



Weatherford

MICRORESISTIVITY LOG

COMPANY GRAND MESA OPERATING COMPANY

WELL Q-B #1-17

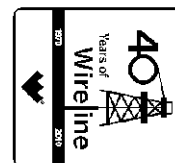
FIELD WILDCAT

PROVINCE/COUNTY GOVE

COUNTRY/STATE U.S.A. / KANSAS

LOCATION 1477' FNL & 2519' FWL

NE NE SE NW



SEC 17 TWP 11S RGE 26W Other Services MPD/MDN MAI/MFE

API Number 15-063-21990

MSS

Permit Number

Permanent Datum G.L., Elevation 2644 feet

Log Measured From KB

Drilling Measured From K.B.

Elevations: KB 2649.00 DF 2648.00 GL 2644.00

Date 20-MAY-2012

Run Number ONE

Depth Driller 4632.00 feet

Depth Logger 4633.00 feet

First Reading 4587.00 feet

Last Reading 3600.00 feet

Casing Driller 260.00 feet

Casing Logger 260.00 feet

Bit Size 7.875 inches

Hole Fluid Type CHEMICAL

Density / Viscosity 9.20 lb/USg 50.00 CP

PH / Fluid Loss 9.50 8.80 ml/30Min

Sample Source FLOWLINE

Rm @ Measured Temp 0.88 @ 93.0 ohm-m

Rmf @ Measured Temp 0.70 @ 93.0 ohm-m

Rmc @ Measured Temp 1.06 @ 93.0 ohm-m

Source Rmf / Rmc CALC CALC

Rm @ BHT 0.68 @ 120.0 ohm-m

Time Since Circulation 4 HOURS

Max Recorded Temp 120.00 deg F

Equipment Name COMPACT

Equipment / Base 13057 LIB

Recorded By L. SCOTT

Witnessed By JOHN GOLDSMITH

S.O.# / JOB# 3534580

STEVE STRIBLING

LB12-130

BOREHOLE RECORD

Last Edited: 20-MAY-2012 14:40

Bit Size inches

7.875

Depth From feet

260.00

Depth To feet

4633.00

CASING RECORD

Type

Size inches

8.625

Depth From feet

0.00

Shoe Depth feet

260.00

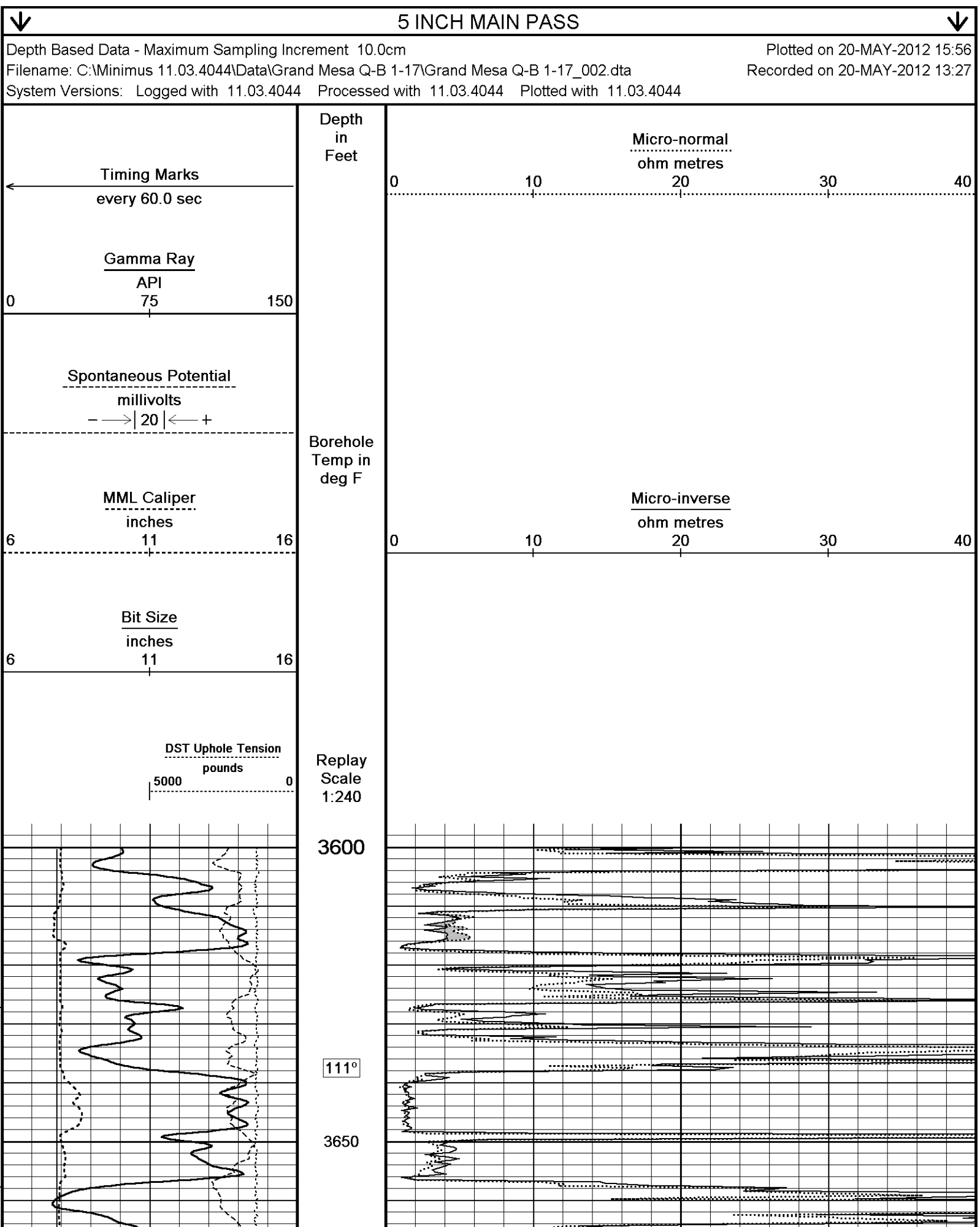
Weight pounds/ft

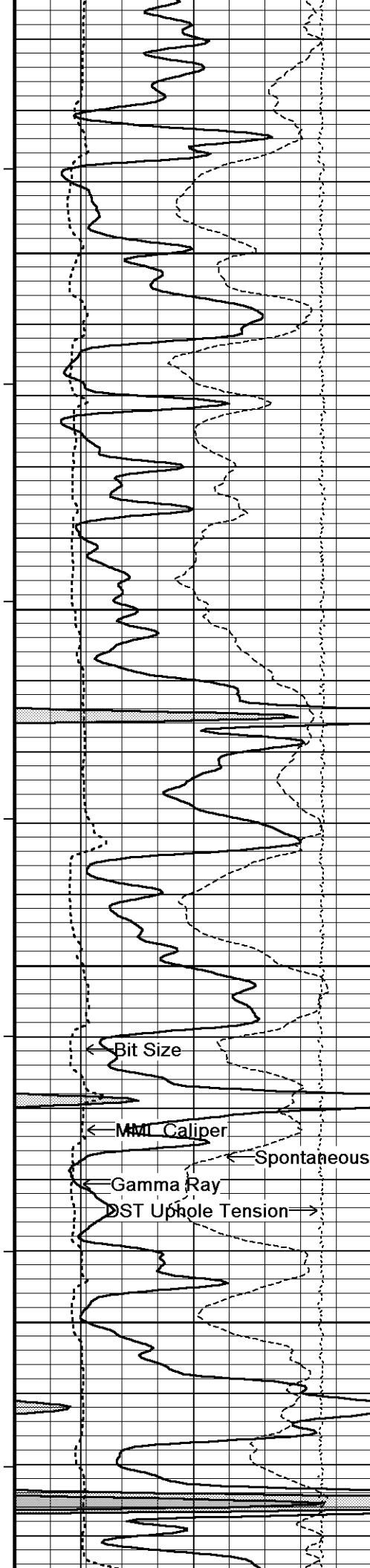
24.00

REMARKS

Tools Ran: MCG, MML, MDN, MPD, MFE, MSS, MAI.
Hardware Used: MDN Dual Eccentralizer used. MPD 8 inch profile plate used.
MFE: 0.5 inch Standoff = 1
MAI: 0.5 inch Standoff = 1
MSS: 0.5 inch Standoffs = 2
2.71 g/cc Limestone Density Matrix used to calculate porosity.
Sonic porosity calculated using (47.5usec/ft) Limestone scale.
All intervals logged and scaled per customer's request.
Annular volume with 5.5 inch production casing= 185 cu. ft.
Total hole volume from TD to surface casing= 1844 cu. ft.
Service order: #3534580
Rig: Murfin #24
Engineer: L. Scott
Operator(s): B. Johnson

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





111°

3700

111°

3750

112°

3800

112°

3850

← Bit Size

← MML Caliper

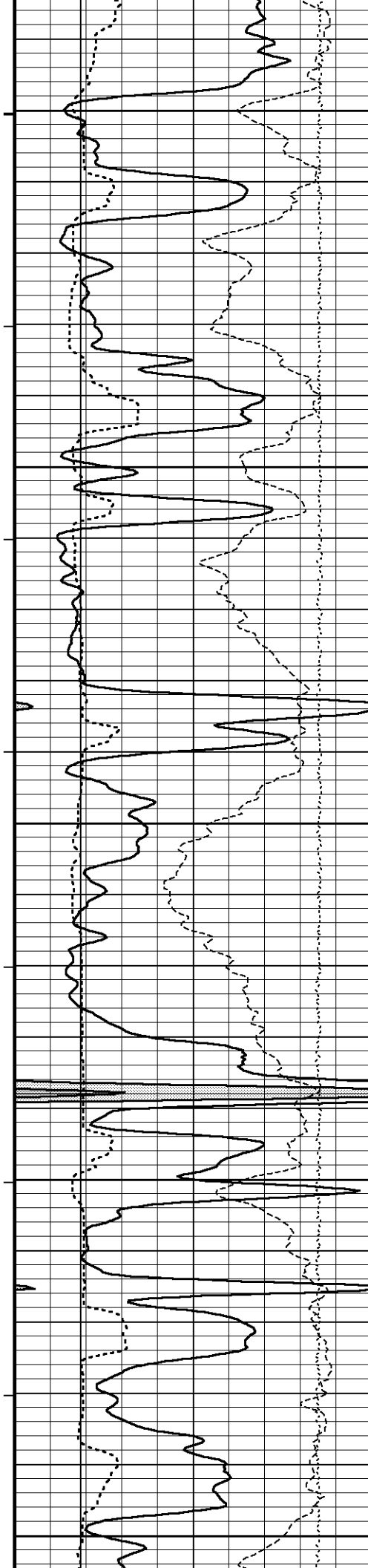
← Gamma Ray

← DST Uphole Tension →

← Spontaneous Potential

Micro-normal →

Micro-inverse →



112°

3900

113°

3950

113°

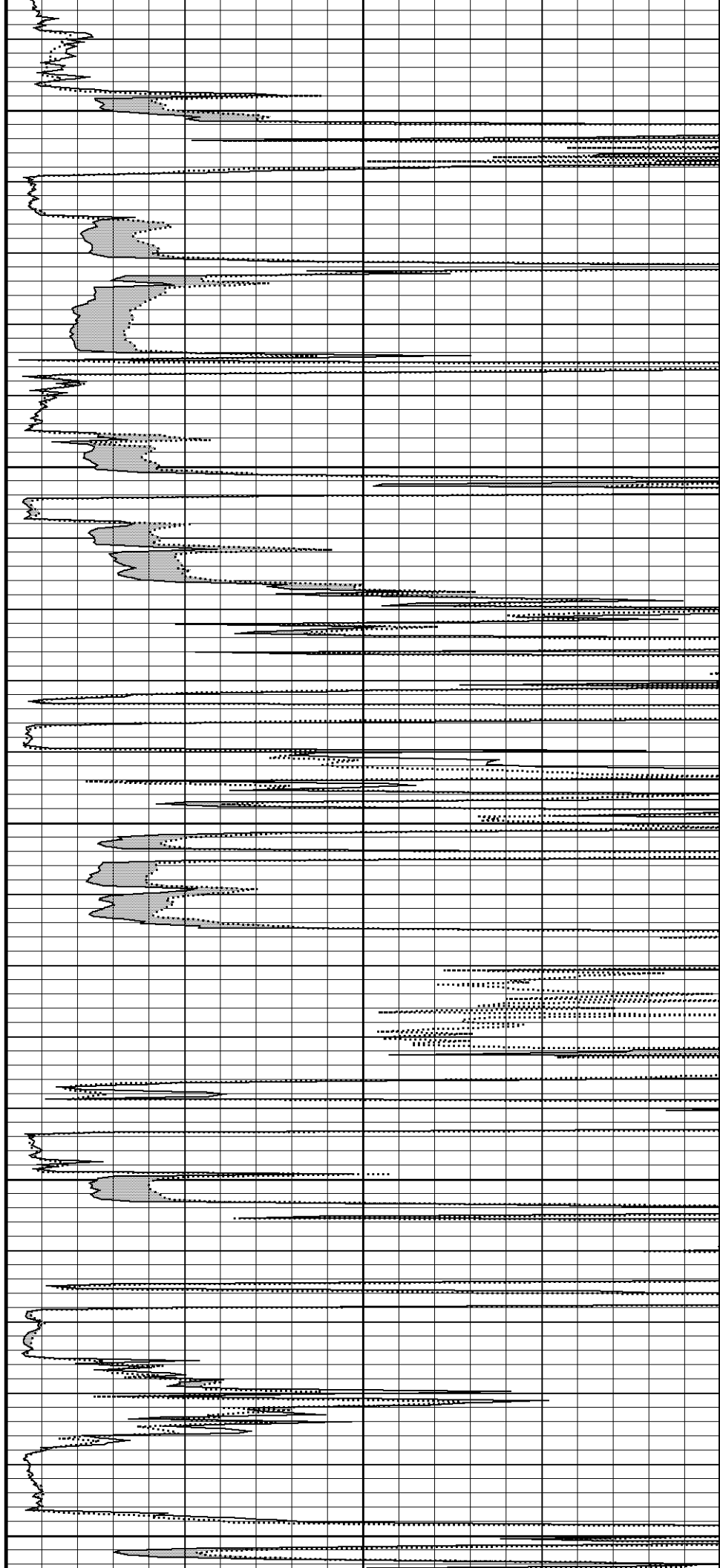
4000

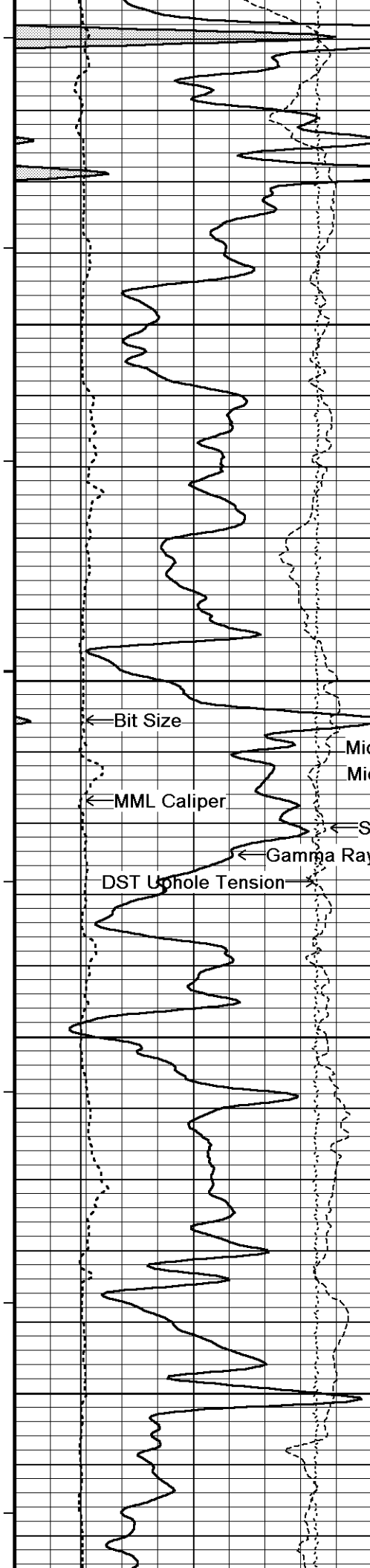
113°

4050

114°

4100





114°

4150

115°

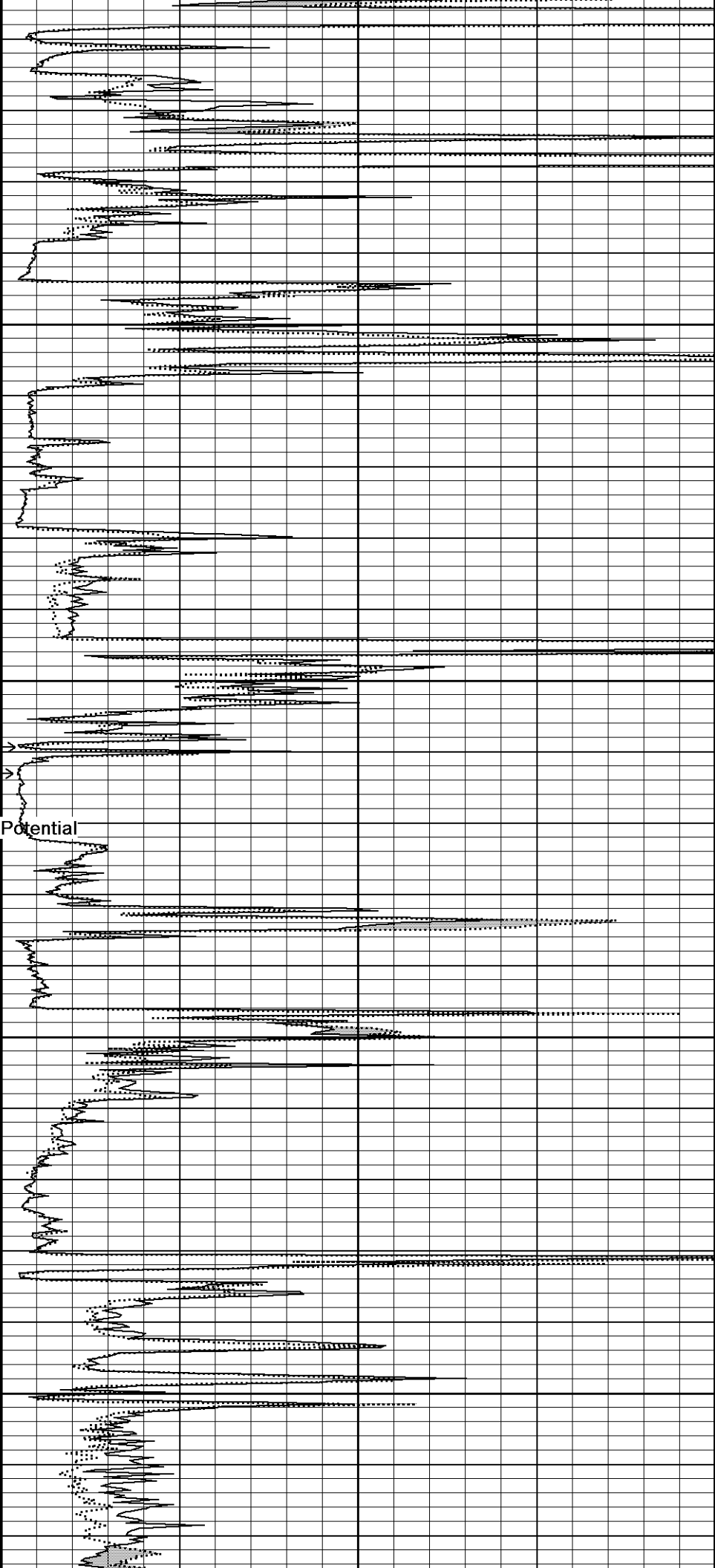
4200

115°

4250

116°

4300





117°

4350

117°

4400

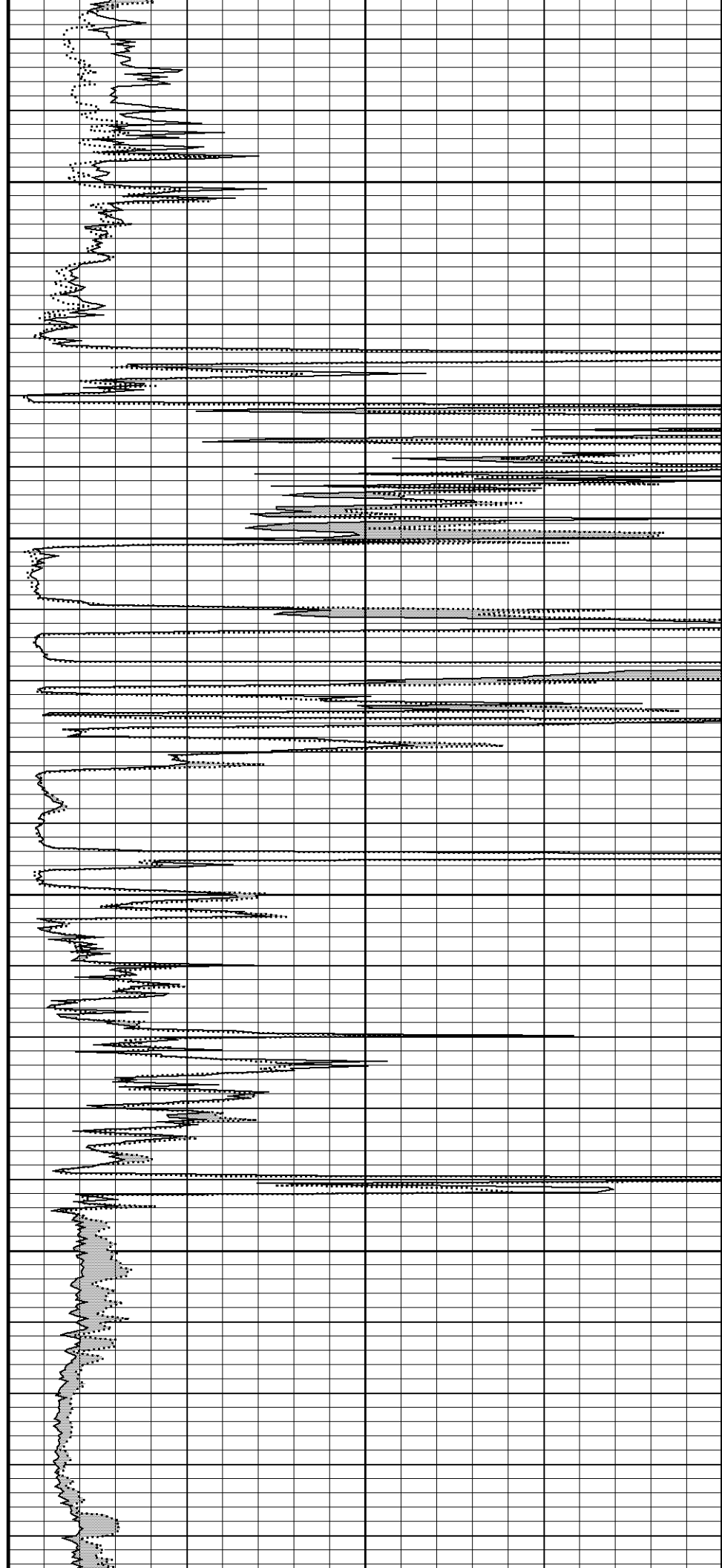
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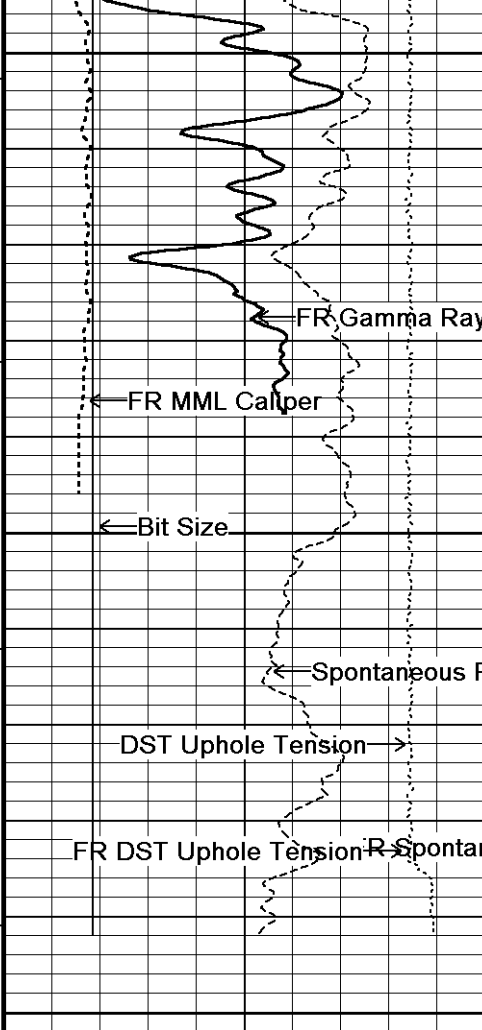
4450

120°

4500

120°



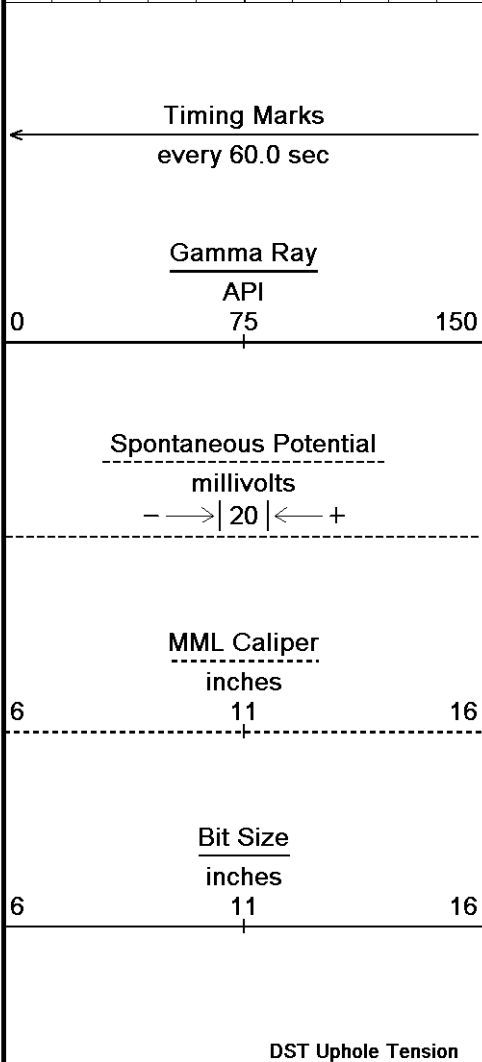
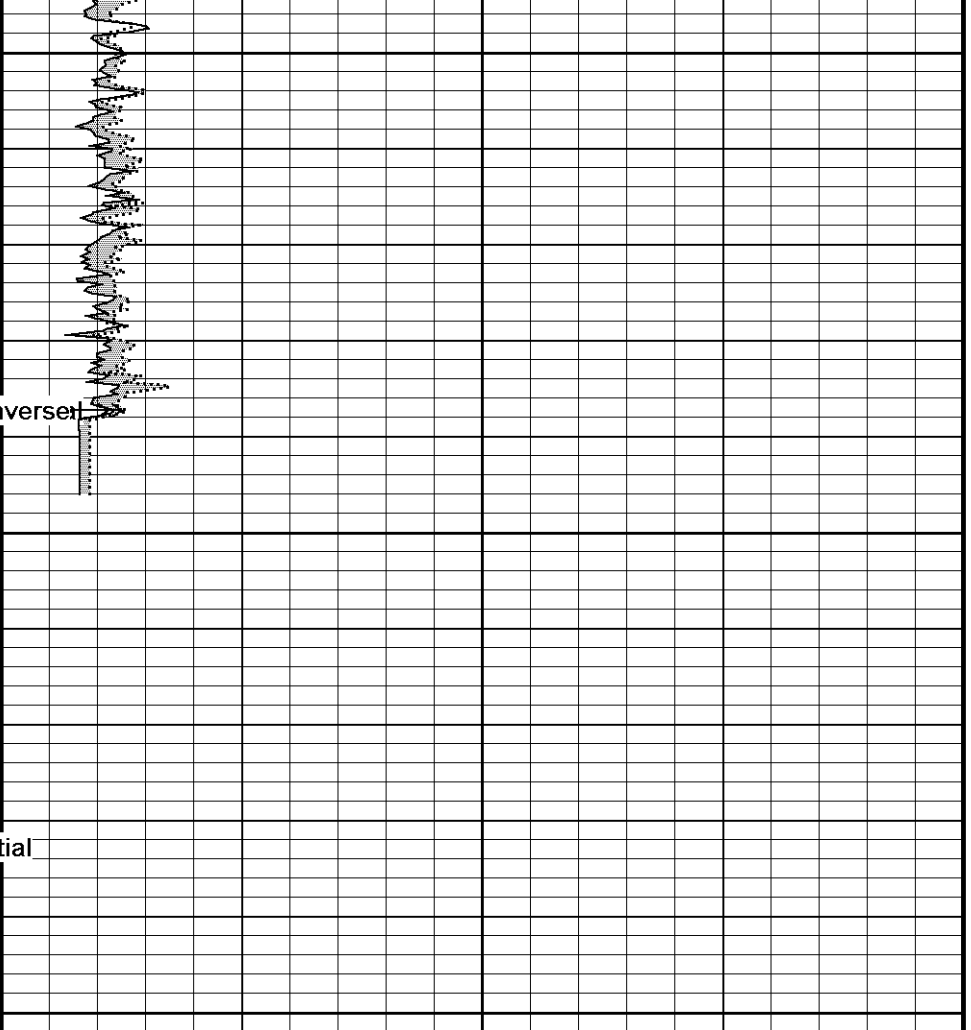


4550

4600

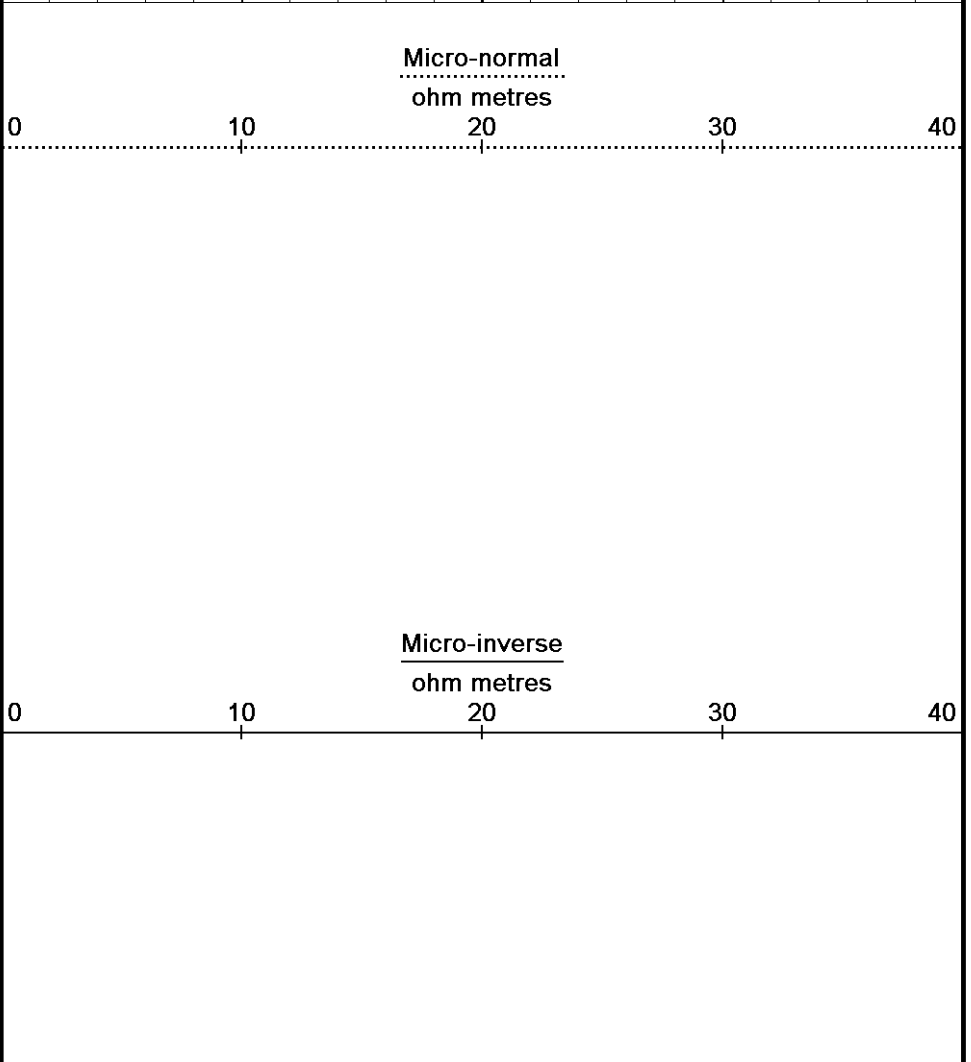
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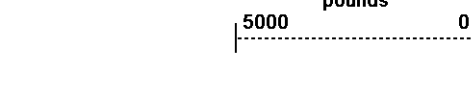
Depth in Feet



Borehole Temp in deg F

Replay





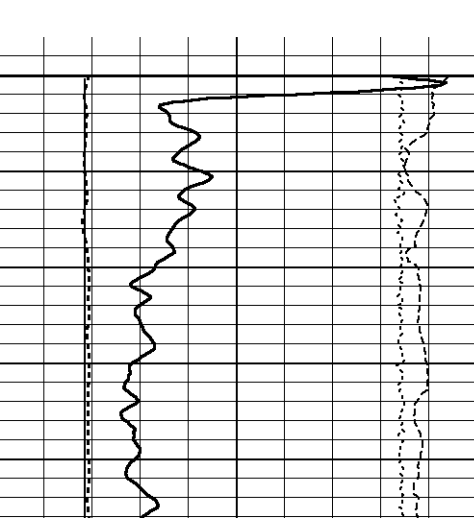
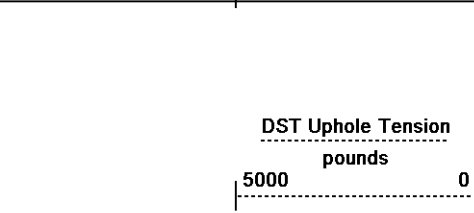
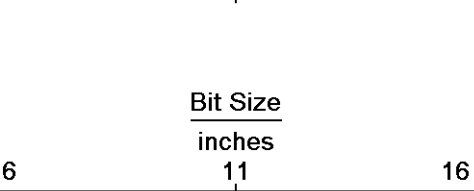
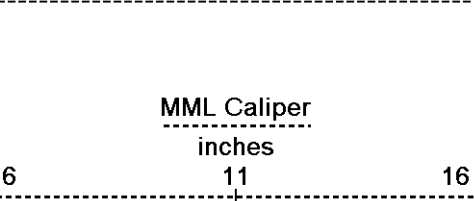
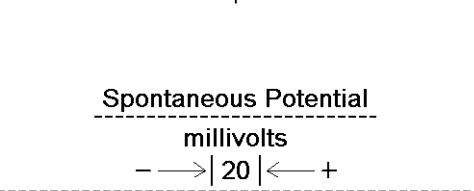
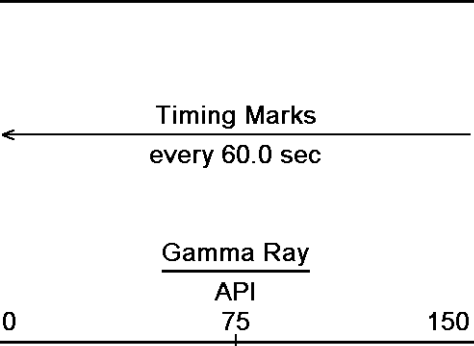
Scale
1:240

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 20-MAY-2012 15:56
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa Q-B 1-17\Grand Mesa Q-B 1-17_002.dta
Recorded on 20-MAY-2012 13:27
System Versions: Logged with 11.03.4044 Processed with 11.03.4044 Plotted with 11.03.4044

↑ 5 INCH MAIN PASS ↑

↓ 5 INCH REPEAT PASS ↓

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 20-MAY-2012 15:56
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa Q-B 1-17\Grand Mesa Q-B 1-17_001.dta
Recorded on 20-MAY-2012 13:06
System Versions: Logged with 11.03.4044 Processed with 11.03.4044 Plotted with 11.03.4044



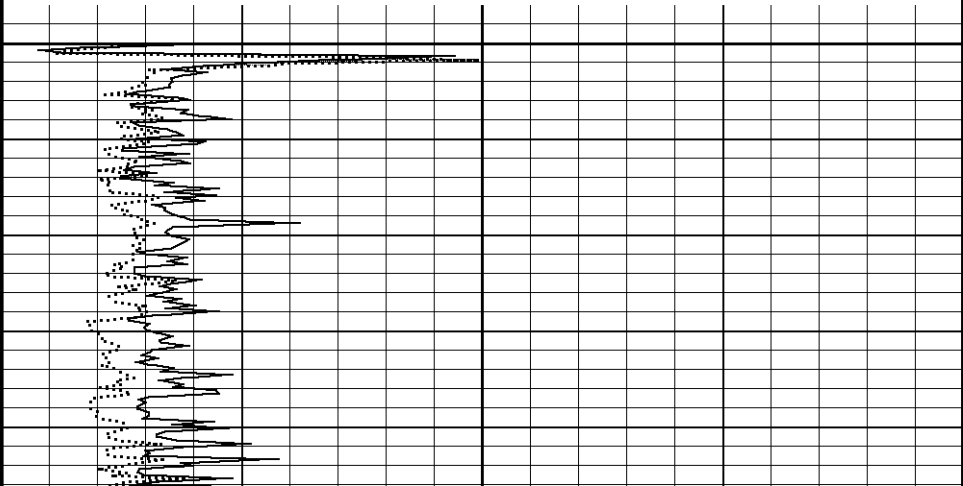
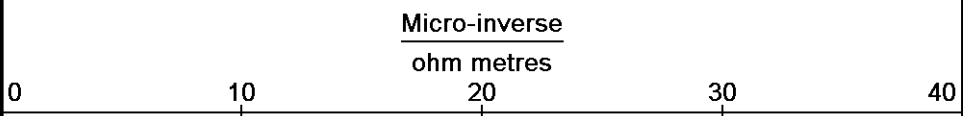
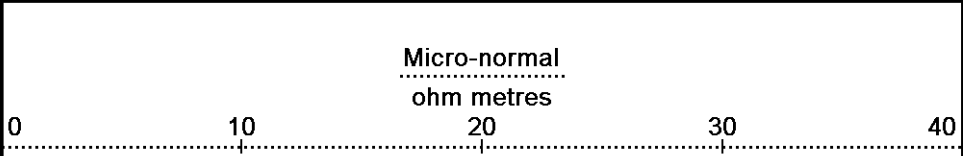
Depth
in
Feet

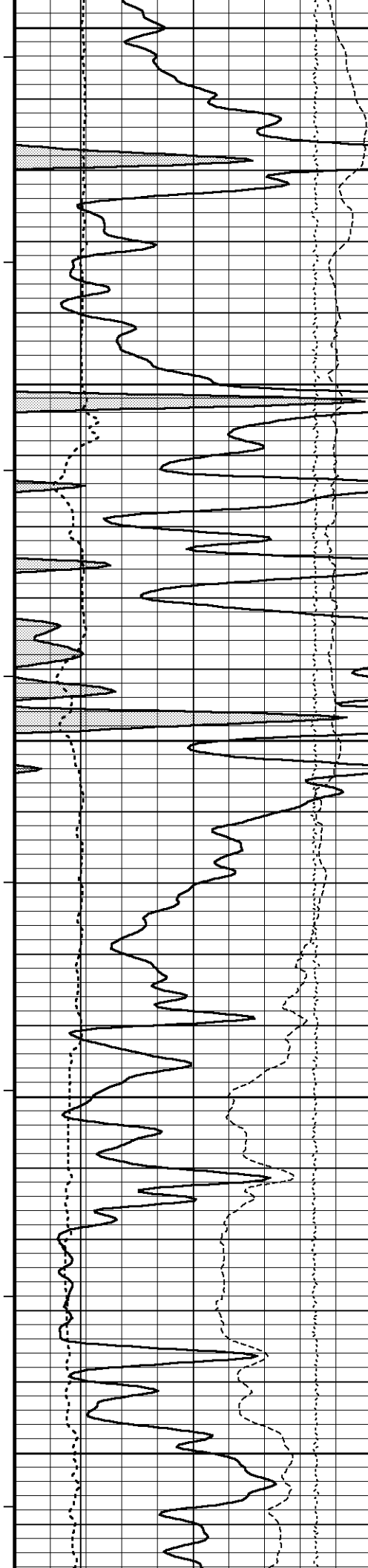
Borehole
Temp in
deg F

Replay
Scale
1:240

4300

115°





4350

116°

4400

117°

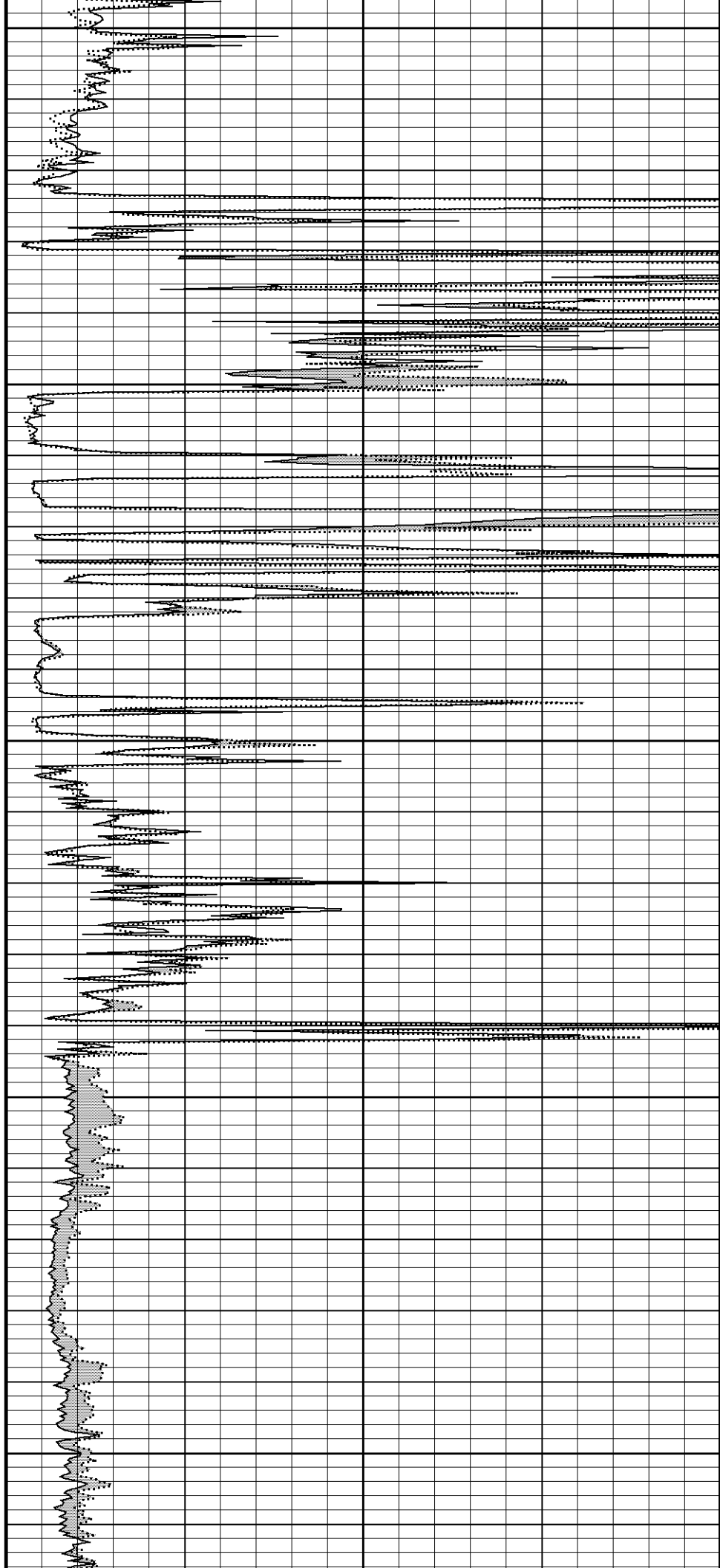
4450

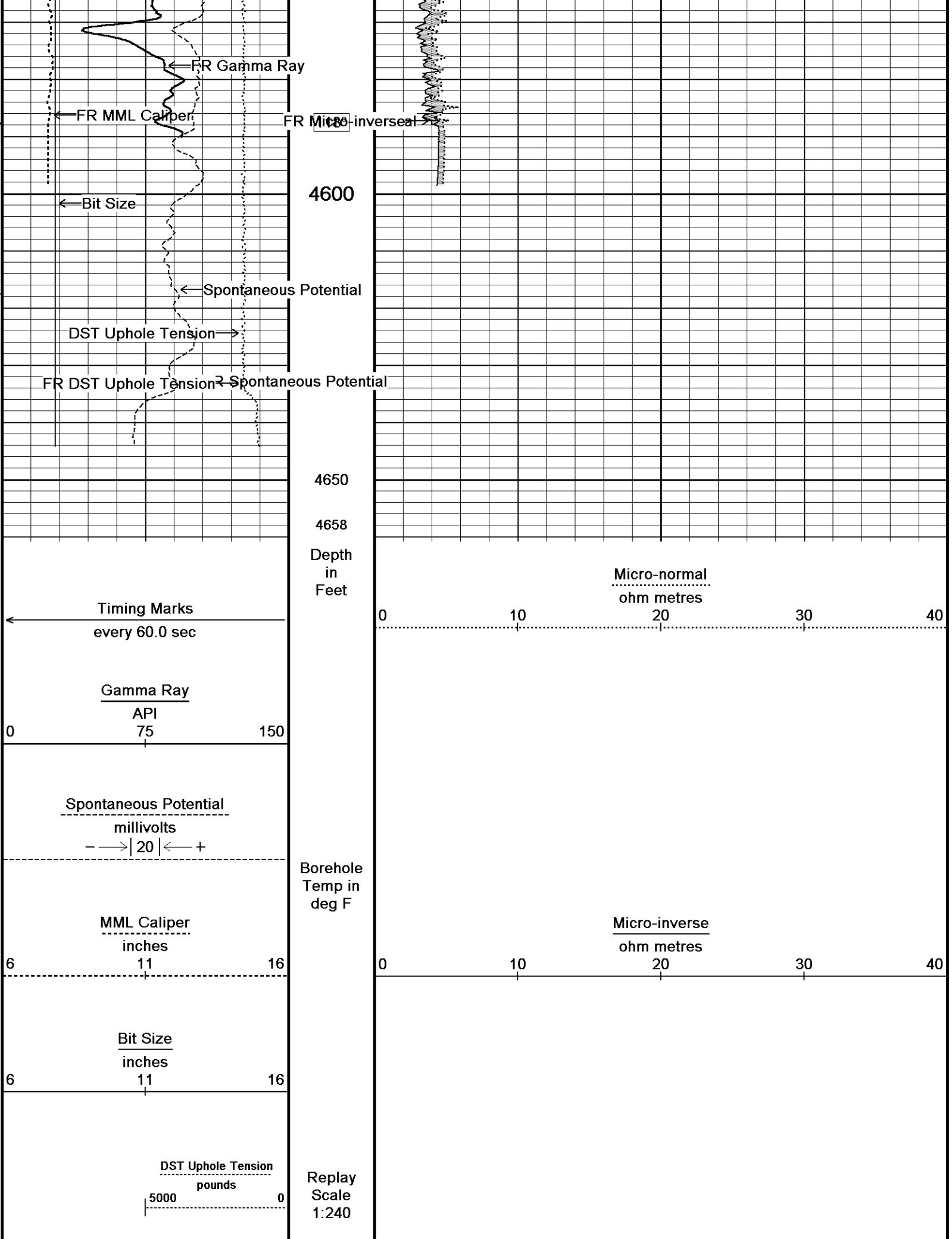
119°

4500

119°

4550





↑ 5 INCH REPEAT PASS ↑

BEFORE SURVEY CALIBRATION

C:\Minimus 11.03.4044\Data\Grand Mesa Q-B 1-17\Grand Mesa Q-B 1-17.dta

General Constants All 000

Last Edited on 20-MAY-2012,12:39

General Parameters

Mud Resistivity	0.880	ohm-metres
Mud Resistivity Temperature	93.000	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

Down-hole Tension Calibration SMS 0

Field Calibration on 11-MAY-2012 11:47

Reading No	Measured	Calibrated (lbs)
1	13322.68	0.00
2	13679.25	383.60

Gamma Calibration MCG-C 84

Field Calibration on 20-MAY-2012 07:19

	Measured	Calibrated (API)
Background	71	48
Calibrator (Gross)	1143	773
Calibrator (Net)	1073	725

Gamma Constants MCG-C 84

Last Edited on 20-MAY-2012,12:40

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-MAY-2012,03:09

	Measured	Calibrated (mV)
Reference 1	103.5	100.0
Reference 2	-96.9	-100.0

High Resolution Temperature Calibration MCG-C 84

Field Calibration on 01-MAY-2012,03:10

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

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 09-MAY-2012 08:19

Field Calibration on 20-MAY-2012 07:11

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14458	5.98
2	17779	7.97

3	21092	9.86
4	25087	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.02	5.98

Micro Normal and Micro Inverse Calibration MML-A 16

Base Calibration on 09-MAY-2012 08:25

Field Check on 20-MAY-2012 07:13

Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.2	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 18-MAY-2012,04:40

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 65

Base Calibration on 27-APR-2012 16:25

Field Check on 20-MAY-2012 07:37

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3227	100	3714	110
Ratio	32.312		33.764	

Field Calibrator at Base

	Calibrated (cps)
	1605 2333
Ratio	0.688

Field Check

	Calibrated (cps)
	1579 2286
Ratio	0.691

Neutron Constants MDN-A.B 65

Last Edited on 20-MAY-2012,07:19

Neutron Source Id	PN-521
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
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 25-APR-2012 15:47

Field Check on 20-MAY-2012 07:01

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	950.5	126.8

Base Check	281.7
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FE Constants MFE-A.A 55

Last Edited on 20-MAY-2012,06:59

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-C.K 330

Last Edited on 20-MAY-2012,12:40

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)	Discriminator (mV)
N/A	N/A	N/A
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

High Resolution Temperature Calibration MAI-A.A 45

Field Calibration on 12-JAN-2012,13:36

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

High Resolution Temperature Constants MAI-A.A 45

Last Edited on 12-JAN-2012,11:13

Pre-filter Length 11

Induction Calibration MAI-A.A 45

Base Calibration on 12-JAN-2012,13:34

Field Check on 20-MAY-2012 06:59

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	14.4	472.6	9.3	966.2
2	5.7	374.0	7.6	821.4
3	3.4	261.2	5.2	566.0
4	2.5	133.9	2.6	279.2

Array Temperature 79.4 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	18.5	3851.8
2	0.0	0.0	31.7	3630.1
3	0.0	0.0	28.7	3050.0
4	0.0	0.0	18.3	2079.5
Deep	0.0	0.0	16.1	1911.5
Medium	0.0	0.0	42.6	4061.6
Shallow	0.0	0.0	49.6	5484.3

Array Temperature 0.0 67.3 Deg F

Induction Constants MAI-A.A 45

Last Edited on 20-MAY-2012,06:57

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

Caliper Calibration MPD-B 59

Base Calibration on 16-MAY-2012 14:32

Field Calibration on 20-MAY-2012 07:02

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	19200	3.99
2	29152	5.98
3	39216	7.97
4	48949	9.86
5	60064	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.94	5.98

Photo Density Calibration MPD-B 59

Base Calibration on 16-MAY-2012 14:49

Field Check on 20-MAY-2012 07:09

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	49293	24802	59556	30836
Reference 2	20819	2436	24941	2541

Field Check at Base

1213.5 1290.5

Field Check

1207.8 1289.0

PE Calibration

Base Calibration	WS	Measured	Ratio	Calibrated
		WH		Ratio
Background	220	1092		
Reference 1	18022	49118	0.371	0.371
Reference 2	5449	20689	0.267	0.272

Field Check at Base

220.3 1091.9

Field Check

218.1 1085.7

Density Constants MPD-B 59

Last Edited on 20-MAY-2012,12:40

Density Source Id	254
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
0.00	0.00

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

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 Micro-log
MML-A 16 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 Neutron
MDN-A.B 65 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 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 Focussed Electric
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Sonic
MSS-C.K 330 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

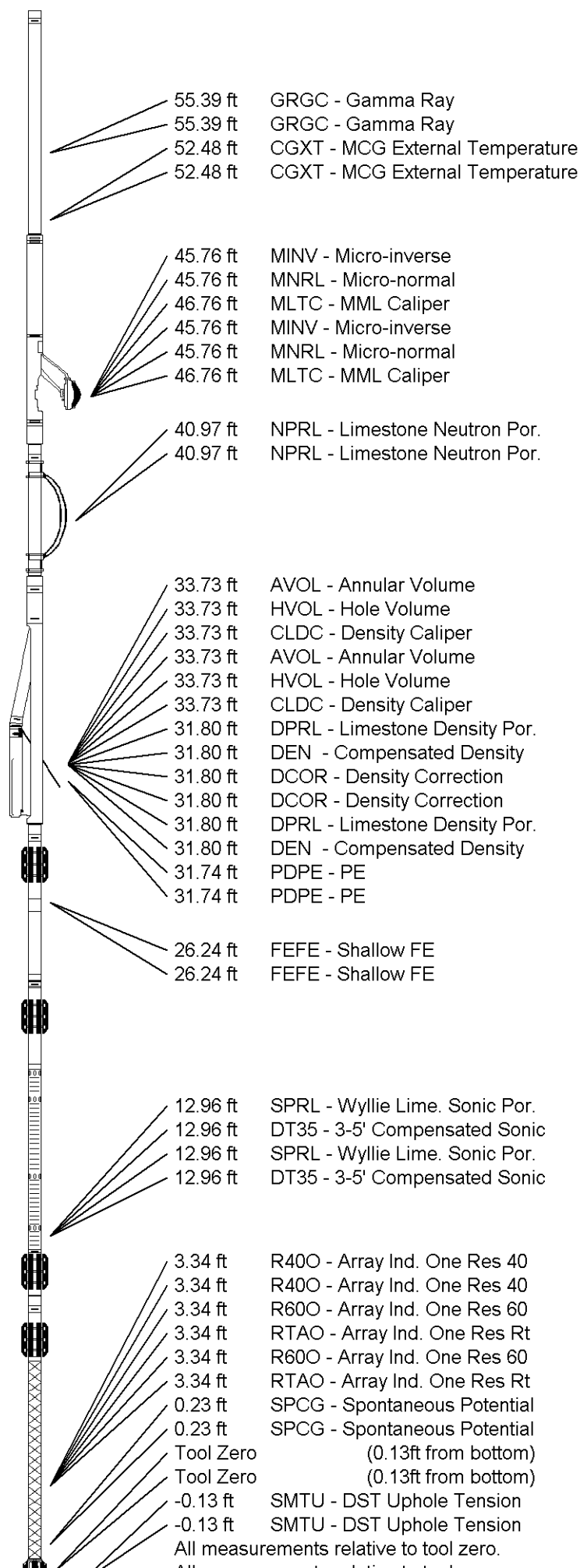
Compact Sonic
MSS-C.K 330 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

Compact Induction
MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 60.68 ft Weight: 456.4 lb

Total Length: 60.68 ft Weight: 456.4 lb





All measurements relative to tool zero.

COMPANY	GRAND MESA OPERATING COMPANY
WELL	Q-B #1-17
FIELD	WILDCAT
PROVINCE/COUNTY	GOVE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2649.00	feet	First Reading	4587.00	feet
Elevation Drill Floor	2648.00	feet	Depth Driller	4632.00	feet
Elevation Ground Level	2644.00	feet	Depth Logger	4633.00	feet



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