MICRO RESISITIVITY LOG

Weatherford®

COMPANY	GRAND MESA OPERATING COMPANY, INC
WELL	SMITH #1-34
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	1896' FNL & 2374' FWL

40 Years of Wireline 1970 2010

SEC	TWP	RGE	Other Services
34	12S	32W	MPD/MDN MAI/MFE

API Number 15-109-20959
Permit Number

Permanent Datum G.L., Elevation 2978 feet
Log Measured From K.B. @ 5 FEET above Permanent Datum
Drilling Measured From K.B.

Elevations:	feet
KB	2983.00
DF	2982.00
GL	2978.00

Date	18-NOV-2010				
Run Number	ONE				
Depth Driller	4670.00	feet			
Depth Logger	4667.00	feet			
First Reading	4631.00	feet			
Last Reading	3650.00	feet			
Casing Driller	209.00	feet			
Casing Logger	209.00	feet			
Bit Size	7.875	inches			
Hole Fluid Type	CHEMICAL				
Density / Viscosity	9.30	lb/USg	62.00	CP	
PH / Fluid Loss	10.00		8.00	ml/30Min	
Sample Source	FLOWLINE				
Rm @ Measured Temp	1.59 @ 77.0	ohm-m			
Rmf @ Measured Temp	1.27 @ 77.0	ohm-m			
Rmc @ Measured Temp	1.91 @ 77.0	ohm-m			
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	1.09 @112.0	ohm-m			
Time Since Circulation	4 HOURS				
Max Recorded Temp	112.00	deg F			
Equipment Name	COMPACT				
Equipment / Base	13096		LIB		
Recorded By	LYNN SCOTT				
Witnessed By	STEVE STRIBLING				
S.O.# / JOB#	3524623		LB10-291		

BOREHOLE RECORD

Last Edited: 18-NOV-2010 11:20

Bit Size inches	Depth From feet	Depth To feet
7.875	209.00	4667.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	209.00	24.00

REMARKS

Tools Run: MAI, MPD, MCG, MDN, MML, MFE, SKJ
Hardware: MPD: 8 inch profile plate used. MAI and MFE: 0.5 Inch standoffs used. MDN: Dual Eccentraliser used.
2.71 G/CC Limestone density matrix used to calculate porosity.
Borhole rugosity, tight pulls, and washouts will affect data quality.
All intervals logged and scaled per customer's request.
Annular volume with 5.5 inch production casing=183 cu. ft.
Service order #3524623
Rig: Murfin #24
Engineer: L. Scott
Operator(s): J. LaPoint

5 Inch Main

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 11_01\Data\Grand Mesa Smith 1-34\GRAND MESA SMITH 1-34_002.dta
System Versions: Logged with 11.01.2198 Plotted with 11.01.2198

Plotted on 18-NOV-2010 13:38
Recorded on 18-NOV-2010 11:35

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
− → | 20 | ← +

MML Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0
0 -5000

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:240

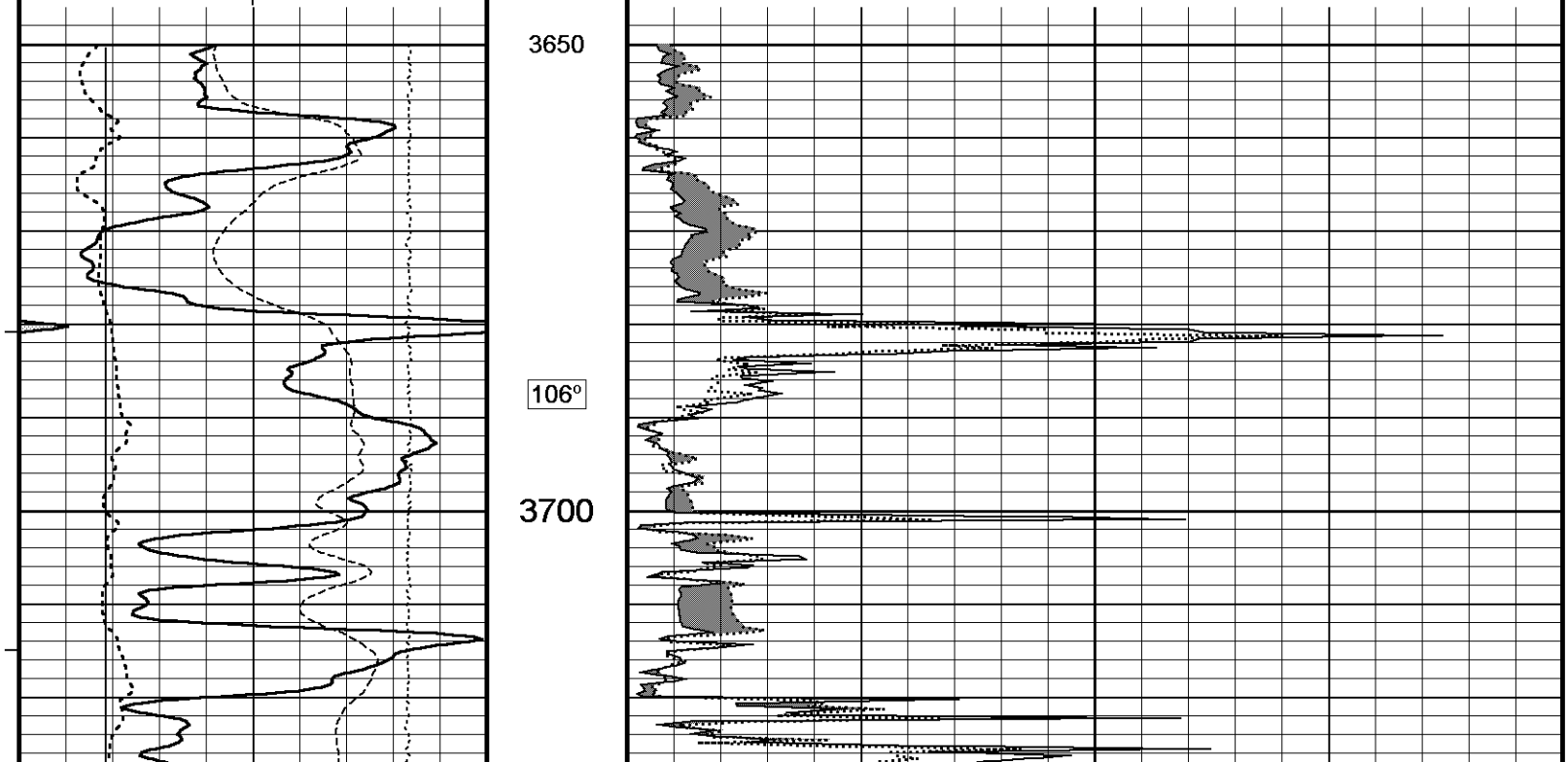
Micro-normal
ohm metres
0 10 20 30 40

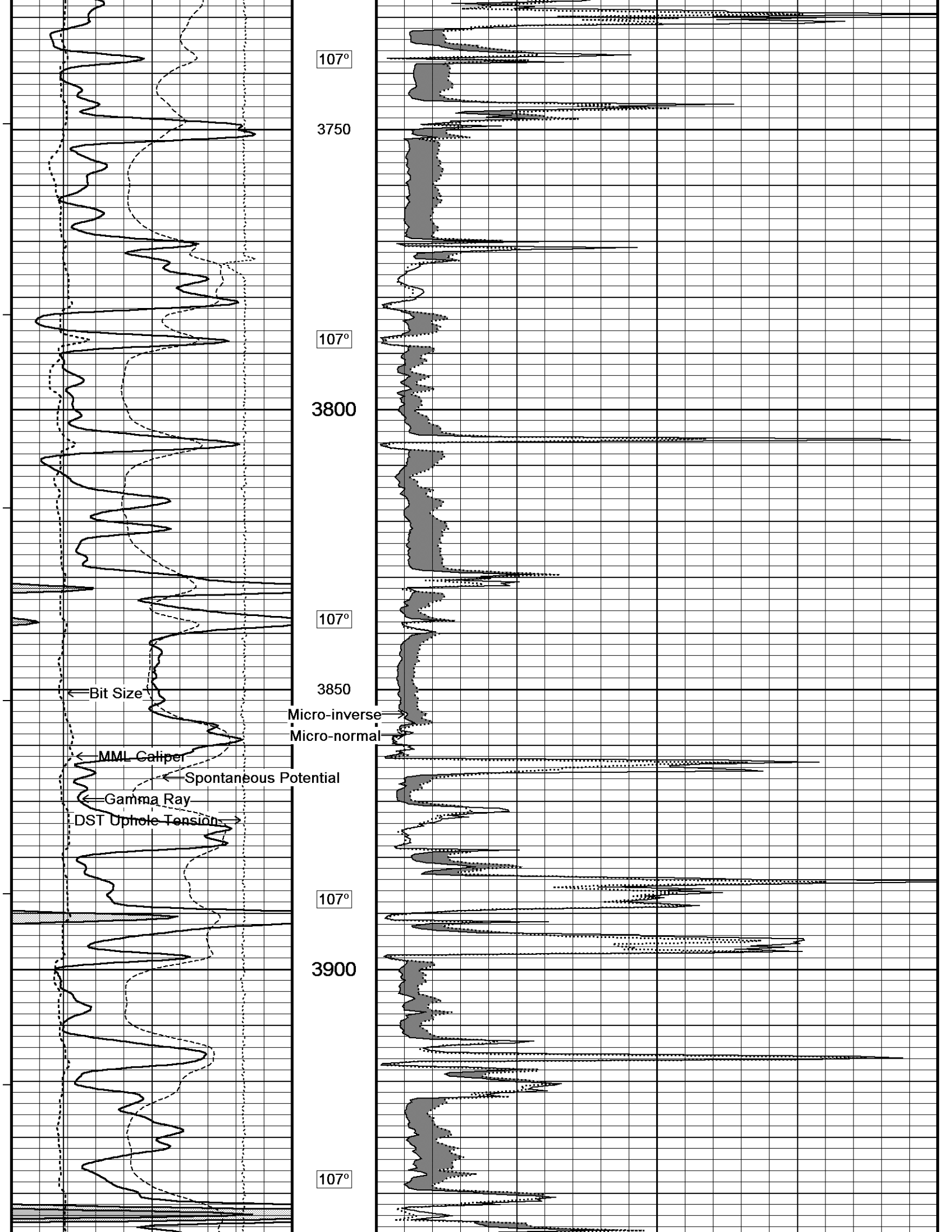
Micro-inverse
ohm metres
0 10 20 30 40

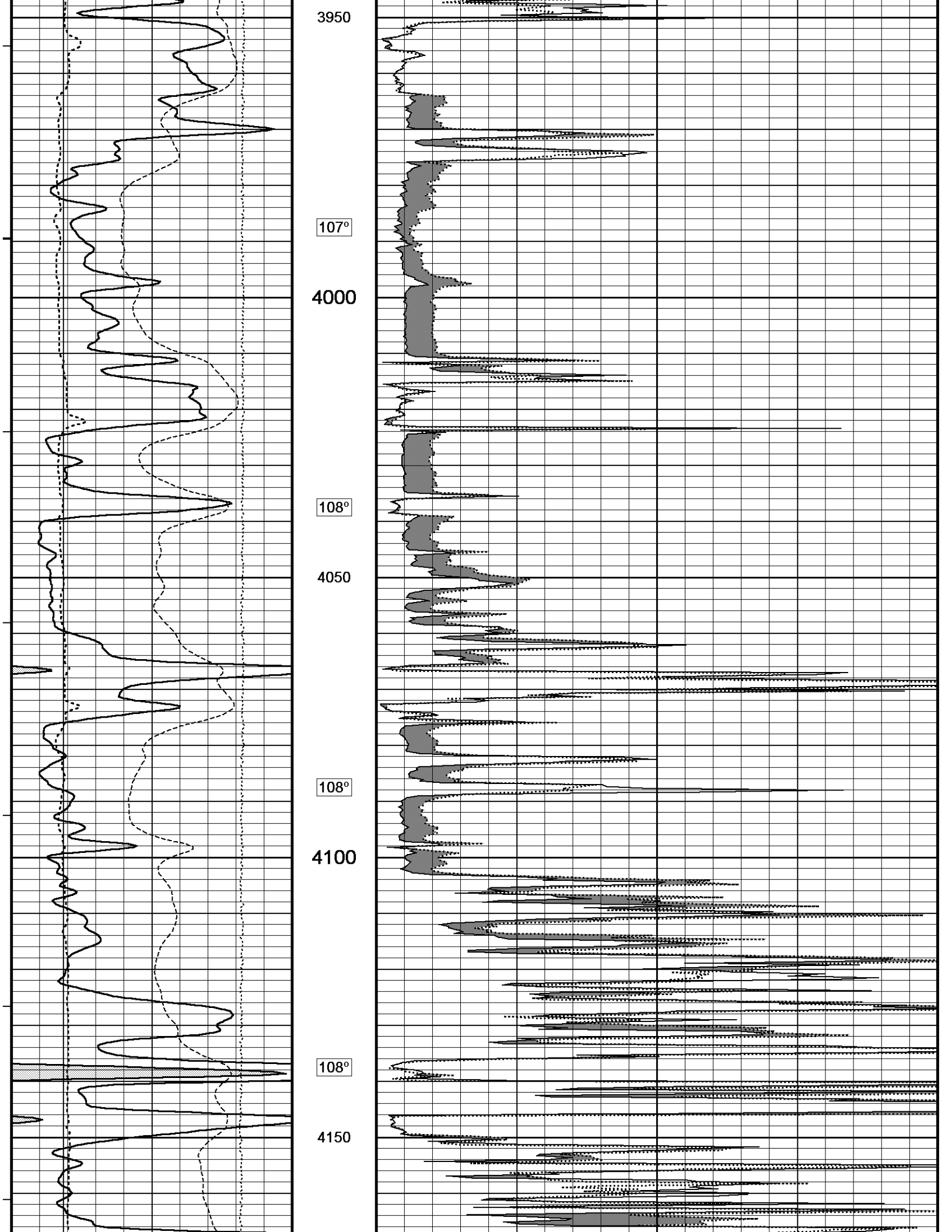
3650

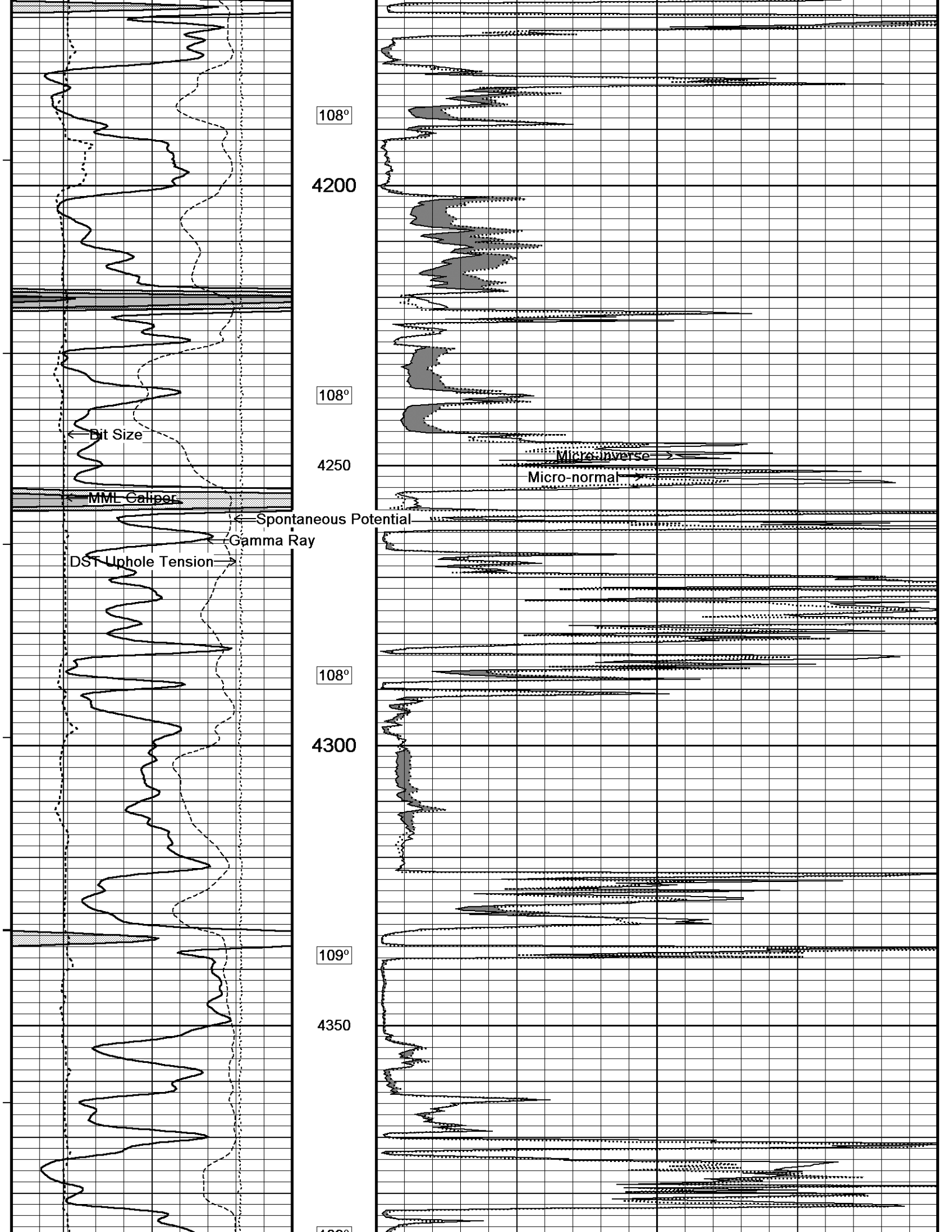
106°

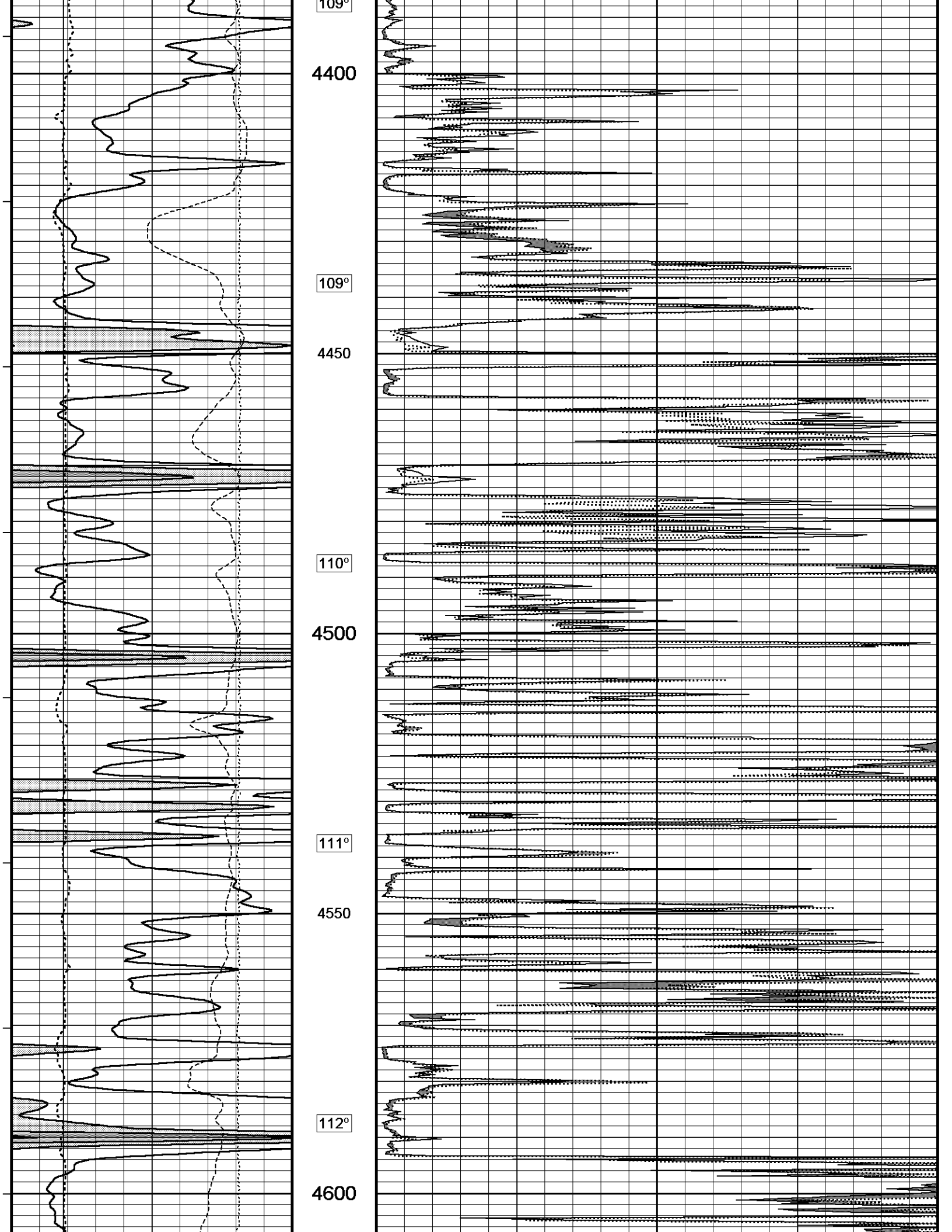
3700

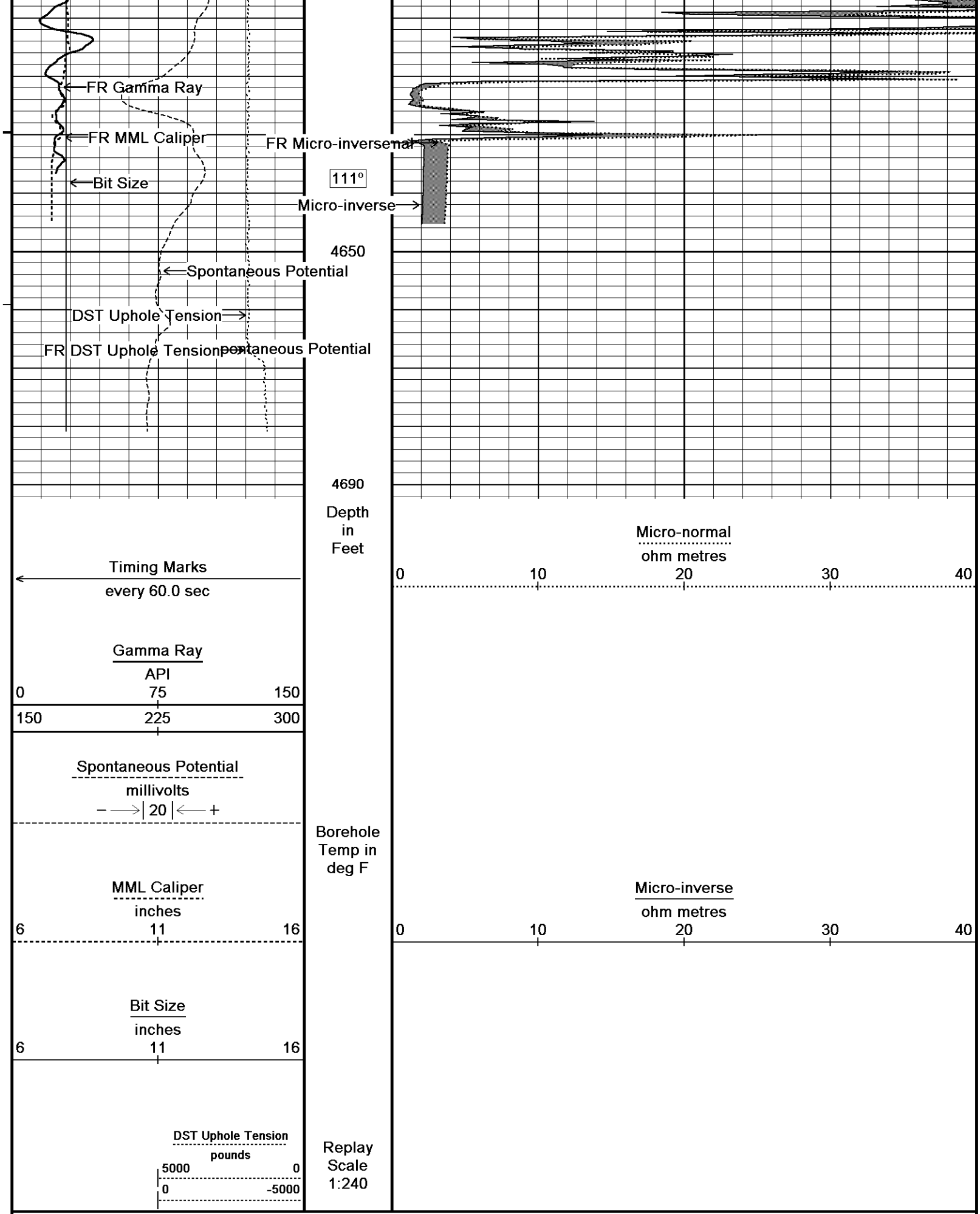



107°
3750
107°
3800
107°
3850
Bit Size
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
107°
3900
107°


3950
107°
4000
108°
4050
108°
4100
108°
4150


108°
4200
108°
Bit Size
4250
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
108°
4300
109°
4350


109°
4400
109°
4450
110°
4500
111°
4550
112°
4600



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 18-NOV-2010 13:39

Filename: C:\Minimus 11_01\Data\Grand Mesa Smith 1-34\GRAND MESA SMITH 1-34_002.dta

Recorded on 18-NOV-2010 11:35

System Versions: Logged with 11.01.2198 Plotted with 11.01.2198

5 Inch Main

Repeat Section

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 18-NOV-2010 13:39
Filename: C:\Minimus 11_01\Data\Grand Mesa Smith 1-34\GRAND MESA SMITH 1-34_001.dta
Recorded on 18-NOV-2010 11:13
System Versions: Logged with 11.01.2198 Plotted with 11.01.2198

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
− → | 20 | ← +

MML Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0
0 -5000

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:240

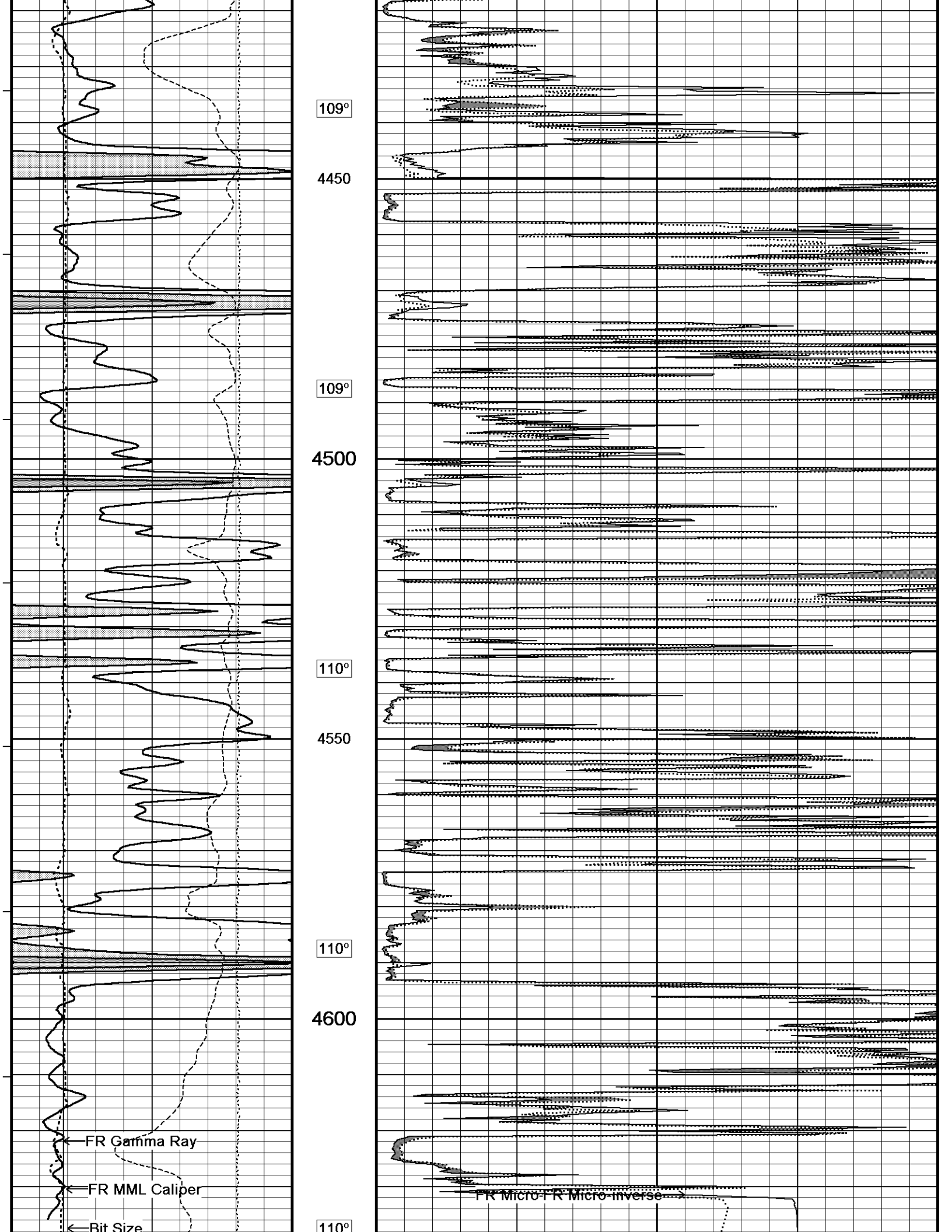
4350

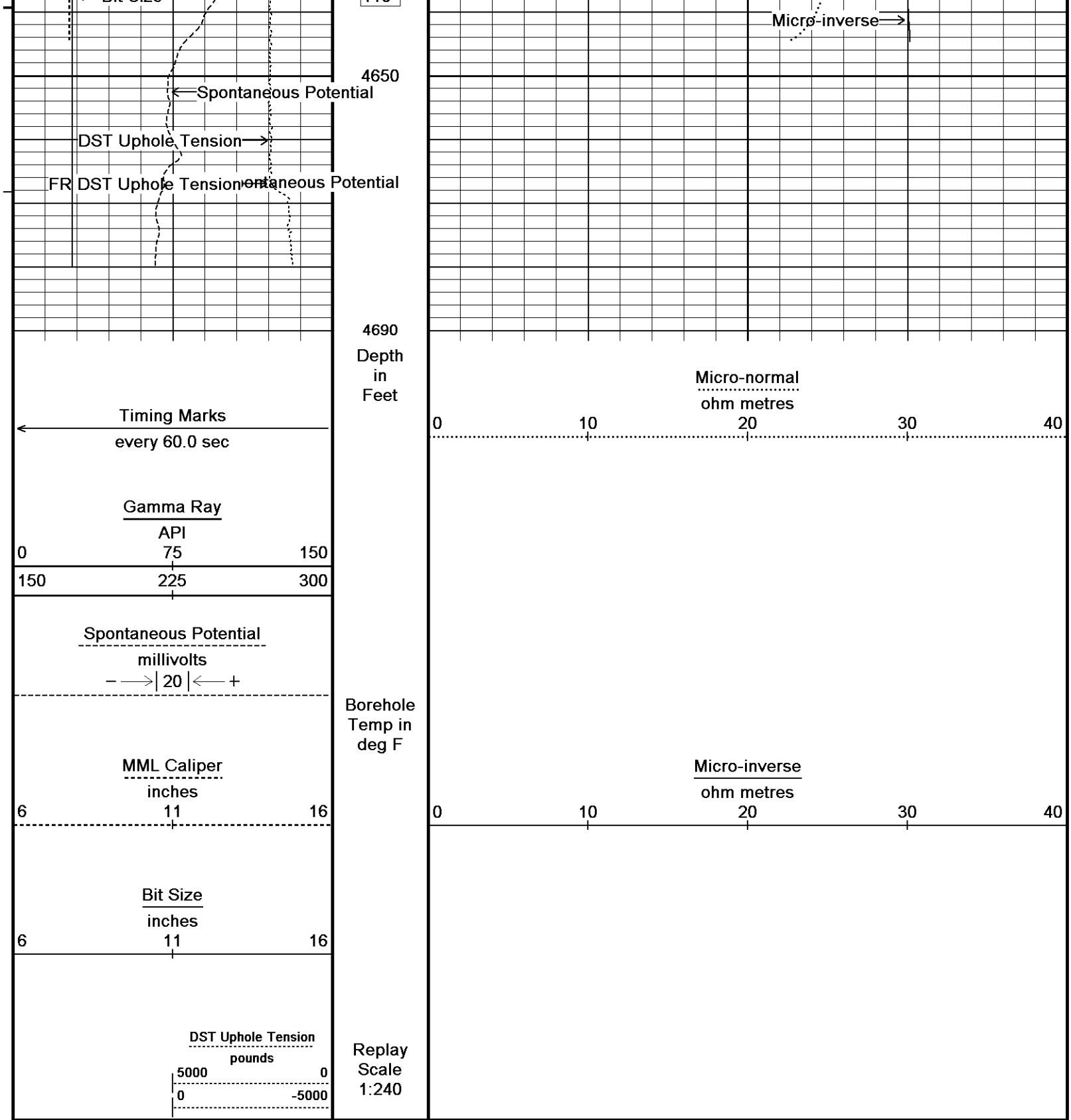
108°

4400

Micro-normal
ohm metres
0 10 20 30 40

Micro-inverse
ohm metres
0 10 20 30 40


109°
4450
109°
4500
110°
4550
110°
4600
110°
FR Gamma Ray
FR MML Caliper
Bit Size
FR Micro-FR Micro-inverse



Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 18-NOV-2010 13:39

Filename: C:\Minimus 11_01\Data\Grand Mesa Smith 1-34\GRAND MESA SMITH 1-34_001.dta
Recorded on 18-NOV-2010 11:13

System Versions: Logged with 11.01.2198 Plotted with 11.01.2198

Repeat Section

BEFORE SURVEY CALIBRATION

C:\Minimus 11_01\Data\Grand Mesa Smith 1-34\GRAND MESA SMITH 1-34.dta

General Constants All 000

Last Edited on 18-NOV-2010,10:07

General Parameters

Mud Resistivity	1.590	ohm-metres

Mud Resistivity Temperature	77.000	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	Limestone Density Por.	
Resistivity used	Array Ind. One Res Rt	
RWA Constant A	1.000	
RWA Constant M	2.000	

High Resolution Temperature Calibration MCG-B 67

Field Calibration on 06-AUG-2010,10:40

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

High Resolution Temperature Constants MCG-B 67

Last Edited on 06-AUG-2010,10:39

Pre-filter Length	11

Gamma Calibration MCG-B 67

Field Calibration on 17-NOV-2010 18:06

	Measured	Calibrated (API)
Background	63	43
Calibrator (Gross)	732	499
Calibrator (Net)	669	456

Gamma Constants MCG-B 67

Last Edited on 18-NOV-2010,09:55

Gamma Calibrator Number	grcc141	
Mud Density	1.12	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Micro Normal and Micro Inverse Calibration MML-A 4

Base Calibration on 12-NOV-2010 14:02
Field Check on 17-NOV-2010 17:56

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.1	60.1	2.6	12.8
Micro Inverse	15.6	78.3	1.7	8.4

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	32.2	32.2
Micro Inverse	16.3	16.3

Micro Normal and Micro Inverse Constants MML-A 4

Last Edited on 17-NOV-2010,17:54

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	N/A	inches

Caliper Calibration MML-A 4

Base Calibration on 12-NOV-2010 13:52
Field Calibration on 17-NOV-2010 17:57

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14910	5.96
2	18255	7.98
3	21651	9.95
4	25473	11.91
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.95	5.96

DOWNHOLE EQUIPMENT

C:\Minimus 11_01\Data\Grand Mesa Smith 1-34\GRAND MESA SMITH 1-34.dta

Compact Comms Gamma
MCG-B 67 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 4 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Neutron
MDN-A.B 41 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

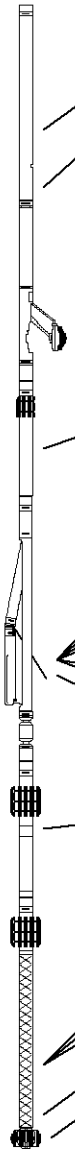
Compact Density/Caliper
MPD-B 61 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 91 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-A.A 67 LG: 6.03 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 188 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 50.30 ft Weight: 407.9 lb



45.02 ft	GRGC - Gamma Ray
42.11 ft	CGXT - MCG External Temperature
35.39 ft	MINV - Micro-inverse
35.39 ft	MNRL - Micro-normal
36.38 ft	MLTC - MML Caliper
30.59 ft	NPRL - Limestone Neutron Por.
23.35 ft	CLDC - Density Caliper
23.35 ft	AVOL - Annular Volume
23.35 ft	HVOL - Hole Volume
21.42 ft	DEN - Compensated Density
21.42 ft	DCOR - Density Correction
21.42 ft	DPRL - Limestone Density Por.
21.36 ft	PDPE - PE
13.70 ft	FEFE - Shallow FE
3.34 ft	R40O - Array Ind. One Res 40
3.34 ft	RTAO - Array Ind. One Res Rt
3.34 ft	R60O - Array Ind. One Res 60
0.23 ft	SPCG - Spontaneous Potential
Tool Zero	(0.13ft from bottom)
-0.13 ft	SMTU - DST Uphole Tension

All measurements relative to tool zero.

COMPANY	GRAND MESA OPERATING COMPANY, INC.
WELL	SMITH #1-34
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2983.00	feet	First Reading	4631.00	feet
Elevation Drill Floor	2982.00	feet	Depth Driller	4670.00	feet
Elevation Ground Level	2978.00	feet	Depth Logger	4667.00	feet

Weatherford®

MICRO RESISITIVITY LOG

40 Years of Wireline 1970 2010