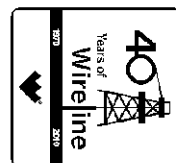




Weatherford

ARRAY INDUCTION SHALLOW FOCUSED

COMPANY KNIGHTON OIL
WELL KACHELMAN # 3
FIELD ALBANO WEST
PROVINCE/COUNTY STAFFORD
COUNTRY/STATE KANSAS
LOCATION 970' FSL & 1030' FEL
30' SW NW SE SE



SEC TWP RGE Other Services
11 25S 14W MPD/MDN
API Number 15-185-23661 MSS MML
Permit Number

Permanent Datum G.L., Elevation 1959 feet
Log Measured From K.B. @ 6 FEET above Permanent Datum
Drilling Measured From K.B. Elevations: KB 1965.00
DF 1963.00
GL 1959.00

Date	18-FEB-2011	
Run Number	ONE	
Depth Driller	4325.00	feet
Depth Logger	4328.00	feet
First Reading	4325.00	feet
Last Reading	255.00	feet
Casing Driller	260.00	feet
Casing Logger	260.00	feet
Bit Size	7.875	inches
Hole Fluid Type	CHEMICAL	
Density / Viscosity	9.00 lb/Usq	50.00 CP
PH / Fluid Loss	8.00	12.80 ml/30Min
Sample Source	FLOWLINE	
Rm @ Measured Temp	0.40 @ 50.0	ohm-m
Rmf @ Measured Temp	0.32 @ 50.0	ohm-m
Rmc @ Measured Temp	0.48 @ 50.0	ohm-m
Source Rmf / Rmc	CALC	CALC
Rm @ BHT	0.19 @ 105.0	ohm-m
Time Since Circulation	6 HOURS	
Max Recorded Temp	105.00	deg F
Equipment Name	COMPACT	
Equipment / Base	13057	LIB
Recorded By	R. HOFFMAN	
Witnessed By	DAVE MONTAGUE	
S O / JOB #	3529081	LB11-034

BOREHOLE RECORD

Last Edited: 22-FEB-2011 19:38

Bit Size inches	Depth From feet	Depth To feet
7.875	260.00	4328.00

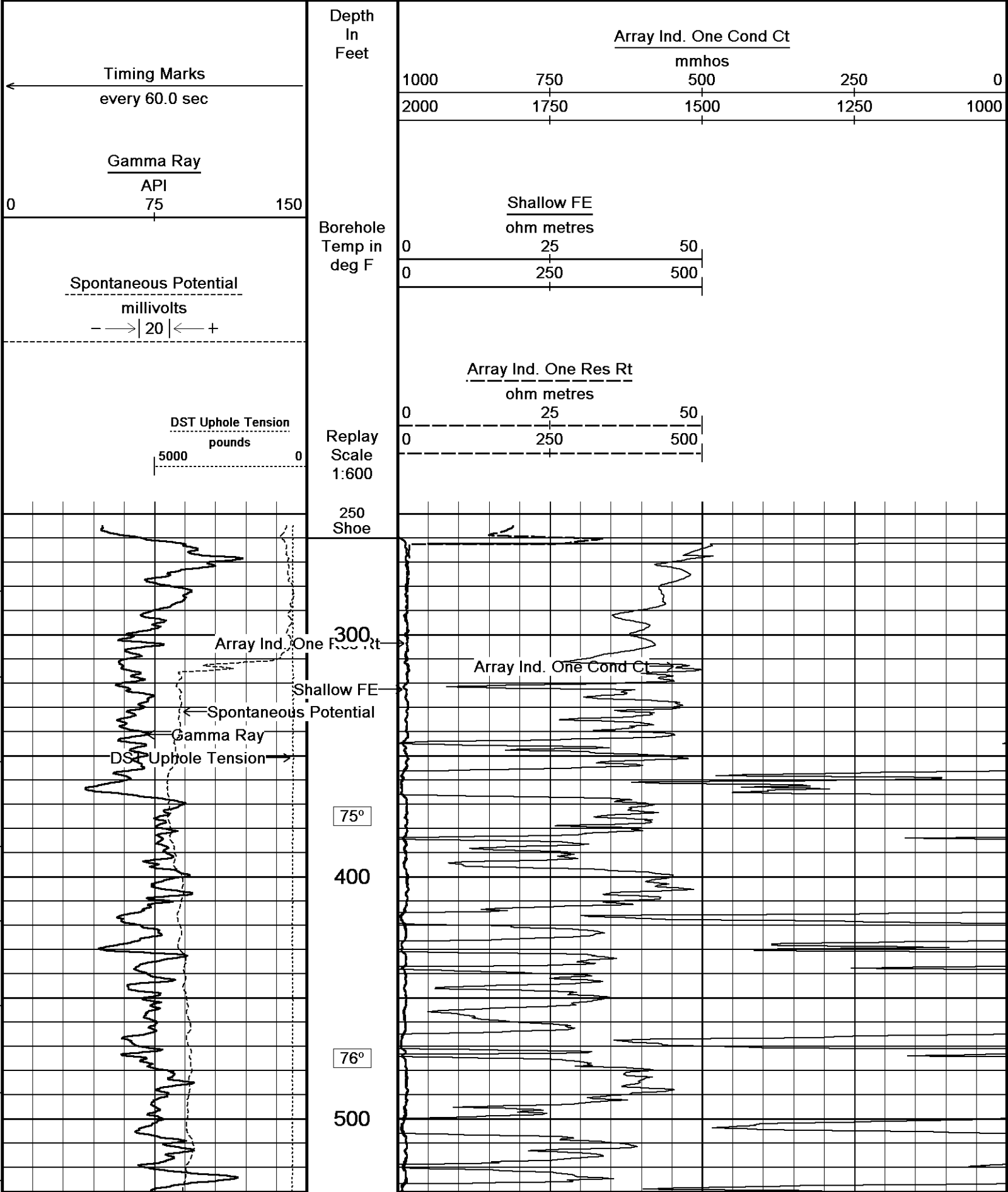
CASING RECORD

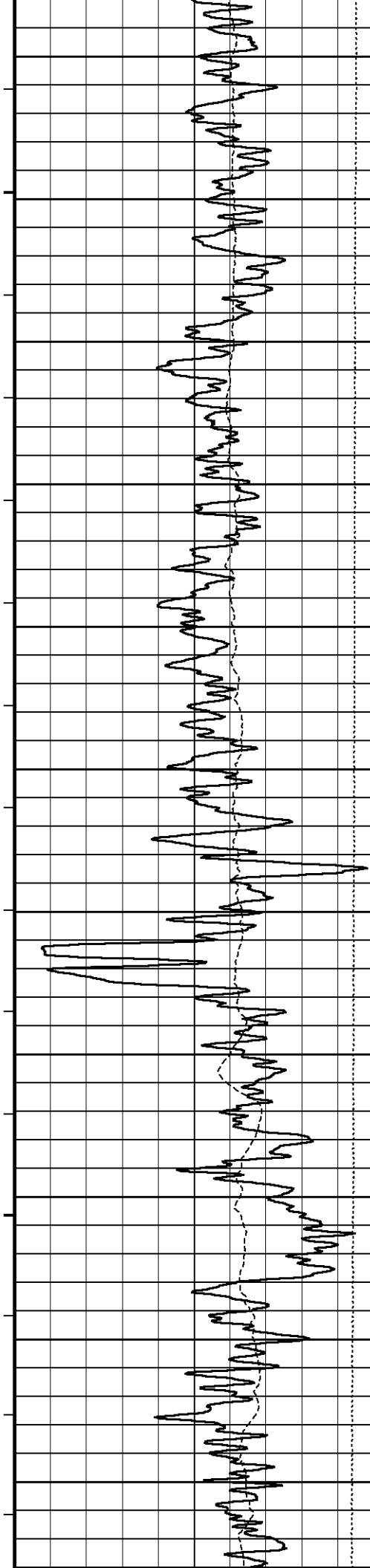
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	260.00	24.00

REMARKS

Tools Used: MPD, MCG, MDN, MFE, MAI, MSS, MML
Hardware: MPD: 4 inch profile plate used. MAI, MFE, MSS: 0.5 Inch standoffs used. MDN: Dual Bowspring used.
2.71 G/CC Limestone density matrix used to calculate porosity.
Sonic porosity calculated using 47.5 usec/ft Limestone scale.
Borehole rugosity, tight pulls, and washouts will affect data quality.
Puled tight at 4160 on repeat pass and 3714 on main pass.
All intervals logged and scaled per customer's request.
Annular volume with 5.5 inch production casing = 418 cu. ft.
Service order #3529081
Rig: Southwind Drilling #4
Engineer: R. Hoffman, A. Sill
Operator(s): B. Reeves

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.





77°

600

78°

700

79°

800

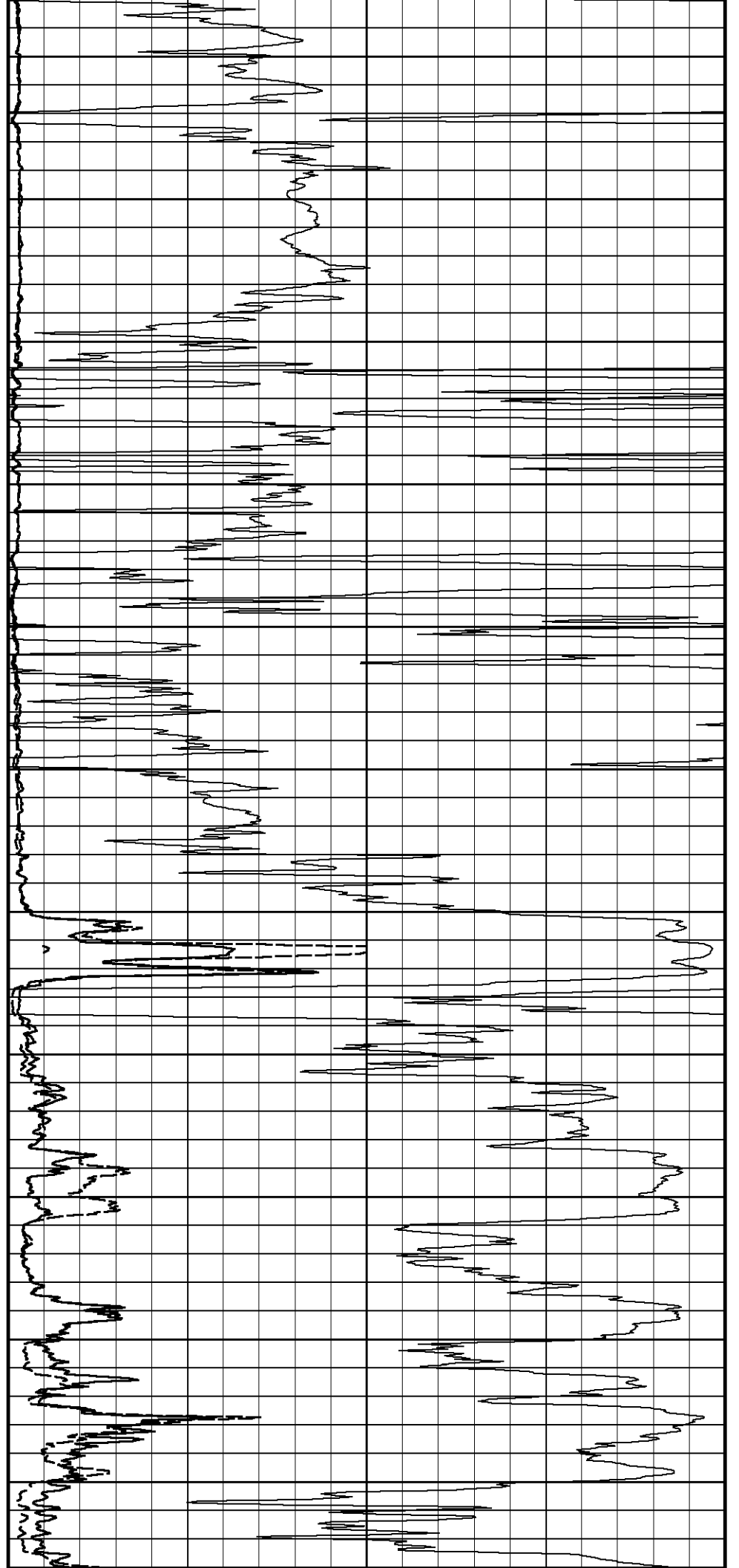
80°

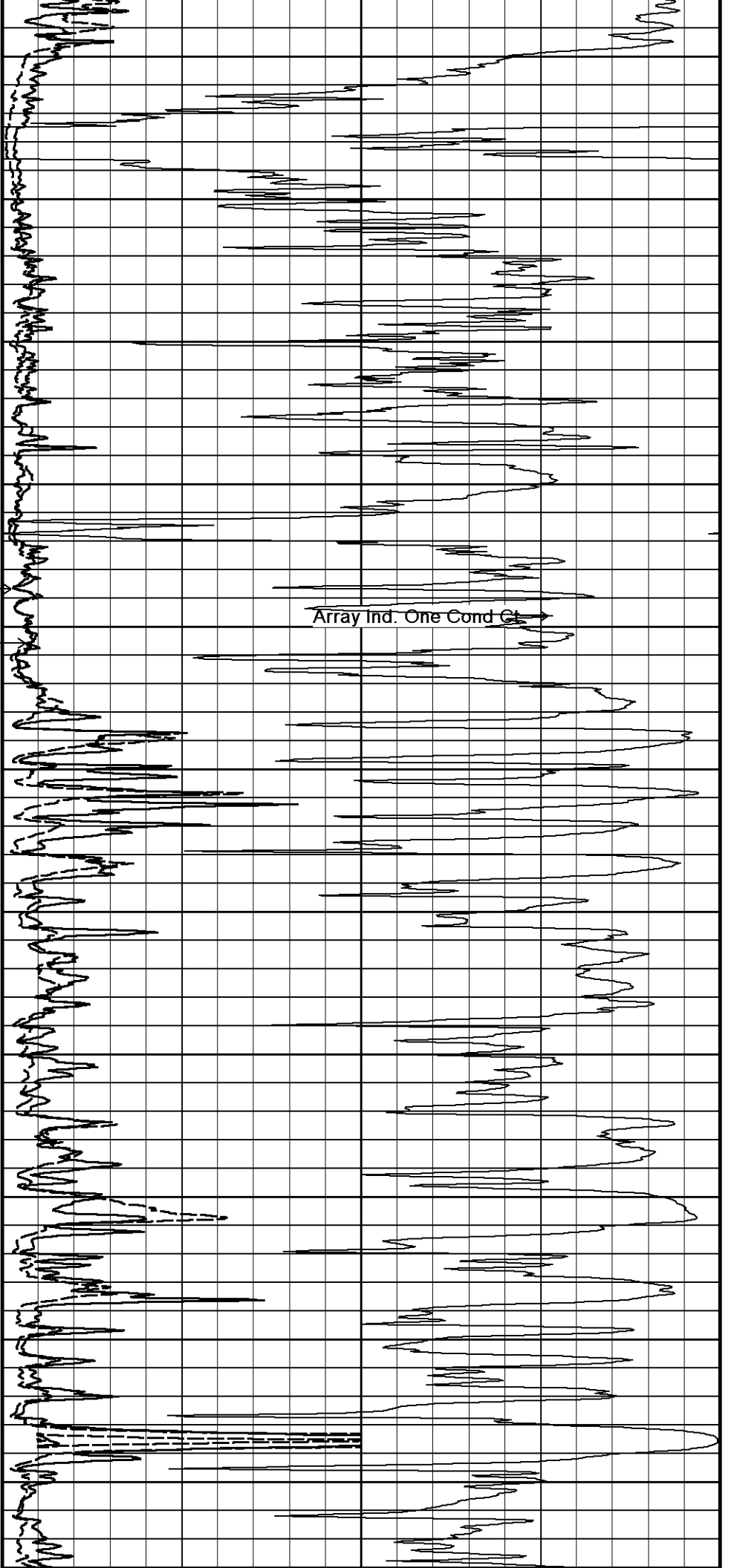
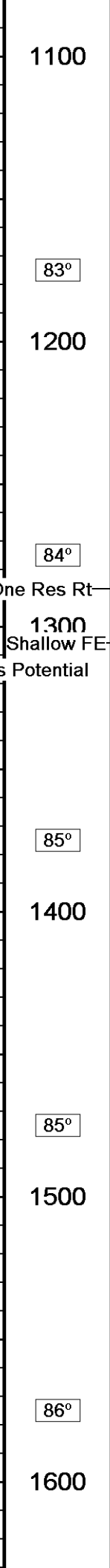
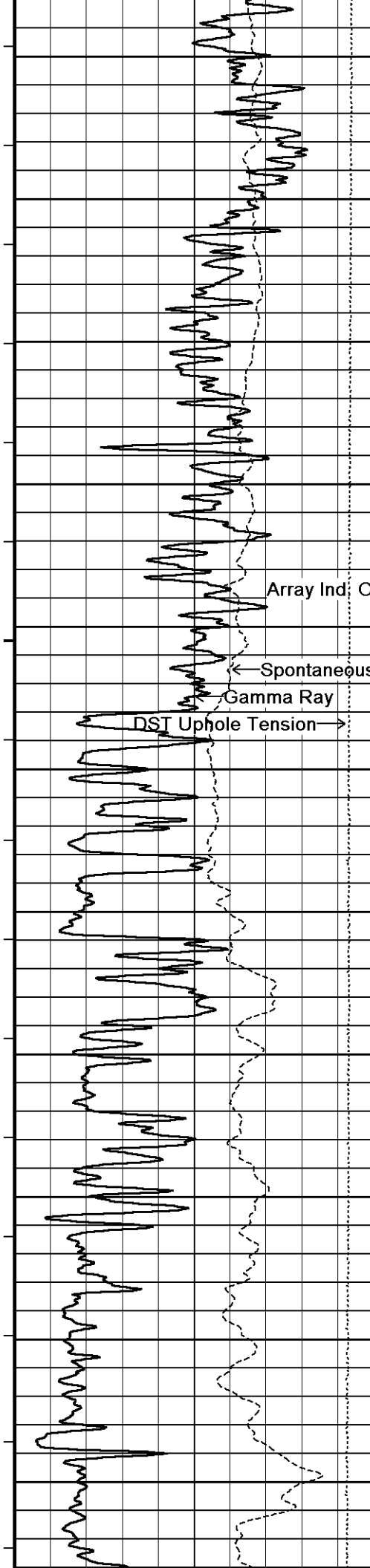
900

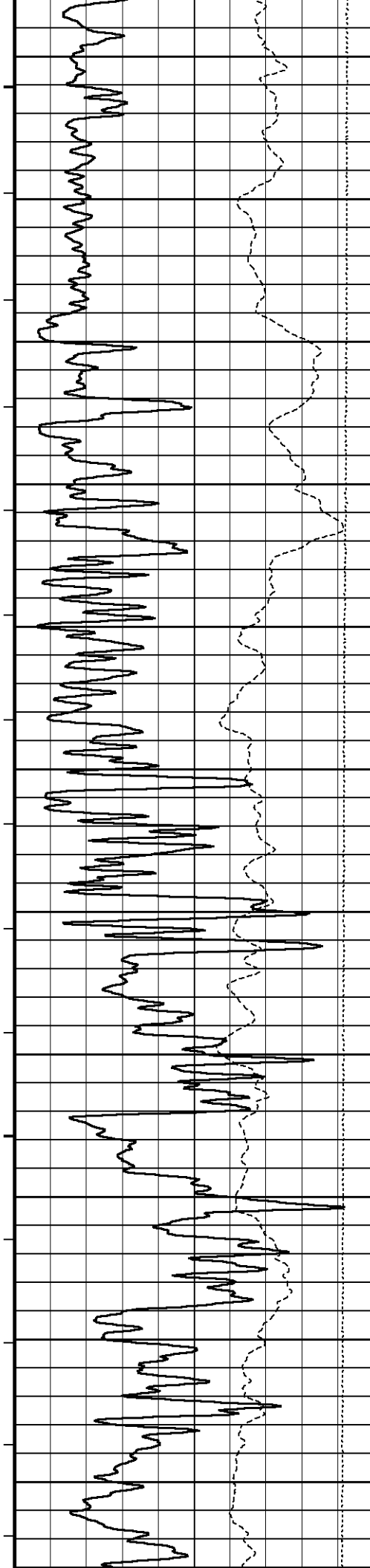
81°

1000

82°







87°

1700

87°

1800

88°

1900

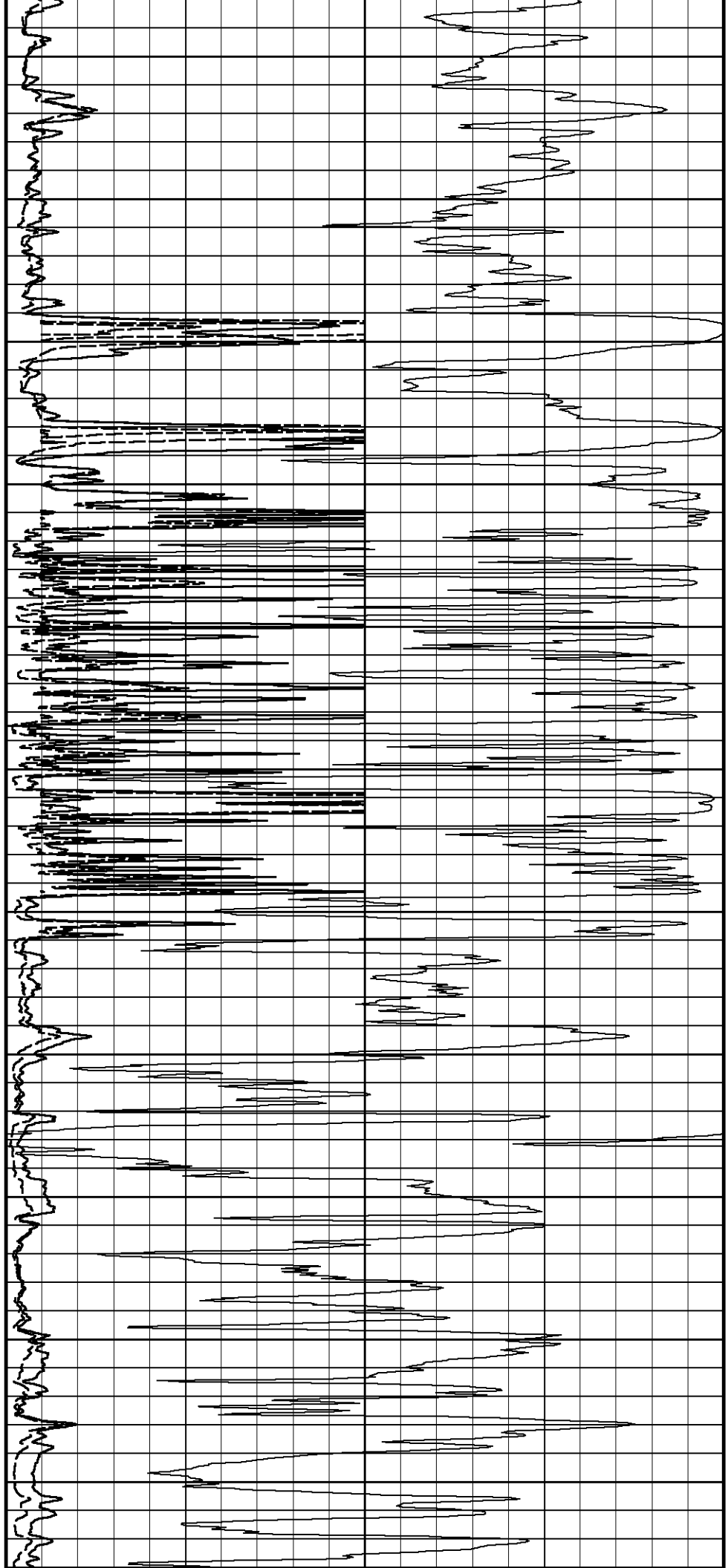
88°

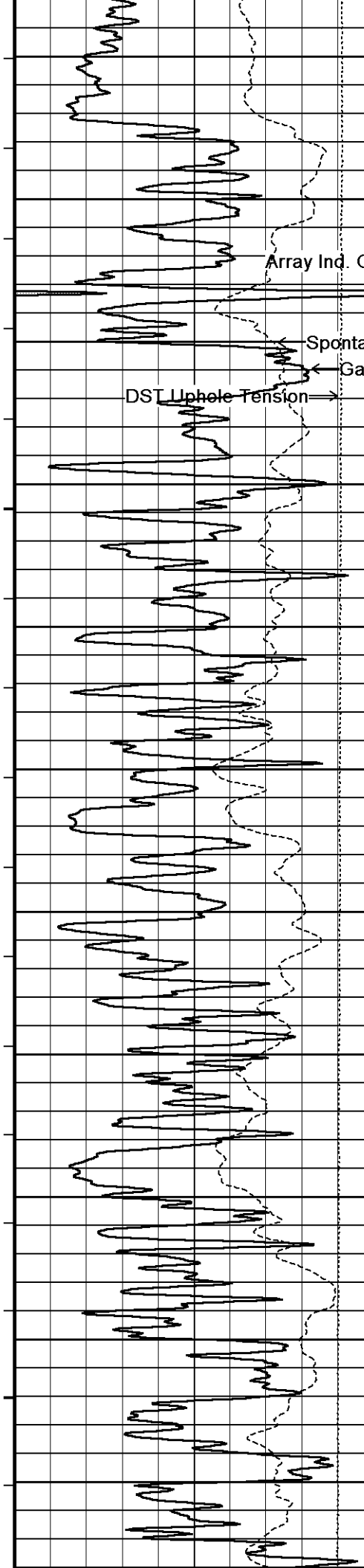
2000

89°

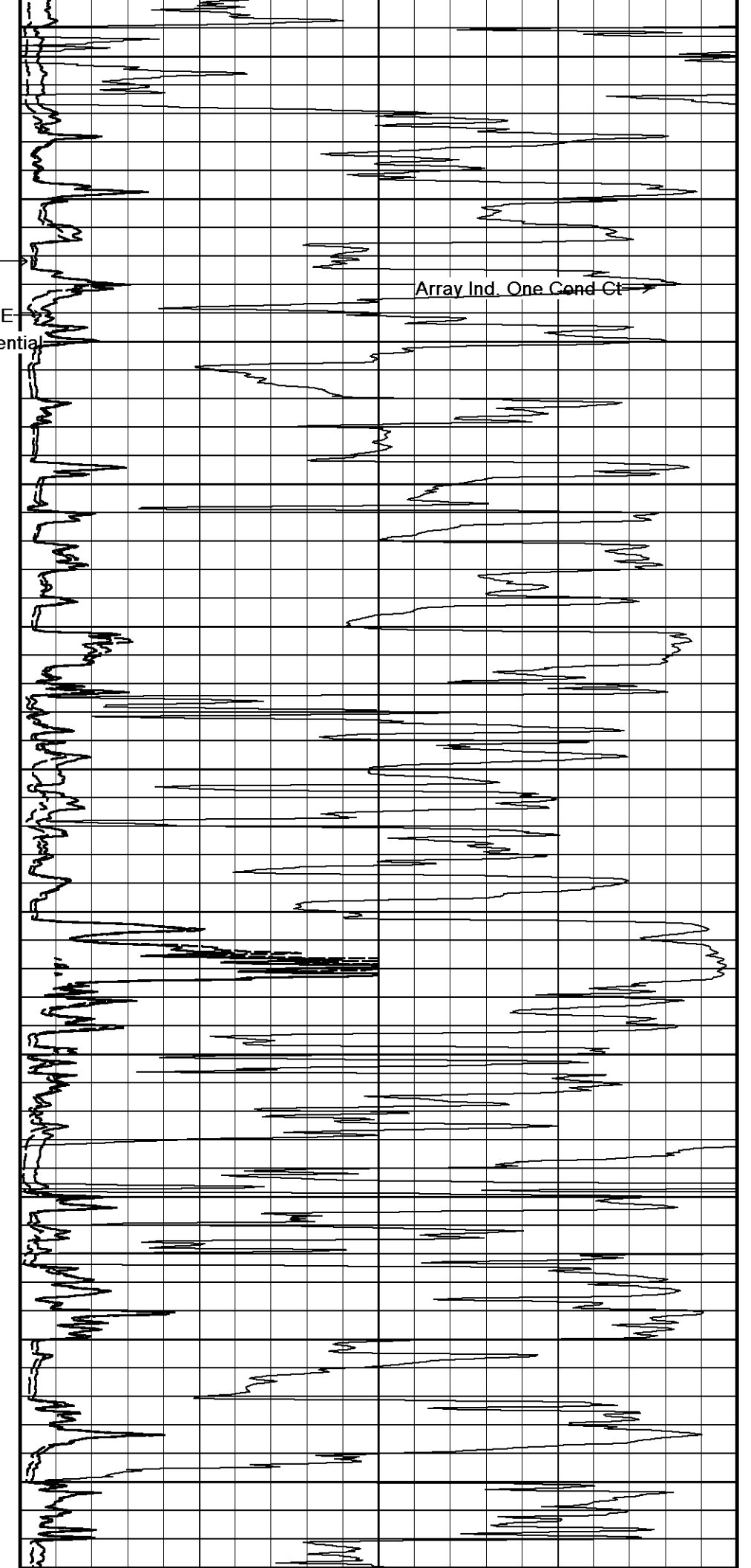
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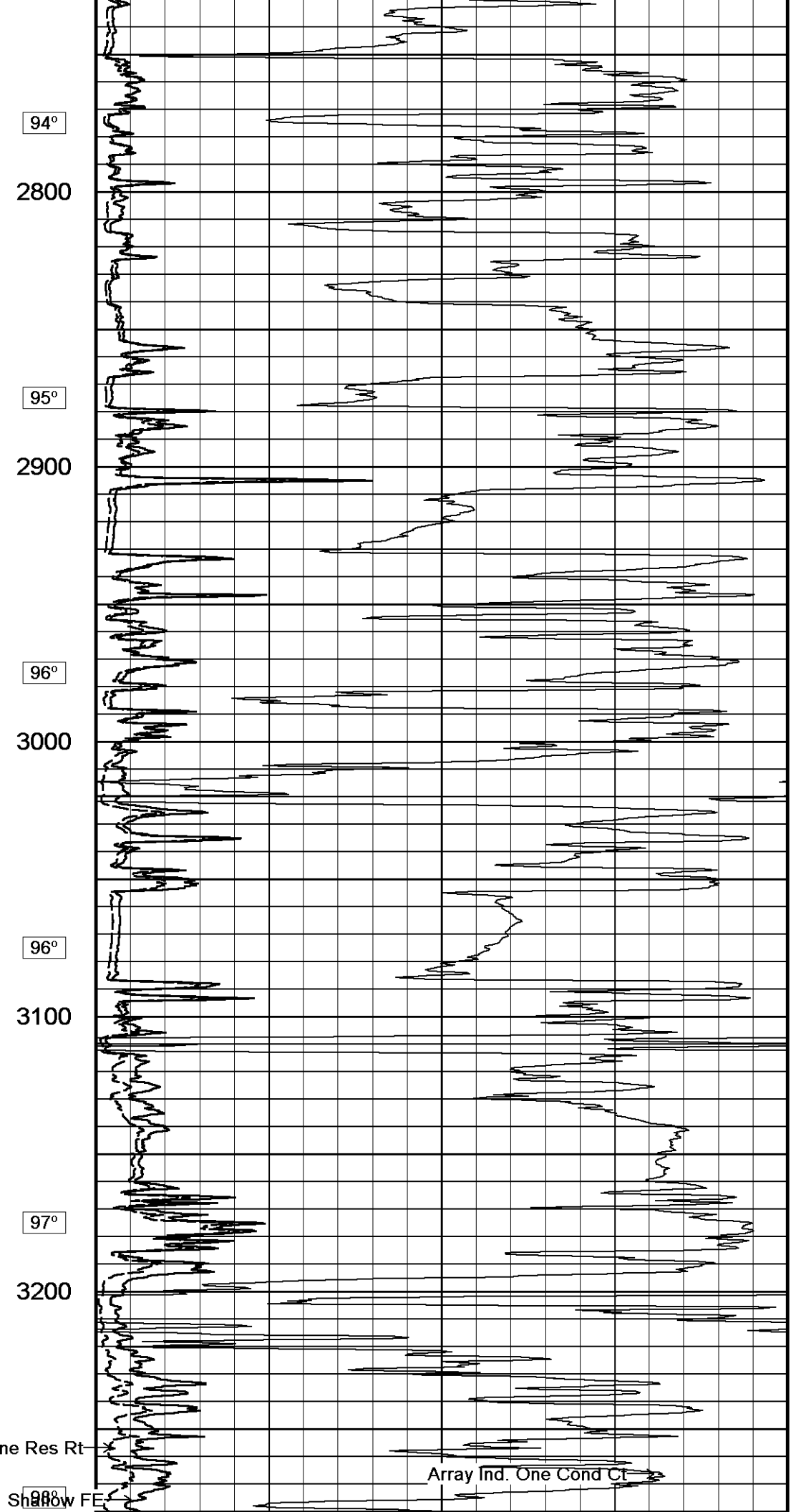
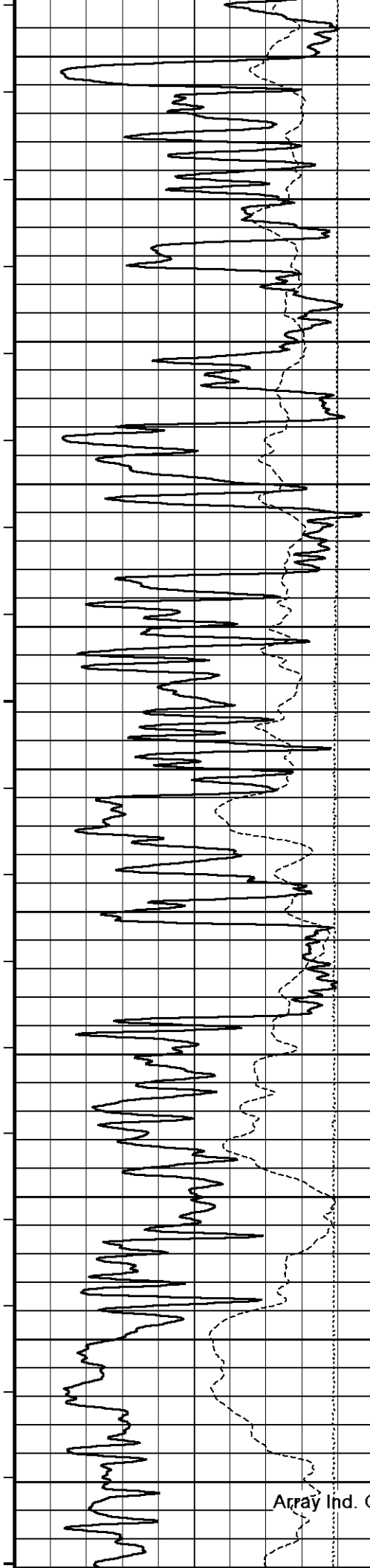
89°





2200
90°
2300
2400
91°
2500
91°
2600
92°
2700
93°





94°

2800

95°

2900

96°

3000

96°

3100

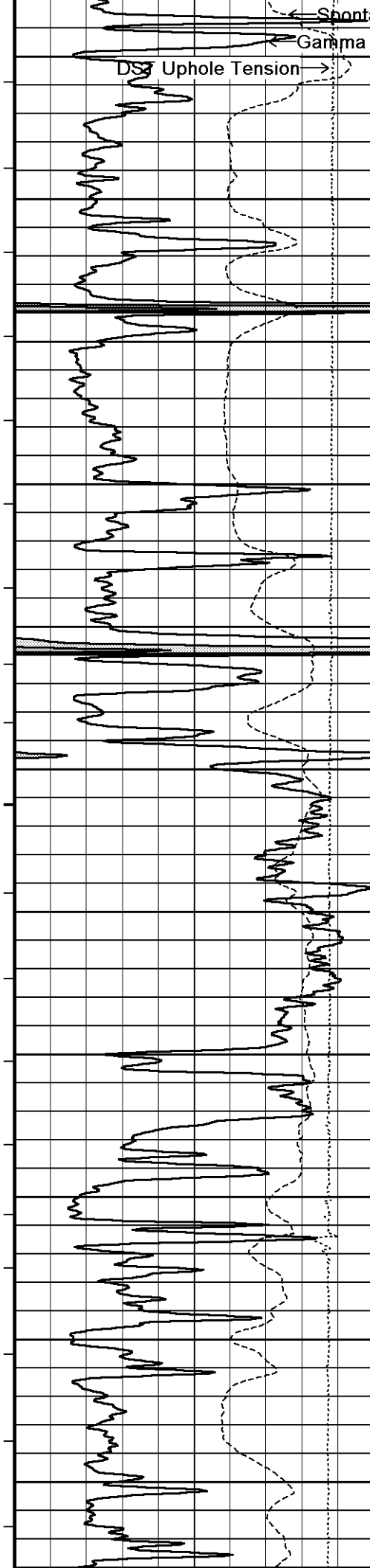
97°

3200

Array Ind. One Res Rt

Shallow FE

Array Ind. One Cond Ct



3300

98°

3400

99°

3500

99°

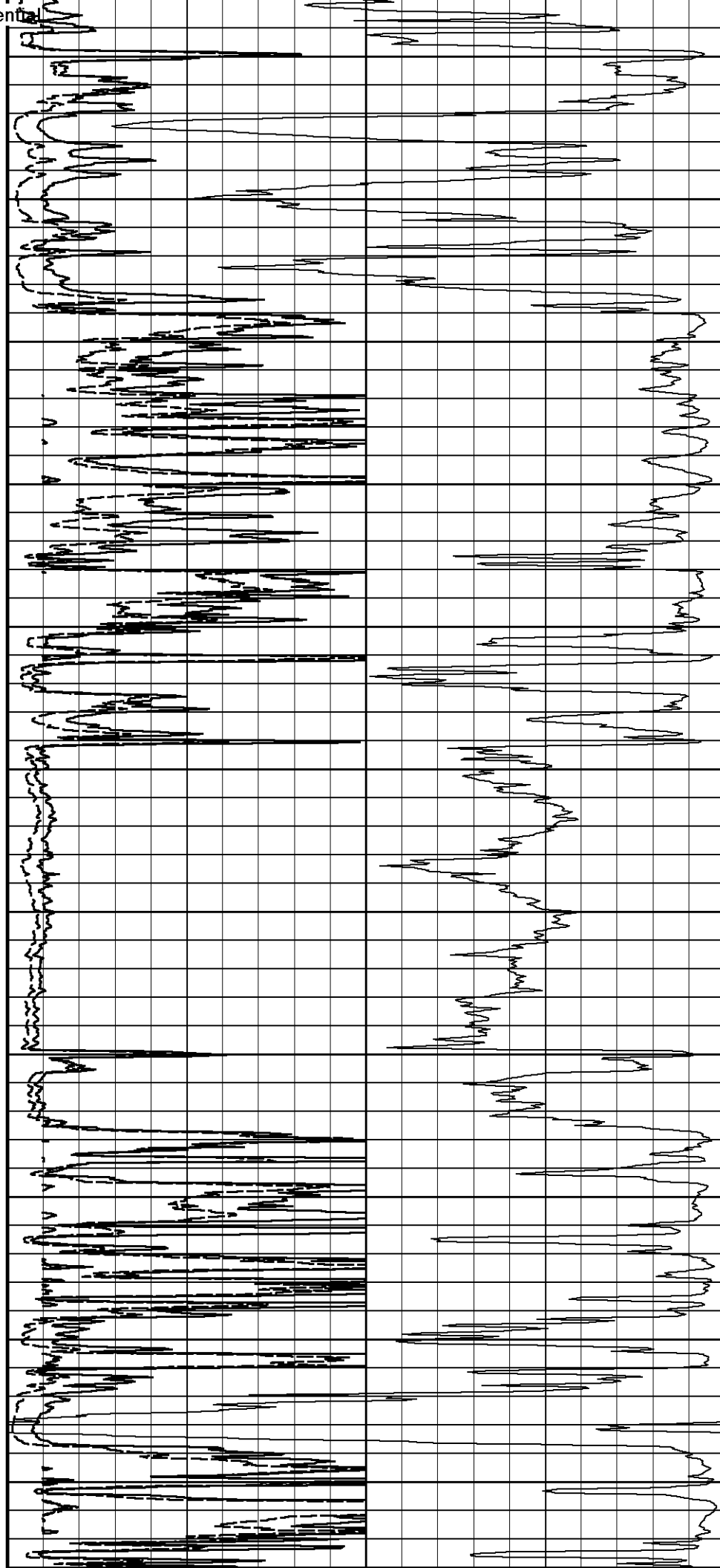
3600

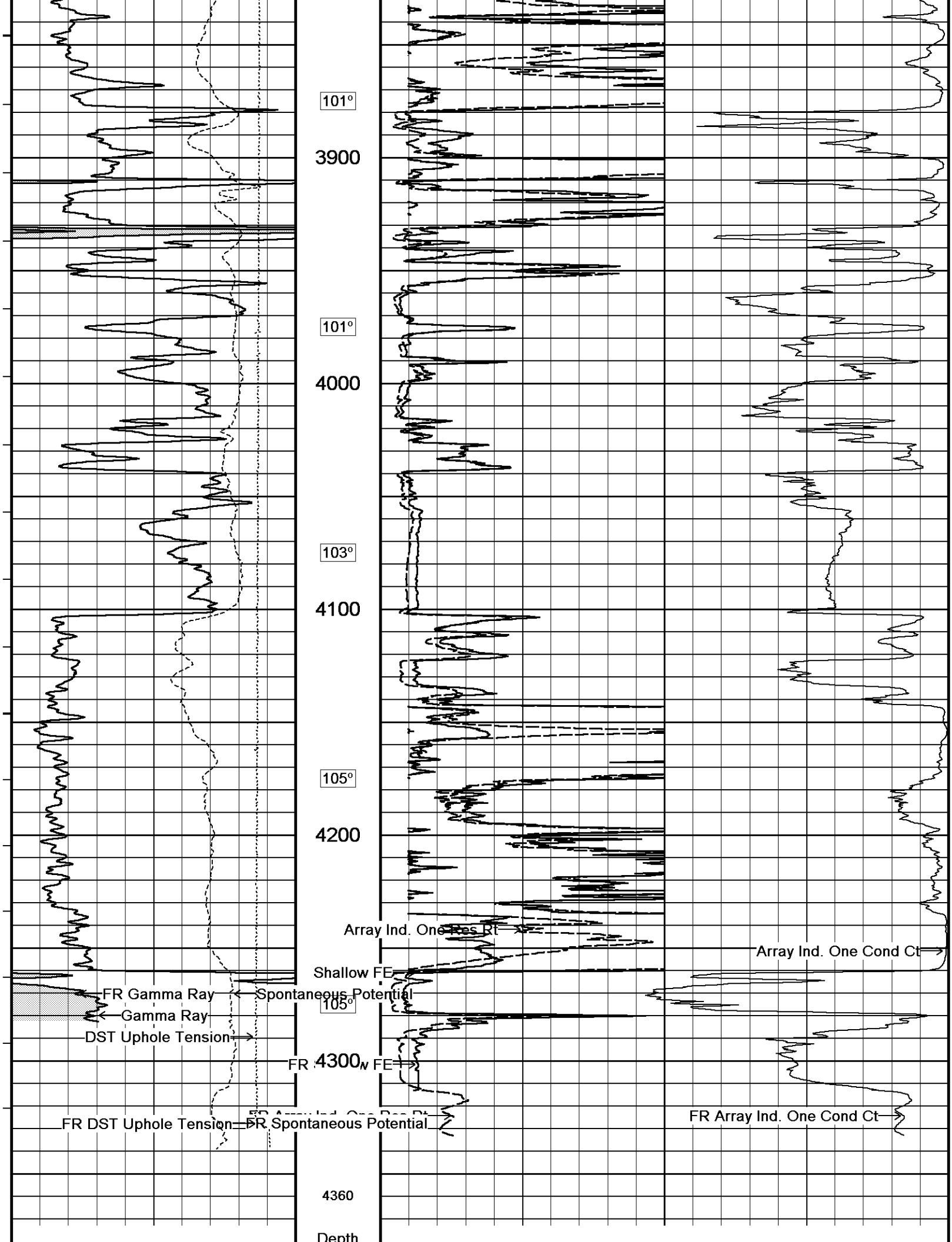
100°

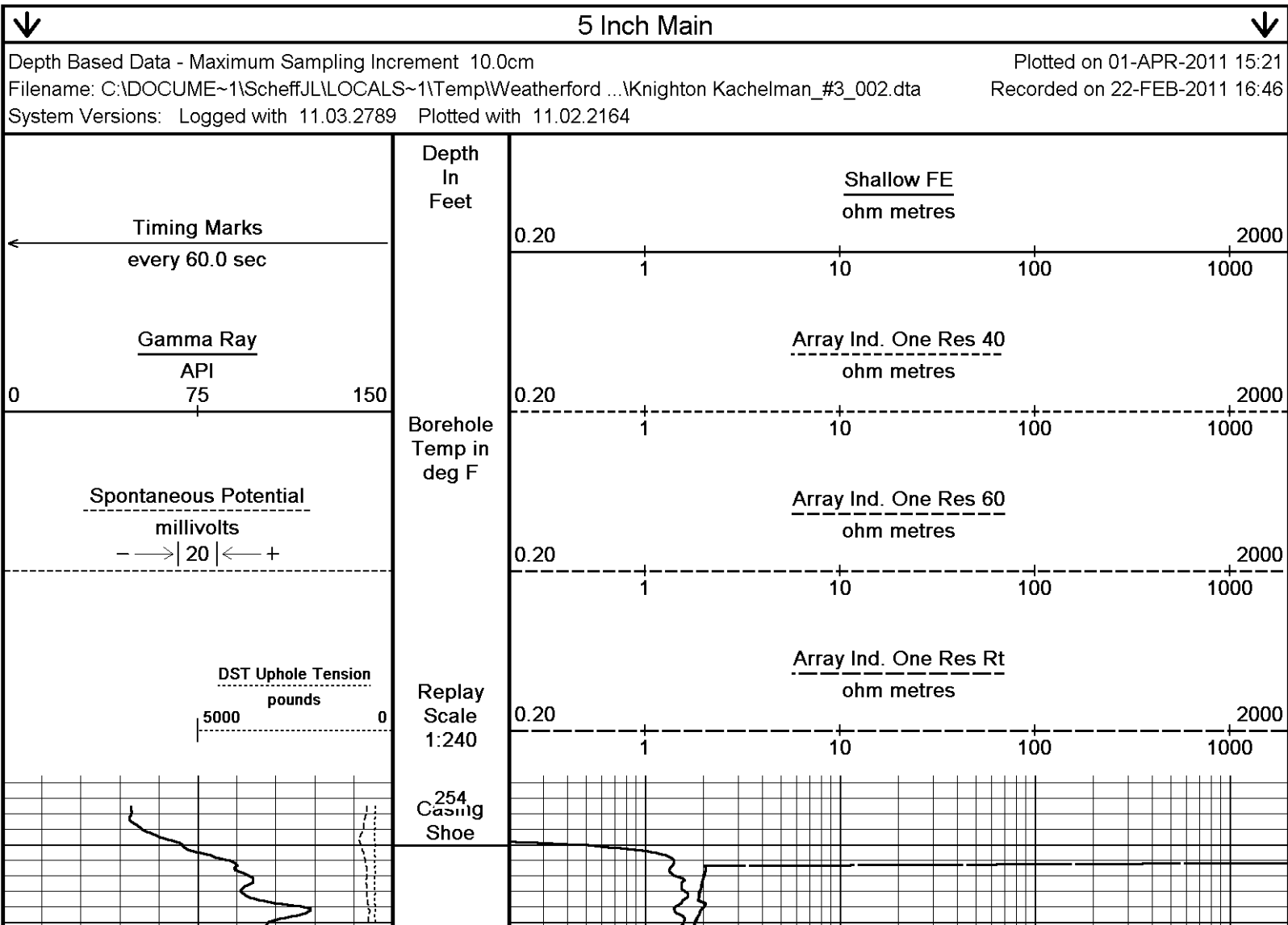
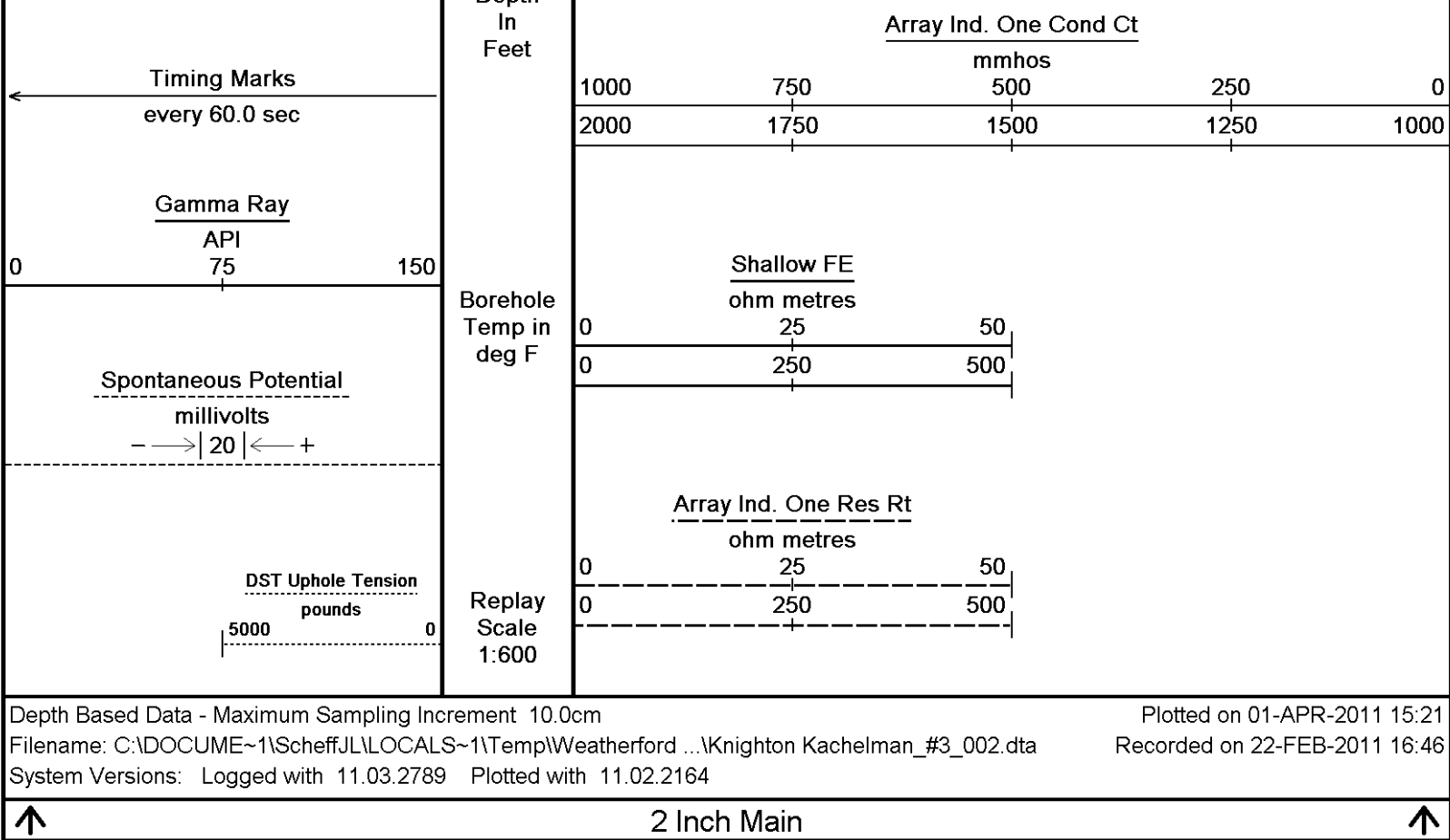
3700

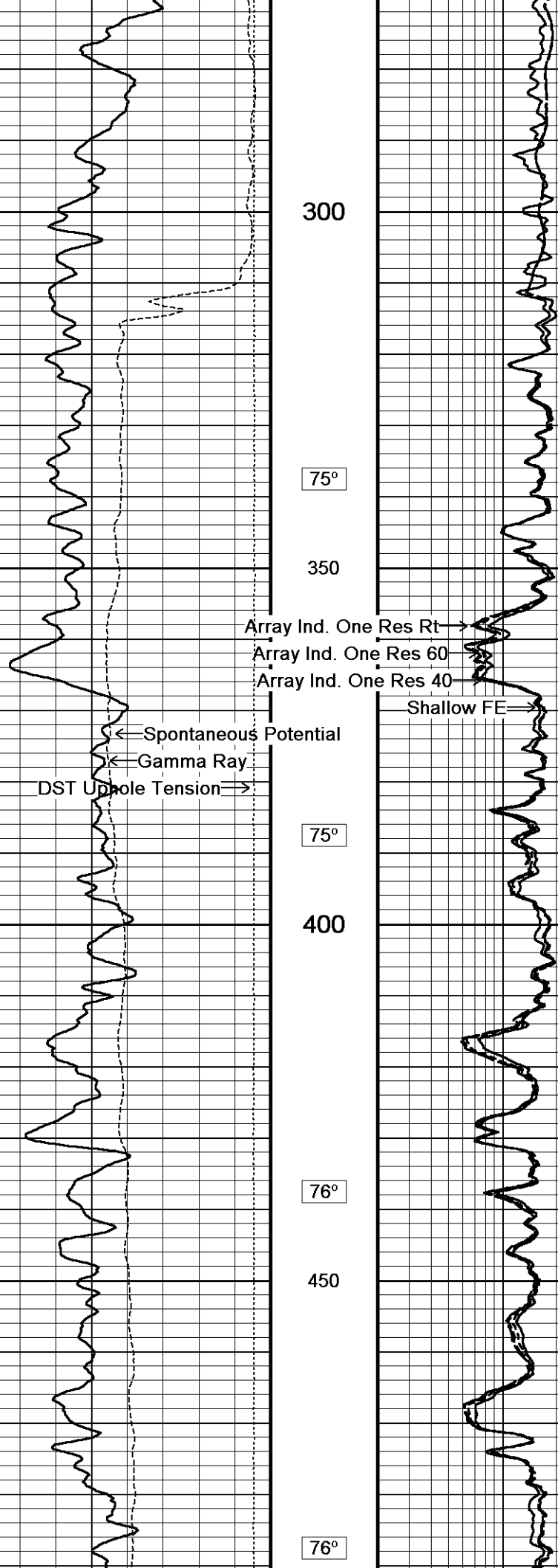
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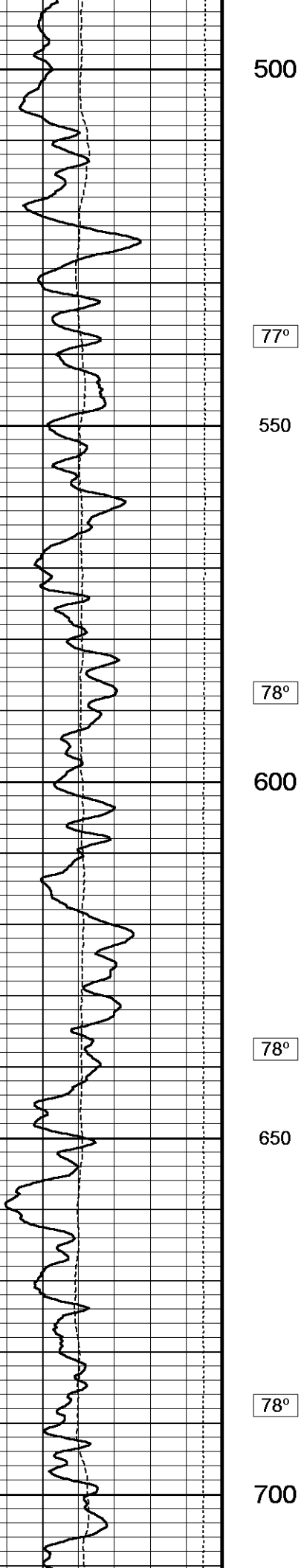
3800











500

77°

550

78°

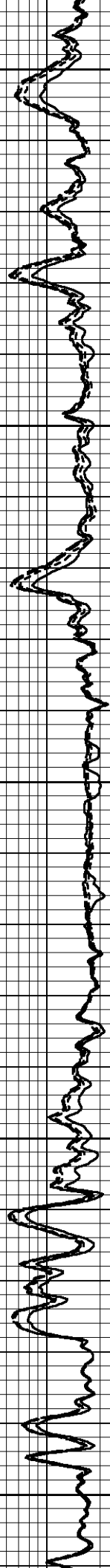
600

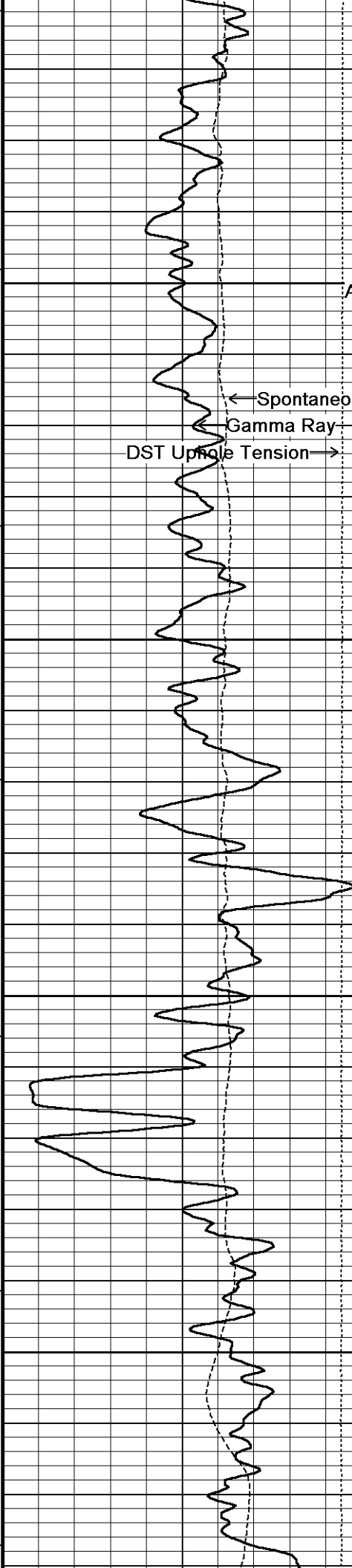
78°

650

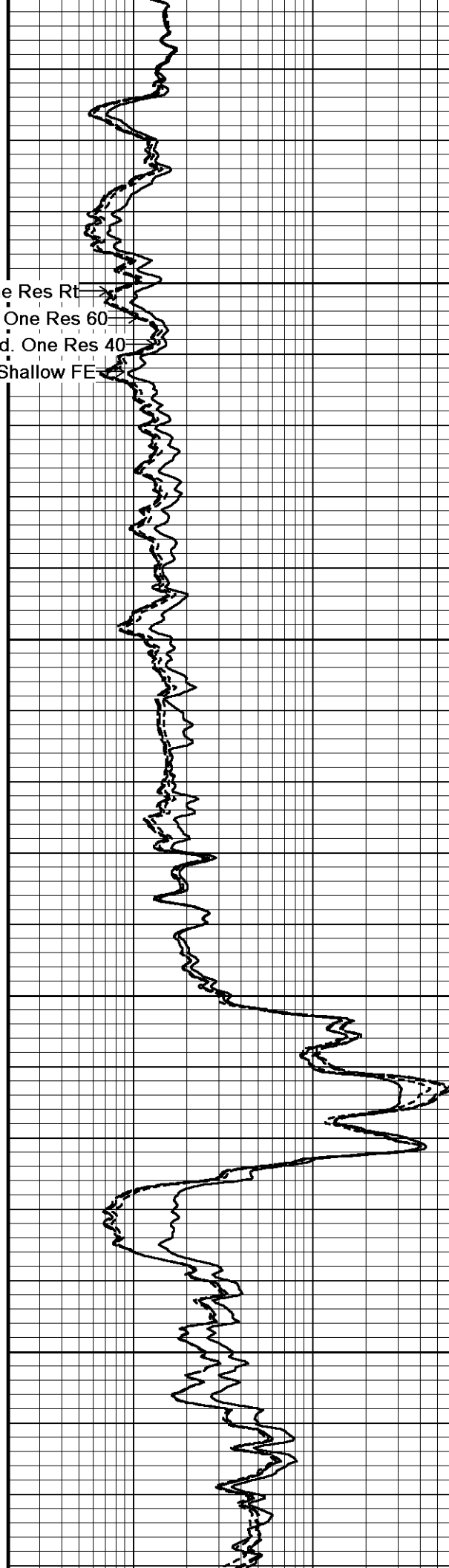
78°

700



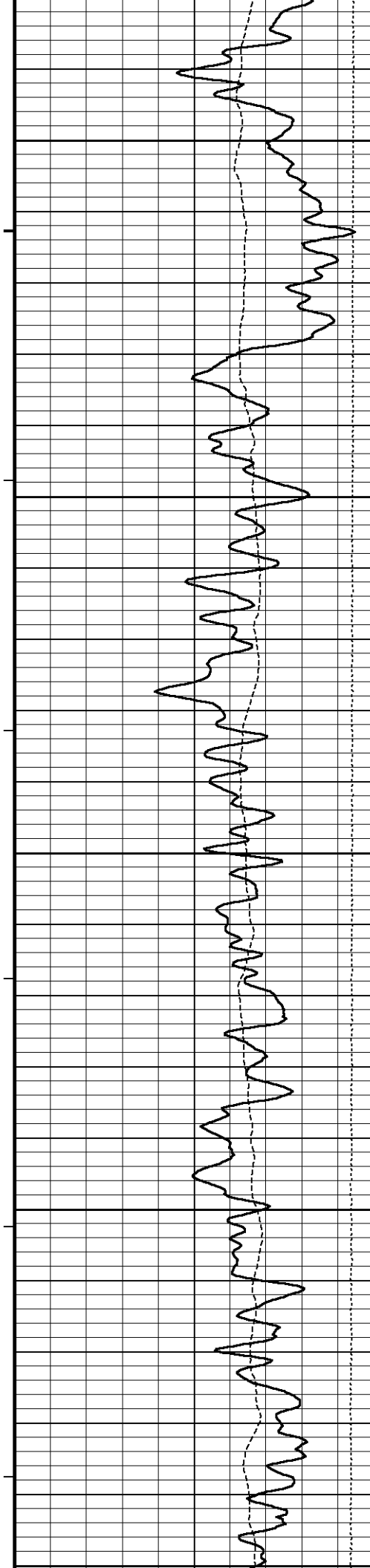


78°
79°
80°
900



Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE

Spontaneous Potential
Gamma Ray
DST Up-hole Tension



80°

950

81°

1000

81°

1050

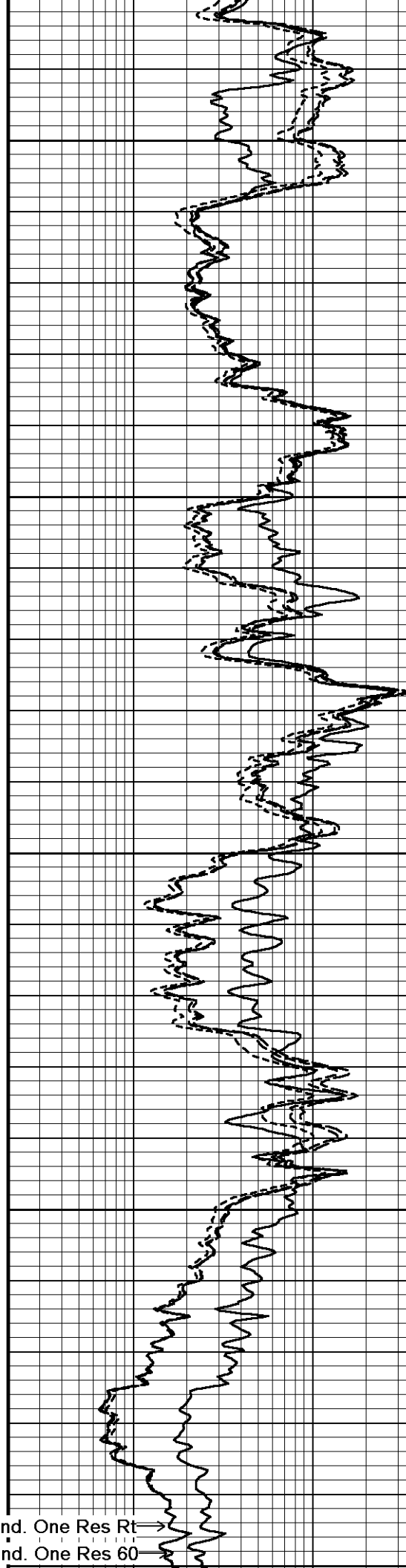
82°

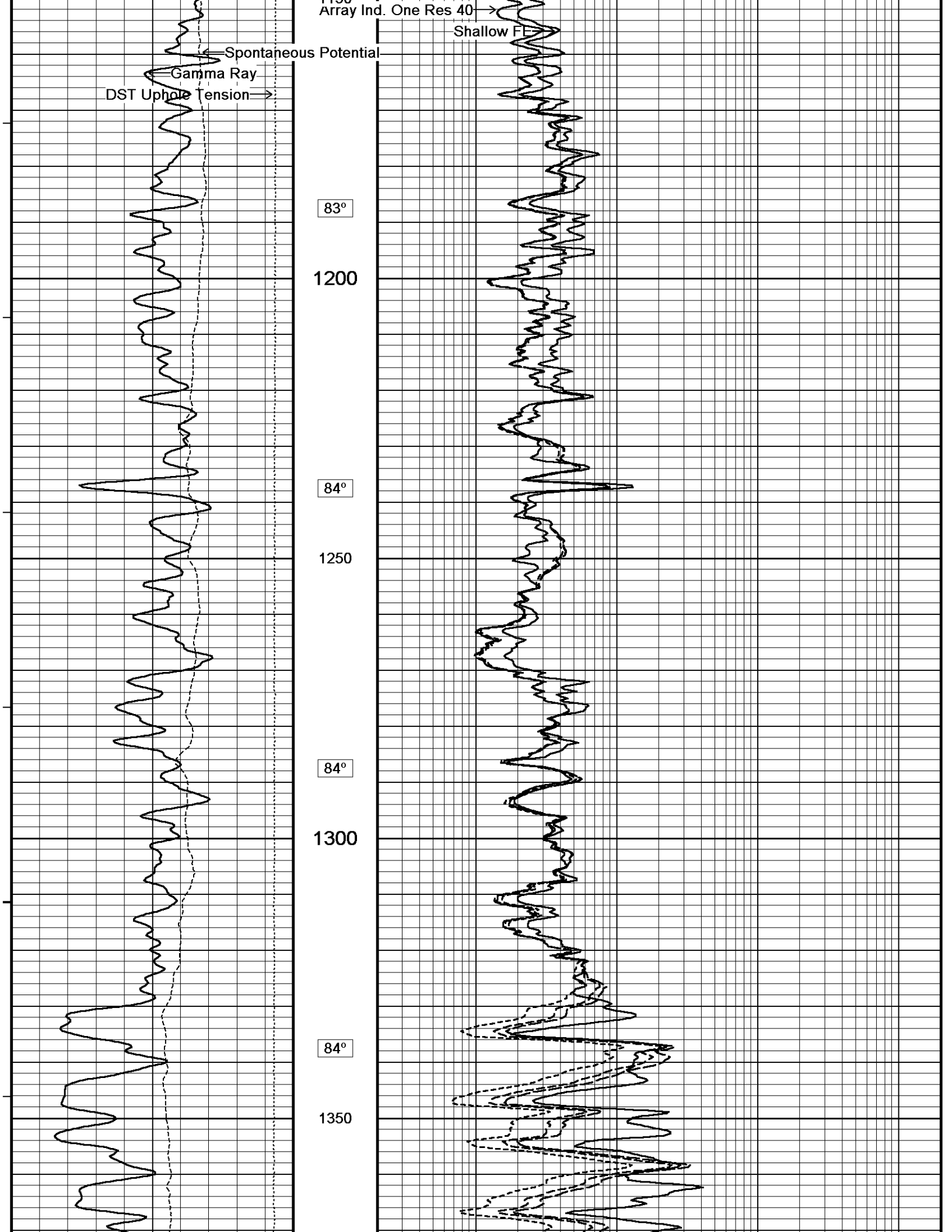
1100

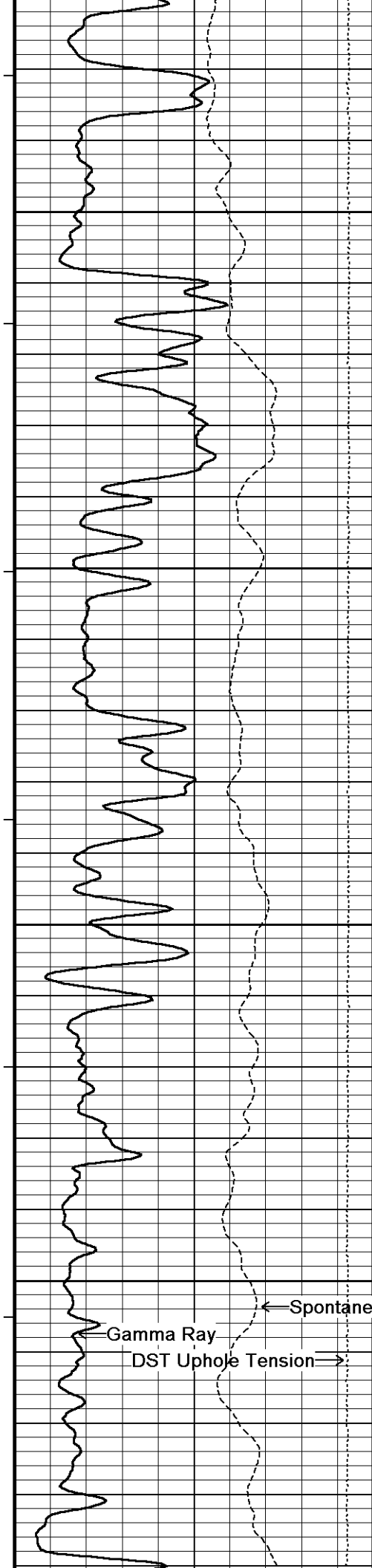
83°

Array Ind. One Res Rt

Array Ind. One Res 60







85°

1400

85°

1450

85°

1500

86°

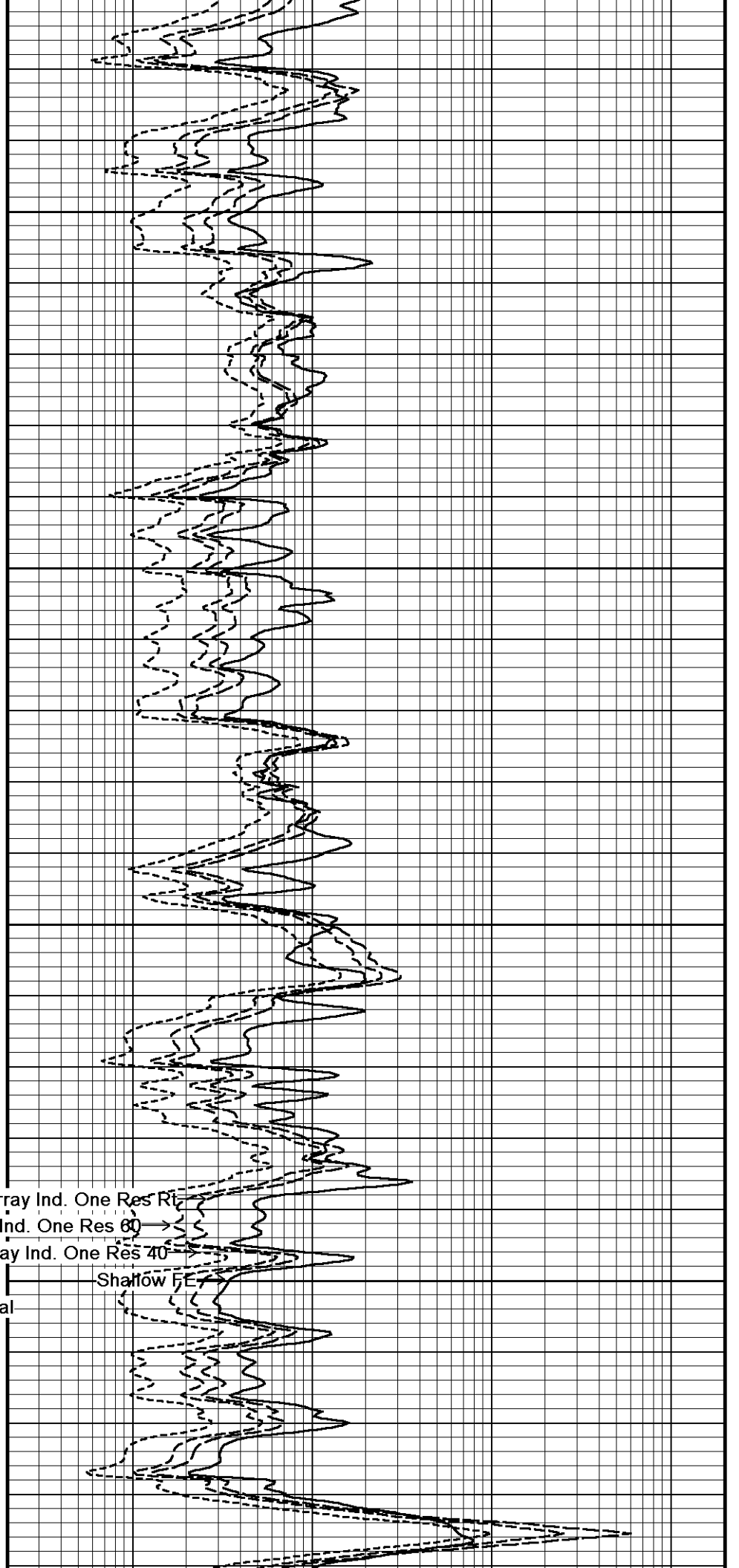
1550

86°

Gamma Ray

DST Uphole Tension

← Spontaneous Potential

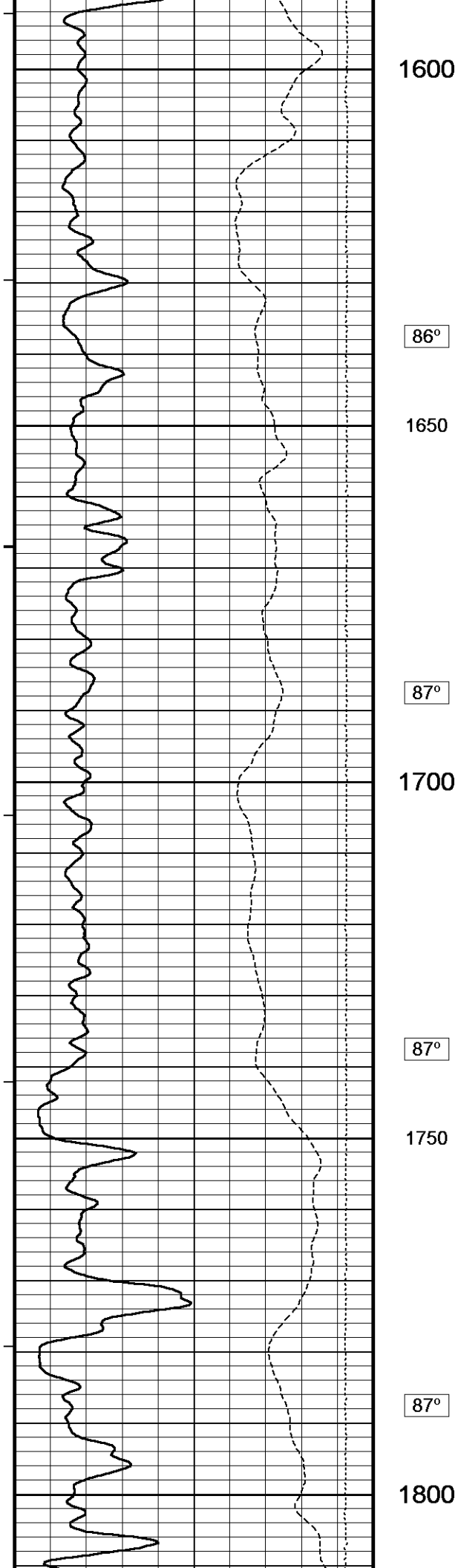


Array Ind. One Res R1

Array Ind. One Res 80

Array Ind. One Res 40

Shallow FE



1600

86°

1650

87°

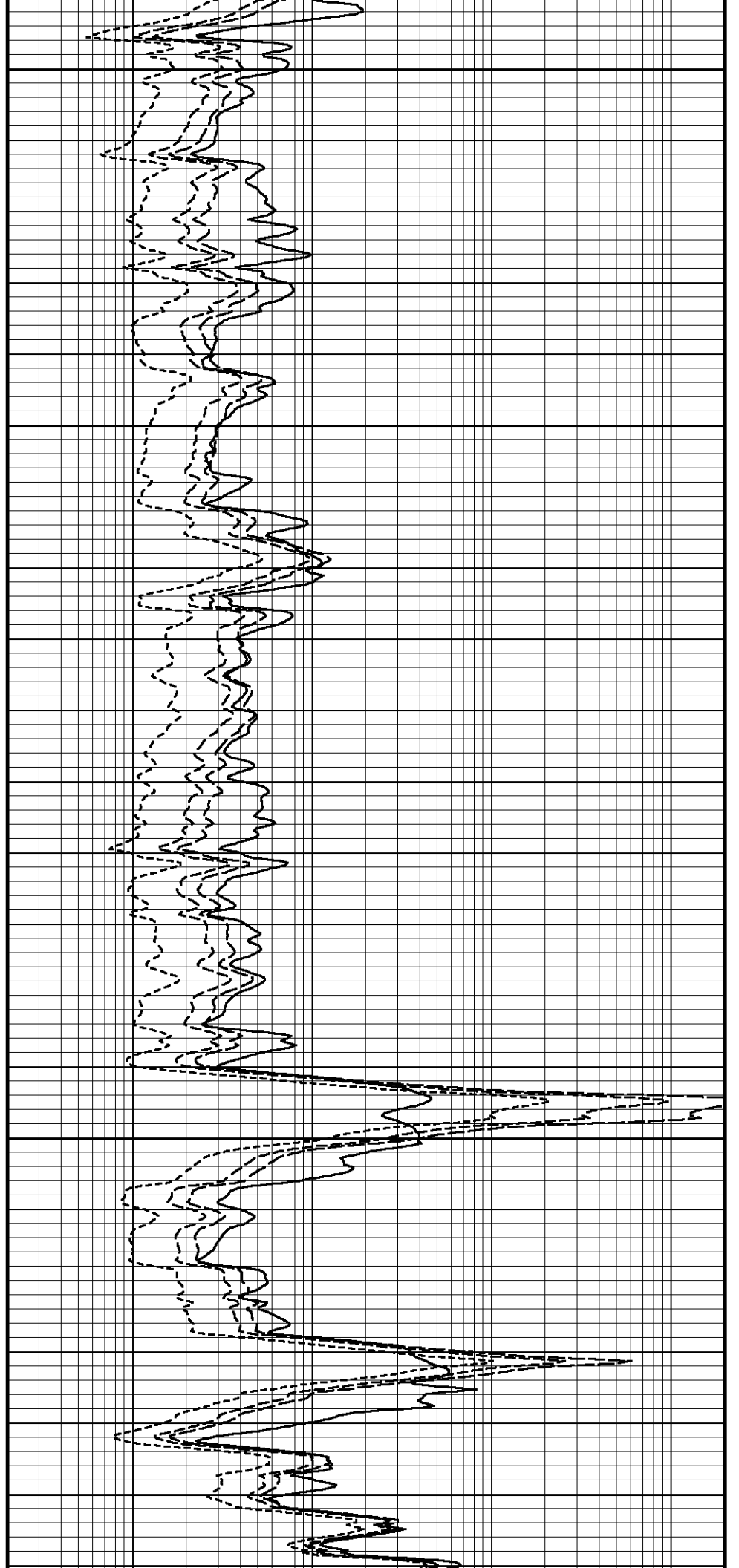
1700

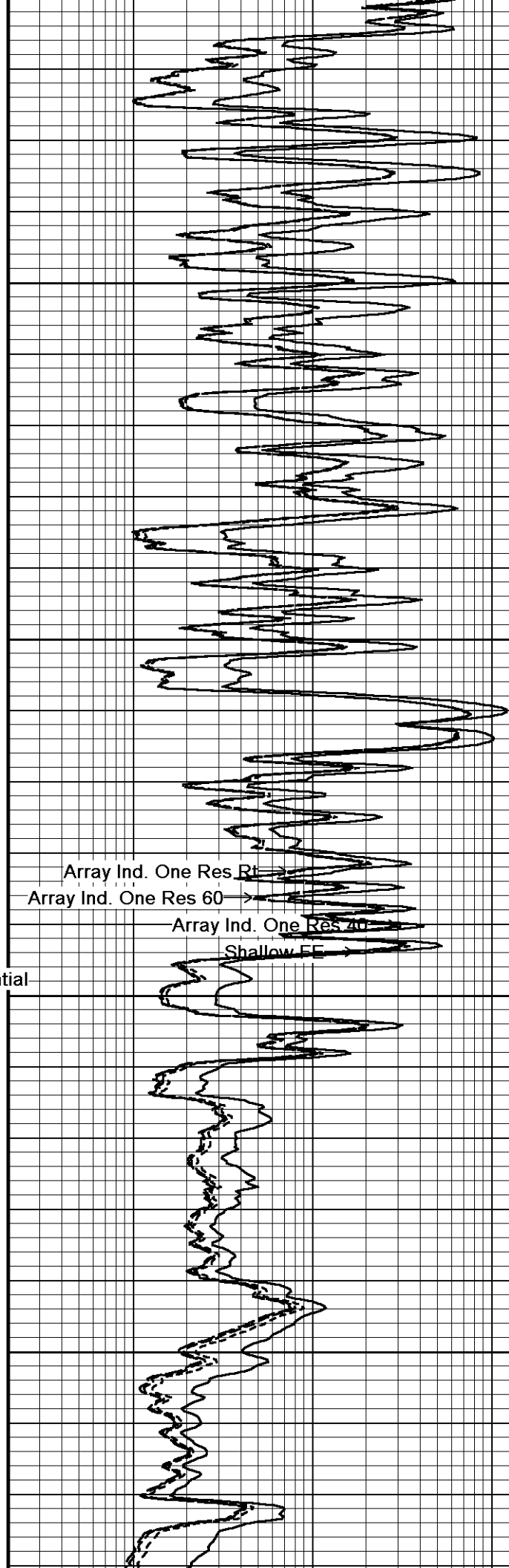
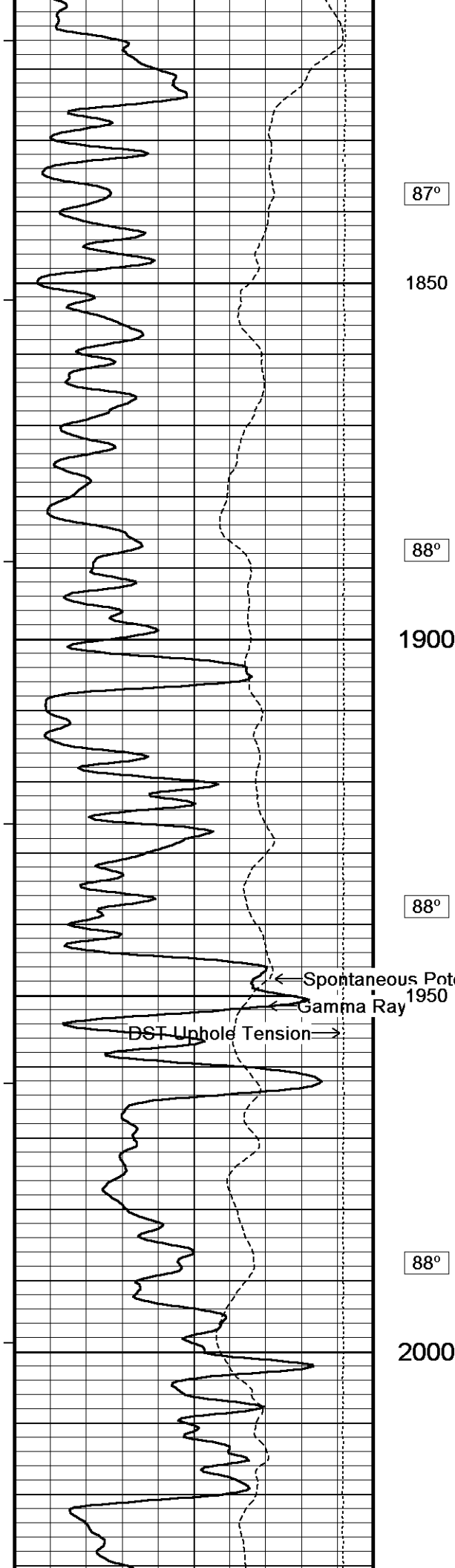
87°

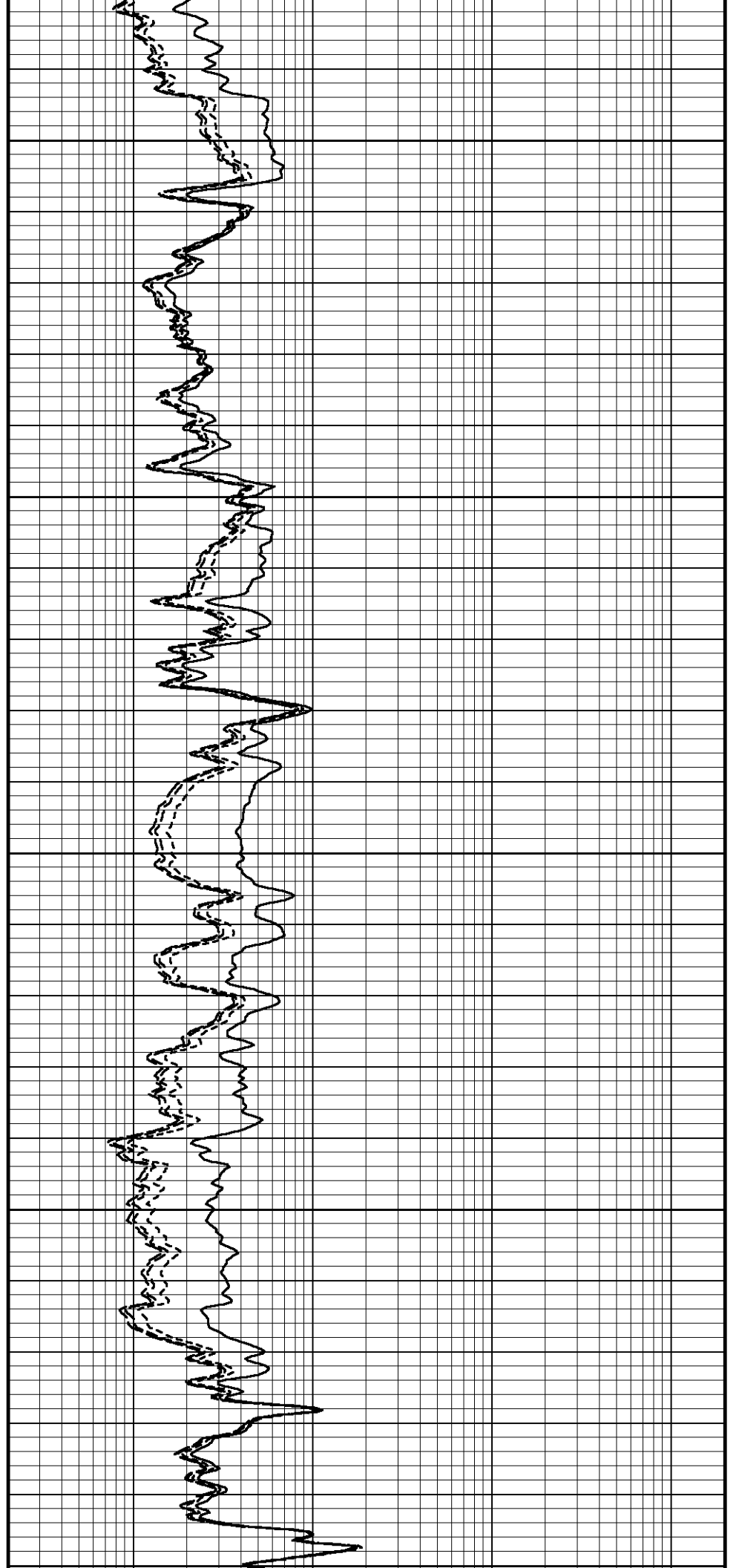
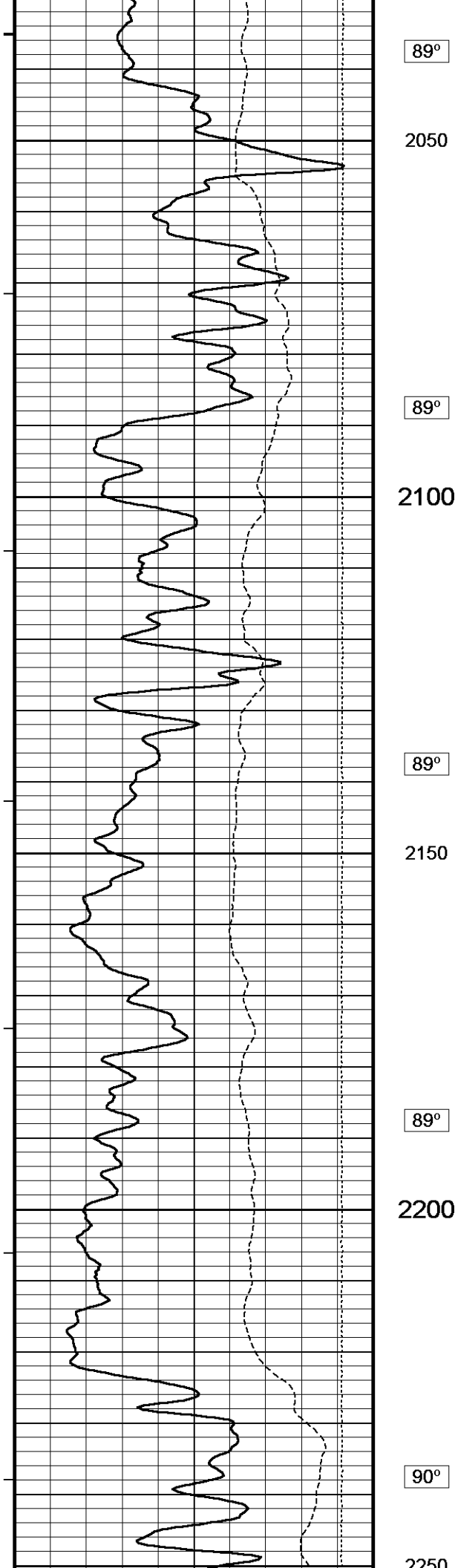
1750

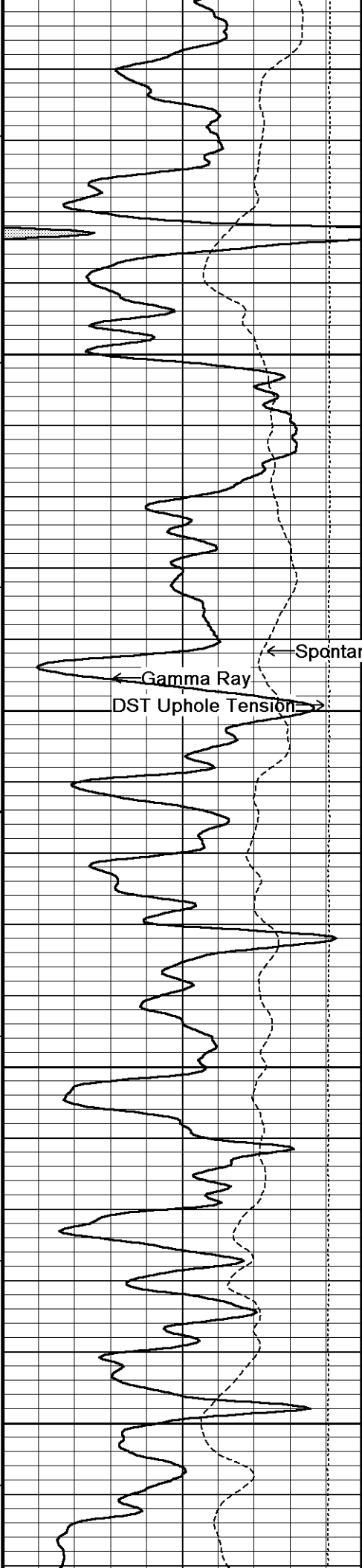
87°

1800









2250

90°

2300

90°

2350

91°

2400

91°

2450

Array Ind. One Res Rt

Array Ind. One Res 60

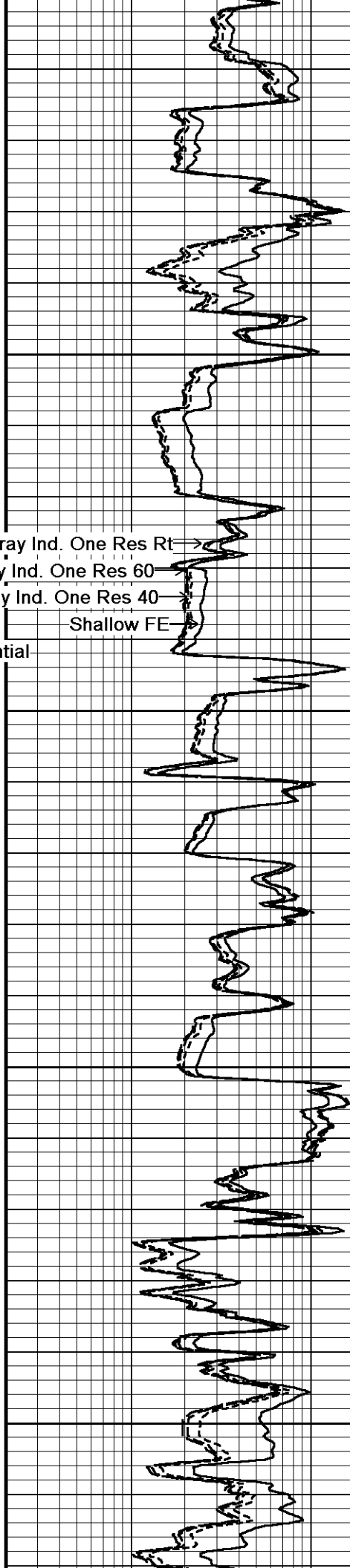
Array Ind. One Res 40

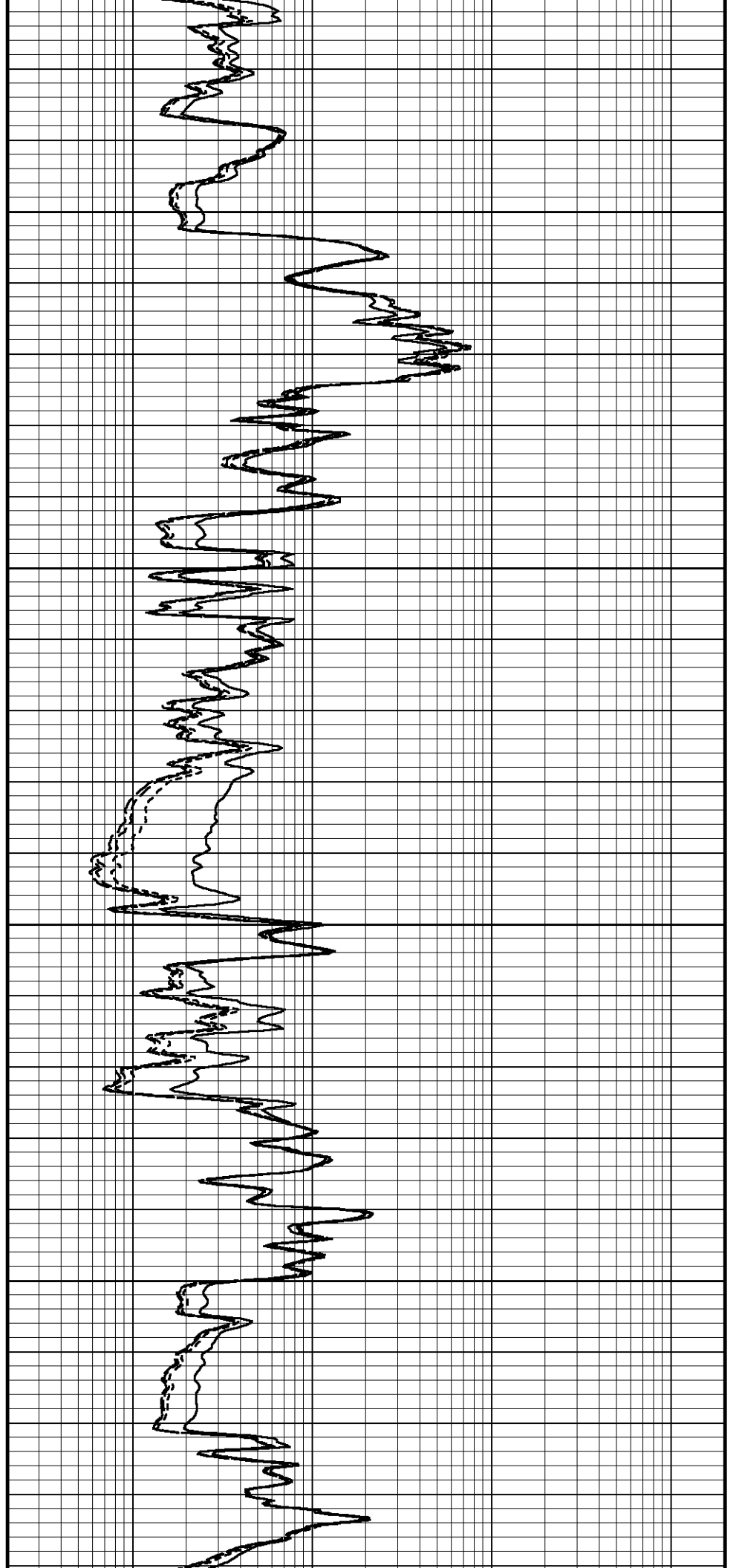
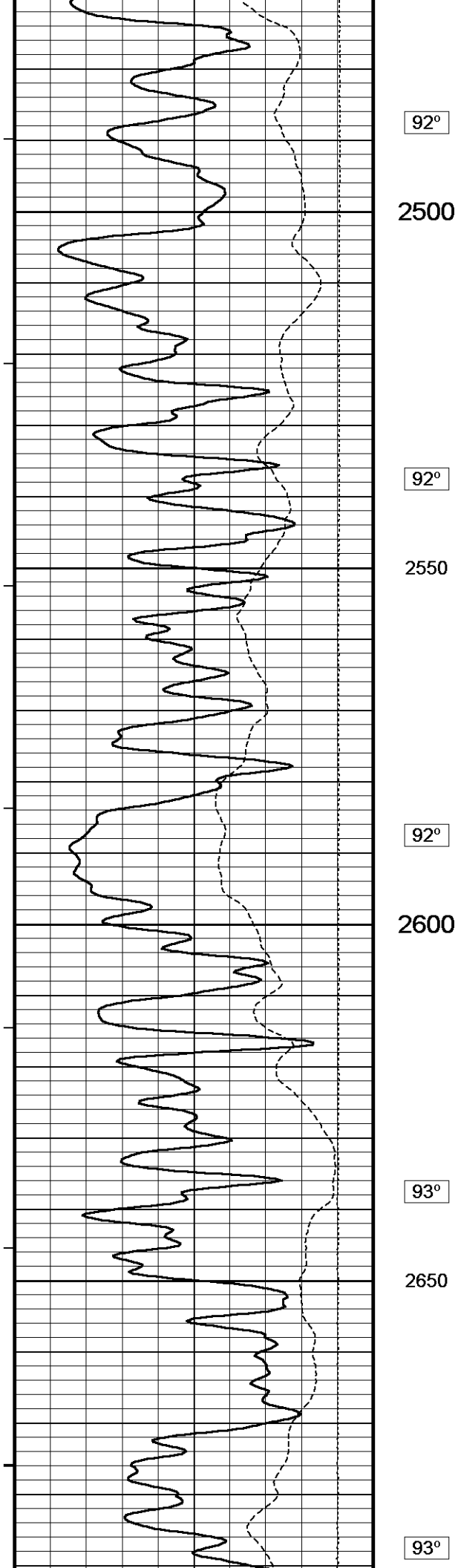
Shallow FE

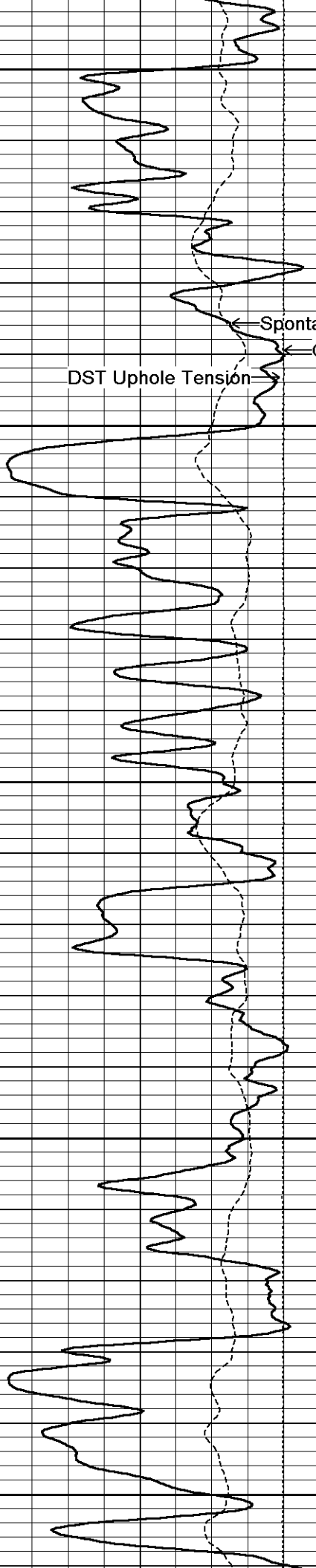
Spontaneous Potential

Gamma Ray

DST Uphole Tension







DST Uphole Tension

Spontaneous Potential

Gamma Ray

2700

2750

2800

2850

2900

94°

94°

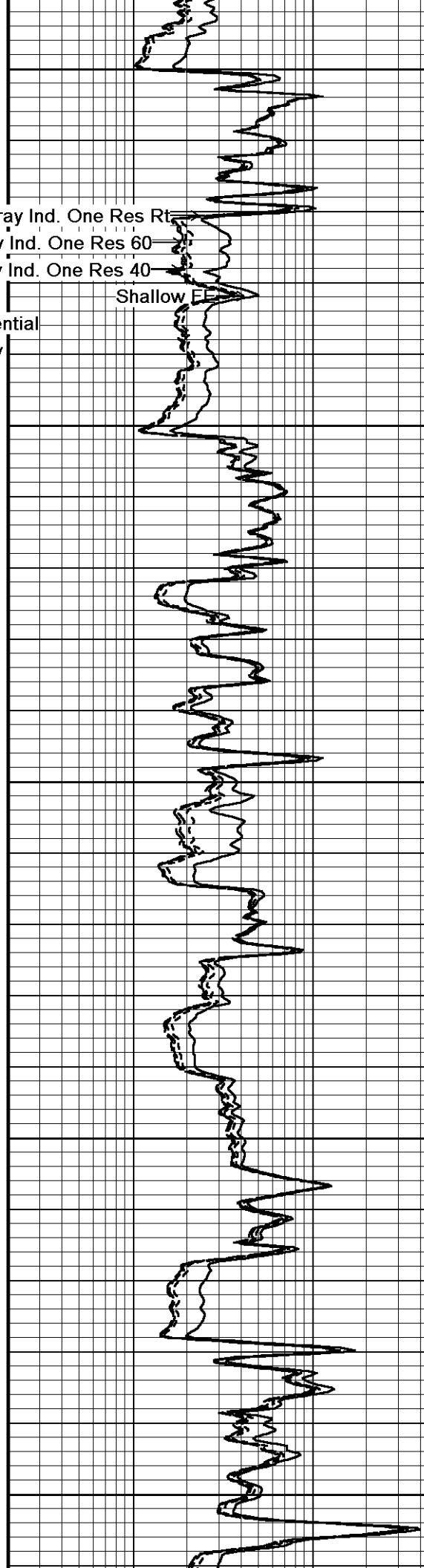
95°

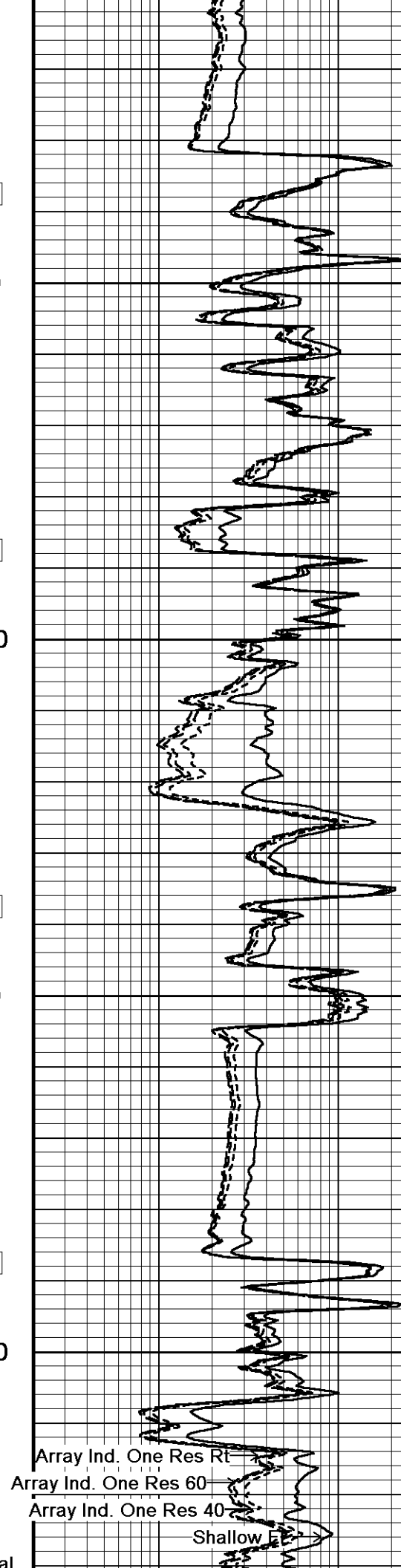
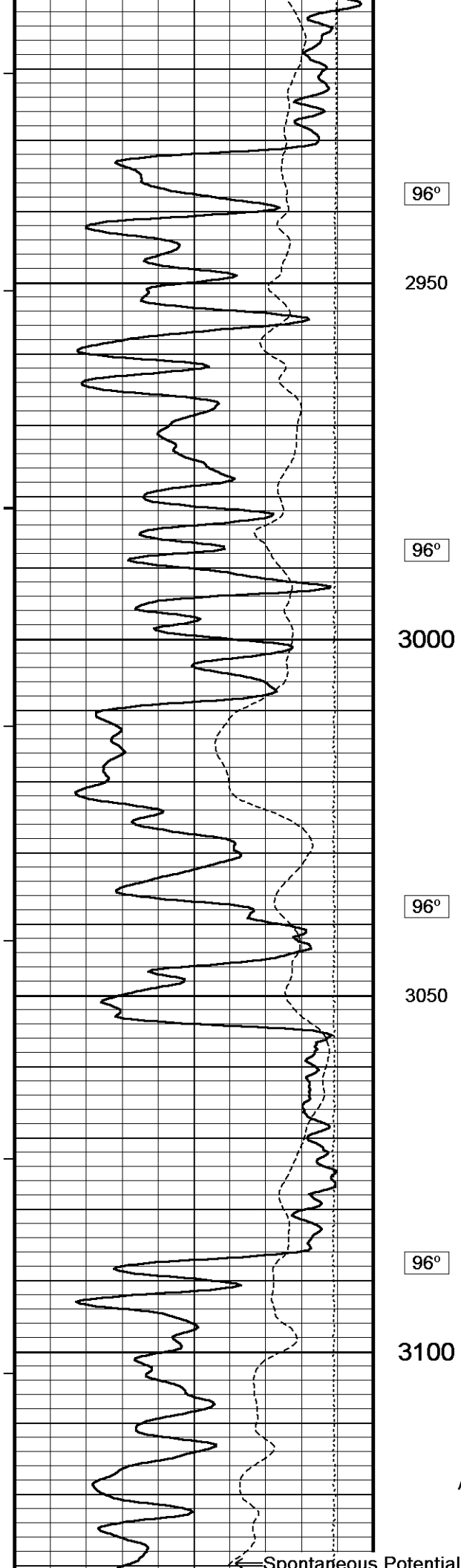
Array Ind. One Res Rt

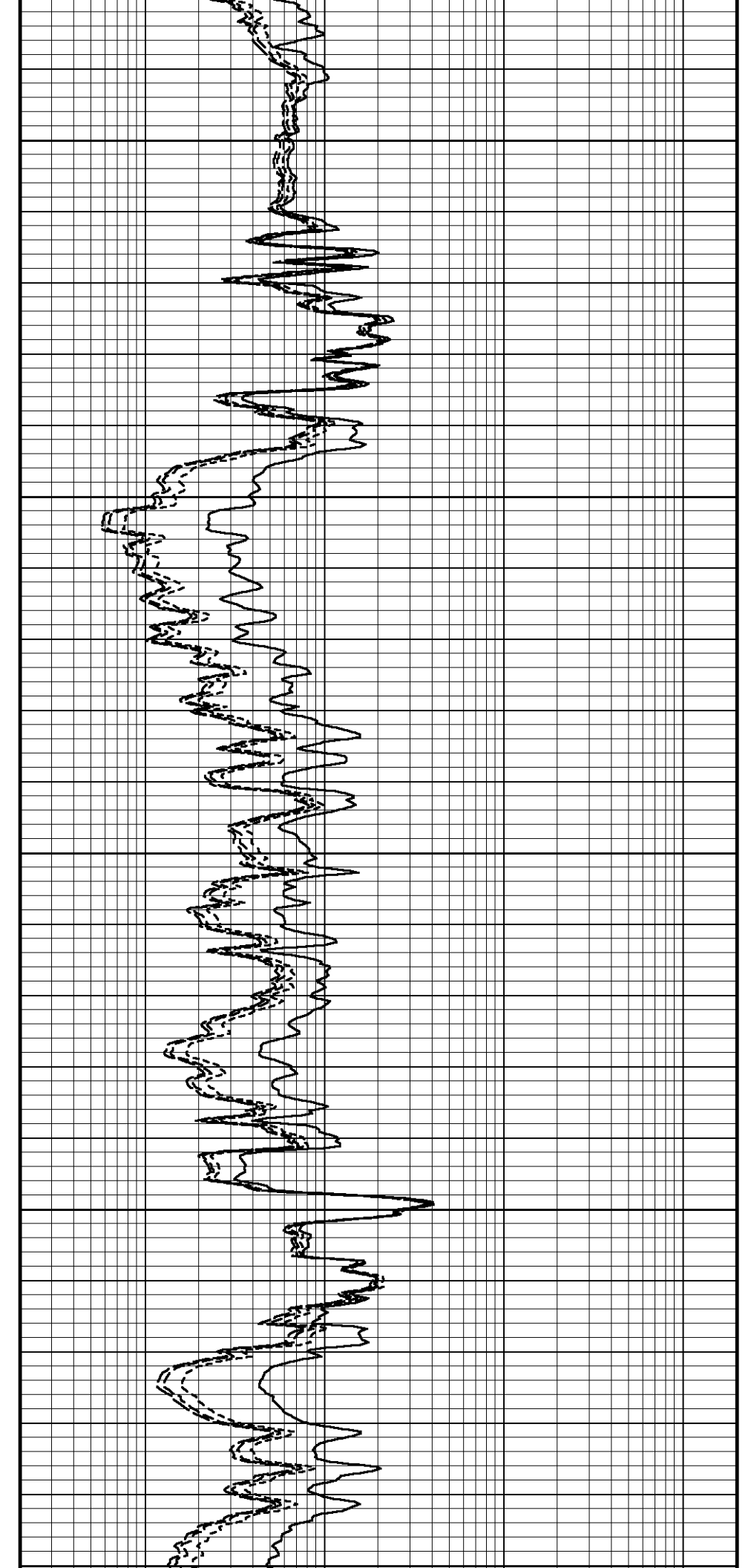
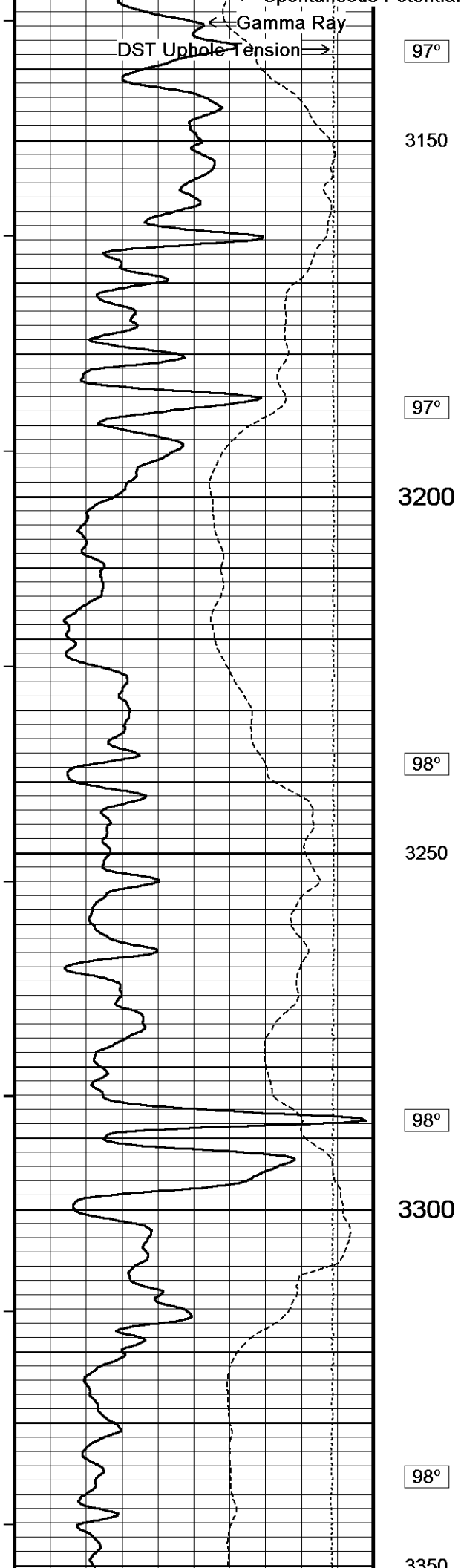
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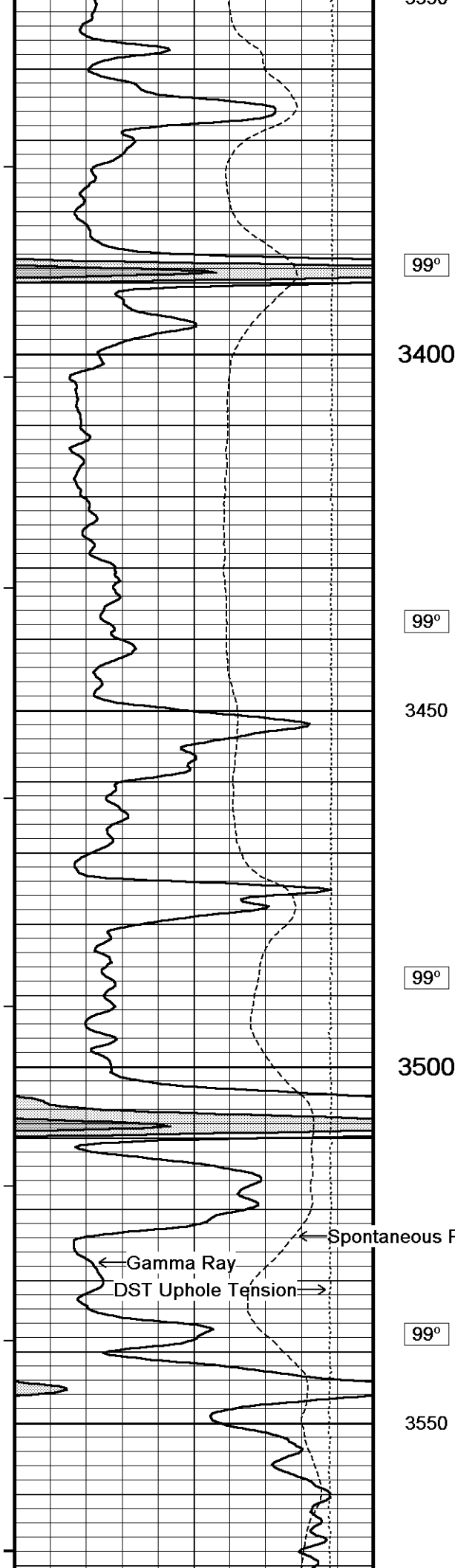
Array Ind. One Res 40

Shallow EE









99°

3400

99°

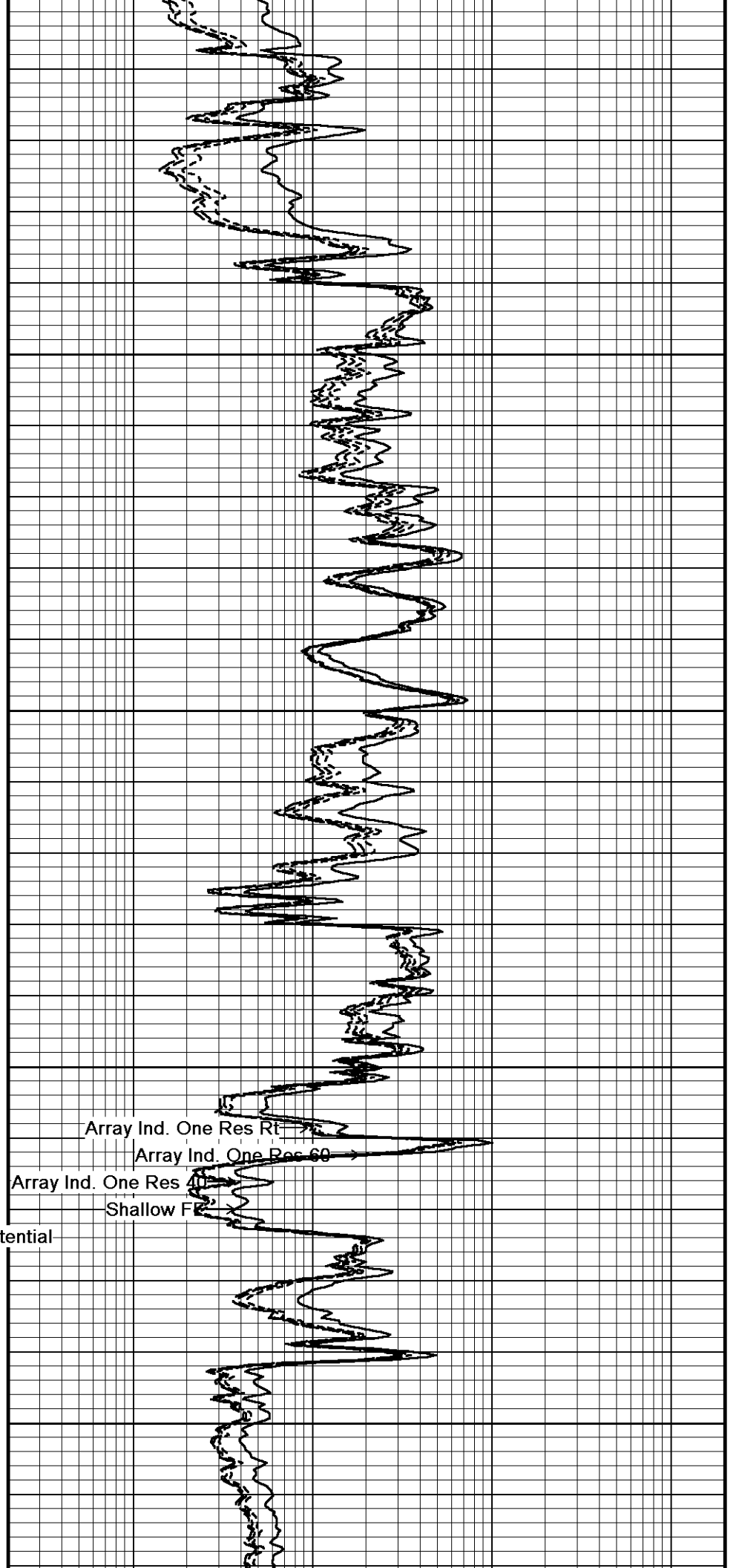
3450

99°

3500

99°

3550

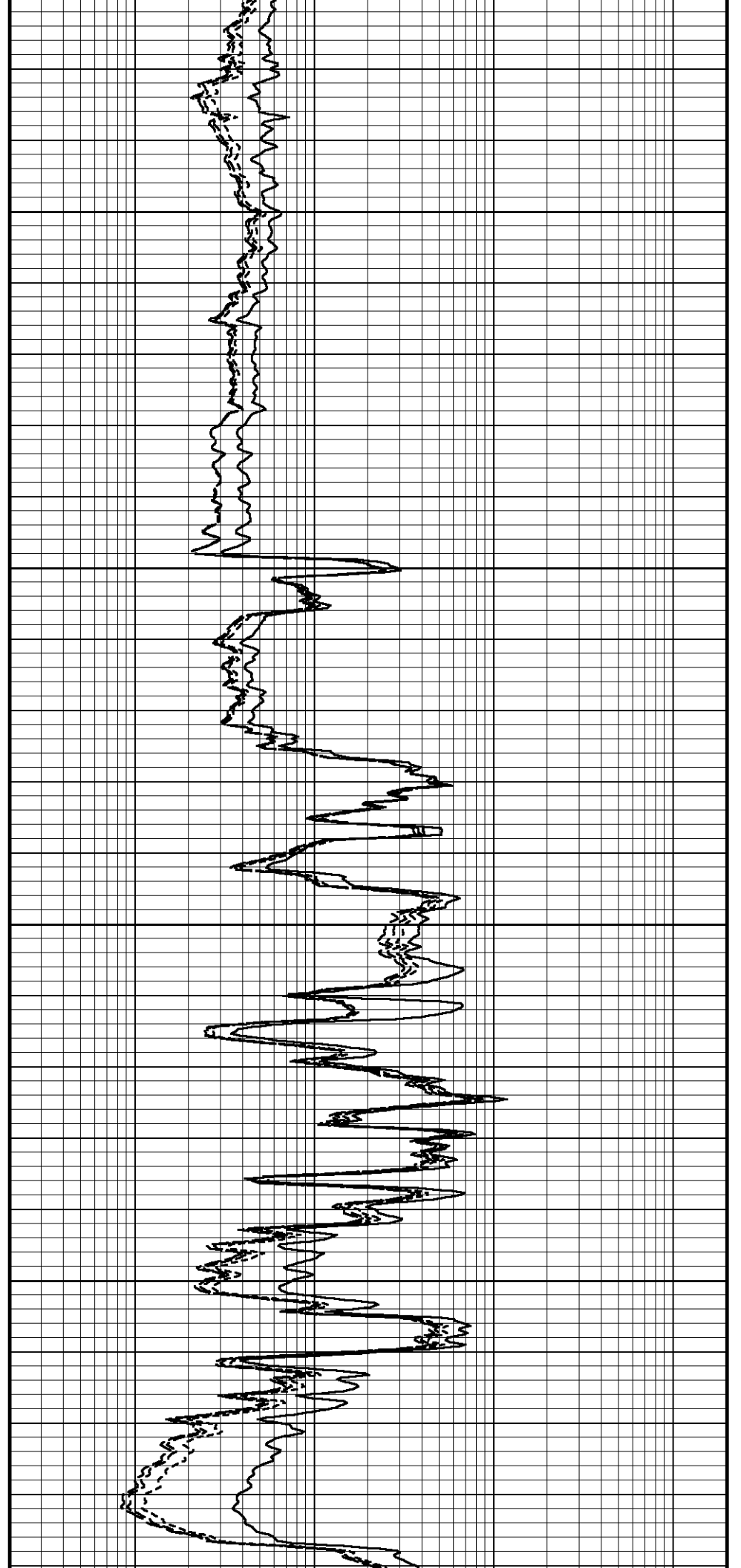
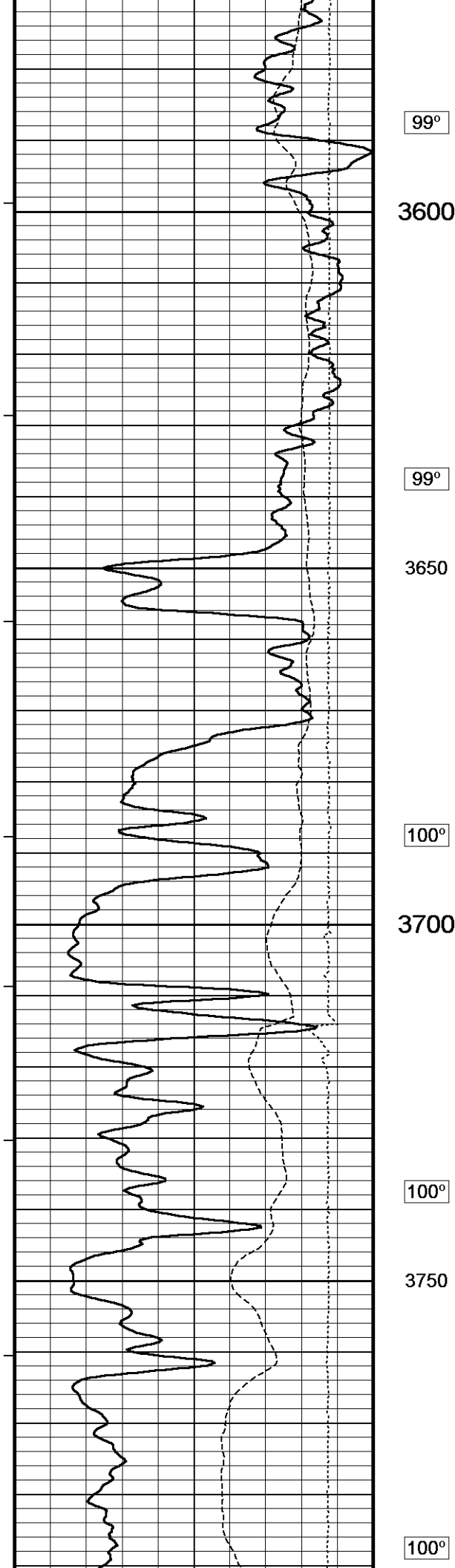


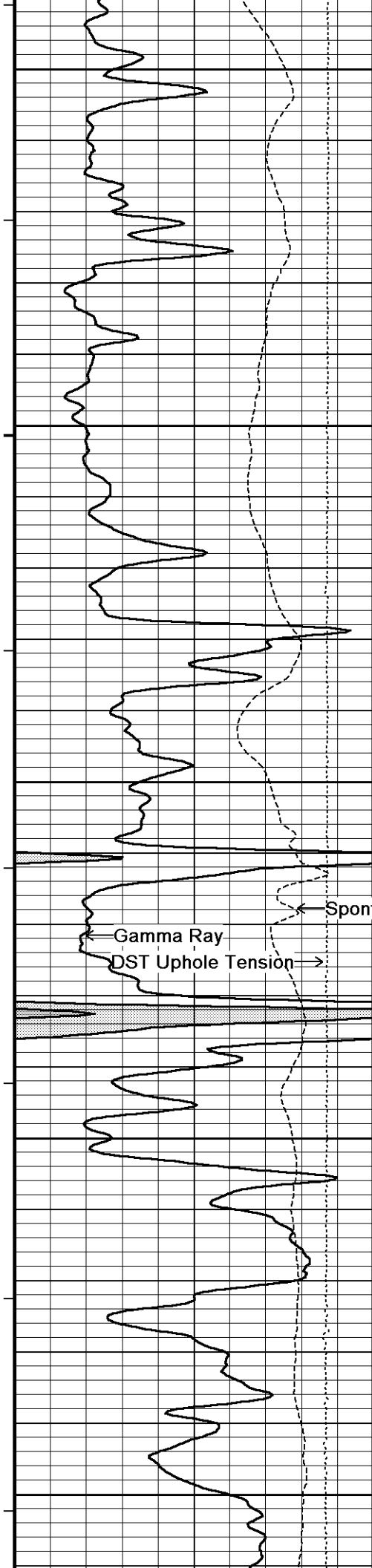
Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

Shallow Fm





3800

101°

3850

101°

3900

← Spontaneous Potential

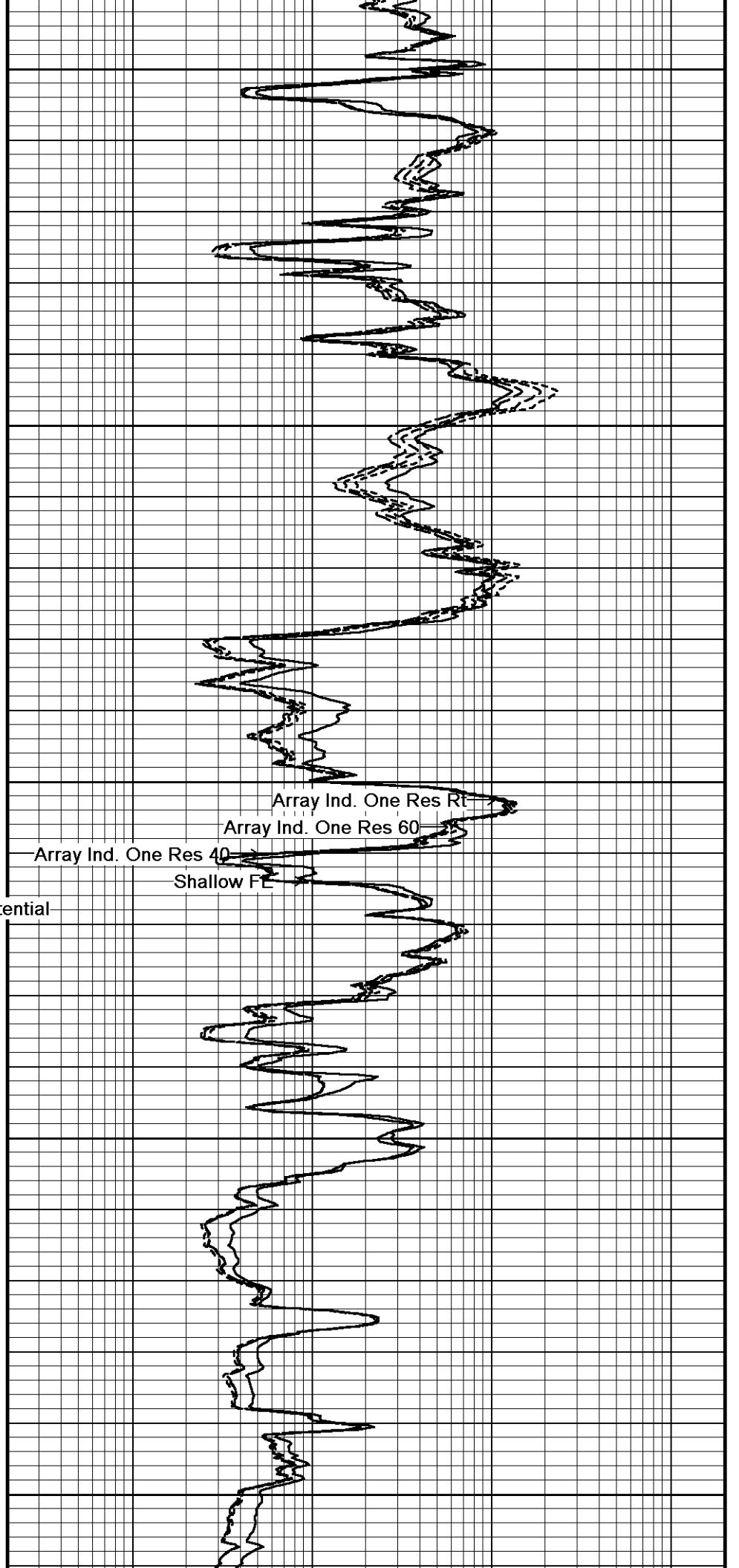
Gamma Ray
DST Uphole Tension →

100°

3950

102°

4000

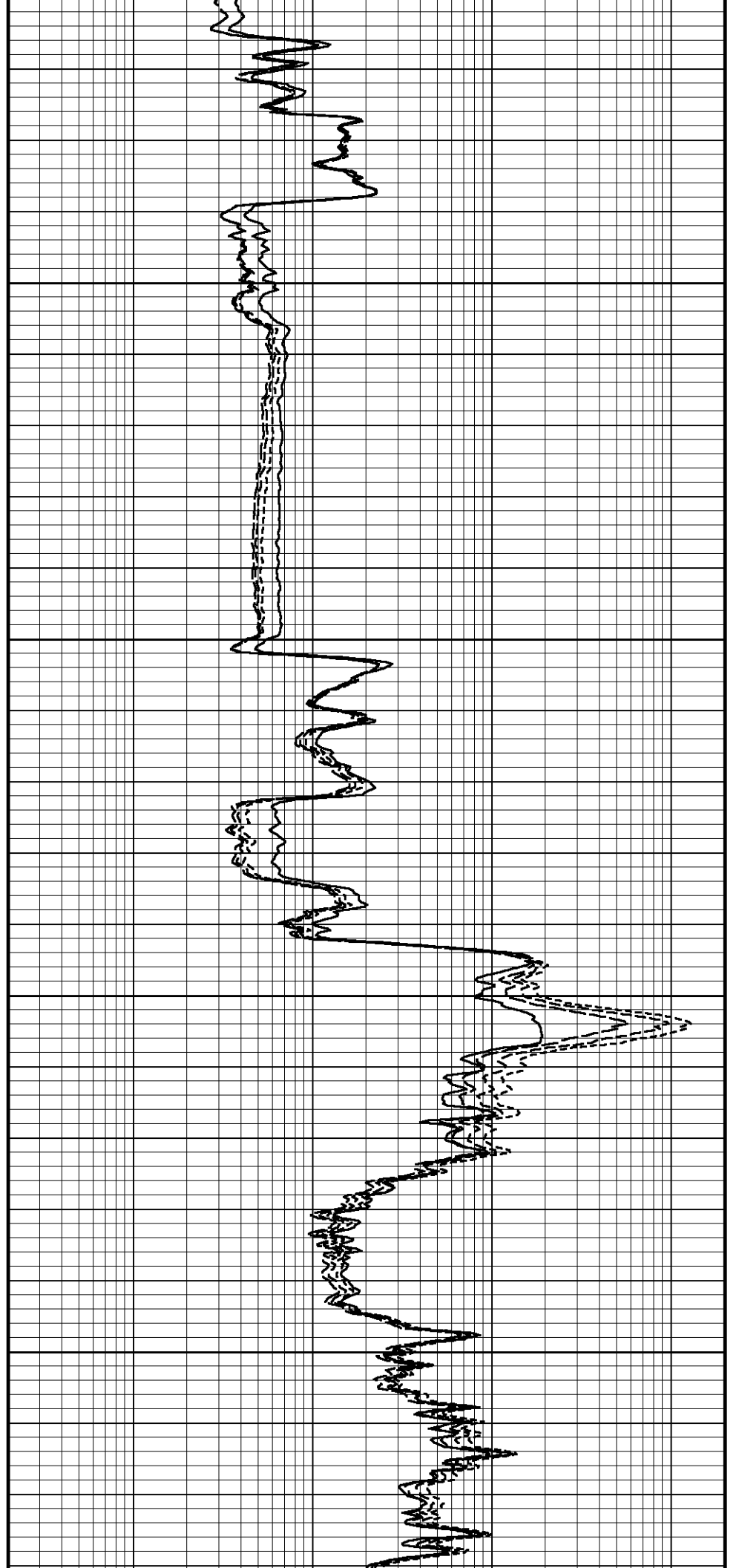
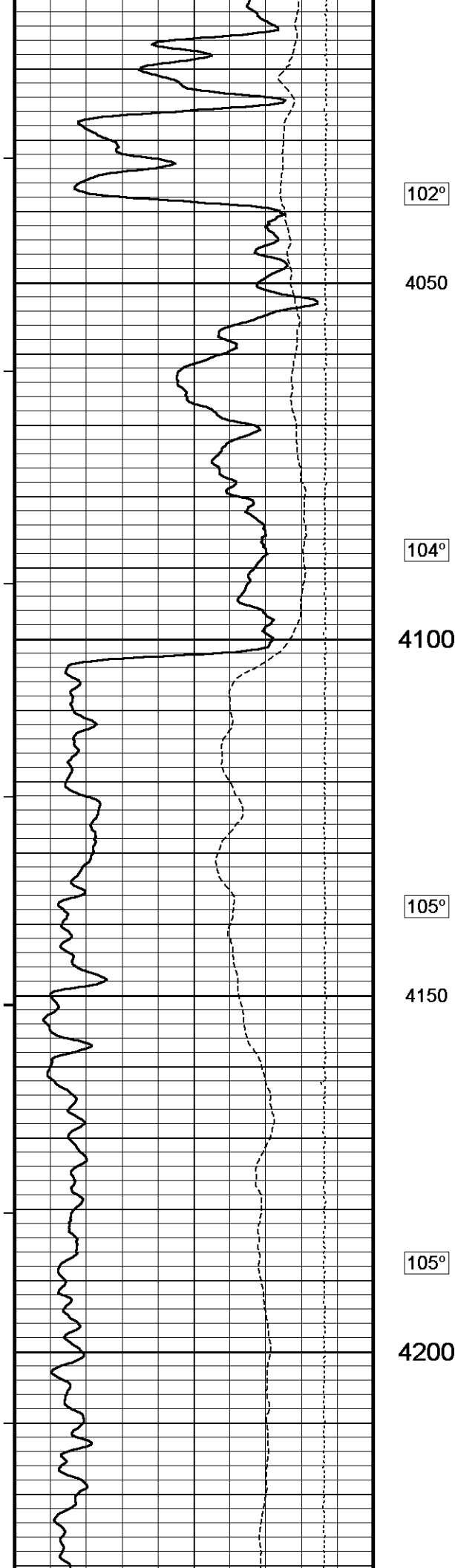


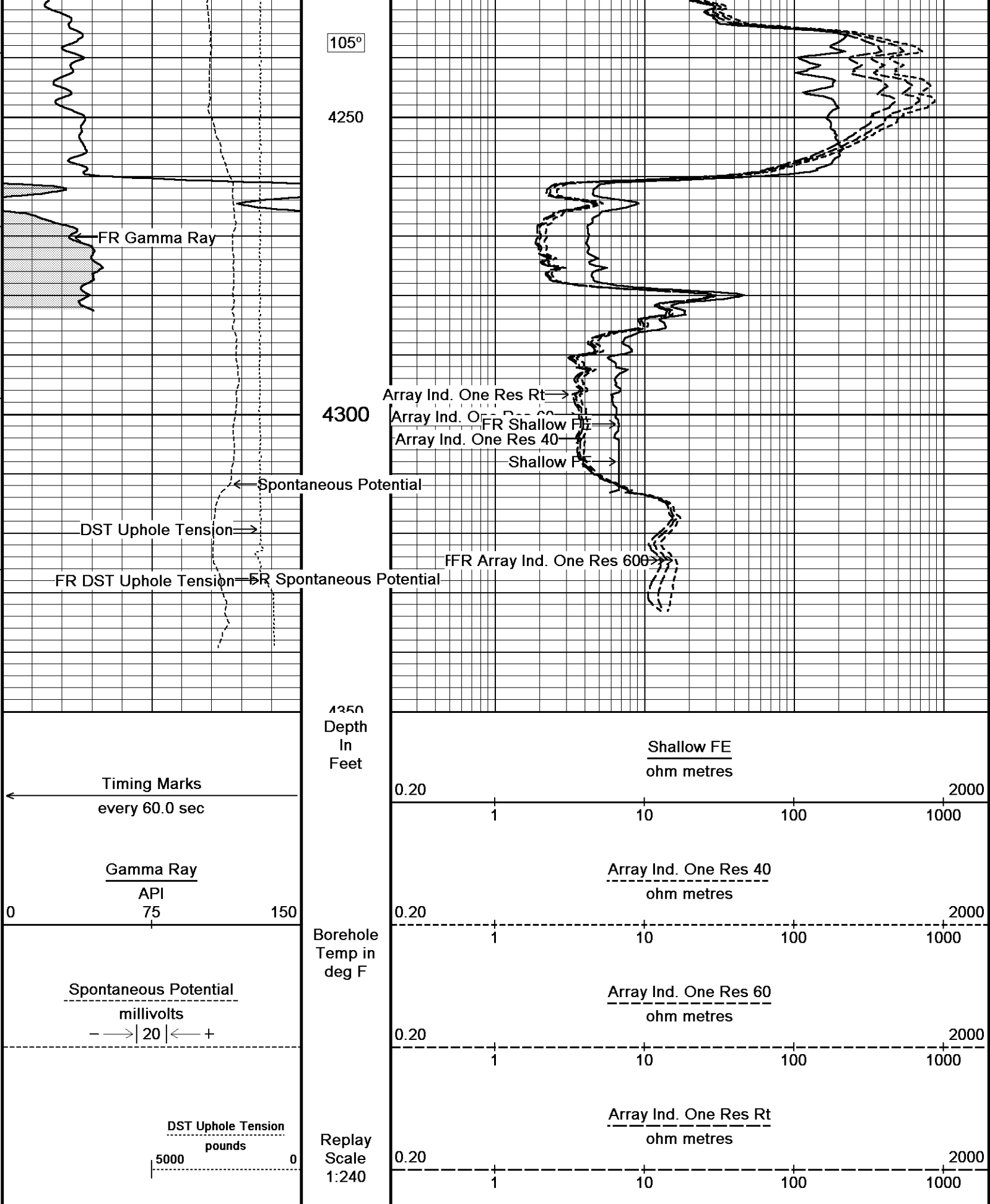
Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

Shallow FE





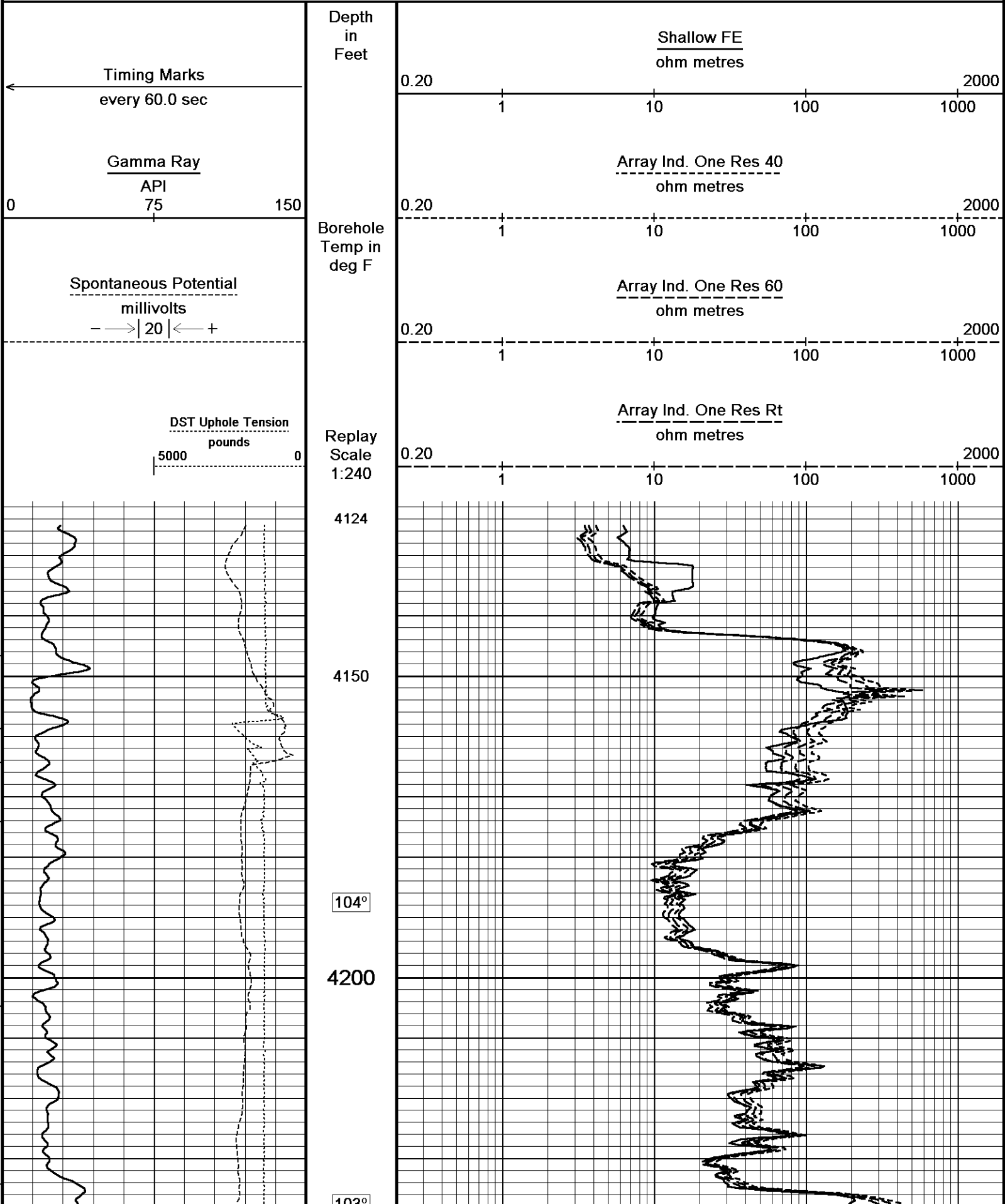
Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 01-APR-2011 15:21

Filename: C:\DOCUME~1\ScheffJL\LOCALS~1\Temp\Weatherford ... \Knighton Kachelman_#3_001.dta

Recorded on 22-FEB-2011 16:30

System Versions: Logged with 11.03.2789 Plotted with 11.02.2164



BEFORE SURVEY CALIBRATION

C:\DOCUME~1\ScheffJL\LOCALS~1\Temp\Weatherford PreView\0\Knighton Kachelman_#3.dta

General Constants All 000

Last Edited on 22-FEB-2011,12:46

General Parameters

Mud Resistivity	0.400	ohm-metres
Mud Resistivity Temperature	50.000	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	4.500	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
-------------------	----

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 08-DEC-2010 12:47

	Measured	Calibrated (API)
Background	69	50
Calibrator (Gross)	1071	775
Calibrator (Net)	1002	725

Gamma Constants MCG-B 34

Last Edited on 19-FEB-2011,08:41

Gamma Calibrator Number	grc38	
Mud Density	1.08	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Caliper Calibration MML-A 9

Base Calibration on 17-JAN-2011 13:36

Field Calibration on 17-FEB-2011 21:10

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	14751	5.96
2	18323	7.98
3	21735	9.95
4	25522	11.91
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.03	5.98

Micro Normal and Micro Inverse Calibration MML-A 9

Base Calibration on 17-JAN-2011 13:45

Field Check on 17-FEB-2011 21:09

Base Calibration

Measured	Calibrated (ohm-m)
----------	--------------------

Channel	Resistor 1	Measured Resistor 2	Calibrated (ohm-m) Resistor 1	Resistor 2
Micro Normal	12.1	59.8	2.6	12.8
Micro Inverse	15.6	78.1	1.7	8.4
Channel	Base Check (ohm-m)		Field Check (ohm-m)	
Micro Normal	32.4		32.4	
Micro Inverse	16.4		16.4	

Micro Normal and Micro Inverse Constants MML-A 9

Last Edited on 17-FEB-2011,21:07

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

Neutron Calibration MDN-A.B 65

Base Calibration on 17-JAN-2011 15:12

Field Check on 17-FEB-2011 21:16

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)	
	1651	2354
Ratio	0.701	

Neutron Constants MDN-A.B 65

Last Edited on 22-FEB-2011,12:46

Neutron Source Id 757
 Neutron Jig Number 5824NE
 Epithermal Neutron No
 Caliper Source for Processing Density Caliper
 Stand-off 0.00 inches
 Mud Density 1.08 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 17-FEB-2011 20:55

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	954.8	126.8
Base Check		281.8
Field Check		281.5

FE Constants MFE-A.A 55

Last Edited on 17-FEB-2011,20:54

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

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	
		Base Check (mmho/m)		Field Check (mmho/m)	
Channel		Low	High	Low	High
1		0.0	0.0	11.8	3762.3
2		0.0	0.0	29.5	3466.1
3		0.0	0.0	27.1	3014.6
4		0.0	0.0	18.6	2063.7
Deep		0.0	0.0	15.7	1995.6
Medium		0.0	0.0	40.1	3956.7
Shallow		0.0	0.0	45.4	5080.2
Array Temperature		0.0		65.7	Deg F

Induction Constants MAI-A.A 178				Last Edited on 19-FEB-2011,09:29	
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 64			Base Calibration on 17-JAN-2011 16:10
			Field Calibration on 17-FEB-2011 21:07
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	14192	4.01	
2	22208	5.96	
3	30608	7.98	
4	39216	9.95	
5	48142	11.91	
6	N/A	N/A	

Field Calibration

Measured Caliper (in)
6.39Actual Caliper (in)
5.98

Photo Density Calibration MPD-B 64

Base Calibration on 17-FEB-2011 08:46

Field Check on 17-FEB-2011 21:05

Density Calibration

Base Calibration

Measured

Calibrated (sdu)

Near

Far

Near

Far

Reference 1

50033

26441

59556

30836

Reference 2

20539

2561

24941

2541

Field Check at Base

1112.6

1367.3

Field Check

1107.7

1367.2

PE Calibration

Base Calibration

Measured

Calibrated

WS

WH

Ratio

Ratio

Background

200

995

Reference 1

18927

49861

0.383

0.371

Reference 2

5504

20415

0.273

0.272

Field Check at Base

200.4

995.2

Field Check

200.1

990.1

Density Constants MPD-B 64

Last Edited on 19-FEB-2011,09:30

Density Source Id

254

Nylon Calibrator Number

DNCE695

Aluminium Calibrator Number

DACD698

Density Shoe Profile

4 inch

Caliper Source for Processing

Density Caliper

PE Correction to Density

Not Applied

Mud Density

1.08

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

DOWNHOLE EQUIPMENT

C:\DOCUME~1\ScheffJL\LOCALS~1\Temp\Weatherford PreView\0\Knighton Kachelman_#3.dta

Compact Comms Gamma

MCG-B 34 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log

MMI-A 9 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in



57.56 ft

GRGC - Gamma Ray

54.65 ft

CGXT - MCG External Temperature

47.93 ft

MINV - Micro-inverse

47.93 ft

MNRI - Micro-normal

Compact Neutron
MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

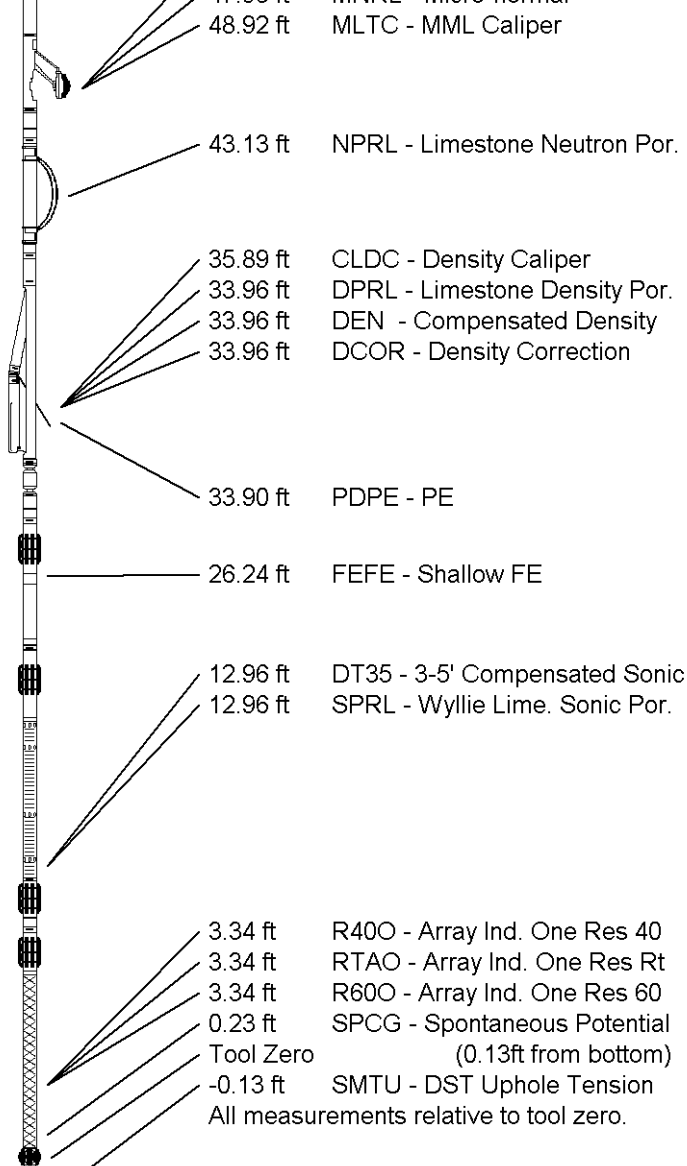
SKJ-D.A Compact Knuckle Joint
SKJ-D.A 37 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

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

Compact Sonic
MSS-A.A 127 LG: 12.52 ft WT: 72.8 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: 62.84 ft Weight: 480.6 lb



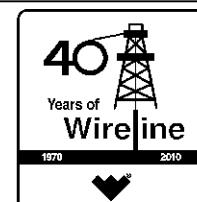
COMPANY KNIGHTON OIL
WELL KACHELMAN # 3
FIELD ALBANO WEST
PROVINCE/COUNTY STAFFORD
COUNTRY/STATE KANSAS

Elevation Kelly Bushing	1965.00	feet	First Reading	4325.00	feet
Elevation Drill Floor	1963.00	feet	Depth Driller	4325.00	feet
Elevation Ground Level	1959.00	feet	Depth Logger	4328.00	feet



Weatherford®

ARRAY INDUCTION
SHALLOW FOCUSED



		COMPANY		KNIGHTON OIL	
WELL		FIELD		KACHELMAN # 3	
PROVINCE/COUNTY		STATE		ALBANO WEST	
COUNTRY/STATE		LOCATION		STAFFORD	
SEC 11		TYPE 255		REC 14W	
Run Number		15-165-2361		OTHER MPD/MBS	
Permanently Datum O.L. Elevation 1969 feet Log Measured From K.B. @ 6 FEET above Perforating Measured From K.B.					
Date		18-FEB-2011			
Run Number		ONE			
Depth Driller		4325.00			
Depth Logger		4328.00			
First Reading		4325.00			
Last Reading		255.00			
Casing Driller		260.00			
Casing Logger		260.00			
Bit Size		7.875			
Fluid Type		CHEMICAL			
Density/Viscosity		9.00 100cP			
PH/Fluid Loss		8.00			
Sample Source		FLOWLINE			
Rm @ Measured Temp		0.40 @ 50.0			
Rm @ Measured Temp		0.32 @ 50.0			
Rm @ Measured Temp		0.48 @ 50.0			
Source Rm/Rm		CALC			
Rm @ BHT		0.19 @ 105.0			
Time since Circulation		6 HOURS			
Max Recorded Temp		105.00			
Equipment Name		COMPACT			
Equipment Base		13057			
Recorded by		R. HOFFMAN			
Witnessed by		DAVE MONTAGNI			
COUCB #		3523081			

ARRAY INDUCTION SHALLOW FOCUSED

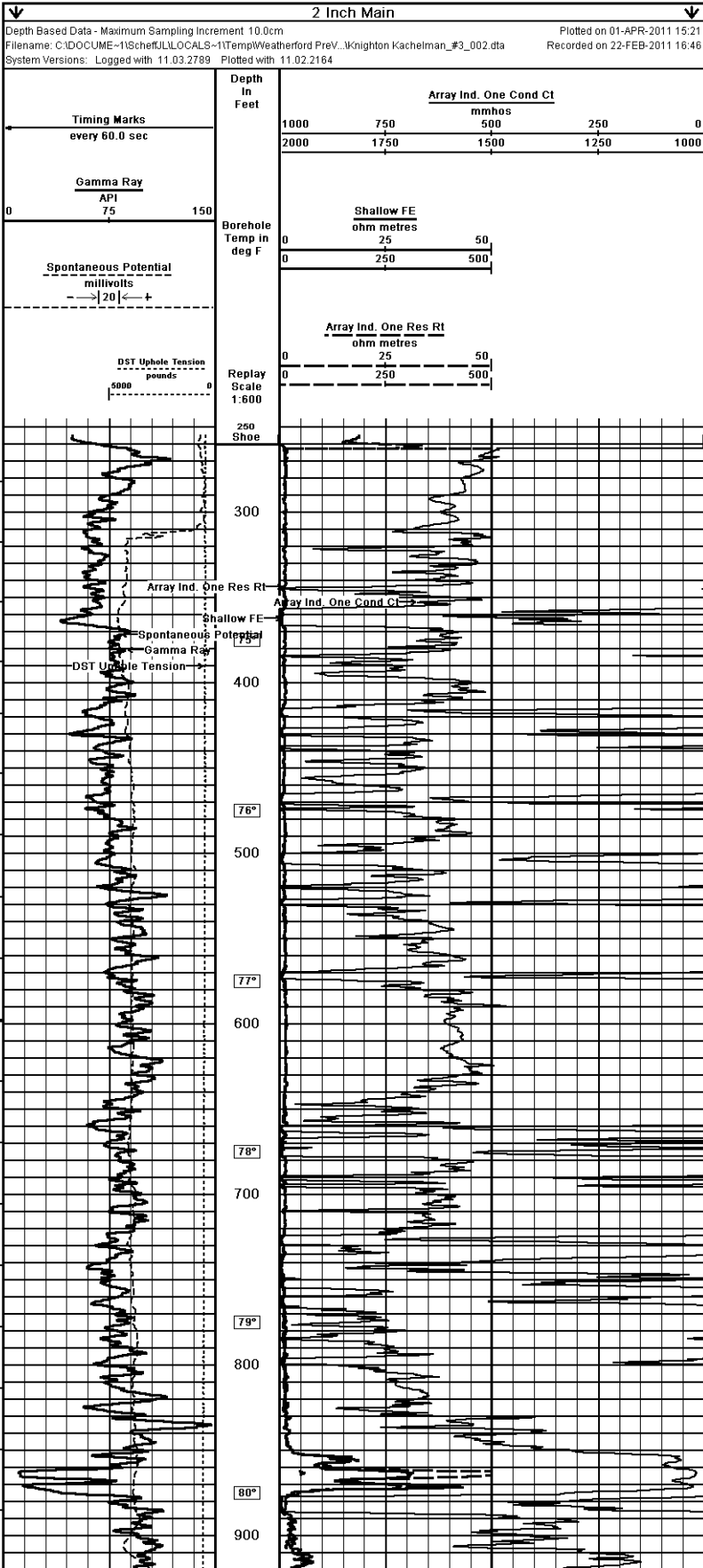
30' FEL
SE
Services
DN

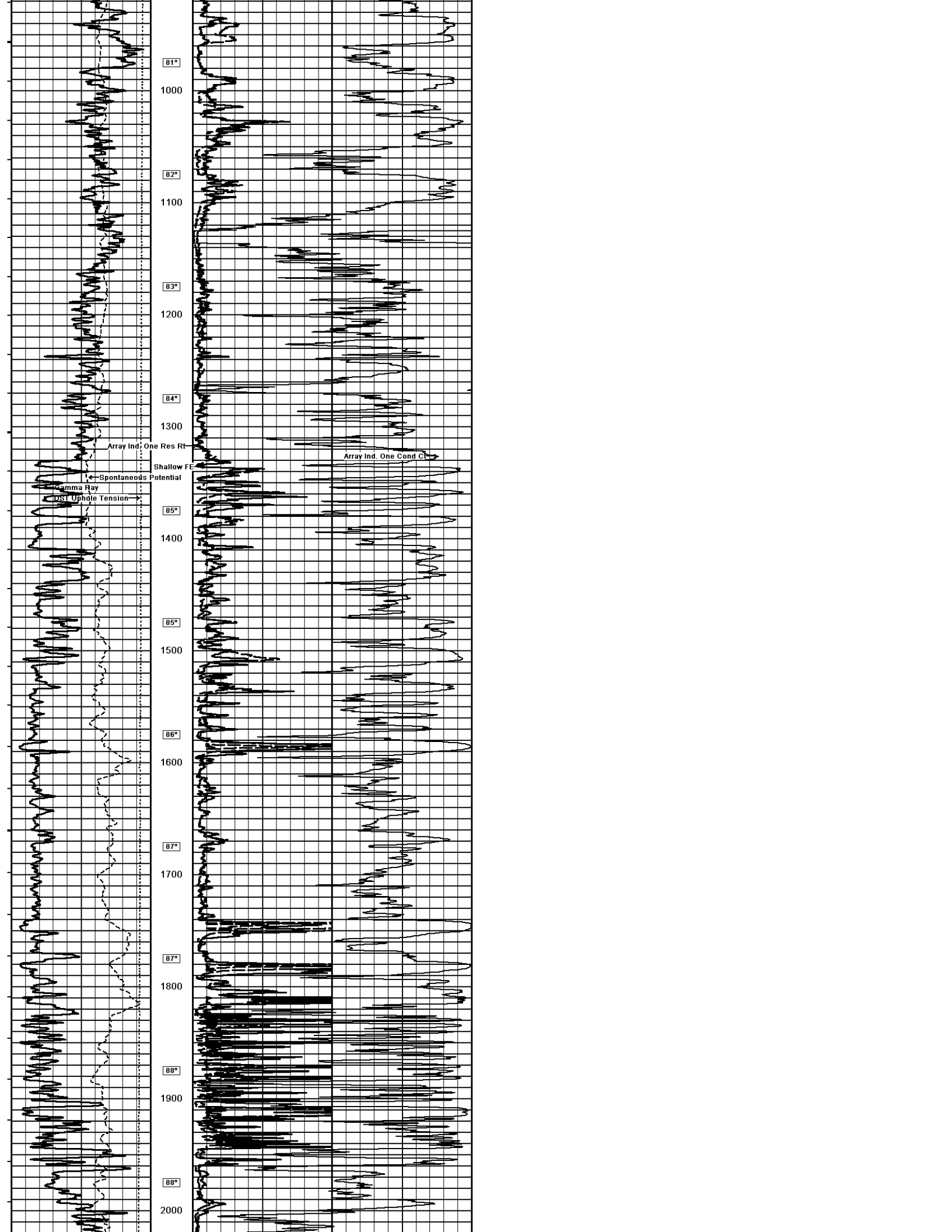
MML

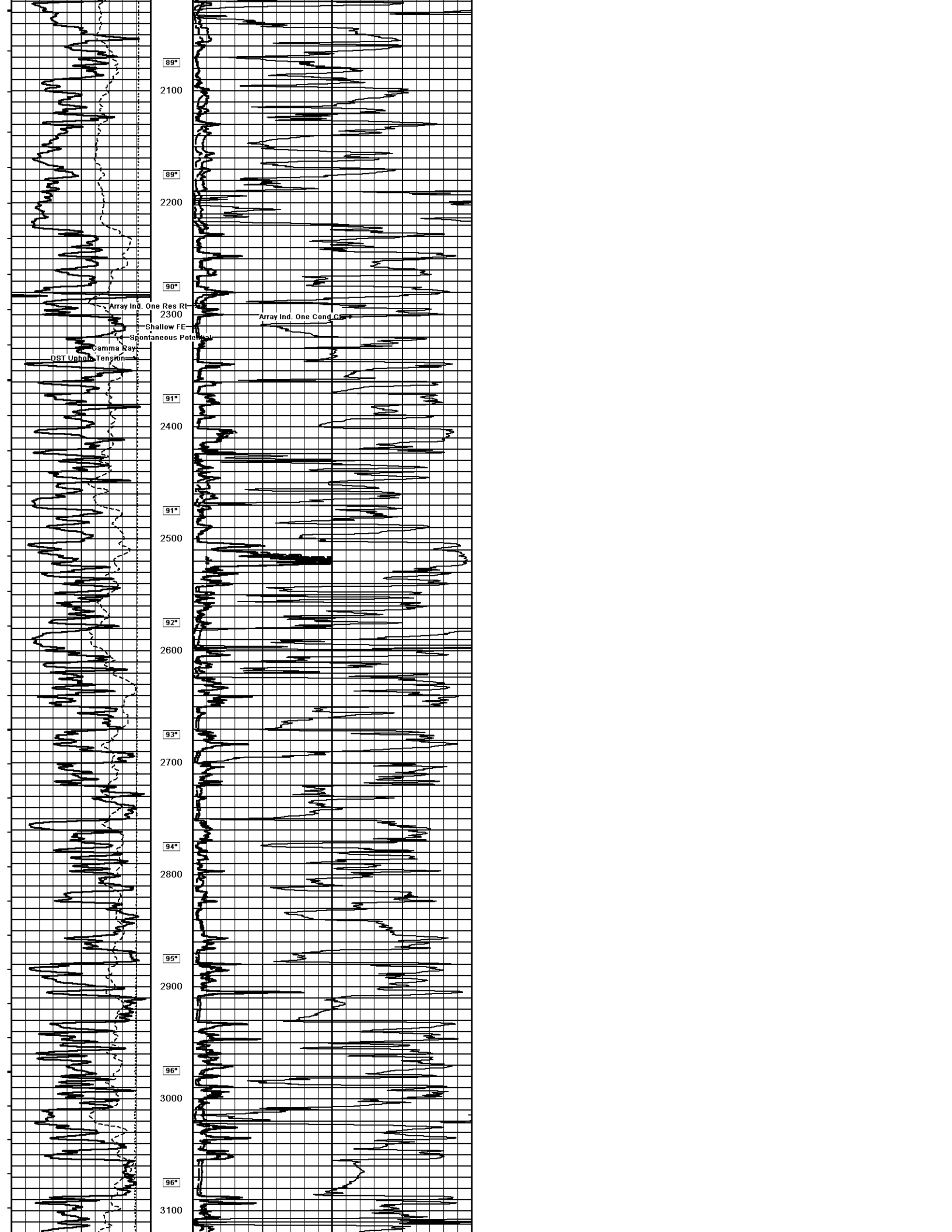
Elevations:	Feet
KB	1965.00
DF	1963.00
GL	1959.00

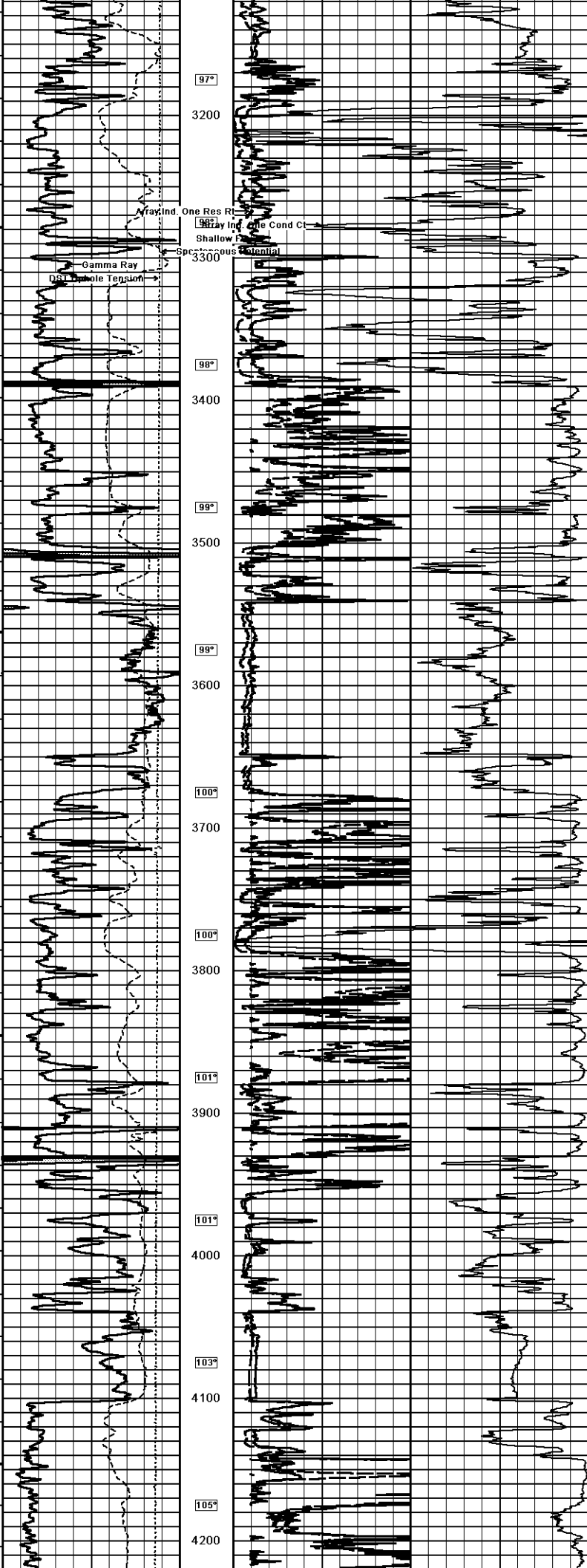
feet	
feet	
feet	
feet	
feet	
inches	
50.00 CP	
12.80 mi/30min	

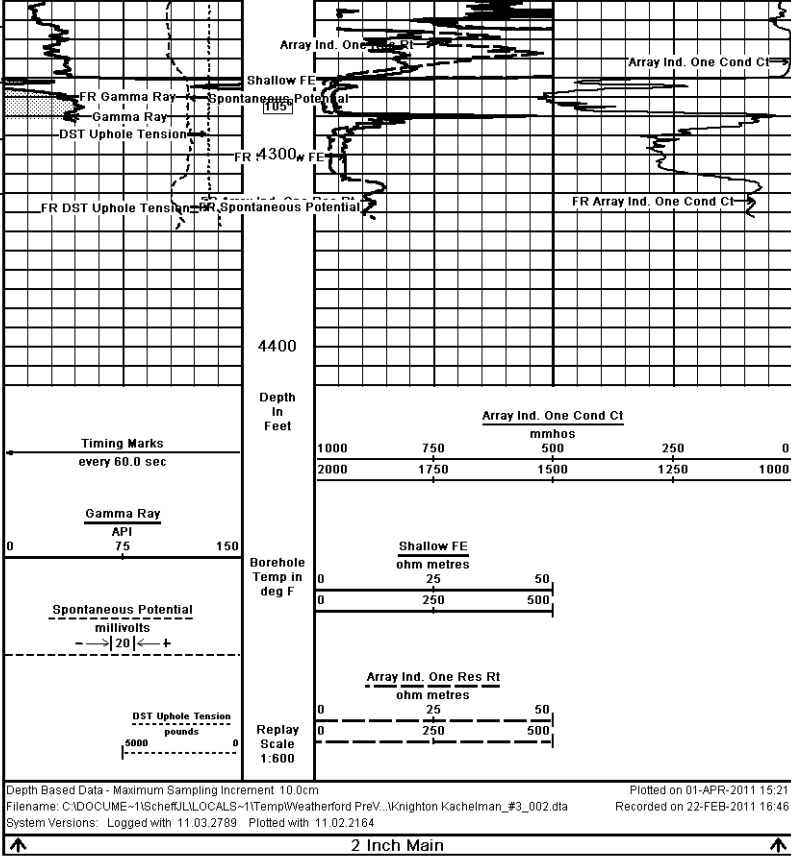
unim	
ohm-m	
ohm-m	
CaLC	
ohm-m	
deg F	
UB	
UE	UB1-034











COMPANY		KNIGHTON OIL			
WELL		KACHELMAN # 3			
FIELD		ALBANO WEST			
PROVINCE/COUNTY		STAFFORD			
COUNTRY/STATE		KANSAS			
Elevation Kelly Bushing	1965.00	feet	First Reading	4325.00	feet
Elevation Drill Floor	1963.00	feet	Depth Driller	4325.00	feet
Elevation Ground Level	1959.00	feet	Depth Logger	4328.00	feet
		ARRAY INDUCTION			
Weatherford		SHALLOW FOCUSED			