



Weatherford

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

COMPANY

SHAKESPEARE OIL COMPANY INC.

WELL

K OTTLEY #1-14

FIELD

WILDCAT

PROVINCE/COUNTY

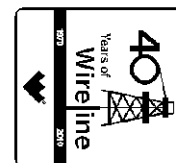
LOGAN

COUNTRY/STATE

U.S.A. / KANSAS

LOCATION

2298' FSL & 800' FWL



SEC

TWP
14S

RGE
32W

Other Services
MPD/MDN
MML

API Number

15-109-21091

Permit Number

Permanent Datum G.L., Elevation 2819 feet

Log Measured From KB

Drilling Measured From K.B. @ 5FT

Date

06-JUN-2012

Run Number

ONE

Depth Driller

4570.00

Depth Logger

4570.00

First Reading

4567.00

Last Reading

3700.00

Casing Driller

219.00

Casing Logger

219.00

Bit Size

7.875

Hole Fluid Type

CHEMICAL

Density / Viscosity

9.10 lb/USg

PH / Fluid Loss

10.00

Sample Source

FLOWLINE

Rm @ Measured Temp

0.78 @ 93.0

Rmf @ Measured Temp

0.62 @ 93.0

Rmc @ Measured Temp

0.94 @ 93.0

Source Rmf / Rmc

CALC

Rm @ BHT

0.63 @ 115.0

Time Since Circulation

4 HOURS

Max Recorded Temp

115.00

deg F

Equipment Name

COMPACT

Equipment / Base

13057

Recorded By

R. HOFFMAN

Witnessed By

STEVE DAVIS

S.O. # / JOB #

3534586

LB12-141

BOREHOLE RECORD

Last Edited: 06-JUN-2012 15:50

Bit Size
inches

7.875

Depth From
feet

219.00

Depth To
feet

4570.00

CASING RECORD

Type

Size
inches

8.625

Depth From
feet

0.00

Shoe Depth
feet

219.00

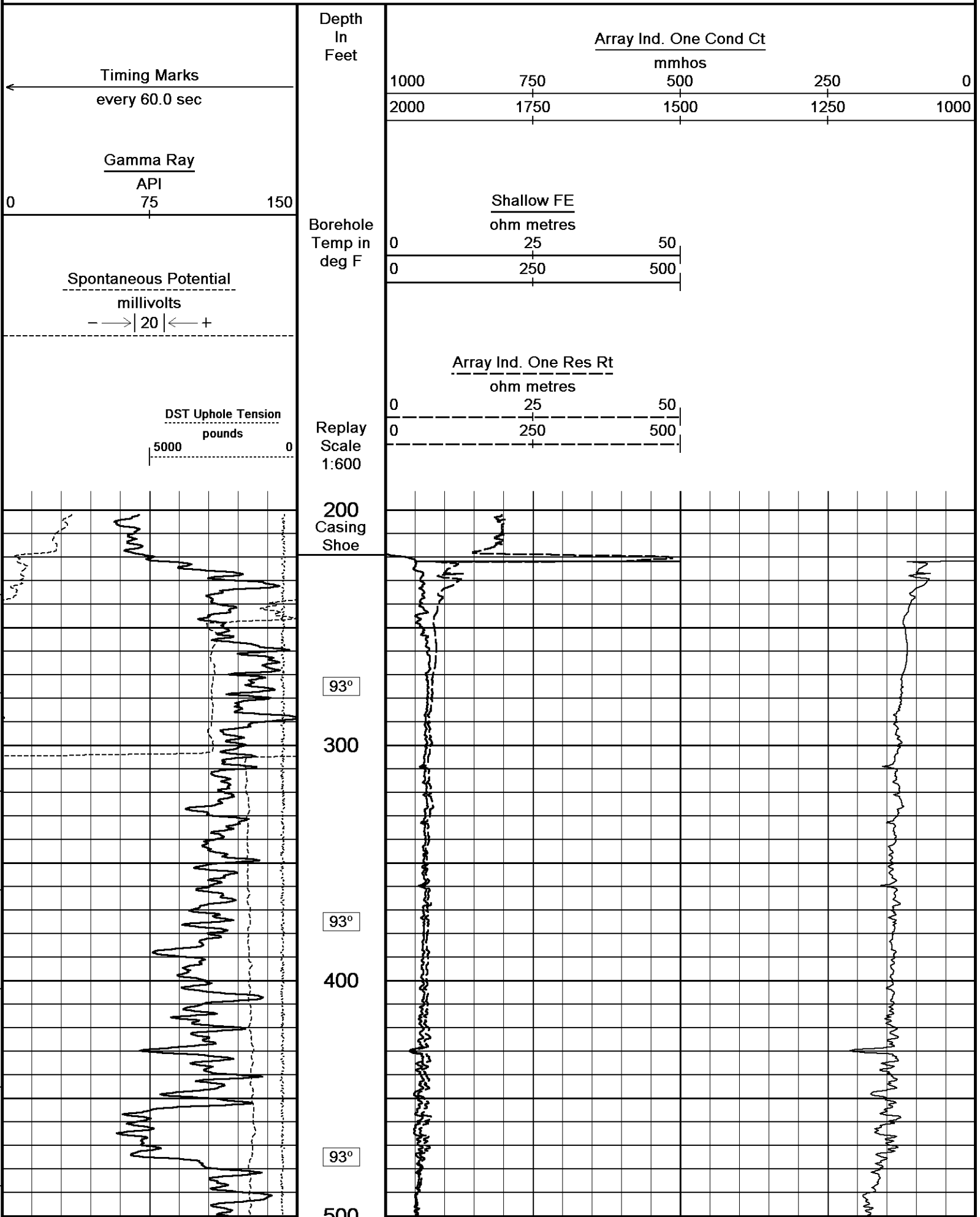
Weight
pounds/ft

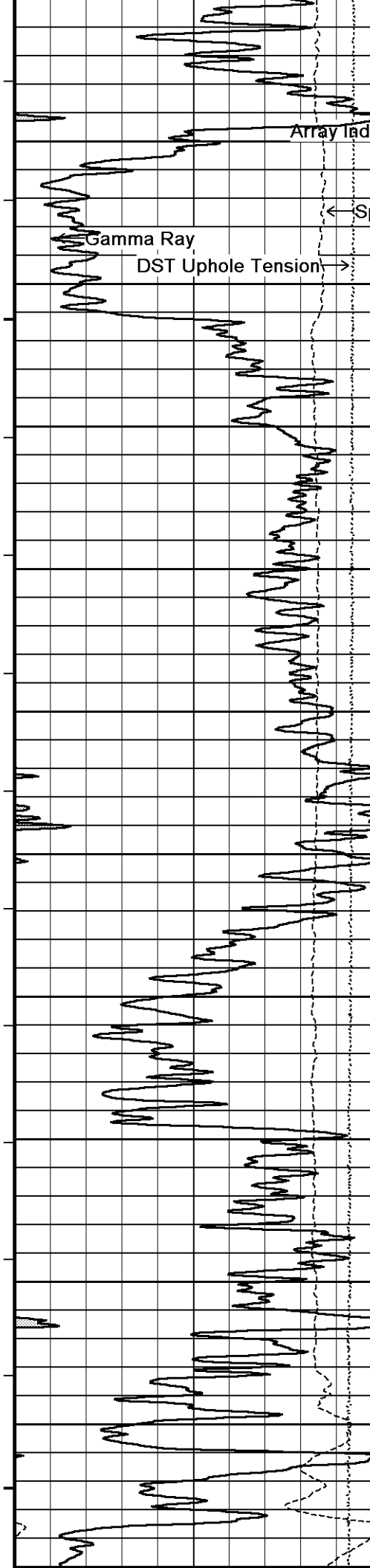
24.00

REMARKS

Tools Ran: MCG, MML, MDN, MPD, SKJ, MFE, MAI.
Hardware Used: MDN Dual Eccentralizer used. MPD 8 inch profile plate used. MFE, MSS 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 calculated from TD to 3700 ft = 175 cu. ft.
Service order #3534586
Rig: WW Drilling Rig #2
Engineer: R. Hoffman
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.





Array Ind. One Res Rt

Shallow FE

← Spontaneous Potential

600

95°

700

96°

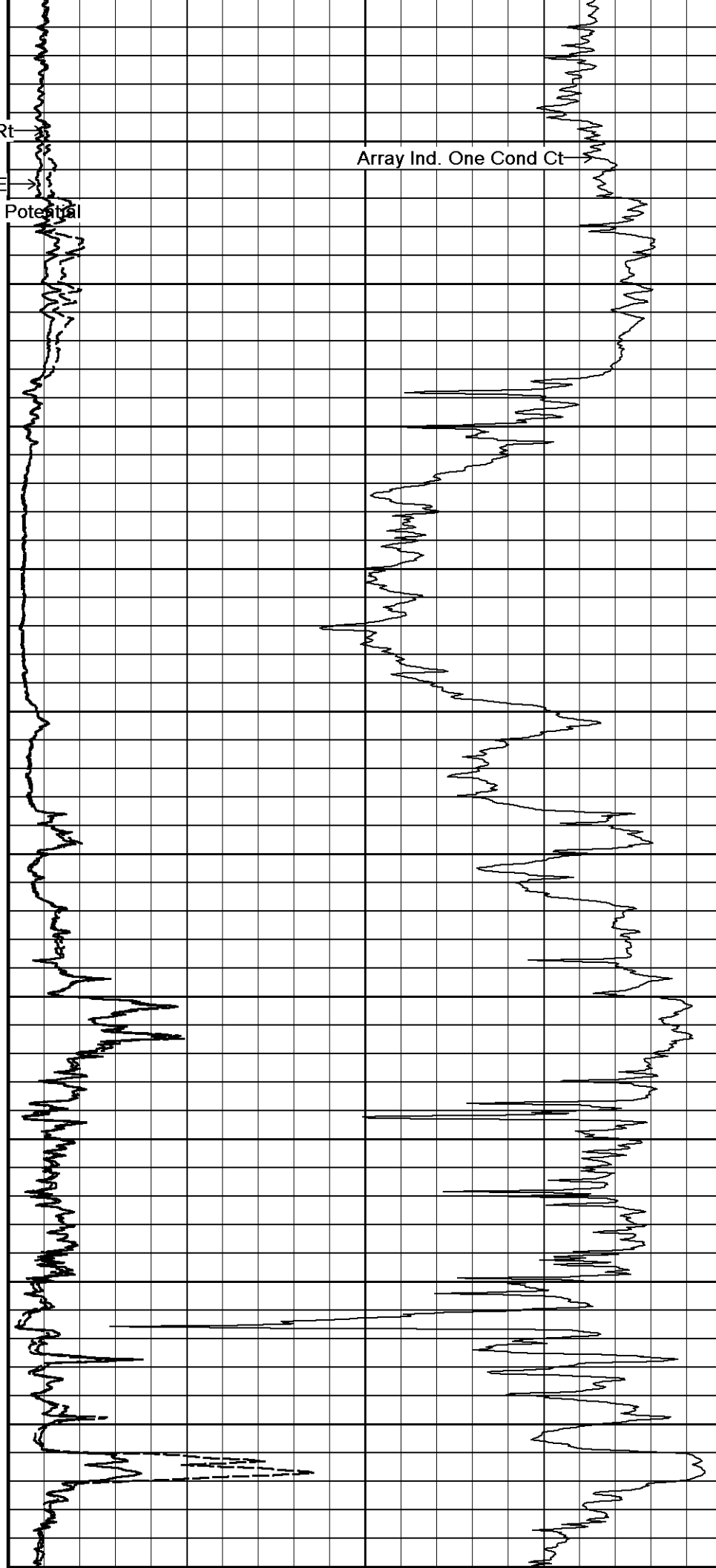
800

97°

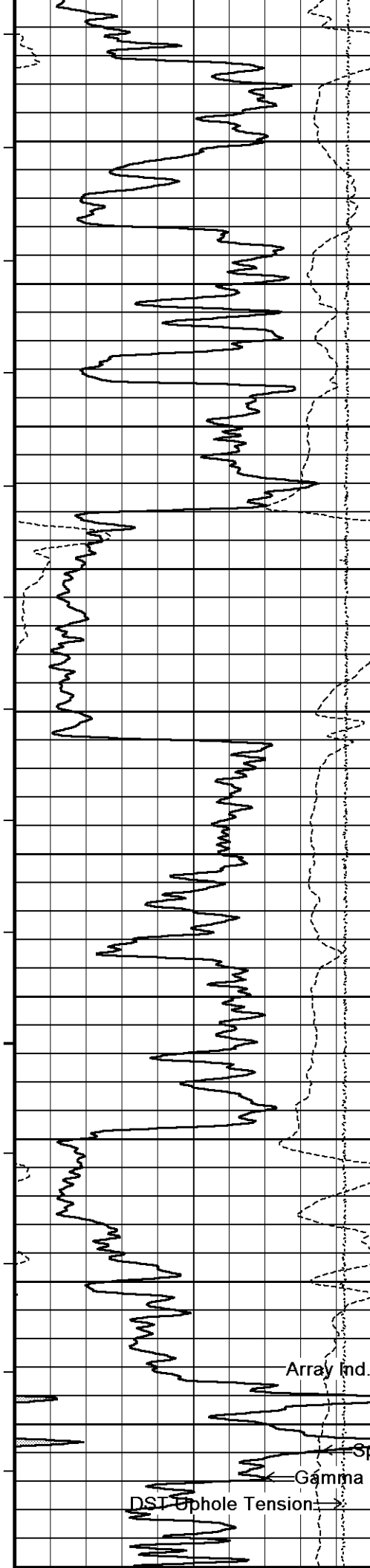
900

97°

1000



Array Ind. One Cond Ct



98°

1100

98°

1200

99°

1300

99°

1400

100°

1500

Array Ind. One Res Rt

Shallow FE

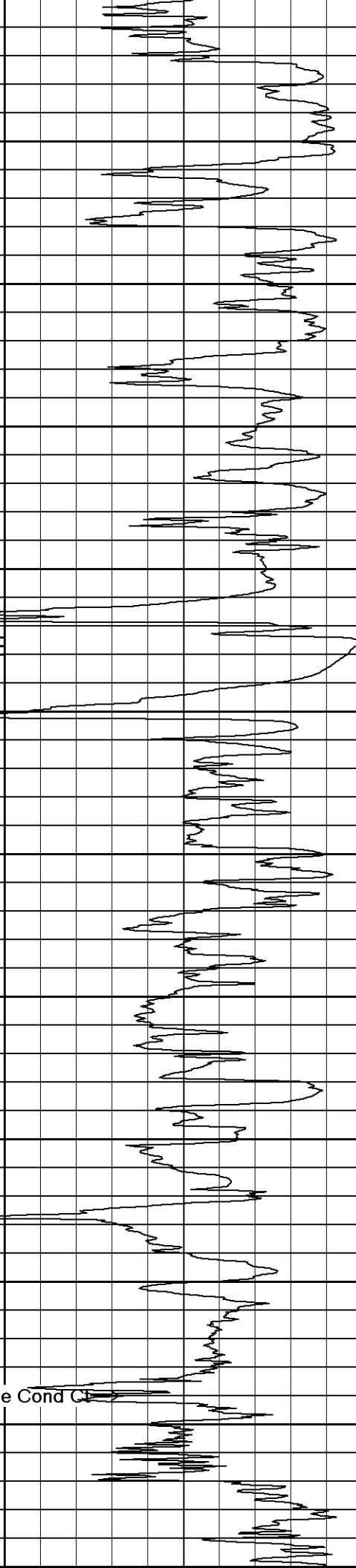
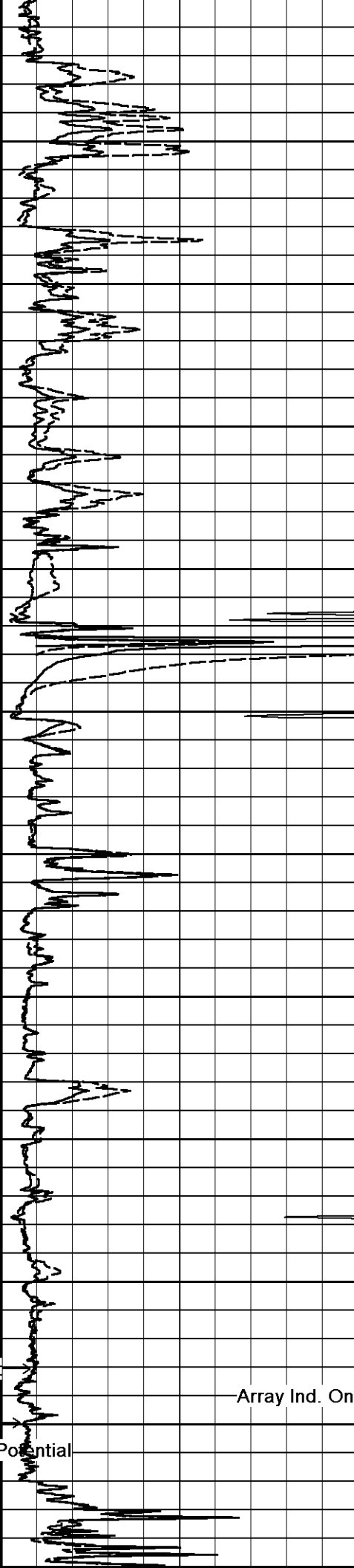
Spontaneous Potential

Gamma Ray

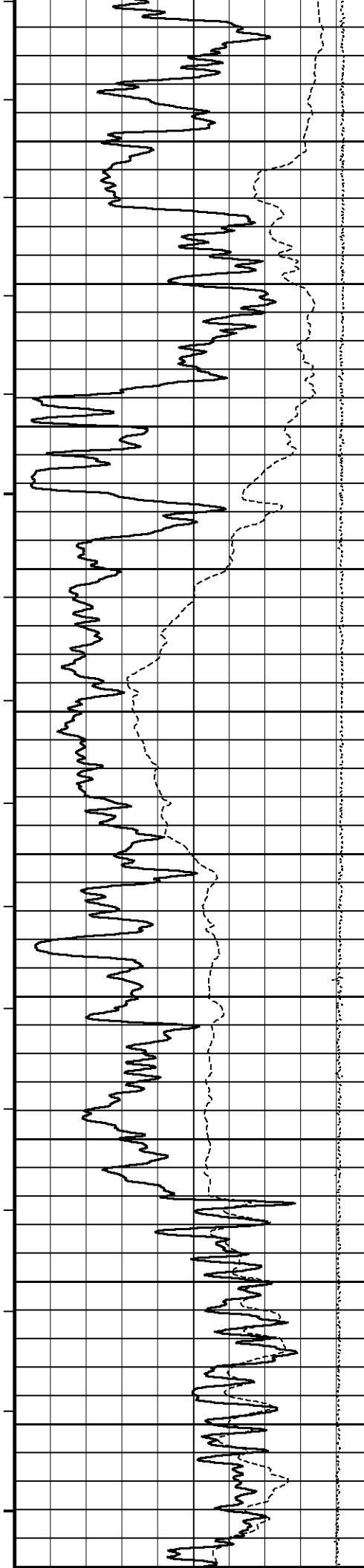
DST Uphole Tension

101°

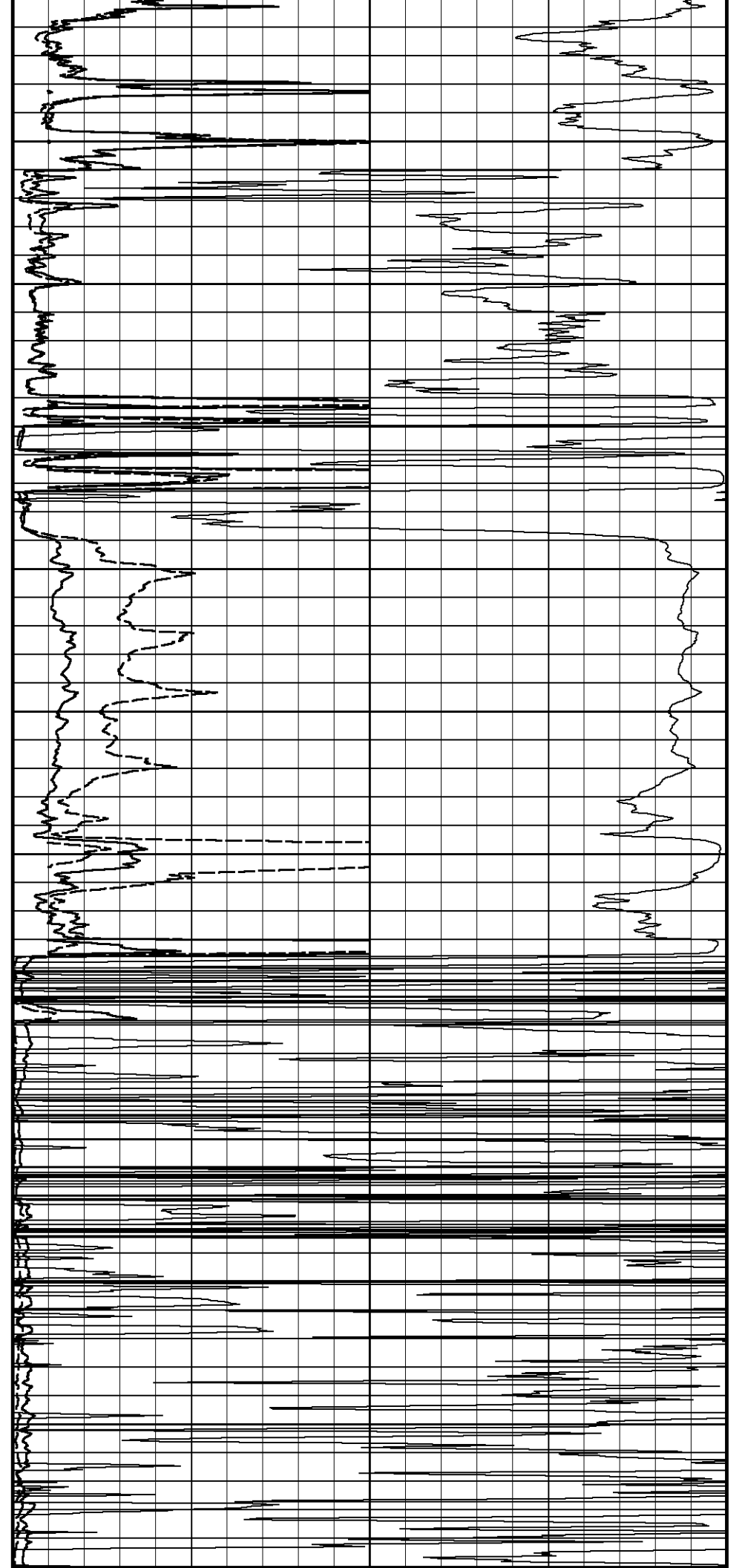
1600

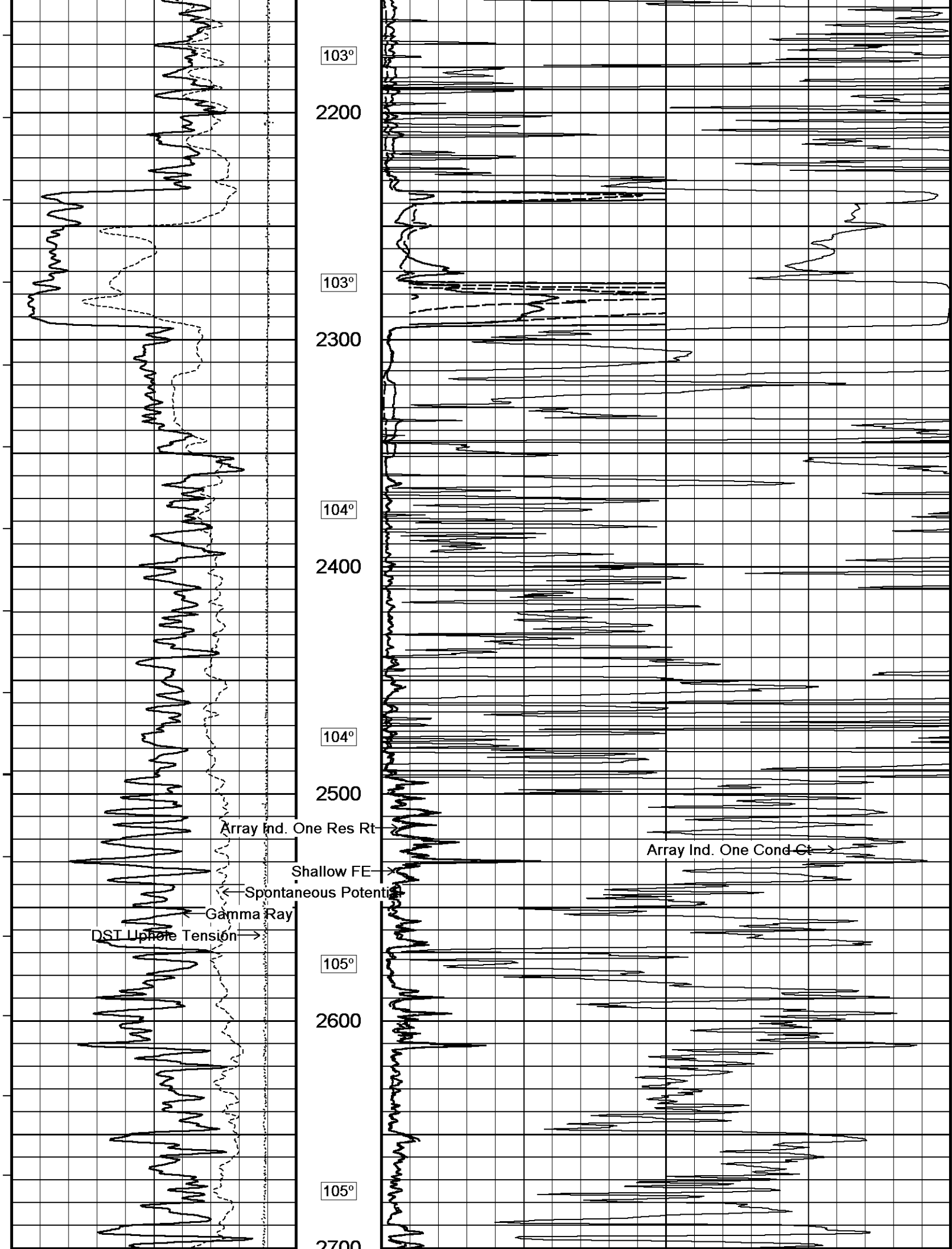


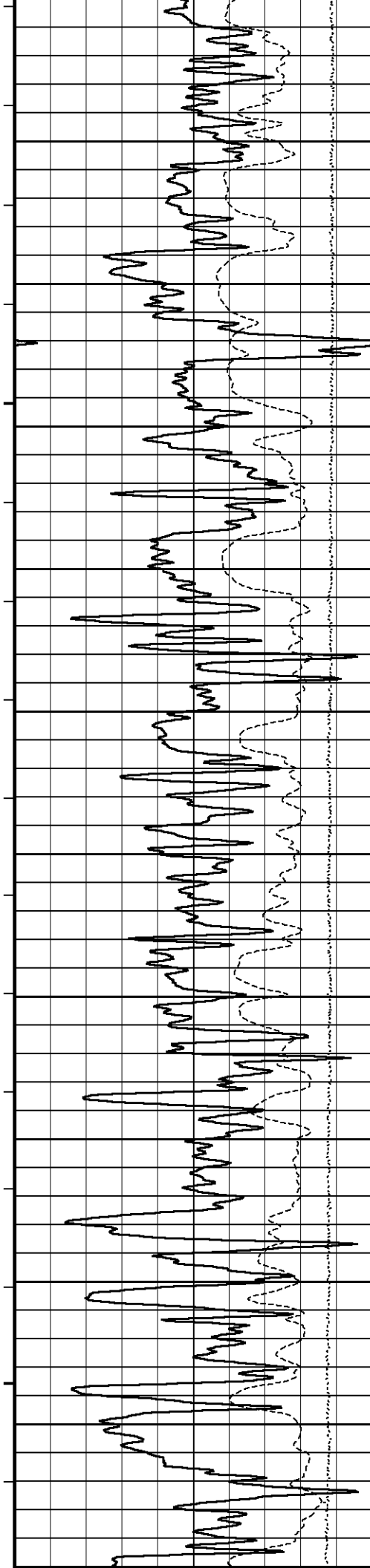
Array Ind. One Cond CL



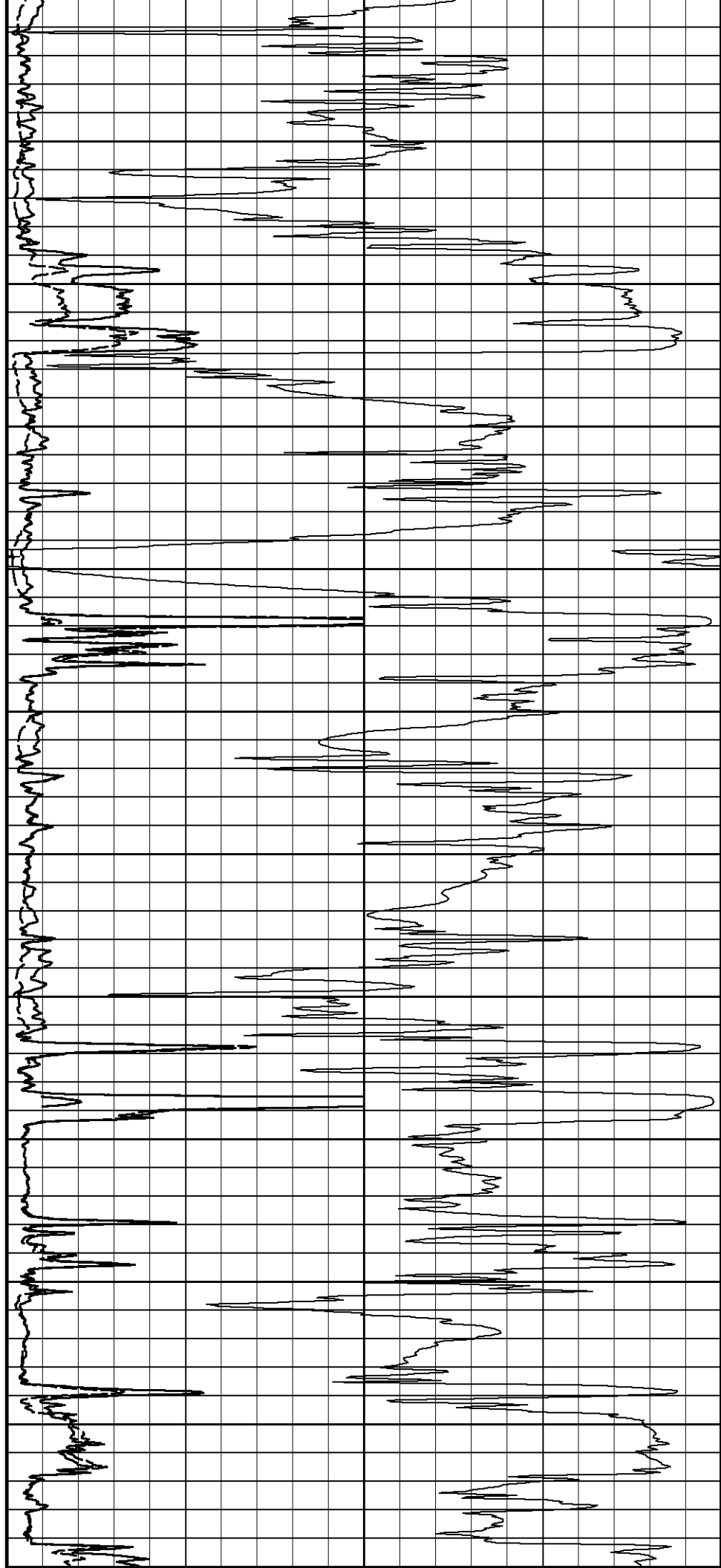
1600
102°
1700
102°
1800
102°
1900
102°
2000
103°
2100

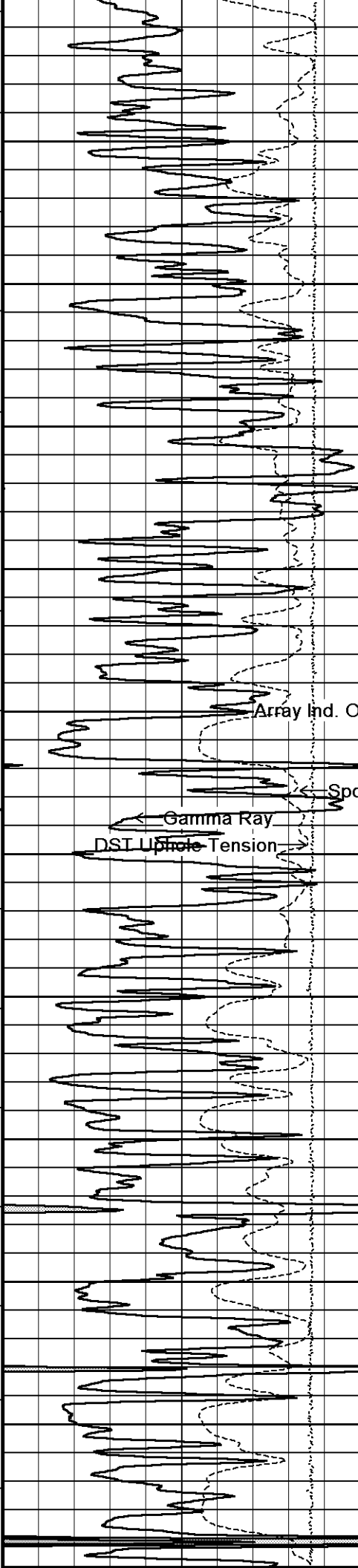






2700
106°
2800
106°
2900
107°
3000
107°
3100
107°
3200





108°

3300

108°

3400

109°

3500

Shallow FESS

Spontaneous Potential

Gamma Ray

DST Up

109°

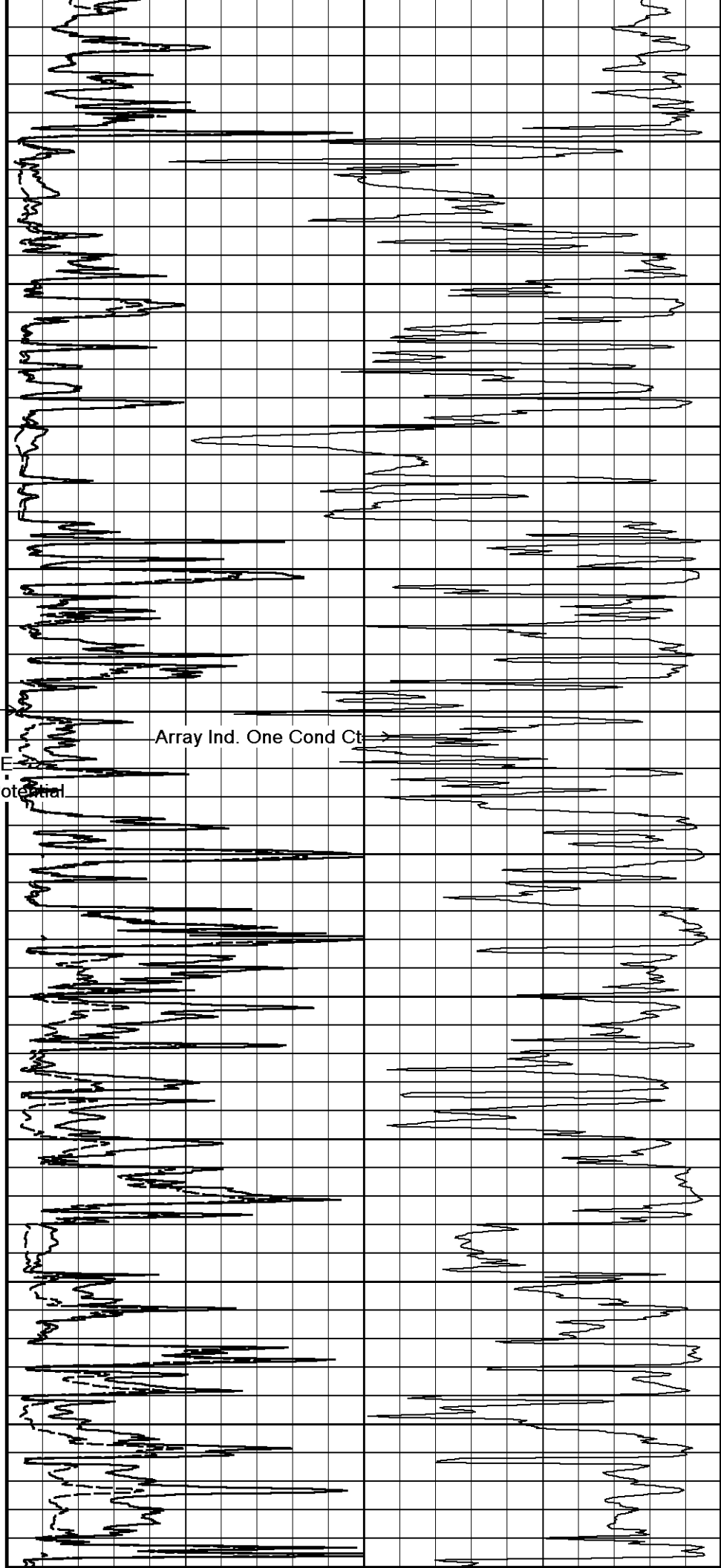
3600

110°

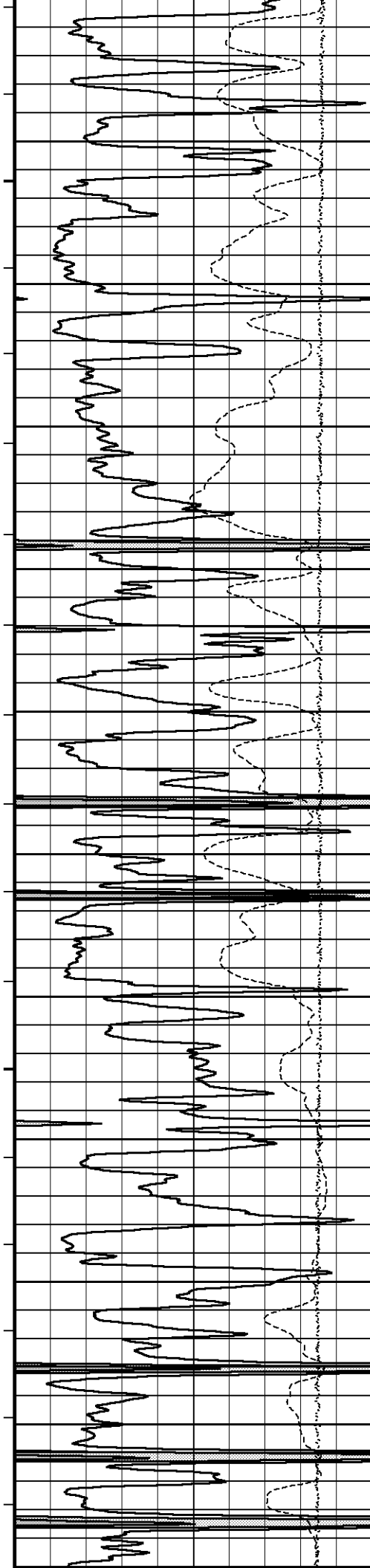
3700

110°

3800



Array Ind. One Cond Ct



3800

111°

3900

111°

4000

112°

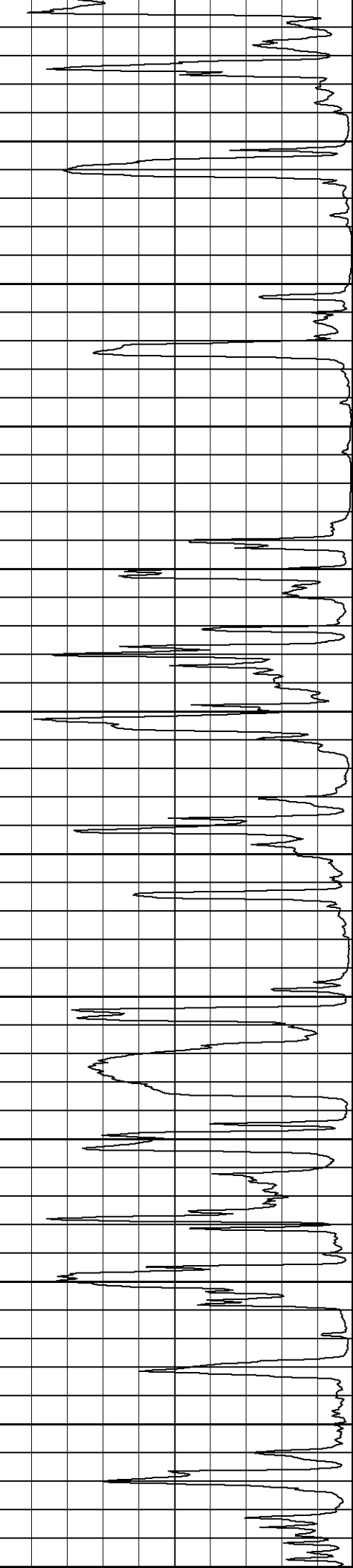
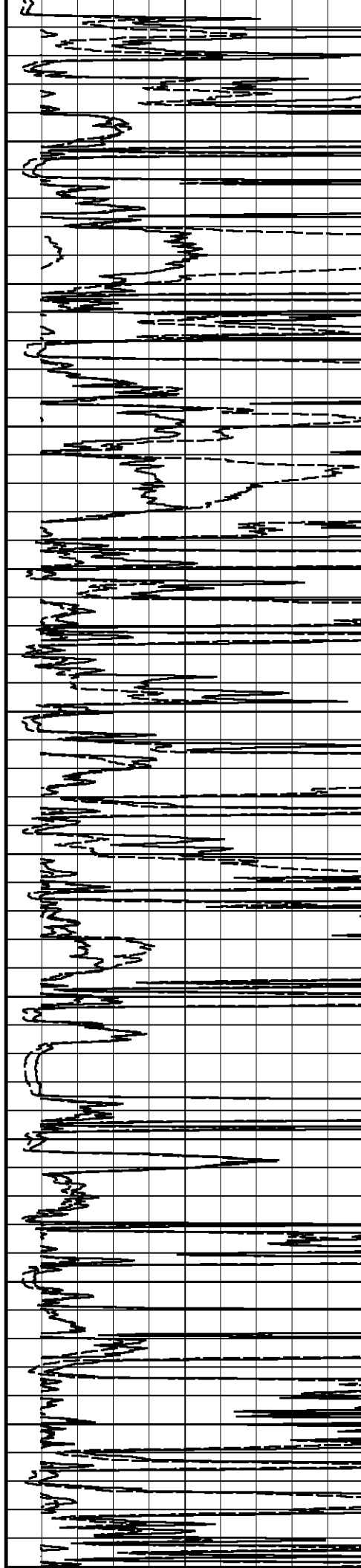
4100

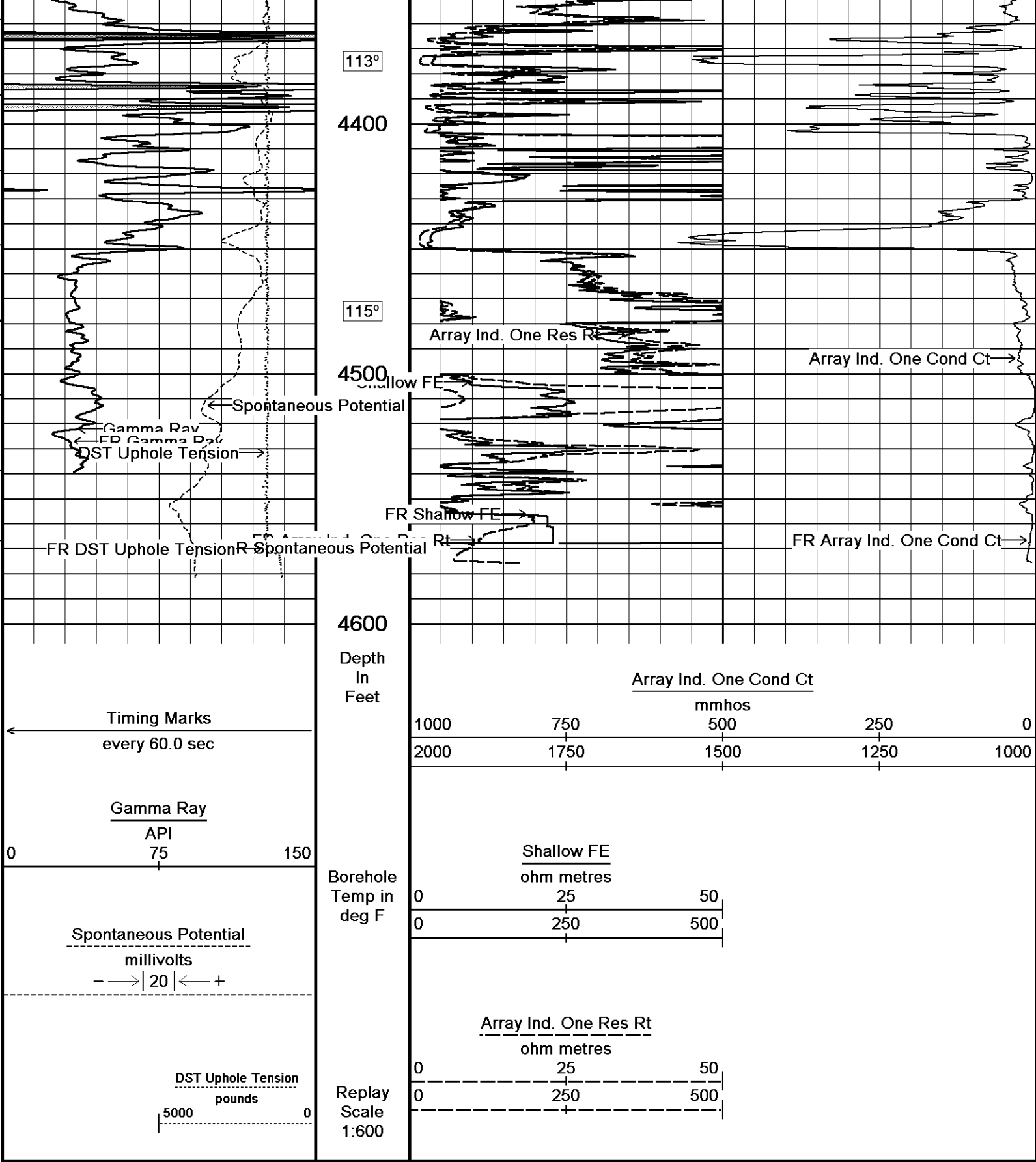
112°

4200

113°

4300



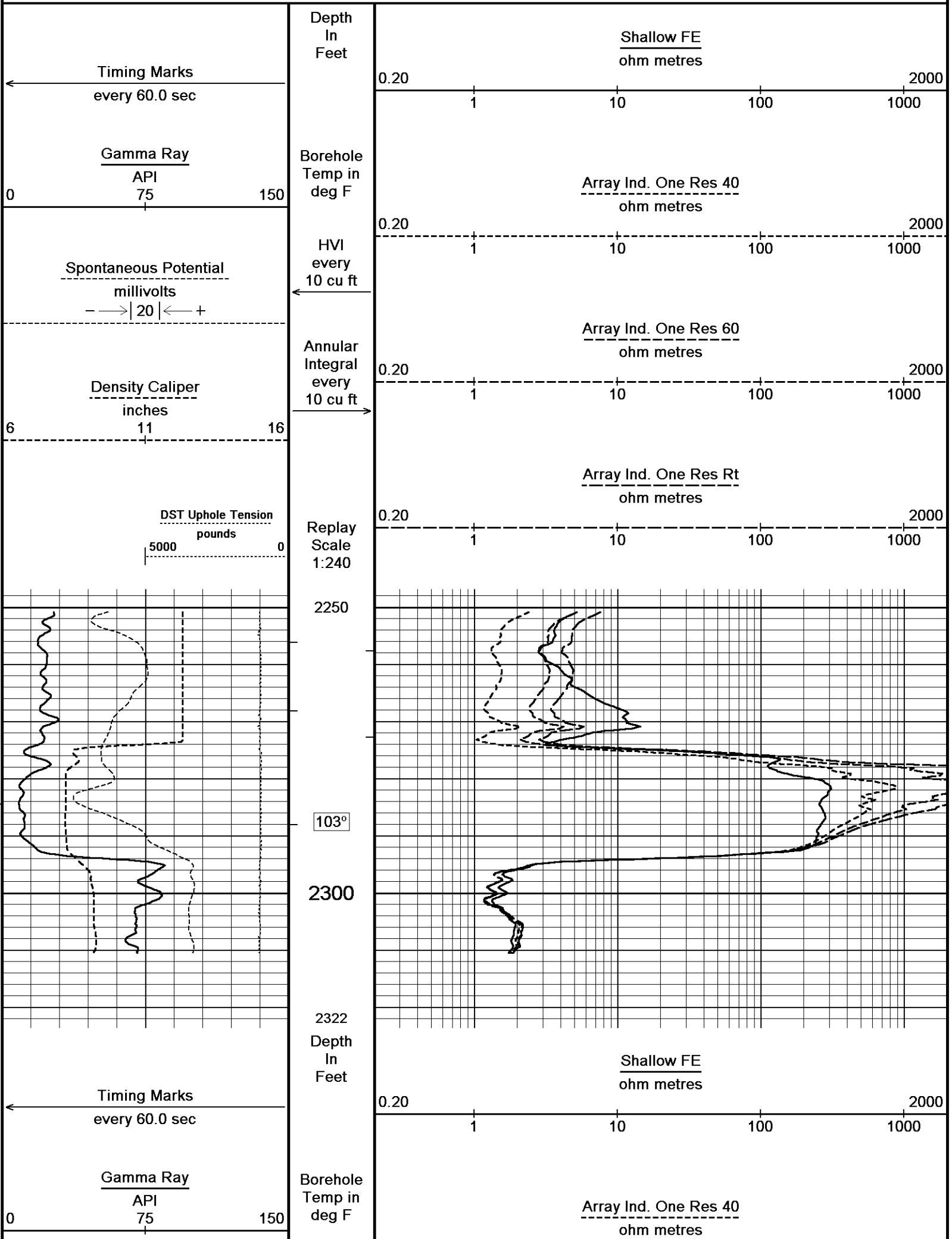


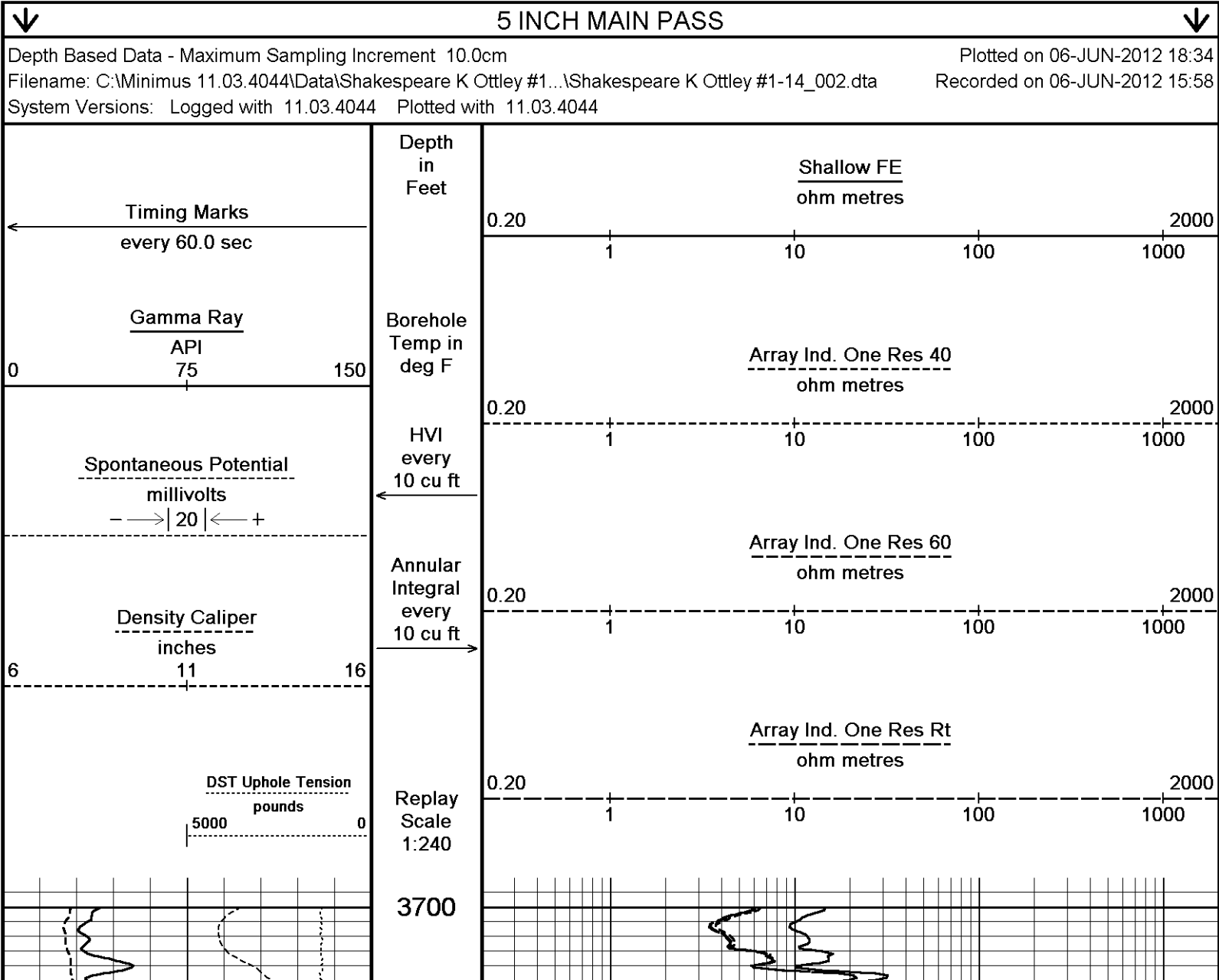
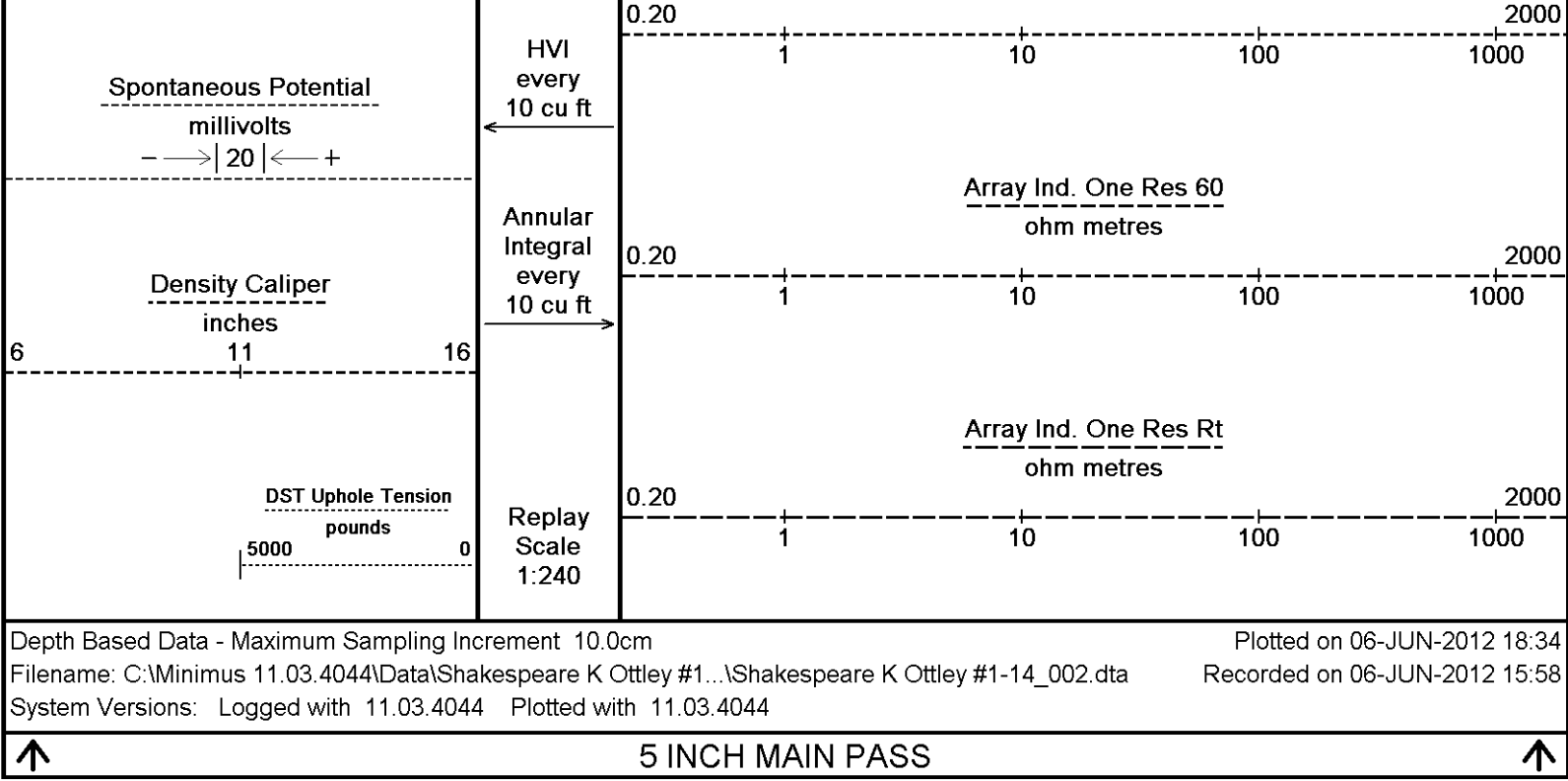
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 06-JUN-2012 18:34
Filename: C:\Minimus 11.03.4044\Data\Shakespeare K Ottley #1...\Shakespeare K Ottley #1-14_002.dta Recorded on 06-JUN-2012 15:58
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

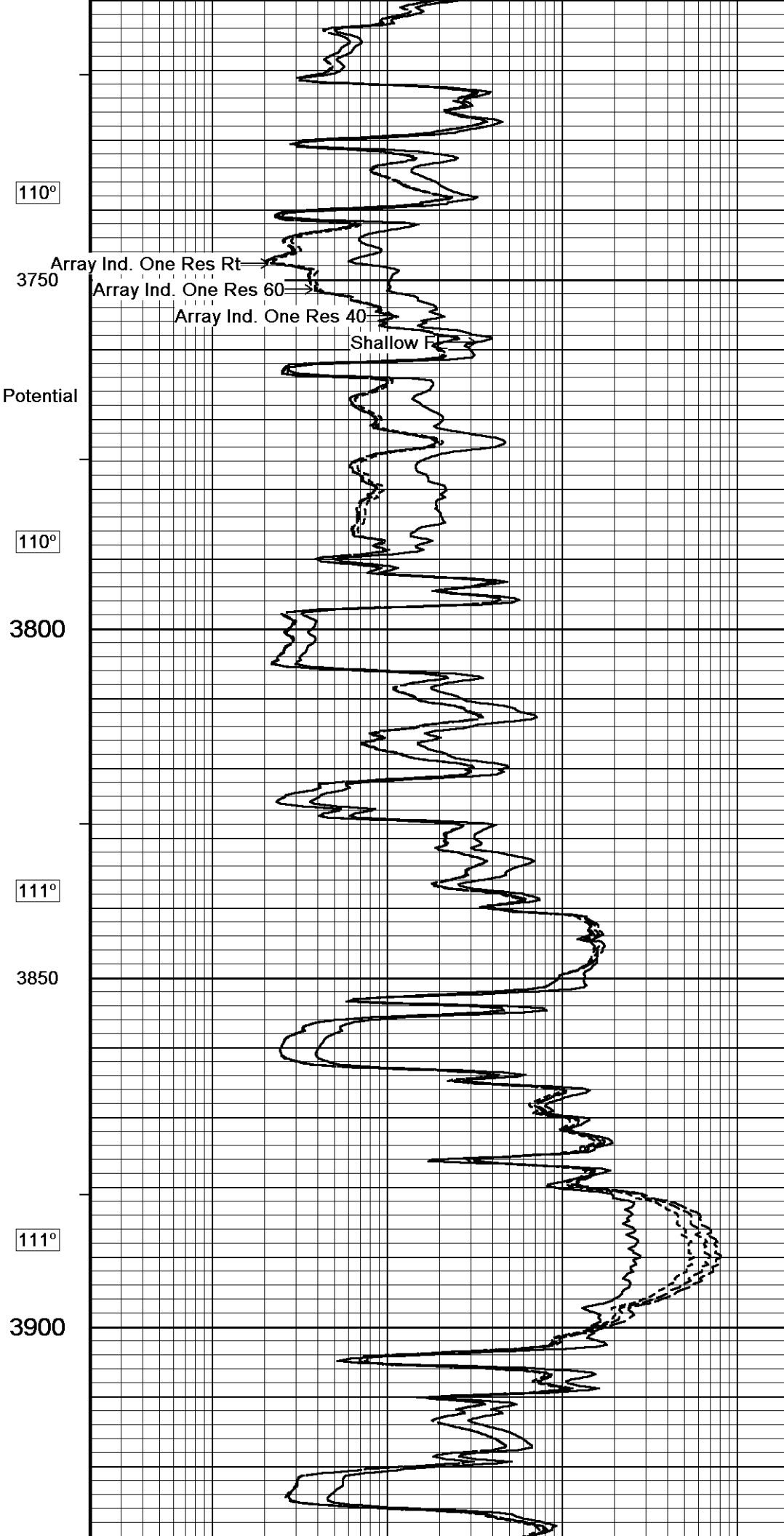
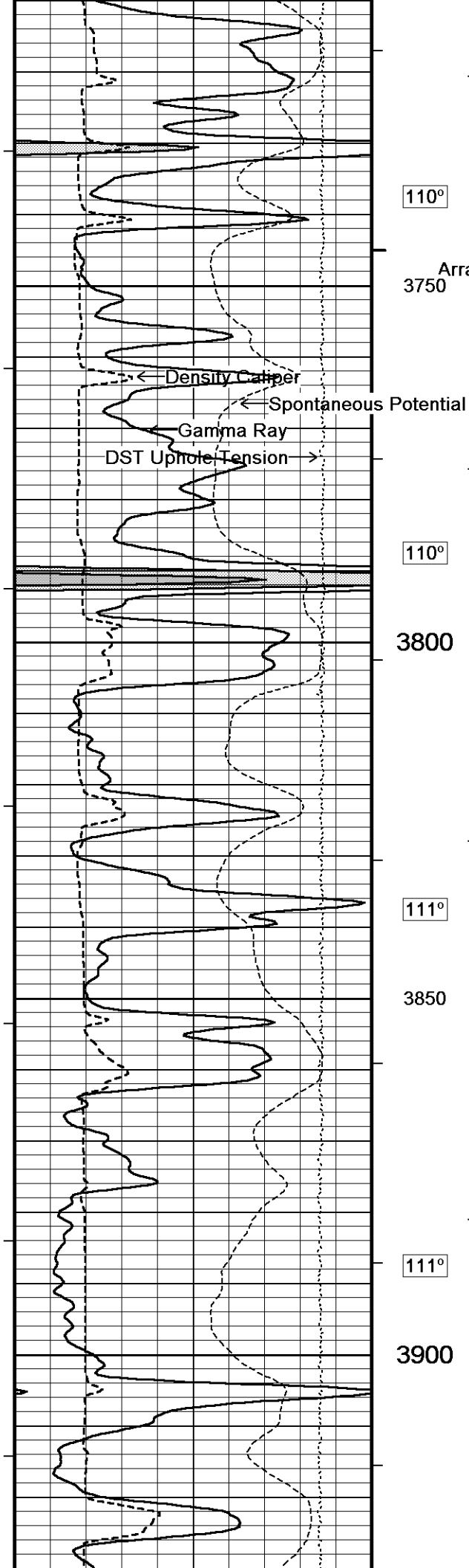
↑ 2 INCH MAIN PASS ↑

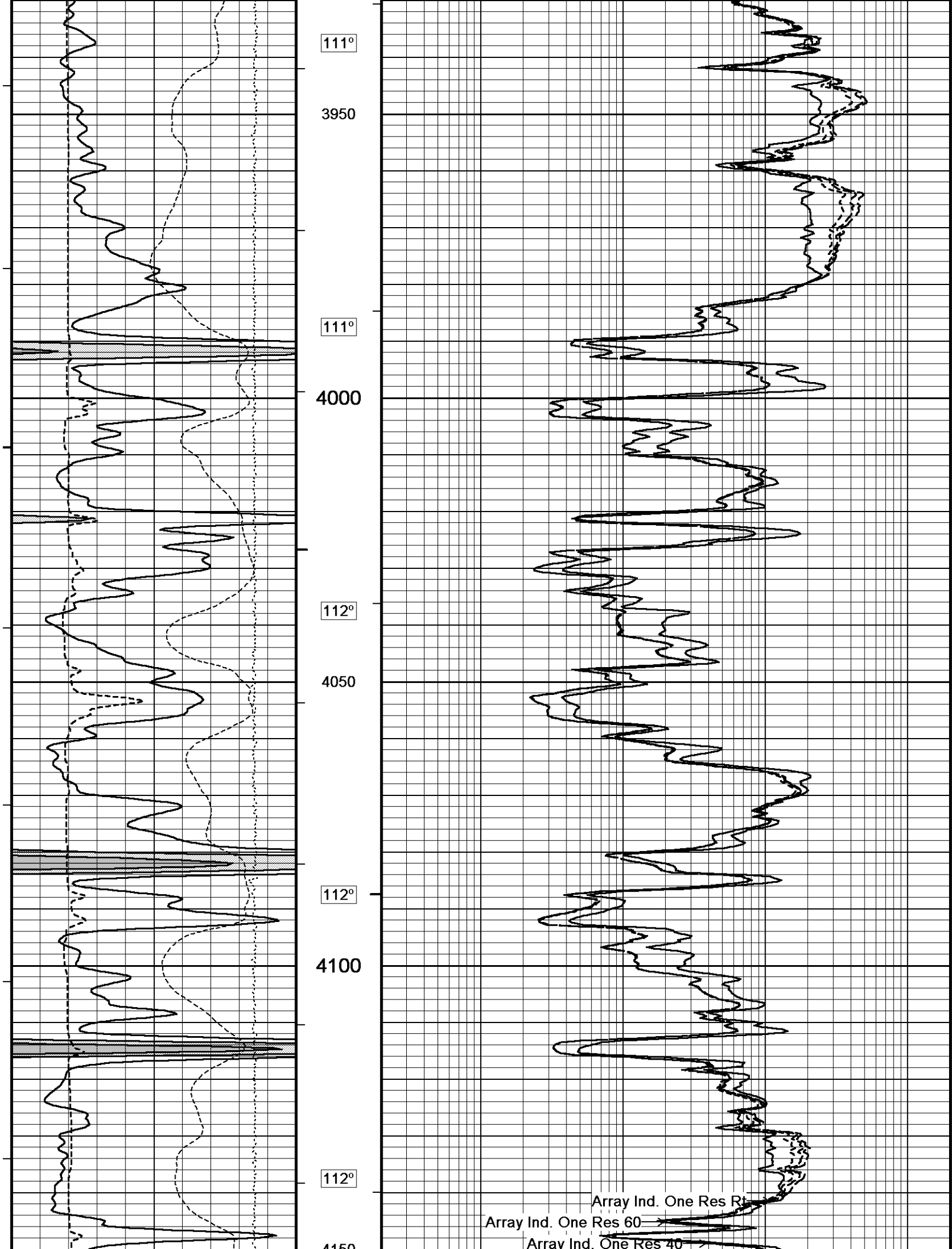
↓ 5 INCH MAIN PASS ↓

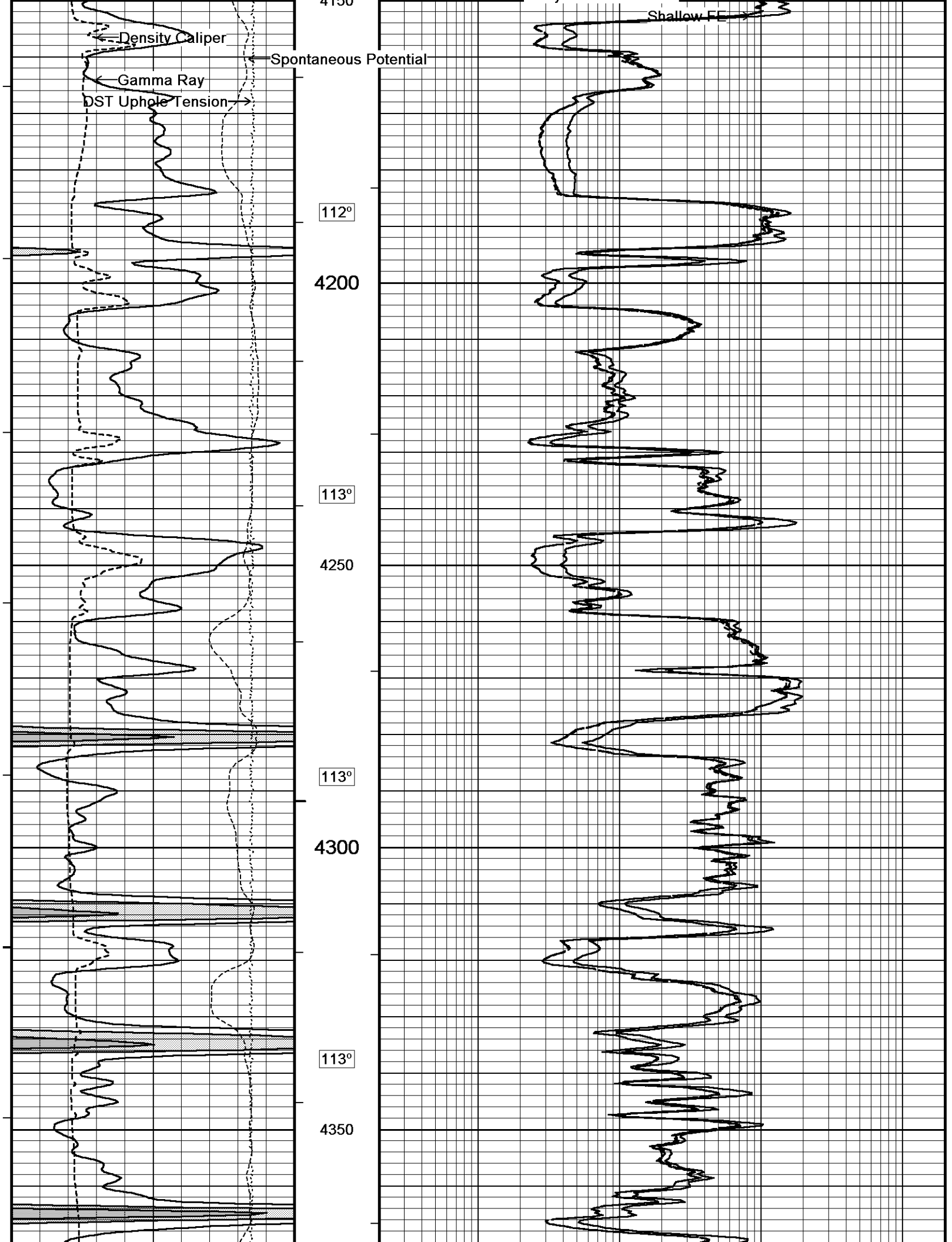
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 06-JUN-2012 18:34
Filename: C:\Minimus 11.03.4044\Data\Shakespeare K Ottley #1...\Shakespeare K Ottley #1-14_002.dta Recorded on 06-JUN-2012 15:58

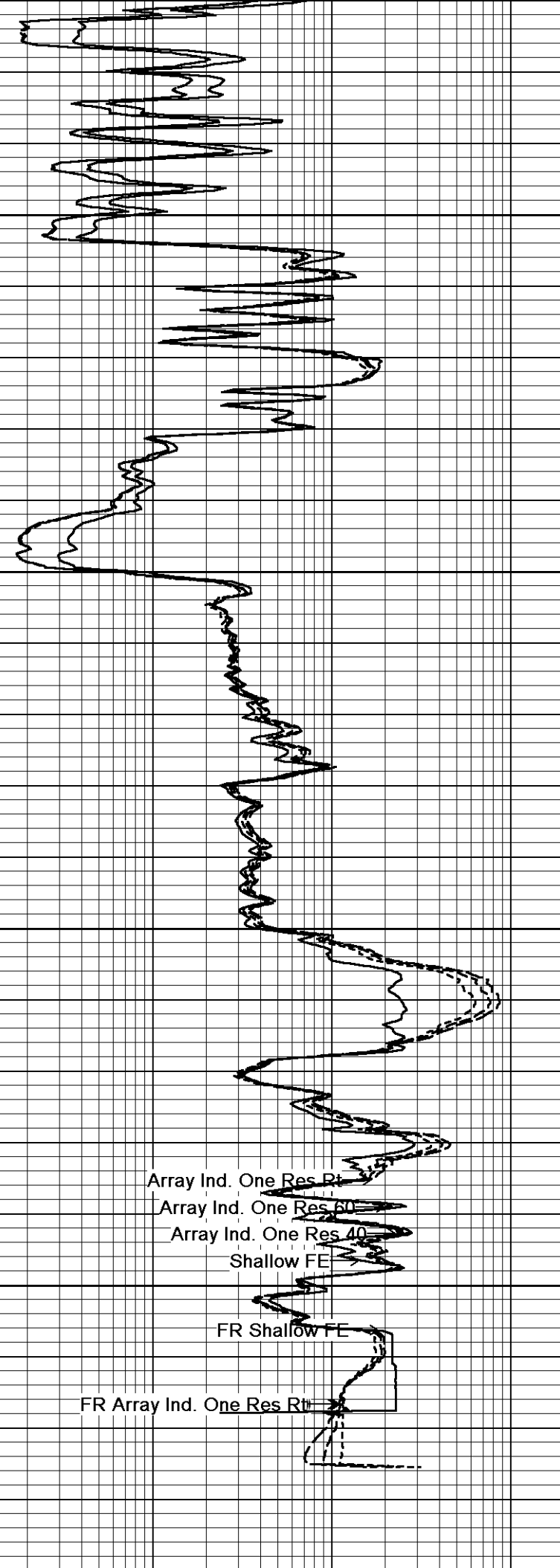
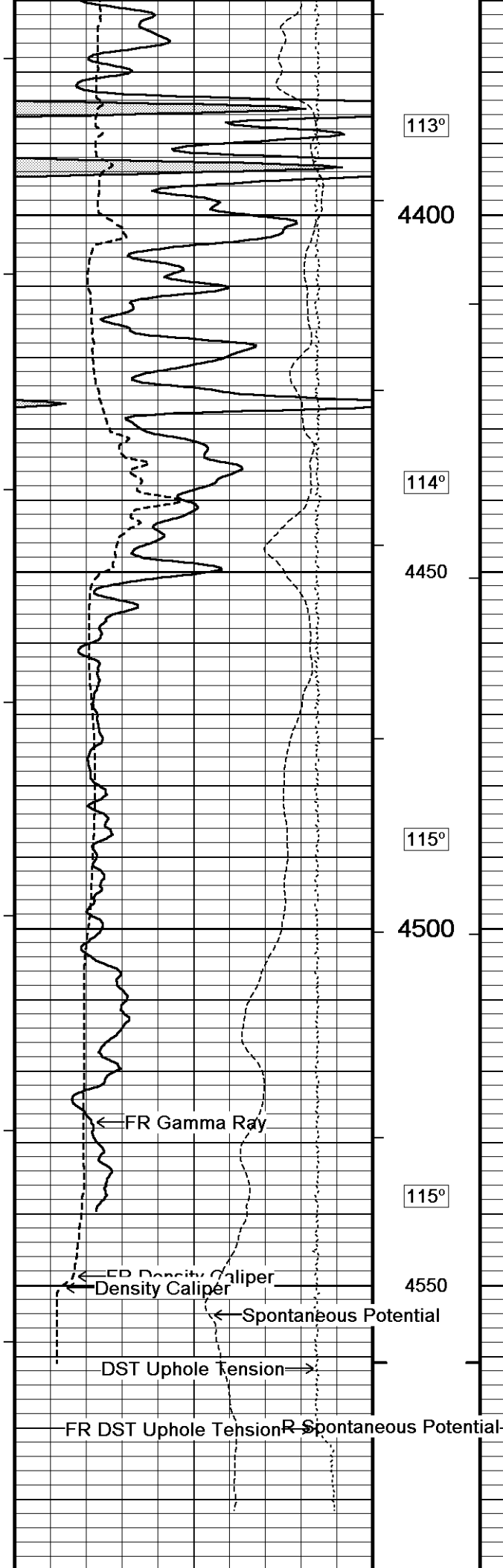


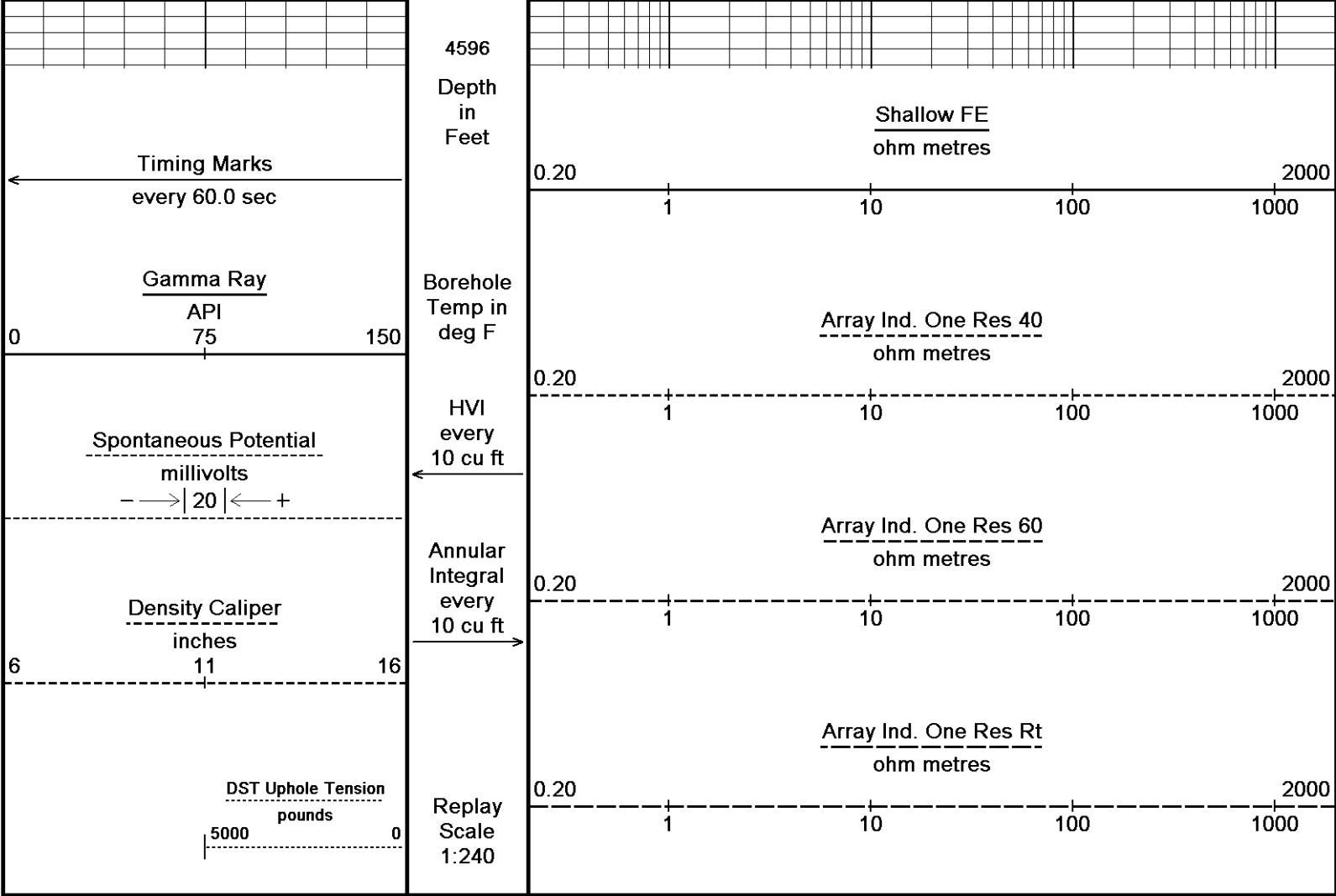












Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 06-JUN-2012 18:34

Filename: C:\Minimus 11.03.4044\Data\Shakespeare K Ottley #1...\Shakespeare K Ottley #1-14_002.dta

Recorded on 06-JUN-2012 15:58

System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

↑

5 INCH MAIN PASS

↑

↓

5 INCH REPEAT PASS

↓

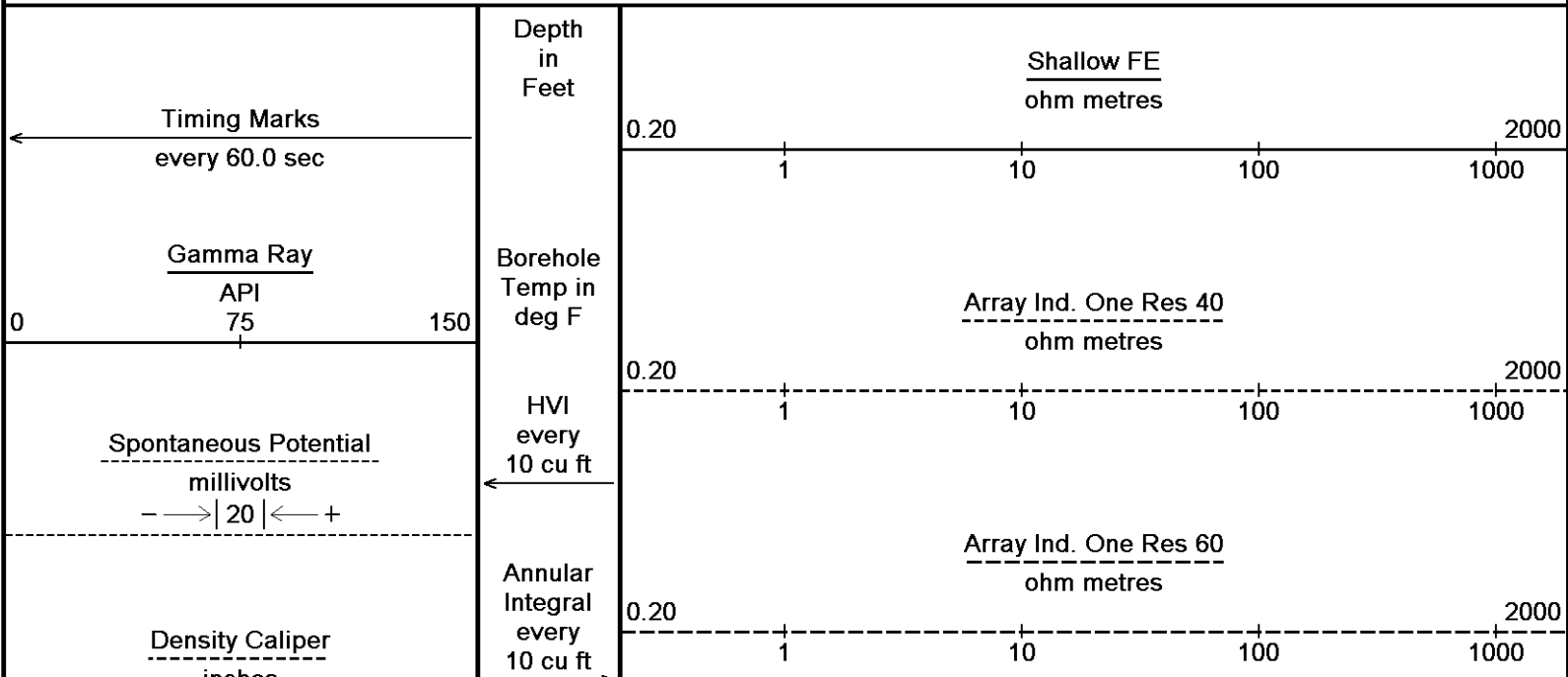
Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 06-JUN-2012 18:34

Filename: C:\Minimus 11.03.4044\Data\Shakespeare K Ottley #1...\Shakespeare K Ottley #1-14_001.dta

Recorded on 06-JUN-2012 15:42

System Versions: Logged with 11.03.4044 Plotted with 11.03.4044



6 11 16
inches

DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

4268

4300

112°

4350

112°

4400

113°

4450

Array Ind. One Res Rt
ohm metres

0.20

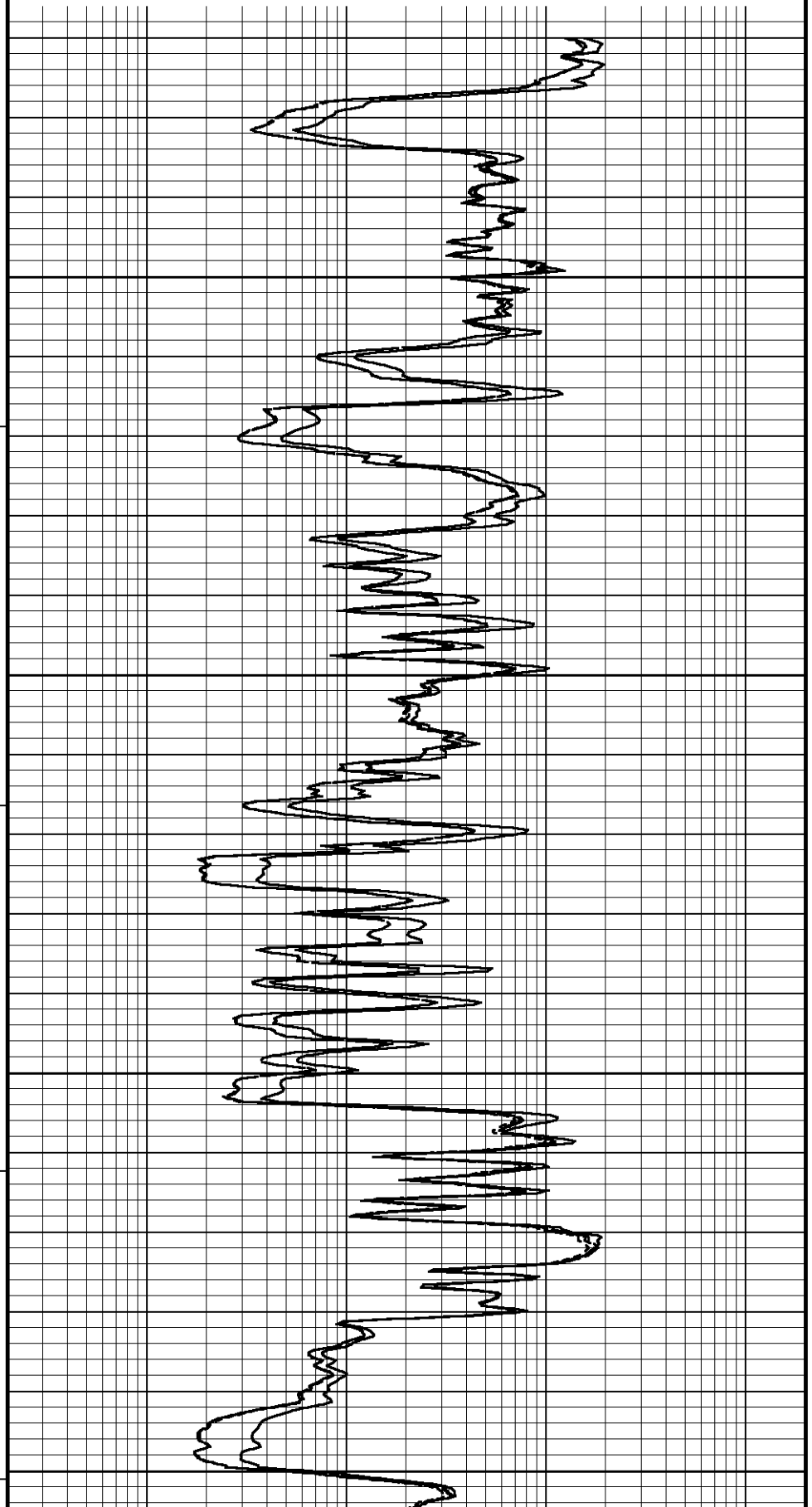
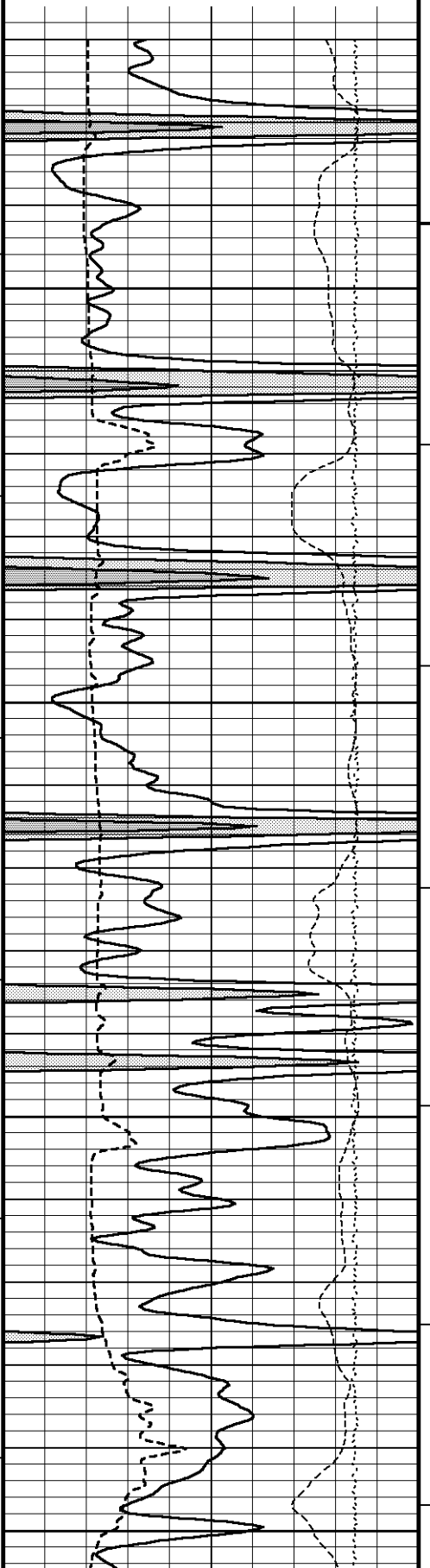
2000

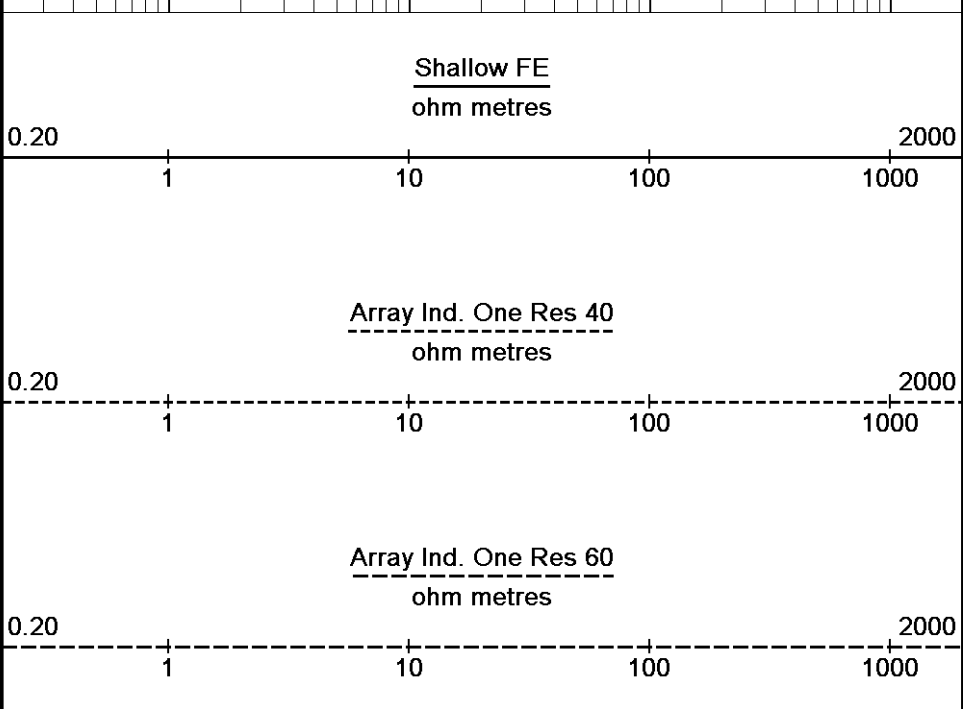
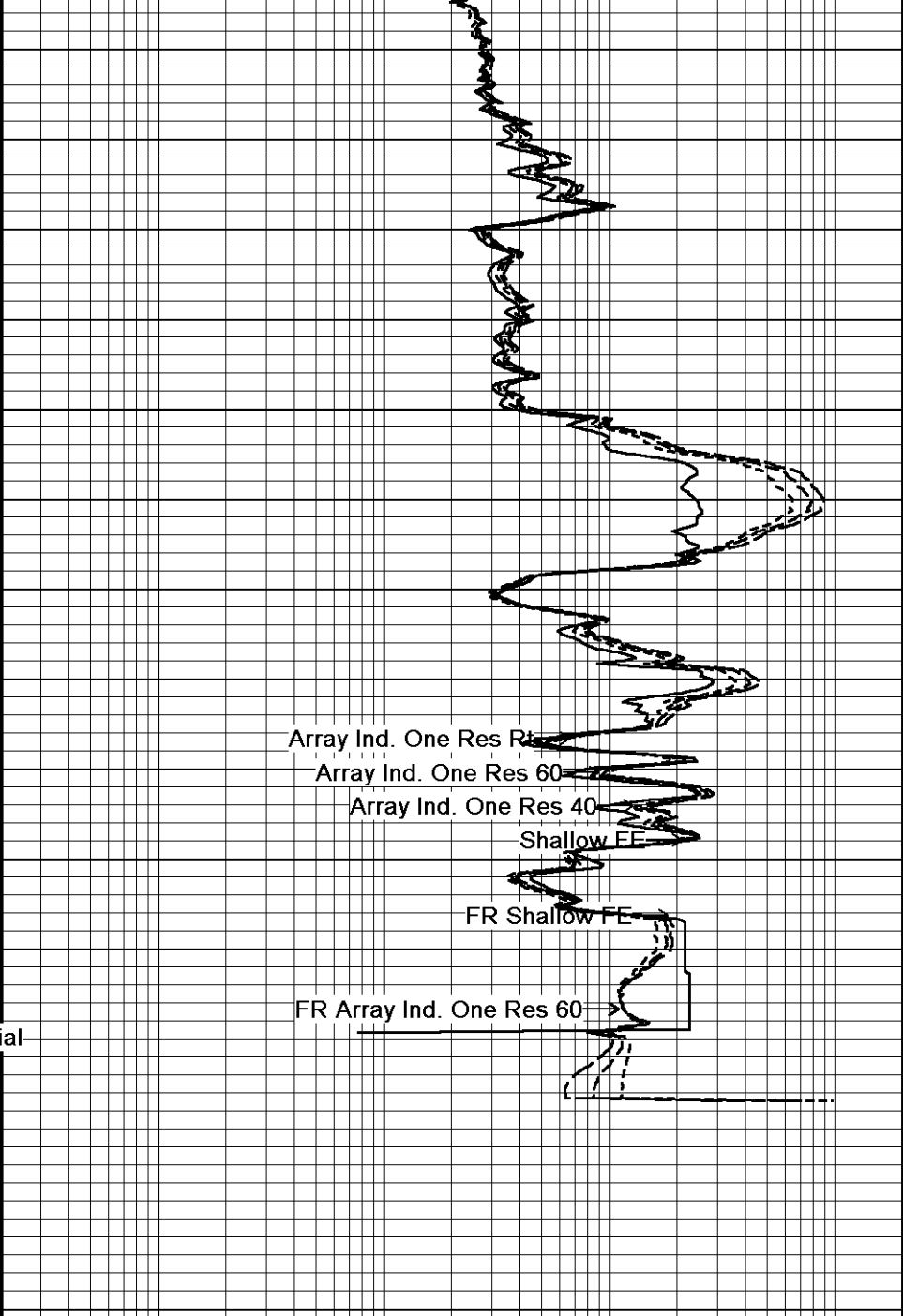
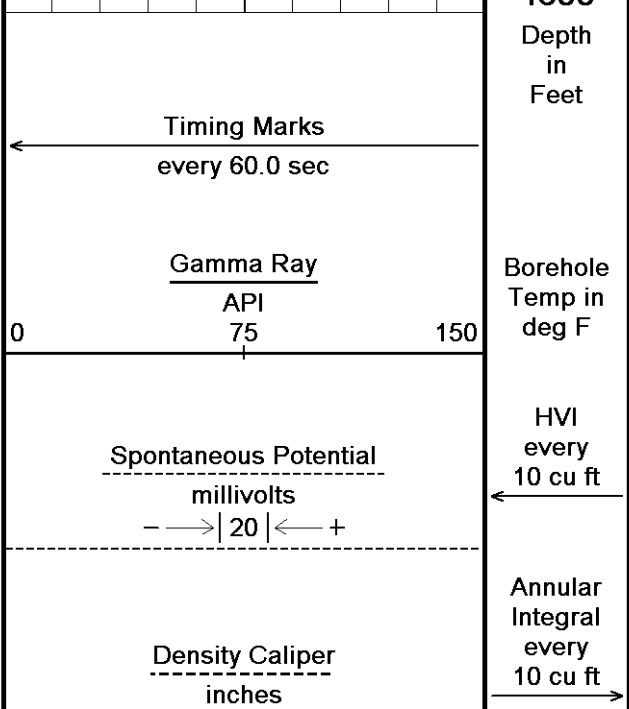
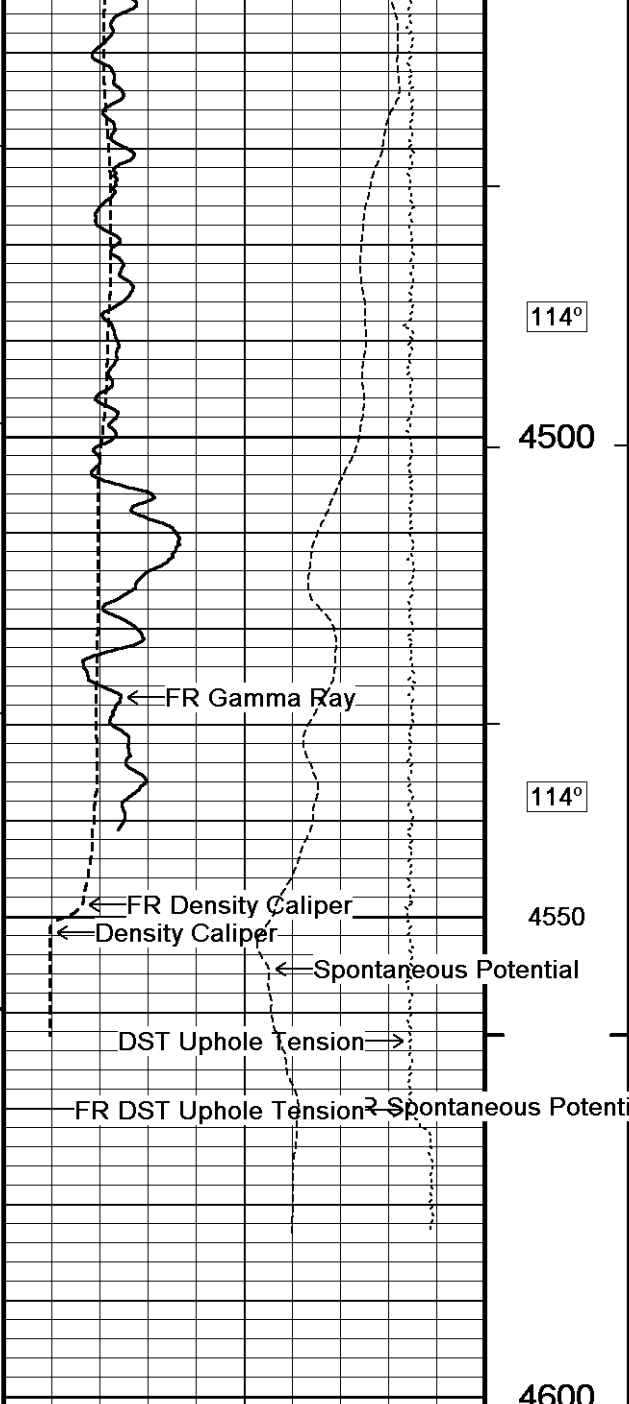
1

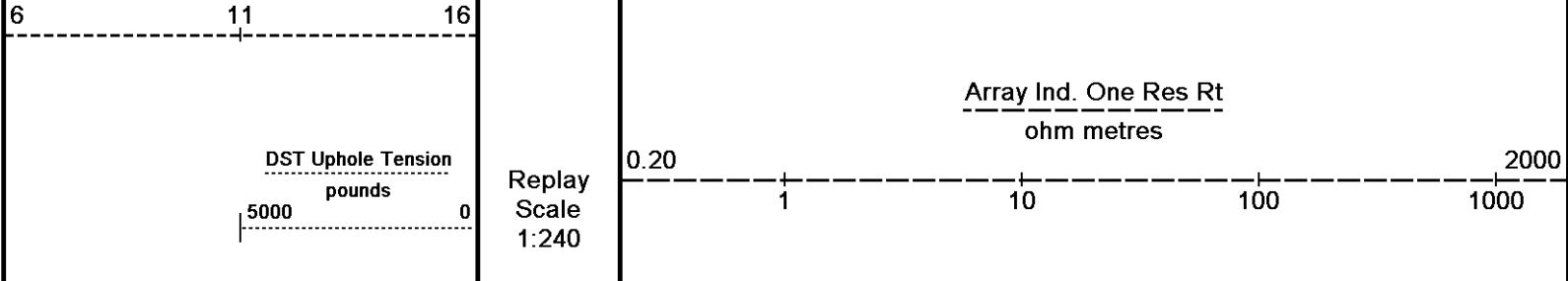
10

100

1000







Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 06-JUN-2012 18:34
 Filename: C:\Minimus 11.03.4044\Data\Shakespeare K Ottley #1-14\Shakespeare K Ottley #1-14_001.dta
 Recorded on 06-JUN-2012 15:42
 System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

↑ 5 INCH REPEAT PASS ↑

BEFORE SURVEY CALIBRATION

C:\Minimus 11.03.4044\Data\Shakespeare K Ottley #1-14\Shakespeare K Ottley #1-14_002.dta

General Constants All 000			Last Edited on 06-JUN-2012,14:34
General Parameters			
Mud Resistivity	0.780	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. Four Res Rt		
RWA Constant A	0.610		
RWA Constant M	2.150		

Gamma Calibration MCG-C 84		Field Calibration on 06-JUN-2012 09:18	
	Measured	Calibrated (API)	
Background	73	49	
Calibrator (Gross)	1142	774	
Calibrator (Net)	1069	725	

Gamma Constants MCG-C 84		Last Edited on 06-JUN-2012,14:34	
Gamma Calibrator Number	GR38		
Mud Density	1.09	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 28-MAY-2012,07:31	
	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 28-MAY-2012,07:32	
	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		

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14501	5.98
2	17771	7.97
3	21107	9.86
4	24905	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.01	5.98

Micro Normal and Micro Inverse Calibration MML-A 16

Base Calibration on 23-MAY-2012 12:04

Field Check on 06-JUN-2012 09:13

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 06-JUN-2012,09:11

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 23-MAY-2012 14:31

Field Check on 06-JUN-2012 09:23

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
Ratio	3164	98	3714	110
	32.187		33.764	

Field Calibrator at Base

	Calibrated (cps)
Ratio	1615 2315
	0.697

Field Check

	Calibrated (cps)
Ratio	1627 2350
	0.692

Neutron Constants MDN-A.B 65

Last Edited on 06-JUN-2012,09:18

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 23-MAY-2012 09:37

Field Check on 06-JUN-2012 09:02

Base Calibration

Reference 1	Measured	0.0	Calibrated (ohm-m)	0.0
Reference 2		951.5		126.8
Base Check				281.5
Field Check				281.7
FE Constants MFE-A.A 55				Last Edited on 06-JUN-2012,09:01
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 45				Base Calibration on 12-JAN-2012,13:34 Field Check on 06-JUN-2012 09:00
Base Calibration				
Test Loop Calibration		Measured		Calibrated (mmho/m)
Channel	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	18.4	3851.3
2	0.0	0.0	31.7	3629.4
3	0.0	0.0	28.7	3049.6
4	0.0	0.0	18.3	2079.3
Deep	0.0	0.0	16.0	1911.4
Medium	0.0	0.0	42.6	4060.9
Shallow	0.0	0.0	49.7	5483.1
Array Temperature	0.0		72.1	Deg F
Induction Constants MAI-A.A 45				Last Edited on 06-JUN-2012,08:59
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 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	

Caliper Calibration MPD-B 59			Base Calibration on 16-MAY-2012 14:32
			Field Calibration on 06-JUN-2012 09:04
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)	
	5.96	5.98	

Photo Density Calibration MPD-B 59

Base Calibration on 16-MAY-2012 14:49

Field Check on 06-JUN-2012 09:08

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

1210.5

1290.3

PE Calibration

Base Calibration

Measured

Calibrated

WS

WH

Ratio

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

219.5

1088.5

Density Constants MPD-B 59			Last Edited on 06-JUN-2012,14:34
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	1.09	gm/cc	
Mud Density Z/A Multiplier	1.11		
Mud Filtrate Density	1.22		

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\Shakespeare K Ottley #1-14\Shakespeare K Ottley #1-14_002.dta

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

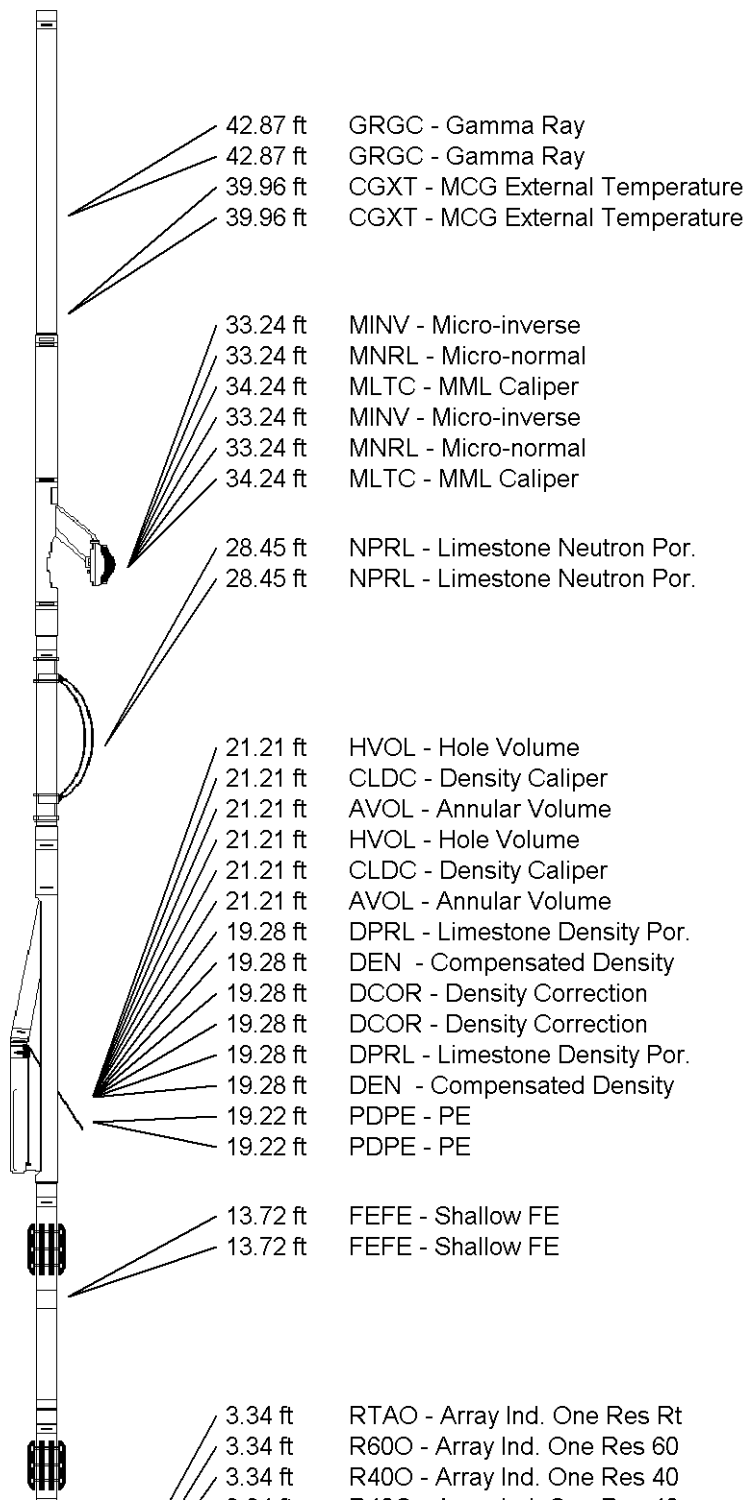
Compact Density/Caliper
MPD-B 59 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

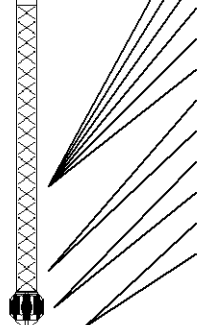
Compact Focussed Electric
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact 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: 48.16 ft Weight: 383.6 lb



3.34 ft	R400 - Array Ind. One Res 40
3.34 ft	R600 - Array Ind. One Res 60
3.34 ft	RTAO - Array Ind. One Res Rt
0.23 ft	SPCG - Spontaneous Potential
0.23 ft	SPCG - Spontaneous Potential
Tool Zero	(0.13ft from bottom)
Tool Zero	(0.13ft from bottom)
-0.13 ft	SMTU - DST Uphole Tension
-0.13 ft	SMTU - DST Uphole Tension

All measurements relative to tool zero.

All measurements relative to tool zero.

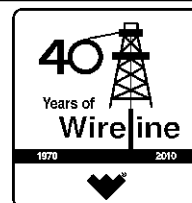
COMPANY	SHAKESPEARE OIL COMPANY INC.
WELL	K OTTLEY #1-14
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2824.00	feet	First Reading	4567.00	feet
Elevation Drill Floor	2822.00	feet	Depth Driller	4570.00	feet
Elevation Ground Level	2819.00	feet	Depth Logger	4570.00	feet



ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

Weatherford®



		COMPANY K OTTLEY #1-14 FIELD WILDCAT PROVINCE/COUNTY LOGAN COUNTRY/STATE U.S.A. / KANSAS LOCATION 2299 FSL & 800 FWL		ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG	
PERMIT NUMBER 15-109-21091		WTP 14S ROE 32W Other Services MP/DMDN MML		ELEVATIONS 2824.00 2822.00 2819.00 feet MBL DFL GL	
DATE 06-JUN-2012		Permanent Datum (G.L. Elevation 2819 feet) Log Measured From (KB) Colling Measured From (KB) @ 5FT			
RUN NUMBER ONE		Depth Driller 4570.00 feet			
Depth Logger 4567.00 feet		First Reading 4567.00 feet			
Last Reading 3700.00 feet		Casing Driller 219.00 feet			
Casing Logger 219.00 feet		Bit Size 7.875 inches			
Hole Fluid Type CHEMICAL		Density/Viscosity 9.10 IU/SG 16.00 CP PH/Fluid Loss 10.00 8.80 ml/min			
Sample Source FLOWLINE		RM @ Measured Temp 0.73 @ 93.0 ohm-in			
RM @ Measured Temp 0.63 @ 93.0 ohm-in		RM @ Measured Temp 0.63 @ 93.0 ohm-in			
RM @ Measured Temp 0.94 @ 93.0 ohm-in		RM @ Measured Temp 0.63 @ 93.0 ohm-in			
RM @ BHT 0.63 @ 115.0 ohm-in		Time Since Circulation 4 HOURS 115.00 deg F			
Max Recorded Temp 115.00 deg F		COMPACT 1.3057 LB			
Equipment Name R. HOFFMAN		Equipment Base STEVE DAVIS			
Recorded By JAMES BY		Witnessed By LBN2-141			

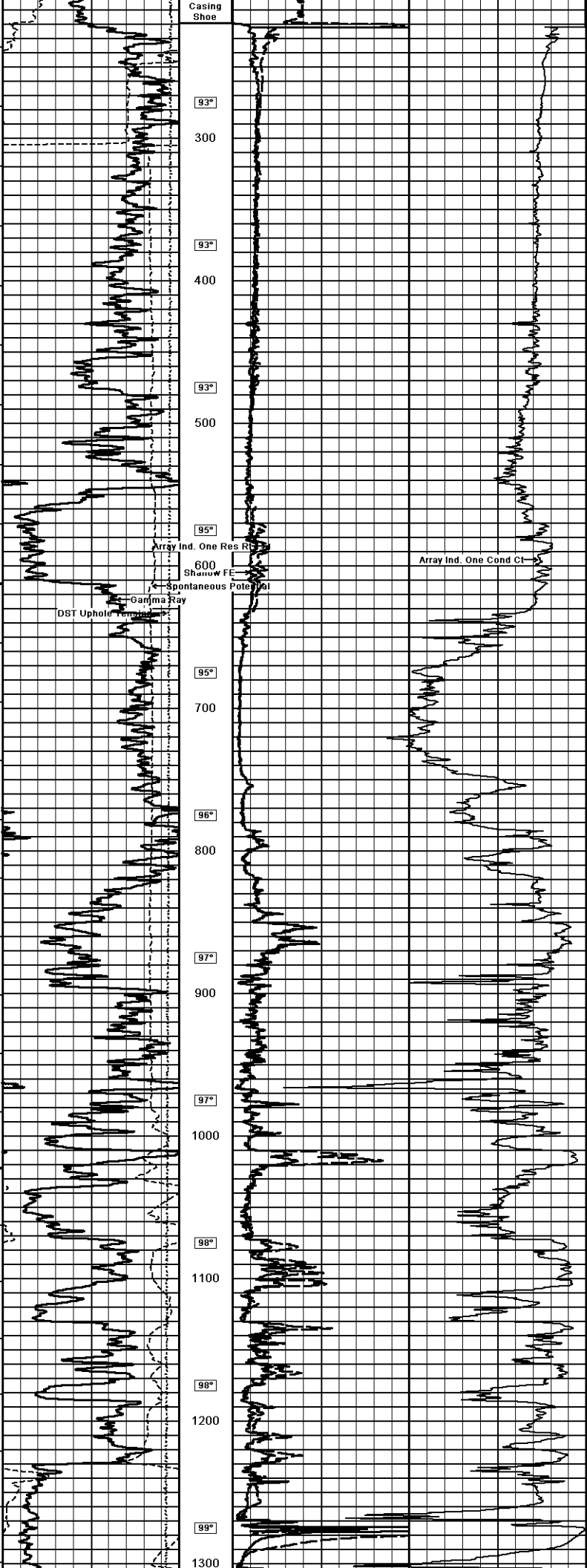
1 INCH MAIN PASS

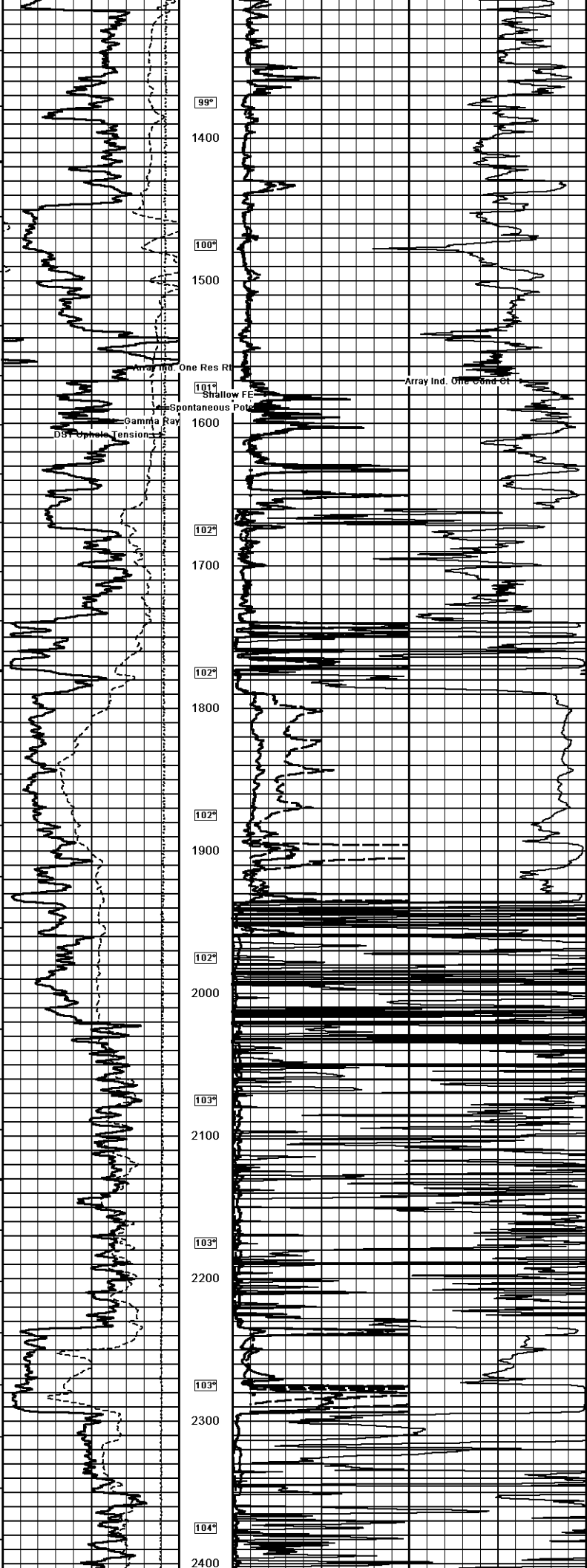
Depth Based Data - Maximum Sampling Increment 10.0cm
 Filename: C:\Minimus 11.03.4044\Data\Shakespeare K Ottley #1-14\Shakespeare K Ottley #1-14_002.dta
 System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

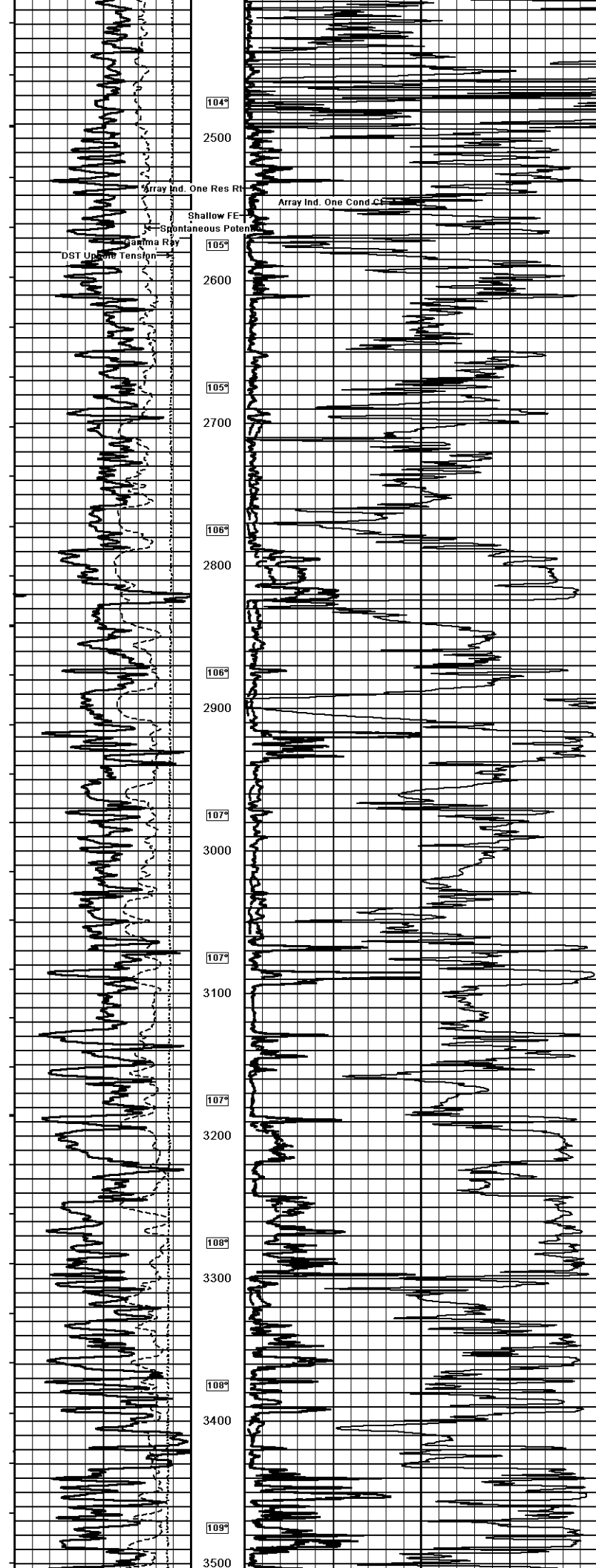
Plotted on 06-JUN-2012 18:34
 Recorded on 06-JUN-2012 15:58

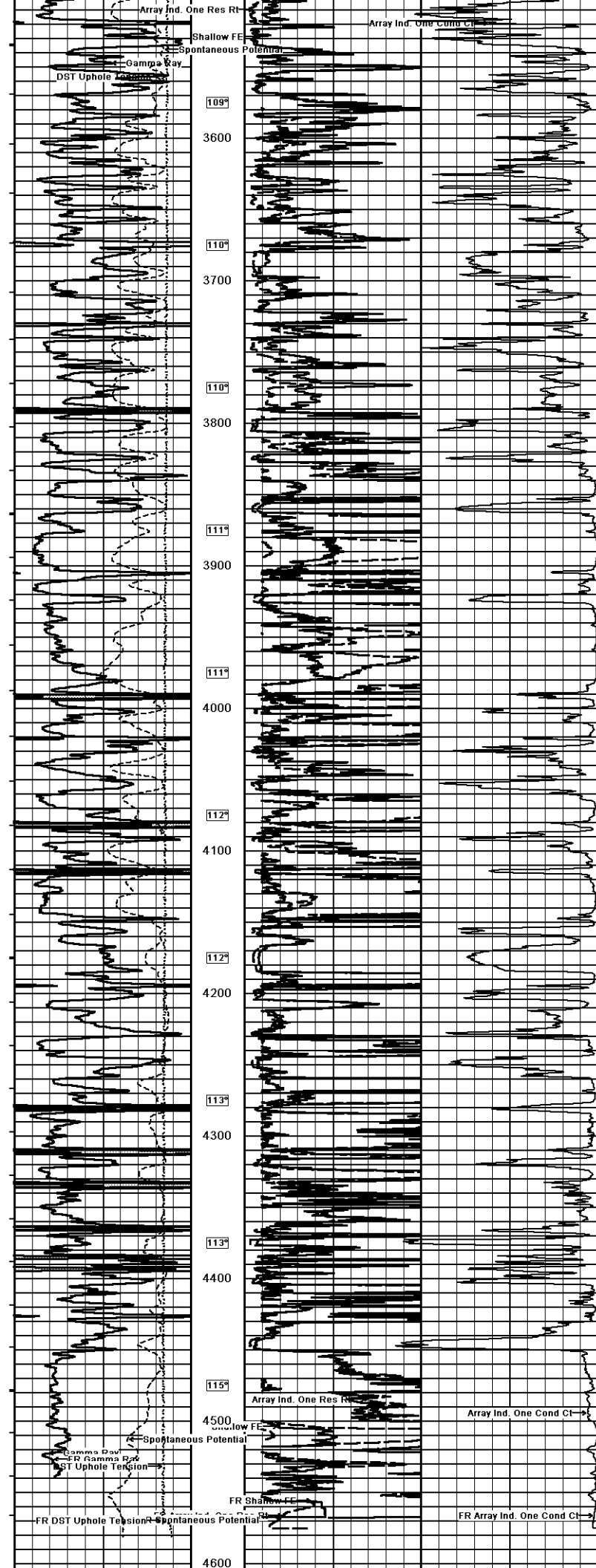
The log plot displays the following tracks from top to bottom:

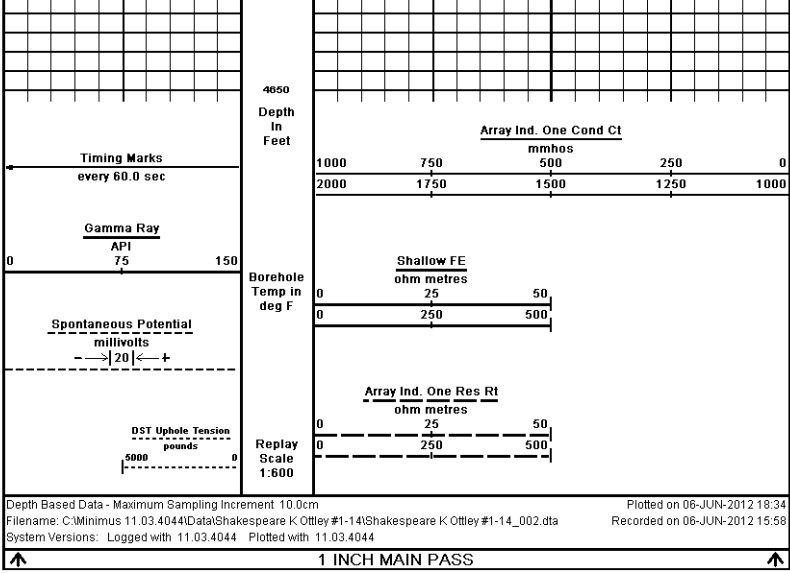
- Timing Marks**: every 60.0 sec
- Gamma Ray**: API (0 to 150)
- Spontaneous Potential**: millivolts (-20 to +20)
- DST Uphole Tension**: pounds (5000 to 0)
- Array Ind. One Cond Ct**: mmhos (1000 to 0)
- Borehole Temp in deg F**: (0 to 50)
- Shallow FE**: ohm metres (0 to 50)
- Array Ind. One Res Rt**: ohm metres (0 to 50)
- Replay Scale**: 1:600











COMPANY		SHAKESPEARE OIL COMPANY INC.	
WELL		K OTTLEY #1-14	
FIELD		WILDCAT	
PROVINCE/COUNTY		LOGAN	
COUNTRY/STATE		U.S.A. / KANSAS	

Elevation Kelly Bushing	2824.00	feet	First Reading	4567.00	feet
Elevation Drill Floor	2822.00	feet	Depth Driller	4570.00	feet
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ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

