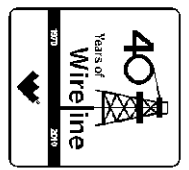




Weatherford[®]

MICRORESISTIVITY LOG

COMPANY GRAND MESA OPERATING COMPANY
WELL DALE #2-34
FIELD WILDCAT
PROVINCE/COUNTY LOGAN
COUNTRY/STATE U.S.A. / KANSAS
LOCATION 478' FNL & 357' FEL



SEC TWP RGE Other Services
 34 12S 32W MAI/MFE
API Number 15-109-21012 MDN/MPD
Permit Number

Permanent Datum G.L., Elevation 2990 feet
Log Measured From K.B. @ 5 FEET above Permanent Datum
Drilling Measured From K.B.

Elevations: feet
 KB 2995.00
 DF 2993.00
 GL 2990.00

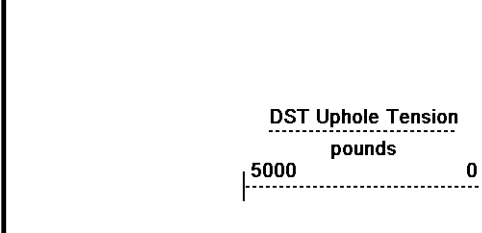
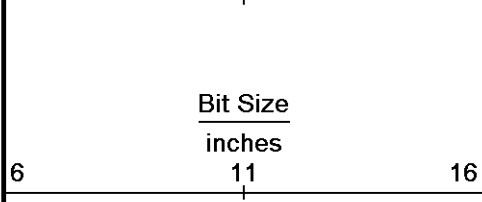
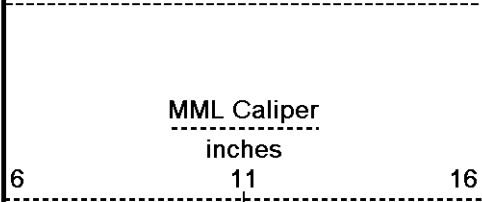
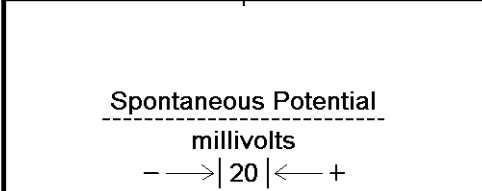
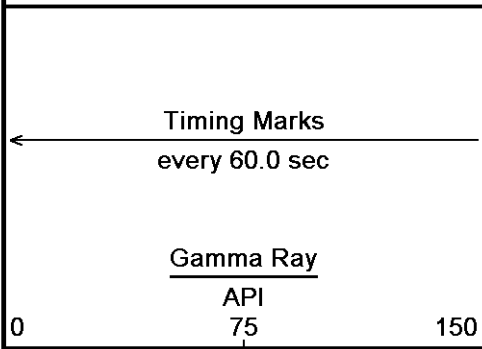
Date	02-JUL-2011
Run Number	ONE
Depth Driller	4730.00 feet
Depth Logger	4728.00 feet
First Reading	4692.00 feet
Last Reading	3700.00 feet
Casing Driller	222.00 feet
Casing Logger	220.00 feet
Bit Size	7.875 inches
Hole Fluid Type	CHEMICAL
Density / Viscosity	9.30 lb/USg 63.00 CP
PH / Fluid Loss	10.00 8.00 ml/30Min
Sample Source	FLOWLINE
Rm @ Measured Temp	1.22 @ 93.0 ohm-m
Rmf @ Measured Temp	0.98 @ 93.0 ohm-m
Rmc @ Measured Temp	1.46 @ 93.0 ohm-m
Source Rmf / Rmc	CALC CALC
Rm @ BHT	0.95 @121.0 ohm-m
Time Since Circulation	5 HOURS
Max Recorded Temp	121.00 deg F
Equipment Name	COMPACT
Equipment / Base	13057 LIB
Recorded By	A. GIAMBALVO
Witnessed By	KENT MATSON
S.O. / JOB #	3531098 LB11-150

BOREHOLE RECORD			Last Edited: 02-JUL-2011 16:54	
Bit Size inches	Depth From feet	Depth To feet		
7.875	220.00	4728.00		
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	220.00	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 = 188 cu. ft.
 Service order #3531098
 Rig: Murfin Drilling Rig #24
 Engineer: A. Giambalvo
 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
in
Feet

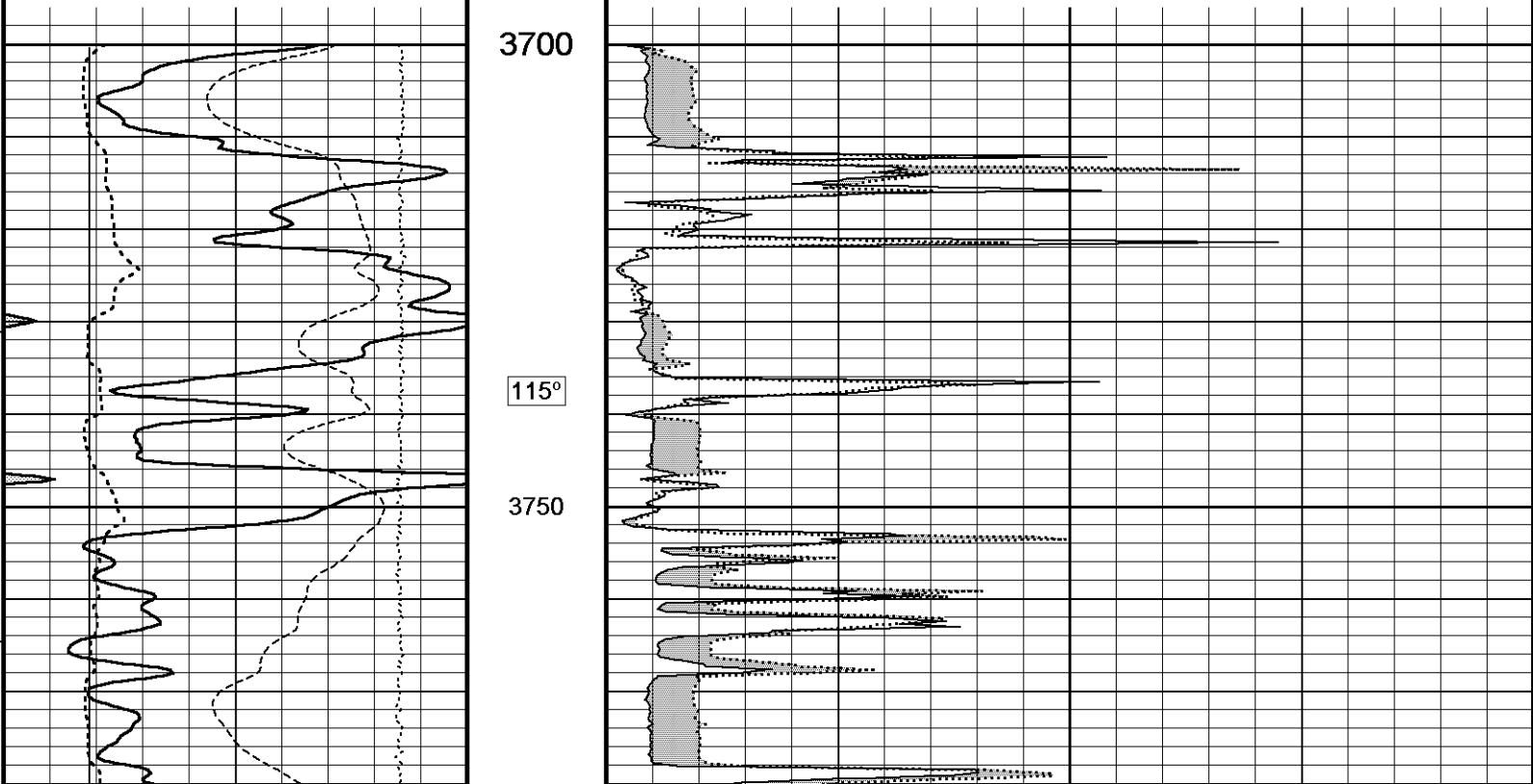
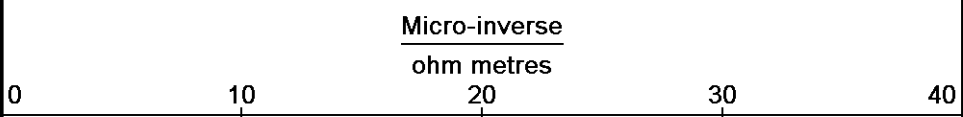
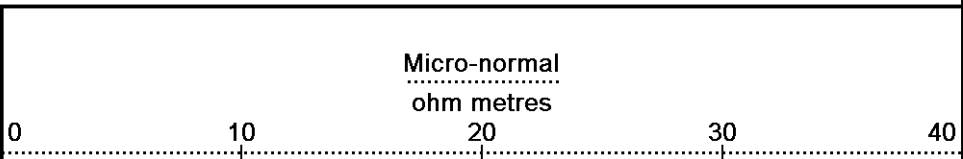
Borehole
Temp in
deg F

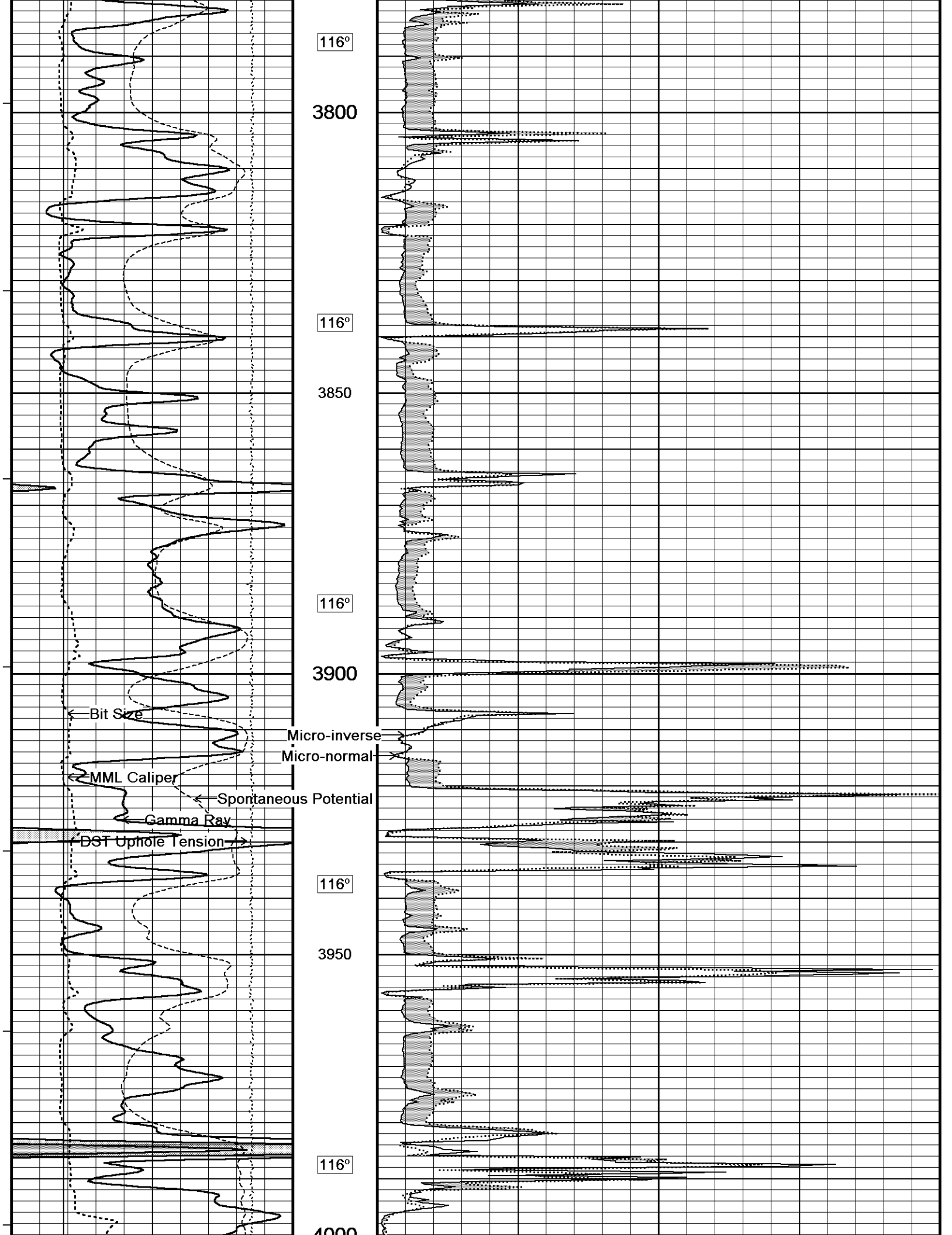
Replay
Scale
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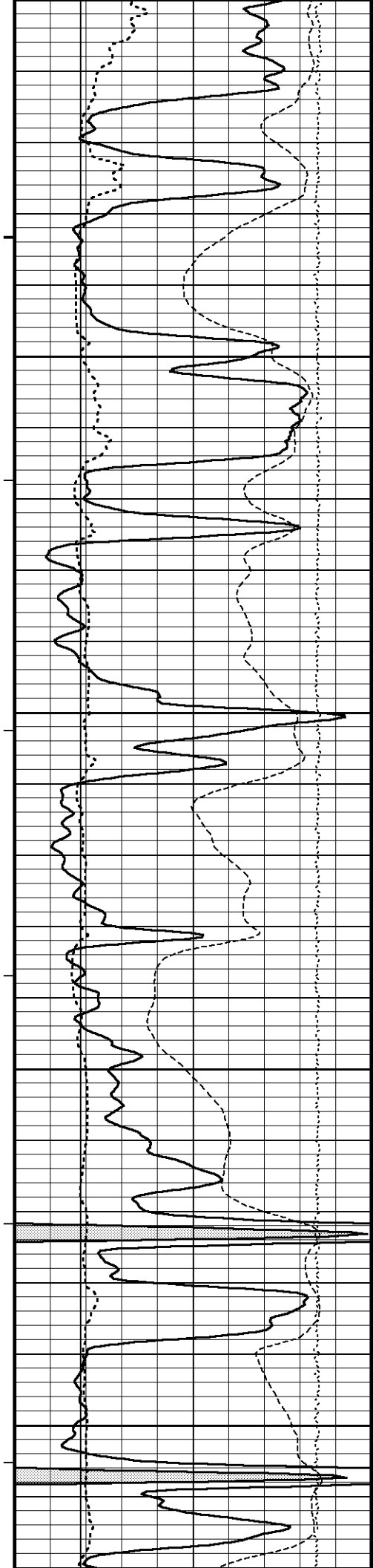
3700

115°

3750







4000

117°

4050

117°

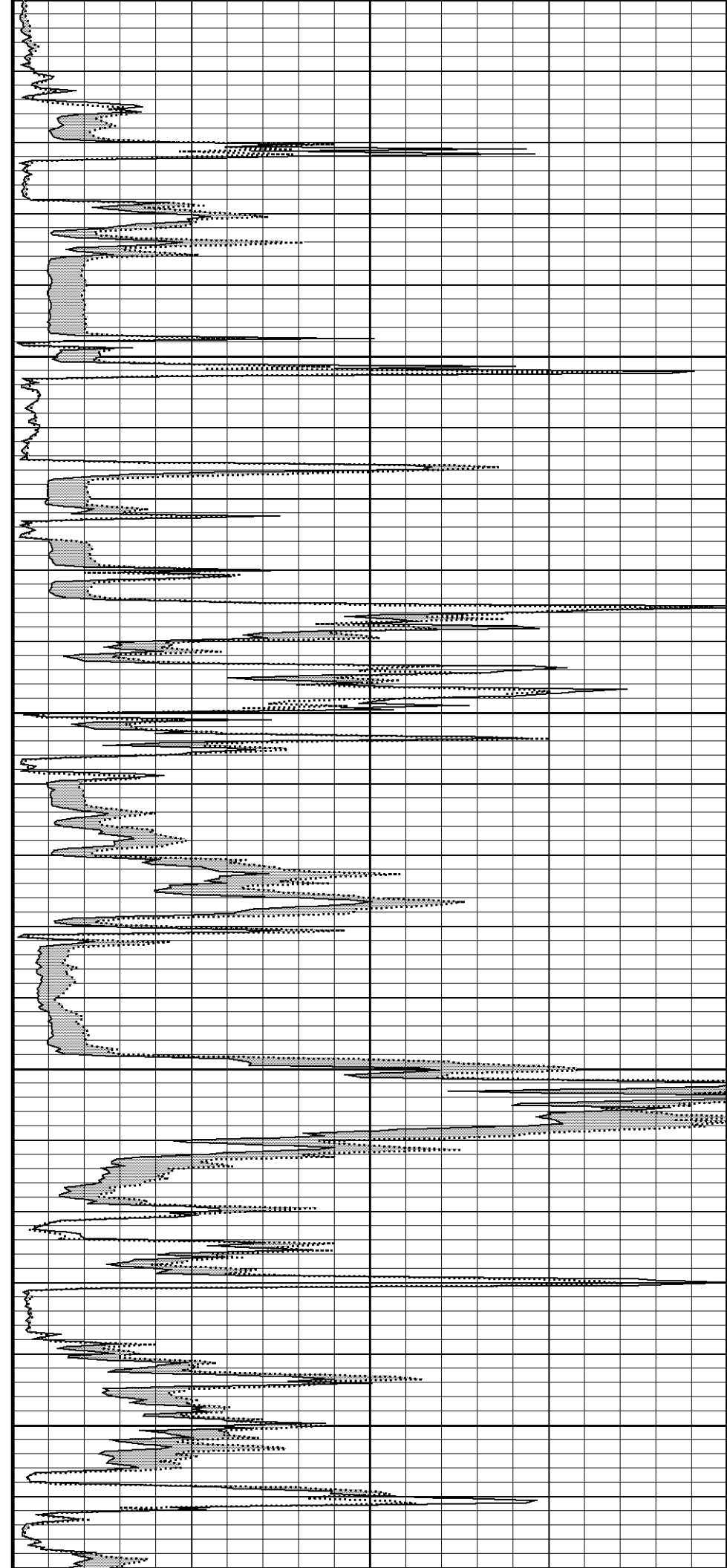
4100

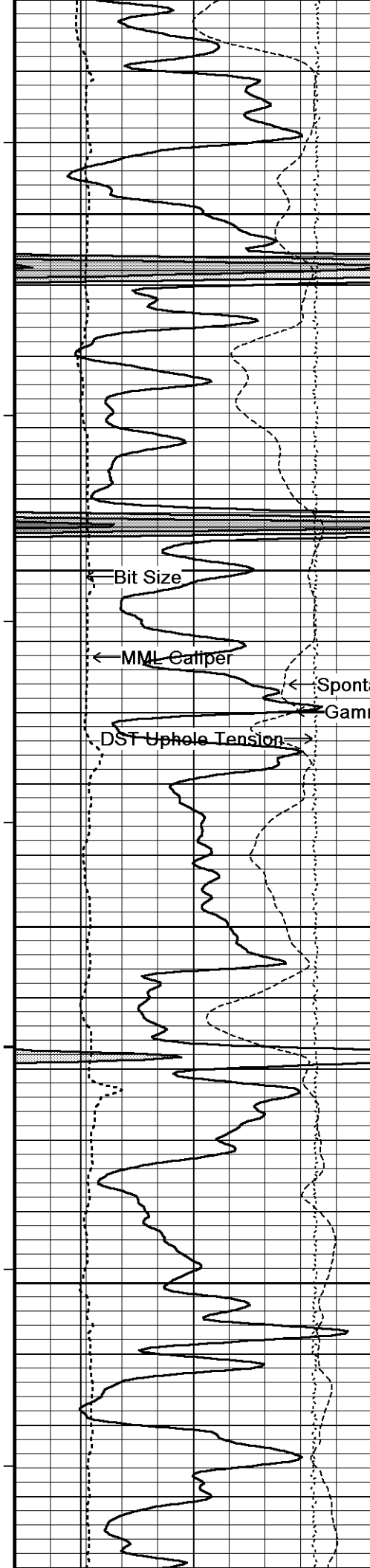
117°

4150

117°

4200





118°

4250

118°

4300

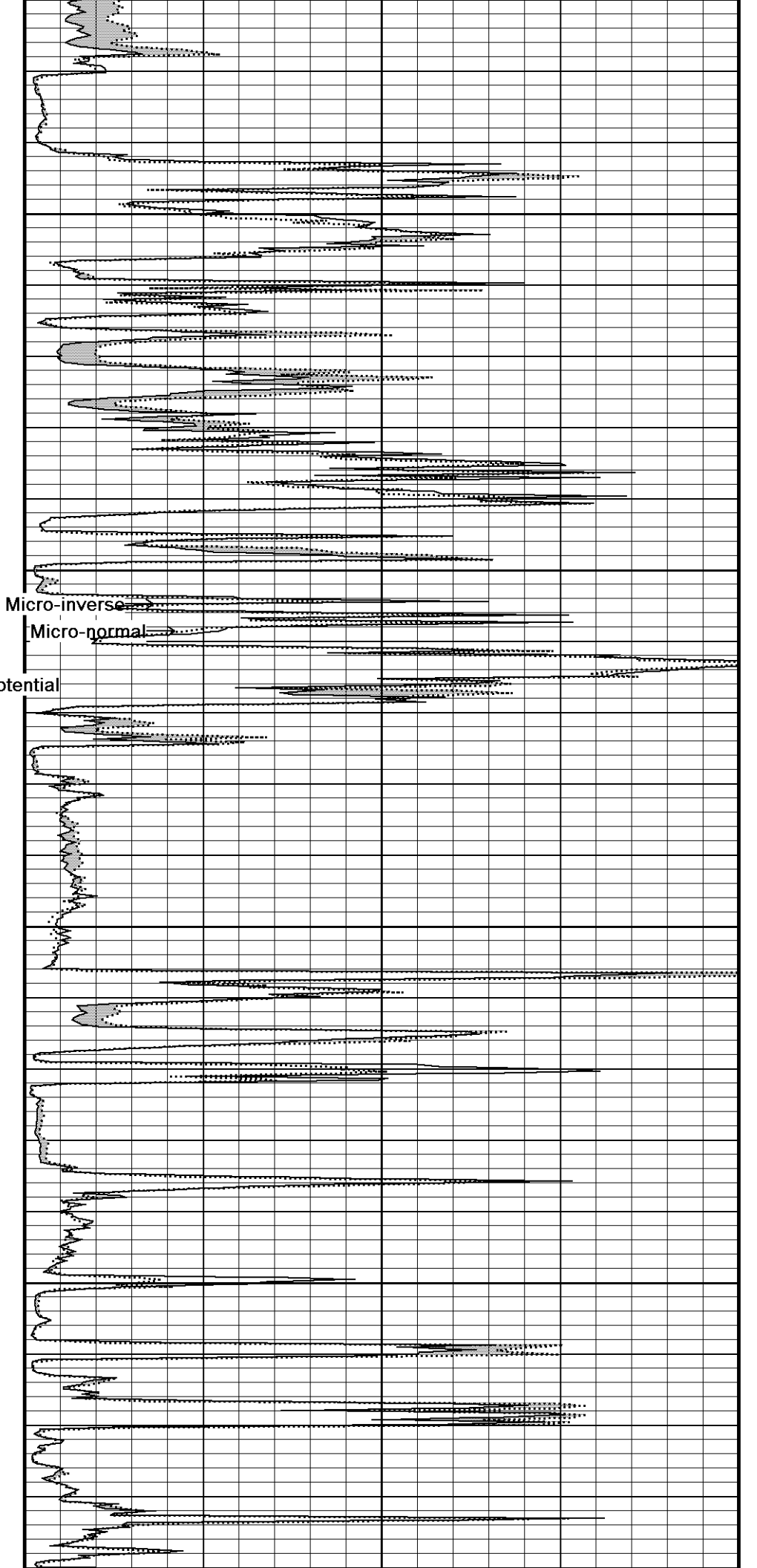
118°

4350

118°

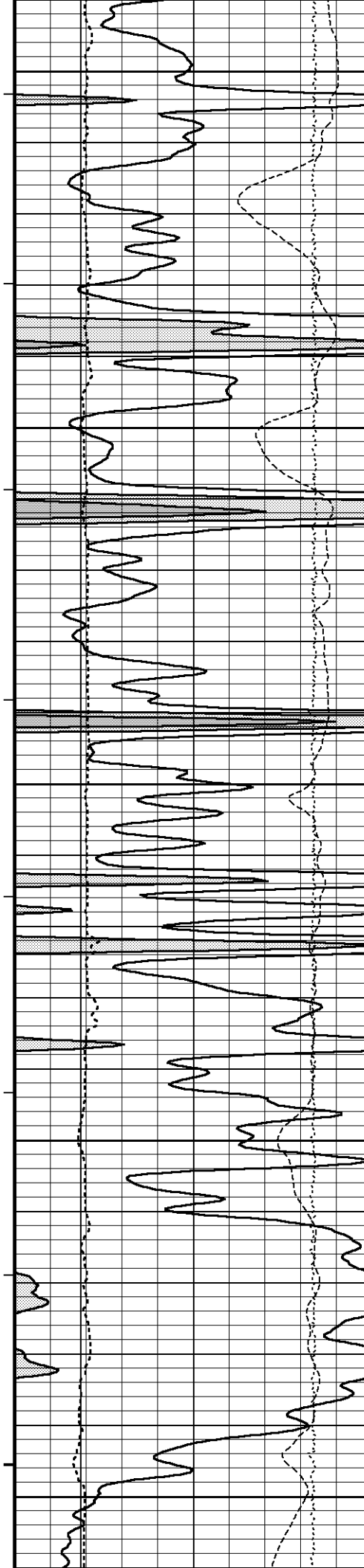
4400

119°



Micro-inverse

Micro-normal



4450

120°

4500

120°

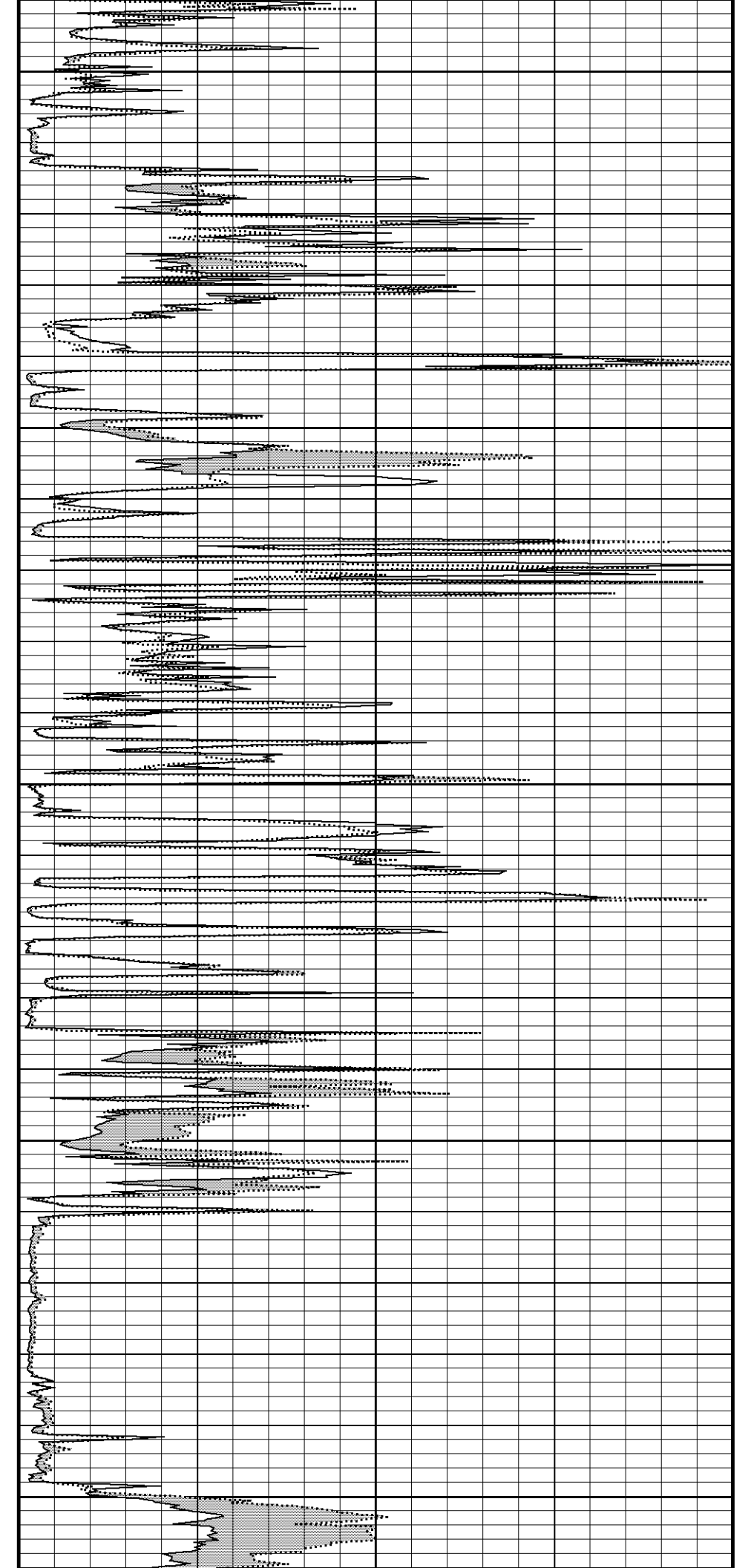
4550

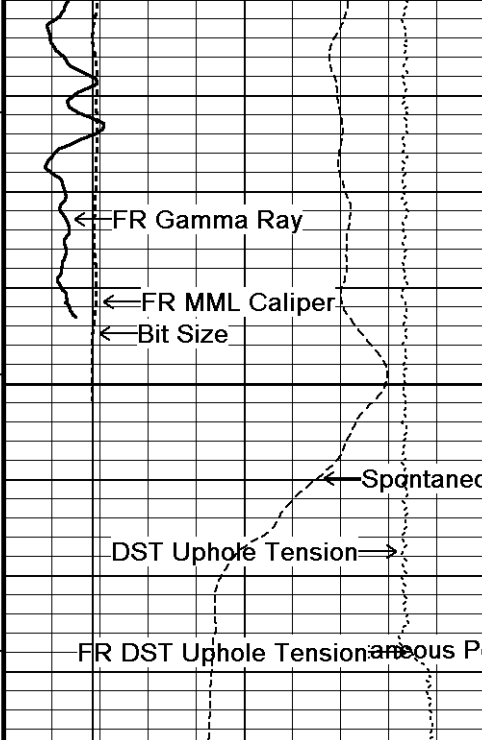
121°

4600

121°

4650



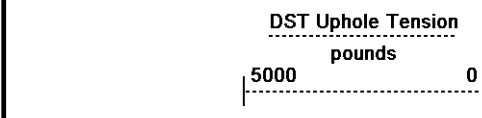
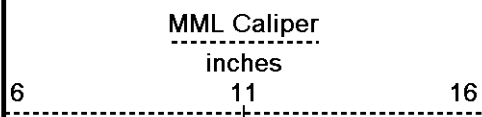
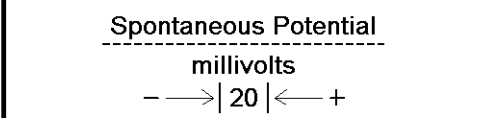
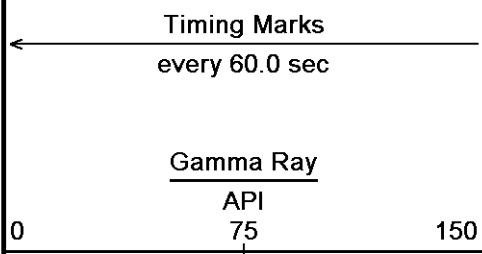


121°

4700

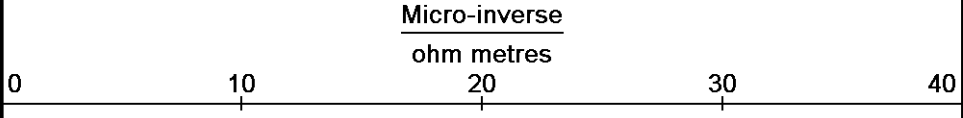
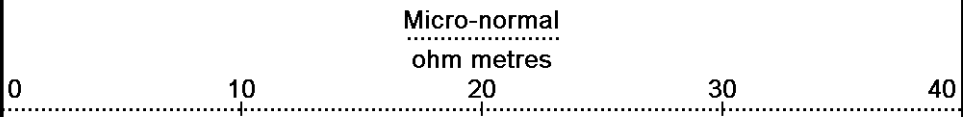
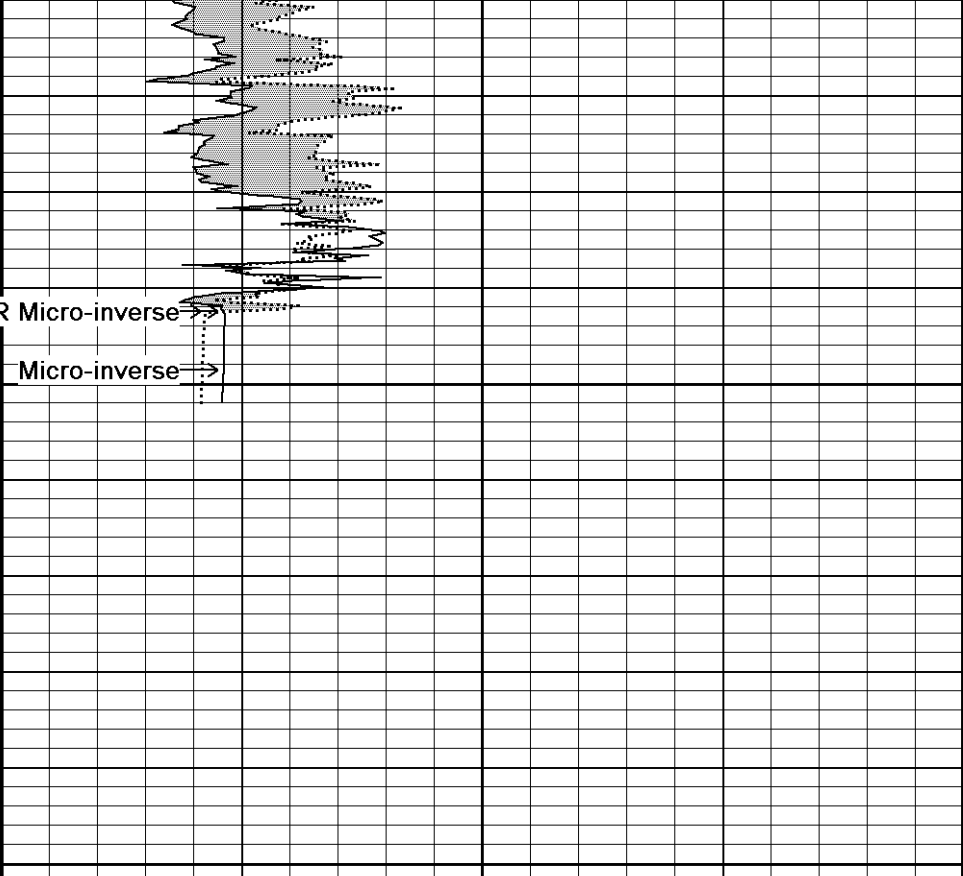
4750

Depth
in
Feet



Borehole
Temp in
deg F

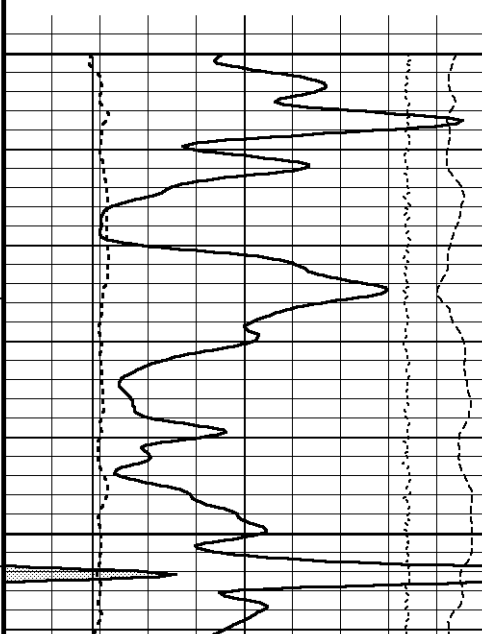
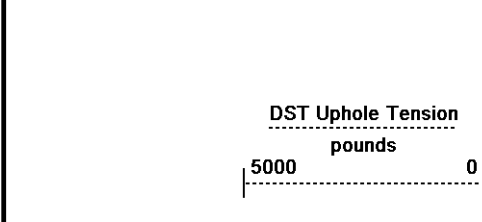
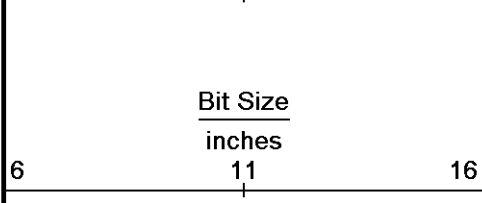
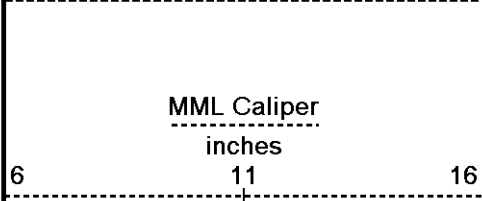
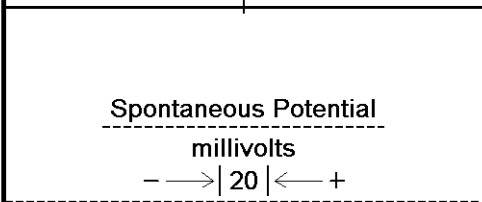
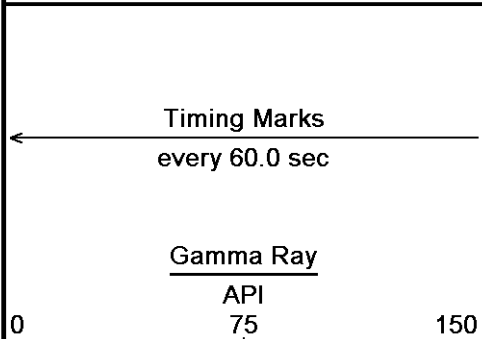
Replay
Scale
1:240



↑ **5 INCH MAIN PASS** ↑

↓ **5 INCH REPEAT PASS** ↓

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 02-JUL-2011 17:09
 Filename: C:\minimus 11.02.3186\Data\Grand Mesa Dale #2-34\Grand Mesa Dale #2-34_002.dta Recorded on 02-JUL-2011 14:32
 System Versions: Logged with 11.02.3186 Plotted with 11.02.3186



Depth in Feet

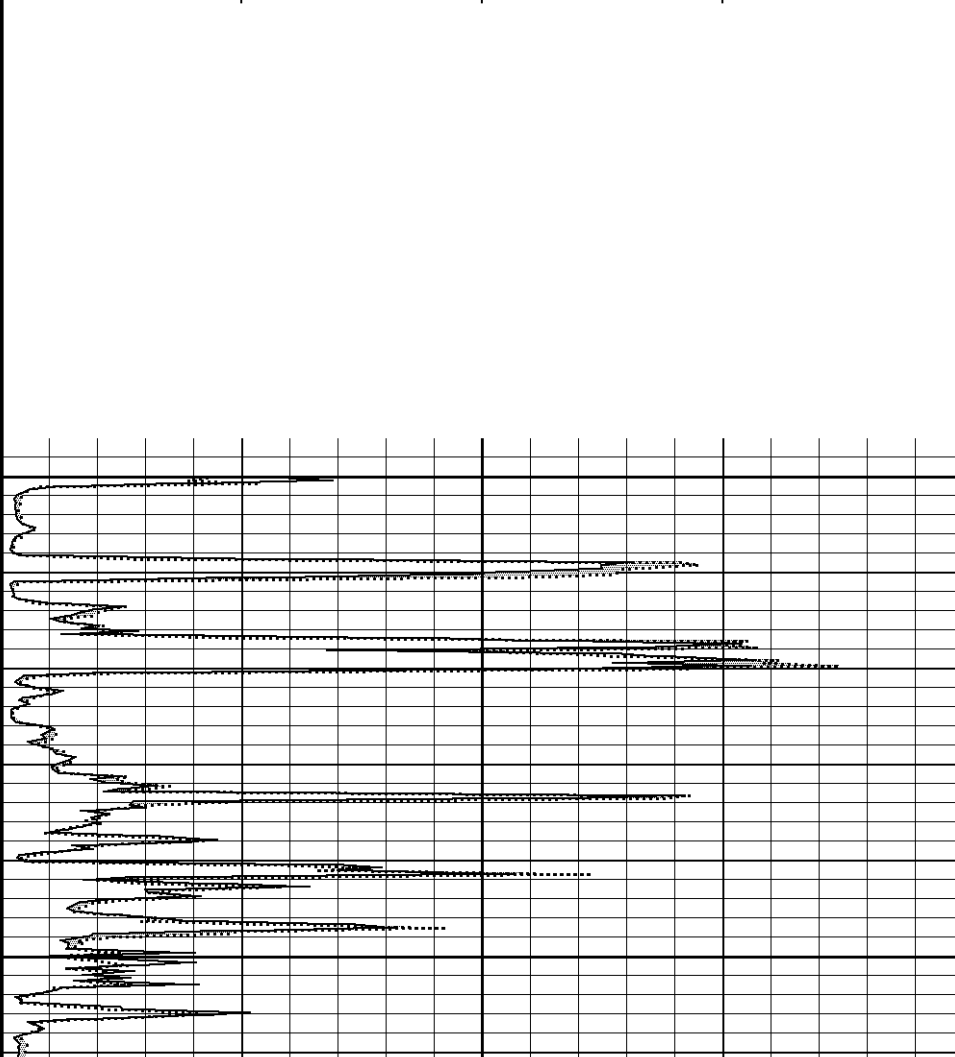
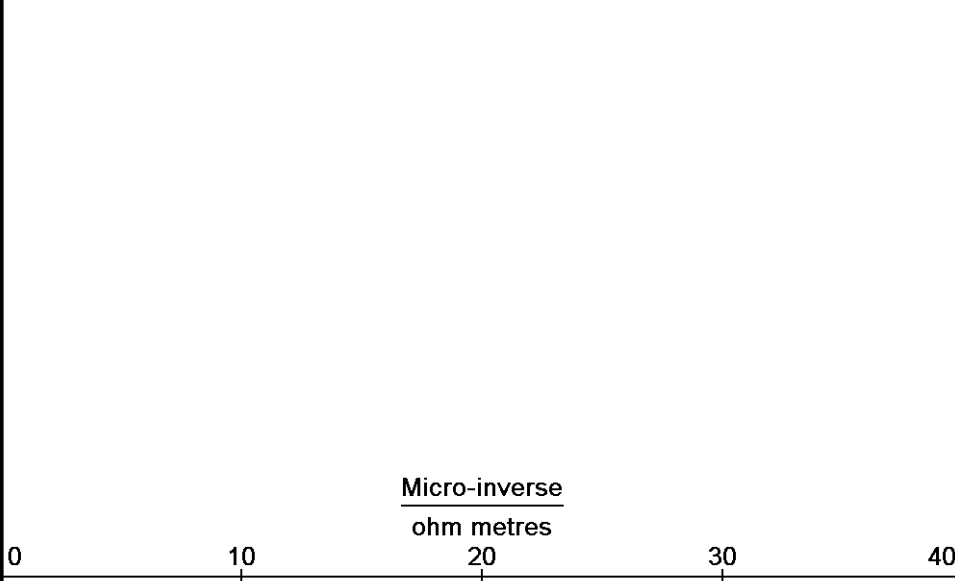
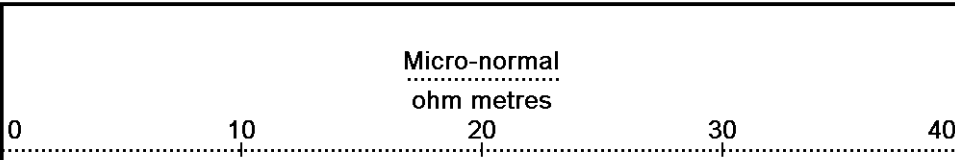
Borehole Temp in deg F

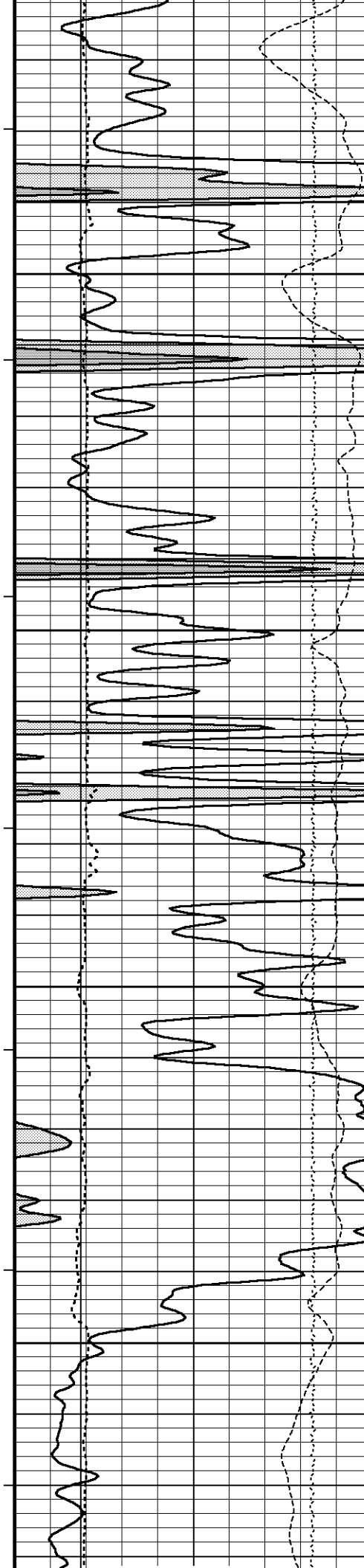
Replay Scale 1:240

4400

118°

4450





119°

4500

120°

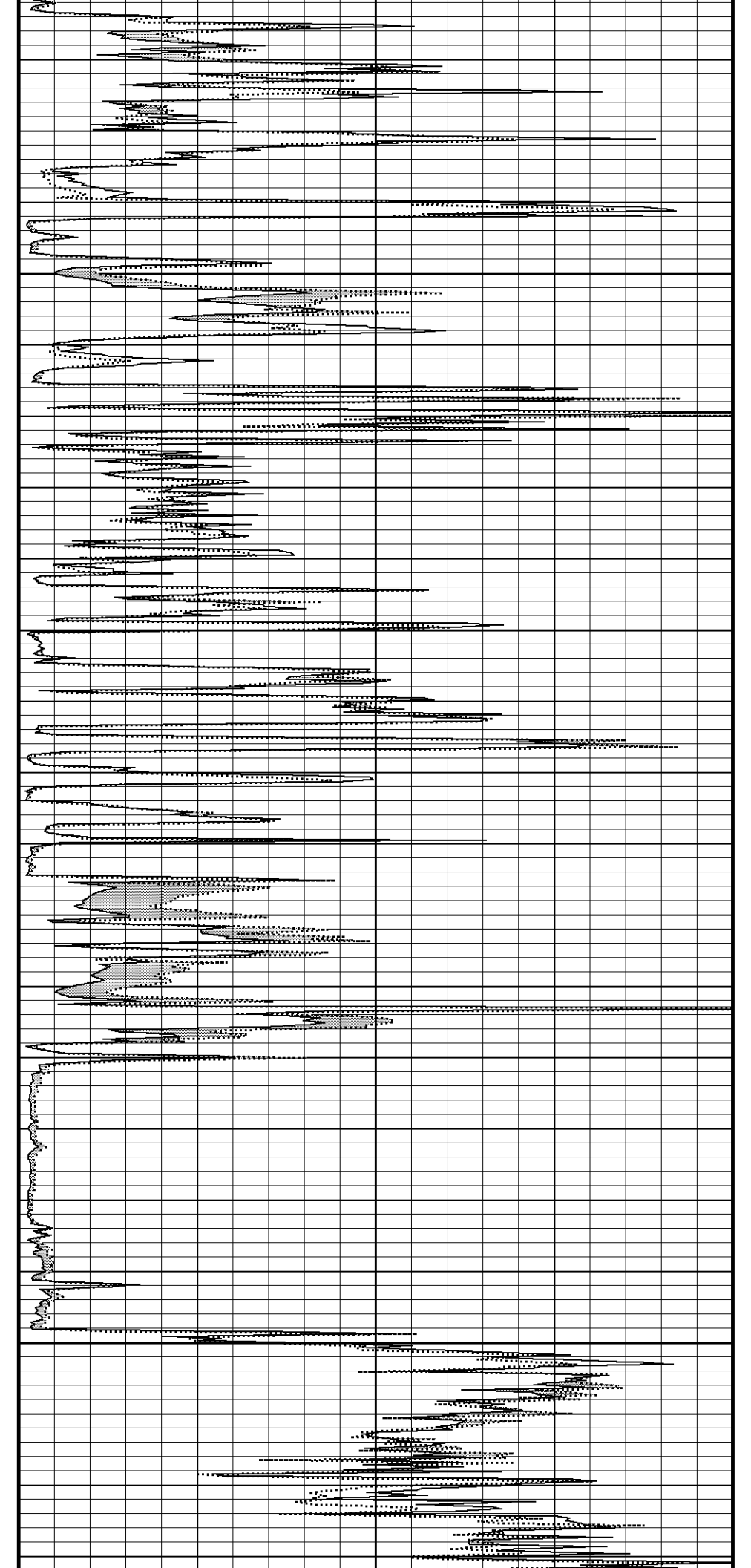
4550

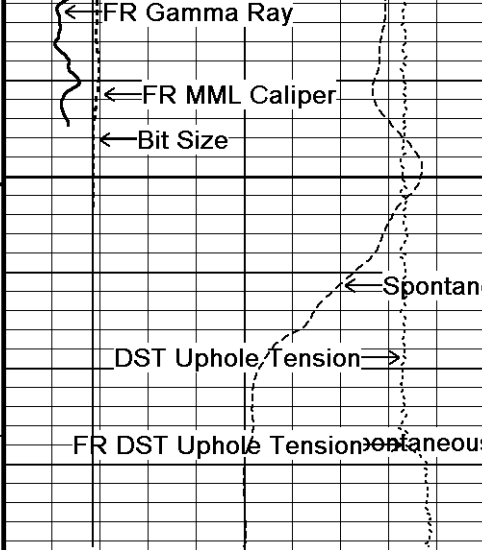
121°

4600

121°

4650





121°

FR Micro-inverse normal

4700 micro-inverse

4750
 Depth
 in
 Feet

Timing Marks
 every 60.0 sec

Gamma Ray
 API
 0 75 150

Spontaneous Potential
 millivolts
 - -> | 20 | <- +

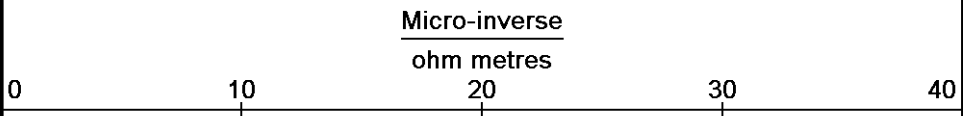
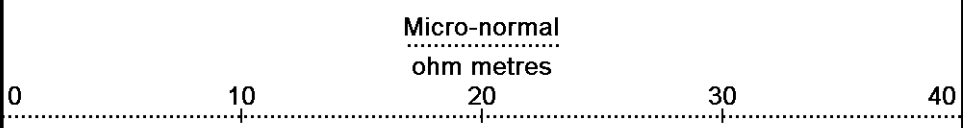
MML Caliper
 inches
 6 11 16

Bit Size
 inches
 6 11 16

DST Uphole Tension
 pounds
 5000 0

Borehole
 Temp in
 deg F

Replay
 Scale
 1:240



Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 02-JUL-2011 17:09
 Filename: C:\Minimus 11.02.3186\Data\Grand Mesa Dale #2-34\Grand Mesa Dale #2-34_002.dta
 Recorded on 02-JUL-2011 14:32
 System Versions: Logged with 11.02.3186 Plotted with 11.02.3186

↑ 5 INCH REPEAT PASS ↑

BEFORE SURVEY CALIBRATION

General Constants All 000

Last Edited on 02-JUL-2011,13:28

General Parameters

Mud Resistivity	1.220	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	Base Density Porosity
Resistivity used	Array Ind. One Res Rt
RWA Constant A	0.610
RWA Constant M	2.150

Down-hole Tension Calibration SMS 0

Field Calibration on 05-JUN-2011 04:37

Reading No	Measured	Calibrated (lbs)
1	13499.89	0.00
2	14983.70	496.00

High Resolution Temperature Calibration MCG-B 34

Field Calibration on 05-MAR-2011,23:56

	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 20-APR-2011 14:53

	Measured	Calibrated (mV)
Reference 1	106.7	100.0
Reference 2	-95.0	-100.0

Gamma Calibration MCG-B 34

Field Calibration on 01-JUL-2011 17:19

	Measured	Calibrated (API)
Background	68	47
Calibrator (Gross)	1102	772
Calibrator (Net)	1034	725

Gamma Constants MCG-B 34

Last Edited on 02-JUL-2011,13:06

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 16-MAY-2011 09:23

Field Check on 26-JUN-2011 03:14

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 02-JUL-2011,13:17

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 16-MAY-2011 09:38
Field Calibration on 26-JUN-2011 03:13

Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	14953	5.98	
2	18280	7.97	
3	21656	9.86	
4	25588	11.92	
5	0	0.00	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	6.01	5.98	

Neutron Calibration MDN-A.B 65

Base Calibration on 16-MAY-2011 11:23
Field Check on 01-JUL-2011 18:26

Base Calibration				
	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3166	99	3714	110
Ratio	31.935		33.764	
Field Calibrator at Base				
			Calibrated (cps)	
			1629	2336
Ratio			0.697	
Field Check				
			Calibrated (cps)	
			1626	2342
Ratio			0.694	

Neutron Constants MDN-A.B 65

Last Edited on 02-JUL-2011,13:28

Neutron Source Id		757	
Neutron Jig Number		5824NE	
Epithermal Neutron		No	
Caliper Source for Processing	Density Caliper		
Stand-off		0.00	inches
Mud Density		1.00	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	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 21-JUN-2011 10:19
Field Check on 26-JUN-2011 03:06

Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	953.6	126.8
Base Check		281.3
Field Check		281.3

FE Constants MFE-A.A 55

Last Edited on 02-JUL-2011,13:21

Running Mode	No Sleeve	
MFE K Factor	0.1268	
Caliper Source for FE correction	Density Caliper	
Caliper Value for FE correction	N/A	inches

Caliper Value for FE correction	N/A	Temperature Corr	
Rm Source for FE correction		MCG External Temperature	
Temp. for Rm Corr.			
Stand-off	0.5		inches

High Resolution Temperature Calibration MAI-A.A 45

Field Calibration on 13-AUG-2010,13:31

	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

Pre-filter Length 11

Induction Calibration MAI-A.A 45

Base Calibration on 13-AUG-2010,13:32
Field Check on 26-JUN-2011 03:04

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	14.5	473.5	9.3	966.2
2	5.2	373.4	7.6	821.4
3	2.8	260.6	5.2	566.0
4	1.6	132.2	2.6	279.2

Array Temperature 86.2 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	19.6	3845.3
2	0.0	0.0	33.1	3631.5
3	0.0	0.0	30.0	3050.3
4	0.0	0.0	20.4	2093.9
Deep	0.0	0.0	18.0	1920.7
Medium	0.0	0.0	43.2	4050.7
Shallow	0.0	0.0	50.2	5475.0

Array Temperature 0.0 87.3 Deg F

Induction Constants MAI-A.A 45

Last Edited on 02-JUL-2011,13:23

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

DOWNHOLE EQUIPMENT

C:\Minimus 11.02.3186\Data\Grand Mesa Dale #2-34\Grand Mesa Dale #2-34.dta

3/8" Triple Cone Cable Head (MCB C A)
 MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

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

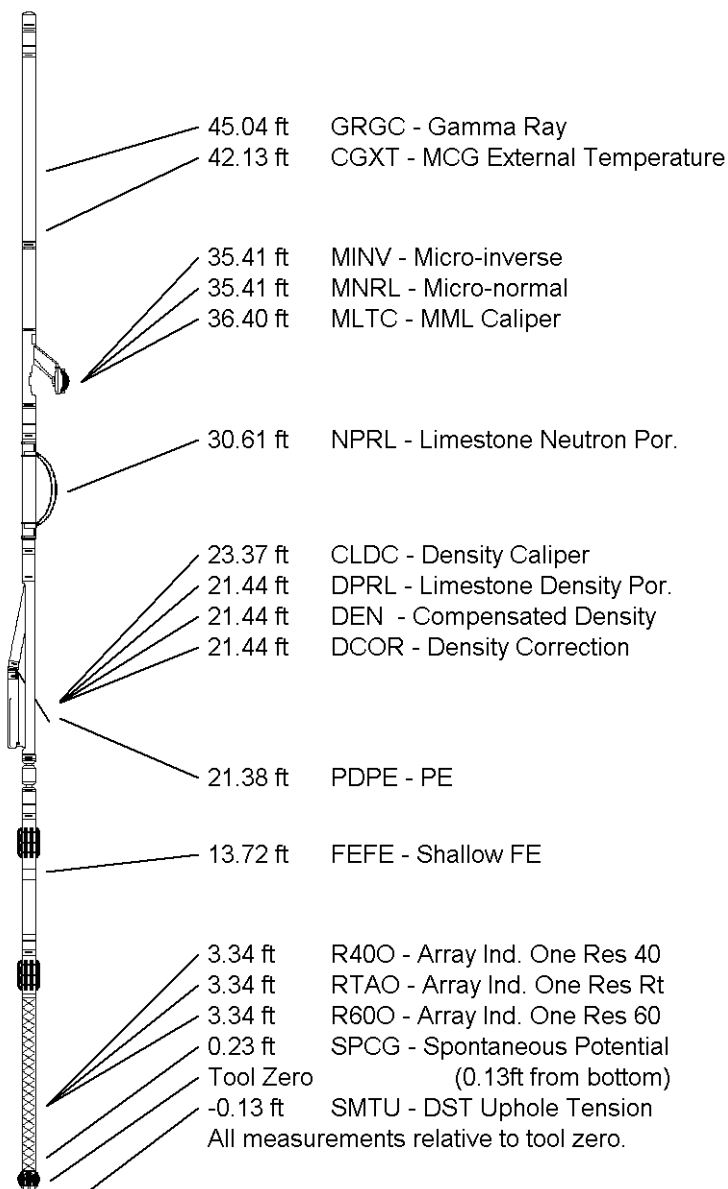
Compact Density/Caliper
 MPD-B 65 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

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

Compact Focused Electric
 MFE-A.A 55 LG: 6.05 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: 51.90 ft Weight: 423.3 lb



COMPANY	GRAND MESA OPERATING COMPANY
WELL	DALE #2-34
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2995.00	feet	First Reading	4692.00	feet
Elevation Drill Floor	2993.00	feet	Depth Driller	4730.00	feet
Elevation Ground Level	2990.00	feet	Depth Logger	4728.00	feet



MICRORESISTIVITY LOG

