Weatherford®

ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

COMPANY	SHAKESPEARE OIL COMPANY, INC.
WELL	ZANOBIA #1-22
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	1090' FSL & 2305' FWL SW/4

40 Years of Wireline 1970 2010

SEC	TWP	RGE	Other Services
22	15S	33W	MPD/MDN MML MSS

API Number 15-109-21088
Permit Number

Permanent Datum G.L., Elevation 2802 feet
Log Measured From KB
Drilling Measured From K.B.

Elevations:	feet
KB	2812.00
DF	2811.00
GL	2802.00

Date	13-JUL-2012			
Run Number	ONE			
Depth Driller	4585.00	feet		
Depth Logger	4585.00	feet		
First Reading	4582.00	feet		
Last Reading	253.00	feet		
Casing Driller	253.00	feet		
Casing Logger	253.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	8.70 lb/USg	54.00 CP		
PH / Fluid Loss	10.00	10.40 ml/30Min		
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.34 @ 87.0	ohm-m		
Rmf @ Measured Temp	0.27 @ 87.0	ohm-m		
Rmc @ Measured Temp	0.41 @ 87.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.27 @109.0	ohm-m		
Time Since Circulation	4 HOURS			
Max Recorded Temp	109.00	deg F		
Equipment Name	COMPACT			
Equipment / Base	13057	LIB		
Recorded By	L. SCOTT			
Witnessed By	TIM PRIEST			
S.O.# / JOB#	3534557		LB12-179	

BOREHOLE RECORD

Last Edited: 13-JUL-2012 12:39

Bit Size inches	Depth From feet	Depth To feet
7.875	253.00	4585.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	253.00	24.00

REMARKS

Tools Ran: MCG, MML, MDN, MPD, MFE, MSS, 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.
Sonic porosity calculated using a Limestone scale (47.5 usec/ft).
All intervals logged and scaled per customer's request.
Tight pulls, washouts and borehole rugosity will affect data quality.
Annular volume with 4.5 inch production casing= 247 cu. ft.
Total hole volume from TD to Surface casing= 2128 cu. ft.
Service order: #3534557
Rig: HD Drilling #2
Engineer: L. Scott
Operator(s): N. Adame

2 INCH MAIN PASS

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 13-JUL-2012 12:40
Filename: C:\Minimus 11.03.4044\Data\Shakespeare Zanobia #1...\Shakespeare Zanobia 1-22_002.dta
Recorded on 13-JUL-2012 10:29
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 1:600

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

240 Csg Shoe

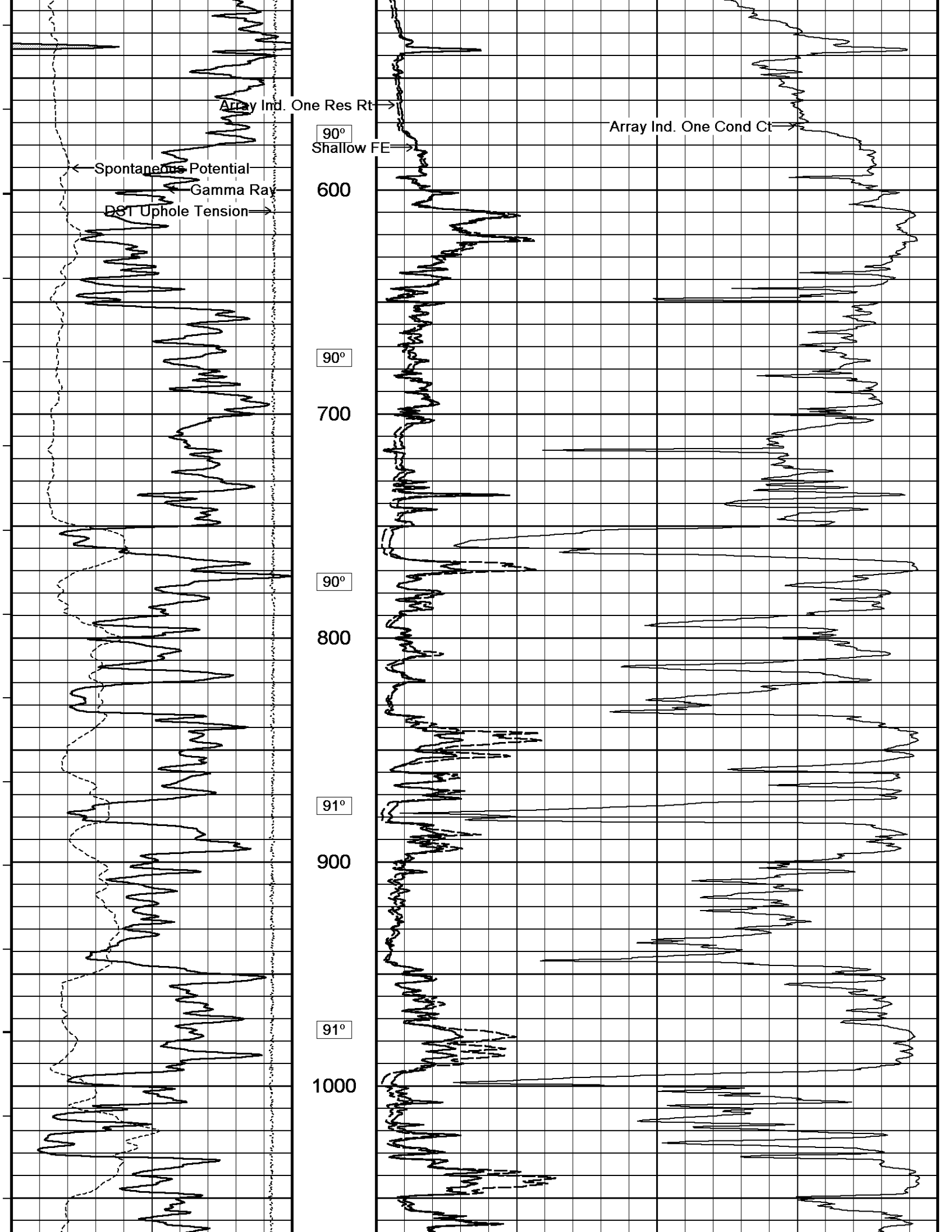
300

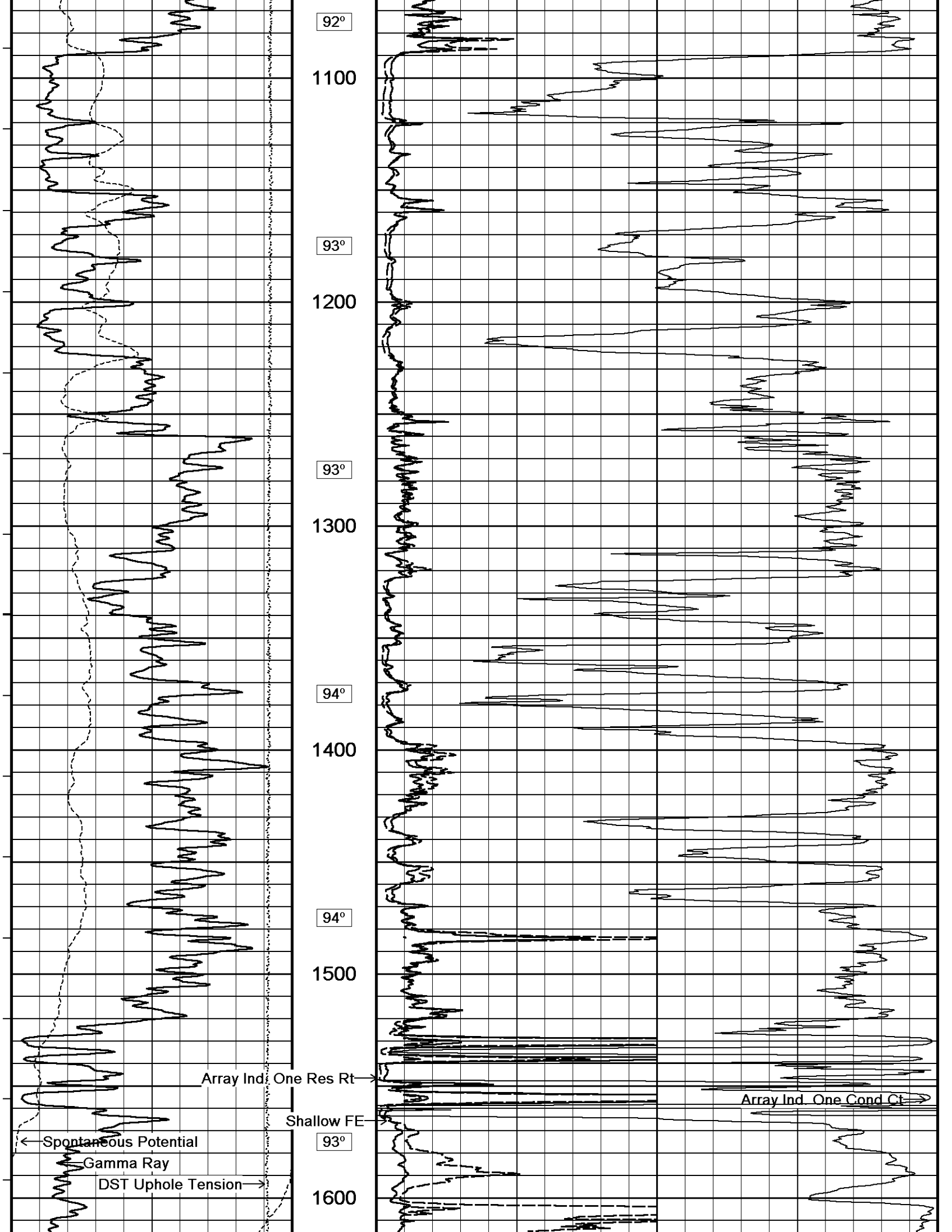
89°

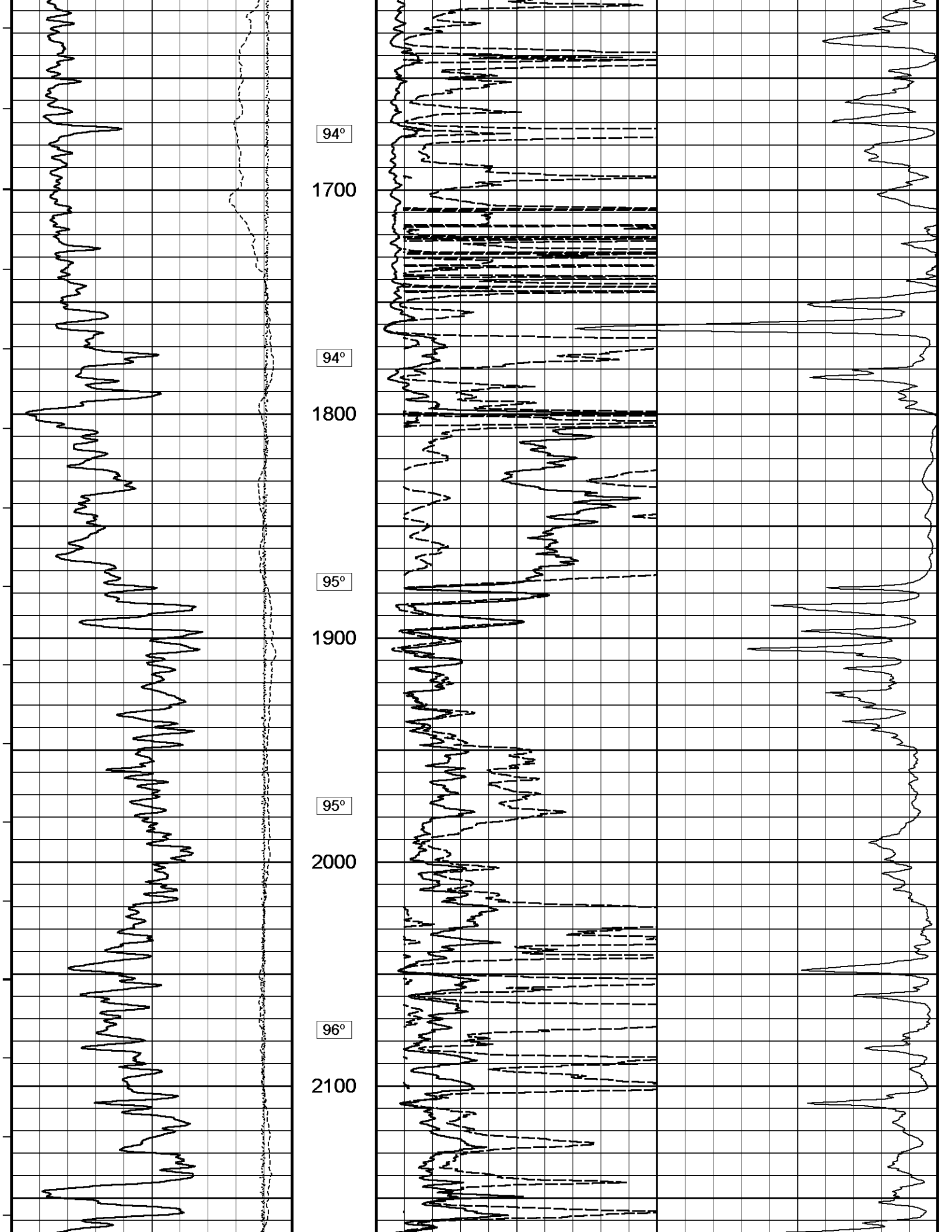
400

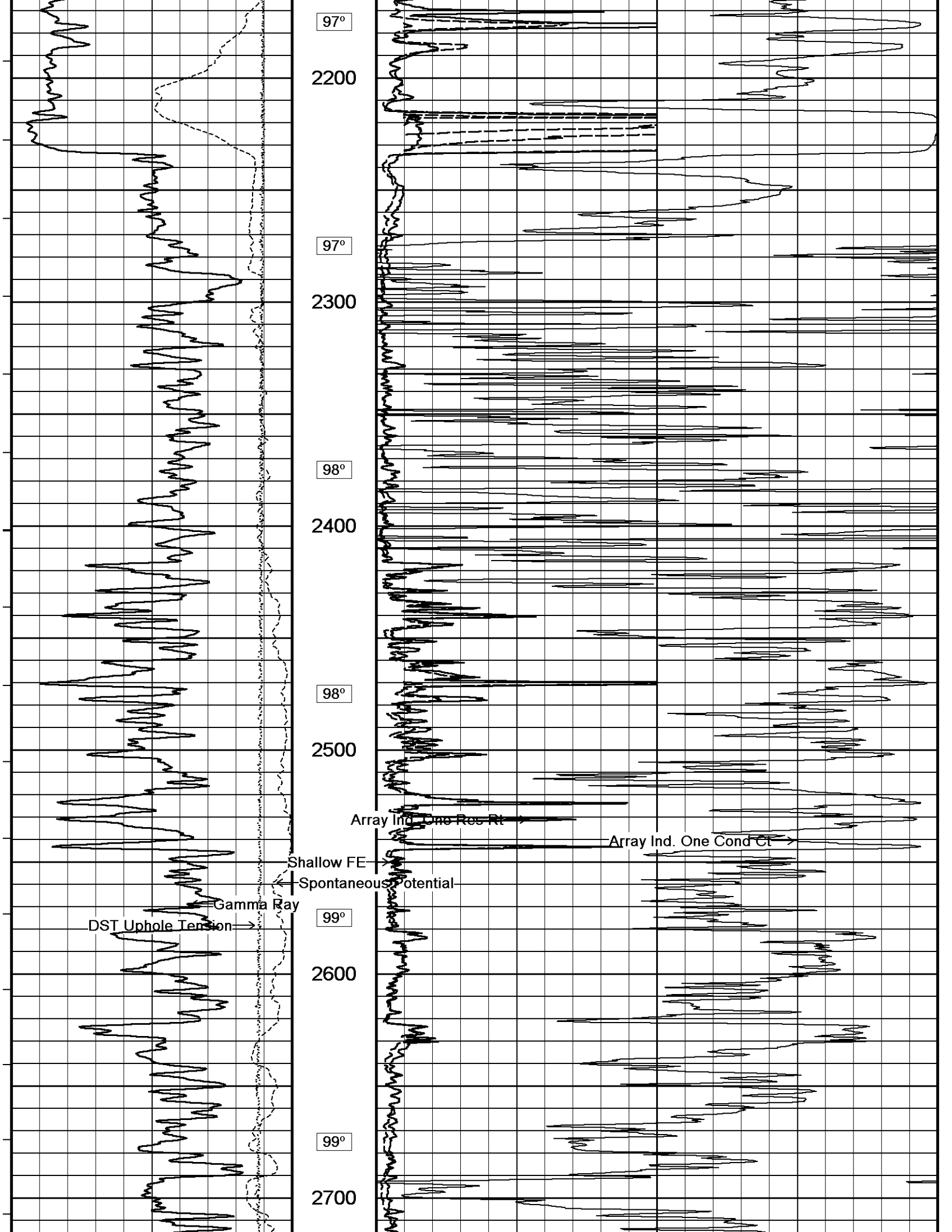
90°

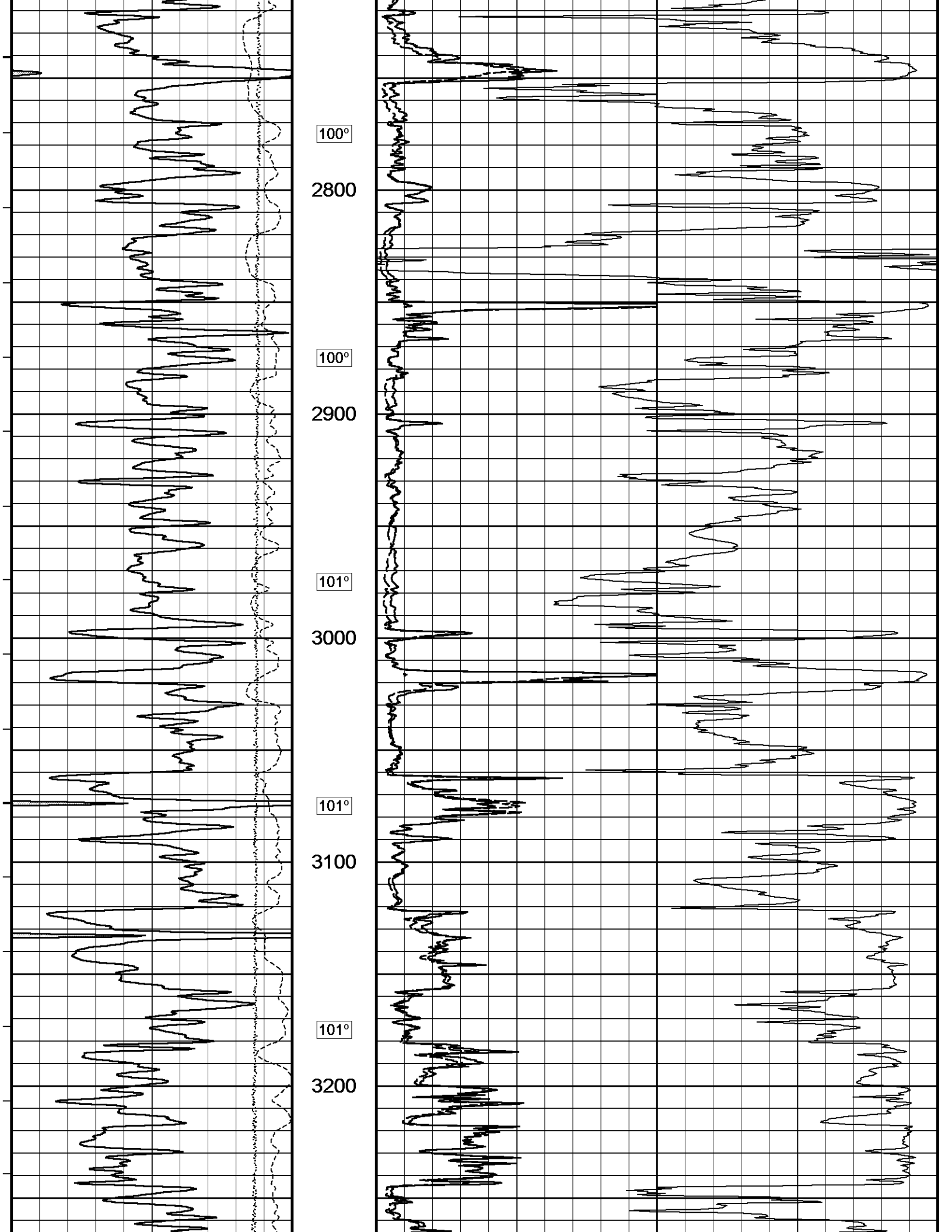
500

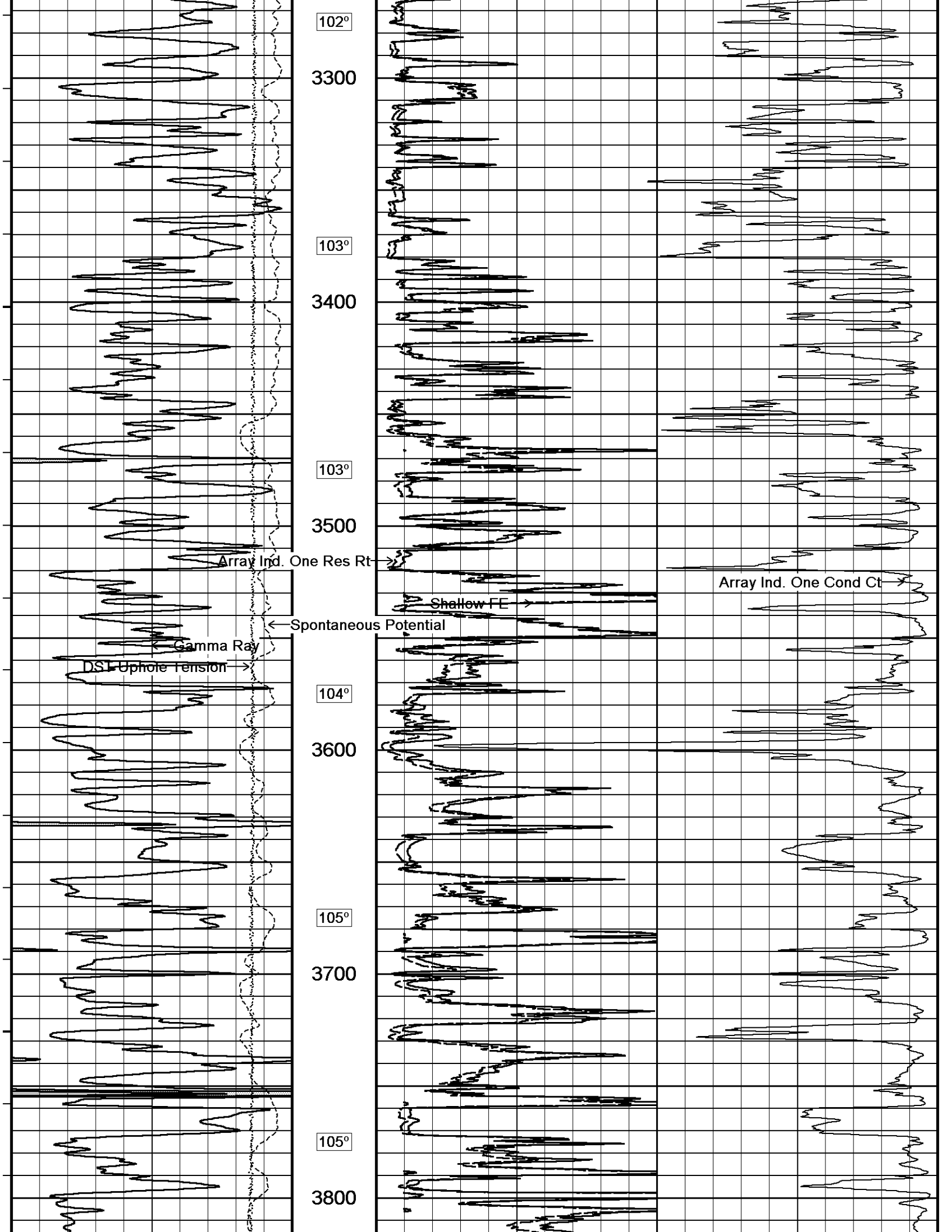

Array Ind. One Res Rt
Array Ind. One Cond Ct
90°
Shallow FE
Spontaneous Potential
Gamma Ray
600
DST Uphole Tension
90°
700
90°
800
91°
900
91°
1000

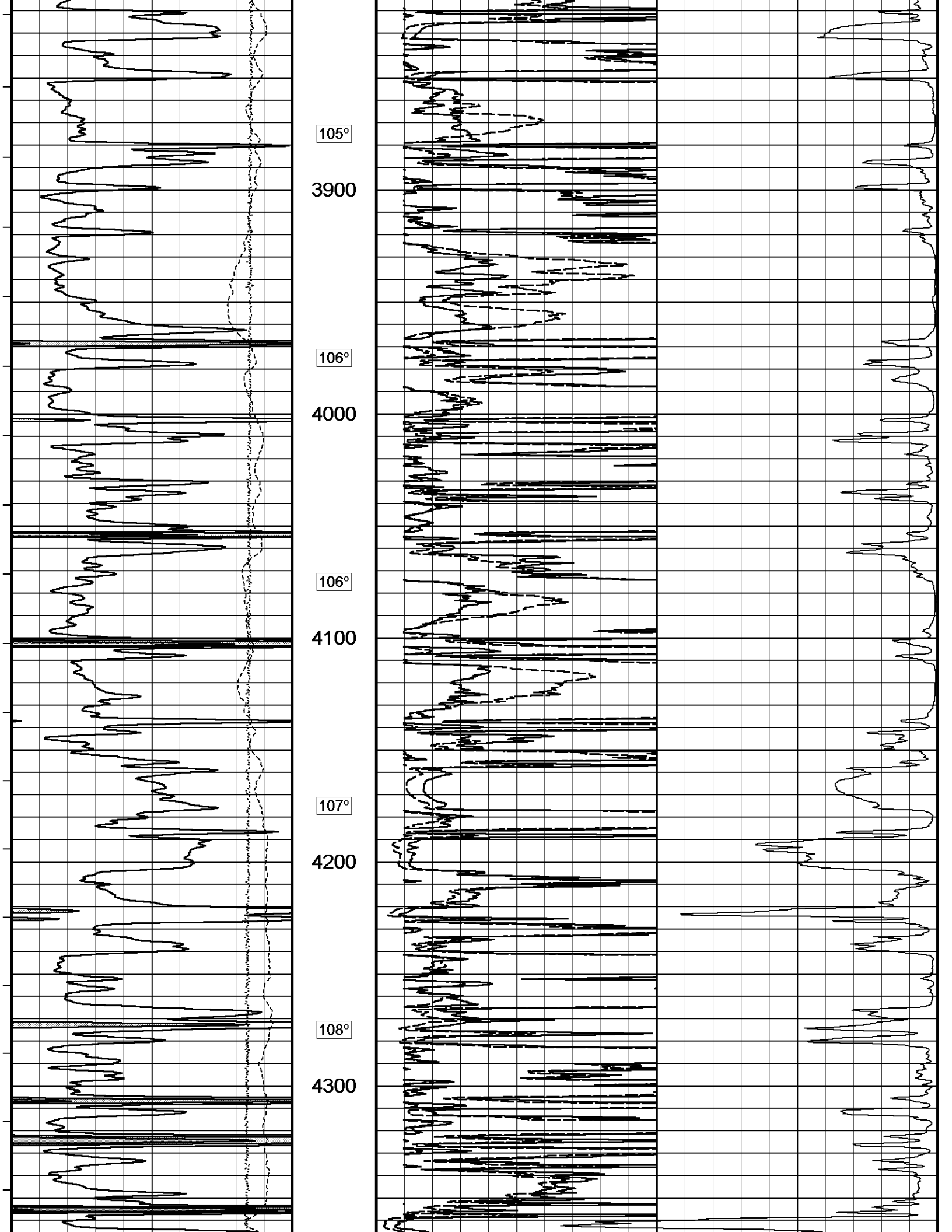

92°
1100
93°
1200
93°
1300
94°
1400
94°
1500
93°
1600
Array Ind. One Res Rt
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct

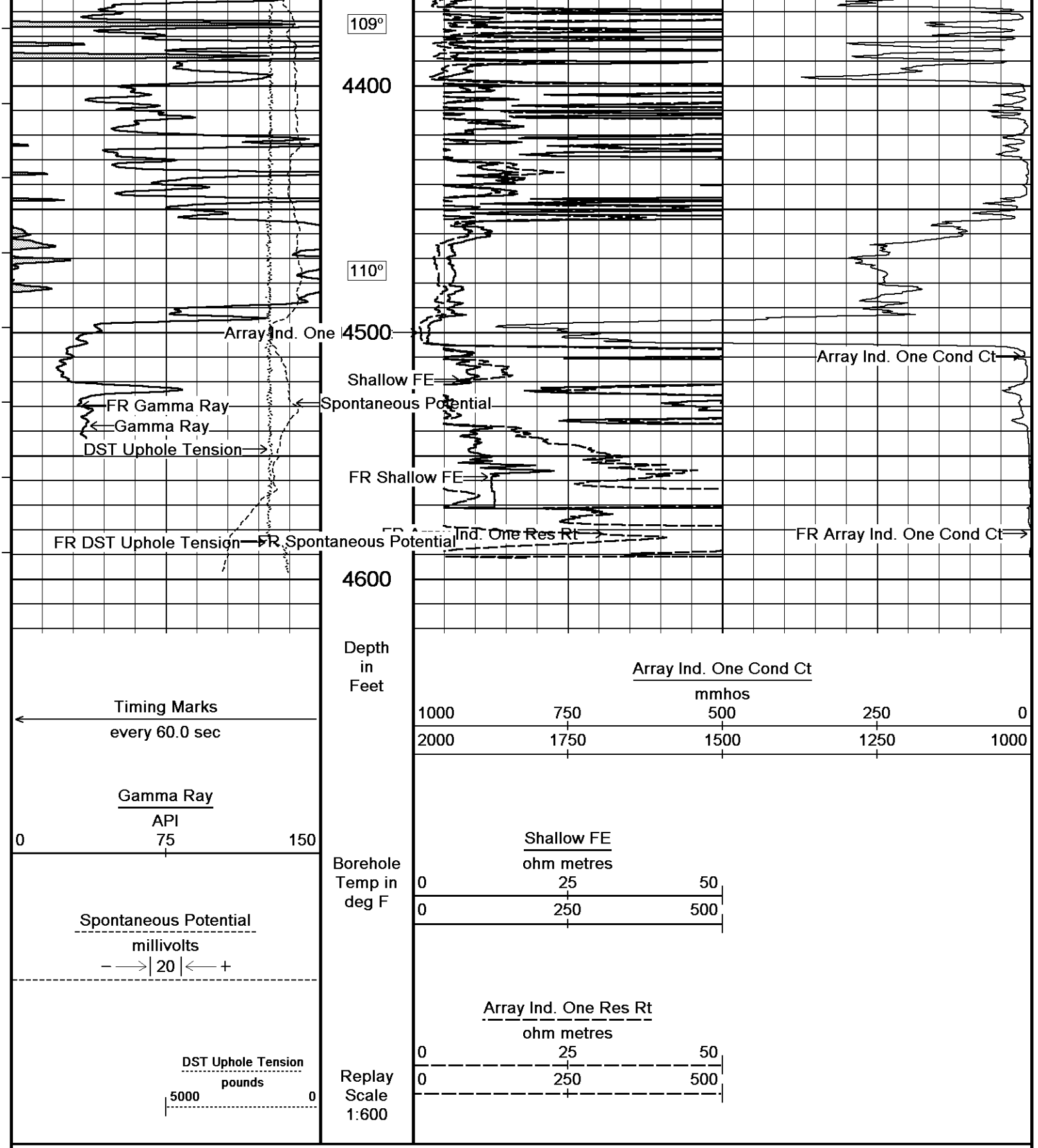

94°
1700
94°
1800
95°
1900
95°
2000
96°
2100


97°
2200
97°
2300
98°
2400
98°
2500
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
99°
DST Uphole Tension
2600
99°
2700


100°
2800
100°
2900
101°
3000
101°
3100
101°
3200


102°
3300
103°
3400
103°
3500
Array Ind. One Res Rt
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct
104°
3600
105°
3700
105°
3800


105°
3900
106°
4000
106°
4100
107°
4200
108°
4300



Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 13-JUL-2012 12:40
Filename: C:\Minimus 11.03.4044\Data\Shakespeare Zanobia #1...\Shakespeare Zanobia 1-22_002.dta
Recorded on 13-JUL-2012 10:29
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

2 INCH MAIN PASS

5 INCH MAIN ANHYDRITE DETAIL

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 13-JUL-2012 12:40
Filename: C:\Minimus 11.03.4044\Data\Shakespeare Zanobia #1...\Shakespeare Zanobia 1-22_002.dta
Recorded on 13-JUL-2012 10:29

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 | ← +

Density Caliper
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

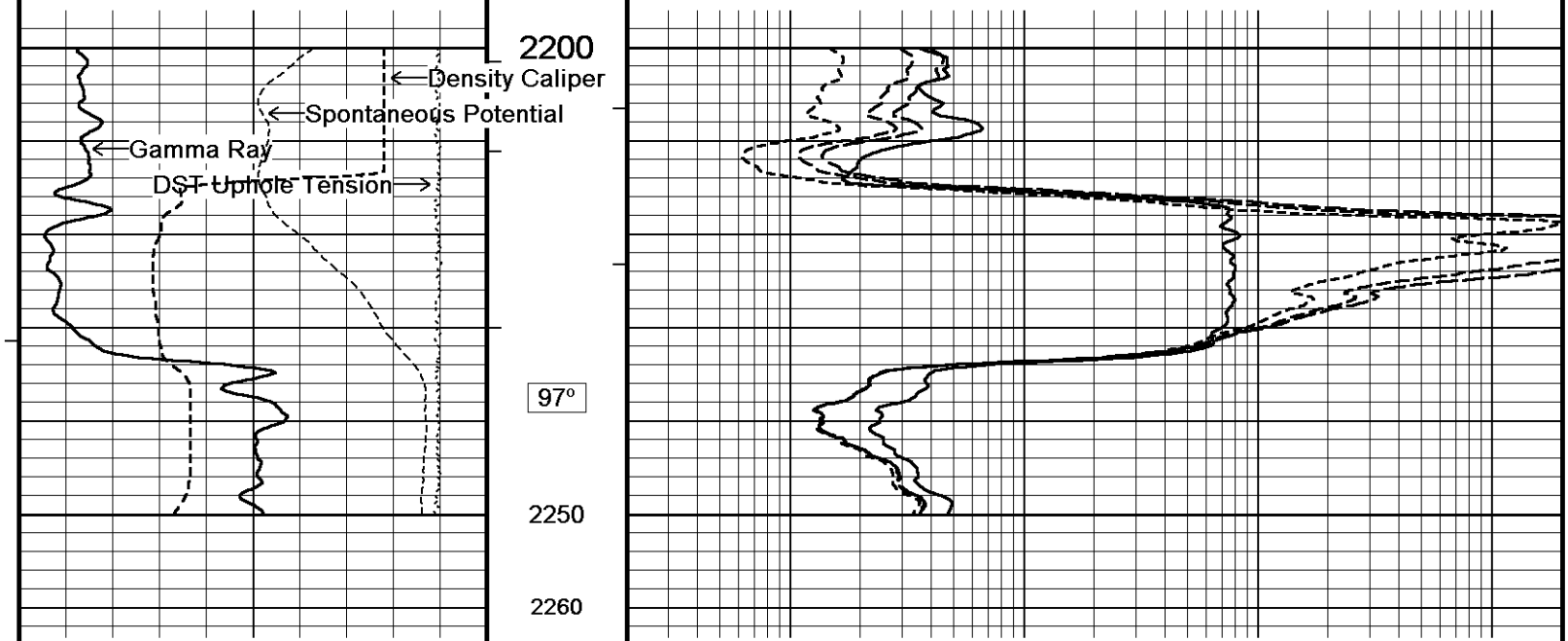
Replay Scale 1:240

Shallow FE
ohm metres
0.20 1 10 100 2000

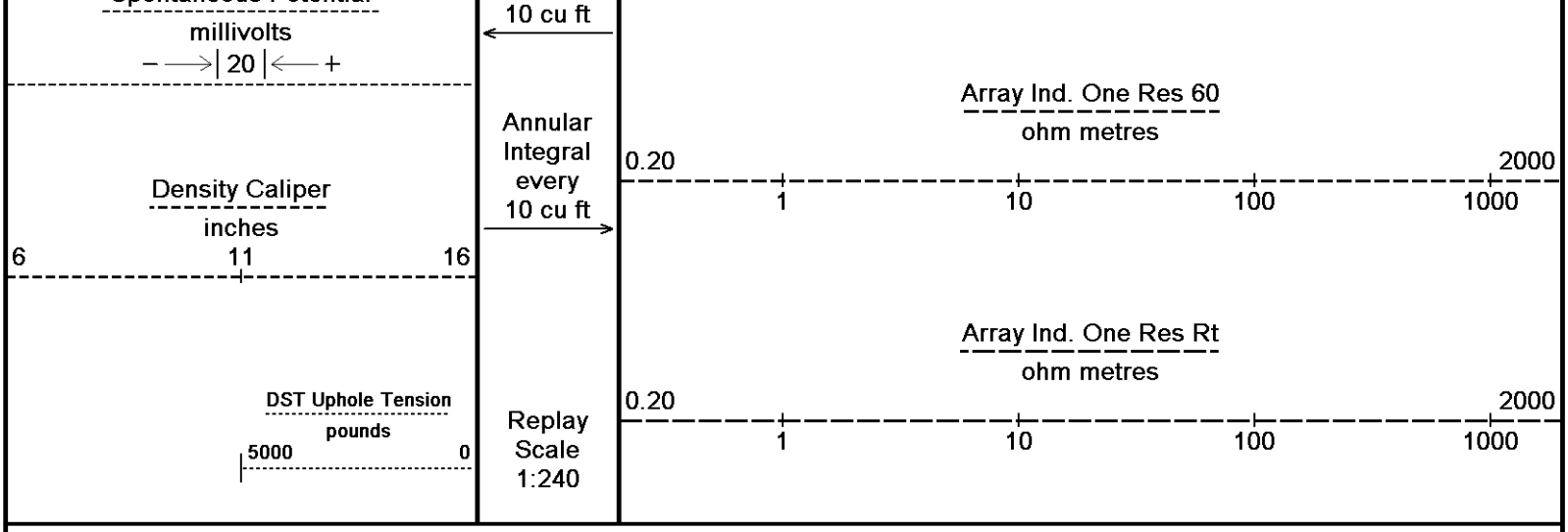
Array Ind. One Res 40
ohm metres
0.20 1 10 100 2000

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



Depth in Feet
Timing Marks
every 60.0 sec
Gamma Ray
API
0 75 150
Borehole Temp in deg F
Spontaneous Potential
HVI every
Shallow FE
ohm metres
0.20 1 10 100 2000
Array Ind. One Res 40
ohm metres
0.20 1 10 100 2000

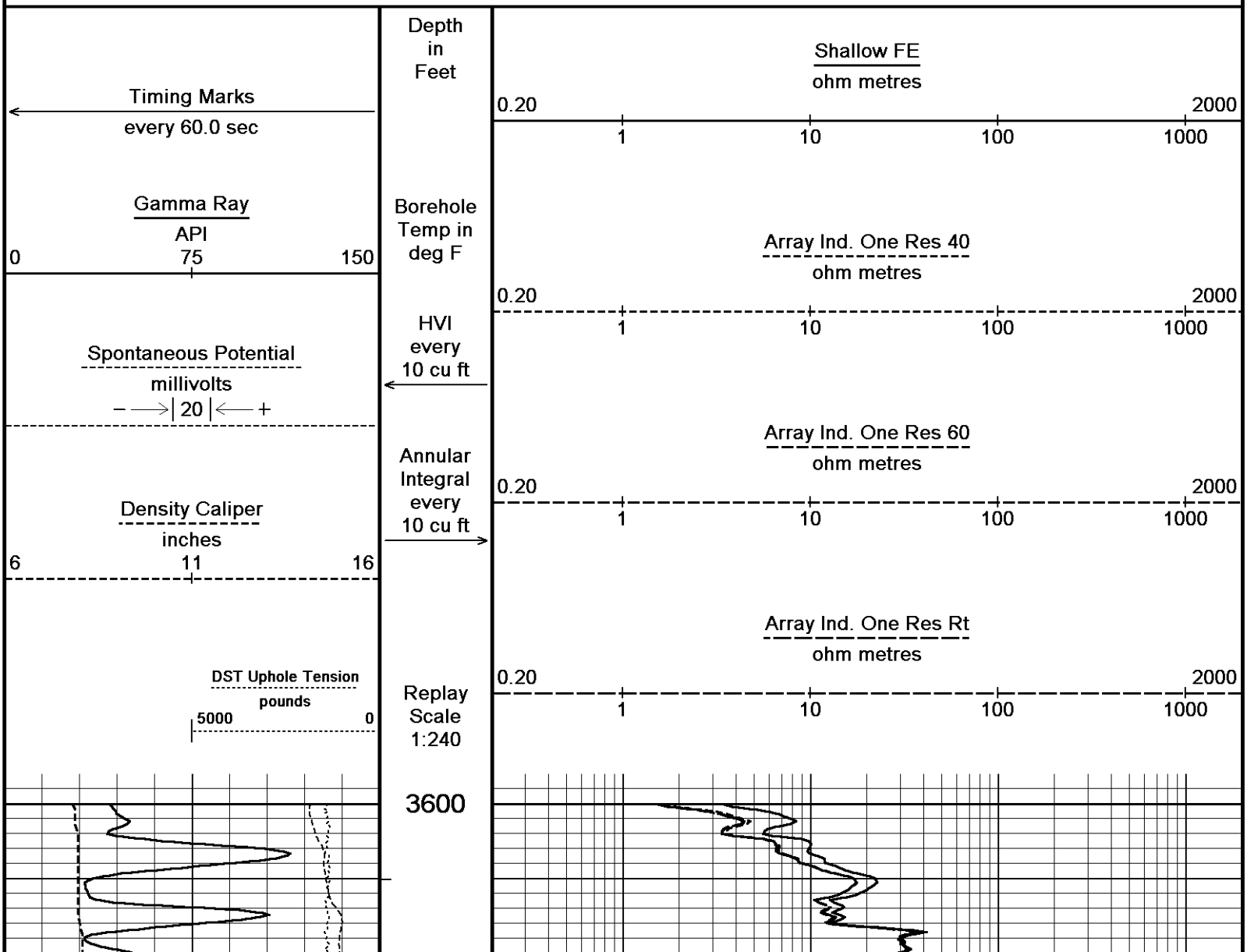


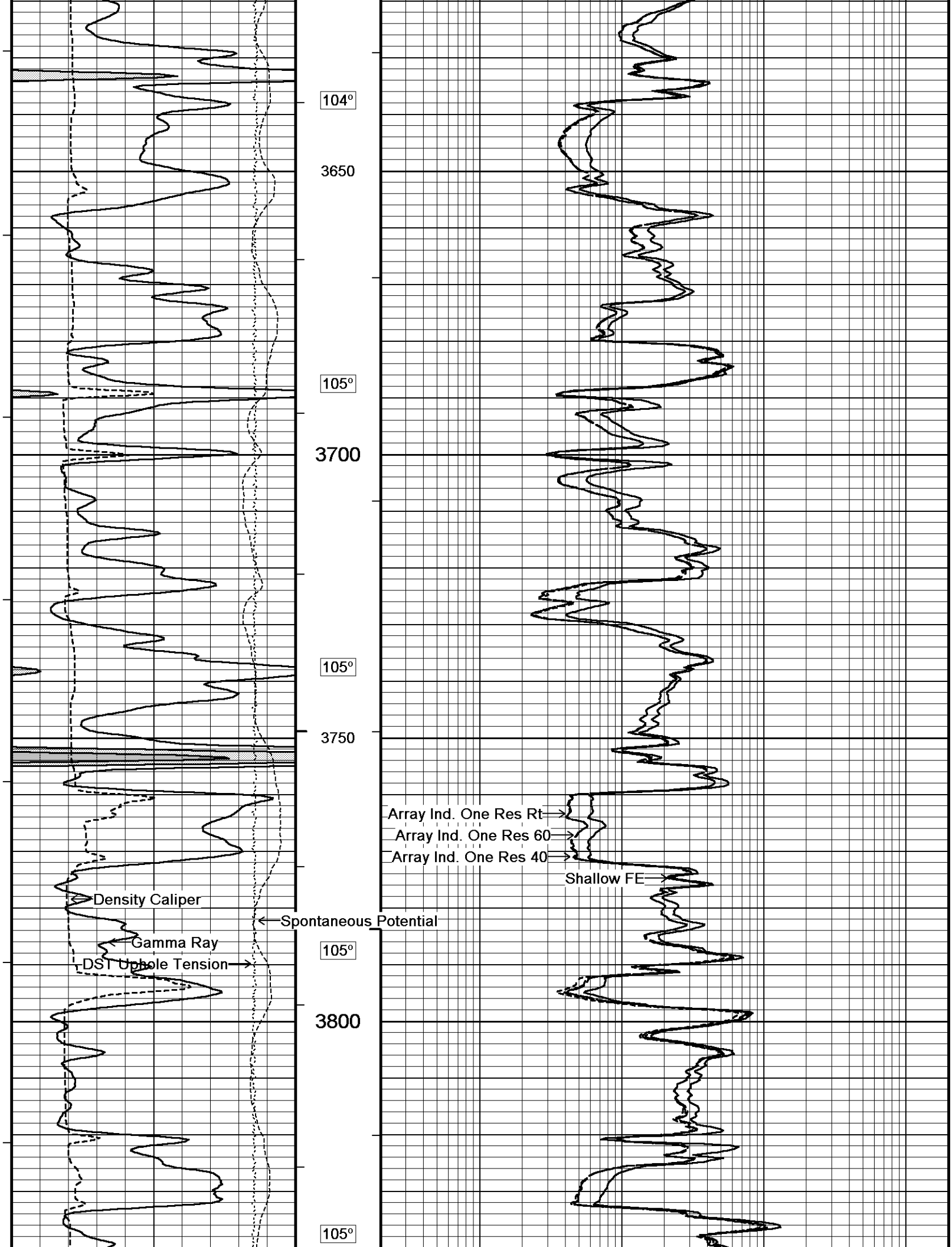
Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 13-JUL-2012 12:40
Filename: C:\Minimus 11.03.4044\Data\Shakespeare Zanobia #1...\Shakespeare Zanobia 1-22_002.dta — Recorded on 13-JUL-2012 10:29
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

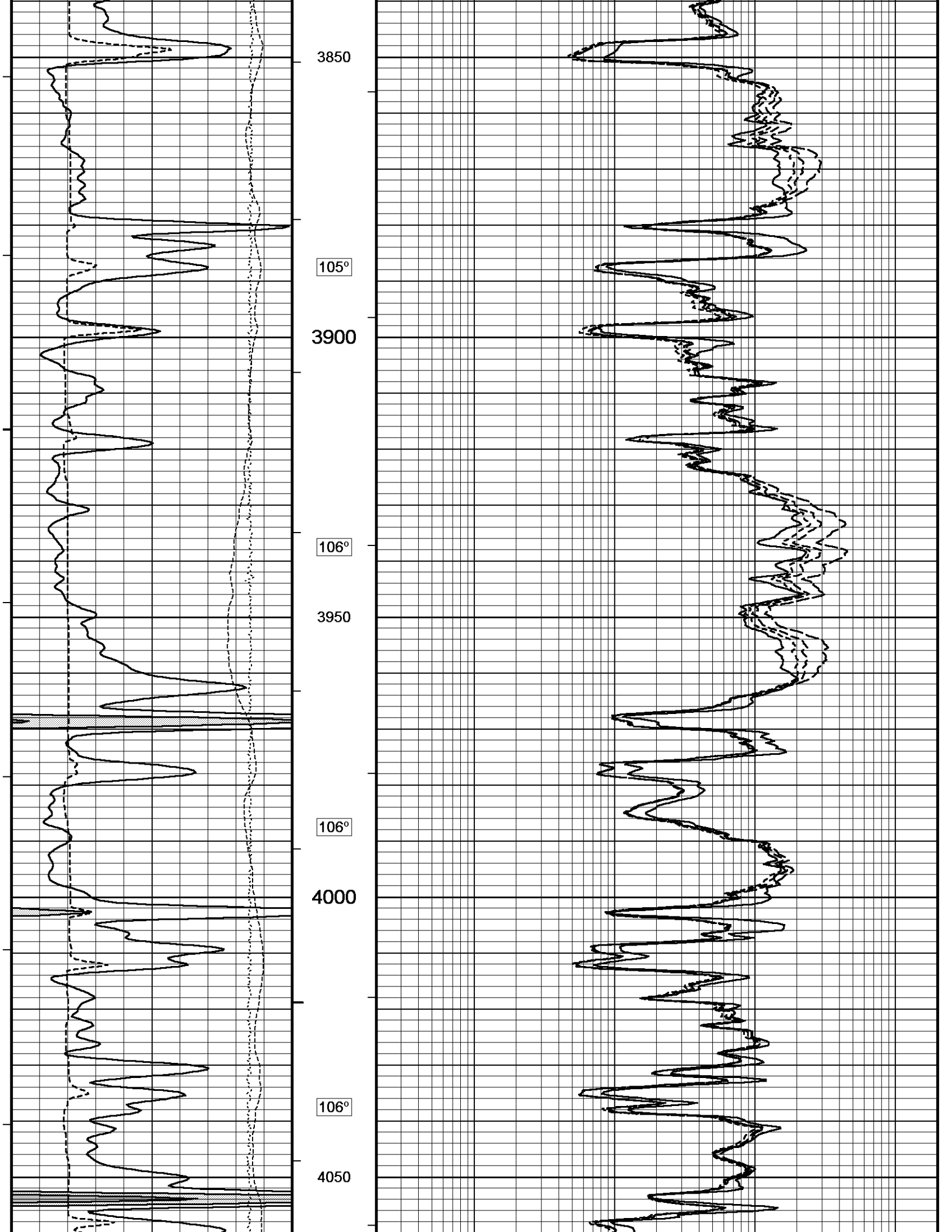
5 INCH MAIN ANHYDRITE DETAIL

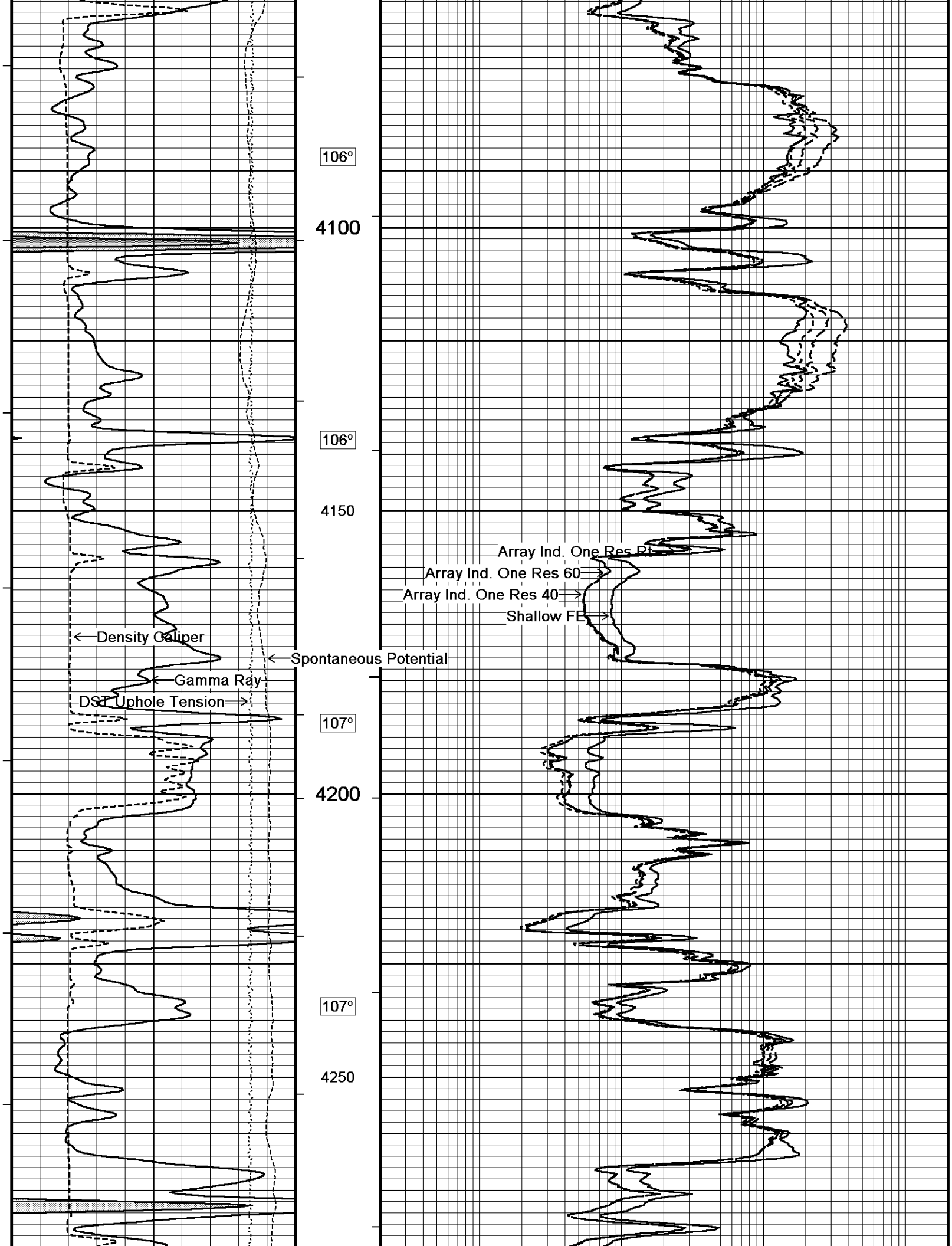
5 INCH MAIN PASS

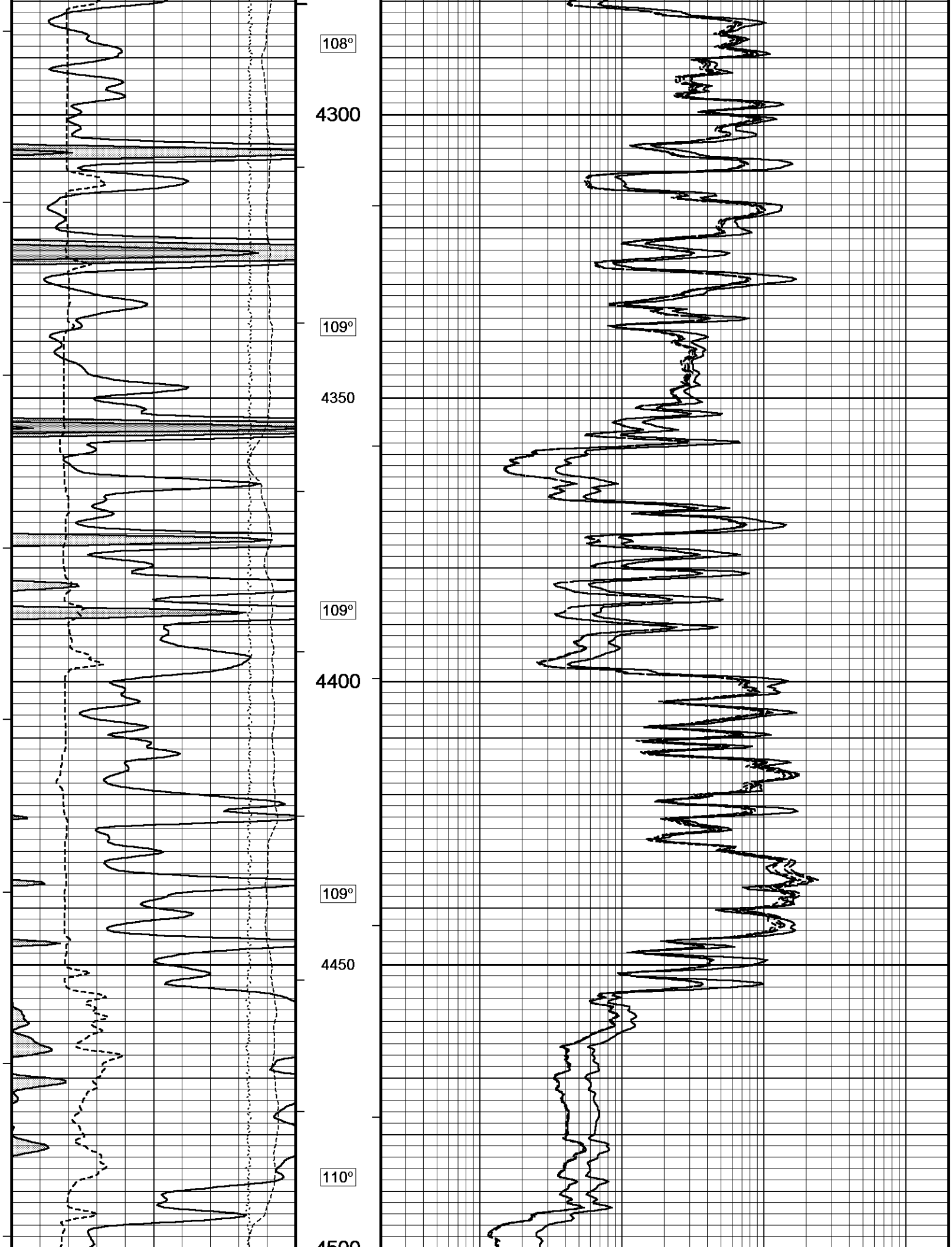
Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 13-JUL-2012 12:40
Filename: C:\Minimus 11.03.4044\Data\Shakespeare Zanobia #1...\Shakespeare Zanobia 1-22_002.dta — Recorded on 13-JUL-2012 10:29
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

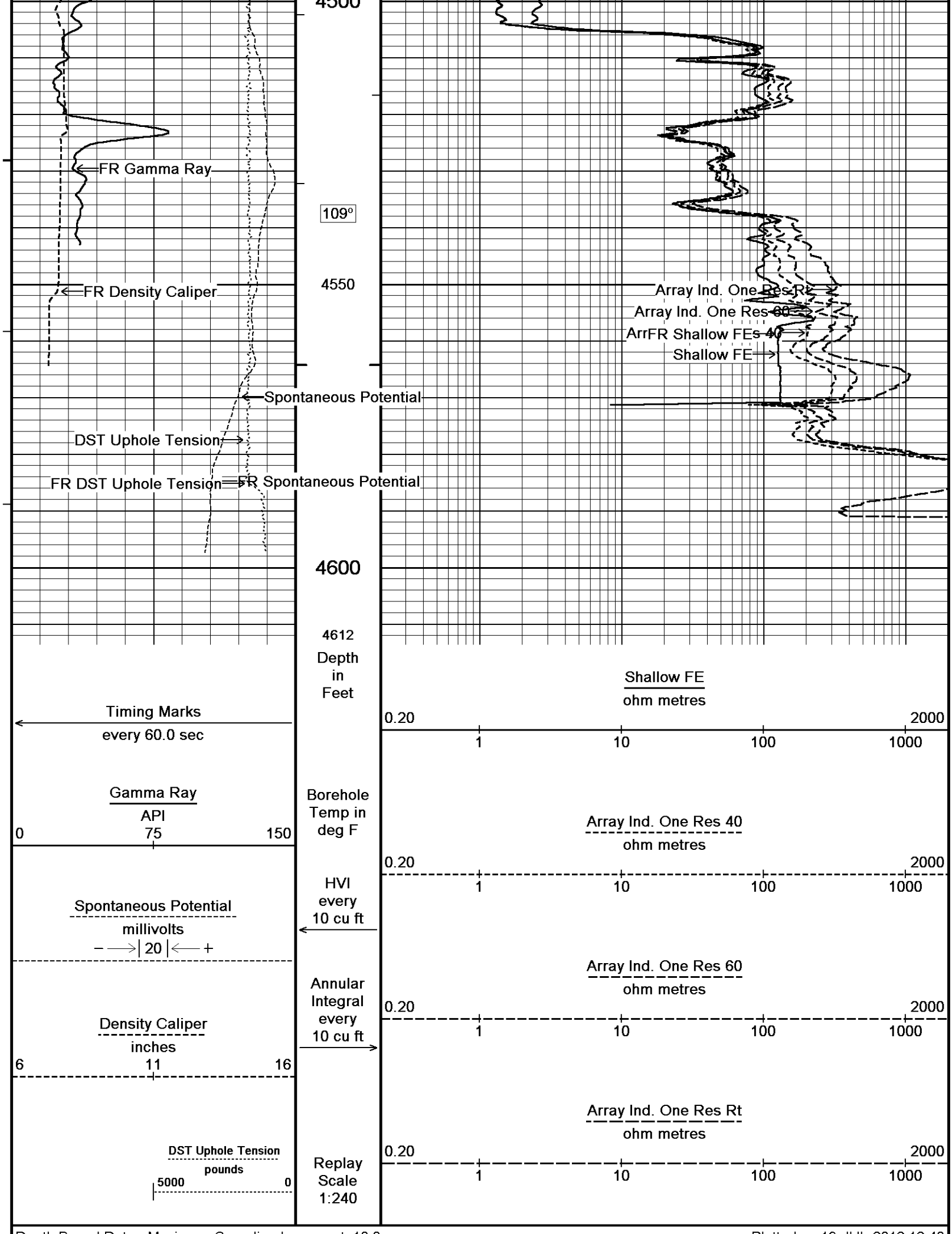



104°
3650
105°
3700
105°
3750
105°
3800
105°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Density Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension


3850
105°
3900
106°
3950
106°
4000
106°
4050


106°
4100
106°
4150
107°
4200
107°
4250
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Density Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension


108°
4300
109°
4350
109°
4400
109°
4450
110°
4500



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 13-JUL-2012 12:40

Filename: C:\Minimus 11.03.4044\Data\Shakespeare Zanobia #1...\Shakespeare Zanobia 1-22_002.dta Recorded on 13-JUL-2012 10:29
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 13-JUL-2012 12:40
Filename: C:\Minimus 11.03.4044\Data\Shakespeare Zanobia #1...\Shakespeare Zanobia 1-22_001.dta Recorded on 13-JUL-2012 10:09
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 | ← +

Density Caliper
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:240

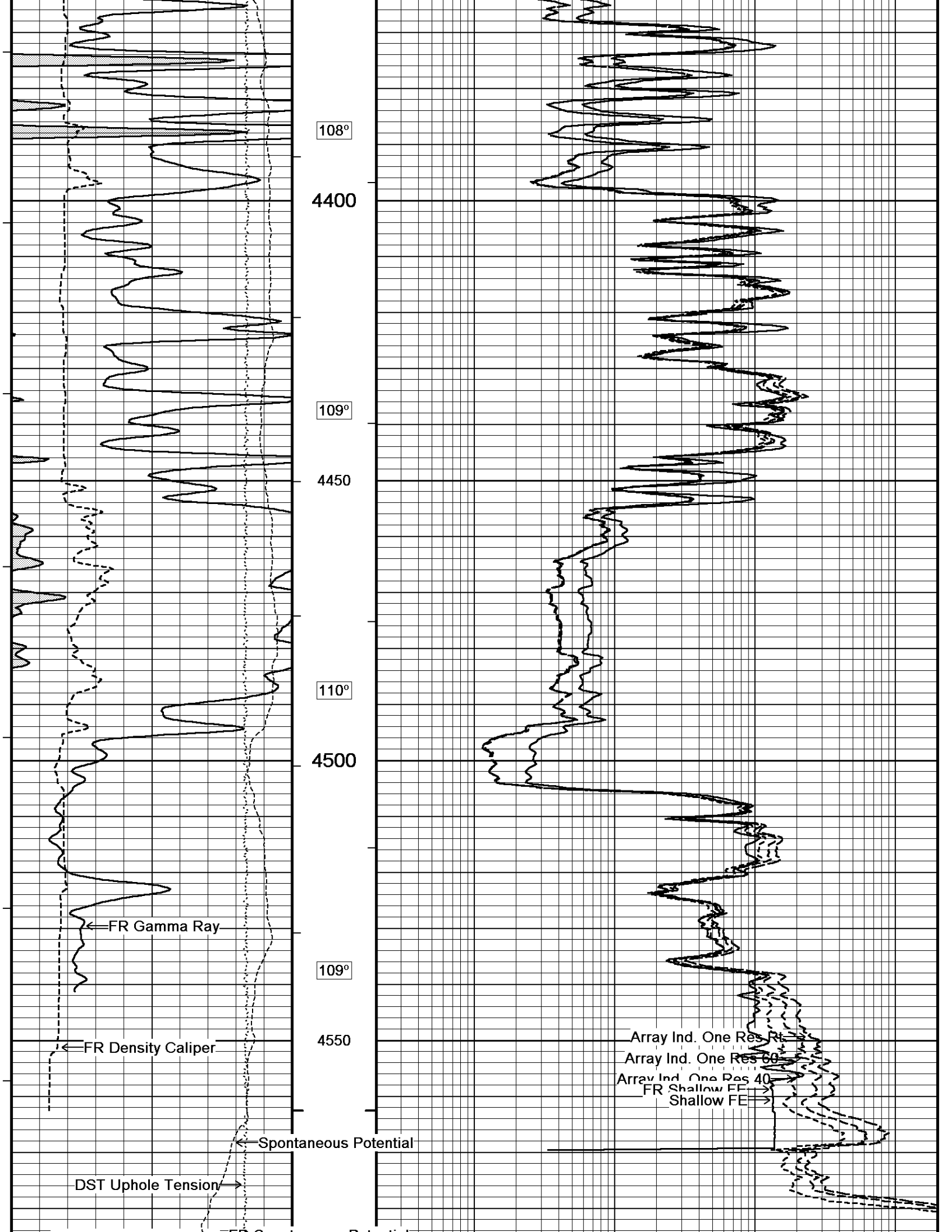
Shallow FE
ohm metres
0.20 2000
1 10 100 1000

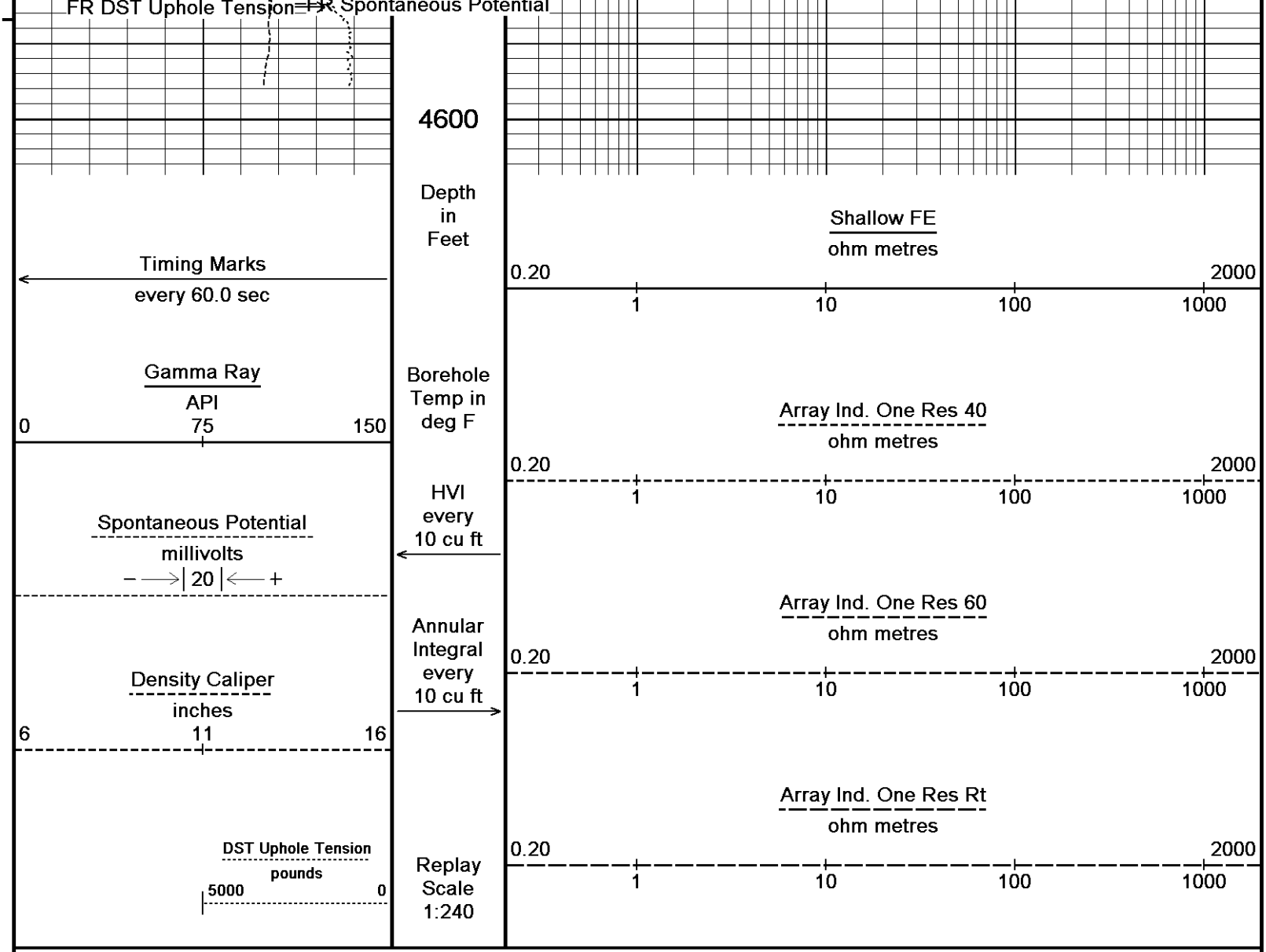
Array Ind. One Res 40
ohm metres
0.20 2000
1 10 100 1000

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

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

4284
4300
108°
4350


108°
4400
109°
4450
110°
4500
109°
4550
FR Gamma Ray
FR Density Caliper
Spontaneous Potential
DST Uphole Tension
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
FR Shallow FE
Shallow FE



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 13-JUL-2012 12:40

Filename: C:\Minimus 11.03.4044\Data\Shakespeare Zanobia #1...\Shakespeare Zanobia 1-22_001.dta — Recorded on 13-JUL-2012 10:09

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 Zanobia #1-22\Shakespeare Zanobia 1-22.dta

General Constants All 000 — Last Edited on 13-JUL-2012,09:08

General Parameters		
Mud Resistivity	0.340	ohm-metres
Mud Resistivity Temperature	87.000	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	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 SMS 0

Field Calibration on 08-JUL-2012 04:57

Reading No	Measured	Calibrated (lbs)
1	13893.37	0.00
2	13954.26	582.00

Gamma Calibration MCG-C 84

Field Calibration on 12-JUL-2012 15:43

	Measured	Calibrated (API)
Background	72	49
Calibrator (Gross)	1139	774
Calibrator (Net)	1067	725

Gamma Constants MCG-C 84

Last Edited on 13-JUL-2012,09:08

Gamma Calibrator Number	GR38	
Mud Density	1.04	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 06-JUL-2012 09:32

	Measured	Calibrated (mV)
Reference 1	105.6	101.0
Reference 2	-96.1	-101.0

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

Micro Normal and Micro Inverse Calibration MML-A 4

Base Calibration on 28-JUN-2012 09:09
Field Check on 12-JUL-2012 15:34

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.2	60.3	5.0	25.0
Micro Inverse	15.7	78.4	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 4

Last Edited on 12-JUL-2012,15:32

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

Caliper Calibration MML-A 4

Base Calibration on 28-JUN-2012 09:05
Field Calibration on 12-JUL-2012 15:32

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	15261	5.98
2	18643	7.97
3	21962	9.86
4	25966	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.09	5.98

Neutron Calibration MDN-A.B 65

Base Calibration on 28-JUN-2012 11:51
Field Check on 12-JUL-2012 15:50

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3161	99	3714	110
Ratio	31.971		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	1631	2328
Ratio	0.700	

Field Check

	Calibrated (cps)	
	1629	2346
Ratio	0.695	

Neutron Constants MDN-A.B 65

Last Edited on 13-JUL-2012,09:09

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 19-JUN-2012 09:07
Field Check on 12-JUL-2012 15:22

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	952.0	126.8
Base Check		281.3
Field Check		281.3

FE Constants MFE-A.A 55

Last Edited on 13-JUL-2012,09:09

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

Sonic Constants MSS-C.K 330

Last Edited on 13-JUL-2012,09:09

Maximum Boundary Contrast	100.00	micro-sec/ft
Fluid Transit Time	189.00	micro-sec/ft
Limestone Transit Time	47.50	micro-sec/ft
Sandstone Transit Time	55.50	micro-sec/ft
Dolomite Transit Time	43.50	micro-sec/ft
Sonic used for Porosities	3-5' Compensated Sonic	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	
MN3FT	N/A	micro-sec
MX3FT	N/A	micro-sec
Hunt-Raymer Constant	83.13	micro-sec/ft
Sonde Mode	Compensated	
Hole Type	Open Hole	

Sonde Parameters

	Measured	Calibrated
Offset	N/A	0.0000
Free Pipe	N/A	N/A

Peak Amplitude Source N/A

Waveform	Start Time (micro-sec)	Width (micro-sec)	Pre Gain	Start Gain	Discriminator (mV)
3'	N/A	N/A	N/A	N/A	N/A
4'	N/A	N/A	N/A	N/A	N/A
5'	N/A	N/A	N/A	N/A	N/A
6'	N/A	N/A	N/A	N/A	N/A

Processed Fixed Gate Parameters

Waveform Used For Processing N/A

Start Time (micro-sec)	End Time (micro-sec)	Discriminator (mV)	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	

Full Waveform Parameters

Use 3' Waveform to derive TR	N/A	
Use 4' Waveform to derive TR	N/A	
Use 5' Waveform to derive TR	N/A	
Use 6' Waveform to derive TR	N/A	
3' Waveform Discriminator Level	N/A	mV
4' Waveform Discriminator Level	N/A	mV
5' Waveform Discriminator Level	N/A	mV
6' Waveform Discriminator Level	N/A	mV
3' Waveform Filter	N/A	
4' Waveform Filter	N/A	
5' Waveform Filter	N/A	
6' Waveform Filter	N/A	
Semblance Level	N/A	
Semblance Window Width	N/A	micro-sec
Sonic 1 Despiker	N/A	N/A
Sonic 2 Despiker	N/A	N/A

Induction Calibration MAI-A.A 45

Base Calibration on 12-JAN-2012,13:34
Field Check on 12-JUL-2012 15:21

Base Calibration

Test Loop Calibration Channel	Measured Low	Measured High	Calibrated (mmho/m) Low	Calibrated (mmho/m) 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) Low	Base Check (mmho/m) High	Field Check (mmho/m) Low	Field Check (mmho/m) High
1	0.0	0.0	18.3	3851.8
2	0.0	0.0	31.6	3629.8
3	0.0	0.0	28.6	3049.8
4	0.0	0.0	18.3	2079.3
Deep	0.0	0.0	16.0	1911.3
Medium	0.0	0.0	42.5	4061.2
Shallow	0.0	0.0	49.5	5483.8
Array Temperature	0.0		88.5	Deg F

Induction Constants MAI-A.A 45

Last Edited on 13-JUL-2012,09:09

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 28-JUN-2012,09:51

	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 31

Base Calibration on 17-JUN-2012 20:26
Field Calibration on 12-JUL-2012 15:23

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	17360	3.99
2	25891	5.98
3	34800	7.97
4	43168	9.86
5	52528	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.00	5.98

Photo Density Calibration MPD-B 31

Base Calibration on 17-JUN-2012 20:49
Field Check on 12-JUL-2012 15:29

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	48464	24458	59556	30836
Reference 2	19785	1991	24941	2541

Field Check at Base

695.5	853.6

Field Check

693.4	856.0

PE Calibration

Base Calibration	WS	Measured WH	Ratio	Calibrated Ratio
Background	128	610		
Reference 1	19401	48326	0.404	0.371
Reference 2	5740	19688	0.294	0.272
Field Check at Base	128.0	610.0		
Field Check	127.7	608.0		

Density Constants MPD-B 31

Last Edited on 13-JUL-2012,09:09

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	1.04	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
0.00	

DOWNHOLE EQUIPMENT

C:\Minimus 11.03.4044\Data\Shakespeare Zanobia #1-22\Shakespeare Zanobia 1-22.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 4 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

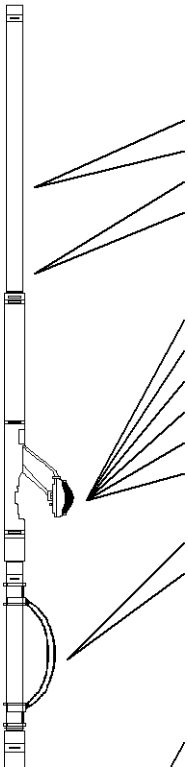
Compact Micro-log
MML-A 4 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Neutron
MDN-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 31 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

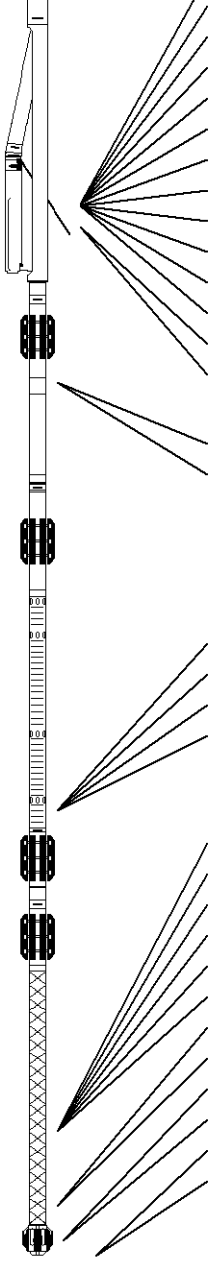
Compact Density/Caliper



55.39 ft	GRGC - Gamma Ray
55.39 ft	GRGC - Gamma Ray
52.48 ft	CGXT - MCG External Temperature
52.48 ft	CGXT - MCG External Temperature
45.76 ft	MINV - Micro-inverse
45.76 ft	MNRL - Micro-normal
46.76 ft	MLTC - MML Caliper
45.76 ft	MINV - Micro-inverse
45.76 ft	MNRL - Micro-normal
46.76 ft	MLTC - MML Caliper
40.97 ft	NPRL - Limestone Neutron Por.
40.97 ft	NPRL - Limestone Neutron Por.
33.73 ft	AVOL - Annular Volume

MPD-B 31 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



33.73 ft HVOL - Hole Volume
33.73 ft CLDC - Density Caliper
33.73 ft AVOL - Annular Volume
33.73 ft HVOL - Hole Volume
33.73 ft CLDC - Density Caliper
31.80 ft DPRL - Limestone Density Por.
31.80 ft DEN - Compensated Density
31.80 ft DCOR - Density Correction
31.80 ft DCOR - Density Correction
31.80 ft DPRL - Limestone Density Por.
31.80 ft DEN - Compensated Density
31.74 ft PDPE - PE
31.74 ft PDPE - PE

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

26.24 ft FEFE - Shallow FE
26.24 ft FEFE - Shallow FE

Compact Sonic
MSS-C.K 330 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

Compact Sonic
MSS-C.K 330 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

12.96 ft SPRL - Wyllie Lime. Sonic Por.
12.96 ft DT35 - 3-5' Compensated Sonic
12.96 ft SPRL - Wyllie Lime. Sonic Por.
12.96 ft DT35 - 3-5' Compensated Sonic

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

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
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

Total Length: 60.68 ft Weight: 456.4 lb

Total Length: 60.68 ft Weight: 456.4 lb

All measurements relative to tool zero.
All measurements relative to tool zero.

COMPANY	SHAKESPEARE OIL COMPANY, INC.
WELL	ZANOBIA #1-22
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	U.S.A. / KANSAS

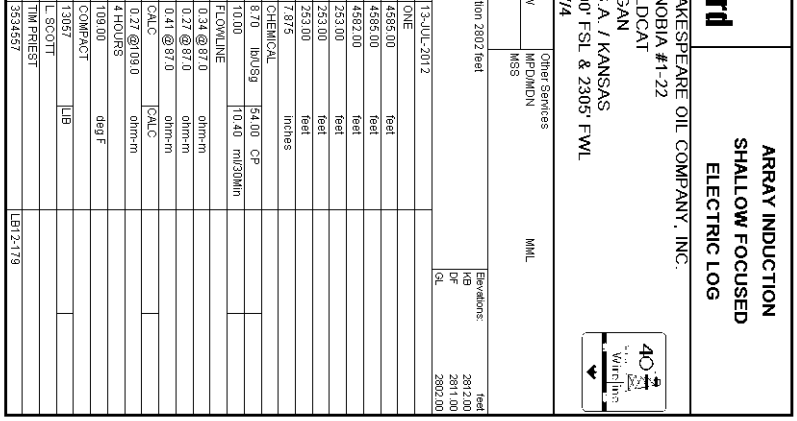
Elevation Kelly Bushing	2812.00	feet	First Reading	4582.00	feet
Elevation Drill Floor	2811.00	feet	Depth Driller	4585.00	feet
Elevation Ground Level	2802.00	feet	Depth Logger	4585.00	feet

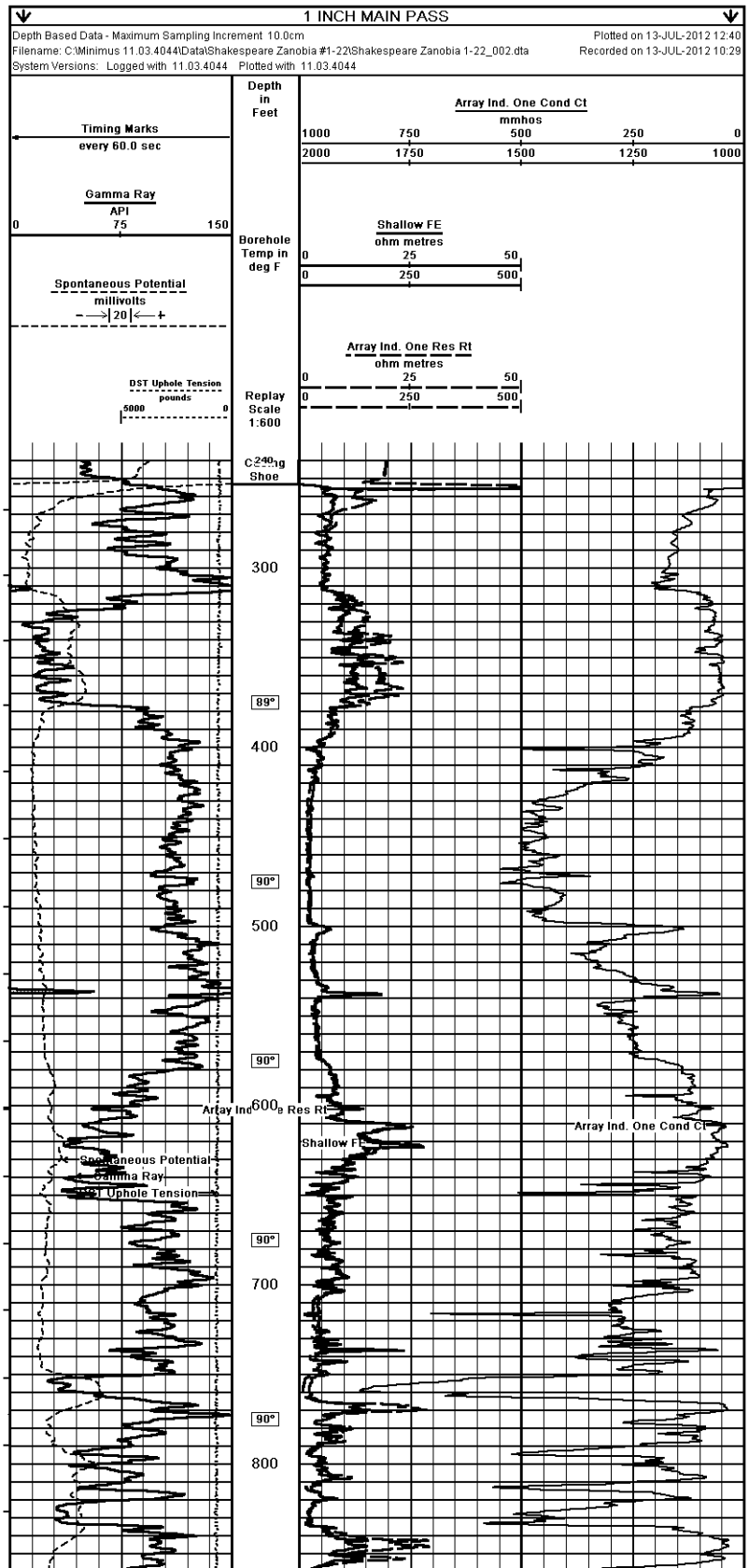
Weatherford®

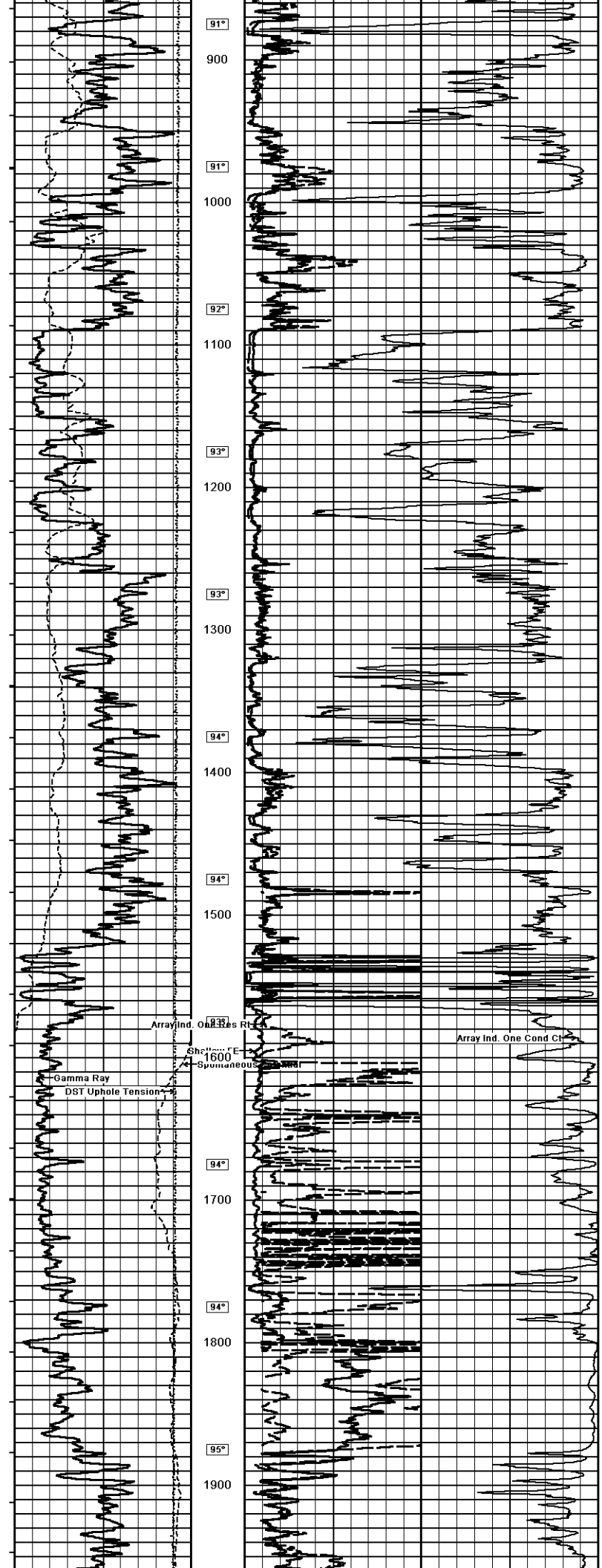
ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

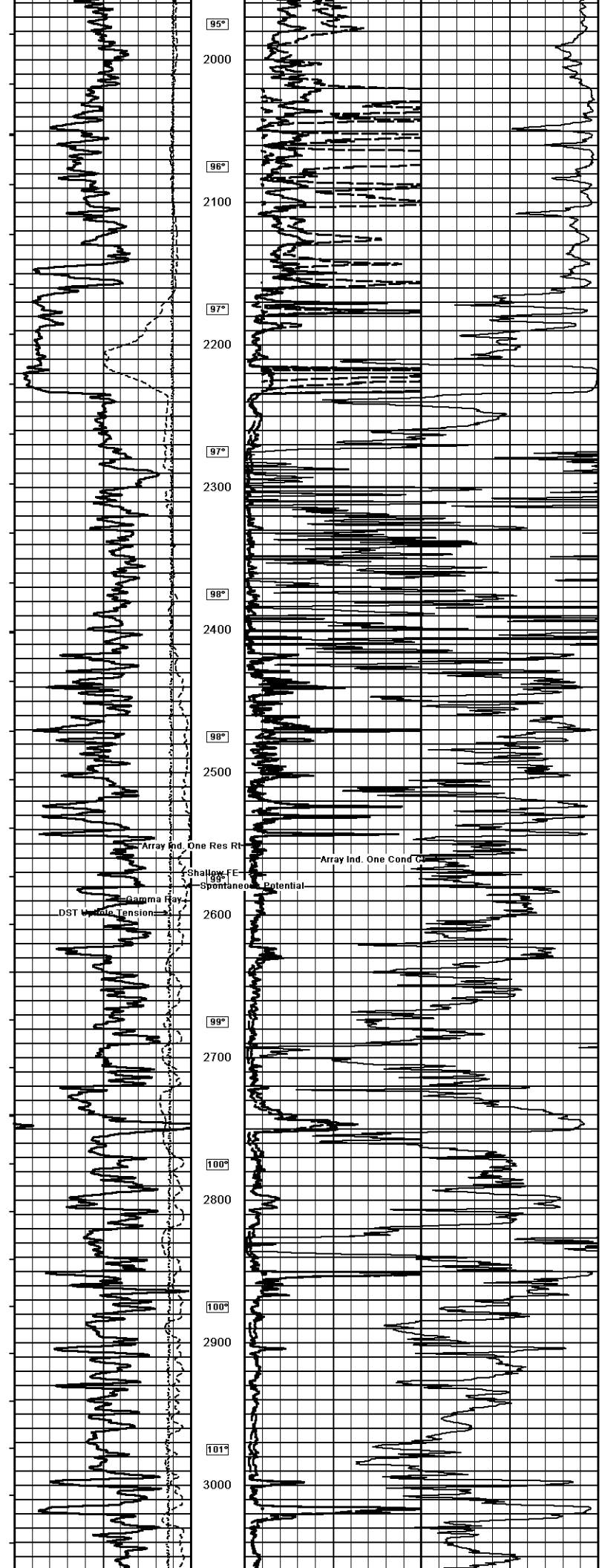
40 Years of Wireline 1970 2010

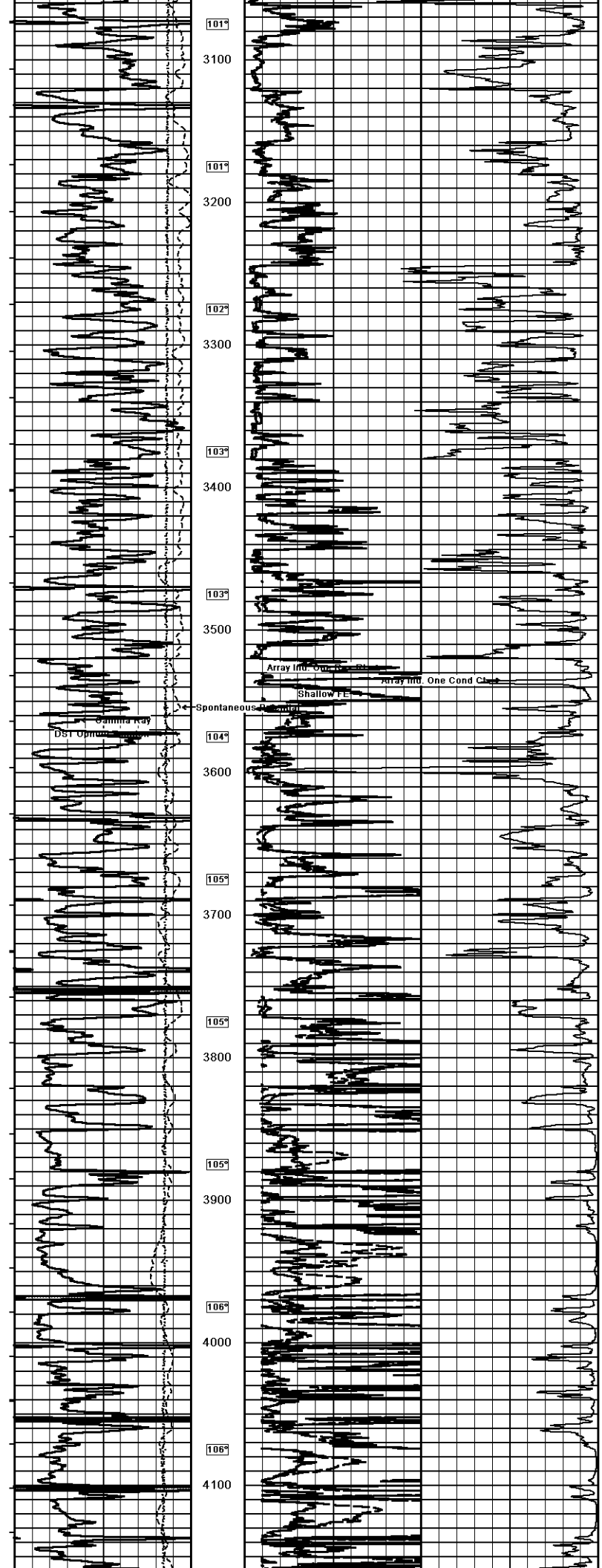
COMPANY	SHA
WELL	ZAN
FIELD	WIL
PROVINCE/COUNTY	LOG
COUNTRY/STATE	U.S.
LOCATION	109
	SW
Sec	22
Twp	15S
Rge	33W
API Number	15-109-21088
Permanent Datum G.L. Elevation	
Log Measured From KB	
Drilling Measured From K.B.	
Date	
Run Number	
Depth Driller	
Depth Logger	
First Reading	
Last Reading	
Casing Logger	
Casing Driller	
Bit Size	
Hole Fluid Type	
Density / Viscosity	
PH / Fluid Loss	
Sample Source	
Rm @ Measured Temp	
Rmf @ Measured Temp	
Rmc @ Measured Temp	
Source Rmf / Rmc	
Rm @ BHT	
Time Since Circulation	
Max Recorded Temp	
Equipment Name	
Equipment / Base	
Recorded By	
Witnessed By	
S.O.# / JOB#	

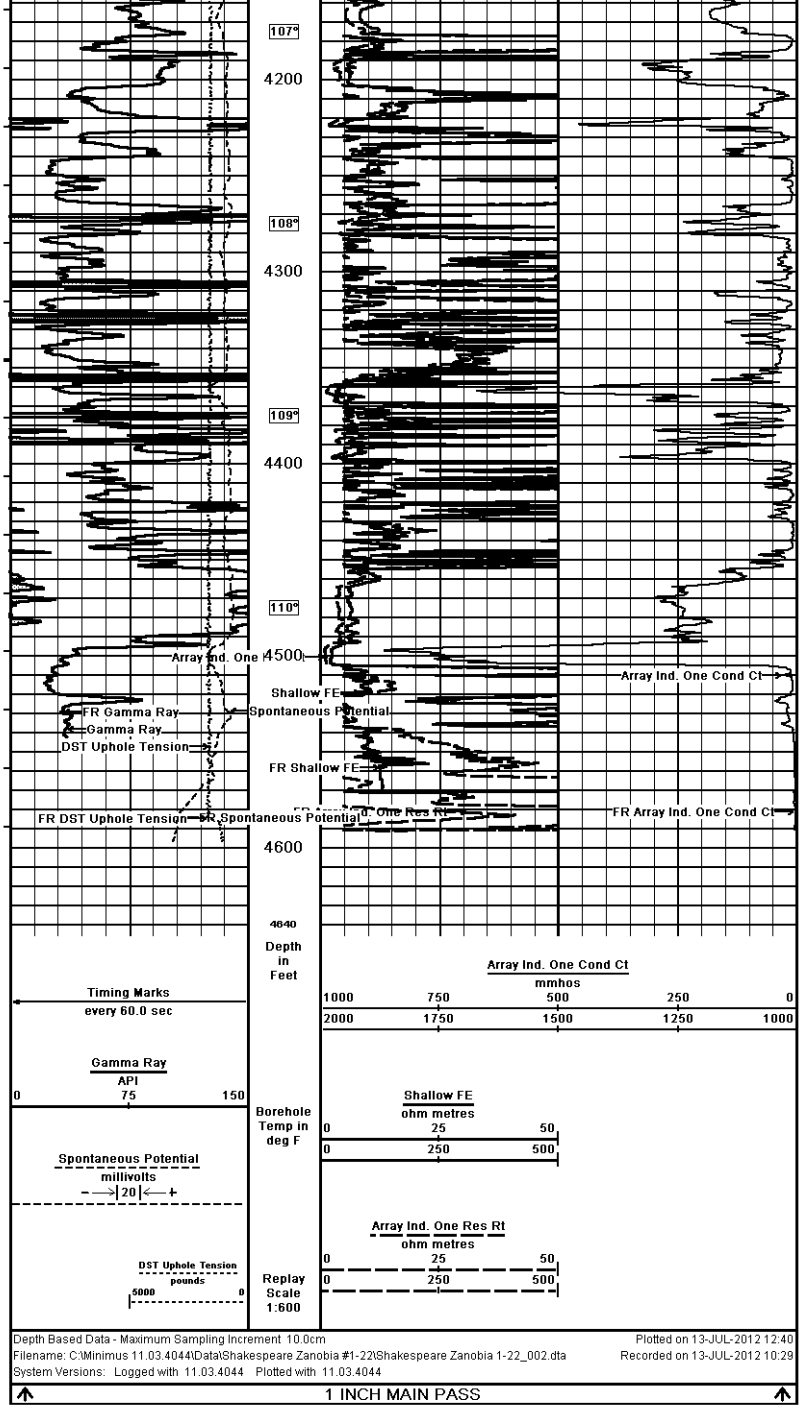

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG
SHAKESPEARE OIL COMPANY, INC.
ZANOBIA #1-22
LDCAT
SAN
S.A. / KANSAS
30' FSL & 2305' FWL
1/4
Other Services
MPD/MDN
MSS
MWL
Elevations:
KB
DF
GL
feet
2812.00
2811.00
2802.00
13-JUL-2012
ONE
4585.00 feet
4582.00 feet
4586.00 feet
253.00 feet
253.00 feet
253.00 feet
253.00 feet
7.875 inches
CHEMICAL
8.70 lbm/bg
10.00 FLOWLINE
0.34 @ 87.0 ohm-m
0.27 @ 87.0 ohm-m
0.41 @ 87.0 ohm-m
CALC
0.27 @ 109.0 ohm-m
4 HOURS
109.00 deg F
COMPACT
13057
L SCOTT
TIM PRIEST
3534567
54.00 CP
10.40 ml/30Min
CALC
LIB
LIB 2-179


1 INCH MAIN PASS
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 13-JUL-2012 12:40
Filename: C:\Minimus 11.03.4044\Data\Shakespeare Zanobia #1-22\Shakespeare Zanobia 1-22_002.dta
Recorded on 13-JUL-2012 10:29
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
1:600
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
Casing
Shoe
240
300
89°
400
90°
500
90°
600
Array Ind. One Res Rt
Shallow FE
Array Ind. One Cond Ct
Spontaneous Potential
Gamma Ray
DST Uphole Tension
90°
700
90°
800


91°
900
91°
1000
92°
1100
93°
1200
93°
1300
94°
1400
94°
1500
94°
1600
94°
1700
94°
1800
95°
1900
Array Ind. One Cond Ct
Gamma Ray
DST Uphole Tension


95°
2000
96°
2100
97°
2200
97°
2300
98°
2400
99°
2500
Array Ind. One Res Rt
Array Ind. One Cond Cs
Shallow FE
99°
Spontaneous Potential
Gamma Ray
DST U - Hole Tension
2600
99°
2700
100°
2800
100°
2900
101°
3000


101°
3100
101°
3200
102°
3300
103°
3400
103°
3500
Array Ind. One Cond Cloc
Shallow FE
Spontaneous Potential
Gamma Ray
104°
3600
105°
3700
105°
3800
105°
3900
106°
4000
106°
4100



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 13-JUL-2012 12:40

Filename: C:\Minimus 11.03.4044\Data\Shakespeare Zanobia #1-22\Shakespeare Zanobia 1-22_002.dta — Recorded on 13-JUL-2012 10:29

System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

1 INCH MAIN PASS

COMPANY	SHAKESPEARE OIL COMPANY, INC.
WELL	ZANOBIA #1-22
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
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Elevation Kelly Bushing	2812.00	feet	First Reading	4582.00	feet
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Weatherford

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG