



Weatherford[®]

MICRORESISTIVITY LOG

COMPANY

CHOLLA PRODUCTION, LLC.

WELL

METZGER #2-16

FIELD

UNNAMED

PROVINCE/COUNTY

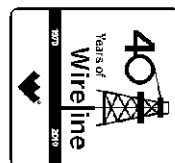
SCOTT

COUNTRY/STATE

U.S.A. / KANSAS

LOCATION

660' FSL & 660' FEL



SEC

TWP
16 19S

RGE
33W

Other Services
MPD/MDN

MAI/MFE

Permit Number

Permanent Datum G.L., Elevation 2961 feet

Log Measured From KB

Drilling Measured From K.B.

Date 27-MAR-2011

Run Number ONE

Depth Driller 4700.00 feet

Depth Logger 4700.00 feet

First Reading 4664.00 feet

Last Reading 2400.00 feet

Casing Driller 264.00 feet

Casing Logger 264.00 feet

Bit Size 7.875 inches

Hole Fluid Type CHEMICAL

Density / Viscosity 9.30 lb/USg 57.00 CP

PH / Fluid Loss 9.00 10.40 ml/30Min

Sample Source FLOWLINE

Rm @ Measured Temp 0.78 @ 73.0 ohm-m

Rmf @ Measured Temp 0.62 @ 73.0 ohm-m

Rmc @ Measured Temp 0.94 @ 73.0 ohm-m

Source Rmf / Rmc CALC CALC

Rm @ BHT 0.50 @ 115.0 ohm-m

Time Since Circulation 5 HOURS

Max Recorded Temp 115.00 deg F

Equipment Name COMPACT

Equipment / Base 13057 LIB

Recorded By L. SCOTT

Witnessed By BILL GOFF

S.O.# / JOB# 3529124

ROGER PEARSON

LB11-056

BOREHOLE RECORD

Last Edited: 27-MAR-2011 07:36

Bit Size
inches

7.875

Depth From
feet

264.00

Depth To
feet

4700.00

CASING RECORD

Type

Size
inches

8.625

Depth From
feet

0.00

Shoe Depth
feet

264.00

Weight
pounds/ft

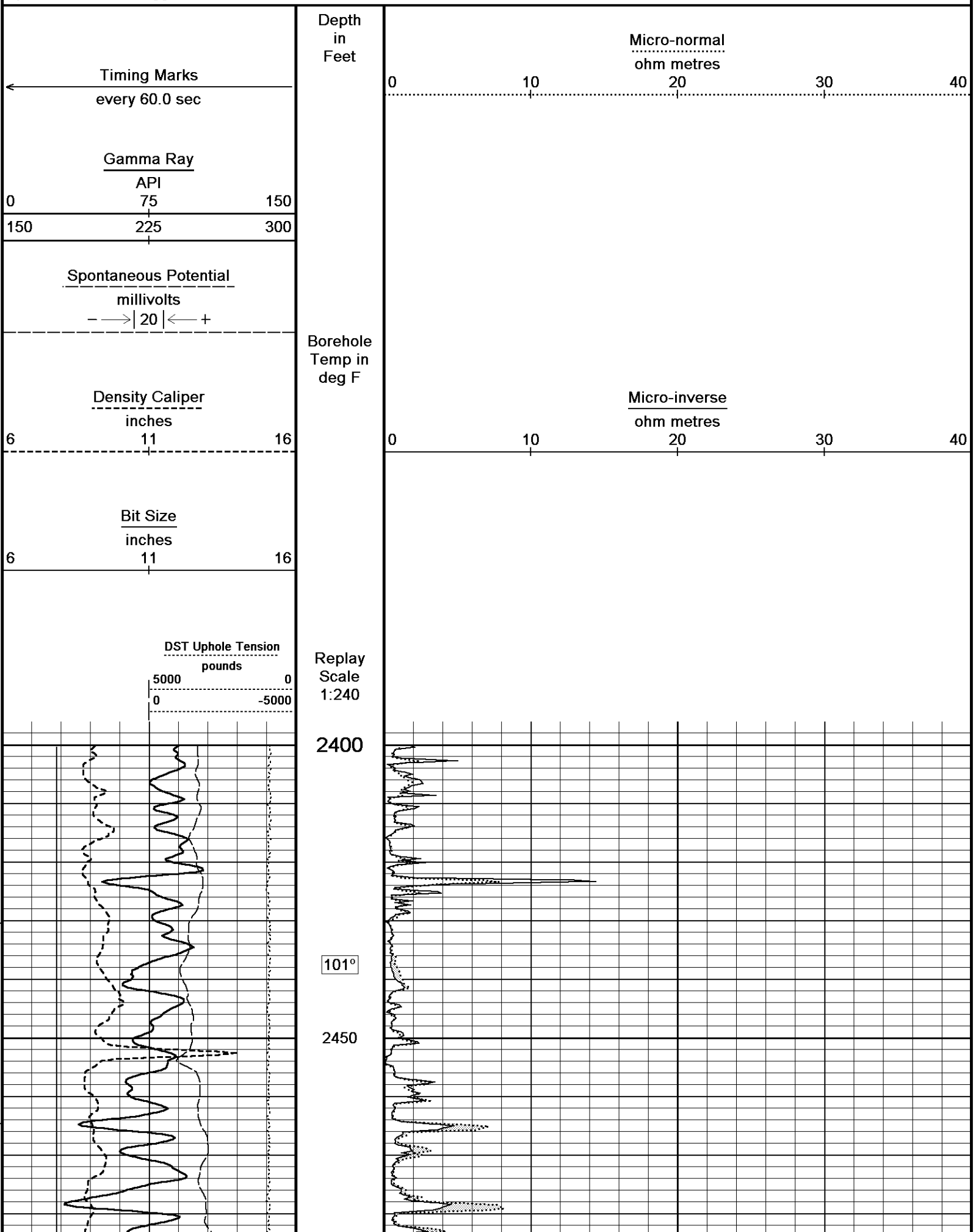
24.00

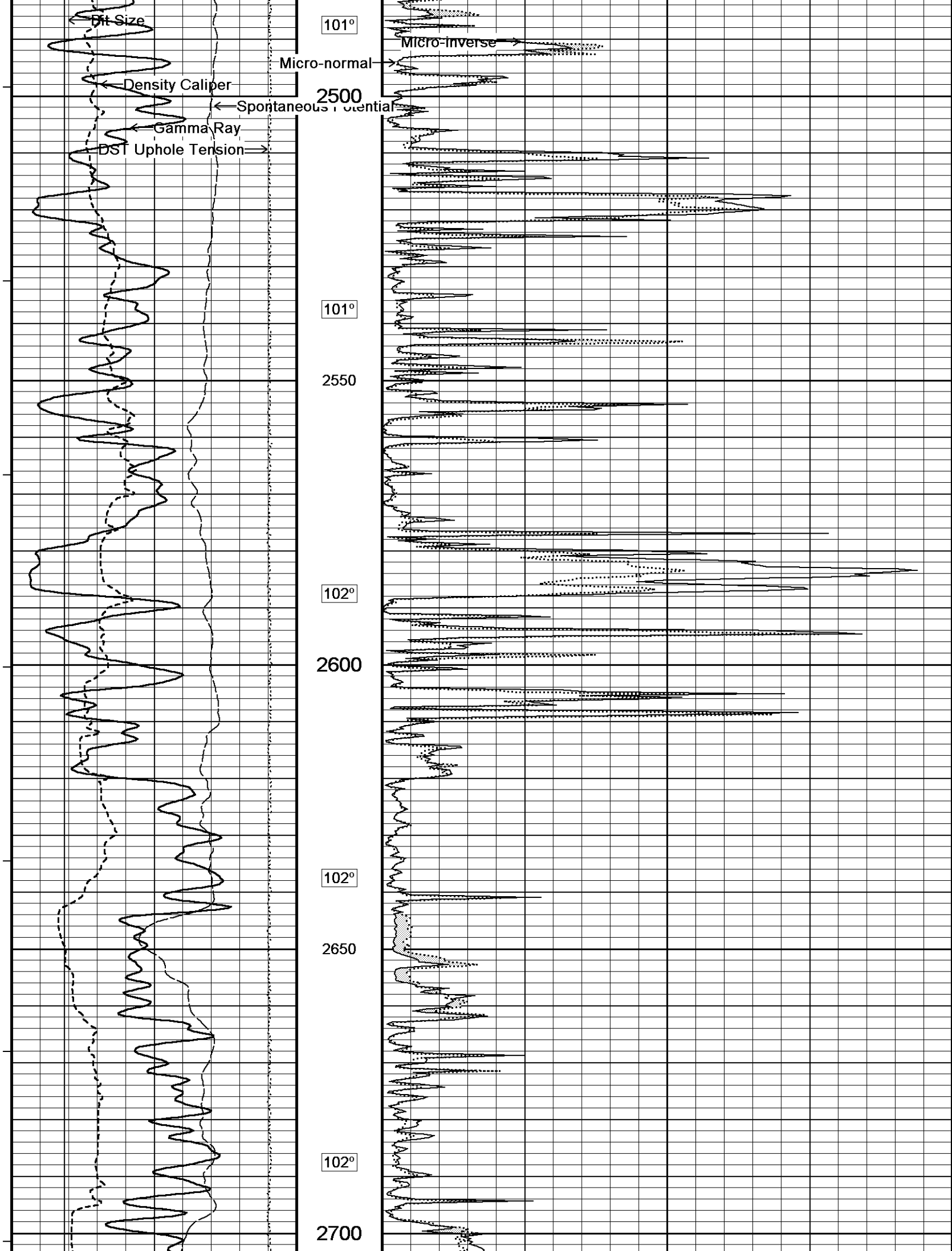
REMARKS

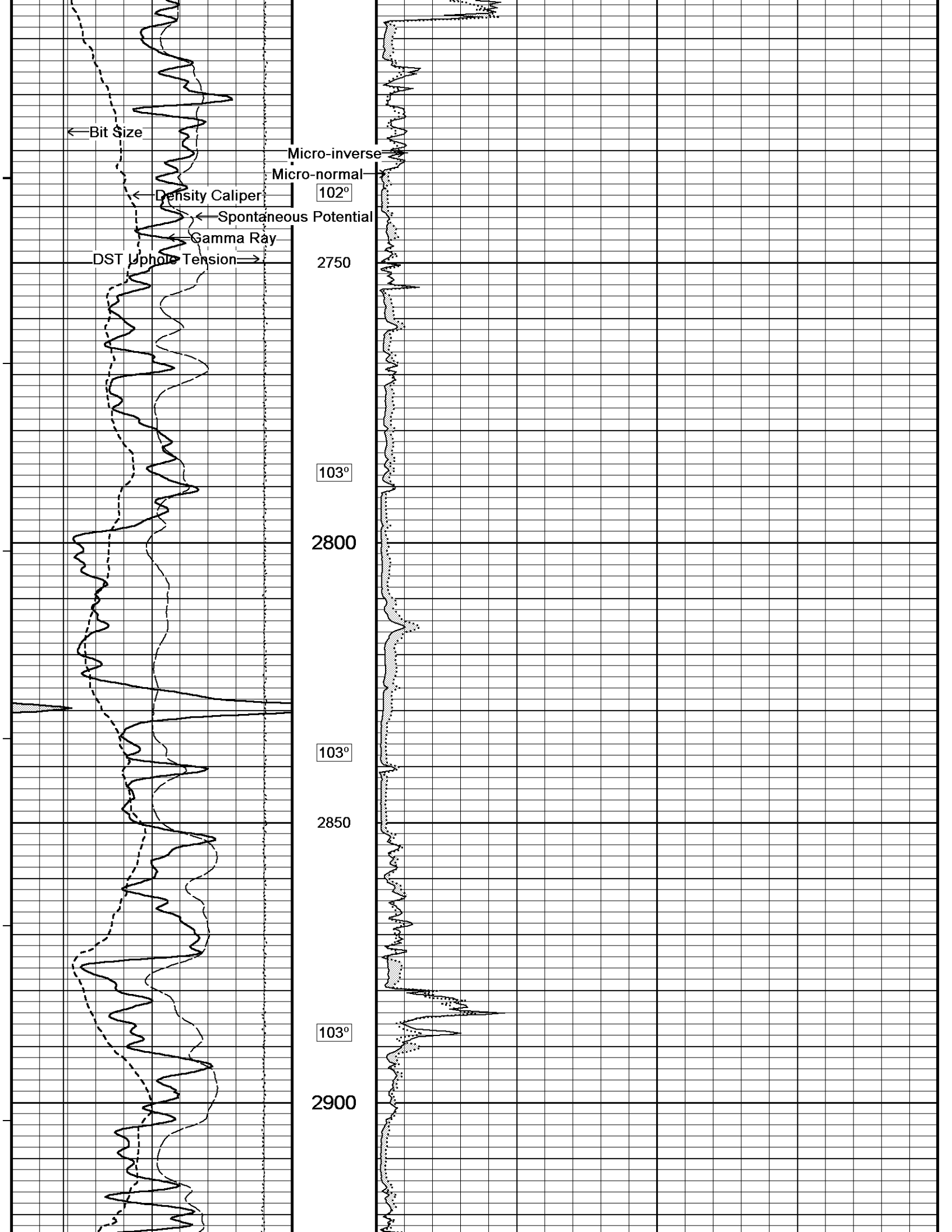
Tools Ran: MCG, MML, MDN, MPD, SKJ, MFE, MAI.
Hardware Used: MDN Dual Eccentralizer used. MPD 8 inch profile plate used. MFE and MAI 0.5 inch standoffs used.
2.71 g/cc Limestone Density Matrix used to calculate porosity.
All intervals logged and scaled per customer's request.
Annular volume with 5.5 inch production casing= 526 cu. ft.
Service order #3529124
Engineer: L. Scott
Operator(s): M. Stegman

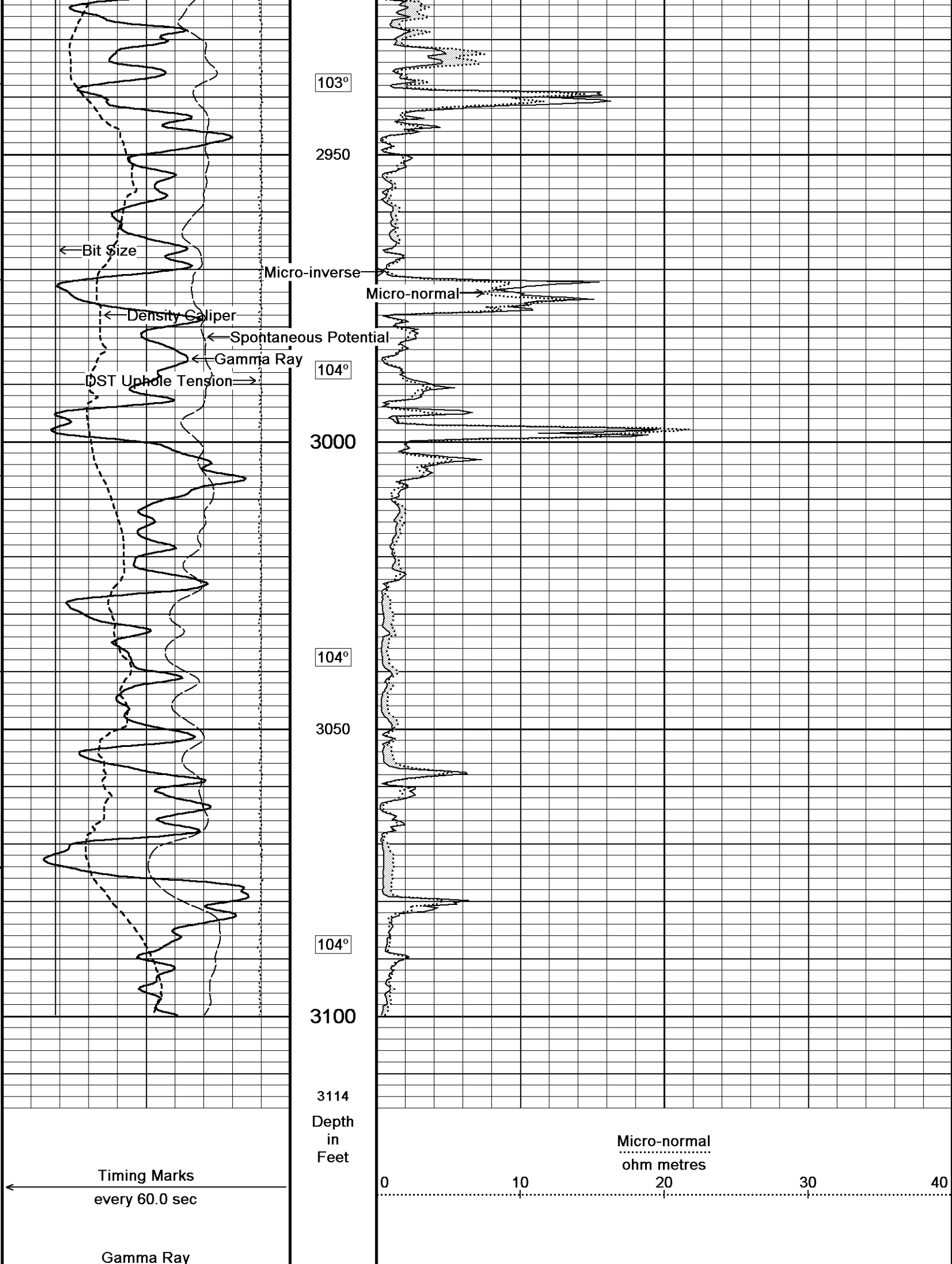
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, 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.

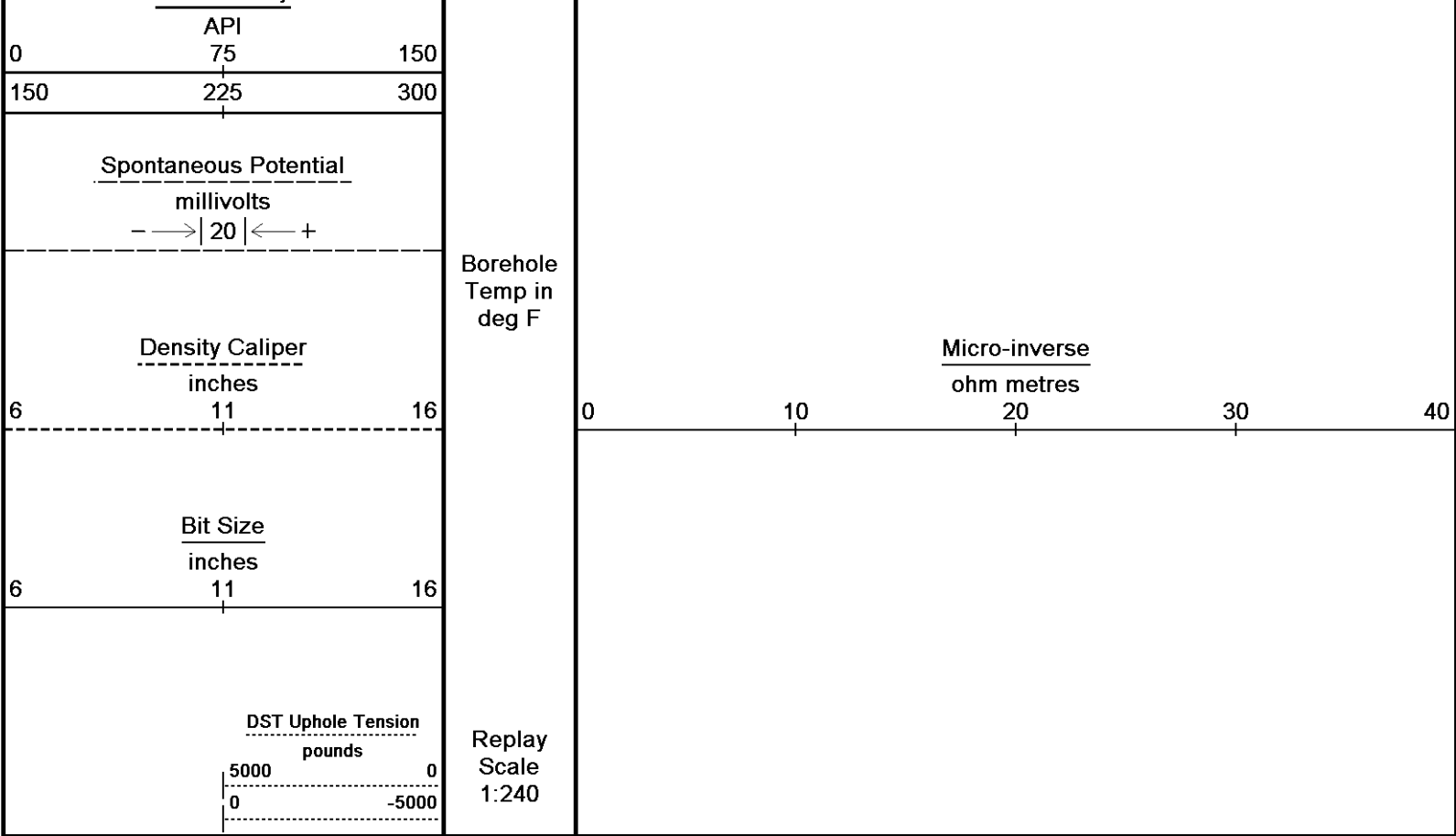












Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 27-MAR-2011 09:03

Filename: C:\Program Files\Weatherford\WLS 11.03\Data\CHOL...\CHOLLA METZGER #2-16_002.dta

Recorded on 27-MAR-2011 05:36

System Versions: Logged with 11.03.3274 Processed with 11.03.3274 Plotted with 11.03.3274



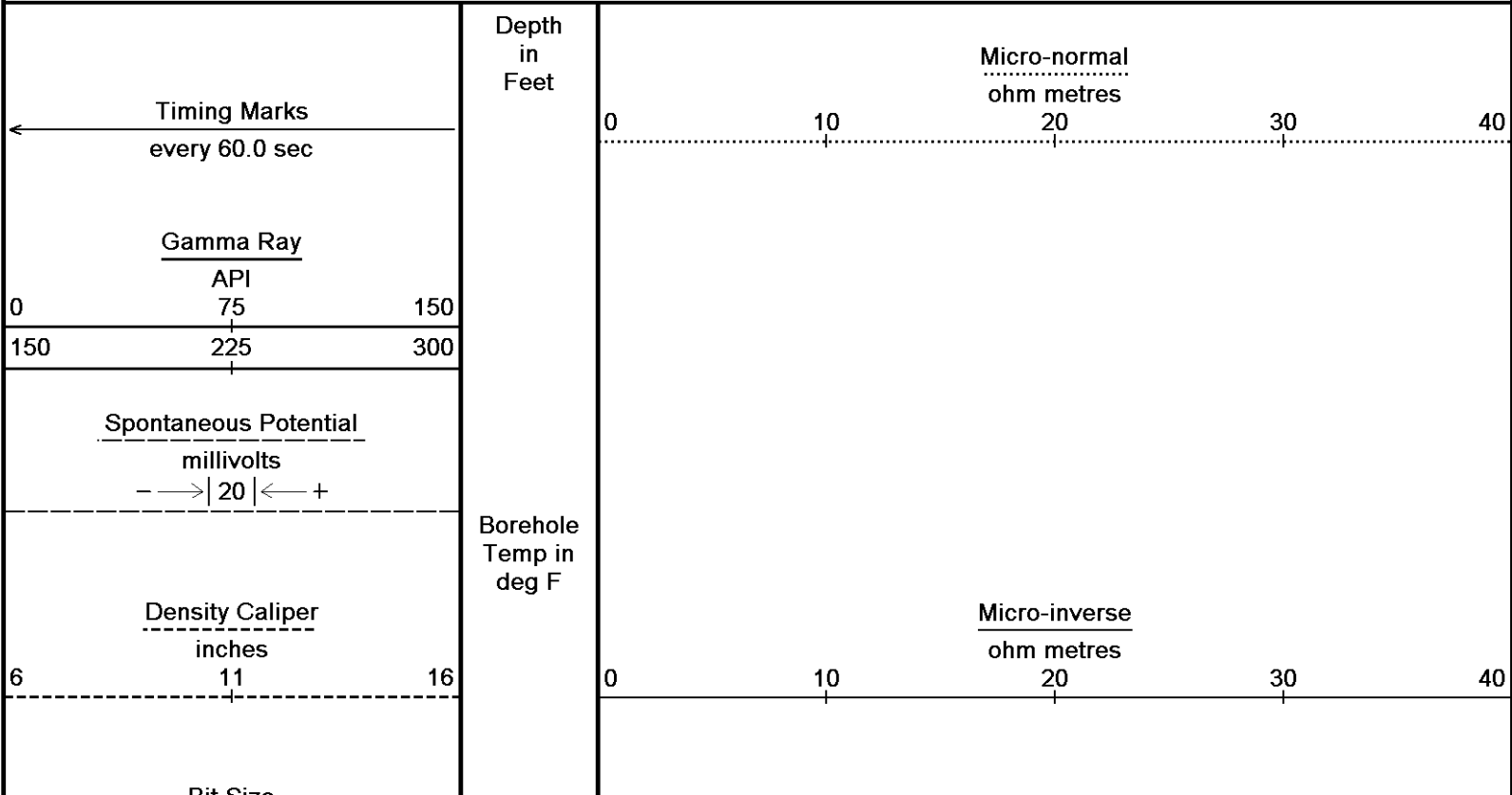
Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 27-MAR-2011 09:03

Filename: C:\Program Files\Weatherford\WLS 11.03\Data\CHOL...\CHOLLA METZGER #2-16_002.dta

Recorded on 27-MAR-2011 05:36

System Versions: Logged with 11.03.3274 Processed with 11.03.3274 Plotted with 11.03.3274



Bit Size

inches

6

11

16

DST Uphole Tension
pounds

5000

0

0

-5000

Replay
Scale
1:240

3750

109°

3800

109°

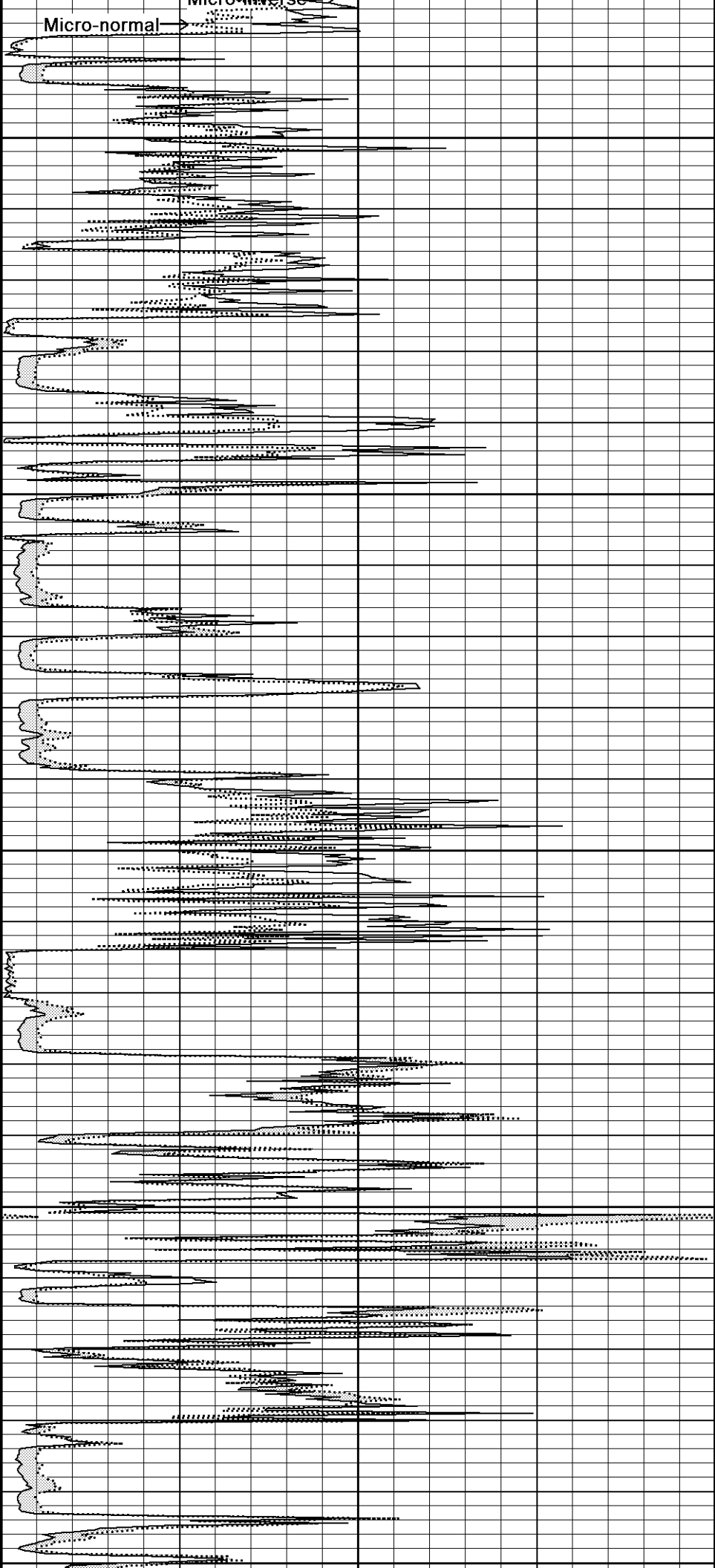
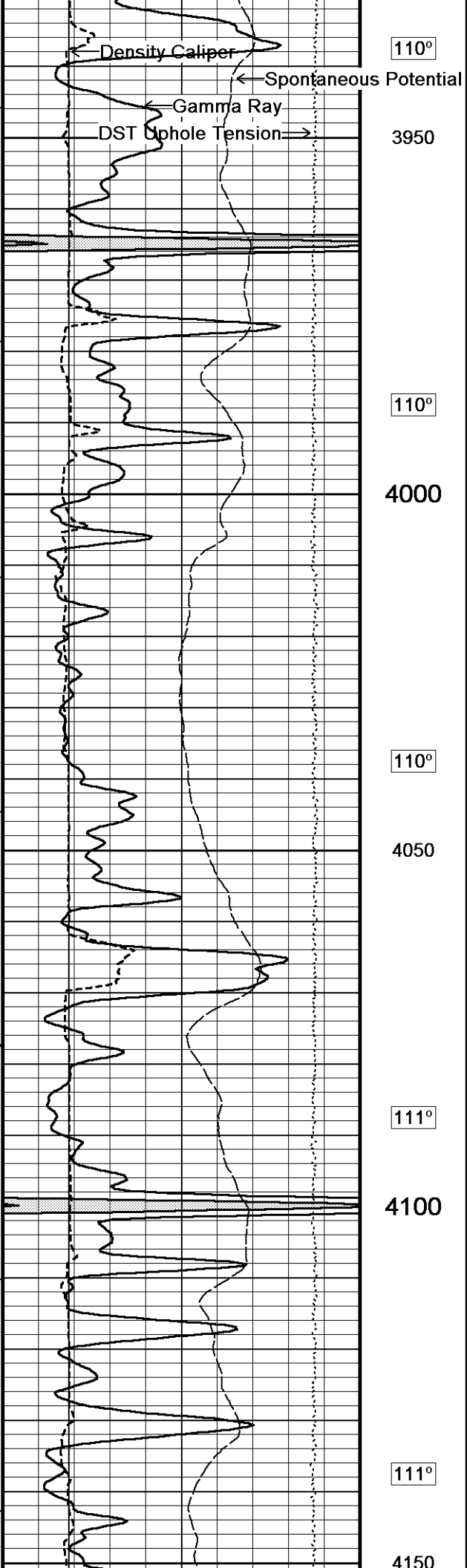
3850

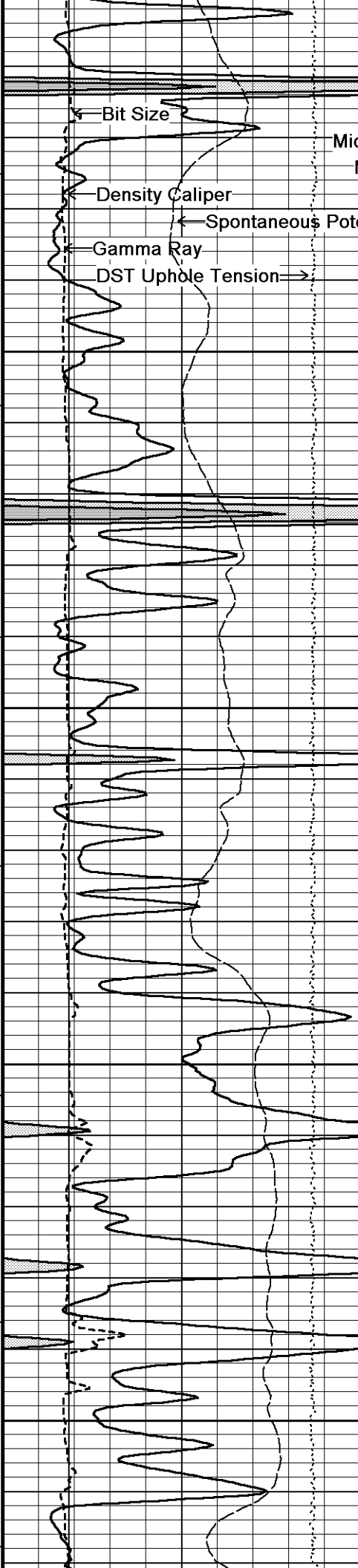
109°

3900

← Bit Size

MINI-INVEST





Micro-inverse
Micro-normal

111°

4200

112°

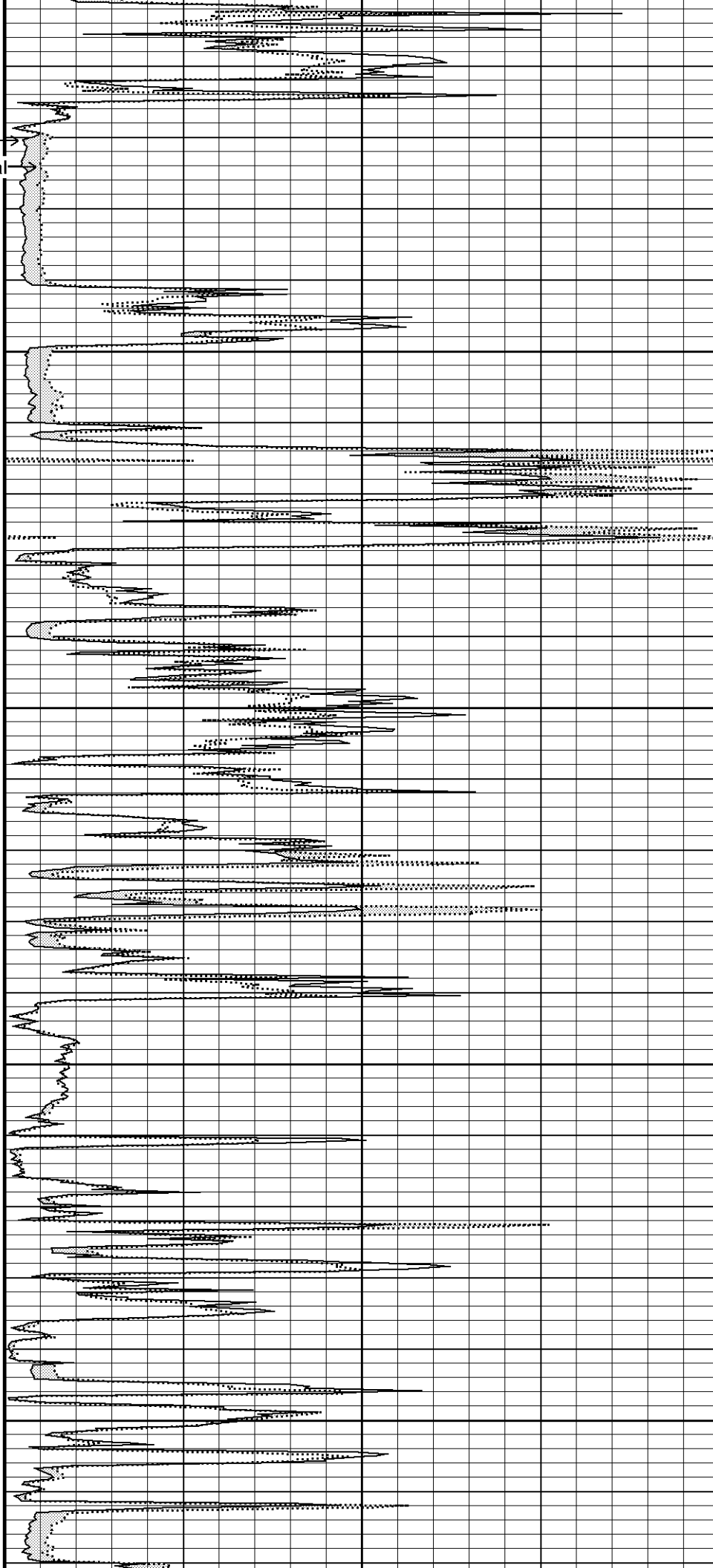
4250

112°

4300

112°

4350





113°

4400

Micro-inverse

Micro-normal

Spontaneous Potential

113°

4450

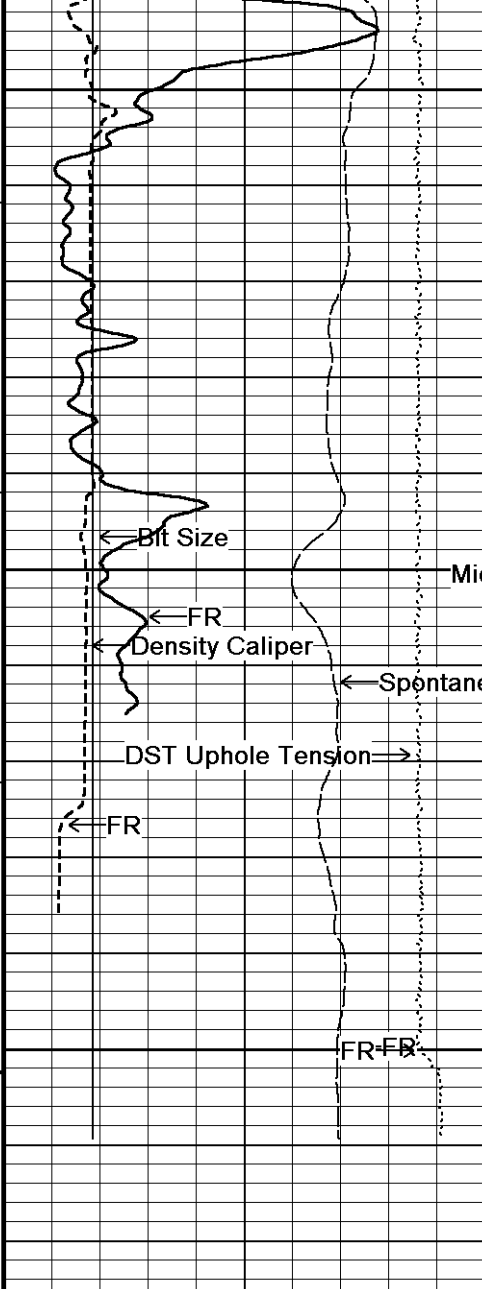
114°

4500

114°

4550

115°



4600

115°

Micro-4650se

Micro-normal

Spontaneous Potential

DST Uphole Tension

FR-FR

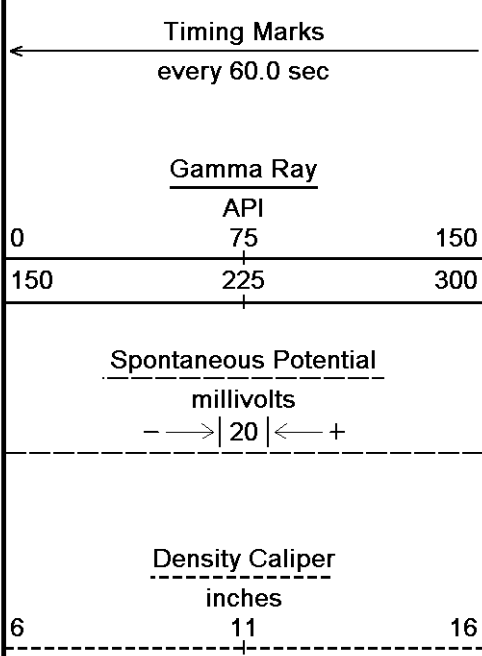
FR

FR-FR

4700

4722

Depth
in
Feet



Timing Marks
every 60.0 sec

Gamma Ray

API

0 75 150
150 225 300

Spontaneous Potential

millivolts

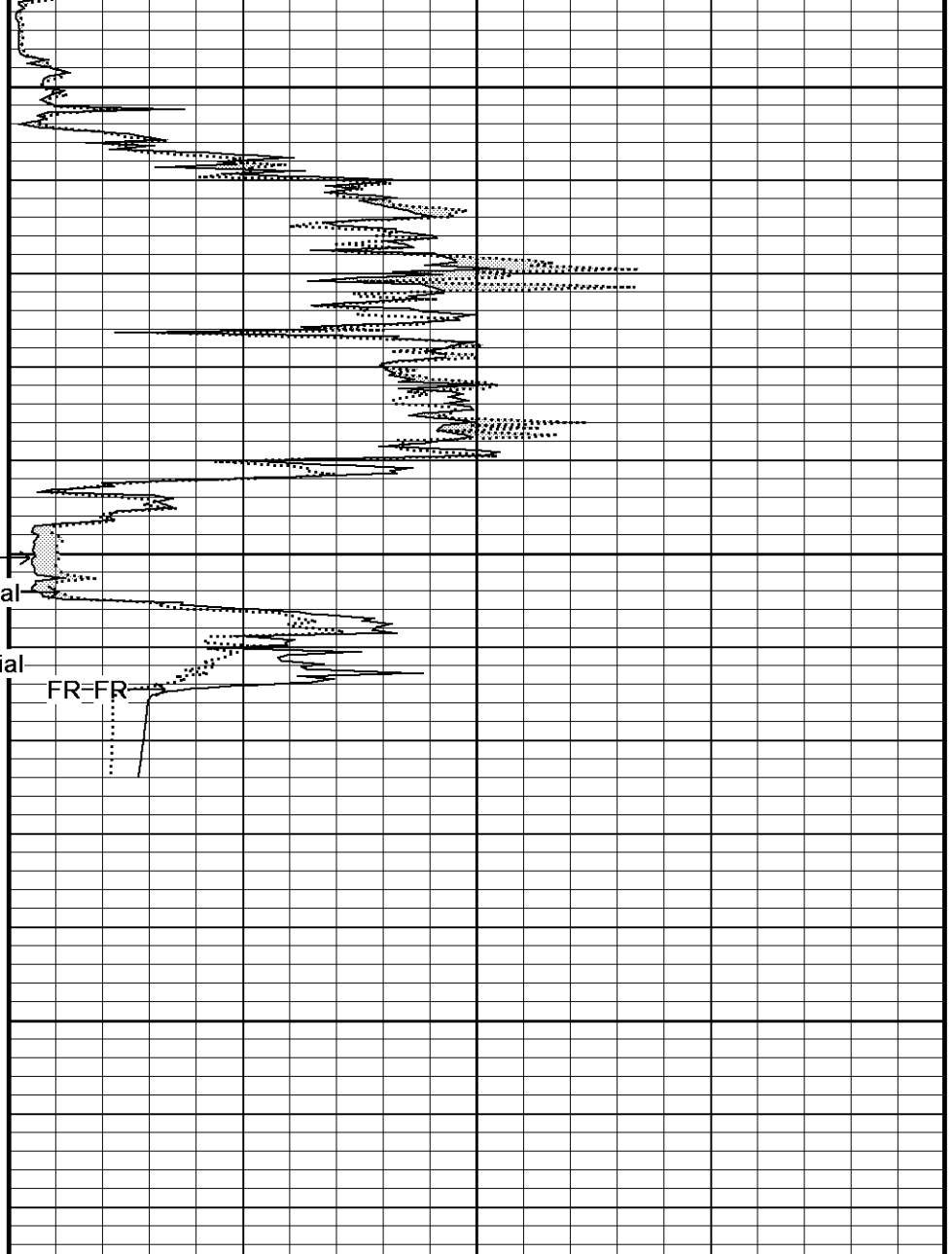
- -> | 20 | <- +

Density Caliper

inches

6 11 16

Borehole
Temp in
deg F

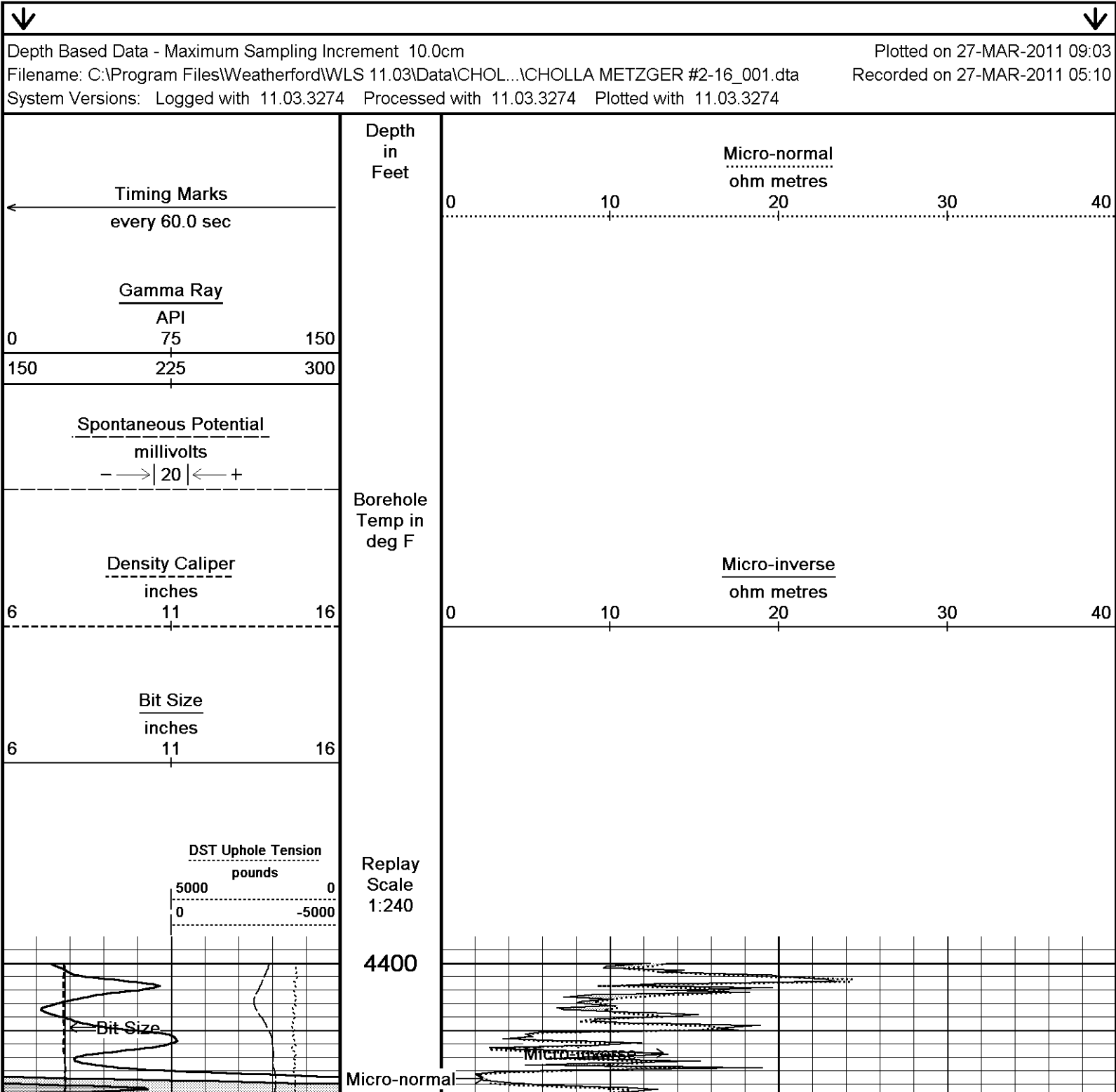
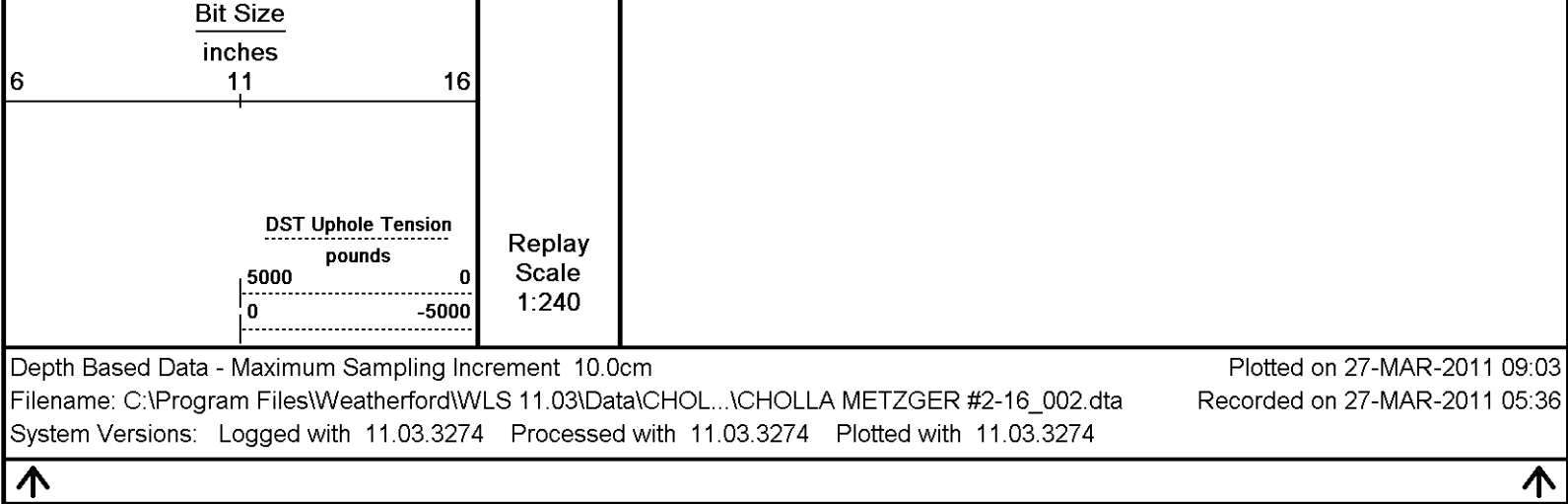


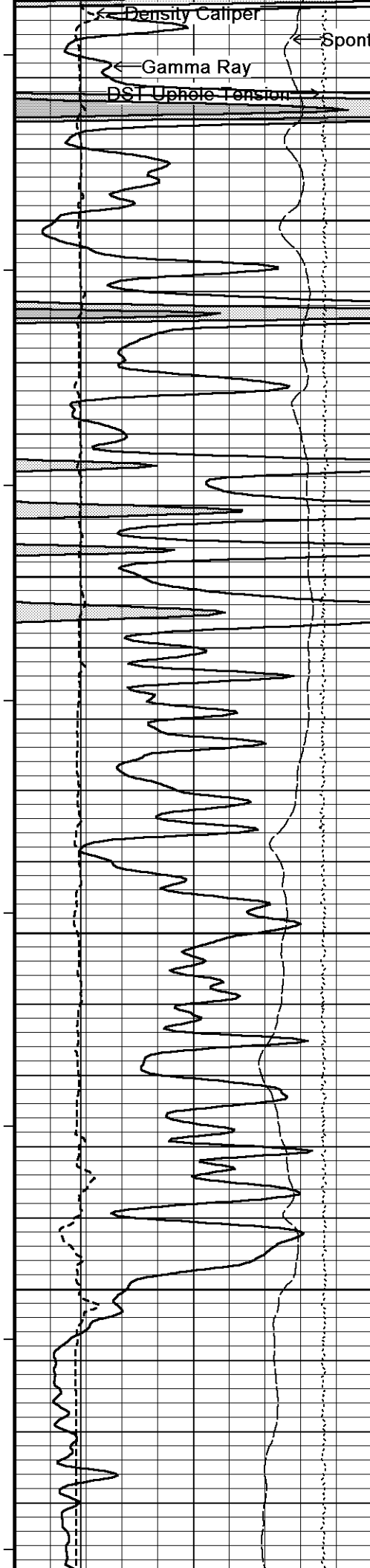
Micro-normal
ohm metres

0 10 20 30 40

Micro-inverse
ohm metres

0 10 20 30 40





113°

4450

113°

4500

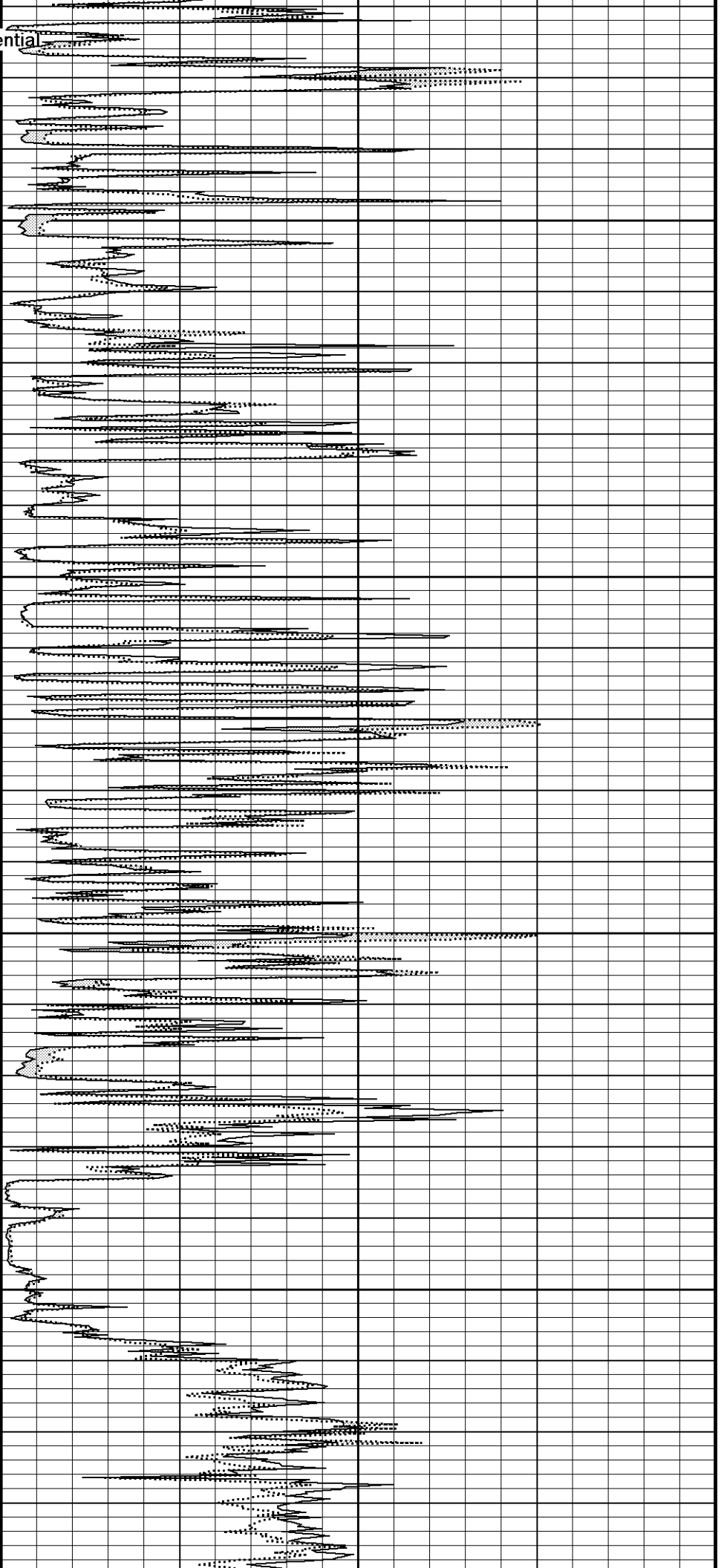
113°

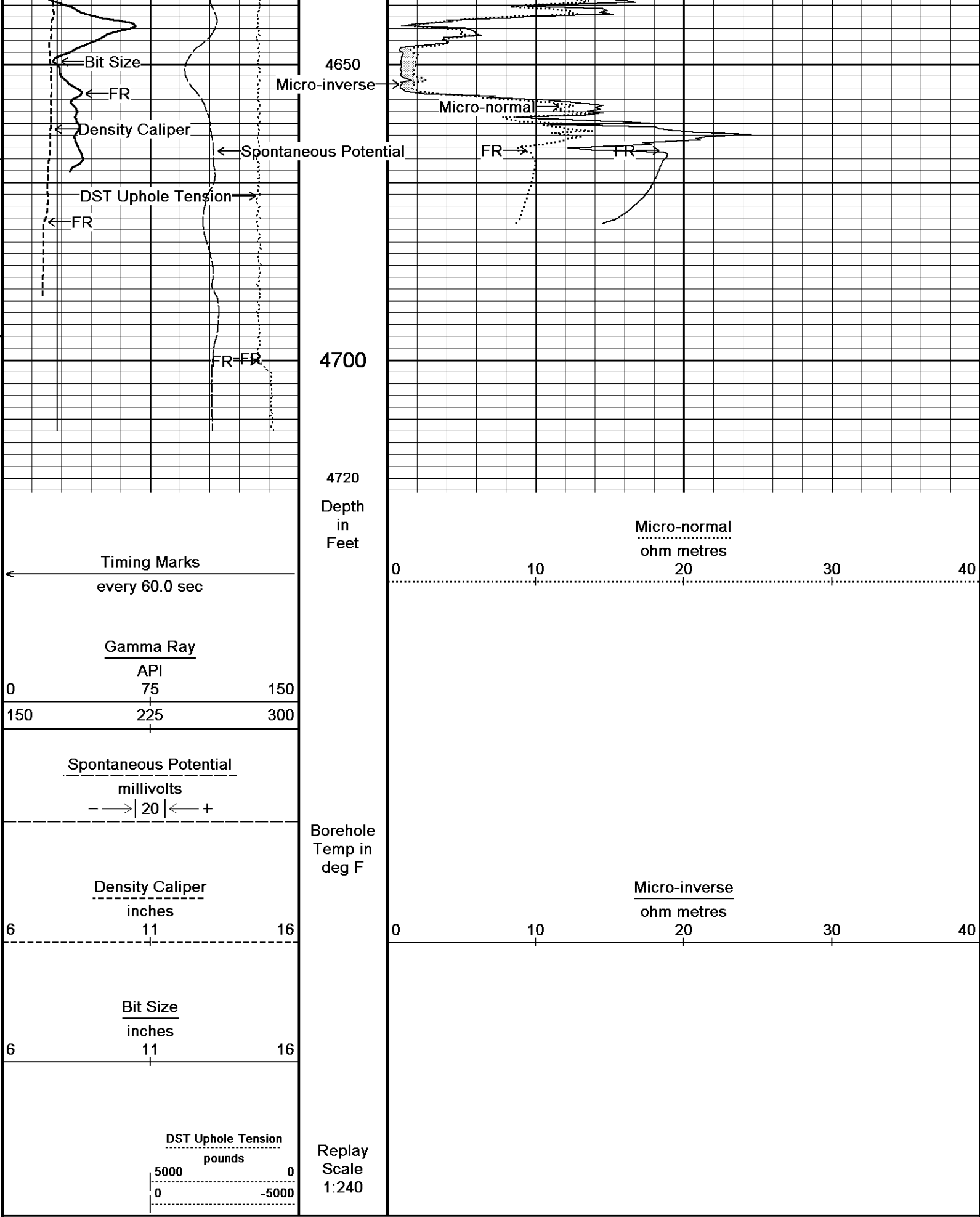
4550

114°

4600

113°





BEFORE SURVEY CALIBRATION

C:\Program Files\Weatherford\WLS 11.03\Data\CHOLLA METZGER #2-16\CHOLLA METZGER #2-16_002.dta

General Constants All 000

Last Edited on 27-MAR-2011,08:08

General Parameters

Mud Resistivity	0.780	ohm-metres
Mud Resistivity Temperature	73.000	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	None	

Rwa Parameters

Porosity used	Base Density Porosity
Resistivity used	Array Ind. One Res Rt
RWA Constant A	1.000
RWA Constant M	2.000

High Resolution Temperature Calibration MCG-B 34

Field Calibration on 19-OCT-2009,11:45

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

High Resolution Temperature Constants MCG-B 34

Last Edited on

Pre-filter Length	11
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SP Calibration MCG-B 34

Field Calibration on 9-NOV-2009,18:07

	Measured	Calibrated (mV)
Reference 1	107.7	100.0
Reference 2	-93.8	-100.0

Gamma Calibration MCG-B 34

Field Calibration on 26-MAR-2011 18:43

	Measured	Calibrated (API)
Background	64	45
Calibrator (Gross)	1107	770
Calibrator (Net)	1043	725

Gamma Constants MCG-B 34

Last Edited on 27-MAR-2011,02:41

Gamma Calibrator Number	grc38	
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 07-JAN-2011 11:32

Field Check on 26-MAR-2011 18:45

Base Calibration

		Measured	Calibrated (ohm-m)
Channel	Resistor 1	Resistor 2	Resistor 1 Resistor 2
Micro Normal	12.2	60.2	2.6 12.8
Micro Inverse	15.7	78.4	1.7 8.4

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	32.1	32.1
Micro Inverse	16.3	16.3

Micro Normal and Micro Inverse Constants MML-A 4

Last Edited on 23-MAR-2011,04:07

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159
Micro Normal K Factor	0.5110

Micro Normal K Factor	0.3110	
Micro Inverse K Factor	0.3380	
Standoff Offset	N/A	inches

Caliper Calibration MML-A 4

Base Calibration on 07-JAN-2011 11:28
Field Calibration on 26-MAR-2011 18:53

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14856	5.96
2	18273	7.98
3	21730	9.95
4	25542	11.91
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.96	5.98

Neutron Calibration MDN-A.B 65

Base Calibration on 17-JAN-2011 15:12
Field Check on 26-MAR-2011 18:50

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3079	97	3714	110
Ratio	31.797		33.764	

Field Calibrator at Base

	Calibrated (cps)
	1654 2338
Ratio	0.708

Field Check

	Calibrated (cps)
	1667 2368
Ratio	0.704

Neutron Constants MDN-A.B 65

Last Edited on 27-MAR-2011,02:41

Neutron Source Id	757	
Neutron Jig Number	5824NE	
Epithermal Neutron	No	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.12	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	MCG External Temperature	
Temperature	N/A	degrees F
Mud Salinity	0.00	kppm
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 17-JAN-2011 13:58
Field Check on 26-MAR-2011 18:36

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	954.8	126.8

Base Check	281.8
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Field Check	281.2
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FE Constants MFE-A.A 55

Last Edited on 27-MAR-2011,08:11

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		0.5	inches
Stand-off				
High Resolution Temperature Calibration MAI-A.A 178				Field Calibration on 28-MAR-2010,00:50
	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			
Induction Calibration MAI-A.A 178				Base Calibration on 17-JAN-2011,15:37 Field Check on 26-MAR-2011 18:27
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	0.0	0.0	11.6	3763.3
2	0.0	0.0	29.5	3467.3
3	0.0	0.0	27.1	3015.6
4	0.0	0.0	18.7	2064.3
Deep	0.0	0.0	15.7	1996.1
Medium	0.0	0.0	40.3	3958.3
Shallow	0.0	0.0	45.5	5082.3
Array Temperature	0.0		61.5	Deg F
Induction Constants MAI-A.A 178				Last Edited on 27-MAR-2011,08:10
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	

Caliper Calibration MPD-B 65			Base Calibration on 26-MAR-2011 21:35
Base Calibration			Field Calibration on 26-MAR-2011 21:36
Reading No	Measured	Calibrator Size (in)	
1	13025	3.99	
2	21664	5.98	
3	30144	7.97	
4	38507	9.86	
5	47728	11.92	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	5.95	5.98	

[illegible]

DOWNHOLE EQUIPMENT

C:\Program Files\Weatherford\WLS 11.03\Data\CHOLLA METZGER #2-16\CHOLLA METZGER #2-16_002.dta

Compact Comms Gamma
MCG-B 34 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 65 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

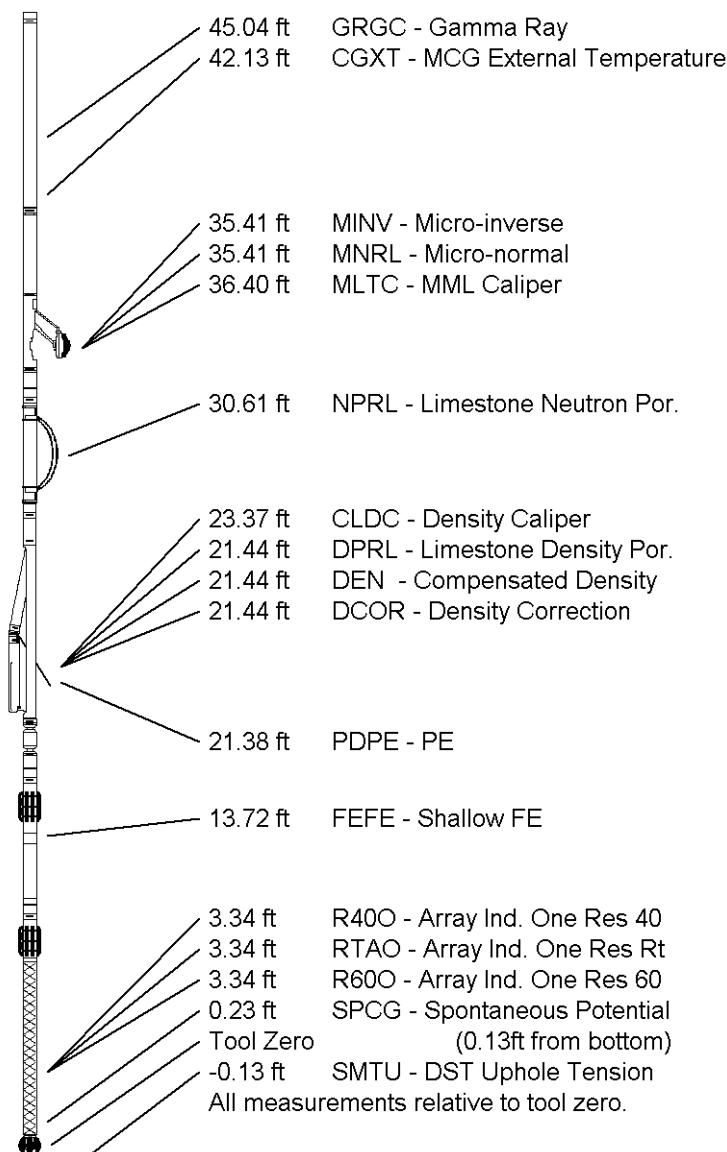
Compact Density/Caliper
MPD-B 65 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 37 LG: 2.17 ft WT: 24.3 lb OD: 2.24 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: 50.32 ft Weight: 407.9 lb



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WELL	METZGER #2-16
FIELD	UNNAMED
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2966.00	feet	First Reading	4664.00	feet
Elevation Drill Floor	2965.00	feet	Depth Driller	4700.00	feet
Elevation Ground Level	2961.00	feet	Depth Logger	4700.00	feet



Weatherford®

MICRORESISTIVITY LOG

