

**Weatherford****MICRORESISTIVITY LOG**

COMPANY

RED OAK ENERGY, INC.

WELL

FS/FRAHM # 1-35

FIELD

WC

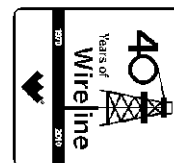
PROVINCE/COUNTY

THOMAS

COUNTRY/STATE

U.S.A. / KANSAS

LOCATION

1980' FSL & 100' FEL**E2 E2 NE SE**

SEC

TWP

RGE

Other Services

35

8S

35W

MPD/MDN

API Number

15-193-20848

MAI/MFE

Permit Number

Permanent Datum G.L., Elevation 3303 feet

Log Measured From KB

Drilling Measured From K.B.

Date

12-MAY-2012

Elevations:
KB 3308.00
DF 3306.00
GL 3303.00

Run Number

ONE

Depth Driller

4860.00

feet

Depth Logger

4857.00

feet

First Reading

4823.00

feet

Last Reading

3800.00

feet

Casing Driller

335.00

feet

Casing Logger

331.00

feet

Bit Size

7.875

inches

Hole Fluid Type

CHEMICAL

Density / Viscosity

9.20

lb/USg

57.00 CP

PH / Fluid Loss

11.00

8.80

ml/30Min

Sample Source

FLOWLINE

Rm @ Measured Temp

0.71 @ 80.0

ohm-m

Rmf @ Measured Temp

0.57 @ 80.0

ohm-m

Rmc @ Measured Temp

0.85 @ 80.0

ohm-m

Source Rmf / Rmc

CALC

CALC

Rm @ BHT

0.47 @ 124.0

ohm-m

Time Since Circulation

5 HOURS

Max Recorded Temp

124.00

deg F

Equipment Name

COMPACT

Equipment / Base

13096

LIB

Recorded By

A. GIAMBALVO

KEVIN DAVIS

LB12-122

BOREHOLE RECORD

Last Edited: 12-MAY-2012 08:32

Bit Size
inches

7.875

Depth From
feet

331.00

Depth To
feet

4857.00

CASING RECORD

Type

Size
inches

8.625

Depth From
feet

5.00

Shoe Depth
feet

331.00

Weight
pounds/ft

24.00

REMARKS

Tools Used: MPD, MCG, MDN, MFE, MAI, MML.

Hardware: MPD: 8 inch profile plate used. MAI and MFE: 0.5 Inch standoffs used. MDN: Dual Bowspring used.

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.

Annular volume with 5.5 inch production casing = 212 cu. ft

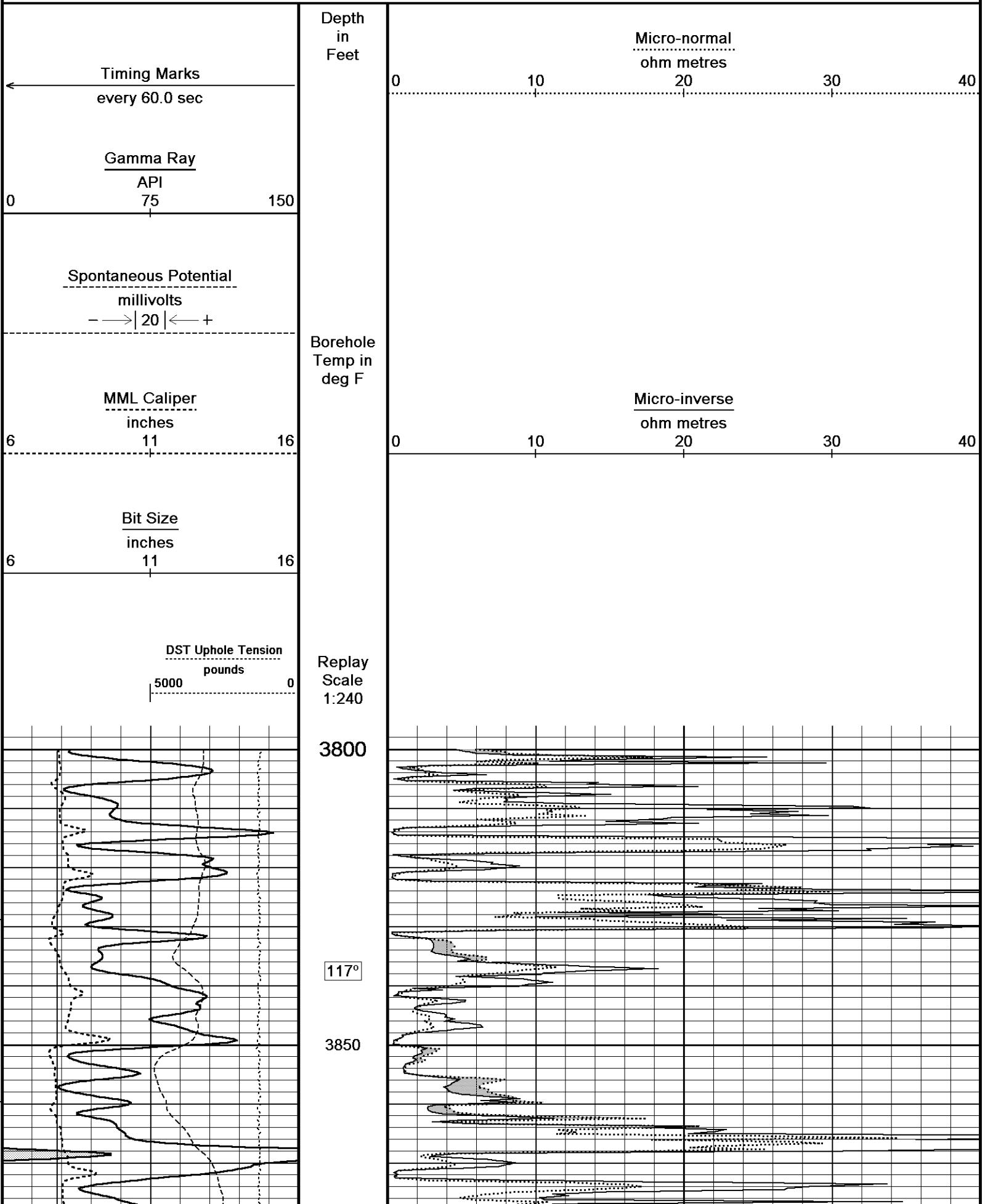
Service order #3534539

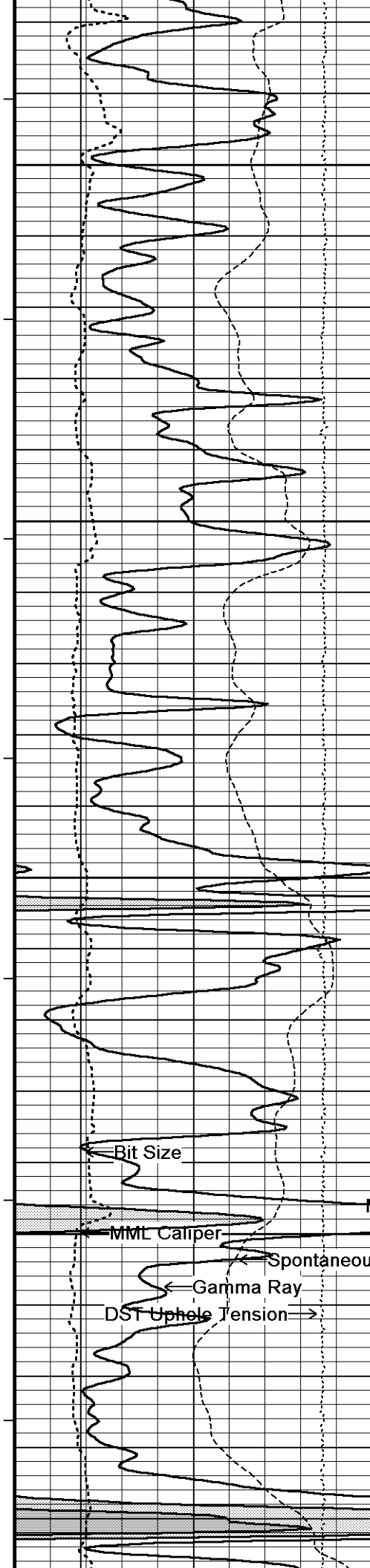
Rig: WW Drilling # 4

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.





117°

3900

118°

3950

118°

4000

118°

Micro-normal

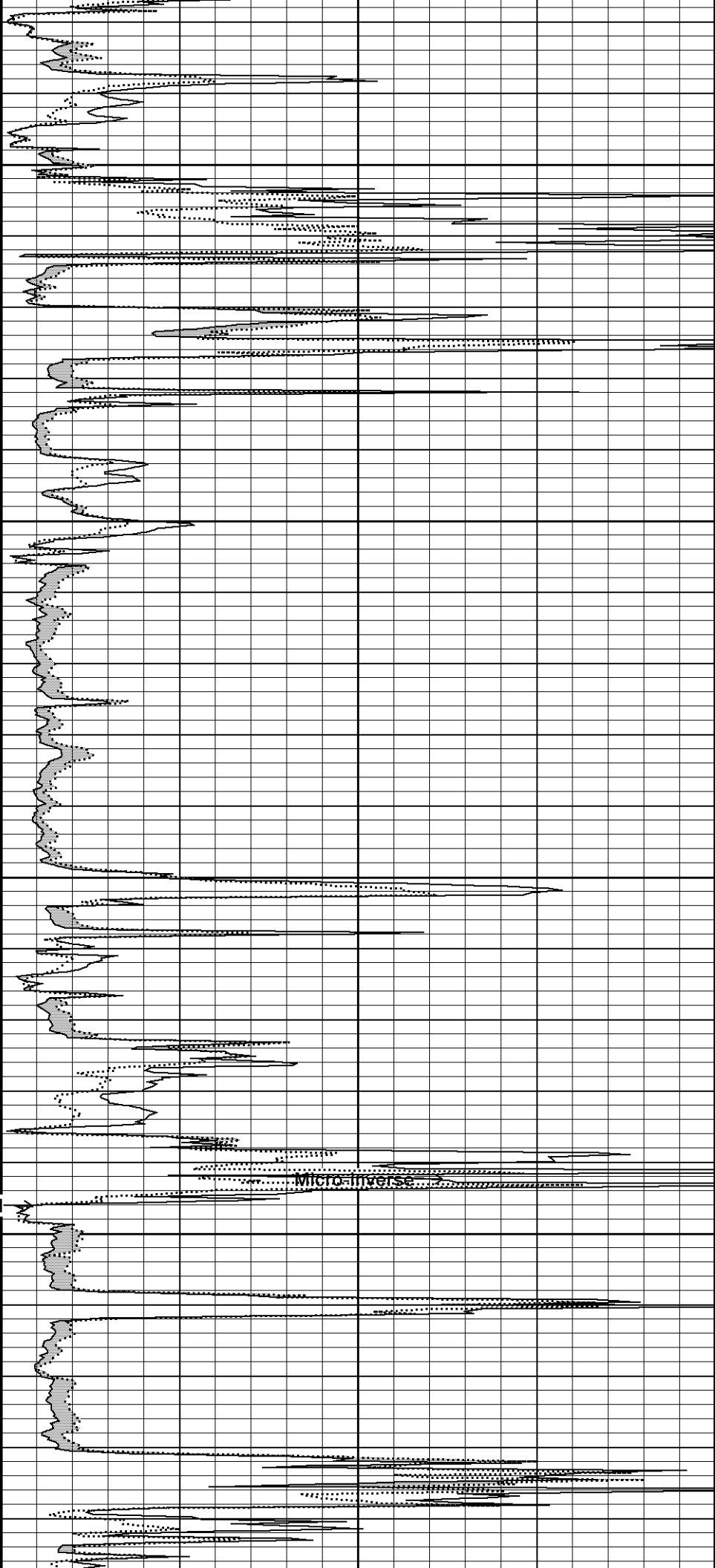
4050

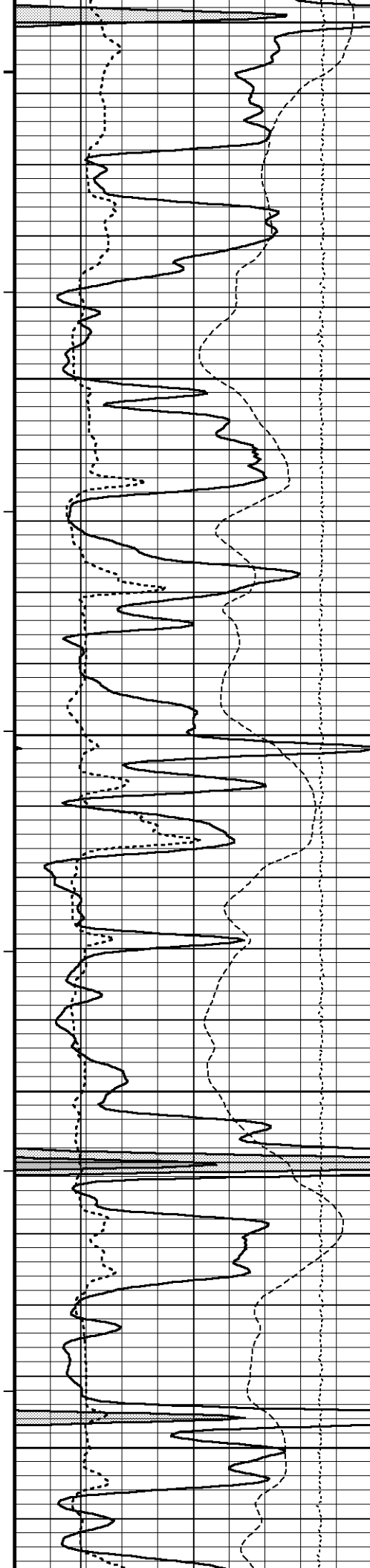
Spontaneous Potential

Gamma Ray

DST Up-hole Tension

118°





4100

118°

4150

118°

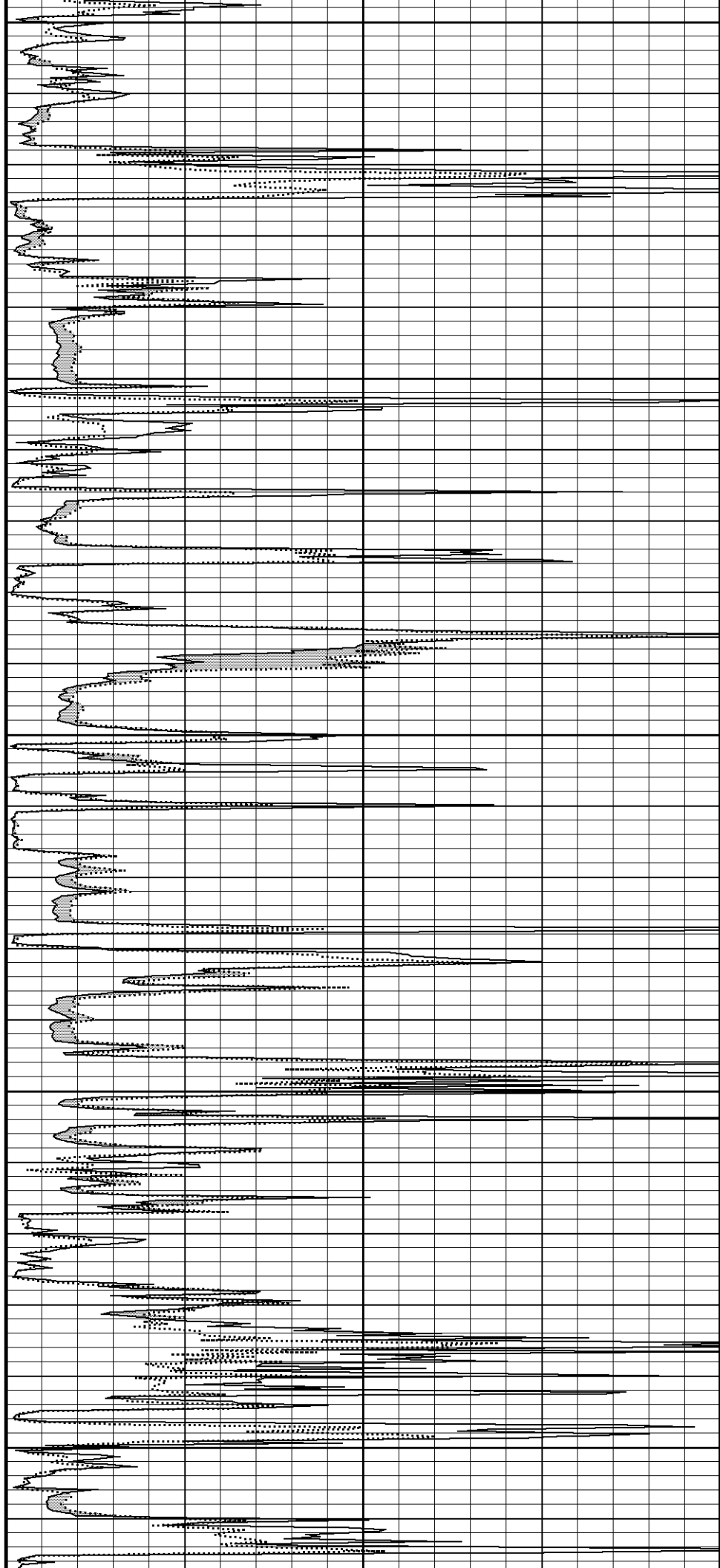
4200

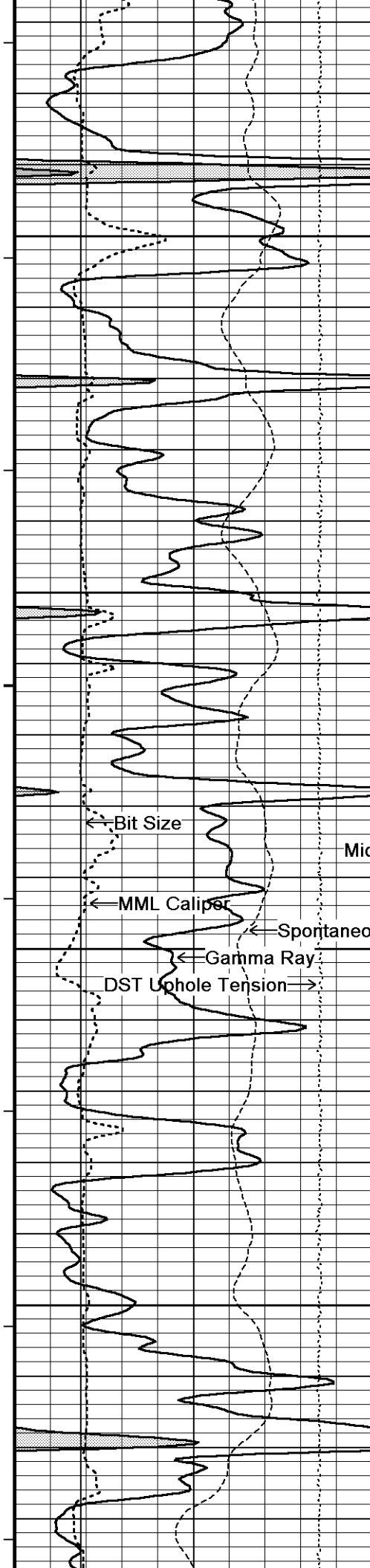
119°

4250

119°

4300





119°

4350

119°

4400

Micro-inverse

Micro-normal

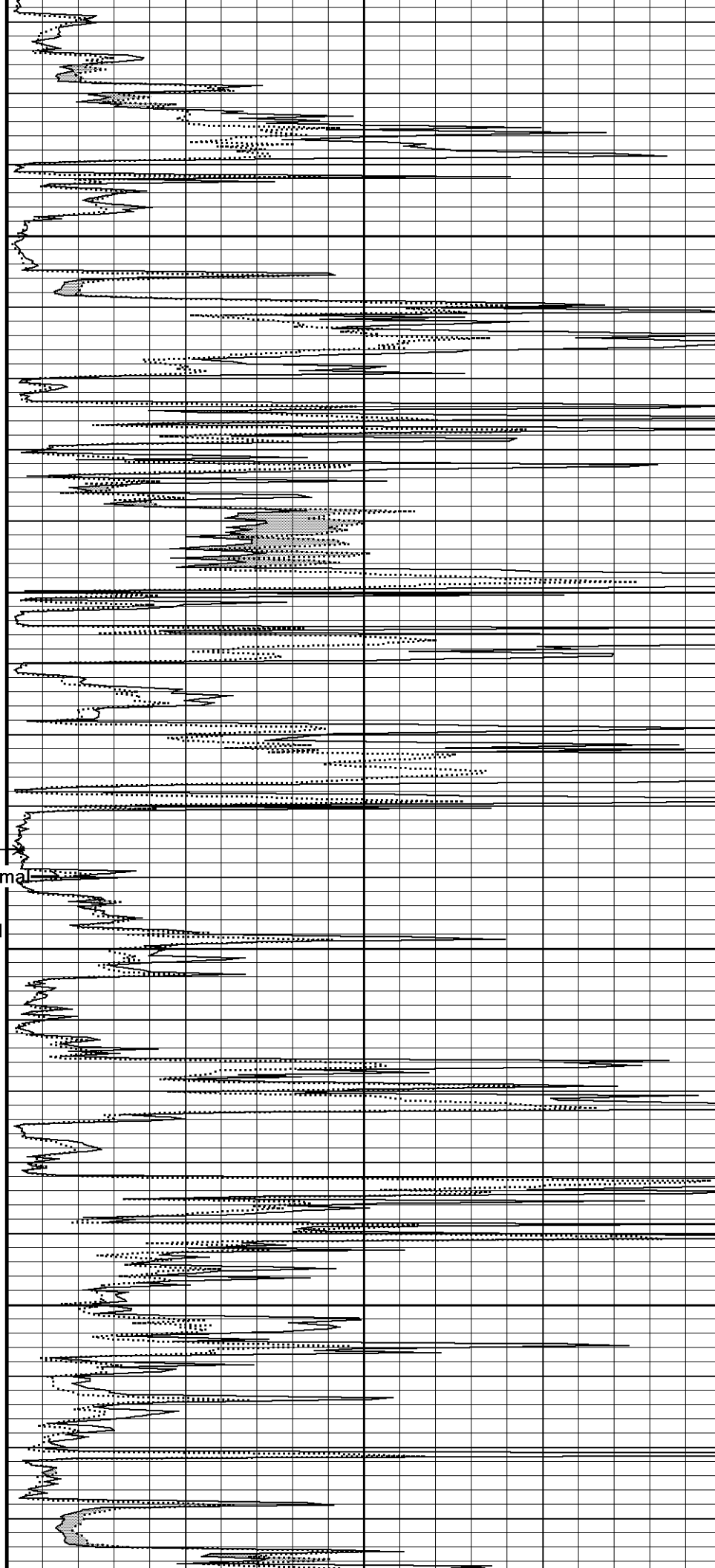
Spontaneous Potential

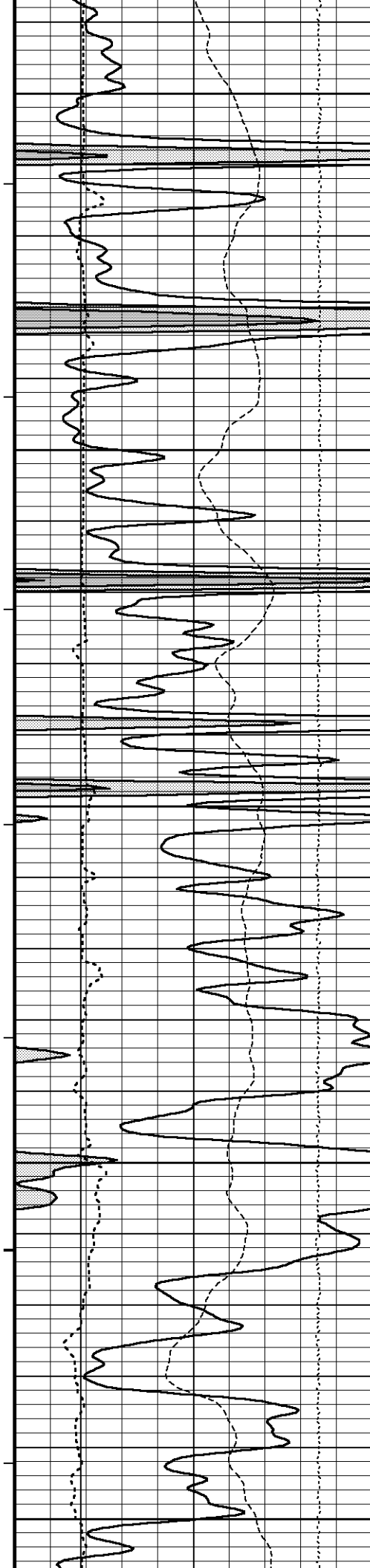
4450

121°

4500

121°





121°

4550

122°

4600

122°

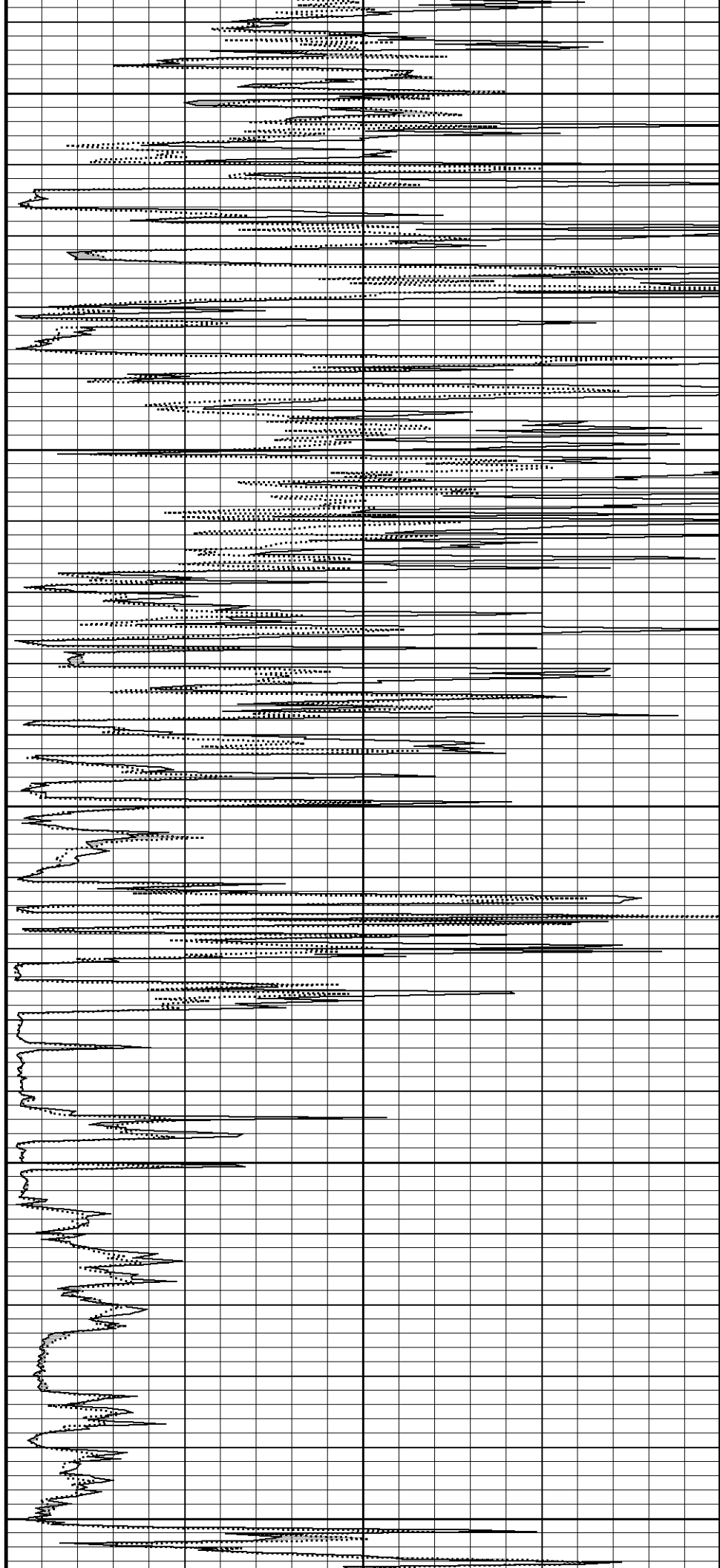
4650

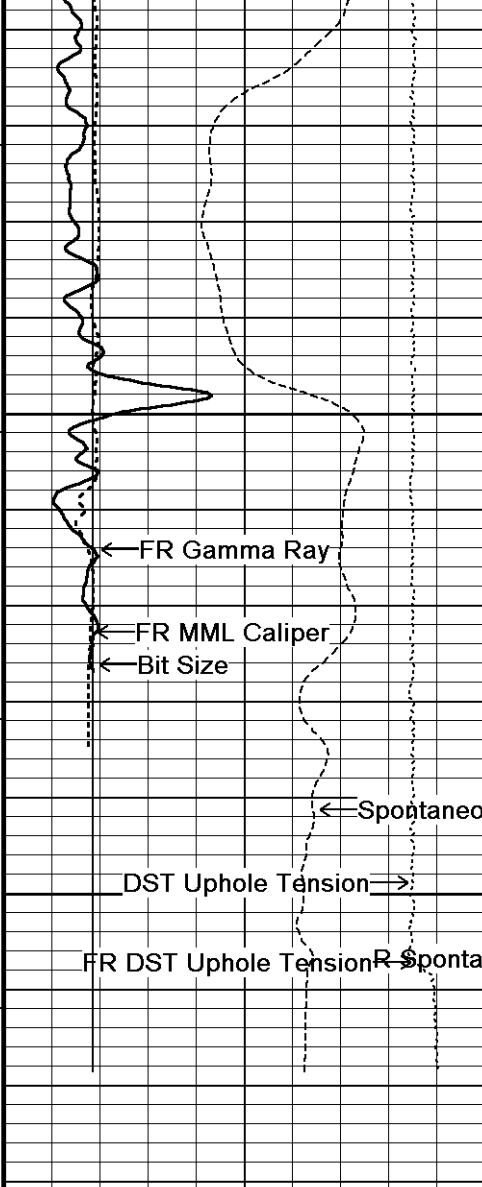
123°

4700

124°

4750





124°

4800

FFFR Micro-inverse

Micro-inverse

Micro-normal

Spontaneous Potential

DST Uphole Tension

4850

FR DST Uphole Tension

Spontaneous Potential

4878

Depth
in
Feet

Timing Marks
every 60.0 sec

Gamma Ray

API

75

150

Spontaneous Potential

millivolts

- -> | 20 | <- +

MML Caliper

inches

11

16

Bit Size

inches

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

DST Uphole Tension
pounds

50000

Replay
Scale
1:240

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 11_03_4044\Data\Red Oak En...\Red Oak Energy, Inc FS-Frahm # 1-35_003.dta
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Plotted on 12-MAY-2012 08:44
Recorded on 12-MAY-2012 05:59

↑

5 INCH MAIN

↑

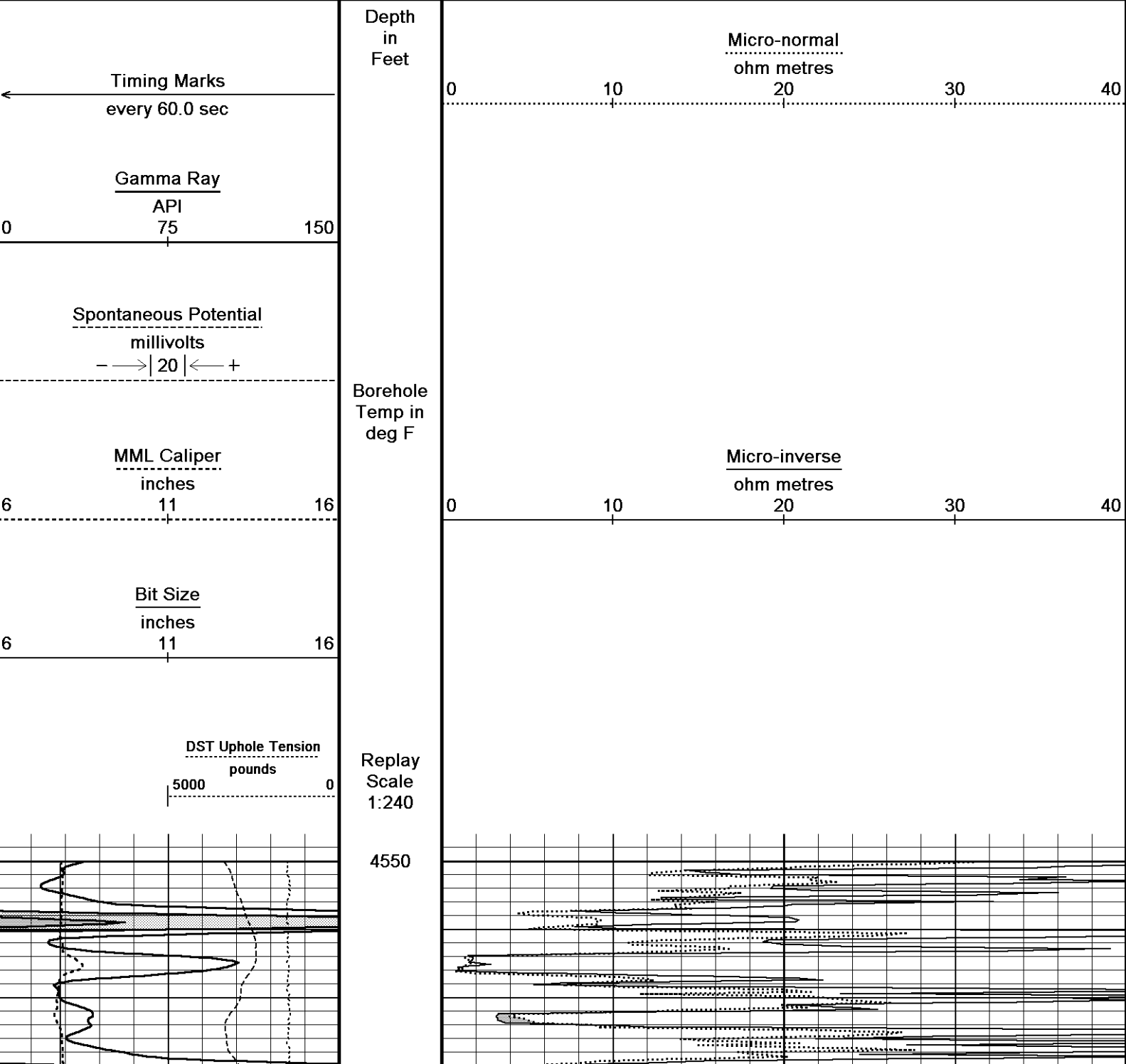
↓

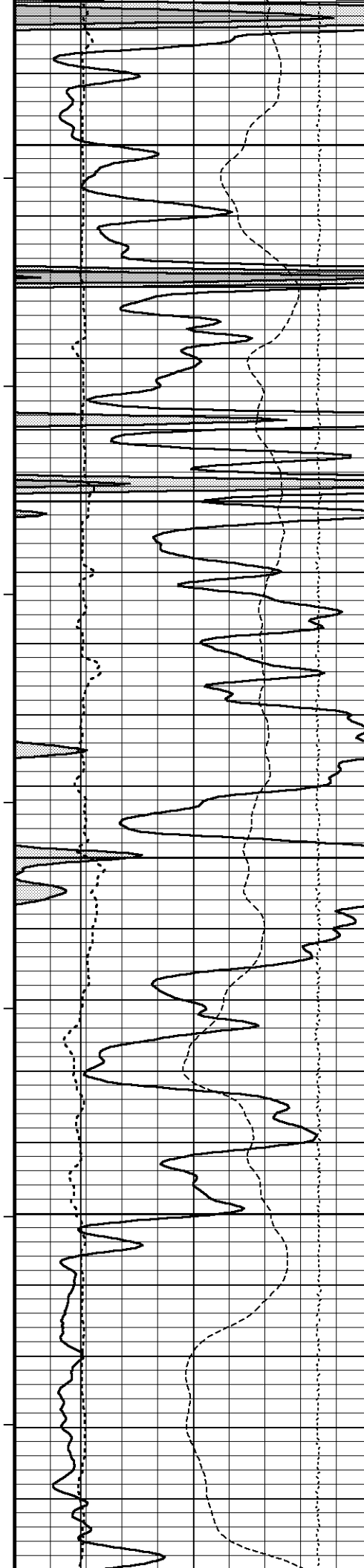
REPEAT SECTION

↓

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 11_03_4044\Data\Red Oak En...\Red Oak Energy, Inc FS-Frahm # 1-35_002.dta
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Plotted on 12-MAY-2012 08:44
Recorded on 12-MAY-2012 05:40





121°

4600

121°

4650

122°

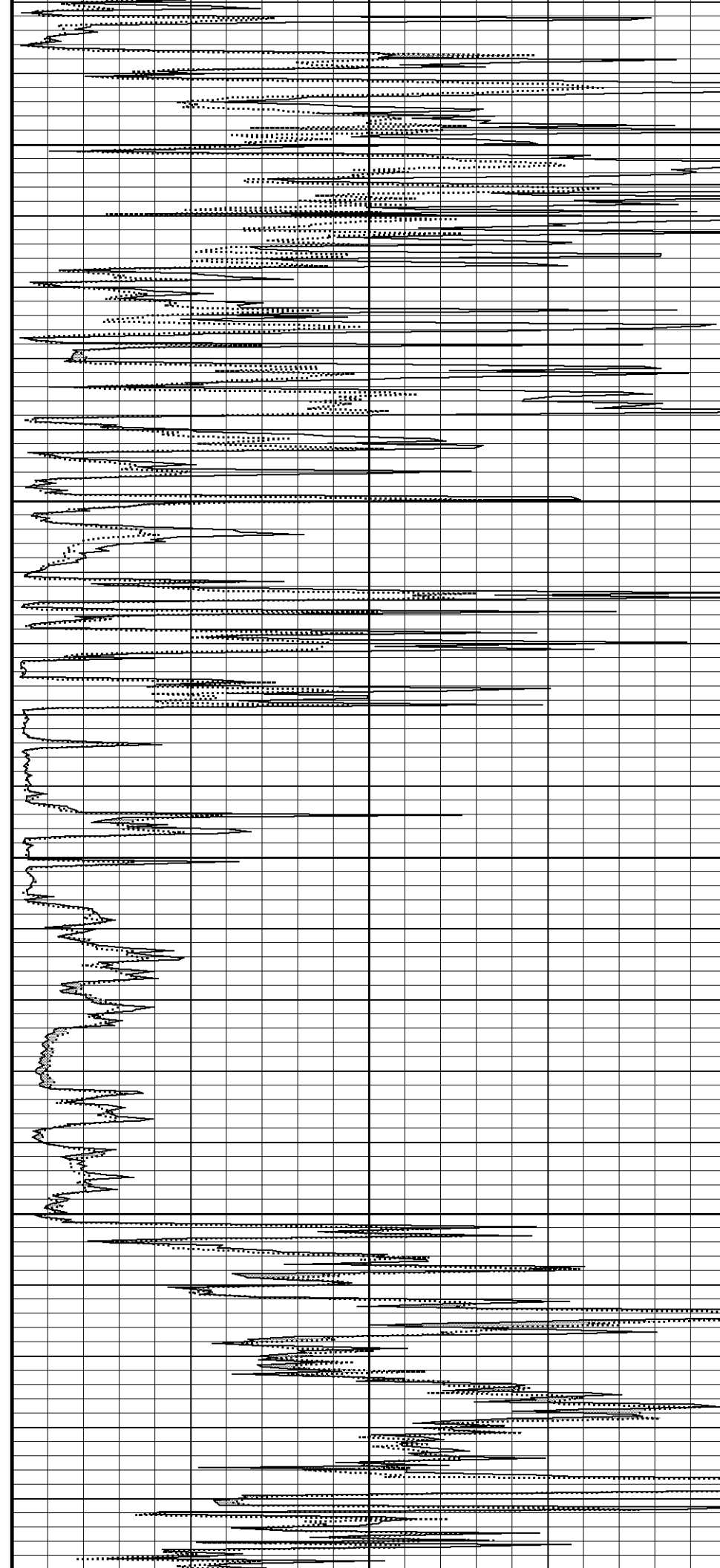
4700

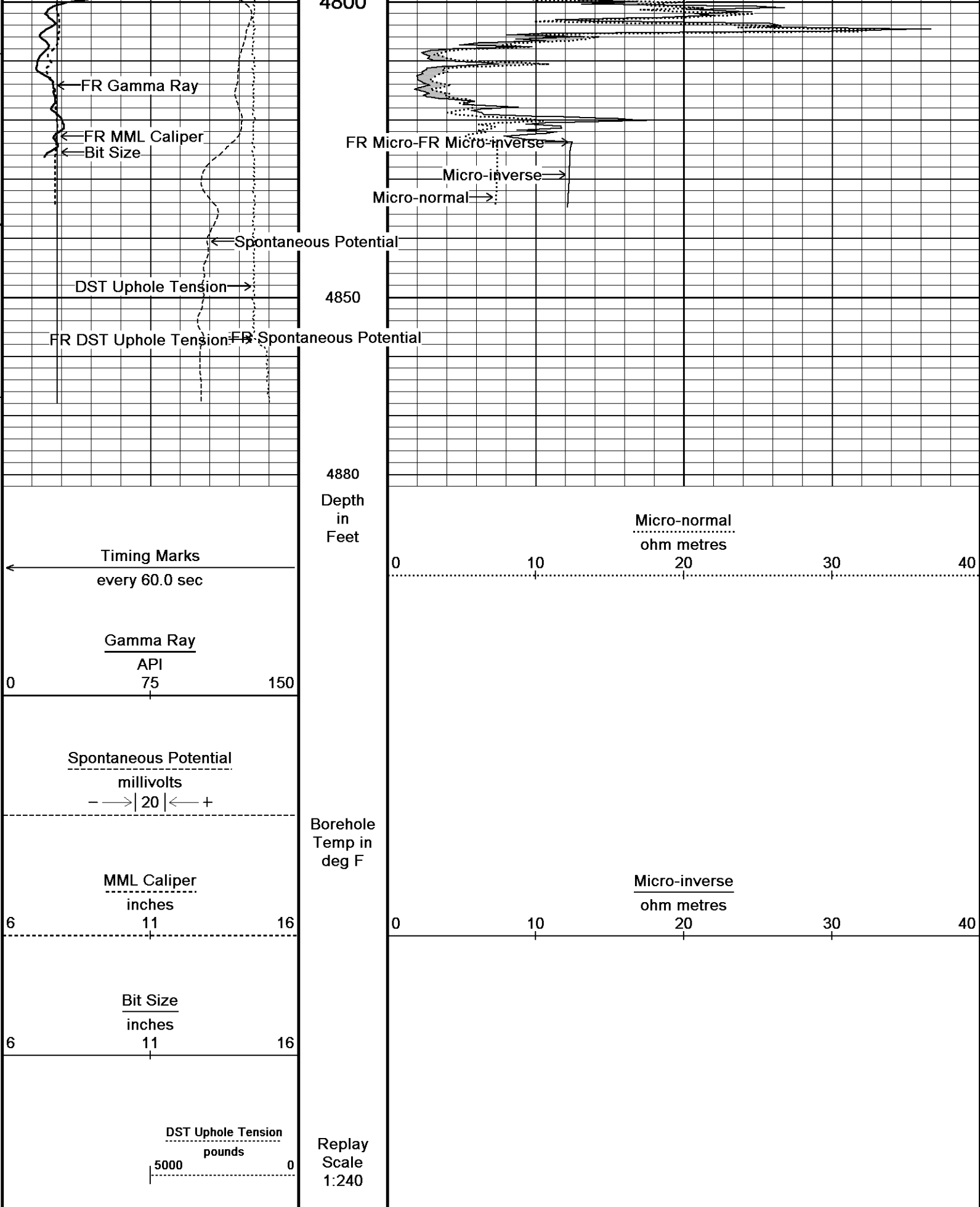
123°

4750

123°

4800





BEFORE SURVEY CALIBRATION

C:\Minimus 11_03_4044\Data\Red Oak Energy, Inc FS-Frahm # 1-35\Red Oak Energy, Inc FS-Frahm # 1-35_003.dta

General Constants All 000

Last Edited on 12-MAY-2012,04:18

General Parameters

Mud Resistivity	0.710	ohm-metres
Mud Resistivity Temperature	80.000	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 09-MAY-2012 17:14

Reading No	Measured	Calibrated (lbs)
1	12472.43	0.00
2	13803.95	582.00

Gamma Calibration MCG-B 39

Field Calibration on 11-MAY-2012 23:07

	Measured	Calibrated (API)
Background	65	44
Calibrator (Gross)	744	500
Calibrator (Net)	680	456

Gamma Constants MCG-B 39

Last Edited on 12-MAY-2012,04:19

Gamma Calibrator Number	GRC141	
Mud Density	1.10	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

SP Calibration MCG-B 39

Field Calibration on 02-APR-2012,14:02

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

High Resolution Temperature Calibration MCG-B 39

Field Calibration on 02-APR-2012,14:03

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

High Resolution Temperature Constants MCG-B 39

Last Edited on

Pre-filter Length	11
-------------------	----

Caliper Calibration MML-A 4

Base Calibration on 0C3170021008,
Field Calibration on 11-MAY-2012 23:18

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	15017	5.98
2	18447	7.97
3	21786	9.86
4	25801	11.92
5	0	0.00
6	N/A	N/A

Field Calibration		Measured Caliper (in)	Actual Caliper (in)
		6.10	5.98
Micro Normal and Micro Inverse Calibration MML-A 4			Base Calibration on 0C3170023008, Field Check on 11-MAY-2012 23:17
Base Calibration			
Channel	Resistor 1	Measured Resistor 2	Calibrated (ohm-m) Resistor 1 Resistor 2
Micro Normal	12.2	60.2	5.0 25.0
Micro Inverse	15.7	78.3	5.0 25.0
Channel	Base Check (ohm-m)		Field Check (ohm-m)
Micro Normal	62.9		62.9
Micro Inverse	48.3		48.3
Micro Normal and Micro Inverse Constants MML-A 4			Last Edited on 10-MAY-2012,23:09
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 09-MAY-2012,12:48 Field Check on 11-MAY-2012 23:16
Base Calibration			
	Near	Measured Far	Calibrated (cps) Near Far
	2956	91	3714 110
Ratio	32.635		33.764
Field Calibrator at Base	Calibrated (cps)		
	2214 3169		
Ratio	0.699		
Field Check	Calibrated (cps)		
	2142 3165		
Ratio	0.677		
Neutron Constants MDN-B.J 387			Last Edited on 12-MAY-2012,04:19
Neutron Source Id	P0204NN		
Neutron Jig Number	NEDC117		
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-B.J 352			Base Calibration on 0C31B0831004 Field Check on 11-MAY-2012 23:11
Base Calibration			
		Measured	Calibrated (ohm-m)
Reference 1	0.0		0.0
Reference 2	963.7		126.8
Base Check	281.5		
Field Check	281.5		
FE Constants MFE-B.J 352			Last Edited on 12-MAY-2012,04:20

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 0C31B0B06000,
Field Check on 11-MAY-2012 23:09

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	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	12.1	3764.2
2	0.0	0.0	29.6	3468.3
3	0.0	0.0	27.1	3014.9
4	0.0	0.0	18.7	2065.5
Deep	0.0	0.0	15.8	1995.8
Medium	0.0	0.0	40.1	3956.2
Shallow	0.0	0.0	45.4	5083.9

Array Temperature 0.0 71.5 Deg F

Induction Constants MAI-A.A 178

Last Edited on 12-MAY-2012,04:20

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 0C4030110004,

	Measured	Calibrated(Deg F)
Lower	32.00	32.00
Upper	68.00	68.00

High Resolution Temperature Constants MAI-A.A 178

Last Edited on 0C4060522000,

Pre-filter Length	11
-------------------	----

Caliper Calibration MPD-B 35

Base Calibration on 0C31C0A2C008
Field Calibration on 11-MAY-2012 23:32

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	20688	3.99
2	30944	5.98
3	41312	7.97
4	50976	9.86
5	61184	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.96	5.98

Photo Density Calibration MPD-B 35

Base Calibration on 0C31C0B00008
Field Check on 11-MAY-2012 23:30

Density Calibration				
Base Calibration		Measured	Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	62298	31871	59556	30836
Reference 2	26887	2863	24941	2541
Field Check at Base				
	1142.9	1359.1		
Field Check				
	1146.5	1361.8		
PE Calibration				
Base Calibration		Measured	Calibrated	
	WS	WH	Ratio	Ratio
Background	204	1008		
Reference 1	23049	62096	0.374	0.371
Reference 2	7079	26739	0.267	0.272
Field Check at Base				
	204.4	1008.1		
Field Check				
	205.5	1014.8		

Density Constants MPD-B 35

Last Edited on 12-MAY-2012,04:20

Density Source Id	18235B	
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 11_03_4044\Data\Red Oak Energy, Inc FS-Frahm # 1-35\Red Oak Energy, Inc FS-Frahm # 1-35_003.dta

MCB-A.A 11B Tension Cablehead
MCB-A.A 161 LG: 2.40 ft WT: 19.8 lb OD: 2.24 in

Compact Comms Gamma
MCG-B 39 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

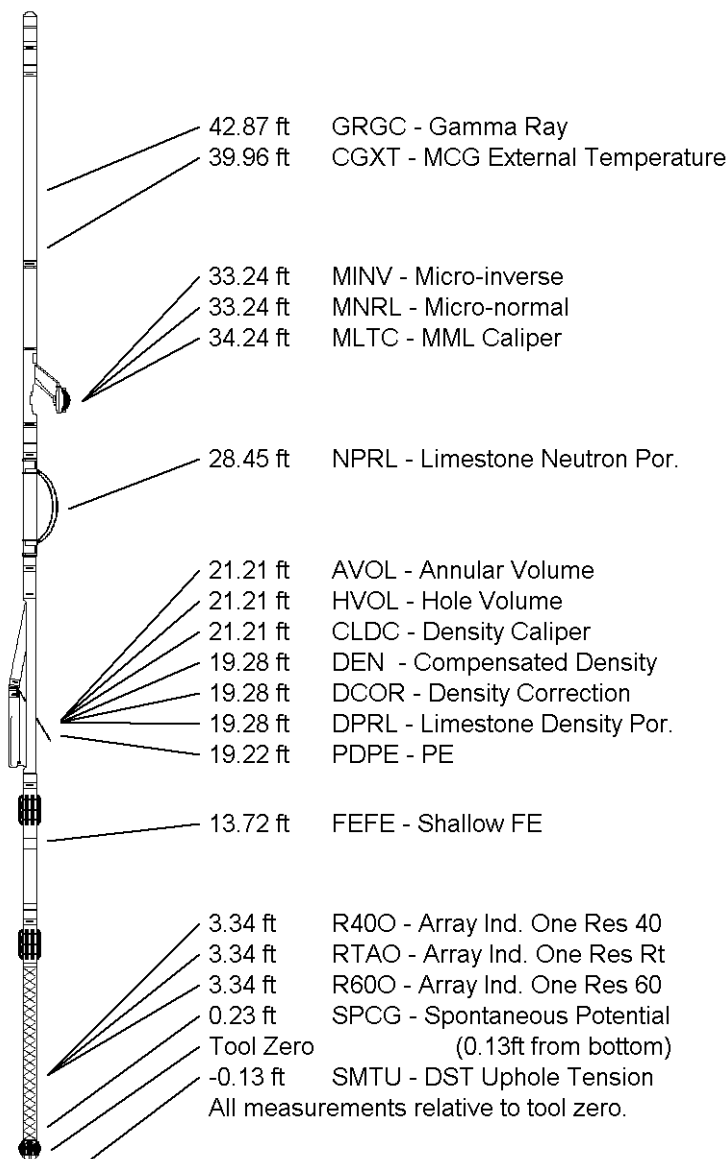
Compact Neutron
MDN-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 35 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric
MFE-B.J 352 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: 50.55 ft Weight: 403.4 lb



COMPANY	RED OAK ENERGY, INC.
WELL	FS/FRAHM # 1-35
FIELD	WC
PROVINCE/COUNTY	THOMAS
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3308.00	feet	First Reading	4823.00	feet
Elevation Drill Floor	3306.00	feet	Depth Driller	4860.00	feet
Elevation Ground Level	3303.00	feet	Depth Logger	4857.00	feet



MICRORESISTIVITY LOG



Weatherford®

