	7.97
4	42560	9.86
5	51728	11.92
6	N/A	N/A

Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	6.04	5.98

Photo Density Calibration MPD-B 59

Base Calibration on 31-DEC-2002 23:33

Field Check on 31-DEC-2002 23:40

Density Calibration		Measured		Calibrated (sdu)	
Base Calibration		Near	Far	Near	Far
Reference 1	56697	27917	59556	30836	
Reference 2	23013	2513	24941	2541	

Field Check at Base		
	1200.6	1281.4

Field Check		
	1199.8	1279.8

PE Calibration				
Base Calibration		Measured		Calibrated
	WS	WH	Ratio	Ratio
Background	220	1079		
Reference 1	21366	56515	0.381	0.371
Reference 2	6125	22879	0.271	0.272

Field Check at Base		
	220.5	1078.6

Field Check		
	218.4	1074.7

Density Constants MPD-B 59

Last Edited on 01-JAN-2003,00:09

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 (ft)	
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

DOWNHOLE EQUIPMENT

C:\Minimus 13.02.6600\Data\Grand Mesa Glennis #2-27\Grand Mesa Glennis #2-27 Splice.dta

Compact Comms Gamma
MCG-C 84 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 16 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

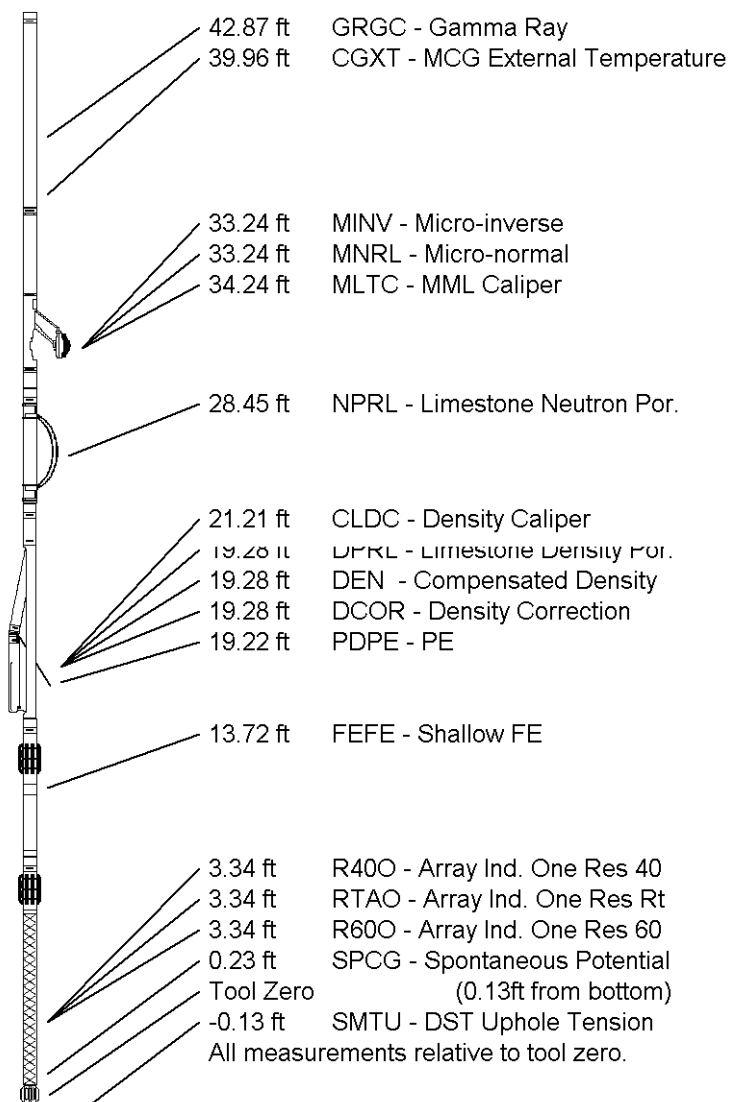
Compact Neutron
MDN-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 59 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 178 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 48.16 ft Weight: 383.6 lb



COMPANY

GRAND MESA OPERATING COMPANY

WELL

GLENNIS #2-27

FIELD

WILDCAT

PROVINCE/COUNTY

GOVE

COUNTRY/STATE

U.S.A. / KANSAS

Elevation Kelly Bushing	2839.00	feet
Elevation Drill Floor	2837.00	feet
Elevation Ground Level	2834.00	feet

First Reading	4589.00	feet
Depth Driller	4622.00	feet
Depth Logger	4622.00	feet



Weatherford®

MICRORESISTIVITY LOG

