ARRAY INDUCTION SHALLOW FOCUSSED ELECTRIC LOG

Weatherford

COMPANY	APACHE CORP.
WELL	HAGER 1-12
FIELD	UNNAMED
PROVINCE/COUNTY	MEADE
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	1320' FSL & 1320' FWL

40 Years of Wireline 1970 2010

SEC	TWP	RGE	Other Services
12	34S	28W	MPD/MDN MML

API Number 15-119-21263
Permit Number

Permanent Datum G.L., Elevation 2359 feet
Log Measured From K.B. @ 12 FEET above Permanent Datum
Drilling Measured From K.B.

Elevations:	feet
KB	2371.00
DF	2369.00
GL	2359.00

Date	02-APR-2011			
Run Number	ONE			
Depth Driller	6260.00	feet		
Depth Logger	6265.00	feet		
First Reading	6262.00	feet		
Last Reading	1631.00	feet		
Casing Driller	1630.00	feet		
Casing Logger	1631.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	9.00 lb/USg	56.00 CP		
PH / Fluid Loss	10.00	7.20 ml/30Min		
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.87 @ 78.0	ohm-m		
Rmf @ Measured Temp	0.70 @ 78.0	ohm-m		
Rmc @ Measured Temp	1.04 @ 78.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.58 @118.0	ohm-m		
Time Since Circulation	6 HOURS			
Max Recorded Temp	118.00	deg F		
Equipment Name	COMPACT			
Equipment / Base	13025	LIB		
Recorded By	L. SCOTT			
Witnessed By	KARL GRAHAM		CODY MARTIN	
S.O.# / JOB#	3529171		LB11-065	

BOREHOLE RECORD

Last Edited: 03-APR-2011 04:15

Bit Size (inches)	Depth From (feet)	Depth To (feet)
7.875	1631.00	6265.00

CASING RECORD

Type	Size (inches)	Depth From (feet)	Shoe Depth (feet)	Weight (pounds/ft)
SURFACE	8.625	0.00	1631.00	24.00

REMARKS

ols Used: MAI, MPD, MCG, MDN, MML, MFE, SKJ
Hardware: MPD: 8 inch profile plate. 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 = 907 cu. ft.
Service order #3529171
Rig: Duke Rig #6
Engineer: L. Scott
Operator(s): N. Adame, J. LaPoint

2 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 03-APR-2011 13:05
Filename: C:\DOCUME~1\garcianr\LOCALS~1\Temp\Weatherford Pr...\APACHE HAGER 1-12_002.dta
Recorded on 03-APR-2011 01:40
System Versions: Logged with 11.03.2789 Plotted with 11.02.2164

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

C1620g Shoe

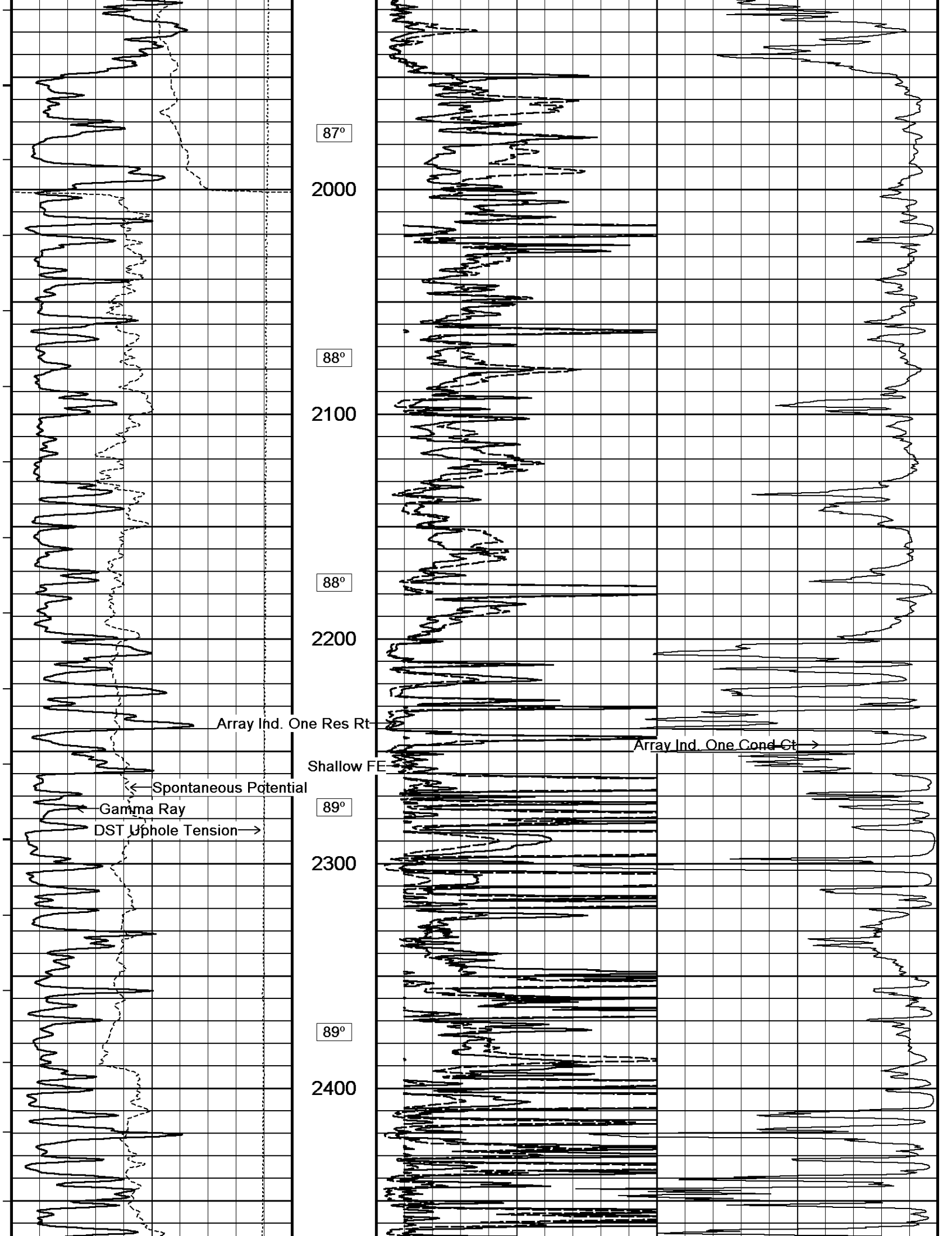
1700

87°

1800

87°

1900


87°
2000
88°
2100
88°
2200
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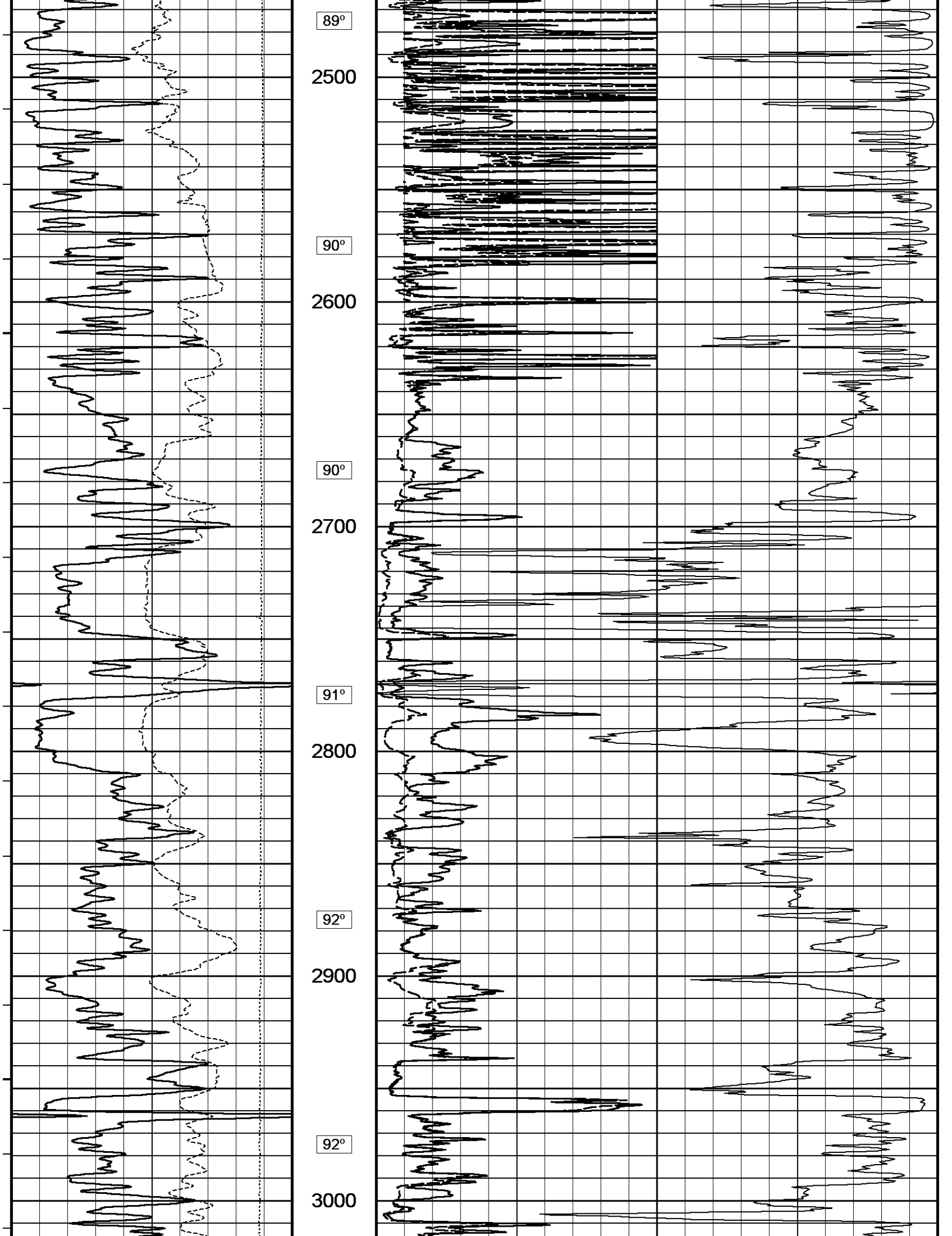
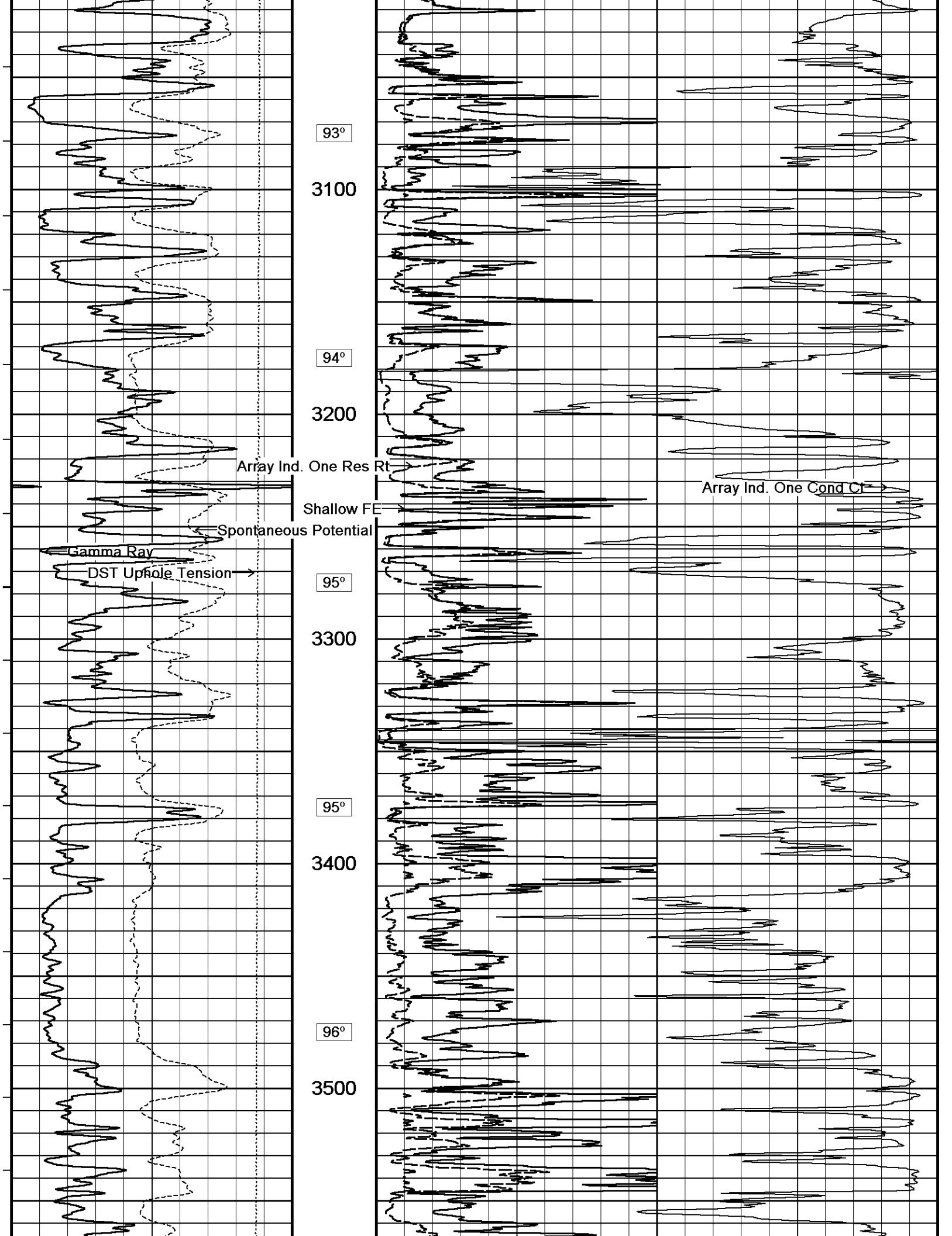
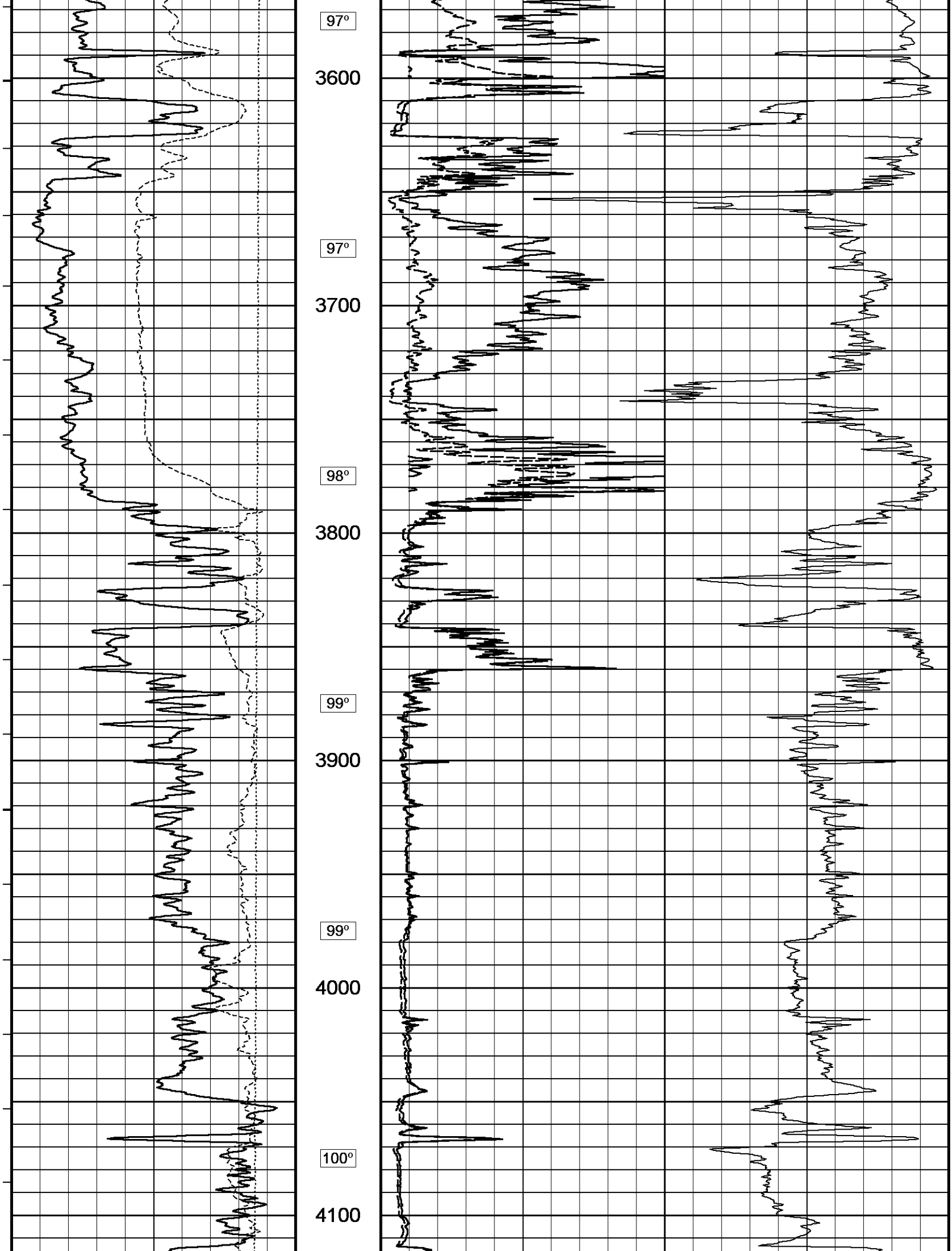
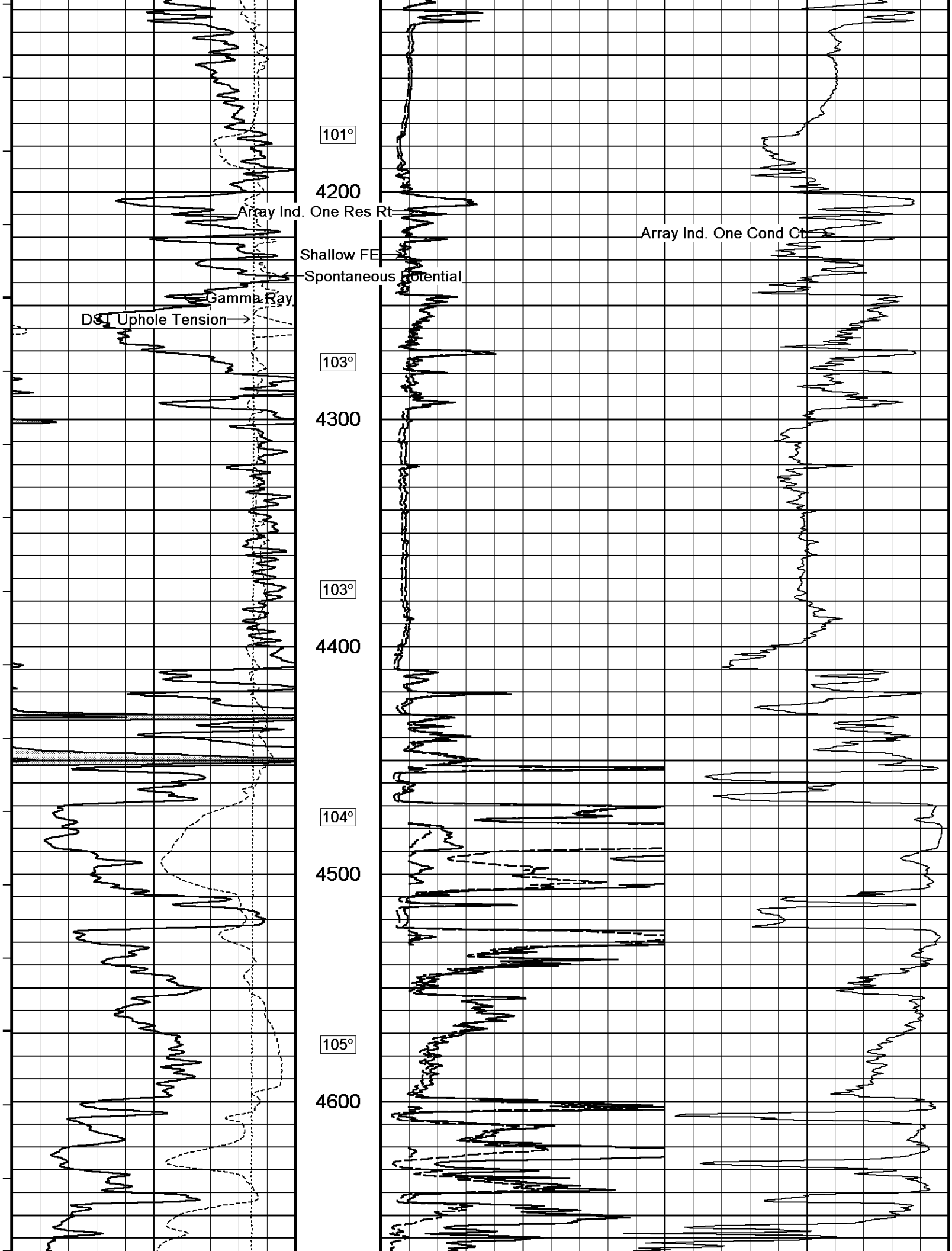
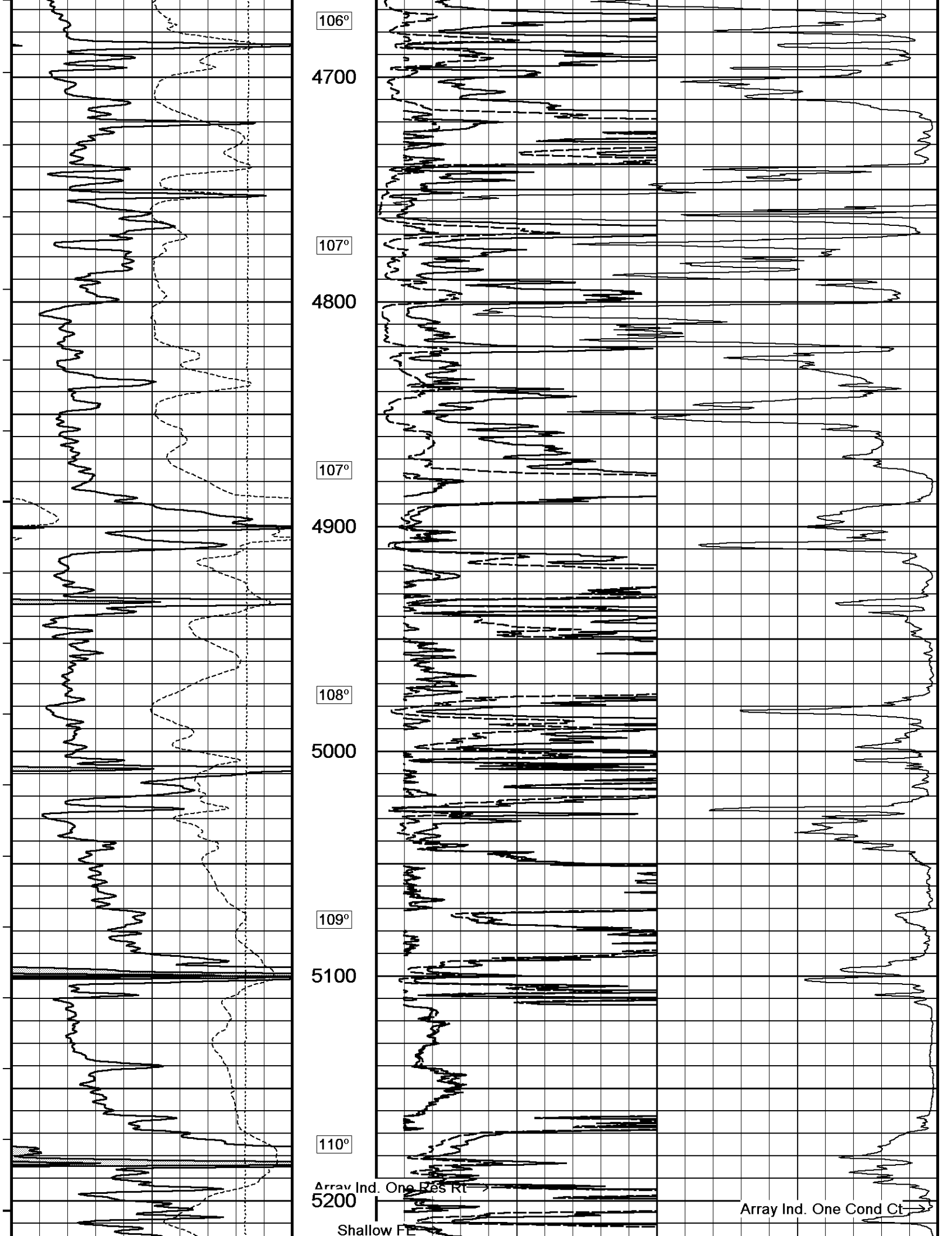
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
89°
Gamma Ray
DST Uphole Tension
2300
89°
2400

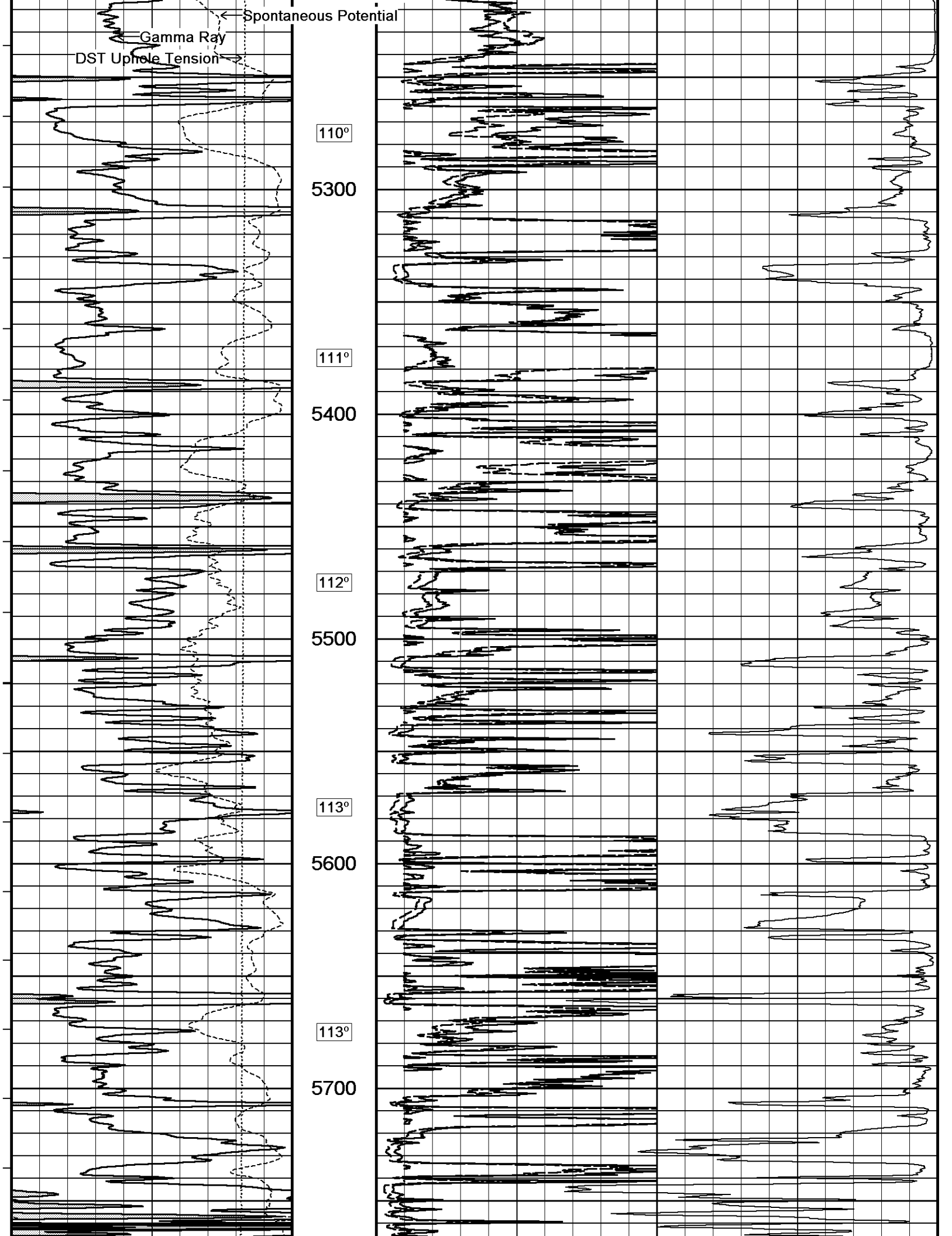

89°
2500
90°
2600
90°
2700
91°
2800
92°
2900
92°
3000

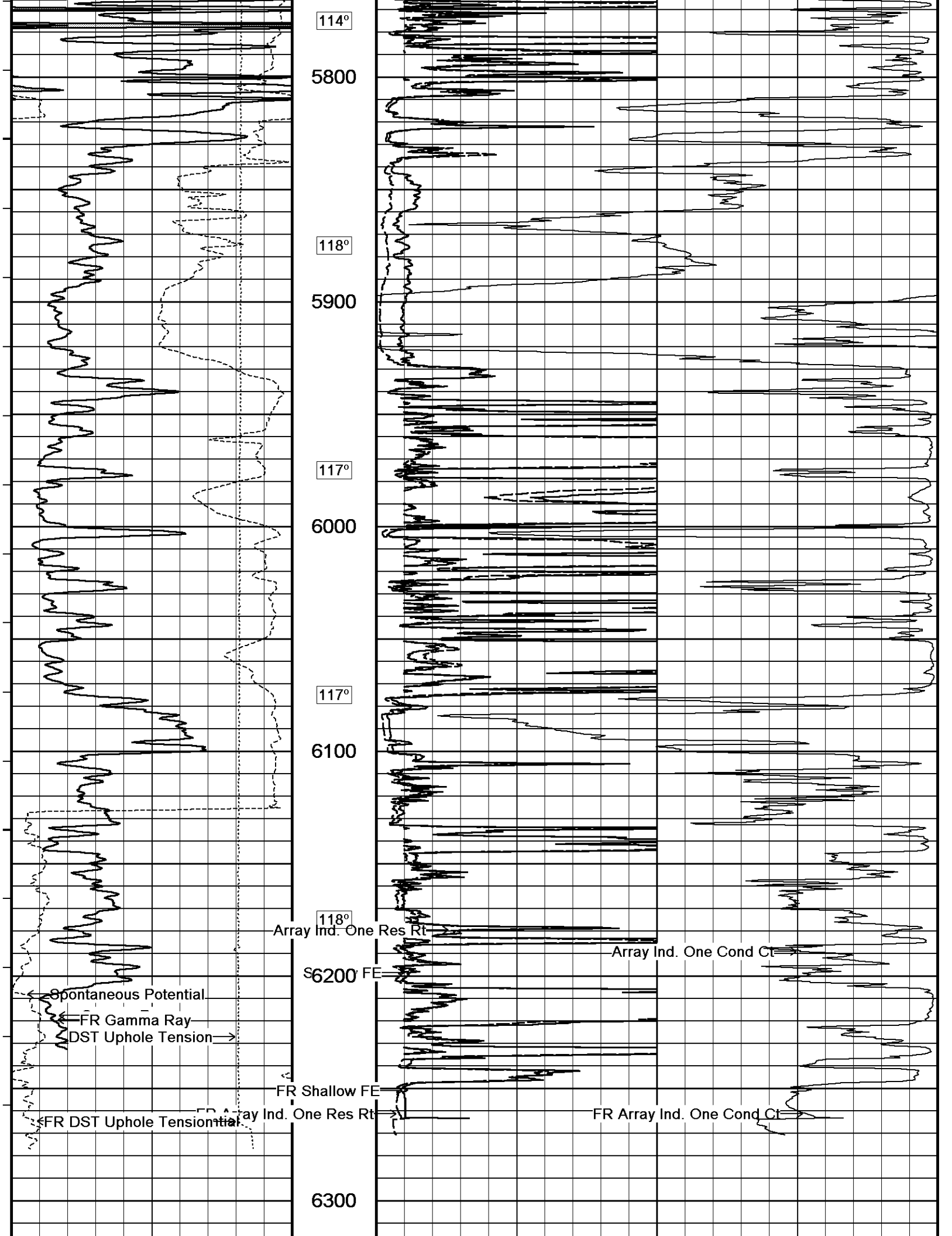

93°
3100
94°
3200
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
95°
3300
95°
3400
96°
3500

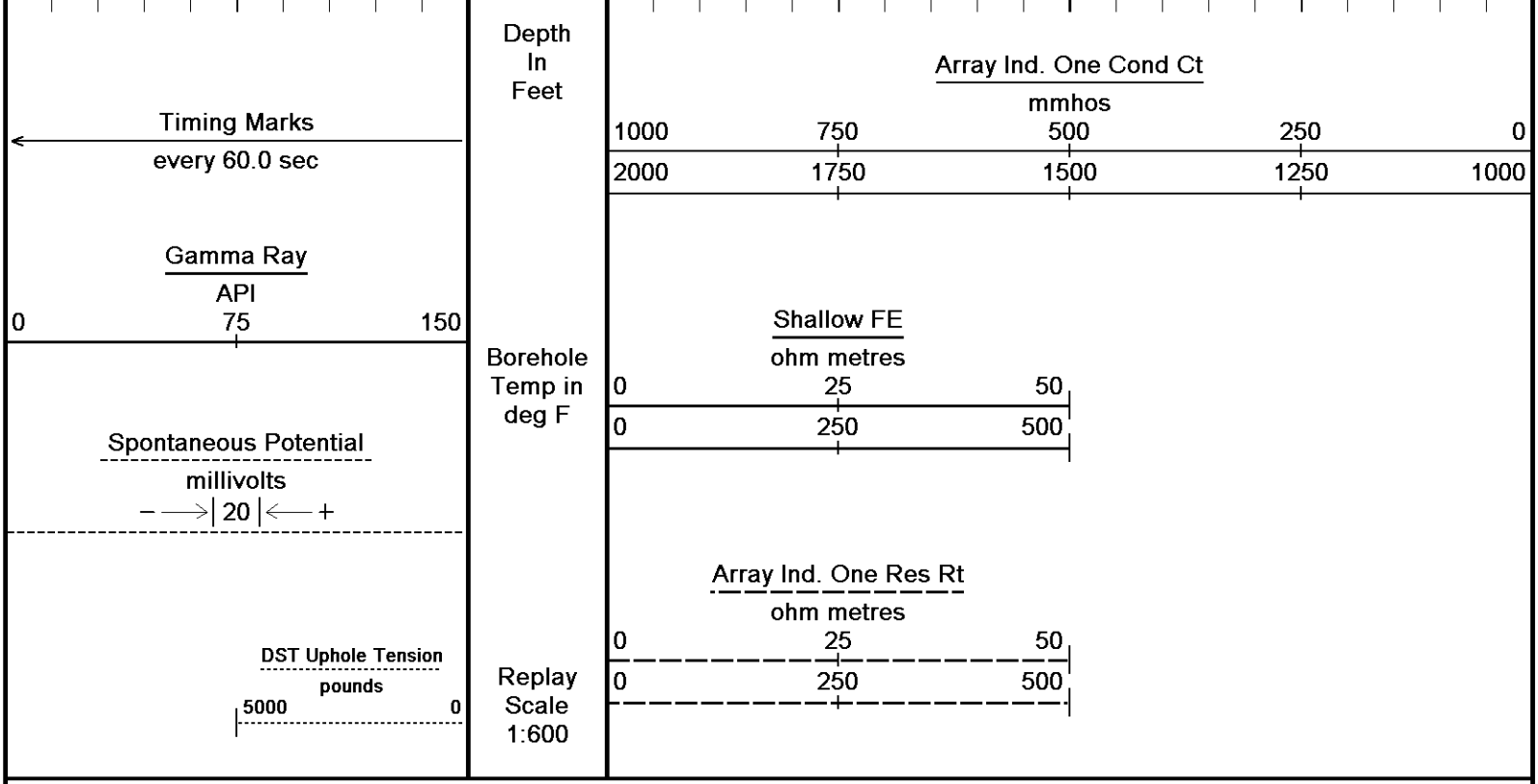

97°
3600
97°
3700
98°
3800
99°
3900
99°
4000
100°
4100


101°
4200
Array Ind. One Res Rt
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct
103°
4300
103°
4400
104°
4500
105°
4600


106°
4700
107°
4800
107°
4900
108°
5000
109°
5100
110°
5200
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE


Spontaneous Potential
Gamma Ray
DST Uphole Tension
110°
5300
111°
5400
112°
5500
113°
5600
113°
5700


114°
5800
118°
5900
117°
6000
117°
6100
118°
6200
6300
Array Ind. One Res Rt
Array Ind. One Cond Ct
FR Shallow FE
Spontaneous Potential
FR Gamma Ray
DST Uphole Tension
FR Array Ind. One Res Rt
FR Array Ind. One Cond Ct
FR DST Uphole Tension



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 03-APR-2011 13:05
Filename: C:\DOCUME~1\garcianr\LOCALS~1\Temp\Weatherford Pr...\APACHE HAGER 1-12_002.dta — Recorded on 03-APR-2011 01:40
System Versions: Logged with 11.03.2789 Plotted with 11.02.2164

2 INCH MAIN

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 03-APR-2011 13:05
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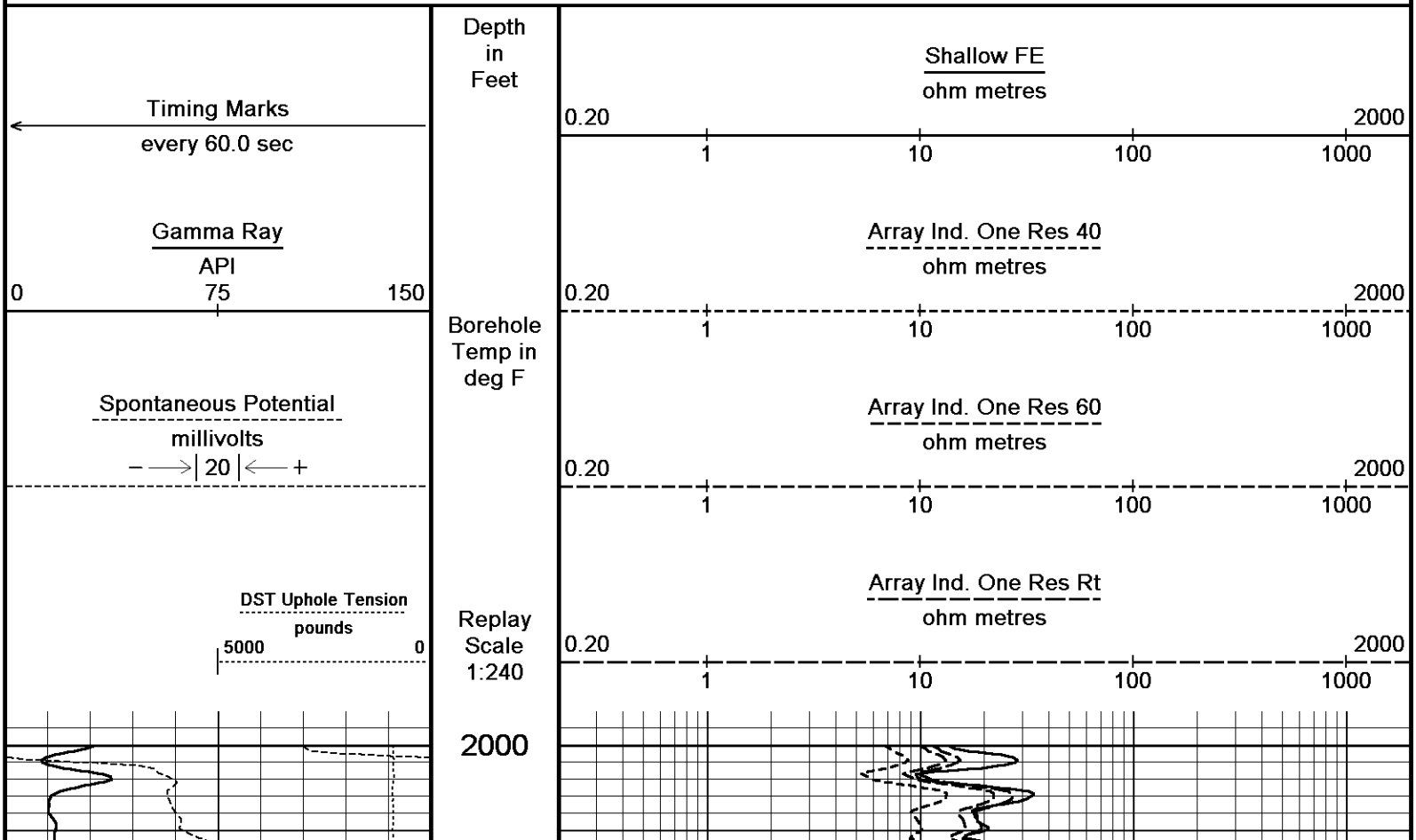
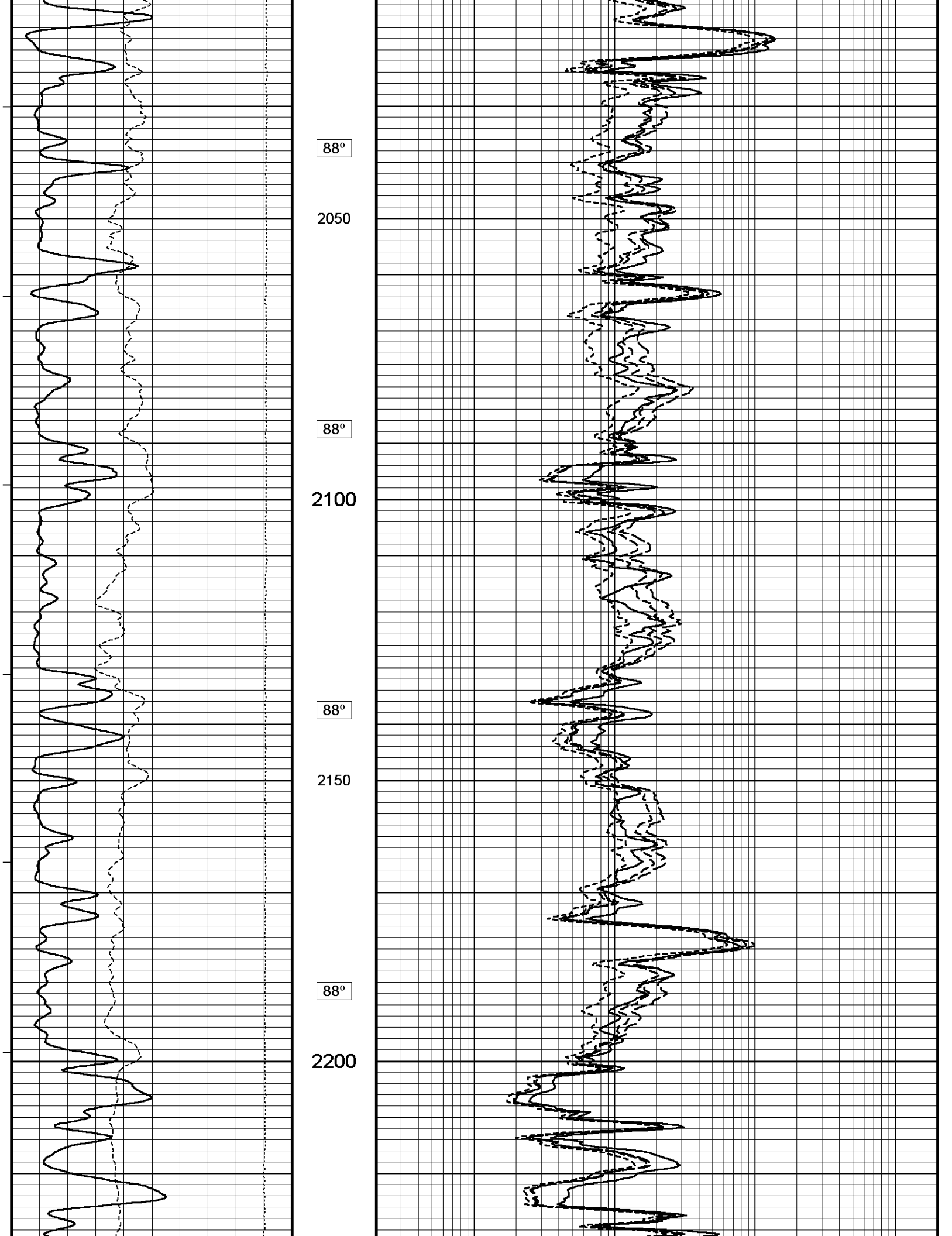
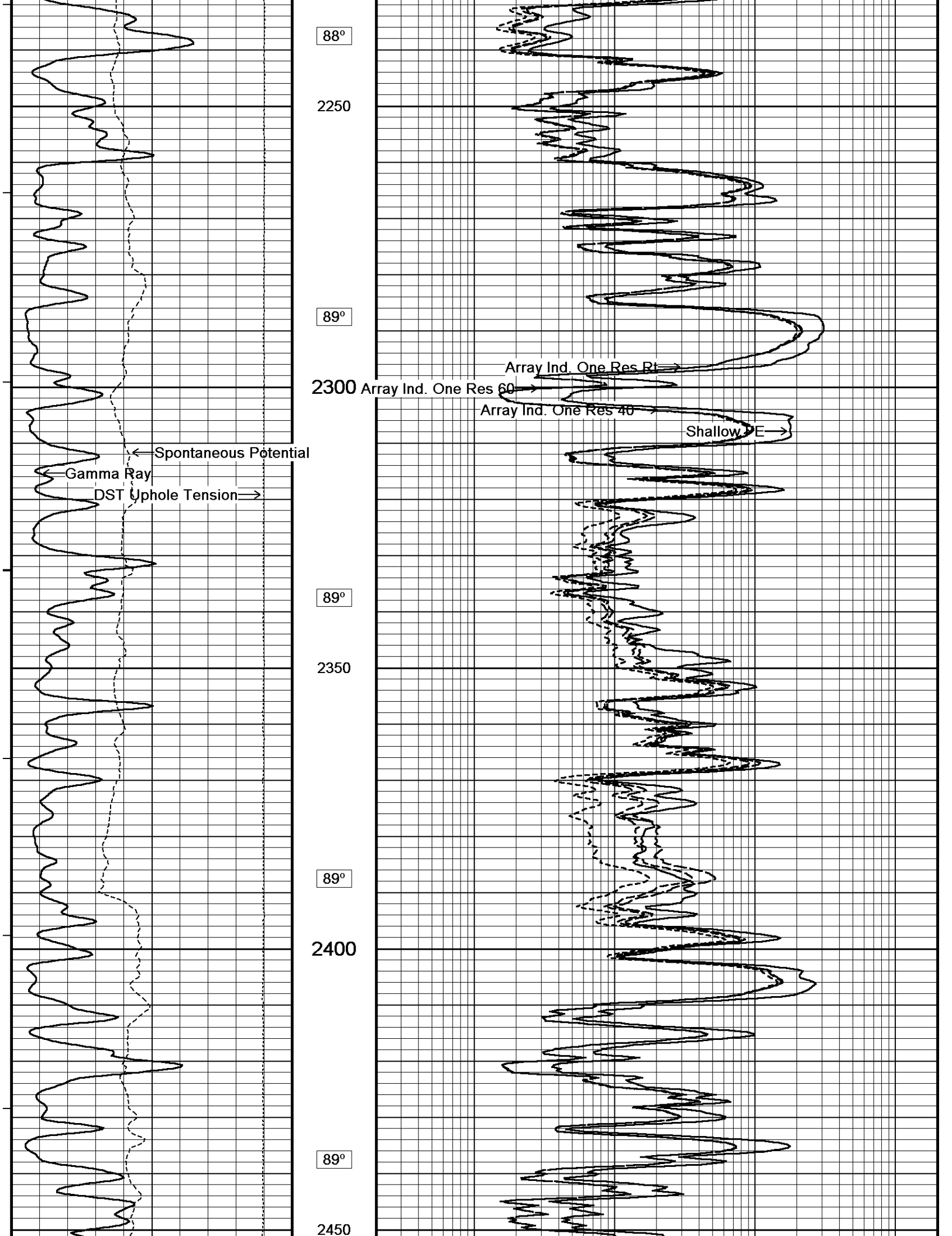
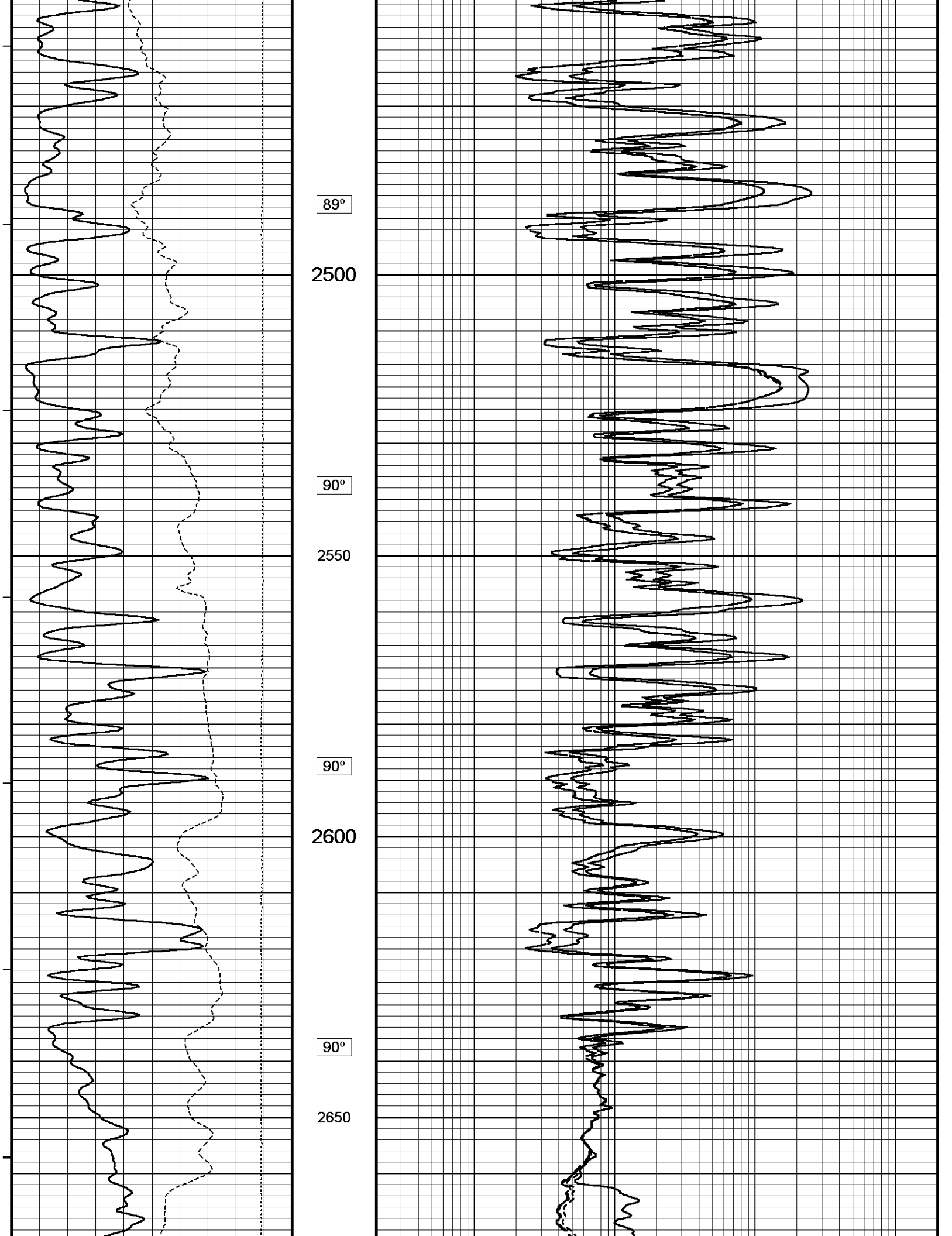
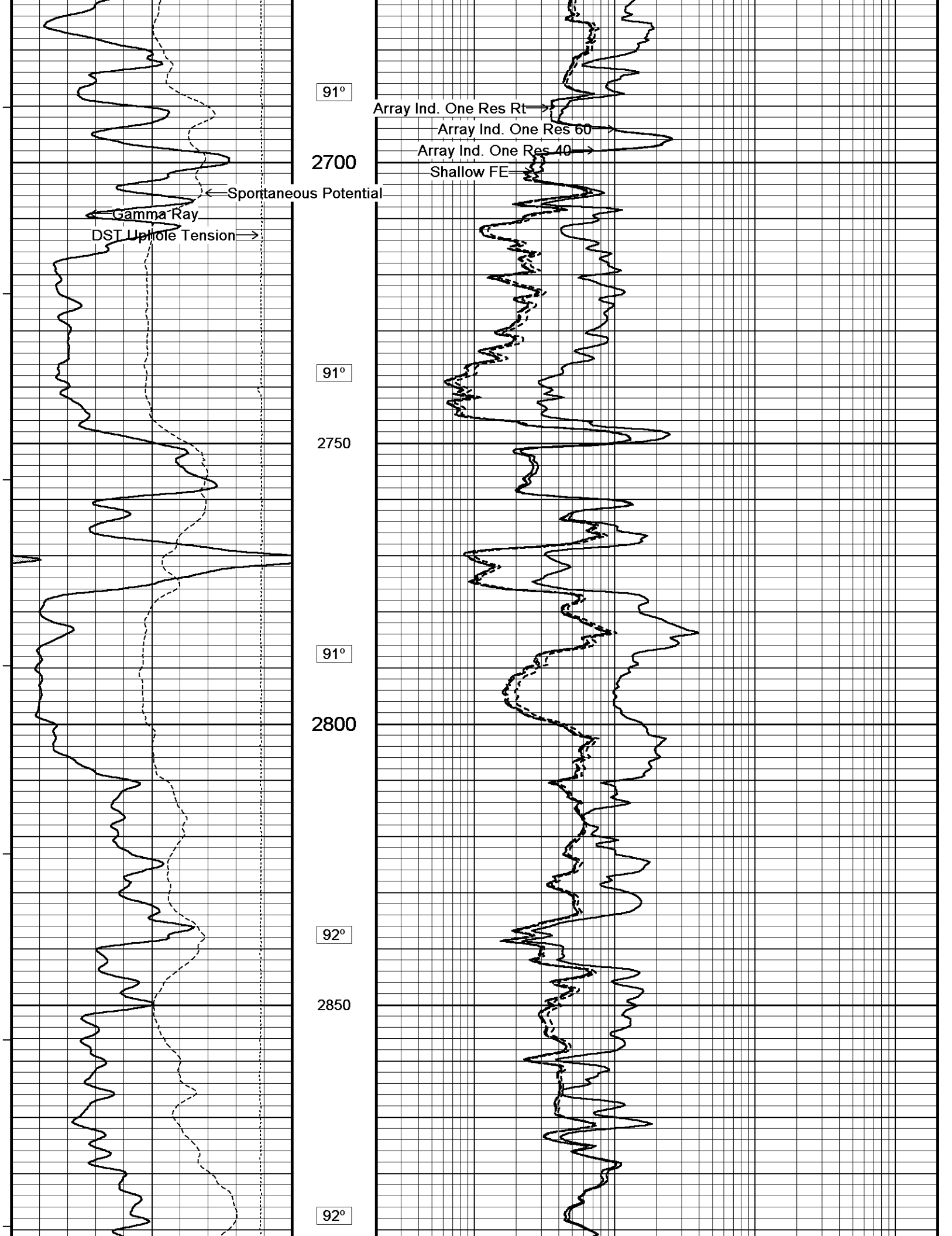
System Versions: Logged with 11.03.2789 Plotted with 11.02.2164

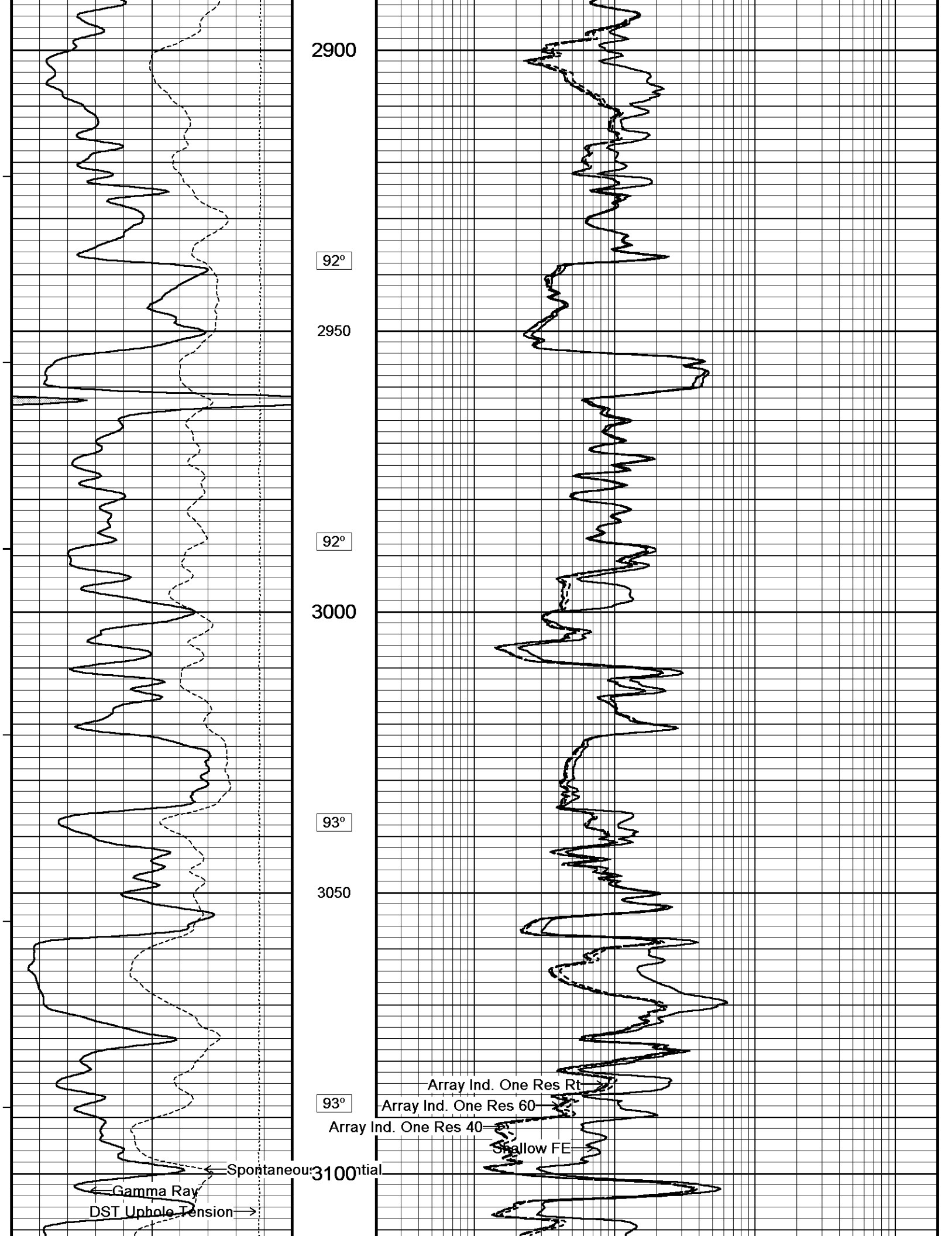


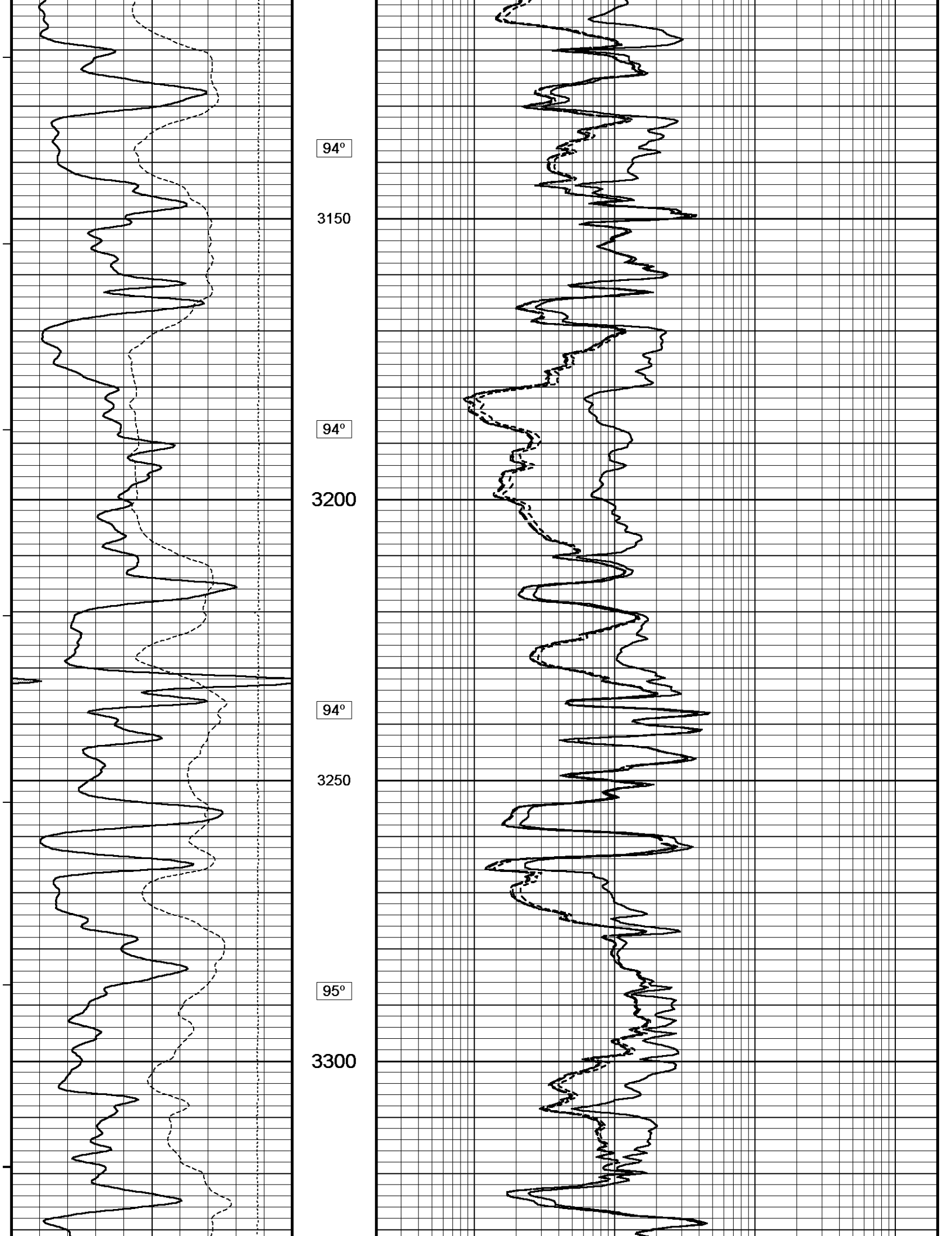

88°
2050
88°
2100
88°
2150
88°
2200

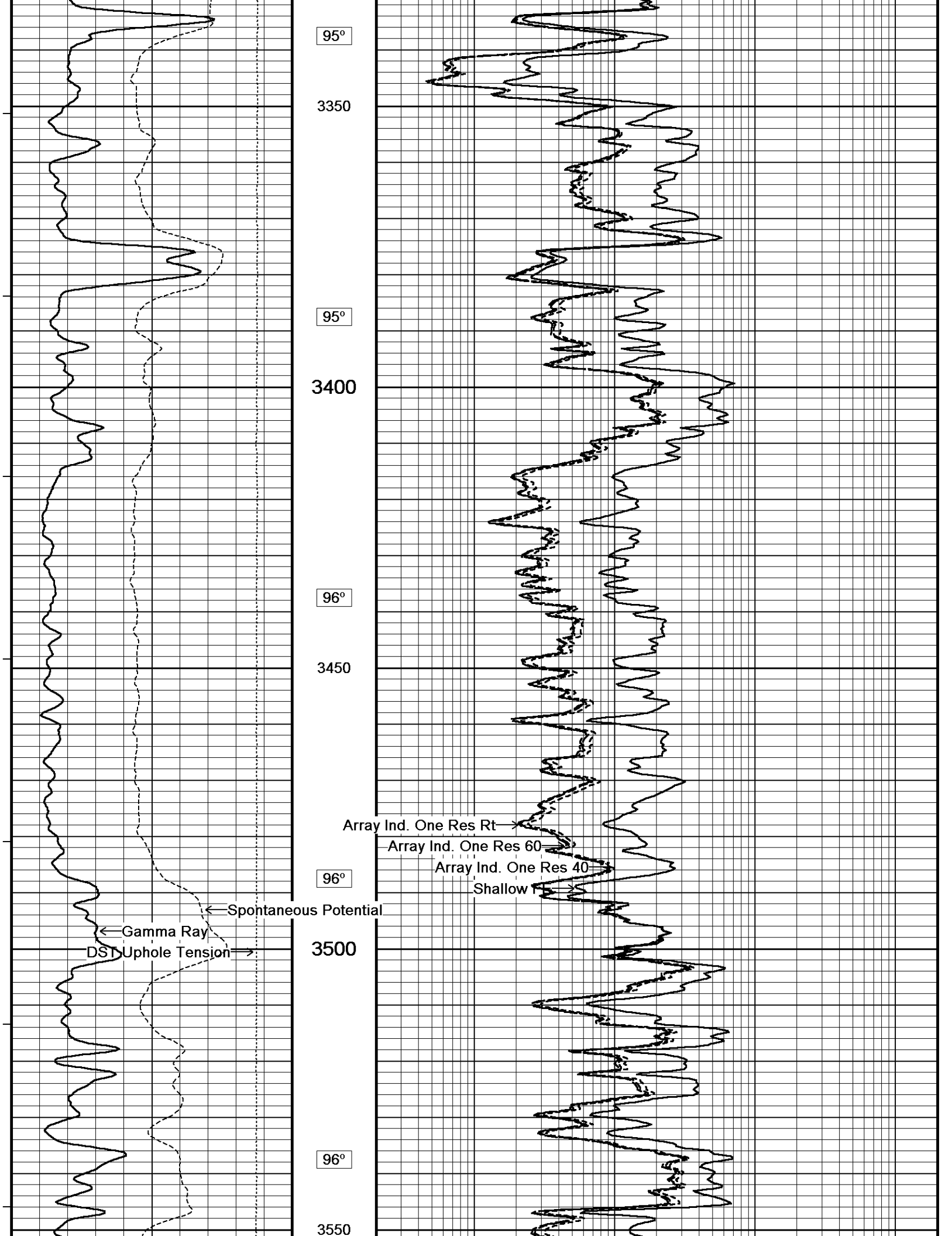

88°
2250
89°
Array Ind. One Res Rt
2300
Array Ind. One Res 60
Array Ind. One Res 40
Shallow ME
Spontaneous Potential
Gamma Ray
DST Uphole Tension
89°
2350
89°
2400
89°
2450

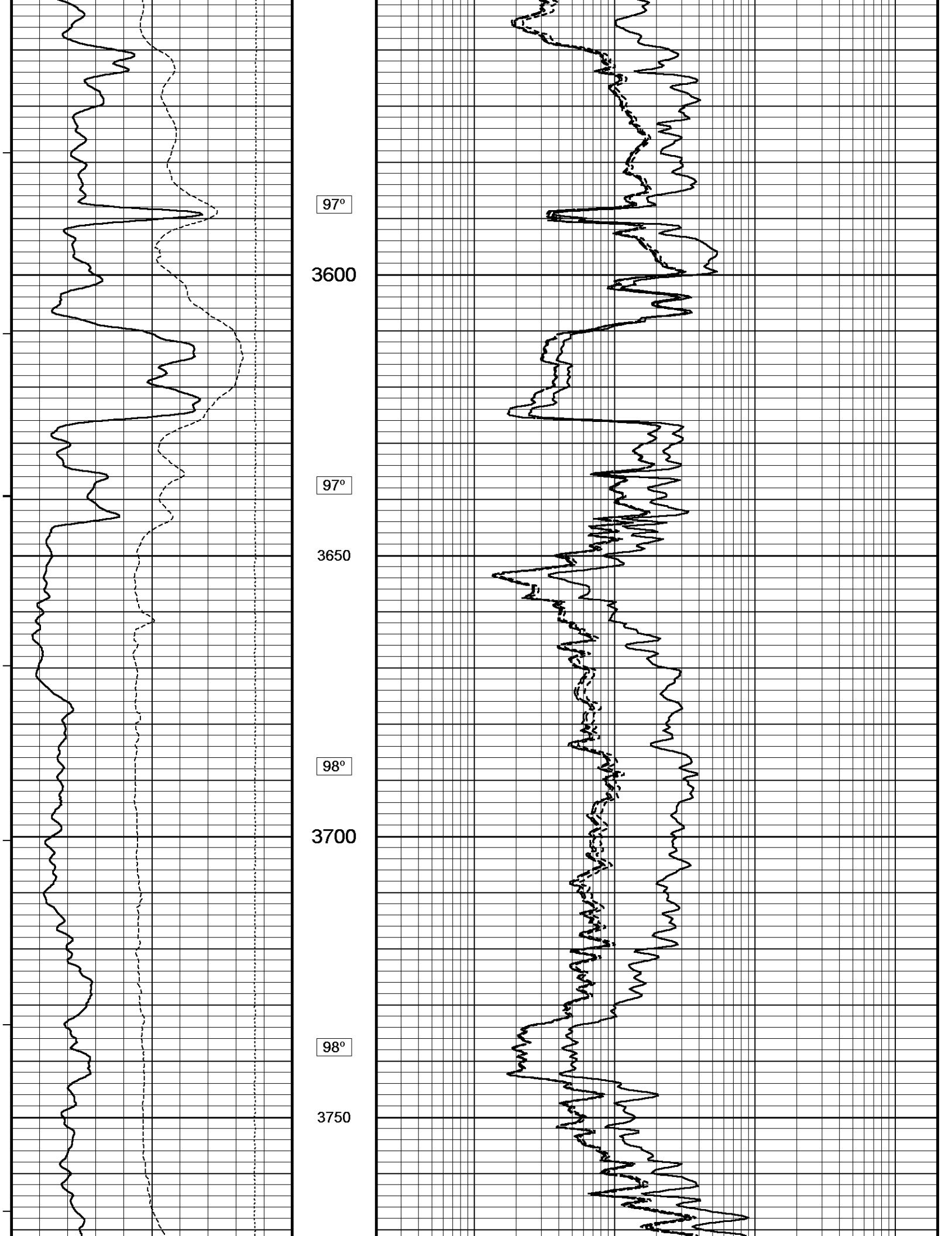

89°
2500
90°
2550
90°
2600
90°
2650

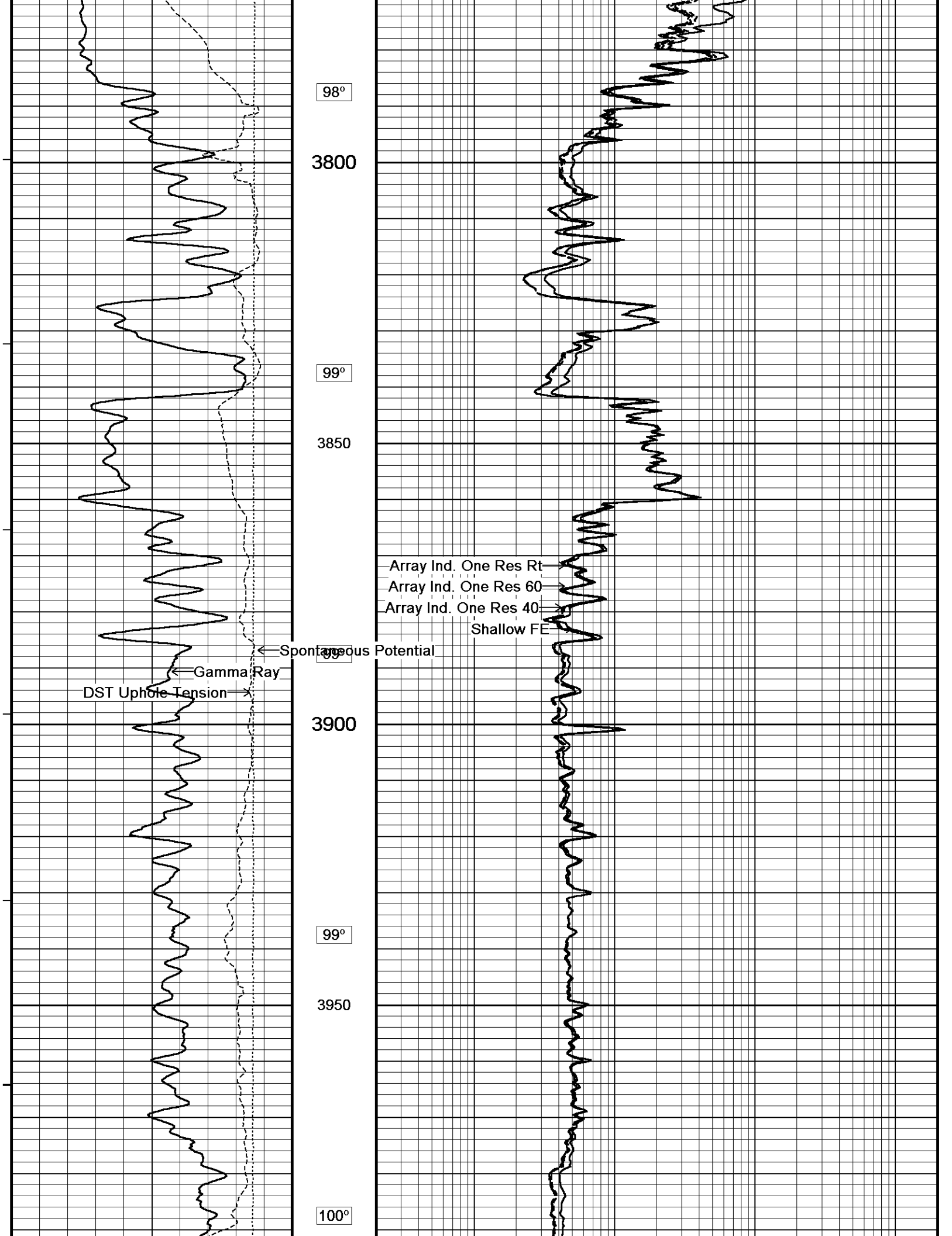

91°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
2700
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
91°
2750
91°
2800
92°
2850
92°

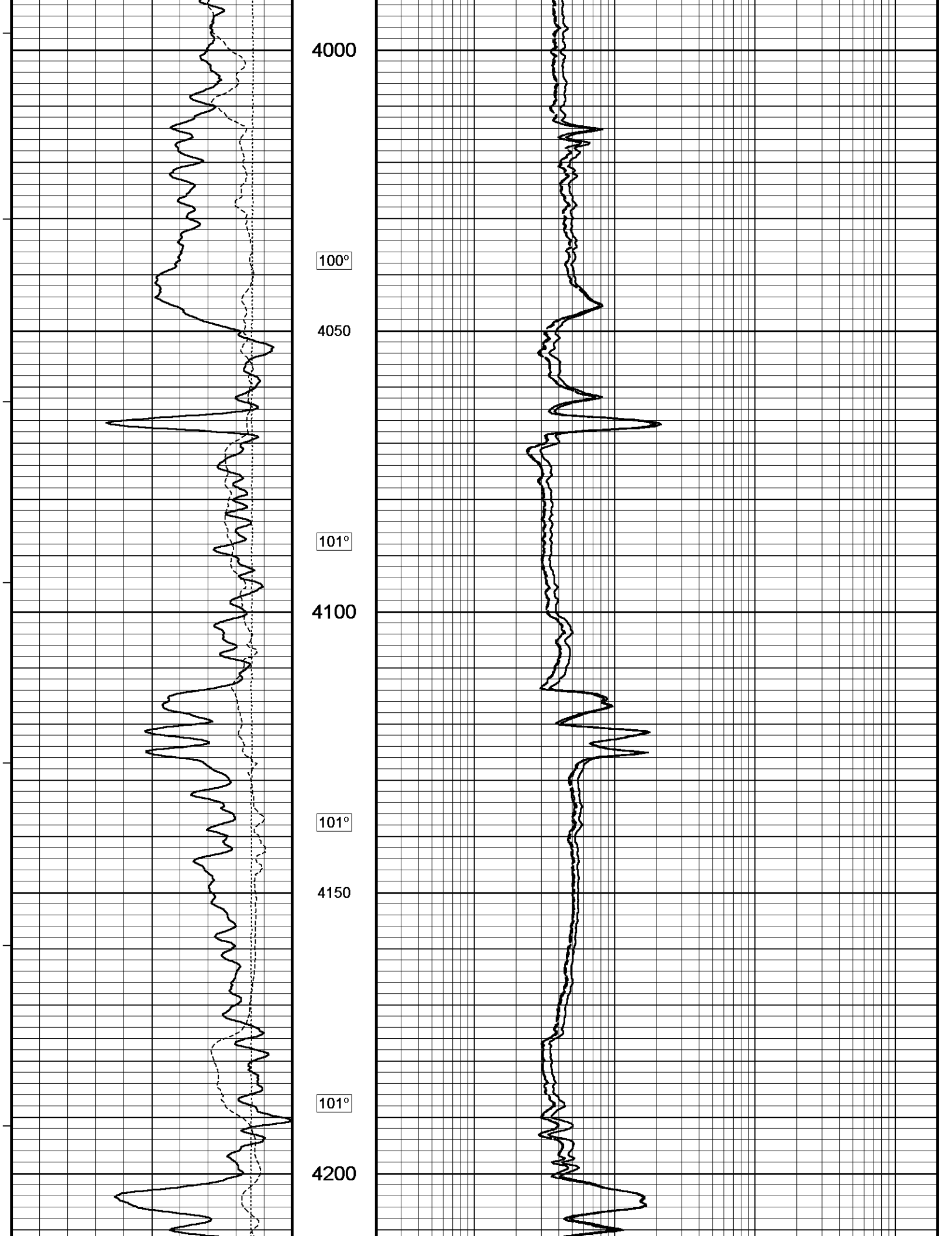

2900
92°
2950
92°
3000
93°
3050
93°
3100
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous
Gamma Ray
DST Uphole Tension

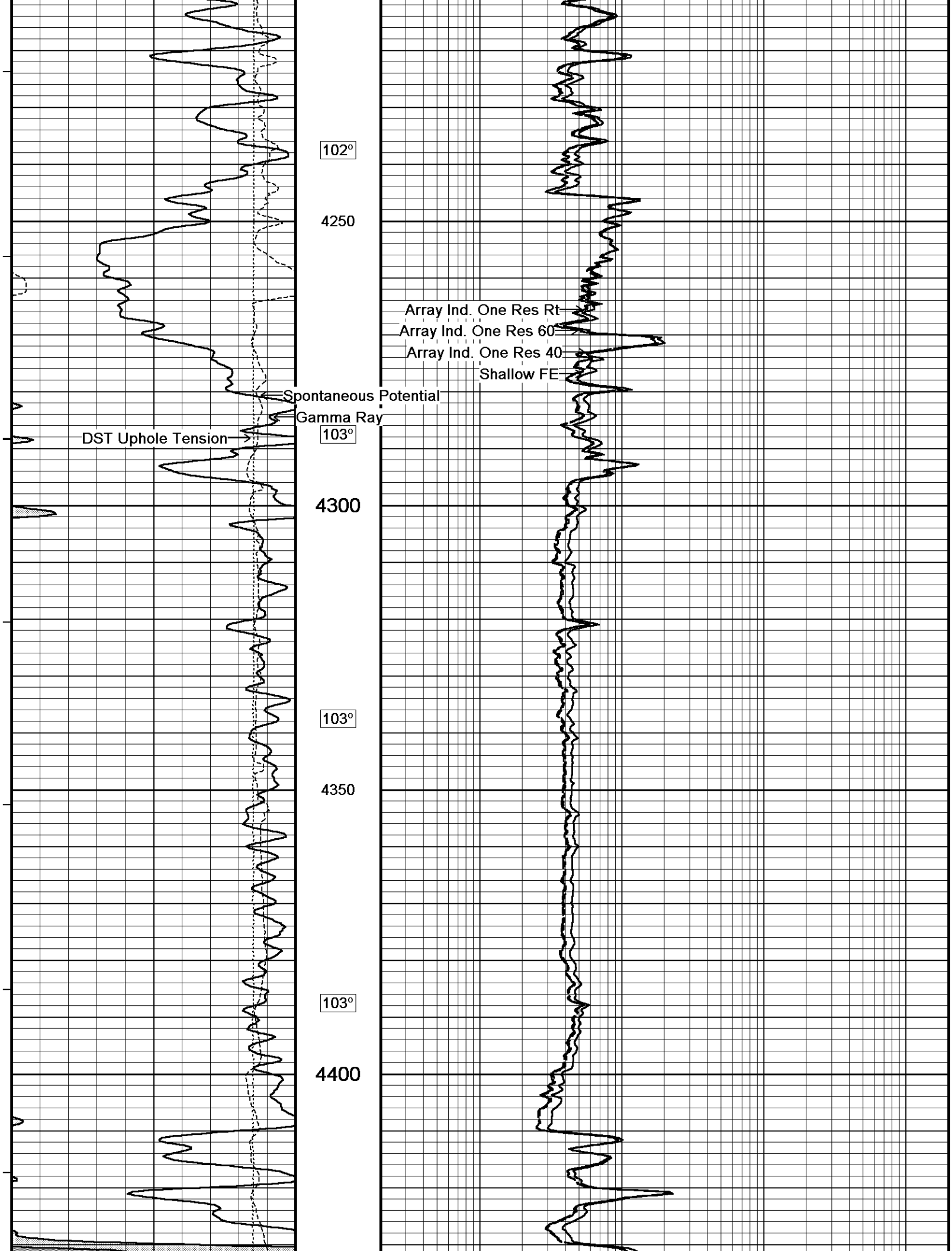

94°
3150
94°
3200
94°
3250
95°
3300

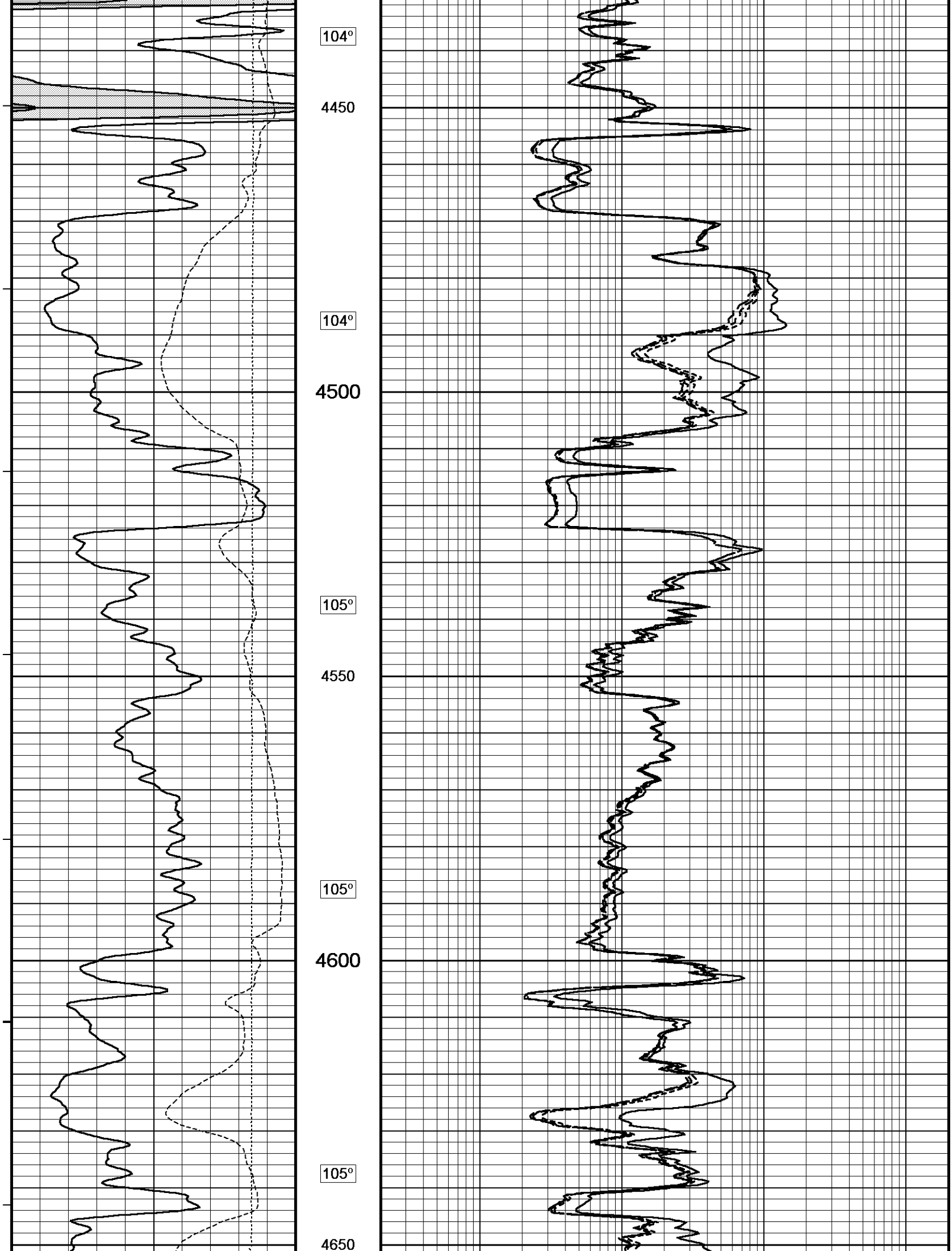

95°
3350
95°
3400
96°
3450
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow
96°
Spontaneous Potential
Gamma Ray
DST Uphole Tension
3500
96°
3550

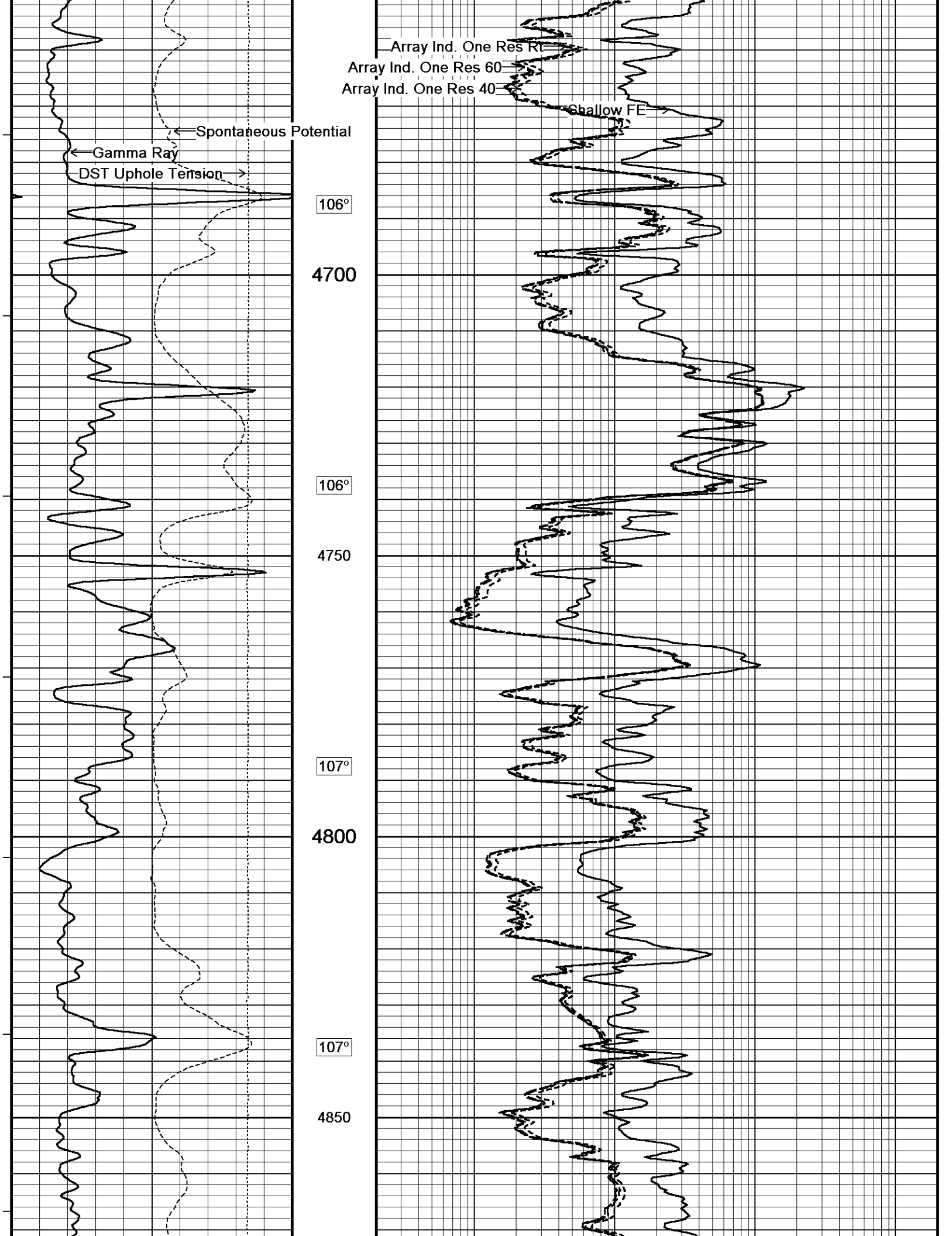

97°
3600
97°
3650
98°
3700
98°
3750

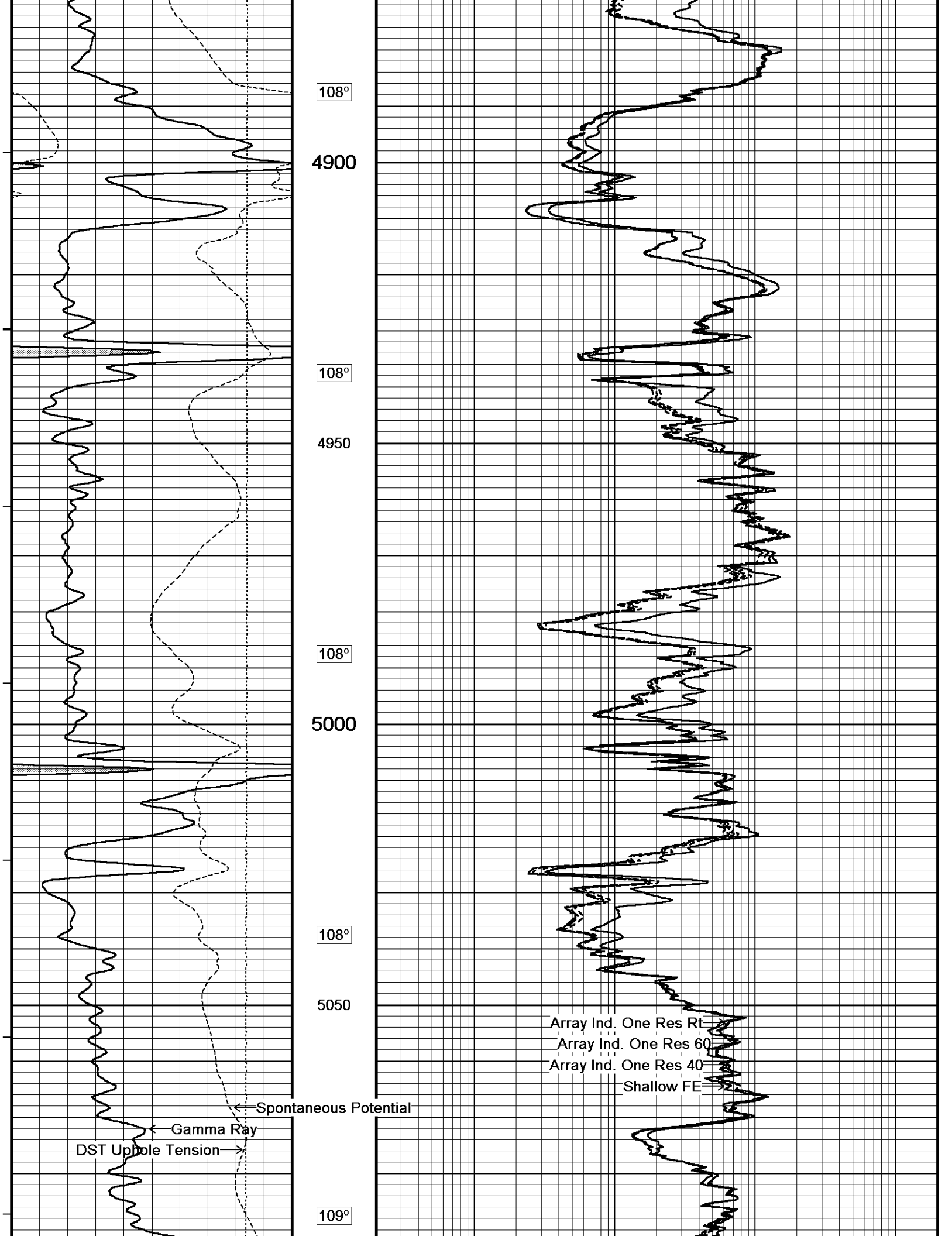

98°
3800
99°
3850
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
99
Gamma Ray
DST Uphole Tension
3900
99°
3950
100°


4000
100°
4050
101°
4100
101°
4150
101°
4200


102°
4250
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
103°
4300
103°
4350
103°
4400


104°
4450
104°
4500
105°
4550
105°
4600
105°
4650


Array Ind. One Res RT
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
106°
4700
106°
4750
107°
4800
107°
4850


108°
4900
108°
4950
108°
5000
108°
5050
109°
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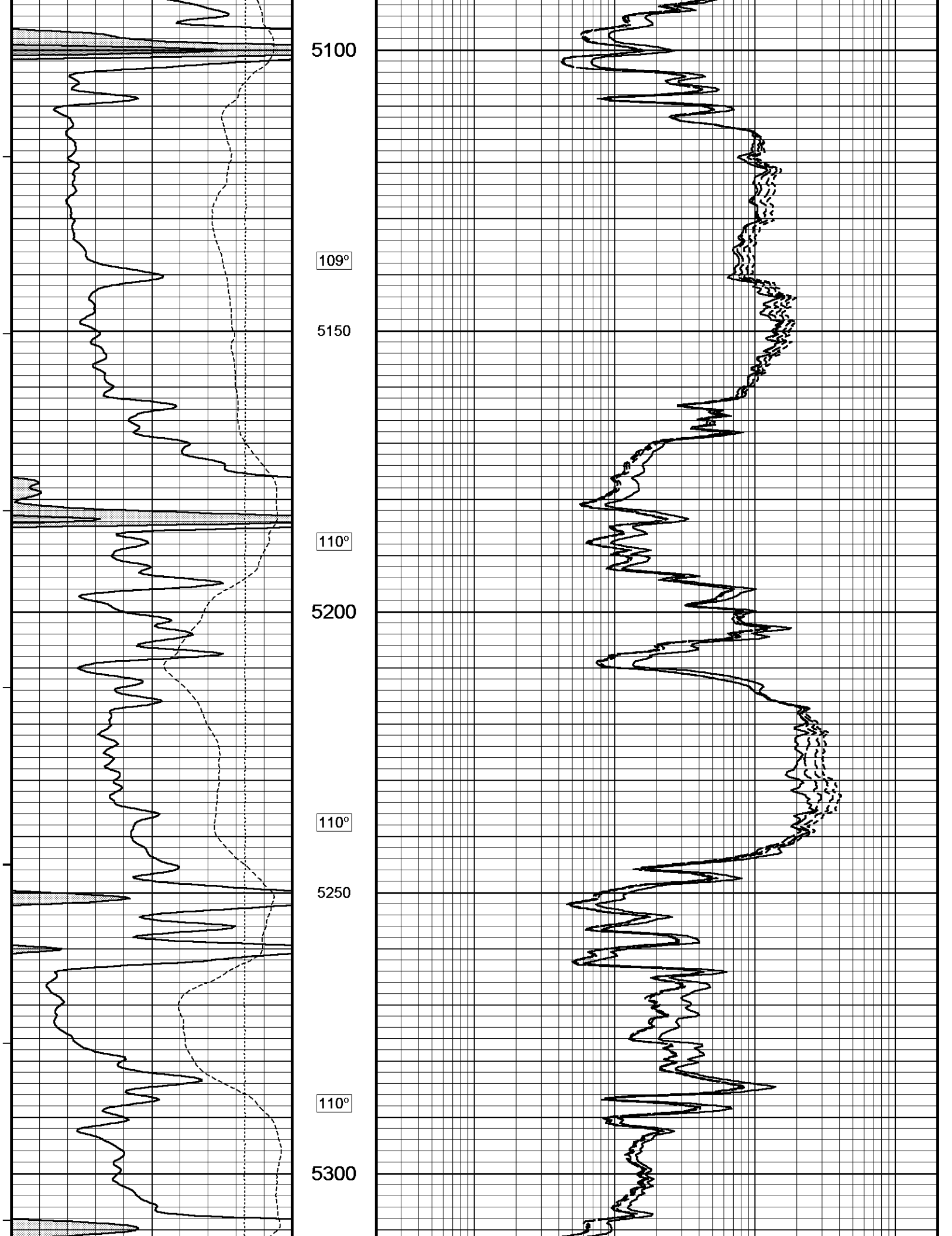
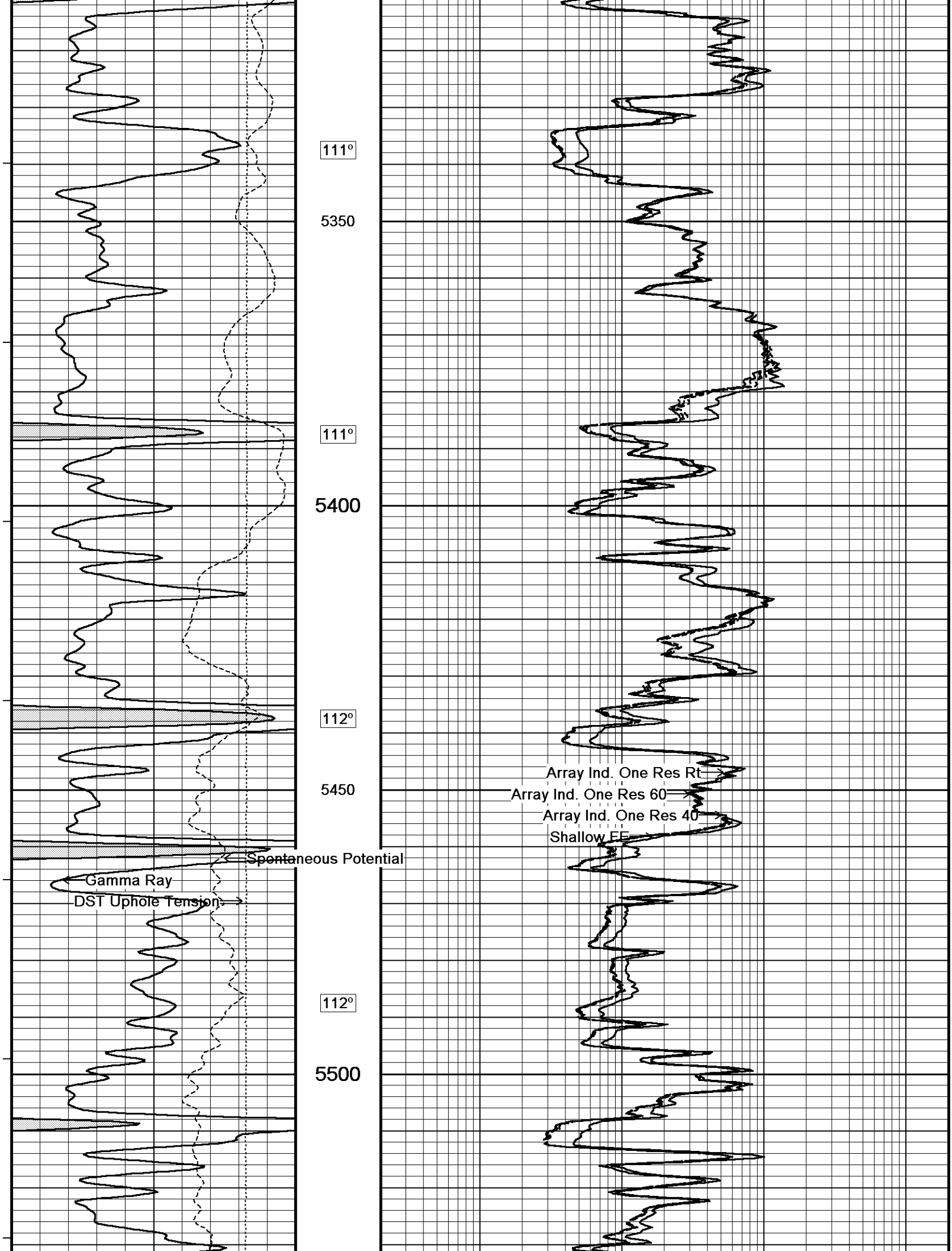
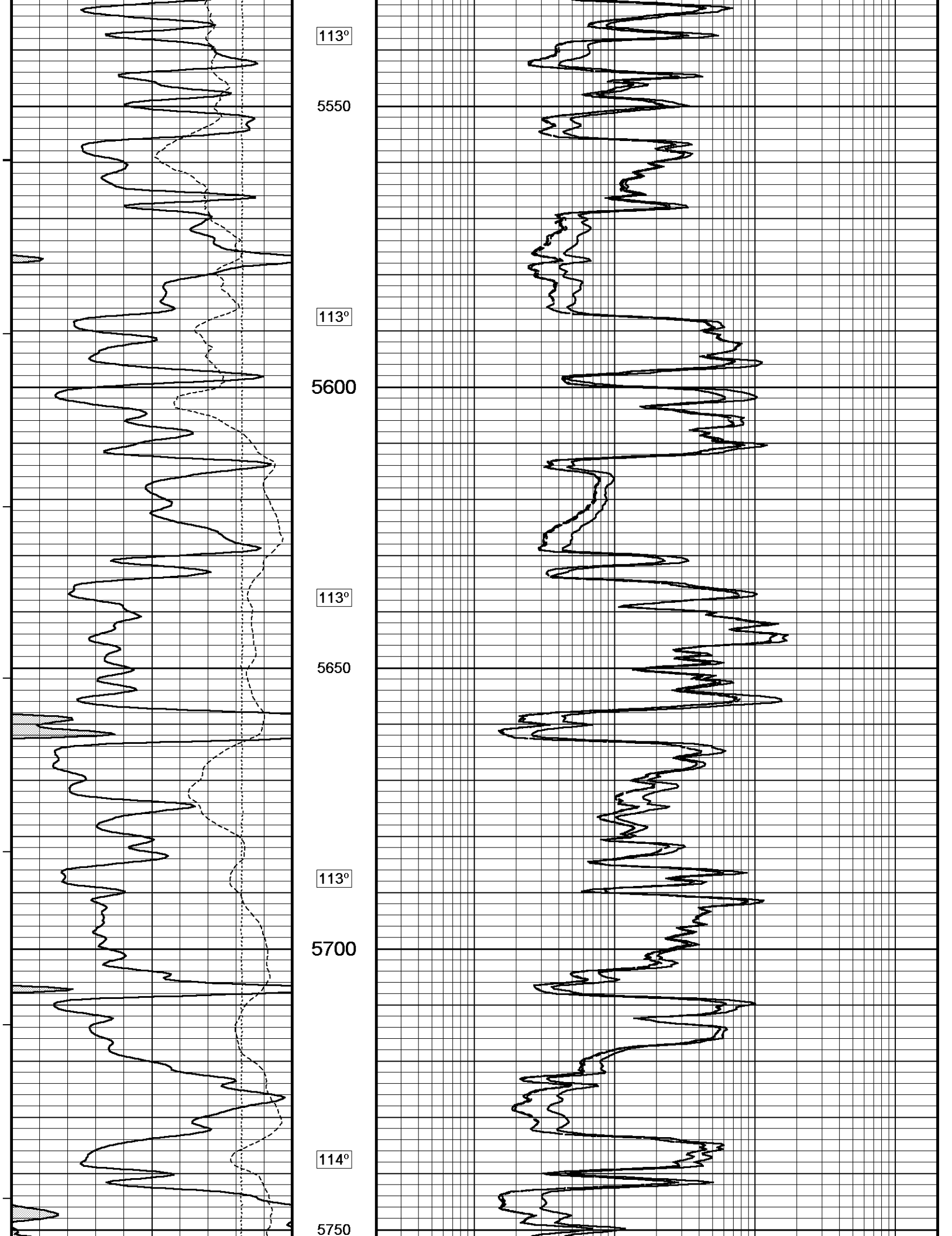
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension


5100
109°
5150
110°
5200
110°
5250
110°
5300


111°
5350
111°
5400
112°
5450
112°
5500
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension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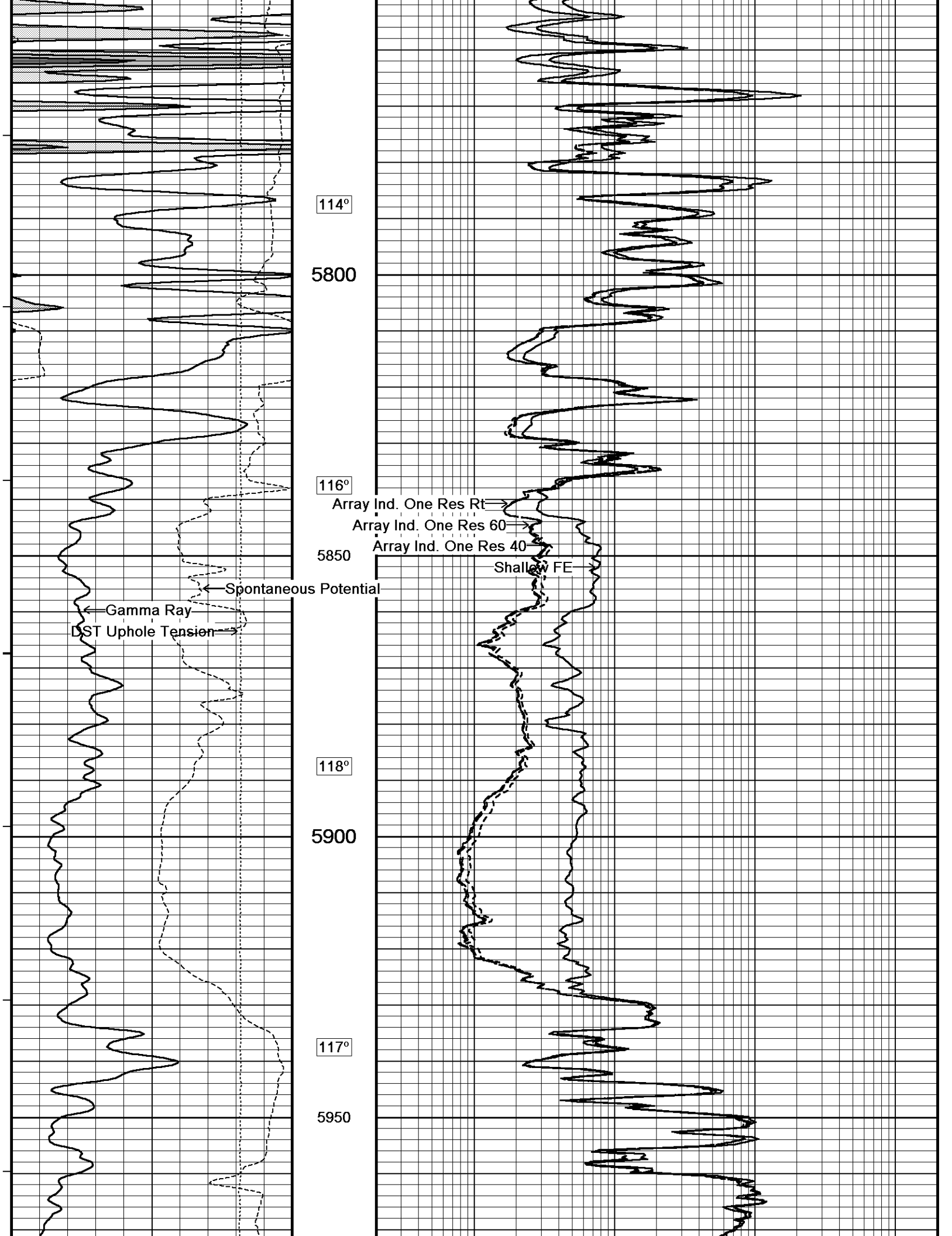
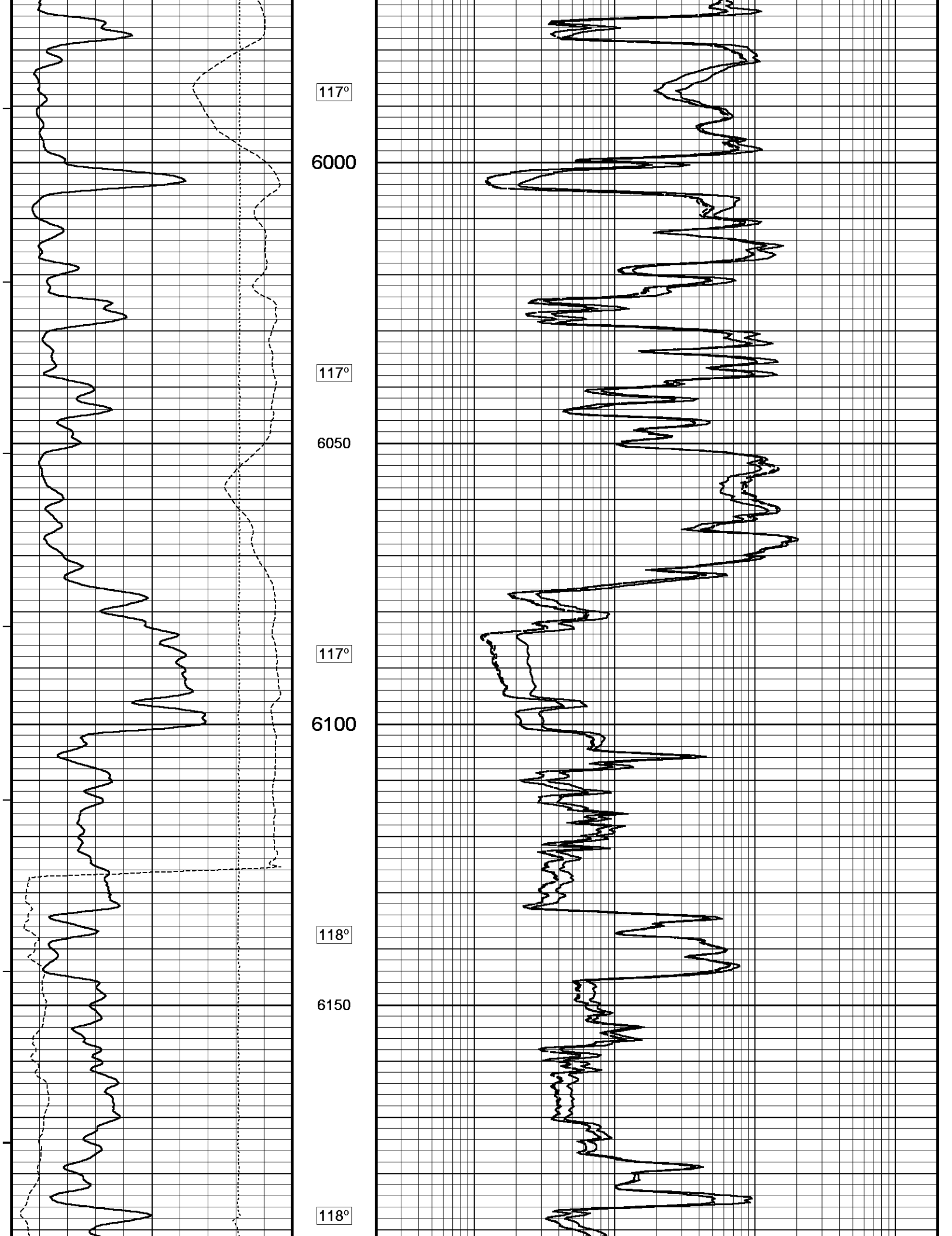
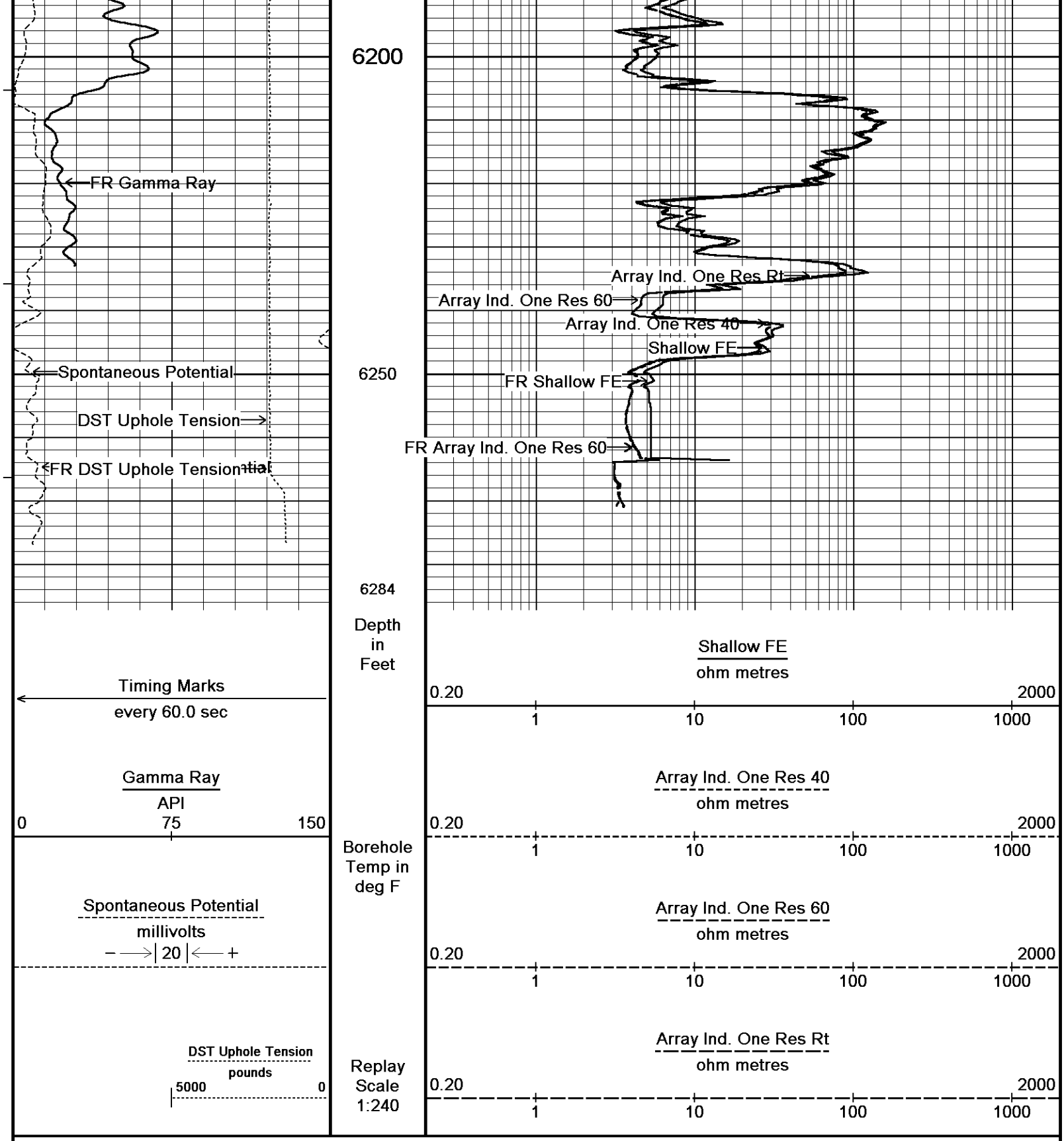
5600
113°
5650
113°
5700
114°
5750


114°
5800
116°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
5850
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
118°
5900
117°
5950


117°
6000
117°
6050
117°
6100
118°
6150
118°

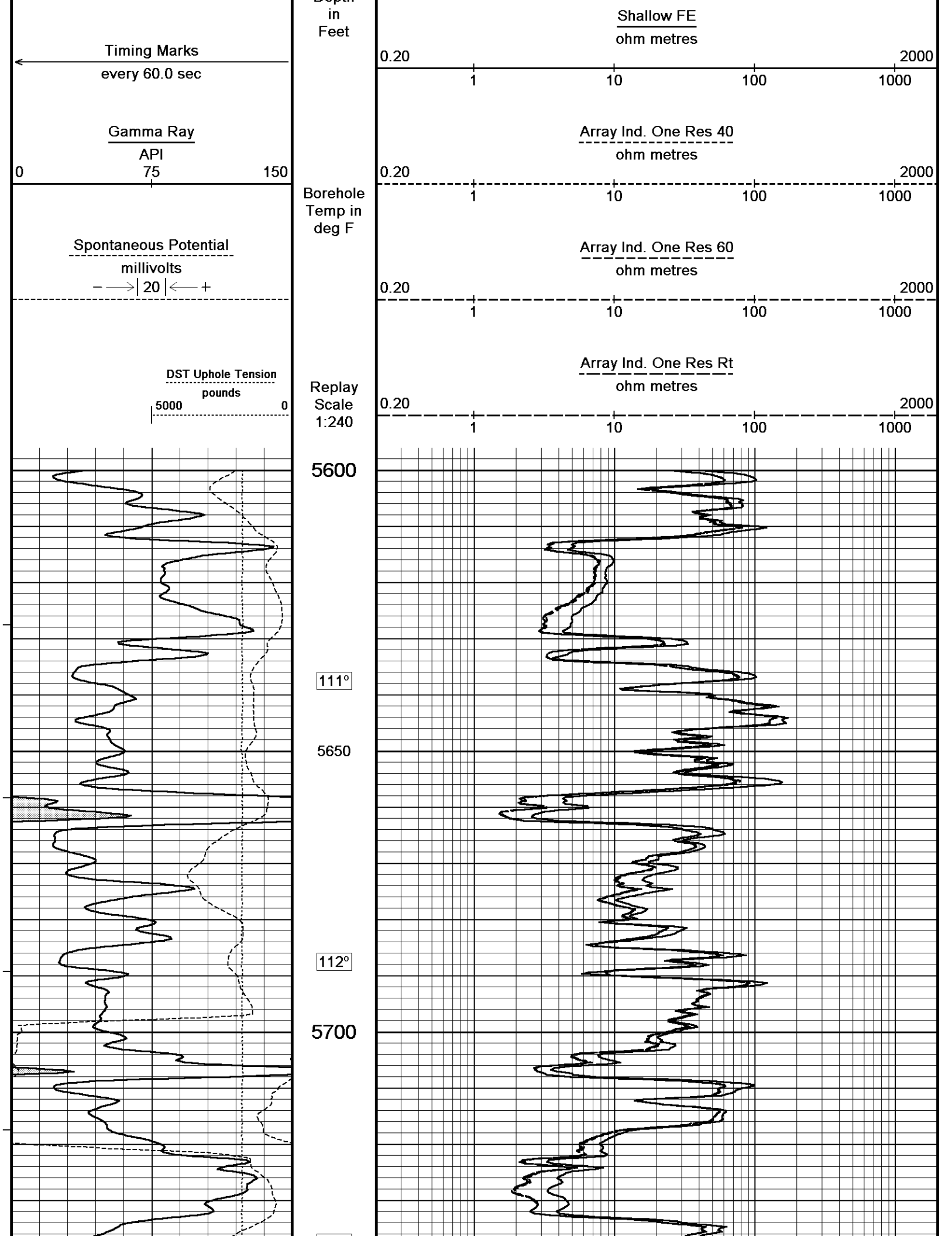


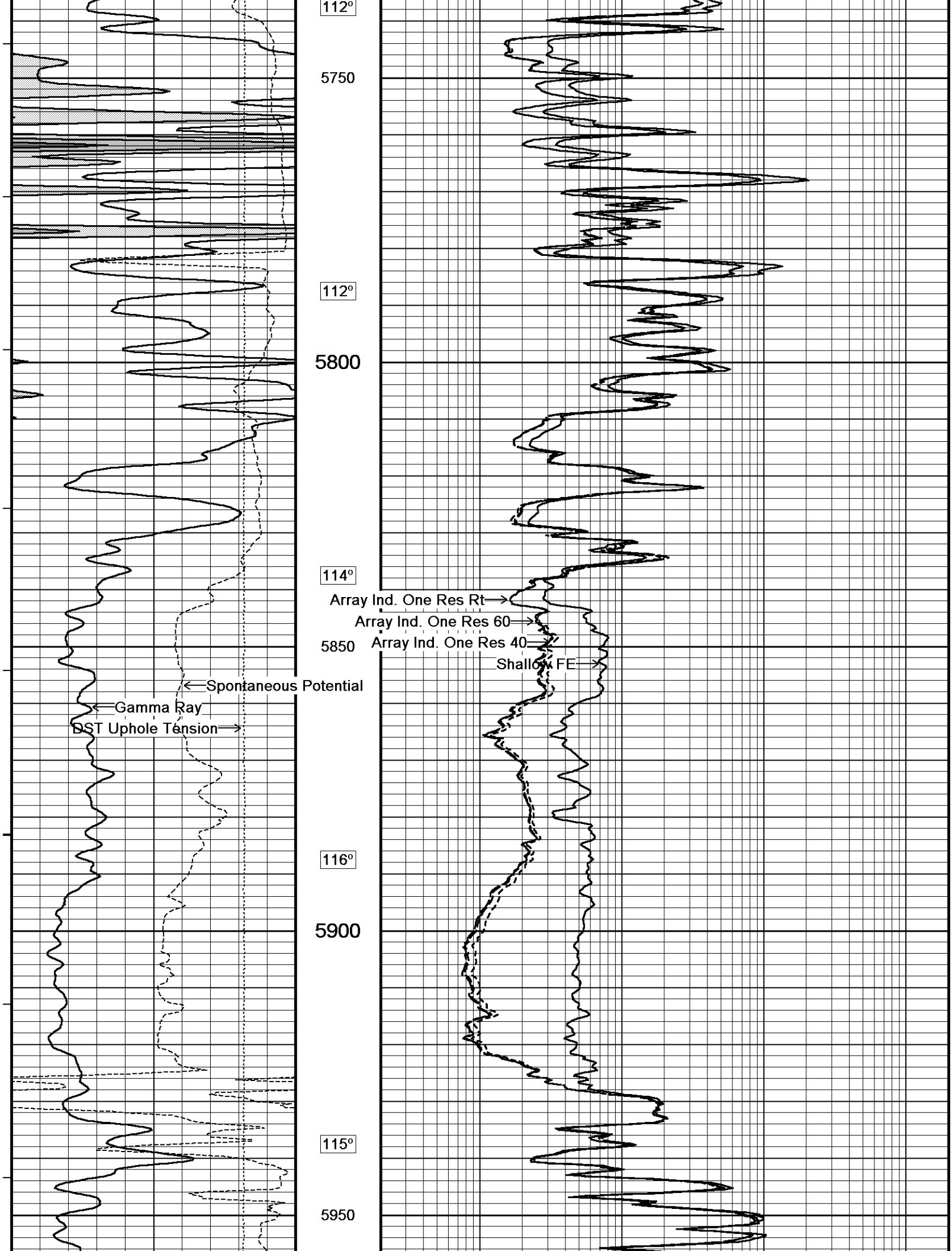
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 03-APR-2011 13:05
Filename: C:\DOCUME~1\garcianr\LOCALS~1\Temp\Weatherford Pr...\APACHE HAGER 1-12_002.dta
Recorded on 03-APR-2011 01:40
System Versions: Logged with 11.03.2789 Plotted with 11.02.2164

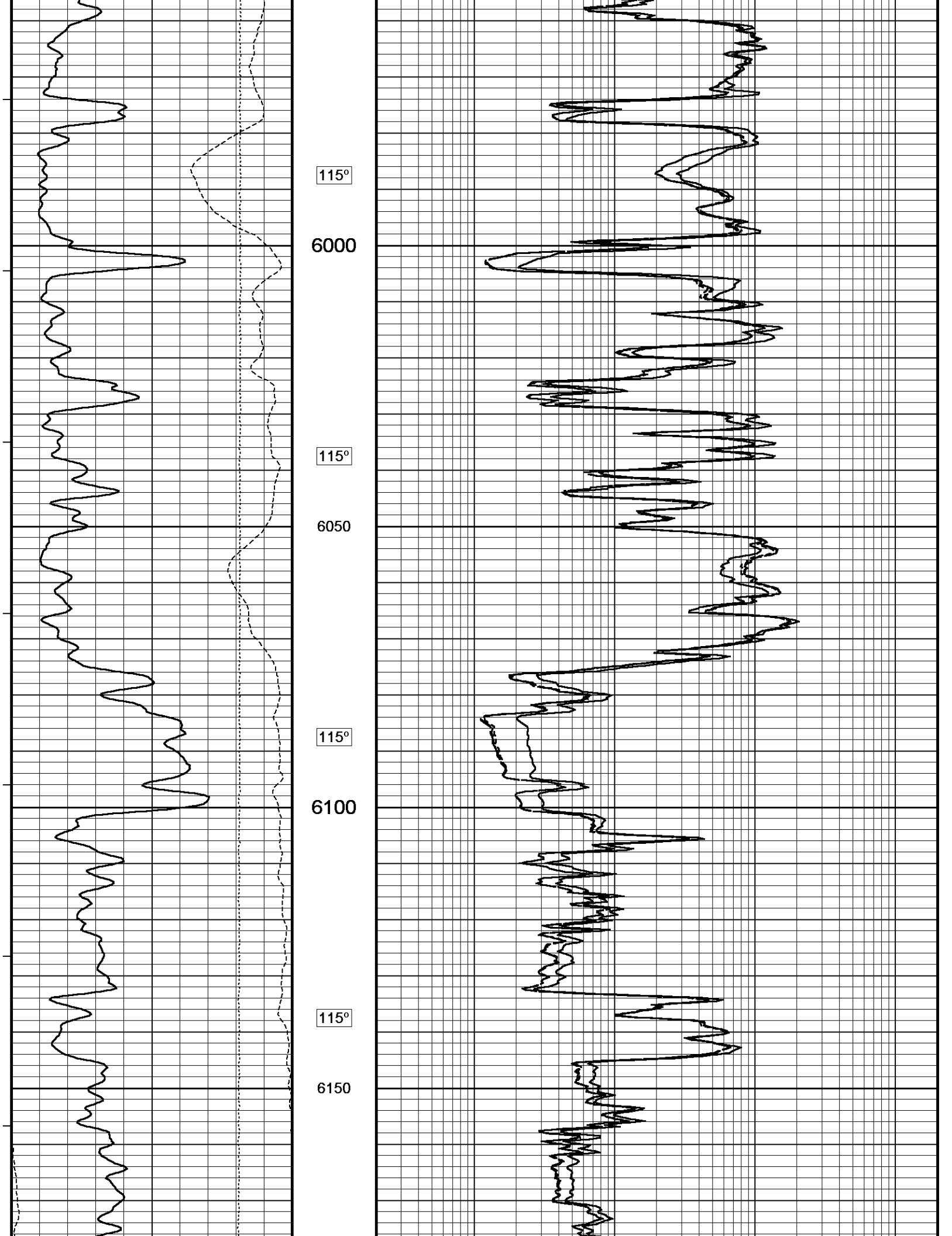
5 INCH MAIN

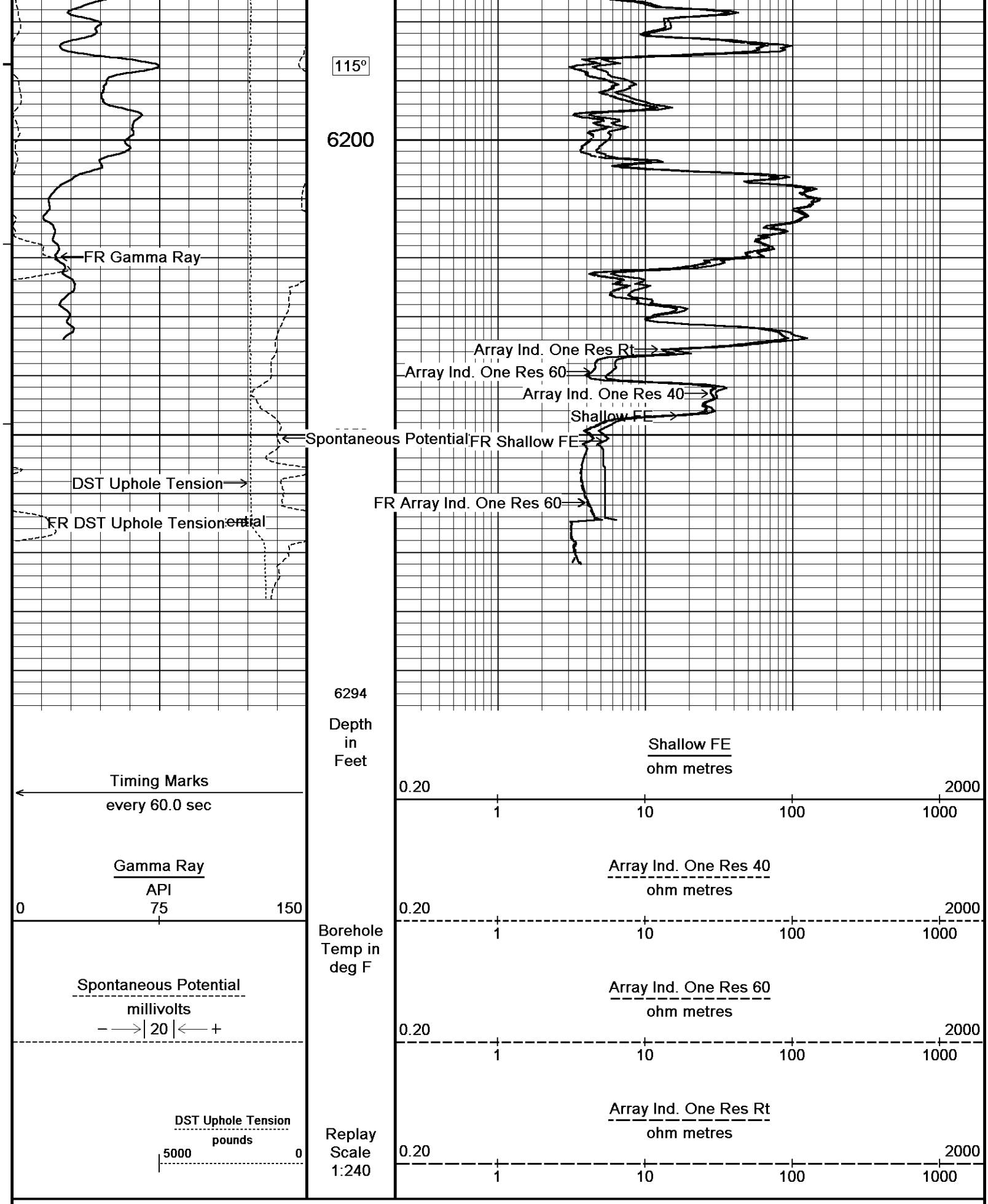
REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 03-APR-2011 13:05
Filename: C:\DOCUME~1\garcianr\LOCALS~1\Temp\Weatherford Pr...\APACHE HAGER 1-12_001.dta
Recorded on 03-APR-2011 00:59
System Versions: Logged with 11.03.2789 Plotted with 11.02.2164


Depth in Feet
Timing Marks
every 60.0 sec
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
Shallow FE
ohm metres
0.20
2000
1
10
100
1000
Array Ind. One Res 40
Array Ind. One Res 60
Array Ind. One Res Rt
5600
111°
5650
112°
5700


112°
5750
112°
5800
114°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
5850
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
116°
5900
115°
5950


115°
6000
115°
6050
115°
6100
115°
6150



Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 03-APR-2011 13:05
Filename: C:\DOCUME~1\garcianr\LOCALS~1\Temp\Weatherford Pr...\APACHE HAGER 1-12_001.dta
Recorded on 03-APR-2011 00:59
System Versions: Logged with 11.03.2789 Plotted with 11.02.2164

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\DOCUME~1\garcianr\LOCALS~1\Temp\Weatherford PreView\0\APACHE HAGER 1-12.dta

General Constants All 000

Last Edited on 02-APR-2011,20:45

General Parameters

Mud Resistivity	0.870	ohm-metres
Mud Resistivity Temperature	78.000	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Wet Hole	

Hole/Annular Volume and Differential Caliper Parameters

HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	5.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters

Porosity used	Base Density Porosity	
Resistivity used	Array Ind. One Res Rt	
RWA Constant A	1.000	
RWA Constant M	2.000	

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 30-JUN-2010

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

High Resolution Temperature Calibration MCG-C 139

Field Calibration on 03-SEP-2010,11:23

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

High Resolution Temperature Constants MCG-C 139

Last Edited on

Pre-filter Length	11

SP Calibration MCG-C 139

Field Calibration on 04-MAR-2011 06:37

	Measured	Calibrated (mV)
Reference 1	103.7	100.0
Reference 2	-96.9	-100.0

Gamma Calibration MCG-C 139

Field Calibration on 02-APR-2011 19:01

	Measured	Calibrated (API)
Background	68	46
Calibrator (Gross)	1138	771
Calibrator (Net)	1071	725

Gamma Constants MCG-C 139

Last Edited on 02-APR-2011,20:45

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

Micro Normal and Micro Inverse Calibration MML-A 16

Base Calibration on 11-MAR-2011 11:10
Field Check on 02-APR-2011 18:47

Base Calibration

Channel	Measured Resistor 1	Measured Resistor 2	Calibrated (ohm-m) Resistor 1	Calibrated (ohm-m) 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 02-APR-2011,18:46

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	0.5110	
Micro Inverse K Factor	0.3380	
Standoff Offset	N/A	inches

Caliper Calibration MML-A 16

Base Calibration on 11-MAR-2011 11:20
Field Calibration on 02-APR-2011 18:51

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13875	5.98
2	17350	7.97
3	20581	9.86
4	24656	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

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

Neutron Calibration MDN-A.B 66

Base Calibration on 11-MAR-2011 13:54
Field Check on 02-APR-2011 18:55

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3091	97	3714	110
Ratio	31.957		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	1660	2371
Ratio	0.700	

Field Check

	Calibrated (cps)	
	1663	2382
Ratio	0.698	

Neutron Constants MDN-A.B 66

Last Edited on 02-APR-2011,20:46

Neutron Source Id	P58125B	
Neutron Jig Number	5824NE	
Epithermal Neutron	No	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.08	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	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 52

Base Calibration on 11-MAR-2011 10:55
Field Check on 02-APR-2011 18:41

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	965.7	126.8

Base Check	279.9
Field Check	279.9

FE Constants MFE-A.A 52

Last Edited on 02-APR-2011,18:40

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

High Resolution Temperature Calibration MAI-A.A 167

Field Calibration on 17-JAN-2011,18:32

	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

Induction Calibration MAI-A.A 167

Base Calibration on 11-MAR-2011,09:58
Field Check on 02-APR-2011 18:40

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	13.0	3839.1
2	0.0	0.0	29.5	3476.9
3	0.0	0.0	29.0	3053.1
4	0.0	0.0	19.7	2081.9
Deep	0.0	0.0	18.5	2049.2
Medium	0.0	0.0	42.1	3991.2
Shallow	0.0	0.0	42.9	5053.8
Array Temperature	0.0		74.7	Deg F

Induction Constants MAI-A.A 167

Last Edited on 02-APR-2011,18:37

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 35

Base Calibration on 11-MAR-2011 11:34
Field Calibration on 02-APR-2011 18:49

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	17936	3.99
2	28079	5.98
3	38384	7.97
4	48048	9.86
5	59047	11.92
6	N/A	N/A

Field Calibration

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

Photo Density Calibration MPD-B 35

Base Calibration on 11-MAR-2011 11:54
Field Check on 02-APR-2011 18:46

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	57876	27553	59556	30836
Reference 2	23524	2615	24941	2541

Field Check at Base		
	1175.2	1398.5

Field Check		
	1173.8	1392.5

PE Calibration

Base Calibration	Measured			Calibrated
	WS	WH	Ratio	Ratio
Background	211	1039		
Reference 1	21426	57673	0.375	0.371
Reference 2	6234	23377	0.270	0.272

Field Check at Base		
211.2	1039.0	

Field Check		
209.4	1039.0	

Density Constants MPD-B 35

Last Edited on 02-APR-2011,20:46

Density Source Id	p50557b	
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	1.08	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	0.00

DOWNHOLE EQUIPMENT

C:\DOCUME~1\garcianr\LOCALS~1\Temp\Weatherford PreView\0\APACHE HAGER 1-12.dta

Compact Comms Gamma
MCG-C 139 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 Neutron
MDN-A.B 66 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

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-A.A 52 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

Total Length: 50.32 ft Weight: 407.9 lb

45.04 ft	GRGC - Gamma Ray
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
30.61 ft	NPRL - Limestone Neutron Por.
23.37 ft	CLDC - Density Caliper
21.44 ft	DPRL - Limestone Density Por.
21.44 ft	DEN - Compensated Density
21.44 ft	DCOR - Density Correction
21.38 ft	PDPE - PE
13.72 ft	FEFE - Shallow FE
3.34 ft	R40O - Array Ind. One Res 40
3.34 ft	RTAO - Array Ind. One Res Rt
3.34 ft	R60O - Array Ind. One Res 60
0.23 ft	SPCG - Spontaneous Potential
Tool Zero	(0.13ft from bottom)
-0.13 ft	SMTU - DST Uphole Tension

All measurements relative to tool zero.

COMPANY	APACHE CORP.
WELL	HAGER 1-12
FIELD	UNNAMED
PROVINCE/COUNTY	MEADE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2371.00	feet	First Reading	6262.00	feet
Elevation Drill Floor	2369.00	feet	Depth Driller	6260.00	feet
Elevation Ground Level	2359.00	feet	Depth Logger	6265.00	feet

Weatherford®

ARRAY INDUCTION SHALLOW FOCUSSED ELECTRIC LOG

40 Years of Wireline 1970 2010

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COMPANY	APACHE CORP.		
WELL	HAGER 1-12		
FIELD	UNNAMED		
PROVINCE/COUNTY	MEADE		
COUNTRY/STATE	U.S.A. / KANSAS		
LOCATION	1320' FSL & 1320' FWL		
SEC 12 / TWP 34S / RGE 28W	Other Services MPD/MDN	MML	
API Number 15-119-21263 / Permit Number			
Permanent Datum G.L., Elevation 2359 feet		Elevations:	feet
Log Measured From K.B. @ 12 FEET above Permanent Datum		KB	2371.00
Drilling Measured From K.B.		DF	2369.00
		GL	2359.00
Date	02-APR-2011		
Run Number	ONE		
Depth Driller	6260.00 feet		
Depth Logger	6265.00 feet		
First Reading	6262.00 feet		
Last Reading	1631.00 feet		
Casing Driller	1630.00 feet		
Casing Logger	1631.00 feet		
Bit Size	7.875 inches		
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.00 lb/USg	56.00 CP	
PH / Fluid Loss	10.00	7.20 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.87 @ 78.0 ohm-m		
Rmf @ Measured Temp	0.70 @ 78.0 ohm-m		
Rmc @ Measured Temp	1.04 @ 78.0 ohm-m		
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.58 @118.0 ohm-m		
Time Since Circulation	6 HOURS		
Max Recorded Temp	118.00 deg F		
Equipment Name	COMPACT		
Equipment / Base	13025	LIB	
Recorded By	L. SCOTT		
Witnessed By	KARL GRAHAM	CODY MARTIN	
S.O.# / JOB#	3529171	LB11-065	

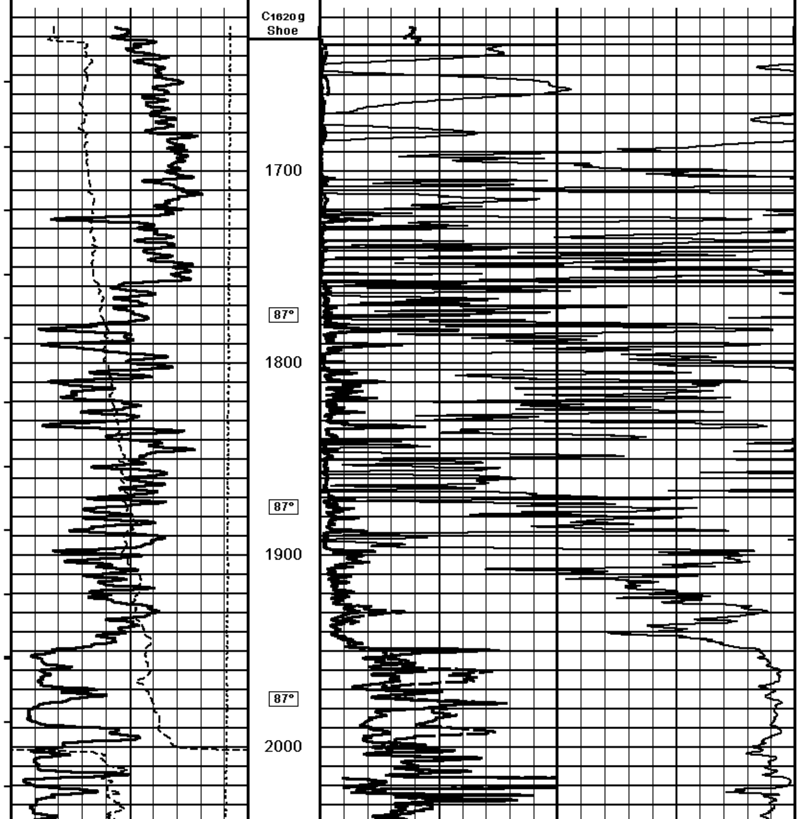
1 INCH MAIN

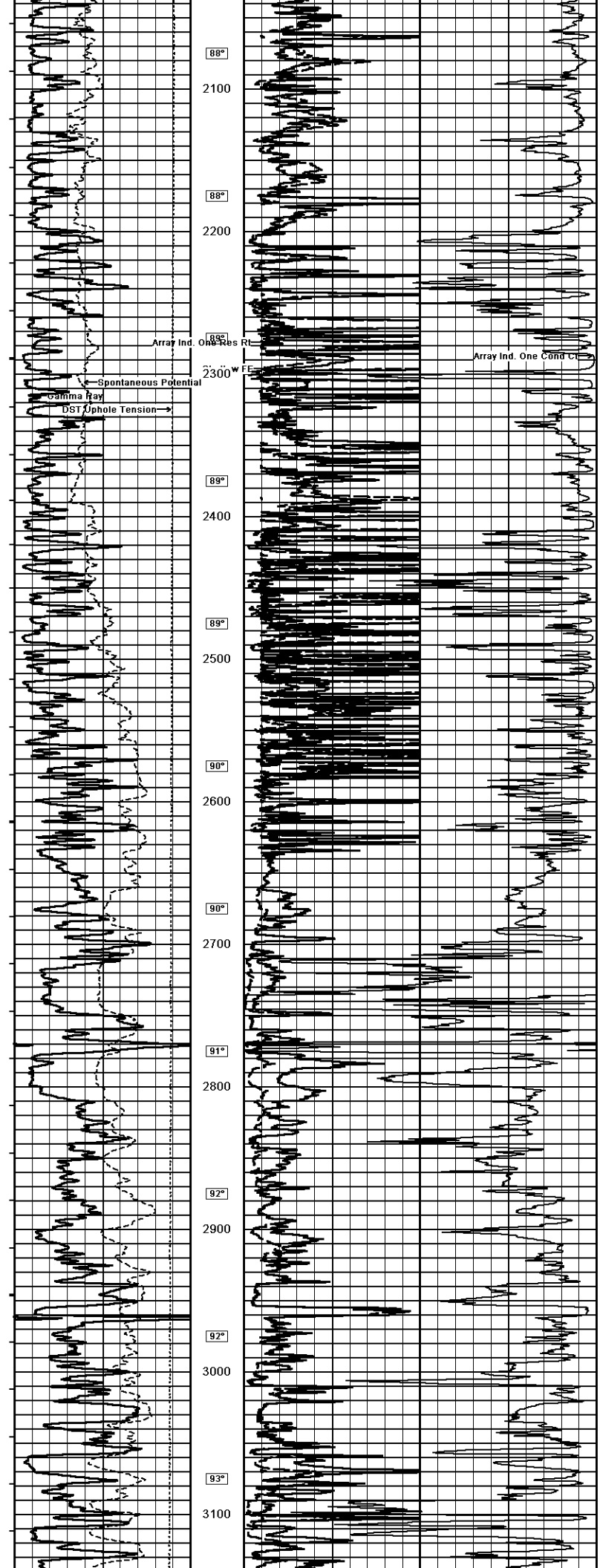
Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 03-APR-2011 13:05

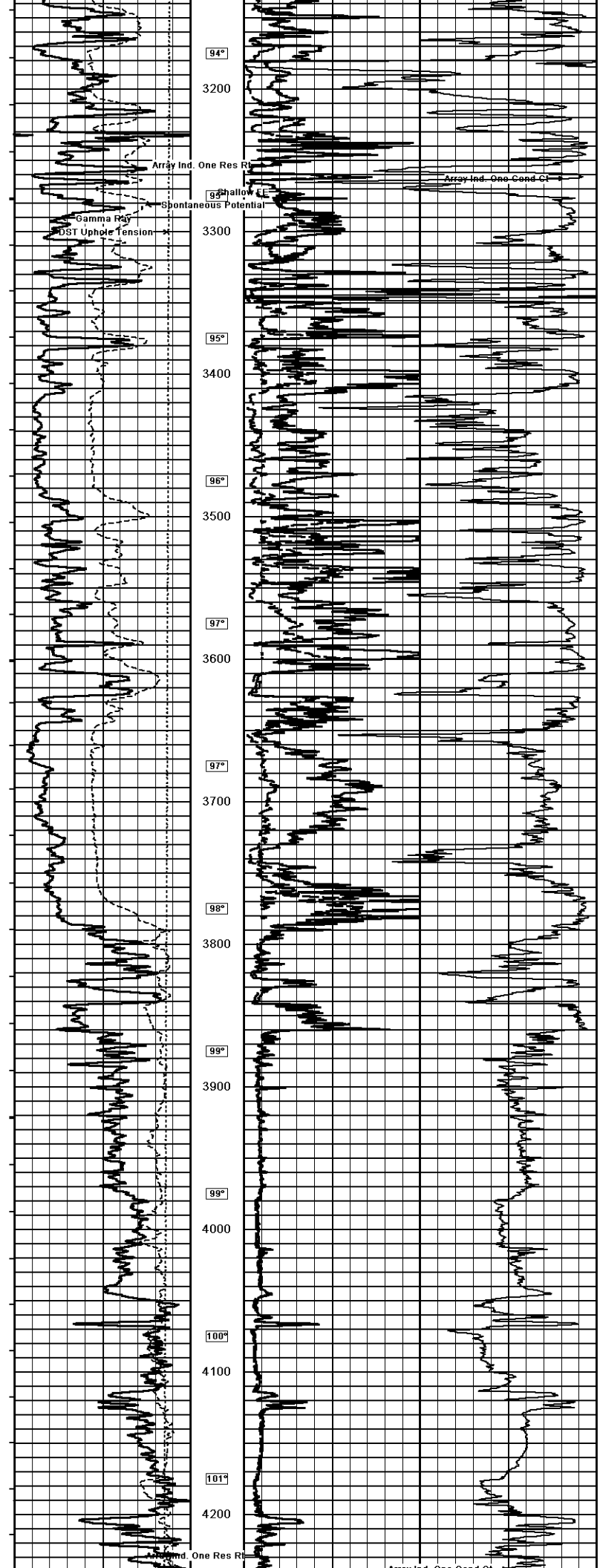
Filename: C:\DOCUME~1\garcianr\LOCALS~1\Temp\Weatherford PreVie...\APACHE HAGER 1-12_002.dta — Recorded on 03-APR-2011 01:40

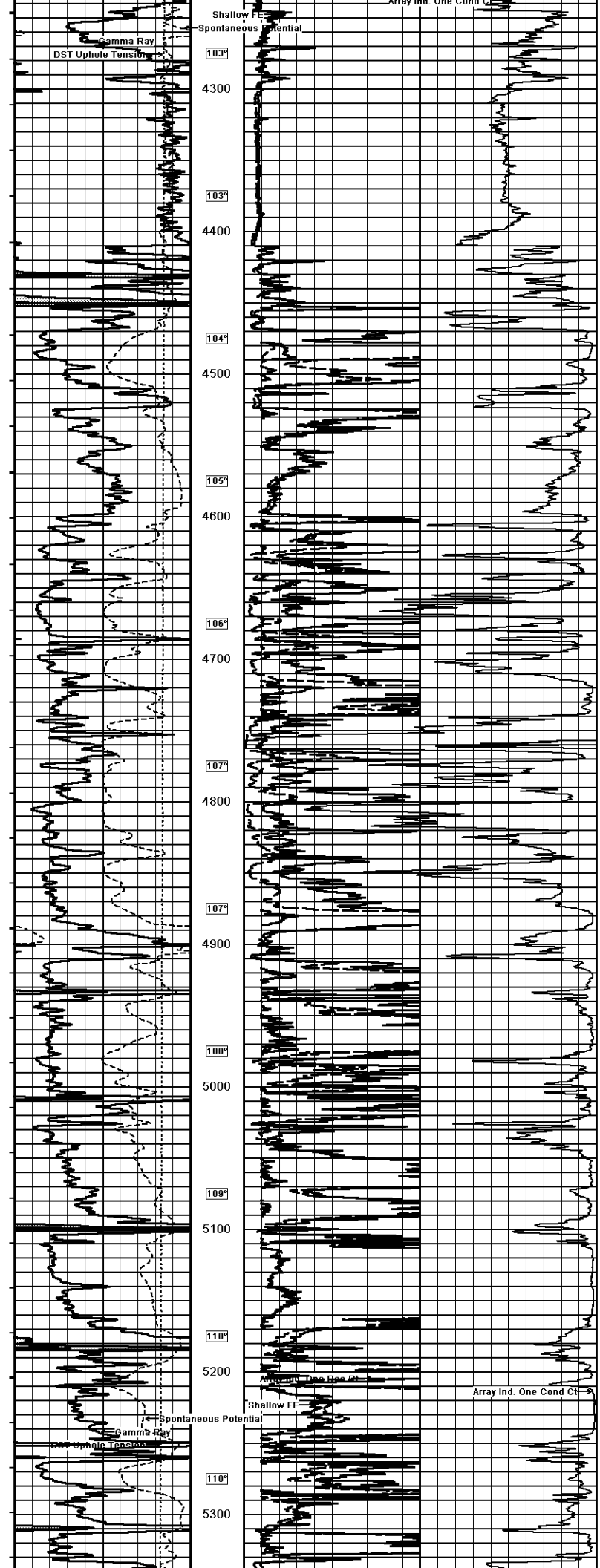
System Versions: Logged with 11.03.2789 Plotted with 11.02.2164

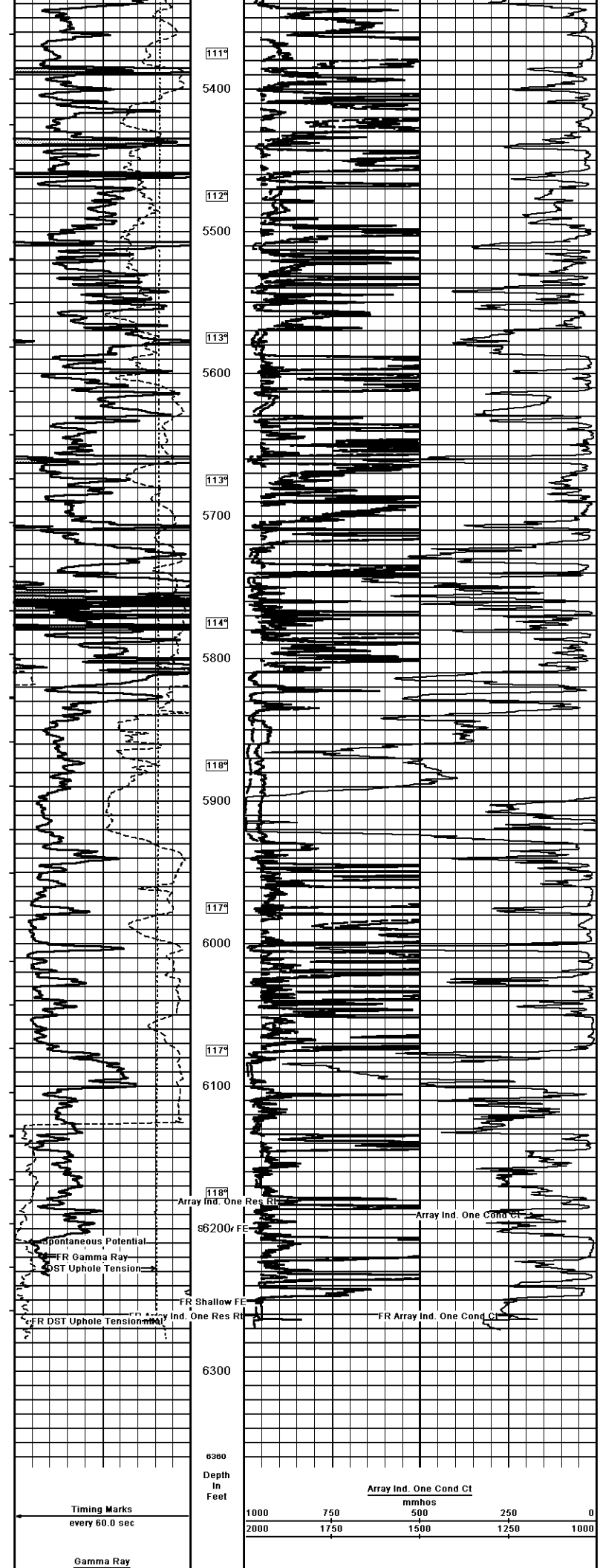
Track 1	Depth	Track 2/3
Timing Marks every 60.0 sec	Depth In Feet	Array Ind. One Cond Ct mmhos 1000 750 500 250 0 / 2000 1750 1500 1250 1000
Gamma Ray API 0 75 150	Borehole Temp in deg F	Shallow FE ohm metres 0 25 50 / 0 250 500
Spontaneous Potential millivolts − →|20|← +		
DST Uphole Tension pounds 5000 0	Replay Scale 1:600	Array Ind. One Res Rt ohm metres 0 25 50 / 0 250 500

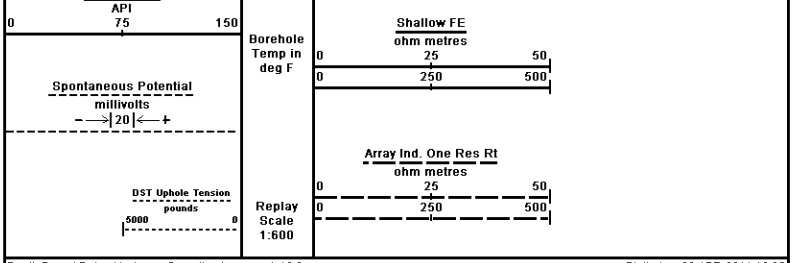



88°
2100
88°
2200
89°
Array Ind. One Res Rt
Array Ind. One Cond Ct
2300
Spontaneous Potential
Gamma Ray
DST Uphole Tension
89°
2400
89°
2500
90°
2600
90°
2700
91°
2800
92°
2900
92°
3000
93°
3100


94°
3200
Array Ind. One Res Rt
Array Ind. One Cond Cf
95°
Shallow Lt
Spontaneous Potential
Gamma Ray
SDST Uphole Tension
3300
95°
3400
96°
3500
97°
3600
97°
3700
98°
3800
99°
3900
99°
4000
100°
4100
101°
4200
Array Ind. One Res Rt


Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
103°
4300
103°
4400
104°
4500
105°
4600
106°
4700
107°
4800
107°
4900
108°
5000
109°
5100
110°
5200
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
110°
5300


111°
5400
112°
5500
113°
5600
113°
5700
114°
5800
118°
5900
117°
6000
117°
6100
118°
6200
6300
6360
Array Ind. One Res Rt
Array Ind. One Cond Ct
Spontaneous Potential
FR Gamma Ray
DST Uphole Tension
FR Shallow FE
FR DST Uphole Tension mtal
FR Array Ind. One Cond Ct
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



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 03-APR-2011 13:05

Filename: C:\DOCUME~1\garciann\LOCALS~1\Temp\Weatherford PreVie...\APACHE HAGER 1-12_002.dta — Recorded on 03-APR-2011 01:40

System Versions: Logged with 11.03.2789 Plotted with 11.02.2164

1 INCH MAIN

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WELL	HAGER 1-12
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ELECTRIC LOG