ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

Weatherford

COMPANY	GRAND MESA OPERATING
WELL	CSC #1-21
FIELD	WILDCAT
PROVINCE/COUNTY	GOVE
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	1200' FNL & 1040' FWL

SEC	TWP	RGE
21	13S	31W

Other Services
MDN/MPD
MML

API Number 15-063-21983
Permit Number

Permanent Datum G.L., Elevation 2888 feet
Log Measured From KB
Drilling Measured From K.B.

Elevations:	feet
KB	2893.00
DF	2891.00
GL	2888.00

Date	24-APR-2012				
Run Number	ONE				
Depth Driller	4640.00	feet			
Depth Logger	4644.00	feet			
First Reading	4641.00	feet			
Last Reading	213.00	feet			
Casing Driller	213.00	feet			
Casing Logger	213.00	feet			
Bit Size	7.875	inches			
Hole Fluid Type	CHEMICAL				
Density / Viscosity	9.30	lb/USg	56.00	CP	
PH / Fluid Loss	8.00		8.00	ml/30Min	
Sample Source	FLOWLINE				
Rm @ Measured Temp	0.78 @ 84.0	ohm-m			
Rmf @ Measured Temp	0.62 @ 84.0	ohm-m			
Rmc @ Measured Temp	0.94 @ 84.0	ohm-m			
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.56 @117.0	ohm-m			
Time Since Circulation	4 HOURS				
Max Recorded Temp	117.00	deg F			
Equipment Name	COMPACT				
Equipment / Base	13025		LIB		
Recorded By	R. HOFFMAN				
Witnessed By	KENT MATSON				
S.O. # / JOB #	3534649		LB12-104		

BOREHOLE RECORD

Last Edited: 24-APR-2012 22:42

Bit Size inches	Depth From feet	Depth To feet
7.875	213.00	4640.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	213.00	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 = 219 cu. ft.
Service order #3534649
Rig: Murfin Drilling Rig #24
Engineer: R. Hoffman
Operator(s): K. Rinehart

2 INCH MAIN

2 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_003.dta
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Plotted on 25-APR-2012 02:04
Recorded on 24-APR-2012 23:50

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150

Spontaneous Potential
millivolts
− 20 +

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:600

Array Ind. One Cond Ct
mmhos
1000 750 500 250 0
2000 1750 1500 1250 1000

Shallow FE
ohm metres
0 25 50
0 250 500

Array Ind. One Res Rt
ohm metres
0 25 50
0 250 500

200 Shoe

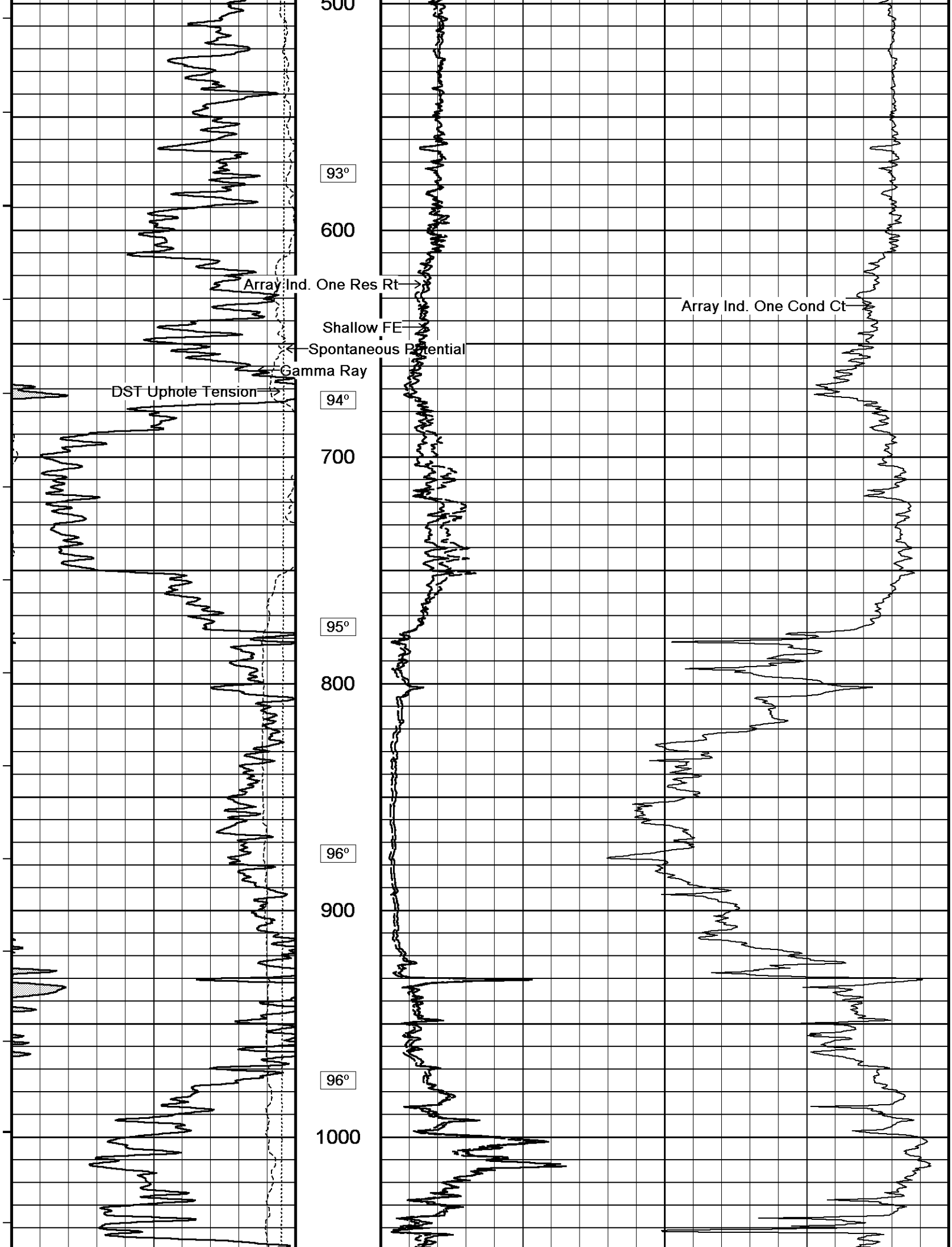
91°

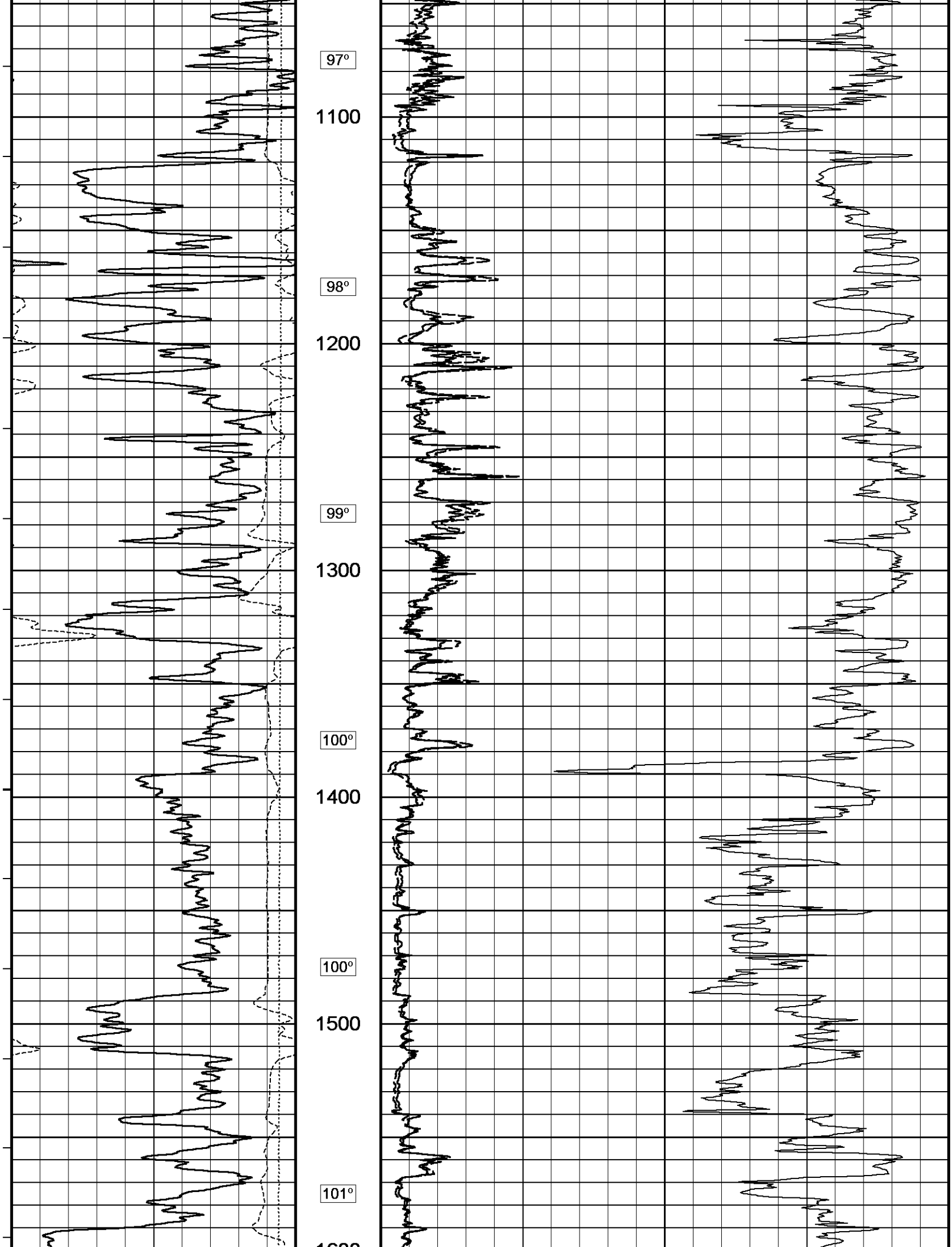
300

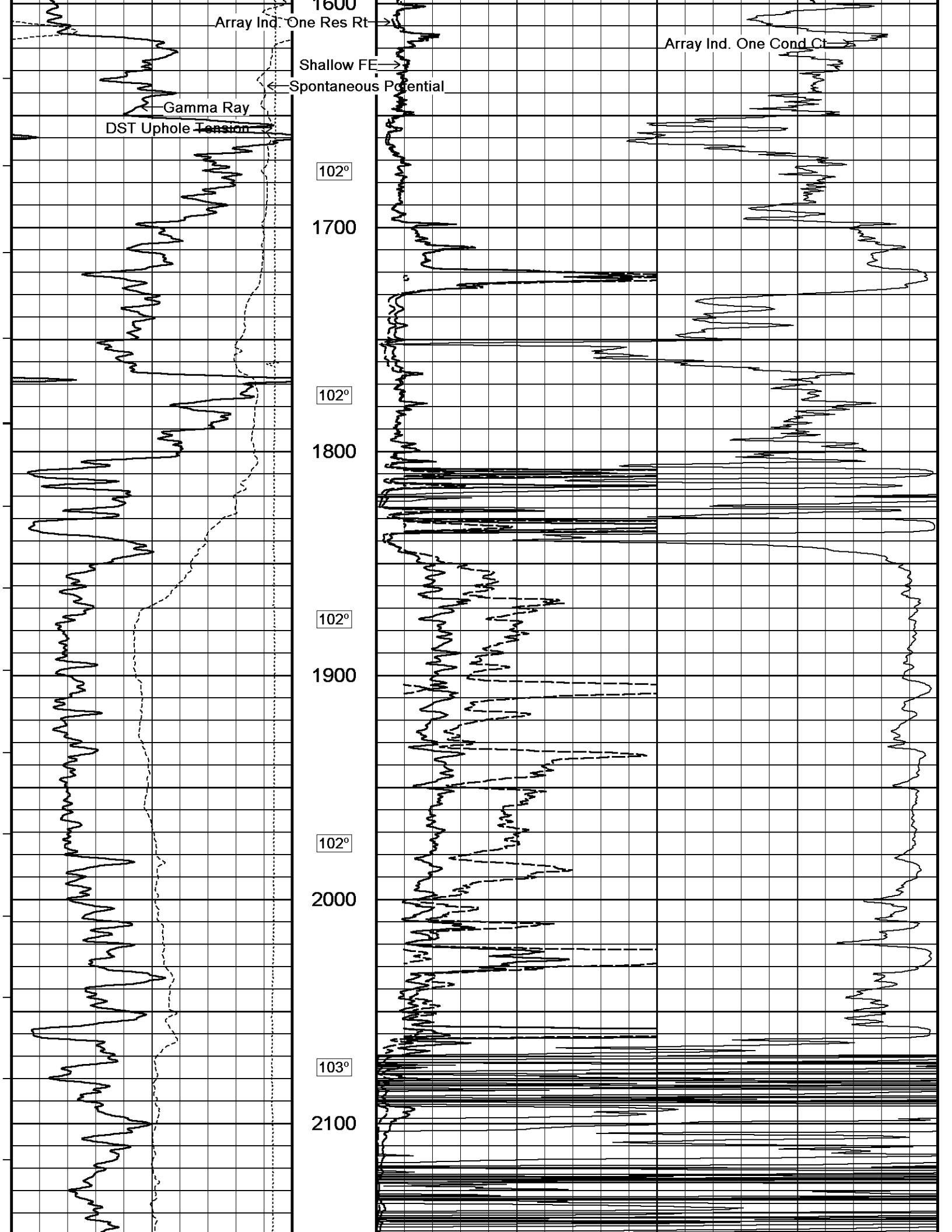
92°

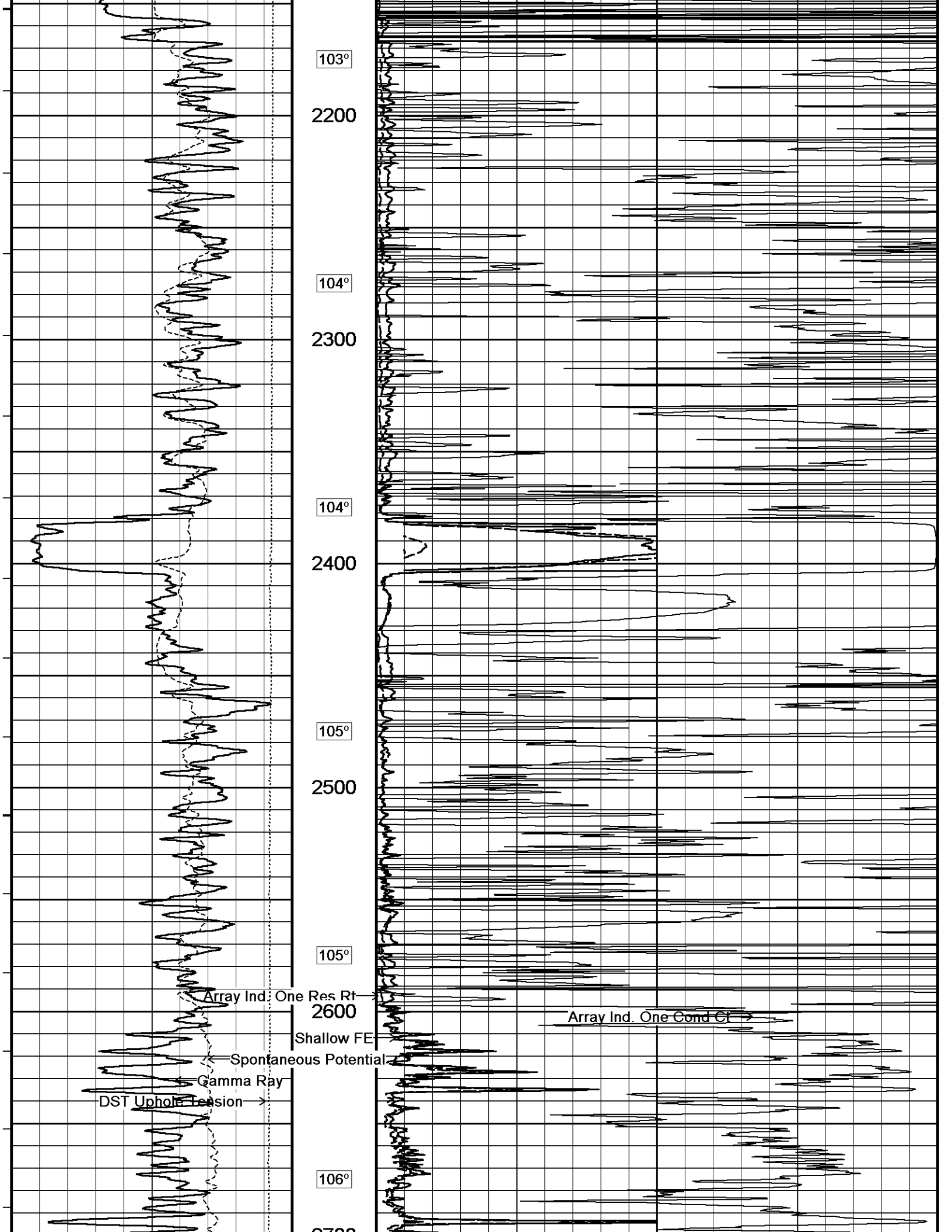
400

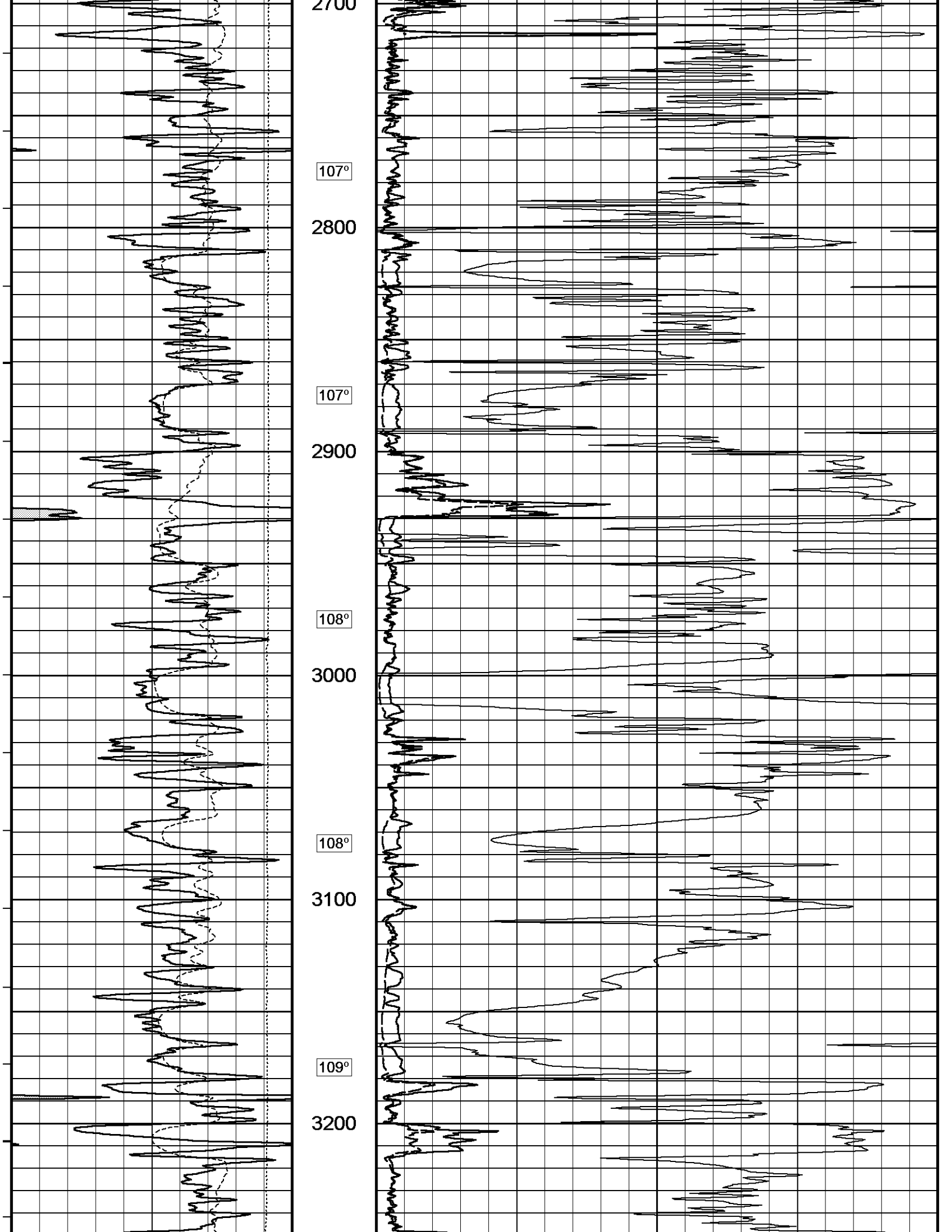
93°

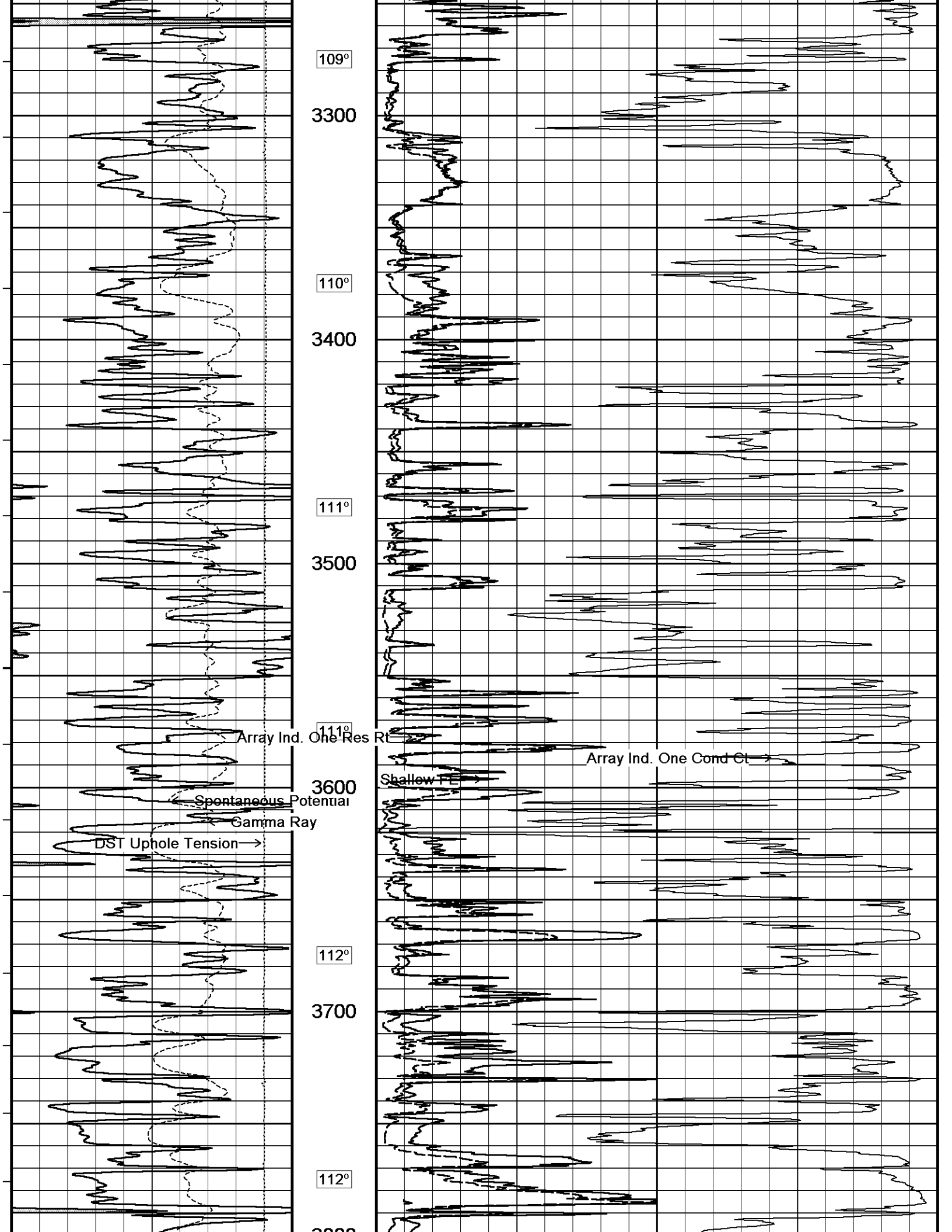

500
93°
600
Array Ind. One Res Rt
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
94°
700
95°
800
96°
900
96°
1000
Array Ind. One Cond Ct

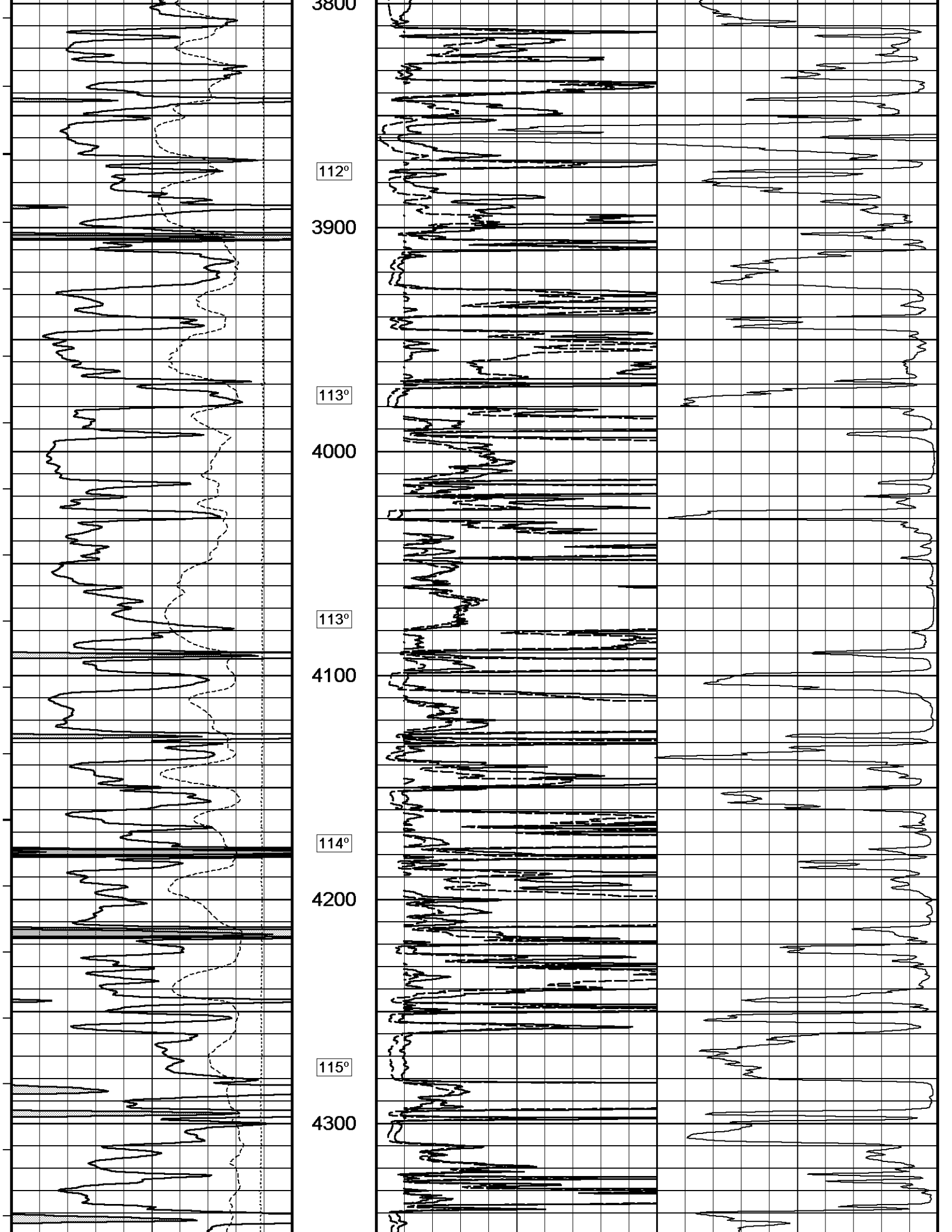

97°
1100
98°
1200
99°
1300
100°
1400
100°
1500
101°

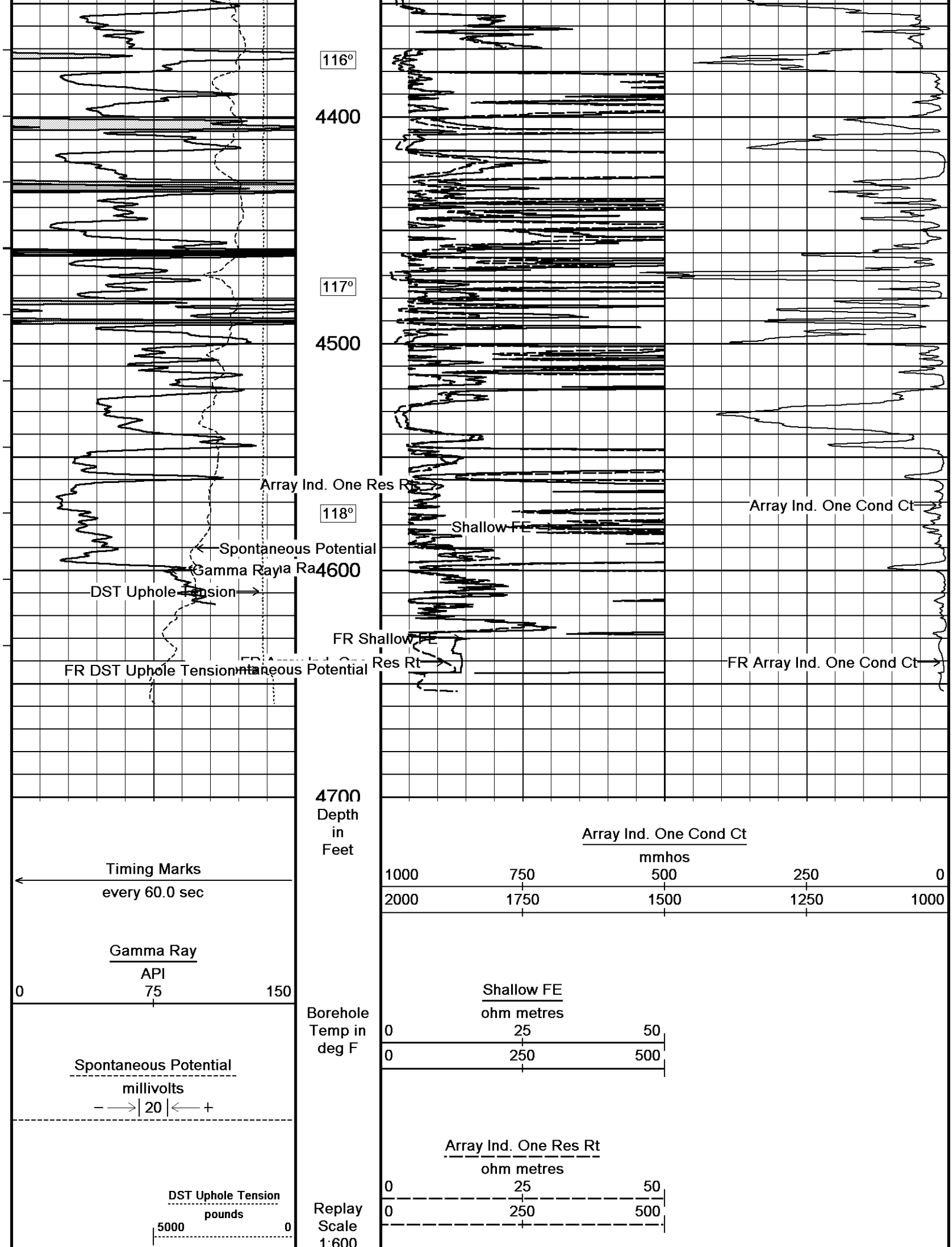

1600
Array Ind. One Res Rt
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct
102°
1700
102°
1800
102°
1900
102°
2000
103°
2100


103°
2200
104°
2300
104°
2400
105°
2500
105°
Array Ind. One Res Rt
2600
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
106°


2700
107°
2800
107°
2900
108°
3000
108°
3100
109°
3200


109°
3300
110°
3400
111°
3500
111°
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow Ft
3600
Spontaneous Potential
Gamma Ray
DST Uphole Tension
112°
3700
112°


3800
112°
3900
113°
4000
113°
4100
114°
4200
115°
4300


116°
4400
117°
4500
Array Ind. One Res Rt
118°
Shallow FE
Spontaneous Potential
Gamma Ray
4600
DST Uphole Tension
FR Shallow FE
FR DST Uphole Tension
FR Array Ind. One Cond Ct
4700
Depth in Feet
Array Ind. One Cond Ct
mmhos
1000 750 500 250 0
2000 1750 1500 1250 1000
Timing Marks
every 60.0 sec
Gamma Ray
API
0 75 150
Shallow FE
ohm metres
0 25 50
0 250 500
Borehole Temp in deg F
Spontaneous Potential
millivolts
− 20 +
Array Ind. One Res Rt
ohm metres
0 25 50
0 250 500
DST Uphole Tension
pounds
5000 0
Replay Scale 1:600

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_003.dta
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Plotted on 25-APR-2012 02:04
Recorded on 24-APR-2012 23:50

2 INCH MAIN

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_003.dta
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Plotted on 25-APR-2012 02:04
Recorded on 24-APR-2012 23:50

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150

Spontaneous Potential
millivolts
− → | 20 | ← +

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:240

200

Casing Shoe

92°

250

92°

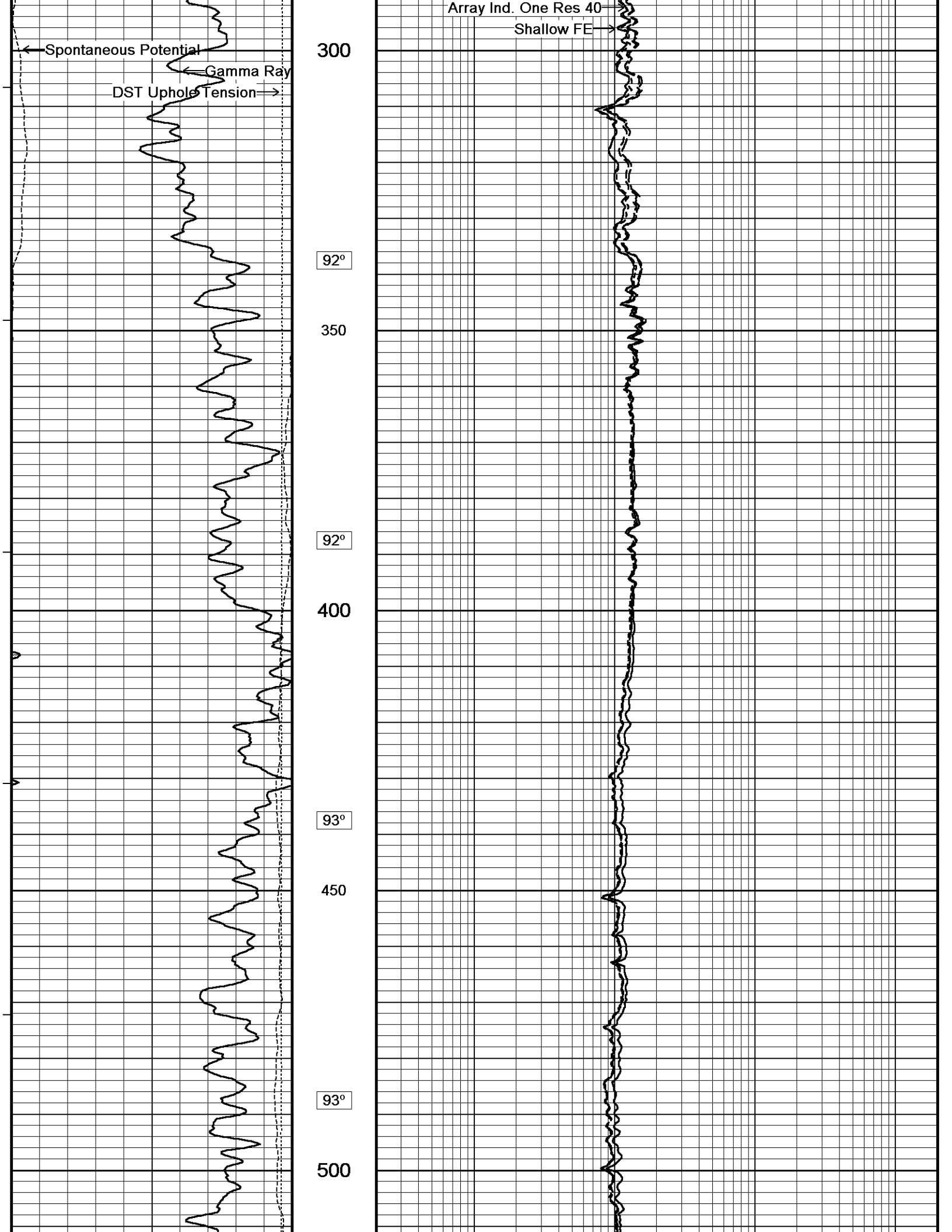
Shallow FE
ohm metres
0.20 1 10 100 1000 2000

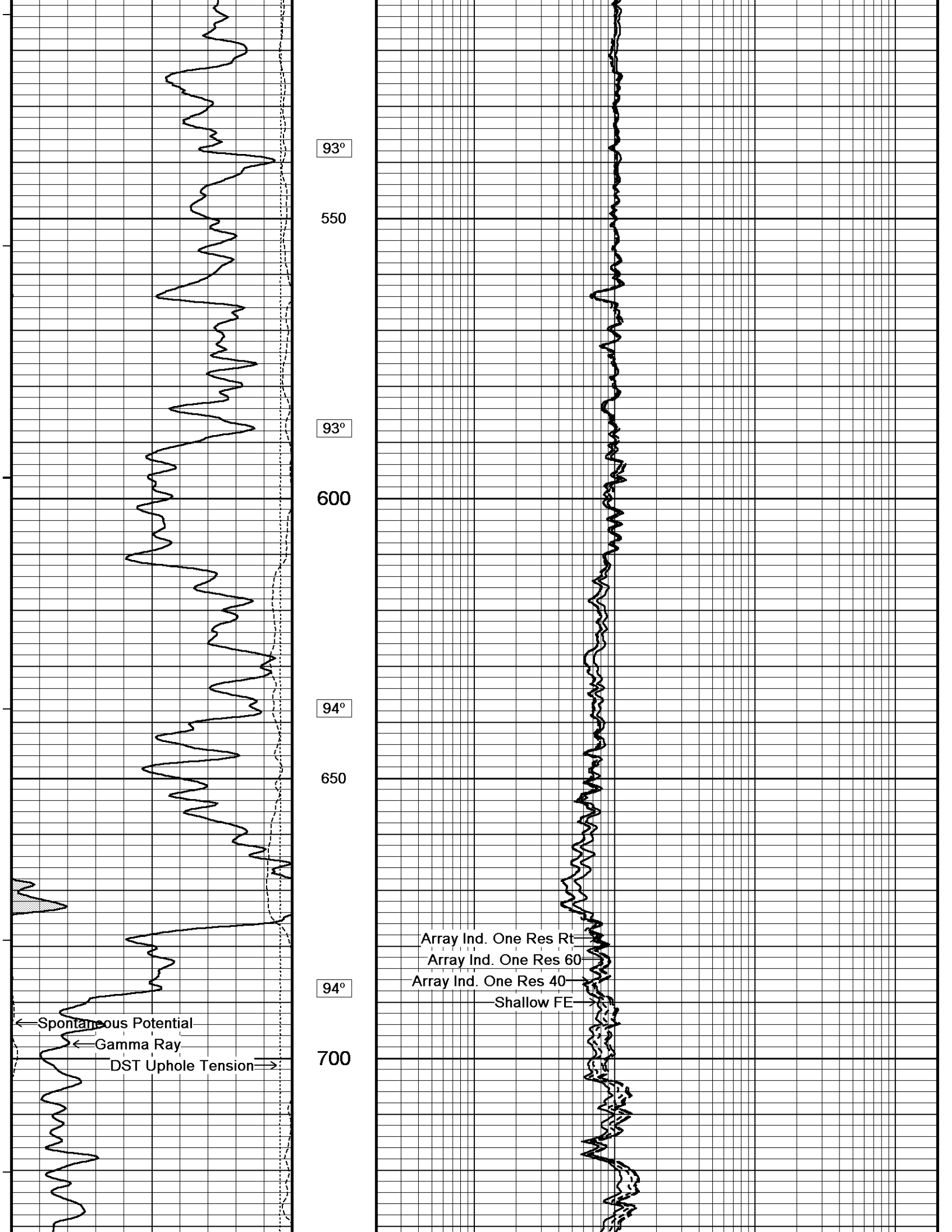
Array Ind. One Res 40
ohm metres
0.20 1 10 100 1000 2000

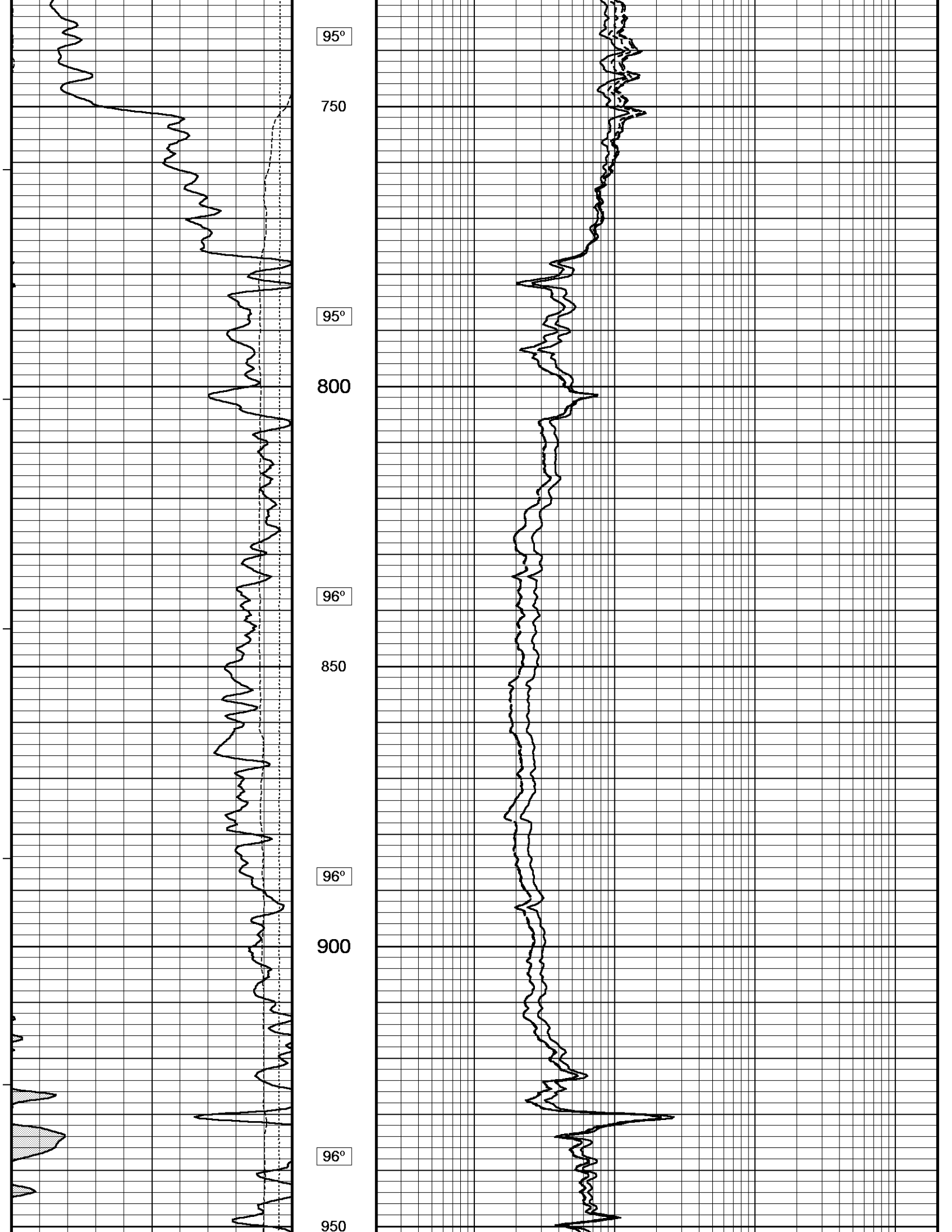
Array Ind. One Res 60
ohm metres
0.20 1 10 100 1000 2000

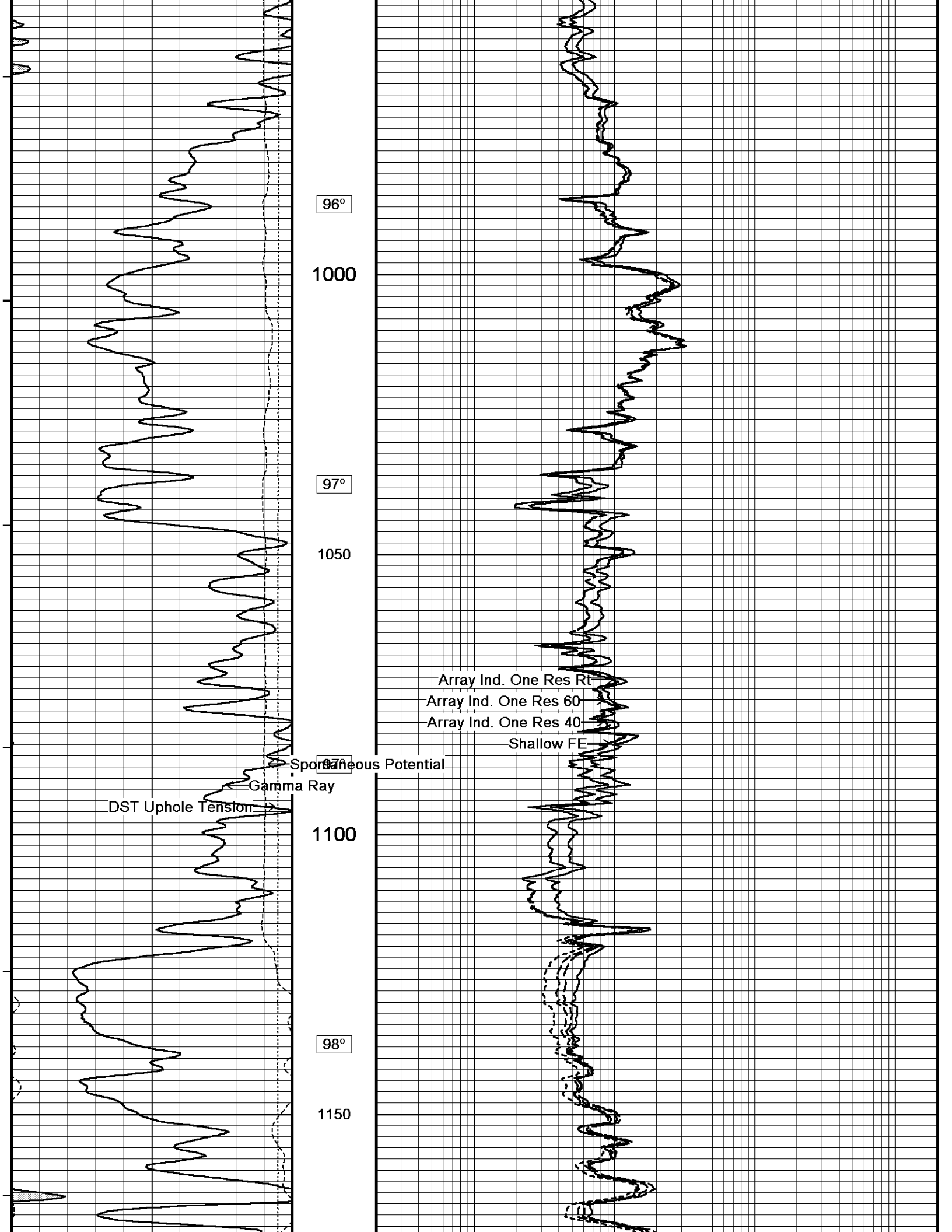
Array Ind. One Res Rt
ohm metres
0.20 1 10 100 1000 2000

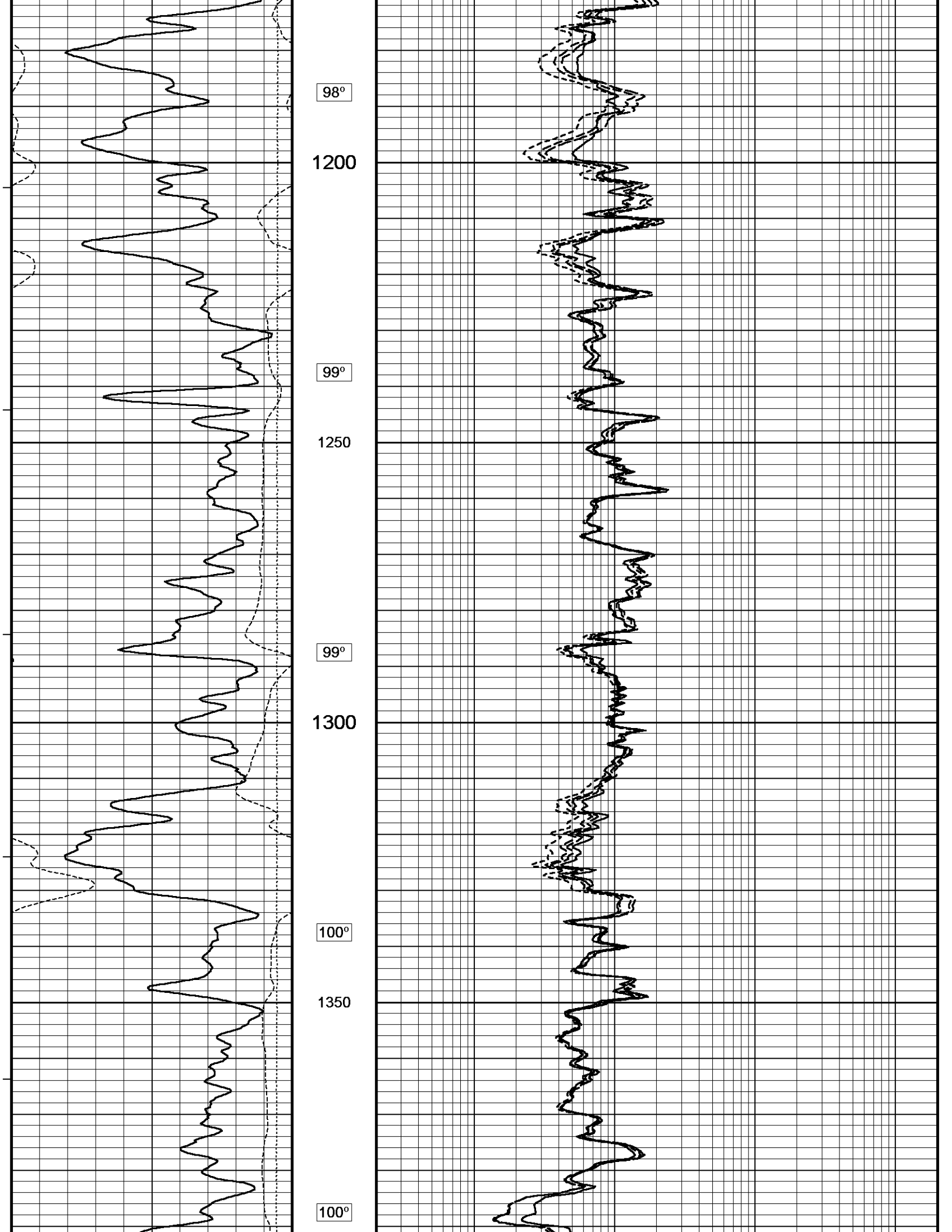
Array Ind. One Res Rt
Array Ind. One Res 60

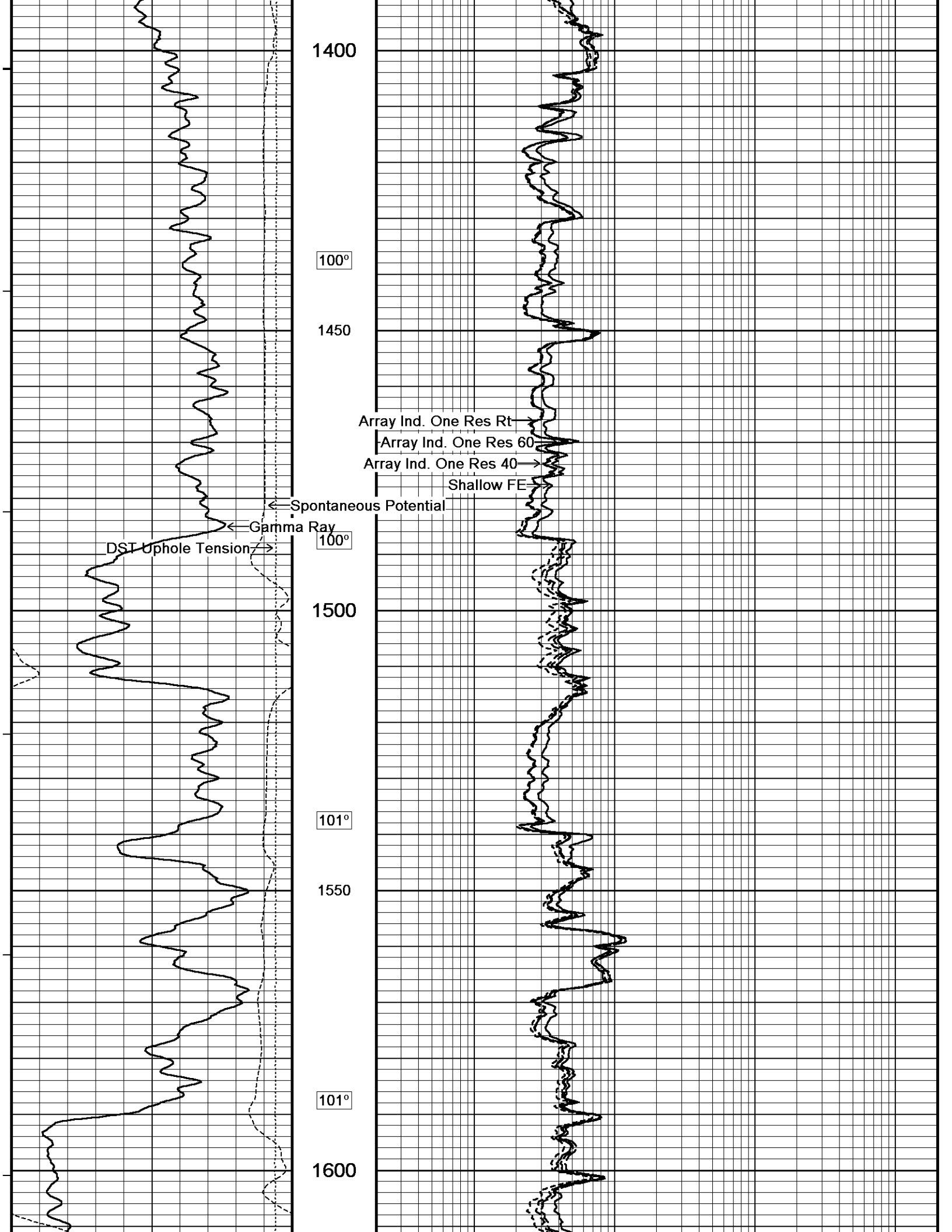

Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Res 40
Shallow FE
300
92°
350
92°
400
93°
450
93°
500

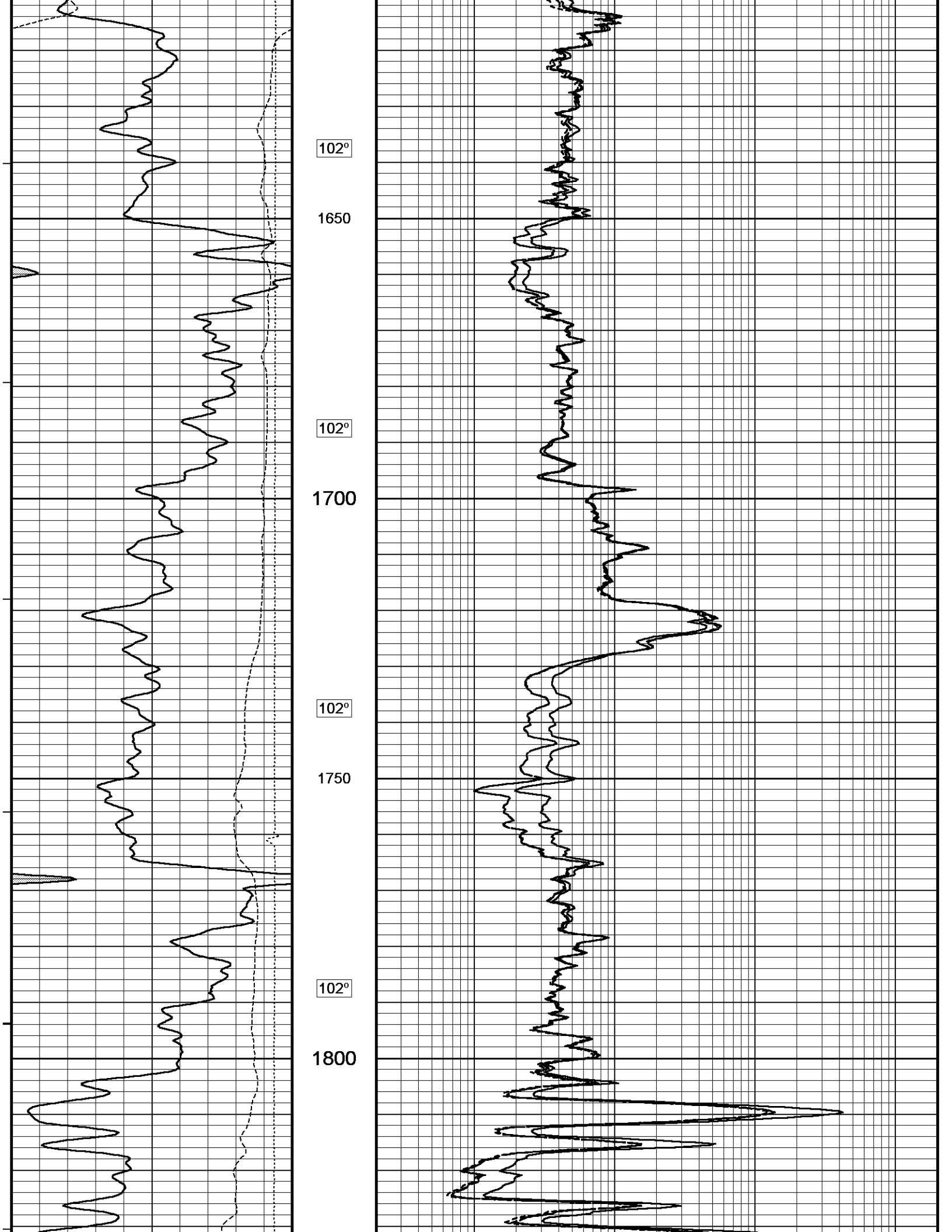

93°
550
93°
600
94°
650
94°
700
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE

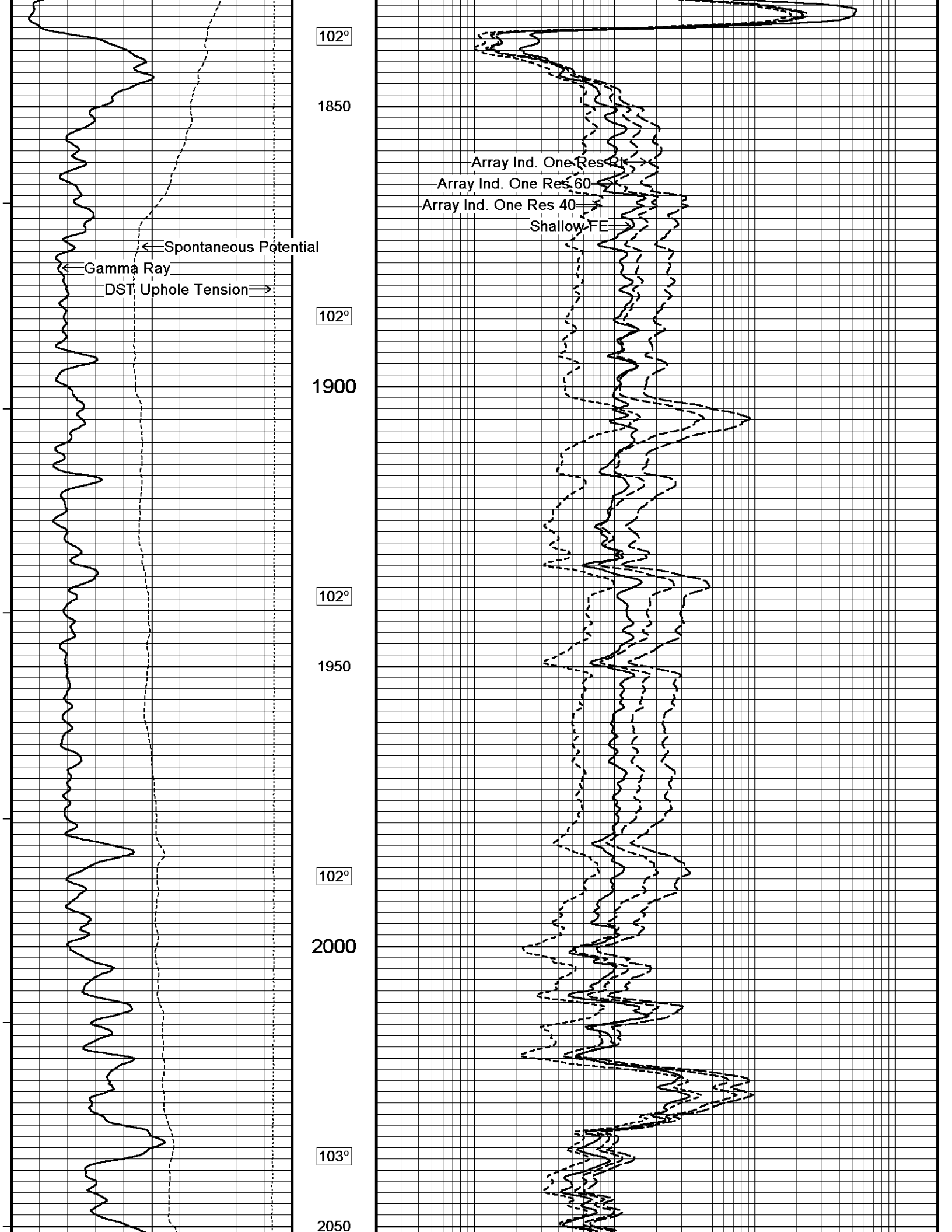

95°
750
95°
800
96°
850
96°
900
96°
950

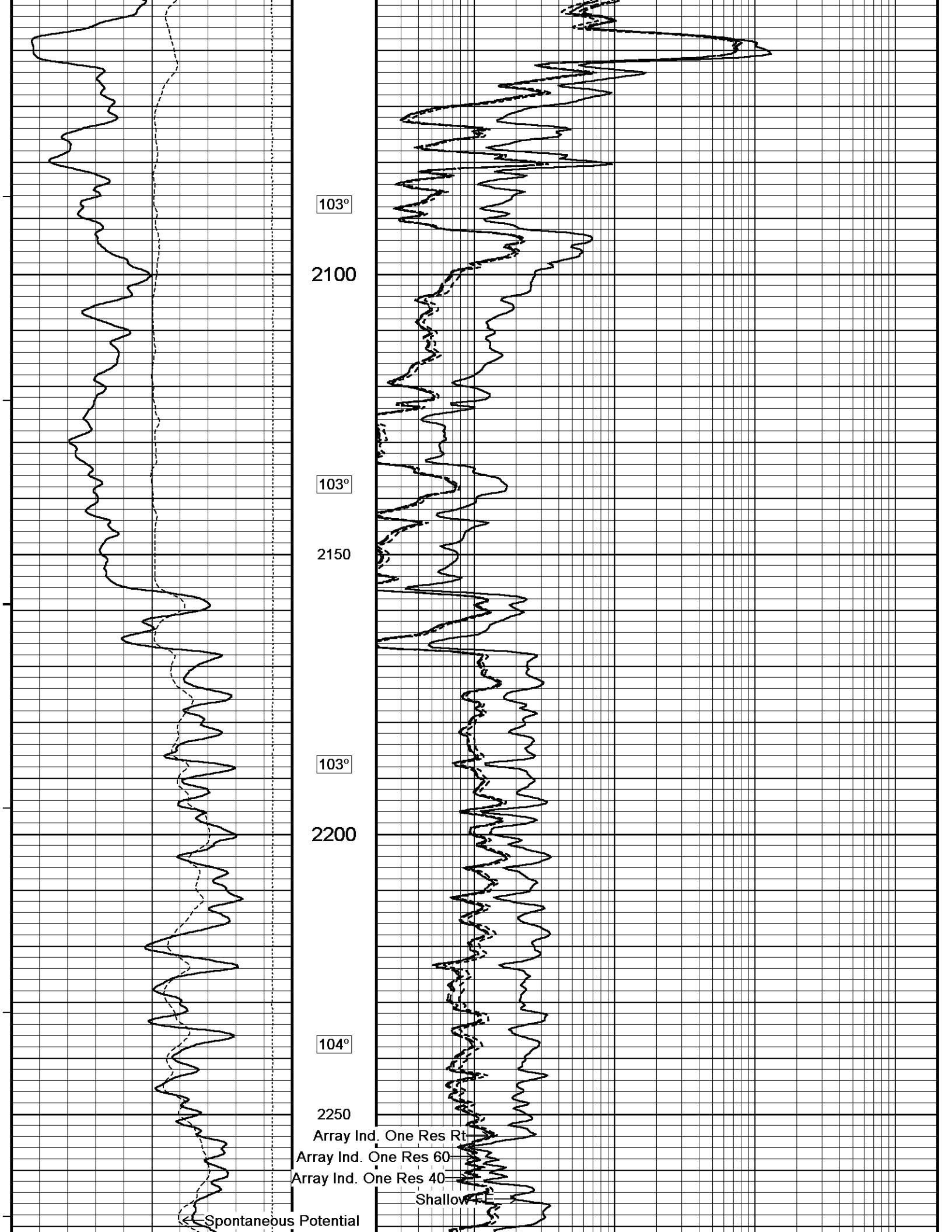

96°
1000
97°
1050
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
1100
98°
1150

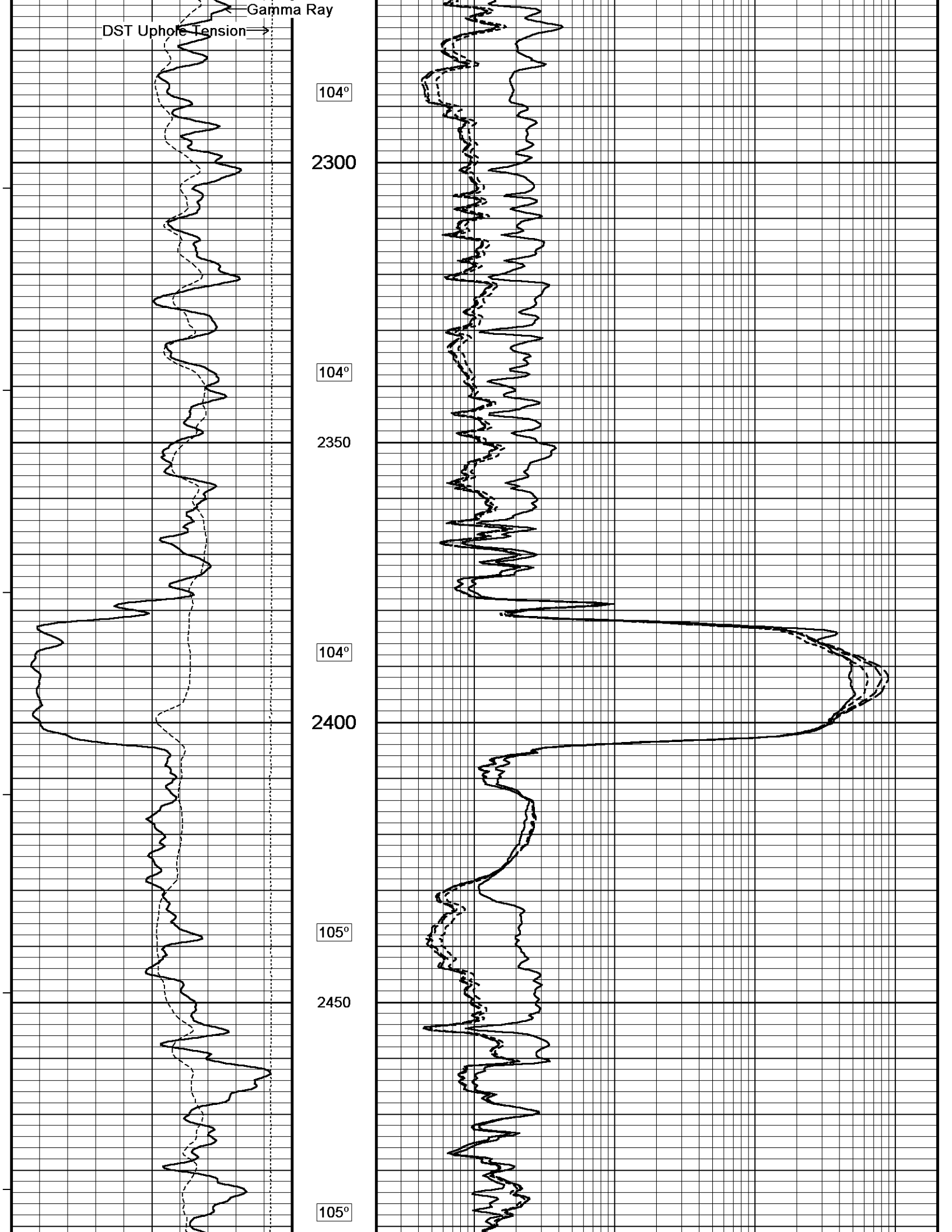

98°
1200
99°
1250
99°
1300
100°
1350
100°

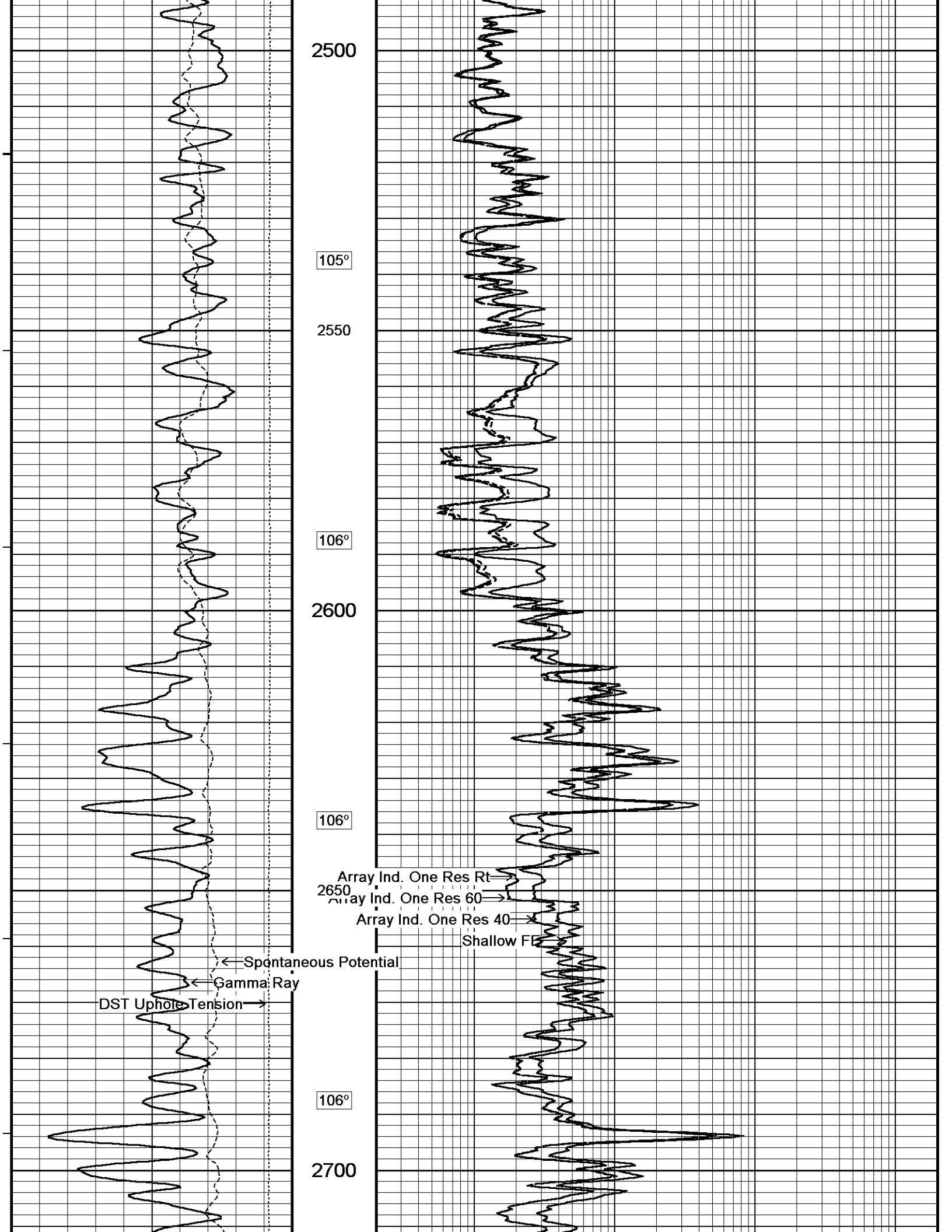

1400
100°
1450
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
100°
1500
101°
1550
101°
1600

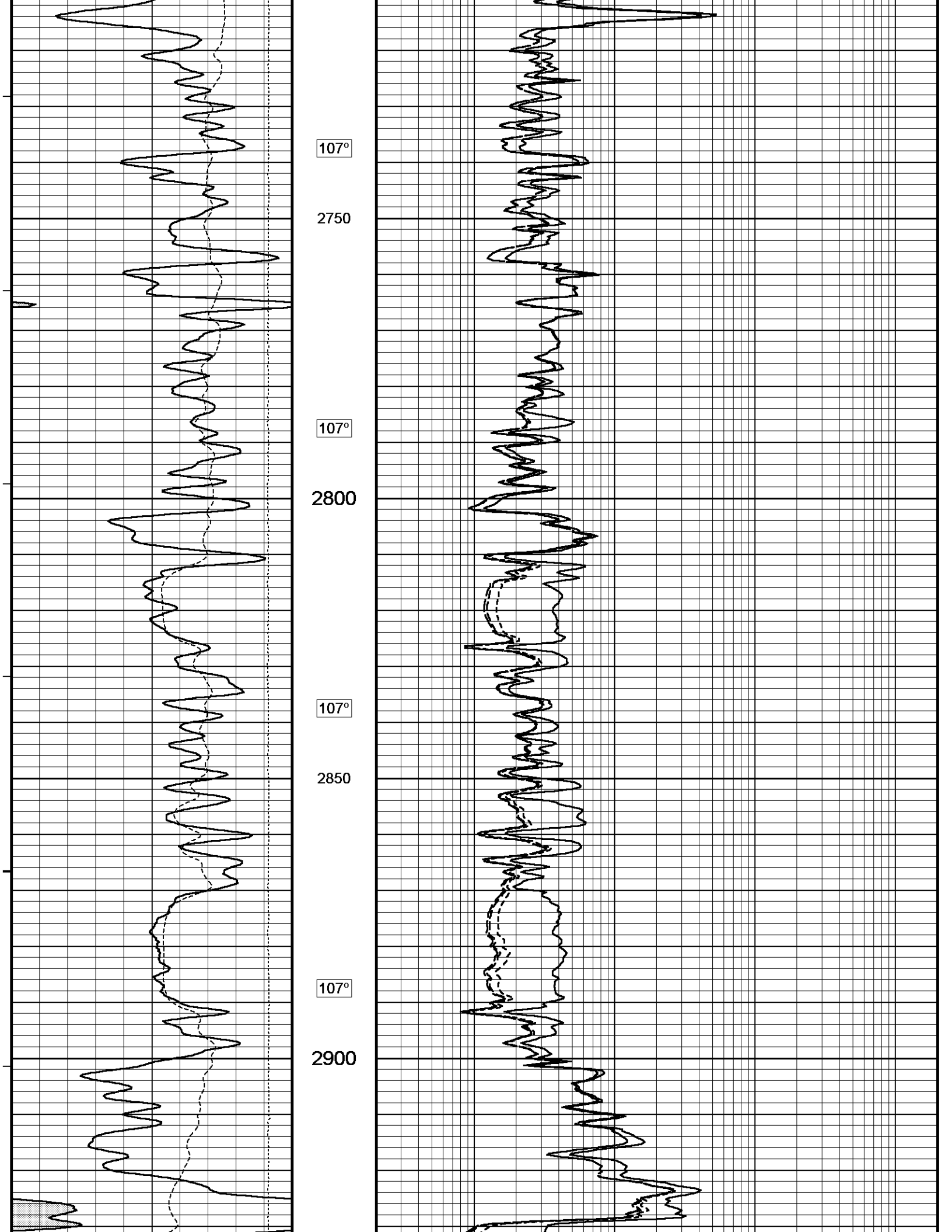

102°
1650
102°
1700
102°
1750
102°
1800

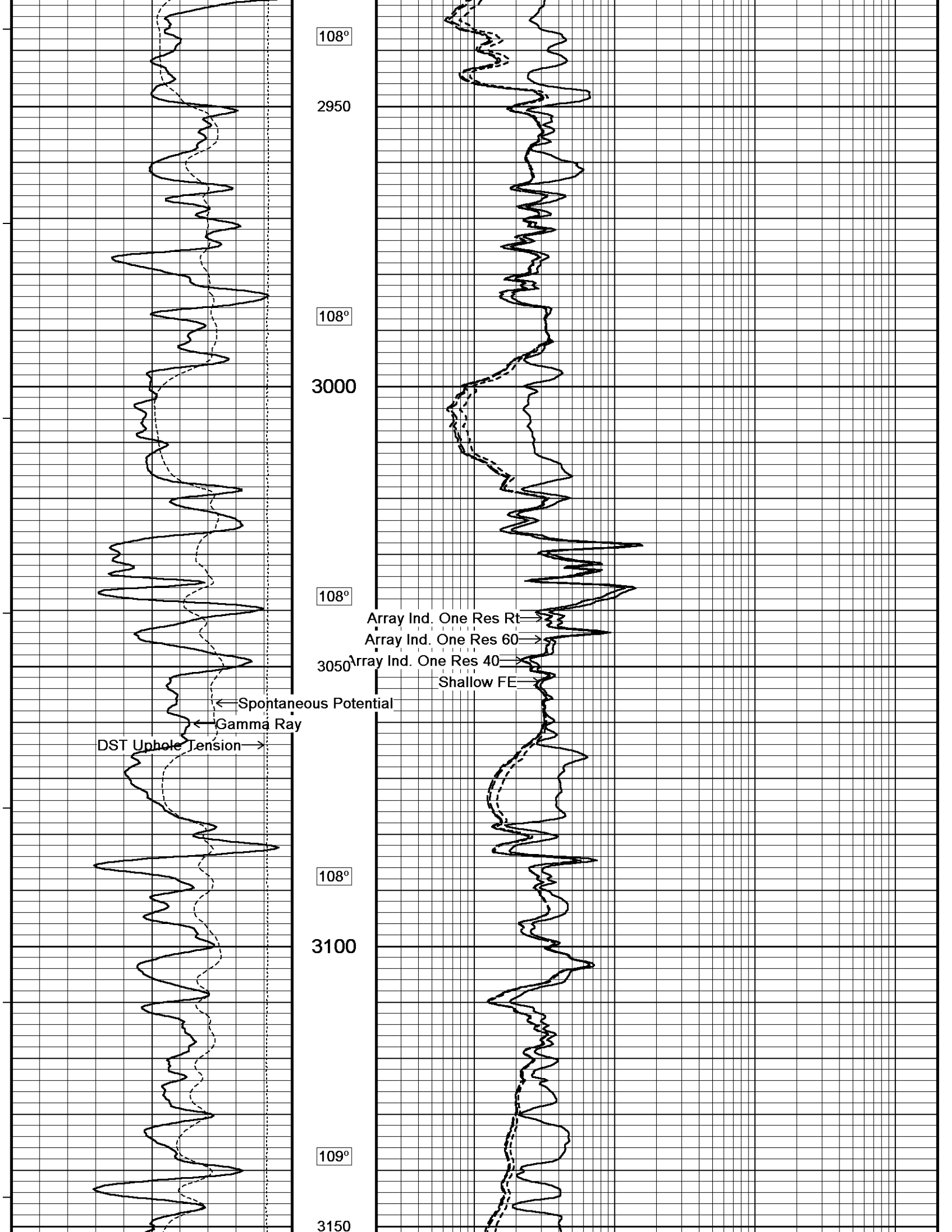

102°
1850
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
102°
1900
102°
1950
102°
2000
103°
2050

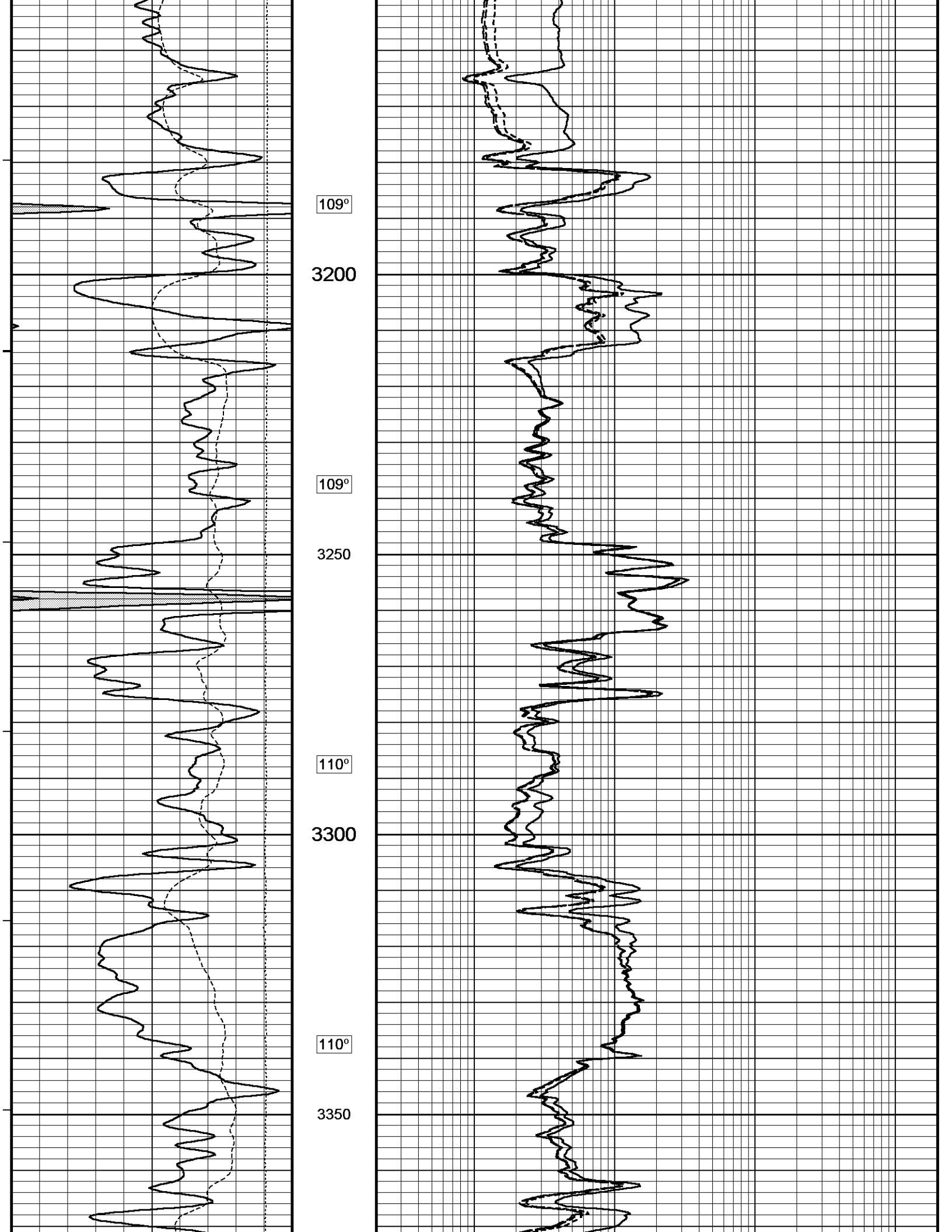

103°
2100
103°
2150
103°
2200
104°
2250
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow Ft
Spontaneous Potential

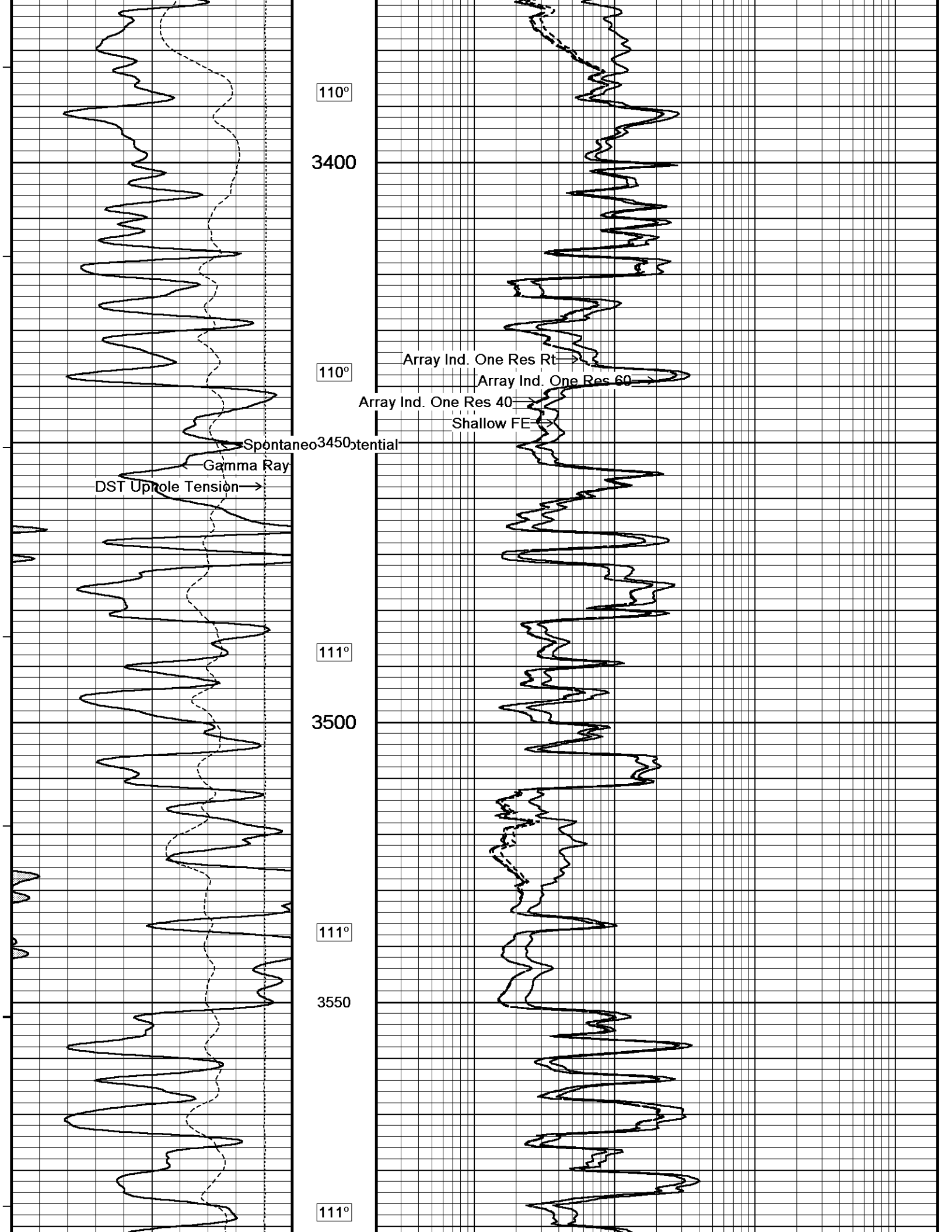

Gamma Ray
DST Uphole Tension
104°
2300
104°
2350
104°
2400
105°
2450
105°

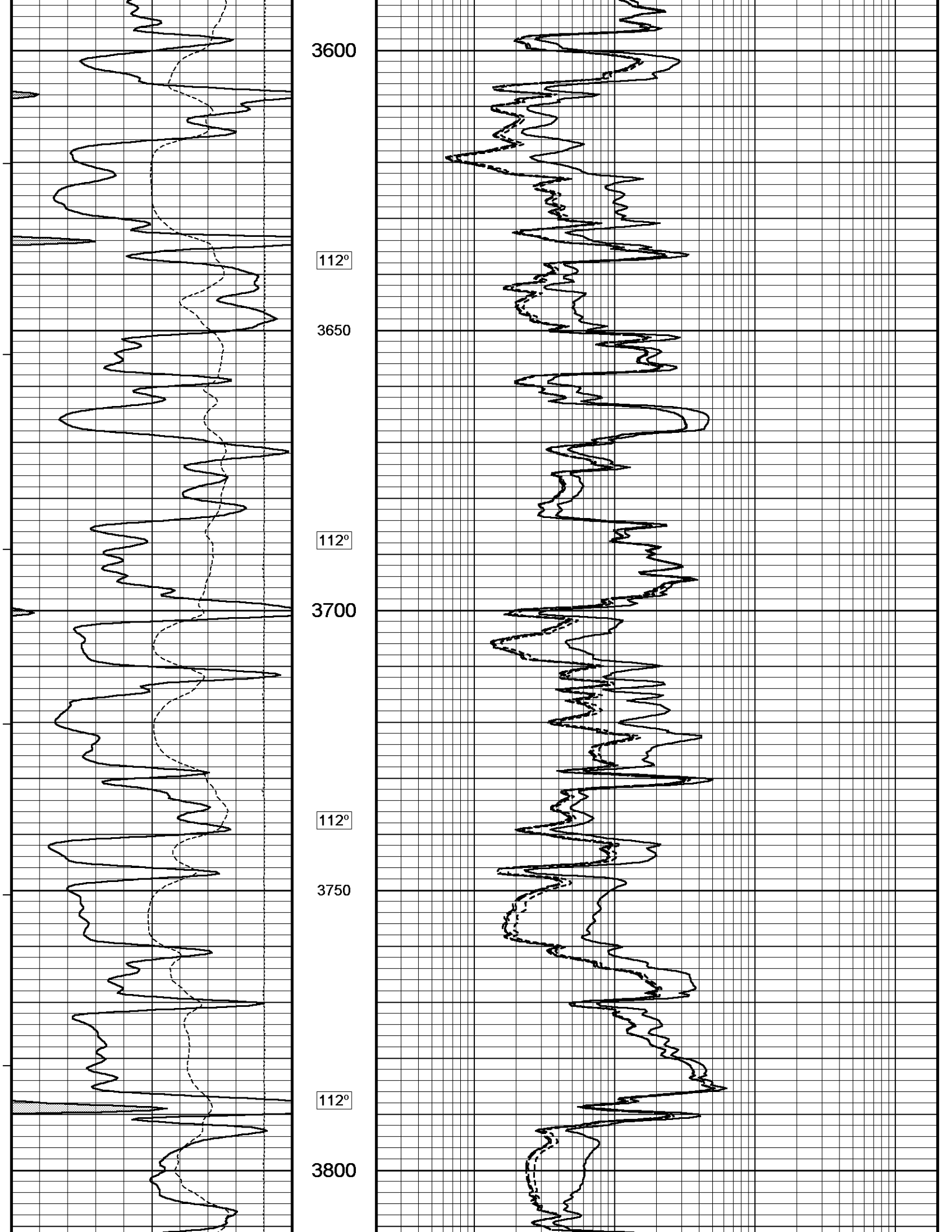

2500
105°
2550
106°
2600
106°
Array Ind. One Res Rt
2650
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
106°
2700

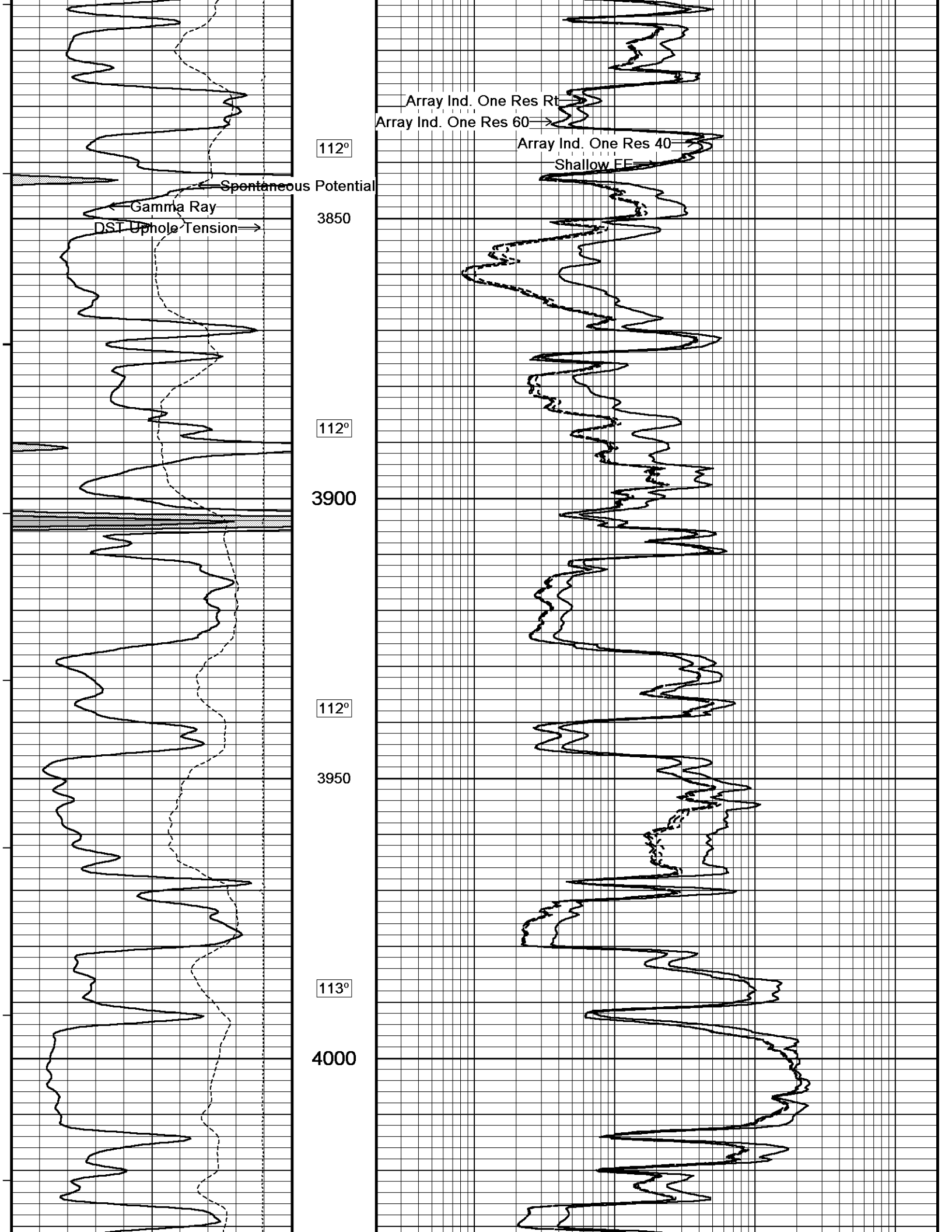

107°
2750
107°
2800
107°
2850
107°
2900

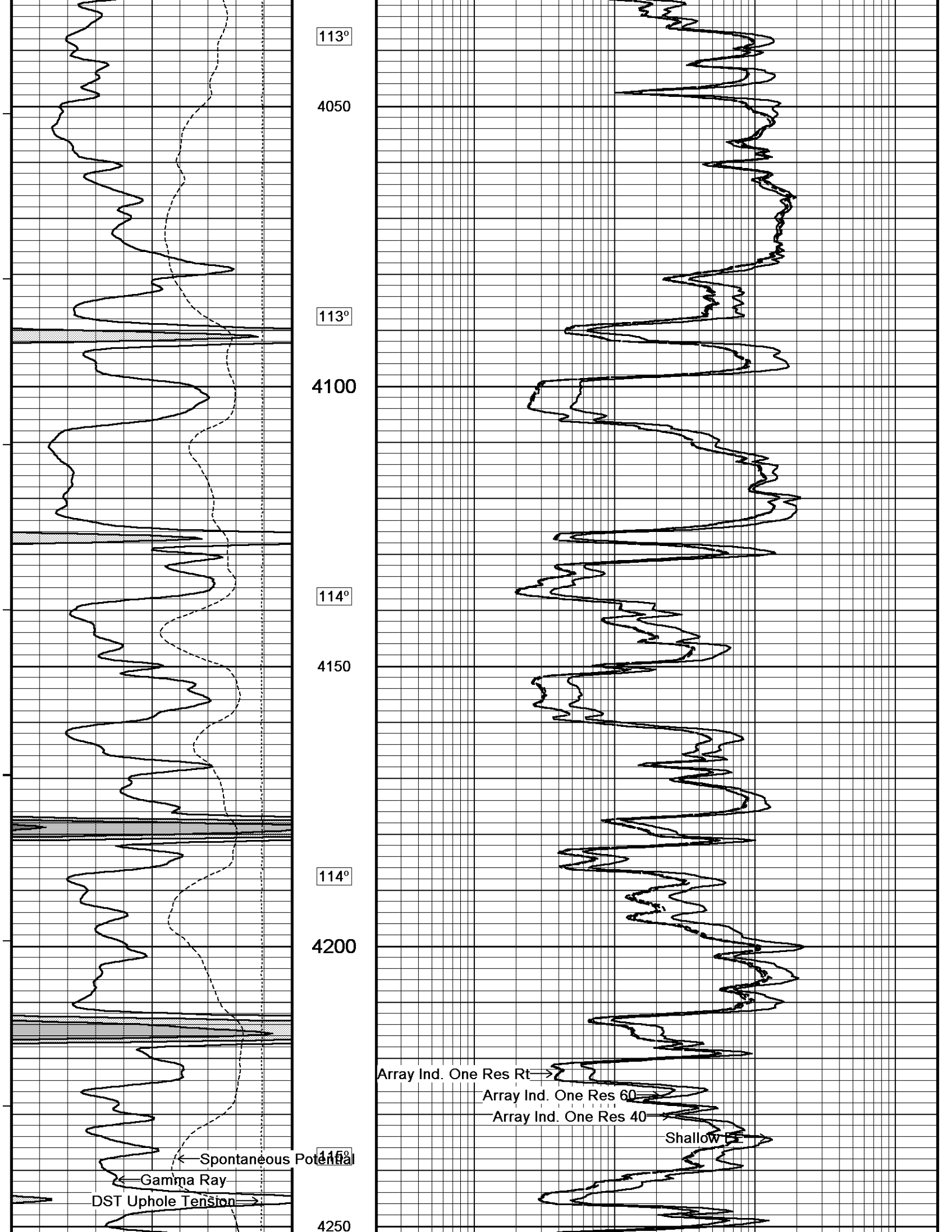

108°
2950
108°
3000
108°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
3050
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
108°
3100
109°
3150

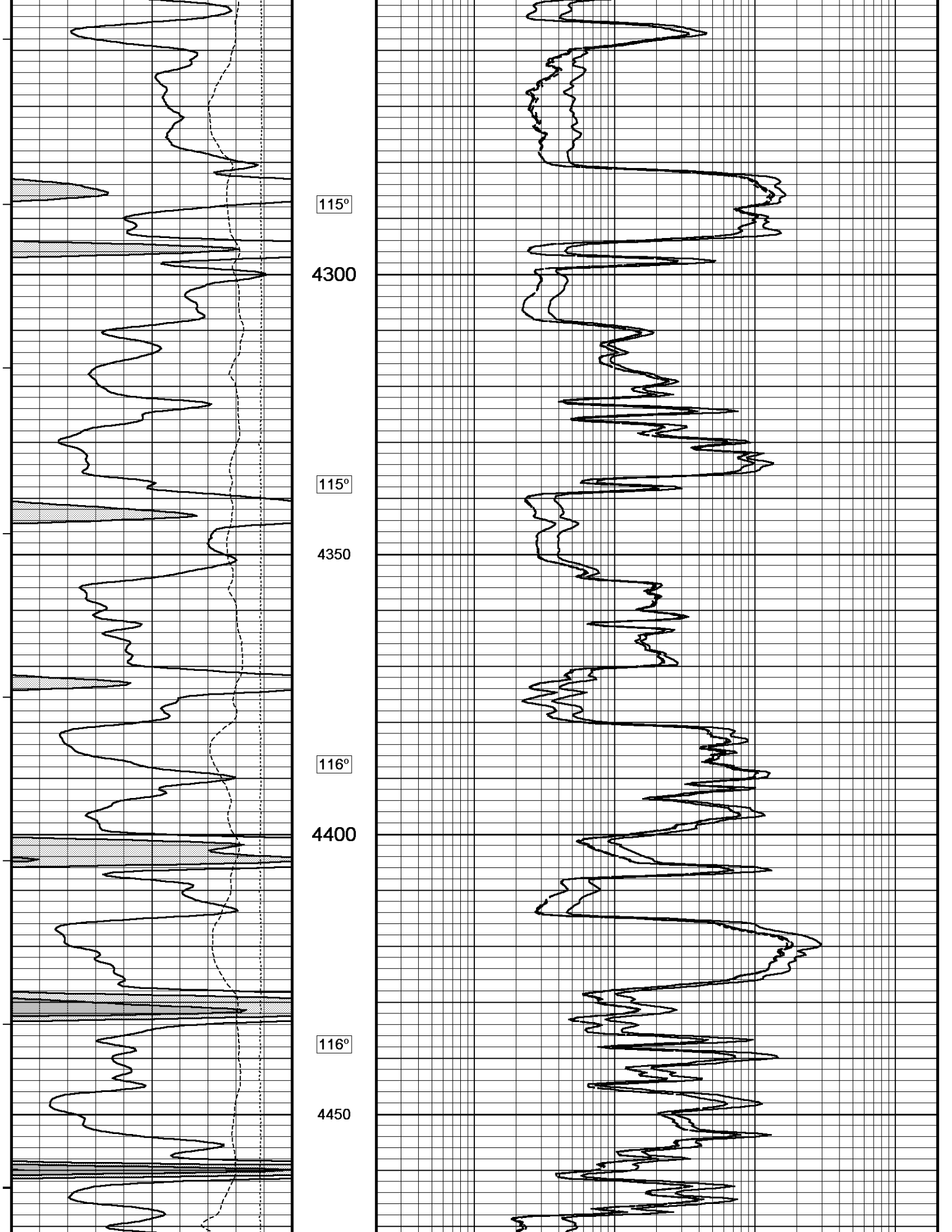

109°
3200
109°
3250
110°
3300
110°
3350

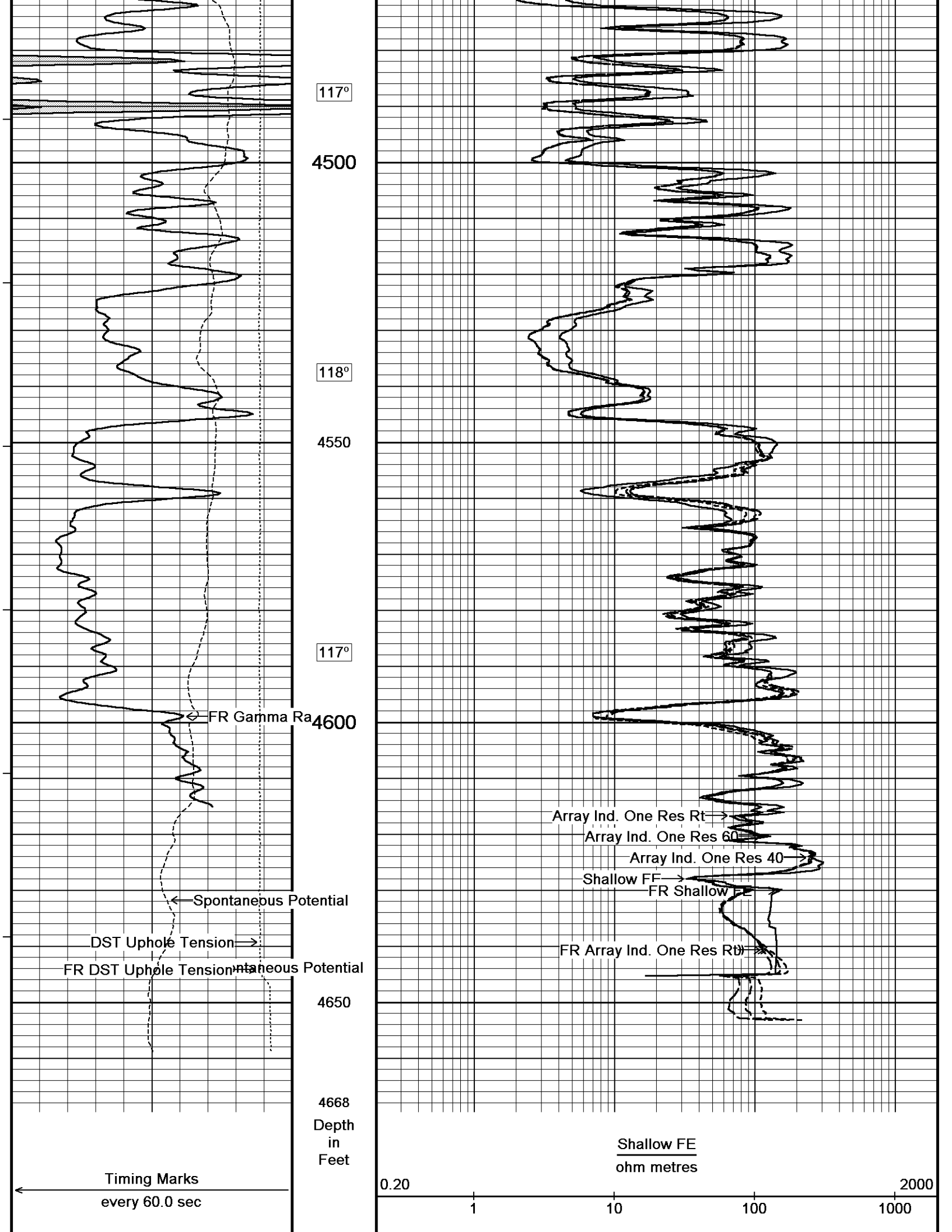

110°
3400
110°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneo 3450 otential
Gamma Ray
DST Uphole Tension
111°
3500
111°
3550
111°


3600
112°
3650
112°
3700
112°
3750
112°
3800


Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
112°
Spontaneous Potential
Gamma Ray
3850
DST Uphole Tension
112°
3900
112°
3950
113°
4000


113°
4050
113°
4100
114°
4150
114°
4200
115°
4250
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow


115°
4300
115°
4350
116°
4400
116°
4450


117°
4500
118°
4550
117°
FR Gamma Ra
4600
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
FR Shallow FE
Spontaneous Potential
DST Uphole Tension
FR DST Uphole Tension
ntaneous Potential
FR Array Ind. One Res Rt
4650
4668
Depth
in
Feet
Timing Marks
every 60.0 sec
Shallow FE
ohm metres
0.20
2000
1
10
100
1000

Gamma Ray
API
0 75 150

Spontaneous Potential
millivolts
− → | 20 | ← +

DST Uphole Tension
pounds
5000 0

Borehole Temp in deg F

Replay Scale 1:240

Array Ind. One Res 40
ohm metres
0.20 1 10 100 2000

Array Ind. One Res 60
ohm metres
0.20 1 10 100 2000

Array Ind. One Res Rt
ohm metres
0.20 1 10 100 2000

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-APR-2012 02:04
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_003.dta
Recorded on 24-APR-2012 23:50
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

5 INCH MAIN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-APR-2012 02:04
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_001.dta
Recorded on 24-APR-2012 23:16
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150

Spontaneous Potential
millivolts
− → | 20 | ← +

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:240

Shallow FE
ohm metres
0.20 1 10 100 2000

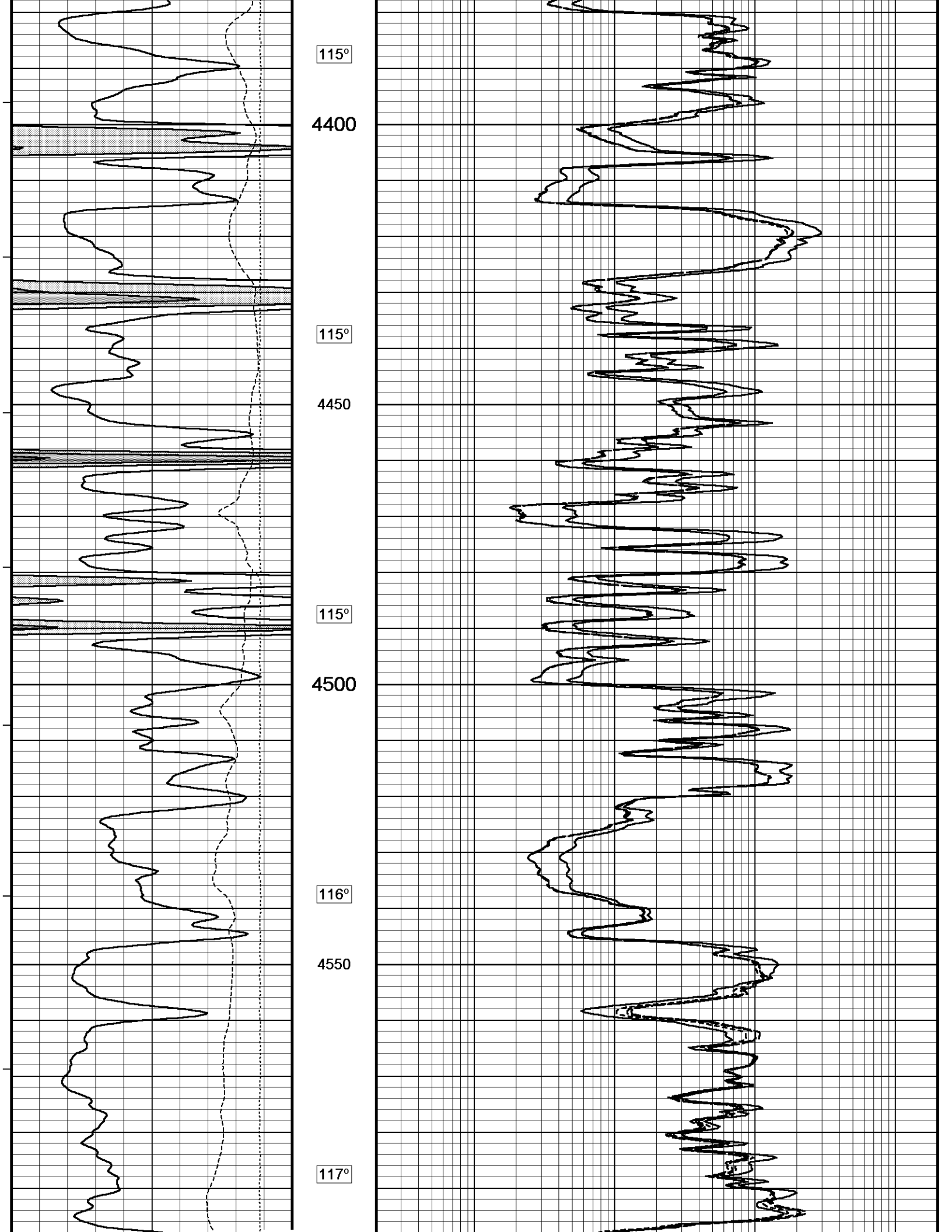
Array Ind. One Res 40
ohm metres
0.20 1 10 100 2000

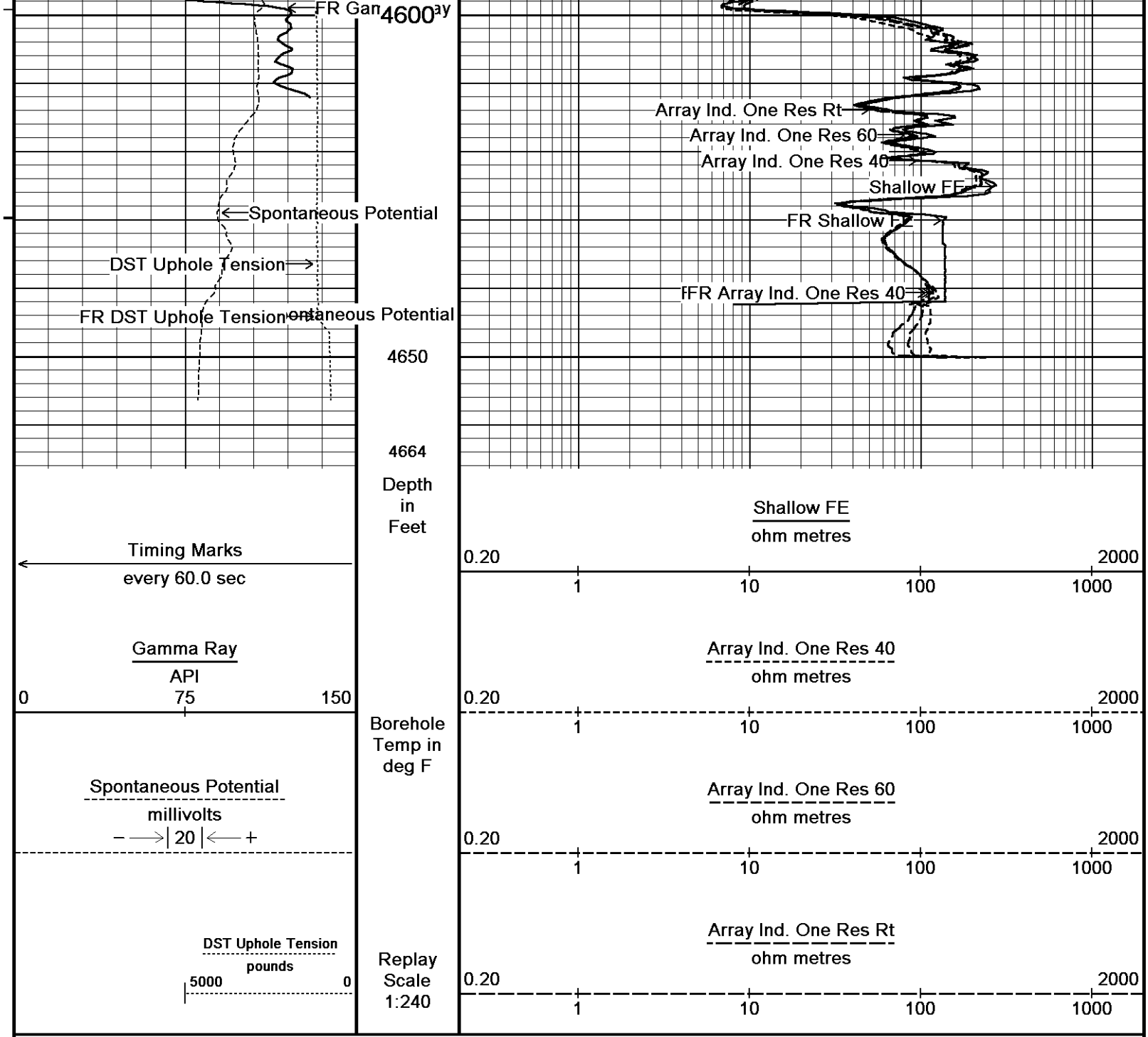
Array Ind. One Res 60
ohm metres
0.20 1 10 100 2000

Array Ind. One Res Rt
ohm metres
0.20 1 10 100 2000

4342

4350


115°
4400
115°
4450
115°
4500
116°
4550
117°



Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-APR-2012 02:04
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_001.dta
Recorded on 24-APR-2012 23:16
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_003.dta

General Constants All 000

Last Edited on 24-APR-2012,22:12

General Parameters		
Mud Resistivity	0.780	ohm-metres
Mud Resistivity Temperature	84.000	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	

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	0.610
RWA Constant M	2.150

Down-hole Tension Calibration All 000

Field Calibration on 30-JUN-2010

Reading No	Measured	Calibrated (lbs)
1	14112.01	10.00
2	15164.79	427.00

Down-hole Tension Calibration SMS 0

Field Calibration on 29-MAR-2012 11:07

Reading No	Measured	Calibrated (lbs)
1	-2133.10	0.00
2	-2135.89	100.00

Gamma Calibration MCG-C 208

Field Calibration on 24-APR-2012 07:33

	Measured	Calibrated (API)
Background	81	60
Calibrator (Gross)	1057	785
Calibrator (Net)	976	725

Gamma Constants MCG-C 208

Last Edited on 24-APR-2012,12:07

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

SP Calibration MCG-C 208

Field Calibration on 24-FEB-2012 11:08

	Measured	Calibrated (mV)
Reference 1	98.6	100.0
Reference 2	-101.8	-100.0

High Resolution Temperature Calibration MCG-C 208

Field Calibration on 18-OCT-2011,14:32

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

High Resolution Temperature Constants MCG-C 208

Last Edited on

Pre-filter Length	11

Caliper Calibration MML-A 16

Base Calibration on 12-MAR-2012 08:42
Field Calibration on 24-APR-2012 07:43

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14446	5.98
2	17749	7.97
3	20974	9.86
4	24969	11.92
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 16

Base Calibration on 12-MAR-2012 08:50
Field Check on 24-APR-2012 07:42

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.2	60.2	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	32.1	32.1
Micro Inverse	16.3	16.3

Micro Normal and Micro Inverse Constants MML-A 16

Last Edited on 24-APR-2012,12:15

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 66

Base Calibration on 12-MAR-2012 14:21
Field Check on 24-APR-2012 07:49

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3048	95	3714	110
Ratio	32.068		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	1659	2400
Ratio	0.691	

Field Check

	Calibrated (cps)	
	1709	2435
Ratio	0.702	

Neutron Constants MDN-A.B 66

Last Edited on 24-APR-2012,12:15

Neutron Source Id	P58125B	
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	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-C.A 353

Base Calibration on 12-MAR-2012 09:09
Field Check on 24-APR-2012 07:40

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	964.2	126.8
Base Check		281.2
Field Check		281.1

FE Constants MFE-C.A 353

Last Edited on 24-APR-2012,12:15

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 167

Base Calibration on 11-MAR-2011,09:58
Field Check on 24-APR-2012 07:39

Base Calibration

Test Loop Calibration

Channel	Measured Low	Measured High	Calibrated (mmho/m) Low	Calibrated (mmho/m) High
1	17.3	474.2	9.3	966.2
2	6.3	388.4	7.6	821.4
3	3.3	259.4	5.2	566.0
4	1.9	133.0	2.6	279.2

Array Temperature 76.8 Deg F

Channel	Base Check (mmho/m) Low	Base Check (mmho/m) High	Field Check (mmho/m) Low	Field Check (mmho/m) High
1	0.0	0.0	12.4	3840.9
2	0.0	0.0	29.4	3479.3
3	0.0	0.0	29.0	3055.3
4	0.0	0.0	19.7	2083.2
Deep	0.0	0.0	18.5	2050.5
Medium	0.0	0.0	42.2	3994.5
Shallow	0.0	0.0	42.8	5057.5
Array Temperature		0.0		62.7 Deg F

Induction Constants MAI-A.A 167

Last Edited on 24-APR-2012,12:15

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 167

Field Calibration on 12-MAR-2012,10:57

	Measured	Calibrated(Deg F)
Lower	1.00	33.80
Upper	11.00	51.80

High Resolution Temperature Constants MAI-A.A 167

Last Edited on

Pre-filter Length	11

Caliper Calibration MPD-B 64

Base Calibration on 13-FEB-2012 10:56
Field Calibration on 13-FEB-2012 10:57

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13425	3.99
2	22192	5.98
3	30768	7.97
4	39024	9.86
5	48432	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.96	5.98

Photo Density Calibration MPD-B 64

Base Calibration on 13-FEB-2012 11:14
Field Check on 13-FEB-2012 11:21

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	47670	25060	59556	30836
Reference 2	19597	2525	24941	2541
Field Check at Base	1199.0	1386.9		
Field Check	1196.3	1389.6		

PE Calibration

Base Calibration	WS	Measured WH	Ratio	Calibrated Ratio
Background	218	1072		
Reference 1	18017	47489	0.383	0.371
Reference 2	5304	19465	0.276	0.272
Field Check at Base	218.3	1071.8		
Field Check	218.5	1068.3		

Density Constants MPD-B 64

Last Edited on 24-APR-2012,12:15

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	1.12	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\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_003.dta

Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Comms Gamma
MCG-C 208 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 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Neutron
MDN-A.B 66 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: 2.45 in

Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 36 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 36 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-C.A 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

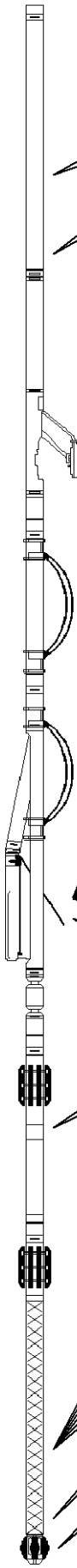
Compact Focussed Electric
MFE-C.A 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 50.32 ft Weight: 407.9 lb

Total Length: 50.32 ft Weight: 407.9 lb



45.04 ft	GRGC - Gamma Ray
45.04 ft	GRGC - Gamma Ray
42.13 ft	CGXT - MCG External Temperature
42.13 ft	CGXT - MCG External Temperature
35.41 ft	MINV - Micro-inverse
35.41 ft	MNRL - Micro-normal
36.40 ft	MLTC - MML Caliper
35.41 ft	MINV - Micro-inverse
35.41 ft	MNRL - Micro-normal
36.40 ft	MLTC - MML Caliper
30.61 ft	NPRL - Limestone Neutron Por.
30.61 ft	NPRL - Limestone Neutron Por.
23.37 ft	HVOL - Hole Volume
23.37 ft	CLDC - Density Caliper
23.37 ft	AVOL - Annular Volume
23.37 ft	HVOL - Hole Volume
23.37 ft	CLDC - Density Caliper
23.37 ft	AVOL - Annular Volume
21.44 ft	DPRL - Limestone Density Por.
21.44 ft	DEN - Compensated Density
21.44 ft	DCOR - Density Correction
21.44 ft	DCOR - Density Correction
21.44 ft	DPRL - Limestone Density Por.
21.44 ft	DEN - Compensated Density
21.38 ft	PDPE - PE
21.38 ft	PDPE - PE
13.91 ft	FEFE - Shallow FE
13.91 ft	FEFE - Shallow FE
3.34 ft	RTAO - Array Ind. One Res Rt
3.34 ft	R60O - Array Ind. One Res 60
3.34 ft	R40O - Array Ind. One Res 40
3.34 ft	R40O - Array Ind. One Res 40
3.34 ft	R60O - 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	GRAND MESA OPERATING
WELL	CSC #1-21
FIELD	WILDCAT
PROVINCE/COUNTY	GOVE

PROVINCE/COUNTY GOVE

COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	2893.00	feet	First Reading	4641.00	feet
Elevation Drill Floor	2891.00	feet	Depth Driller	4640.00	feet
Elevation Ground Level	2888.00	feet	Depth Logger	4644.00	feet

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40 Years of Wireline 1970 2010

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ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

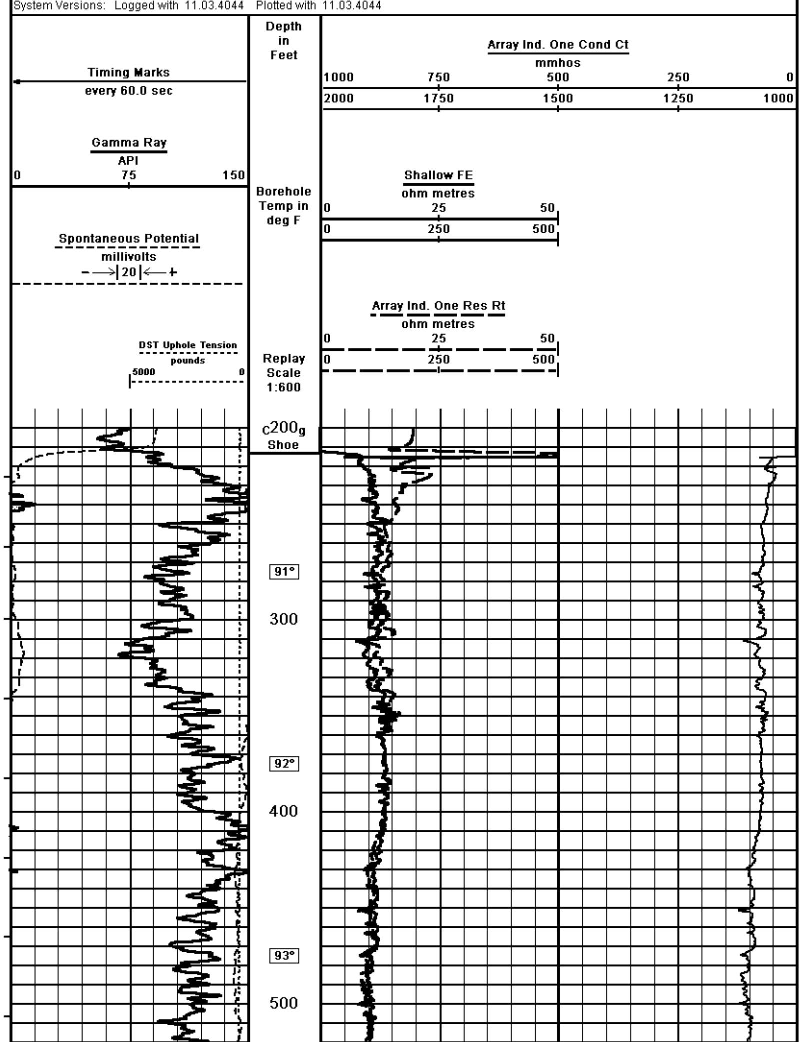
COMPANY	GRAND MESA OPERATING		
WELL	CSC #1-21		
FIELD	WILDCAT		
PROVINCE/COUNTY	GOVE		
COUNTRY/STATE	U.S.A. / KANSAS		
LOCATION	1200' FNL & 1040' FWL	Other Services MDN/MPD MML	
SEC 21	TWP 13S	RGE 31W	
API Number	15-063-21983		
Permit Number			
Permanent Datum	G.L., Elevation 2888 feet	Elevations:	
Log Measured From	KB	KB	2893.00 feet
Drilling Measured From	KB	DF	2891.00
		GL	2888.00
Date	24-APR-2012		
Run Number	ONE		
Depth Driller	4640.00 feet		
Depth Logger	4644.00 feet		
First Reading	4641.00 feet		
Last Reading	213.00 feet		
Casing Driller	213.00 feet		
Casing Logger	213.00 feet		
Bit Size	7.875 inches		
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.30 lb/USg	56.00 CP	
PH / Fluid Loss	8.00	8.00 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.78 @ 84.0 ohm-m		
Rmf @ Measured Temp	0.62 @ 84.0 ohm-m		
Rmc @ Measured Temp	0.94 @ 84.0 ohm-m		
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.56 @ 117.0 ohm-m		
Time Since Circulation	4 HOURS		
Max Recorded Temp	117.00 deg F		
Equipment Name	COMPACT		
Equipment / Base	13025	LIB	
Recorded By	R. HOFFMAN		
Witnessed By	KENT MATSON		
S.O. # / JOB #	3534649	LB12-104	

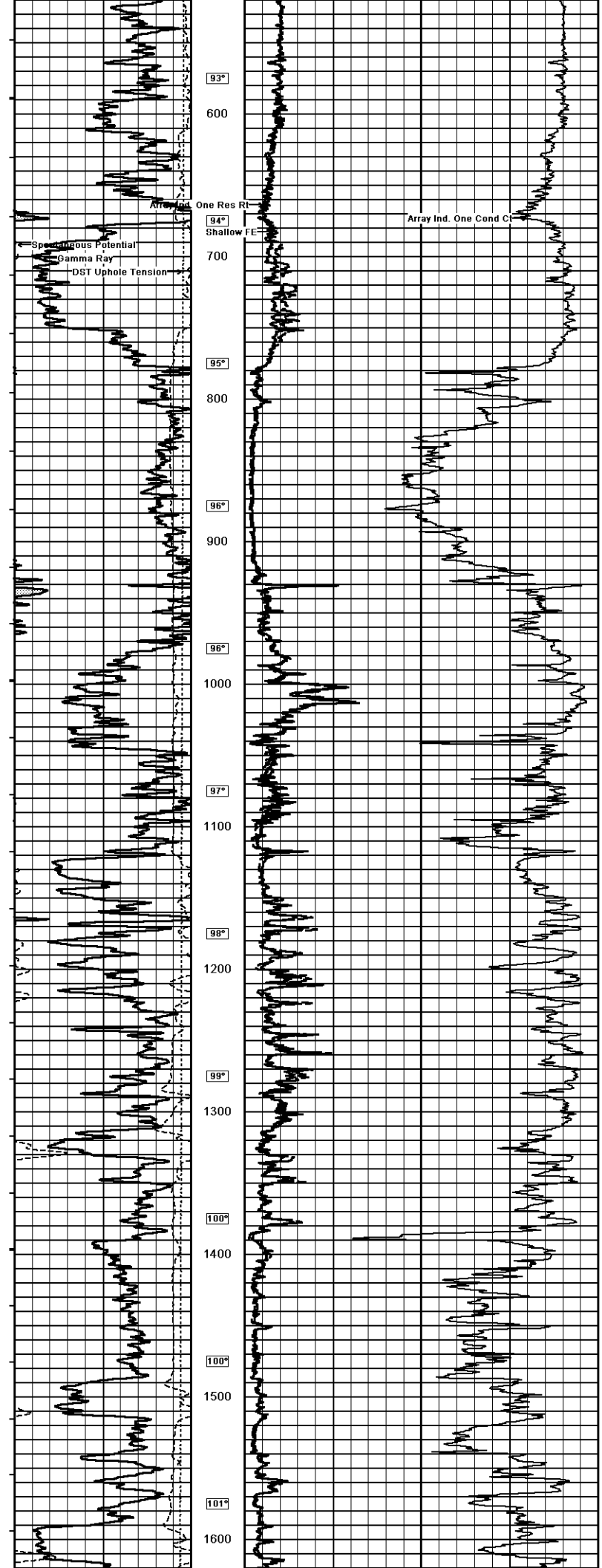
1 INCH MAIN

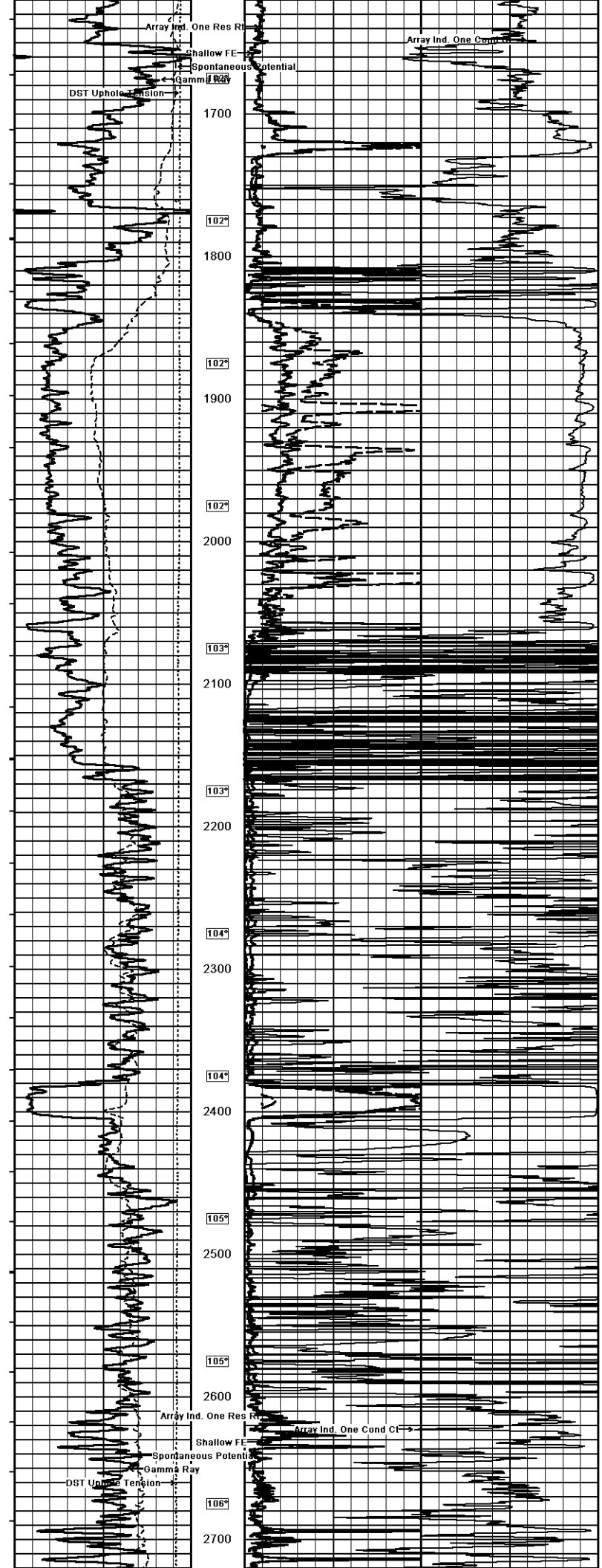
Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 25-APR-2012 02:04

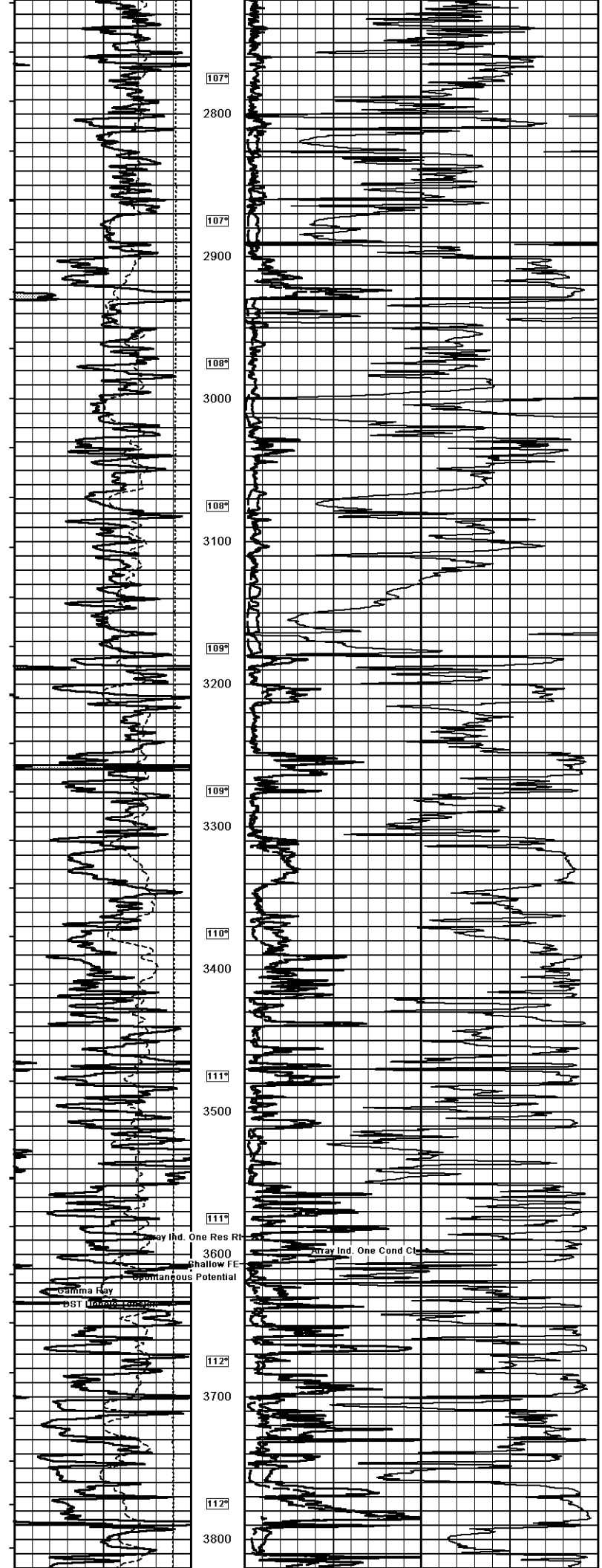
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_003.dta — Recorded on 24-APR-2012 23:50

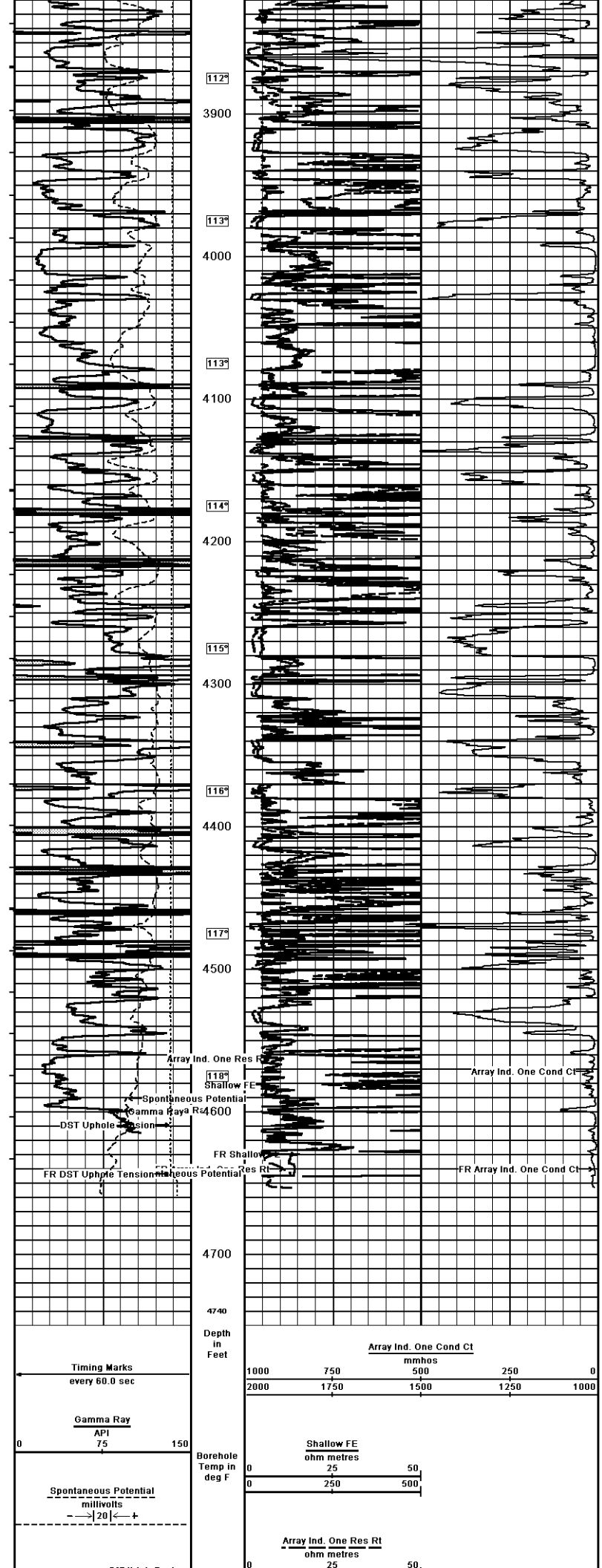
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

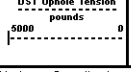



93°
600
Array Ind. One Res RI
94°
Array Ind. One Cond CI
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
700
95°
800
96°
900
96°
1000
97°
1100
98°
1200
99°
1300
100°
1400
100°
1500
101°
1600

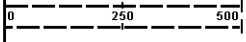

Array Ind. One Res Rt
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
102"
103"
104"
105"
106"
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension


107°
2800
107°
2900
108°
3000
108°
3100
109°
3200
109°
3300
110°
3400
111°
3500
111°
3600
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
112°
3700
112°
3800


112"
3900
113"
4000
113"
4100
114"
4200
115"
4300
116"
4400
117"
4500
118"
4600
4700
4740
Array Ind. One Res Rt
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
FR Shallow FE
FR DST Uphole Tension
Spontaneous Potential
FR Array Ind. One Res Rt
Array Ind. One Cond Ct
FR Array Ind. One Cond Ct
Depth in Feet
Timing Marks every 60.0 sec
Gamma Ray API 0 75 150
Borehole Temp in deg F
Spontaneous Potential millivolts 20
Array Ind. One Cond Ct mmhos 1000 750 500 250 0 2000 1750 1500 1250 1000
Shallow FE ohm metres 0 25 50 0 250 500
Array Ind. One Res Rt ohm metres 0 25 50



Replay Scale 1:600



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 25-APR-2012 02:04

Filename: C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_003.dta — Recorded on 24-APR-2012 23:50

System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

1 INCH MAIN

COMPANY	GRAND MESA OPERATING
WELL	CSC #1-21
FIELD	WILDCAT
PROVINCE/COUNTY	GOVE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2893.00	feet	First Reading	4641.00	feet
Elevation Drill Floor	2891.00	feet	Depth Driller	4640.00	feet
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40 Wireline