

**Weatherford****ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG**

COMPANY	SHAKESPEARE OIL CO, INC.			
WELL	YORK #1-2			
FIELD	WILDCAT			
PROVINCE/COUNTY	SCOTT			
COUNTRY/STATE	UNITED STATES / KANSAS			
LOCATION	1734' FSL & 1348' FEL			
SEC	TWP	RGE	Other Services	
2	16S	31W	MPD/MDN	
API Number	15-171-20967		MML	
Permit Number	MSS			
Permanent Datum G.L., Elevation 2866 feet				Elevations: feet
Log Measured From KB				KB 2876.00
Drilling Measured From K.B. @ 10 FEET				DF 2874.00
				GL 2866.00
Date	26-AUG-2013			
Run Number	ONE			
Service Order	3541074			
Depth Driller	4630.00			feet
Depth Logger	4629.00			feet
First Reading	4626.00			feet
Last Reading				
Casing Driller	226.00			feet
Casing Logger	222.00			feet
Bit Size	7.880			inches
Hole Fluid Type	CHEMICAL			
Density / Viscosity	9.30 lb/USg		52.00 CP	
PH / Fluid Loss	10.50		7.60 ml/30Min	
Sample Source	MUDPIT			
Rm @ Measured Temp	1.62 @ 75.0		ohm-m	
Rmf @ Measured Temp	1.29 @ 75.0		ohm-m	
Rmc @ Measured Temp	1.94 @ 75.0		ohm-m	
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	1.06 @ 115.0		ohm-m	
Time Since Circulation	4 HOURS			
Max Recorded Temp	115.00		deg F	
Equipment / Base	13096		LIB	
Recorded By	W. STAMBAUGH			
Witnessed By	TIM PRIEST			
JOBS#	LB13-235			

BOREHOLE RECORD

Last Edited: 26-AUG-2013 09:51

Bit Size inches	Depth From feet	Depth To feet
7.880	222.00	4629.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	222.00	24.00

REMARKS

- SOFTWARE ISSUE: WLS 13.05.9583
- TOOLS: MCG, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION
- HARDWARE:
 - MDN: DUAL BOWSPRING ECCENTRALIZER
 - MFE 1 x 0.5 INCH STANDOFF
 - MSS 2x 0.5 INCH STANDOFF
 - MAI 1 x 0.5 INCH STANDOFF
- 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
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING AT 226 FEET : 1980 CU. FT

- ANNULAR HOLE VOLUME WITH 5.5 INCH CASING FROM TD TO SURFACE CASING AT 226 FT: 1260 CU. FT

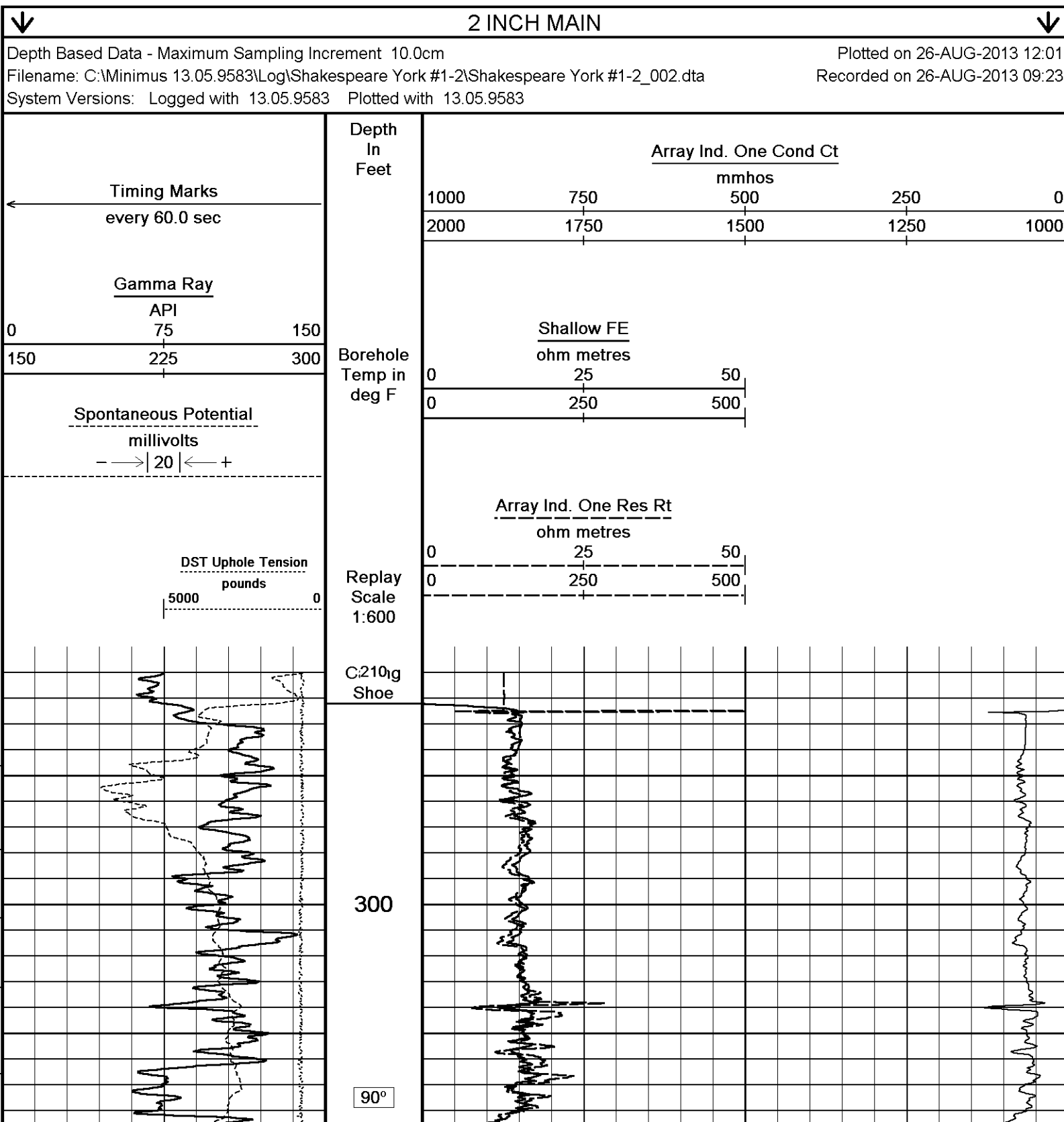
- RIG: HD #2

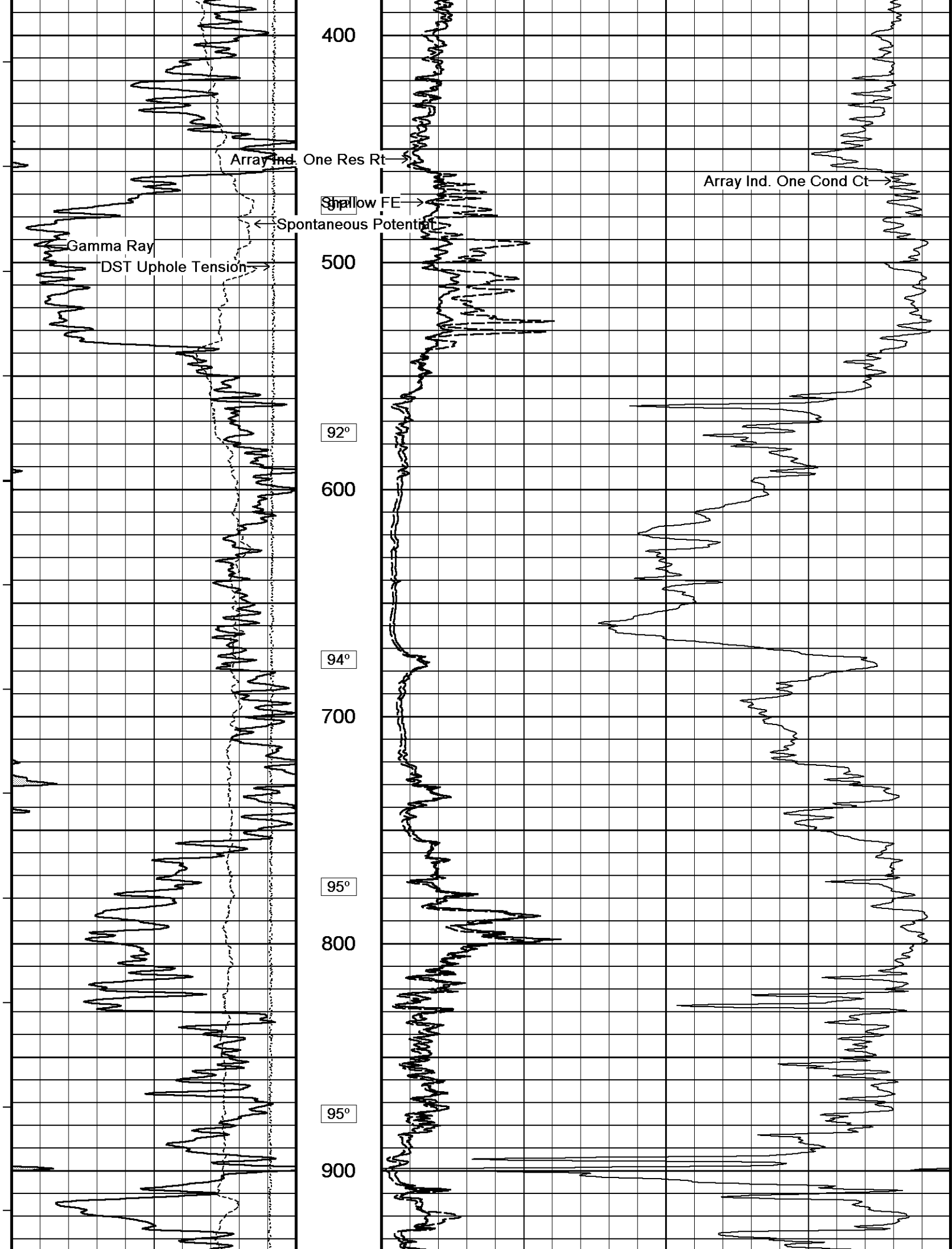
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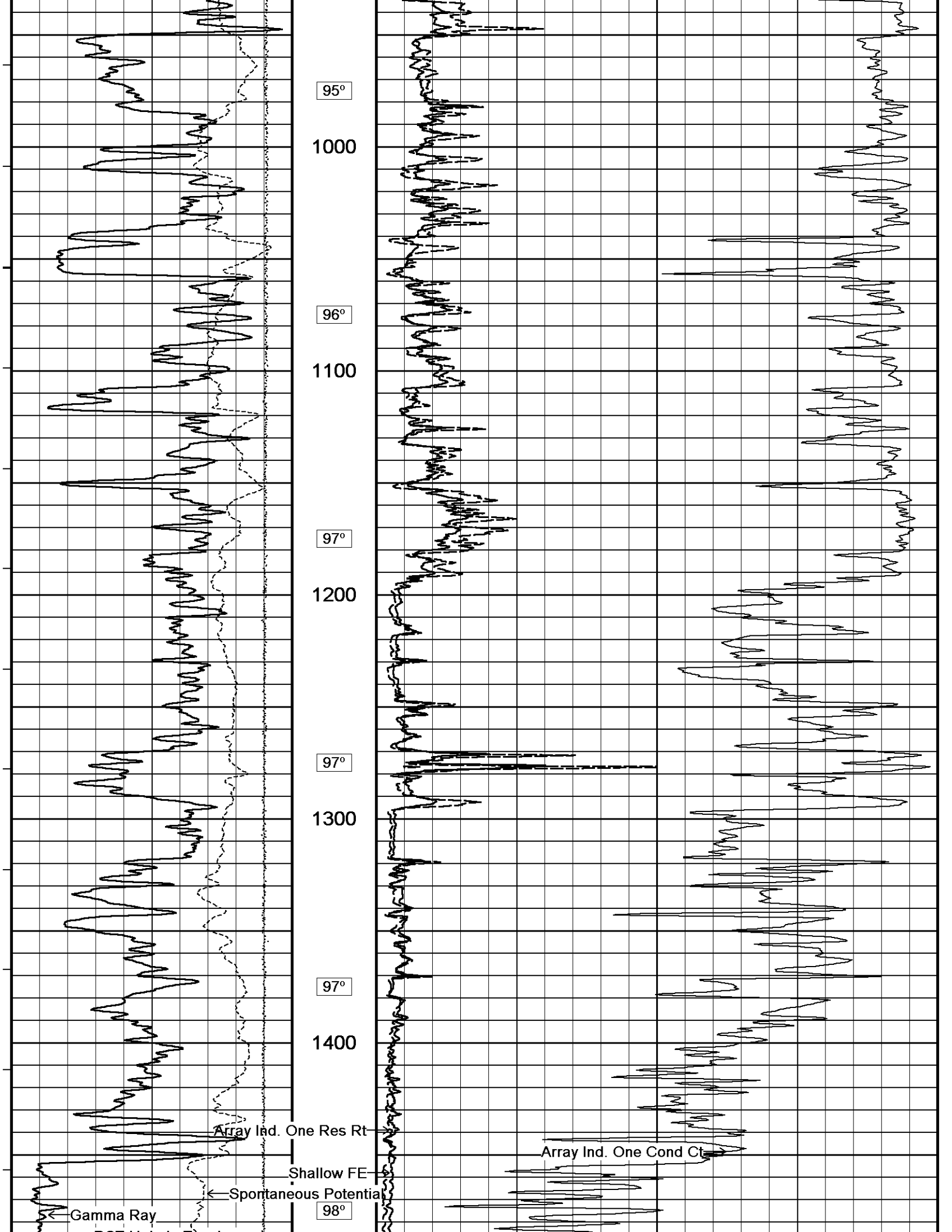
- ENGINEERS: WILLIAM STAMBAUGH

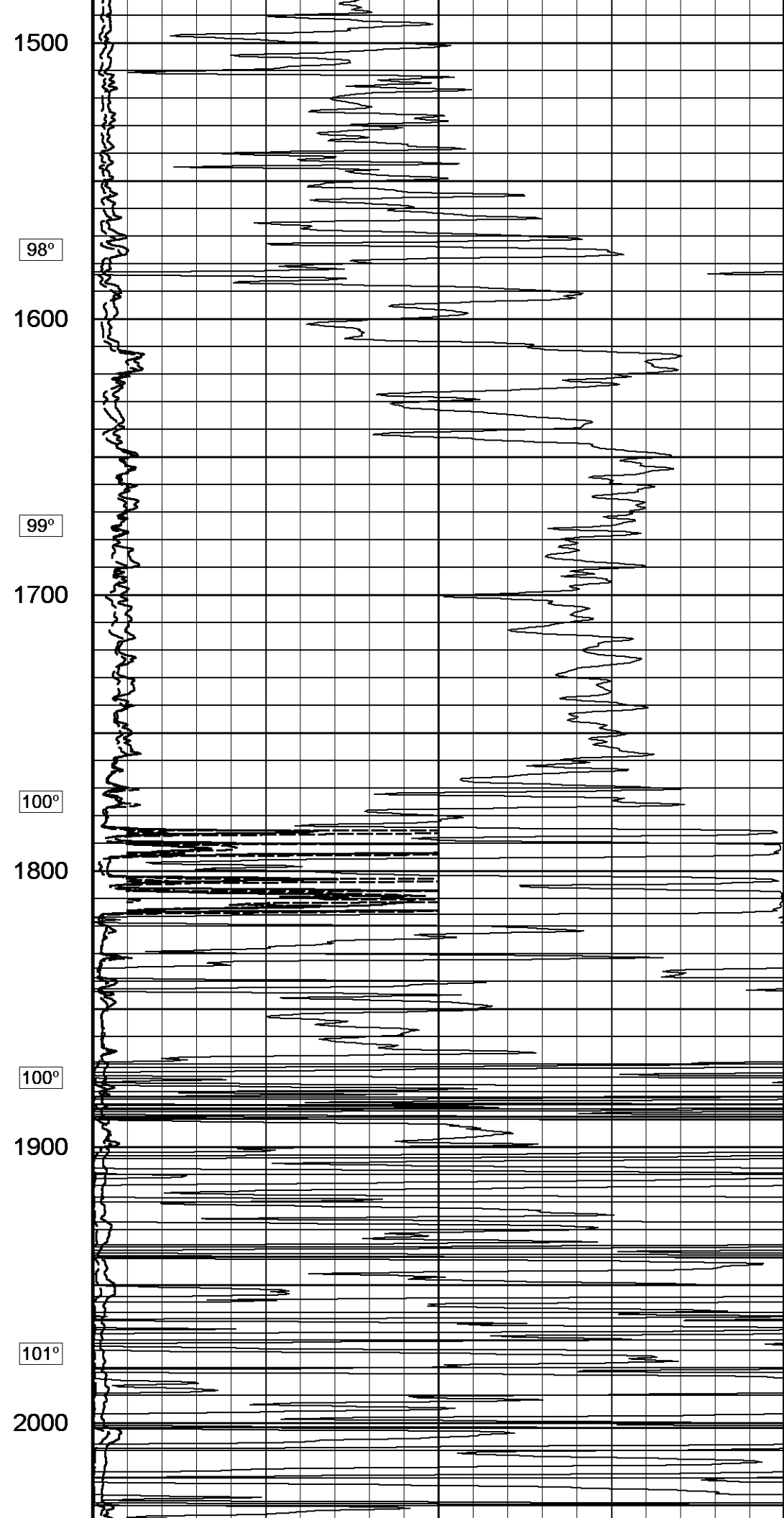
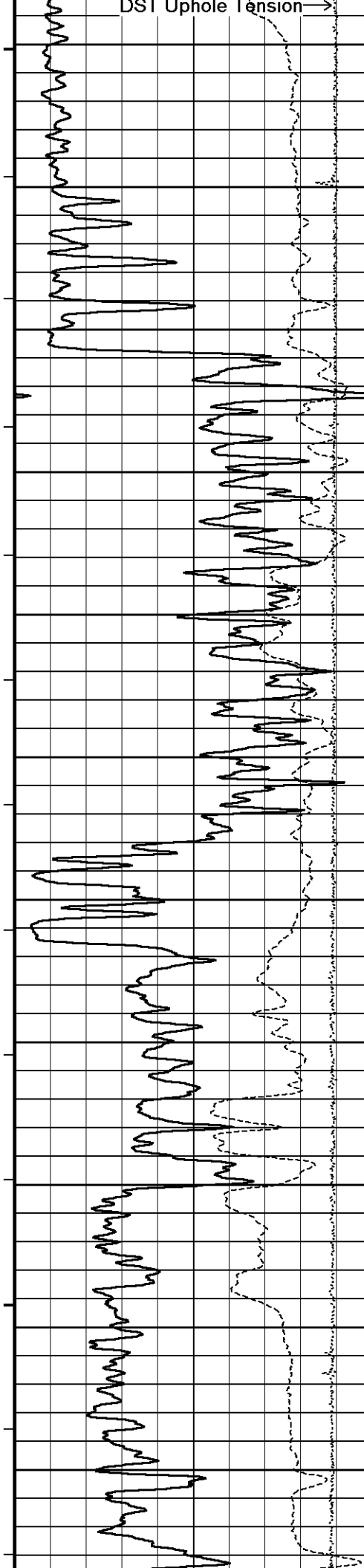
- OPERATORS: K. RINEHART / JOHN DUNLAP

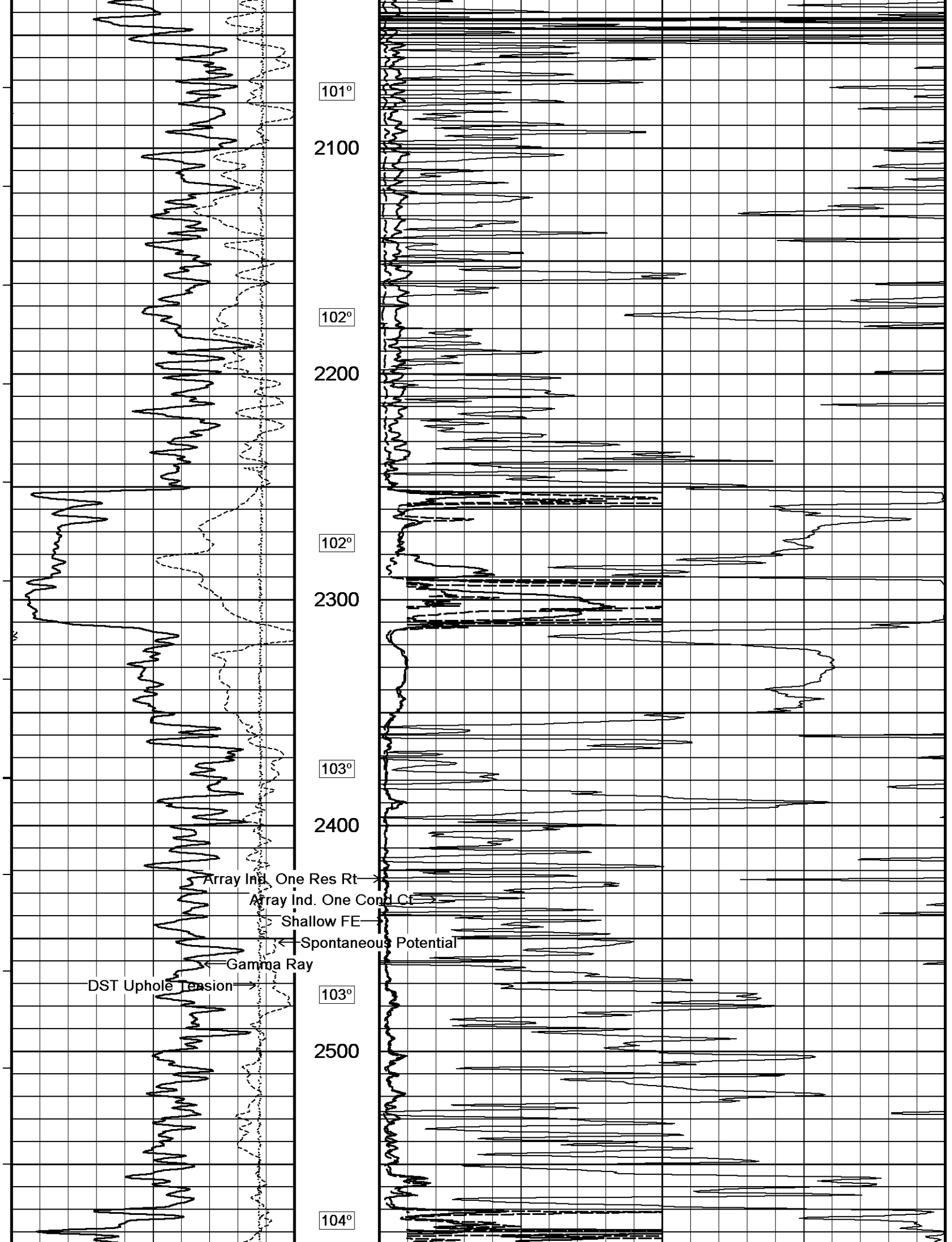
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.

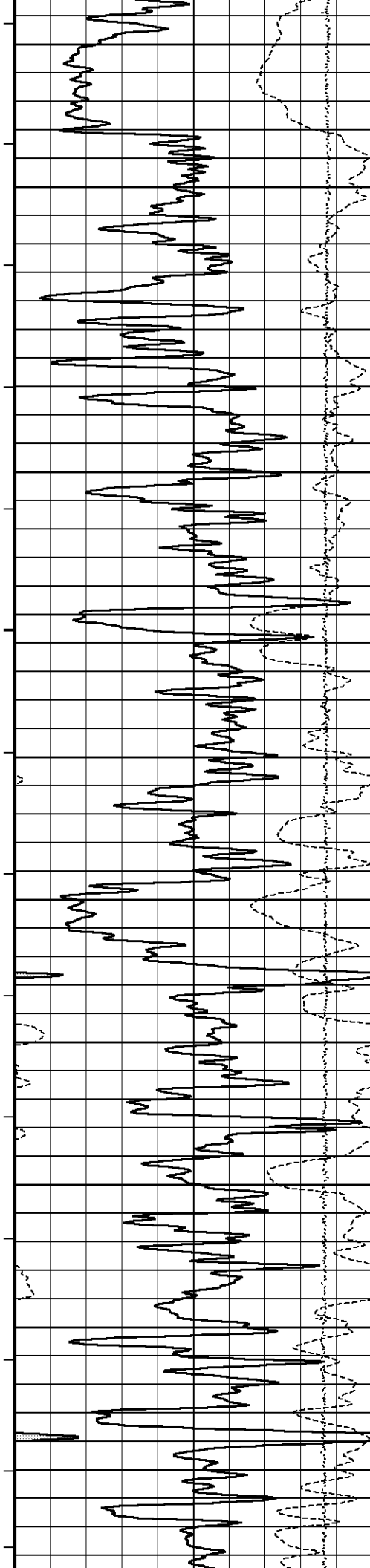












2600

104°

2700

105°

2800

105°

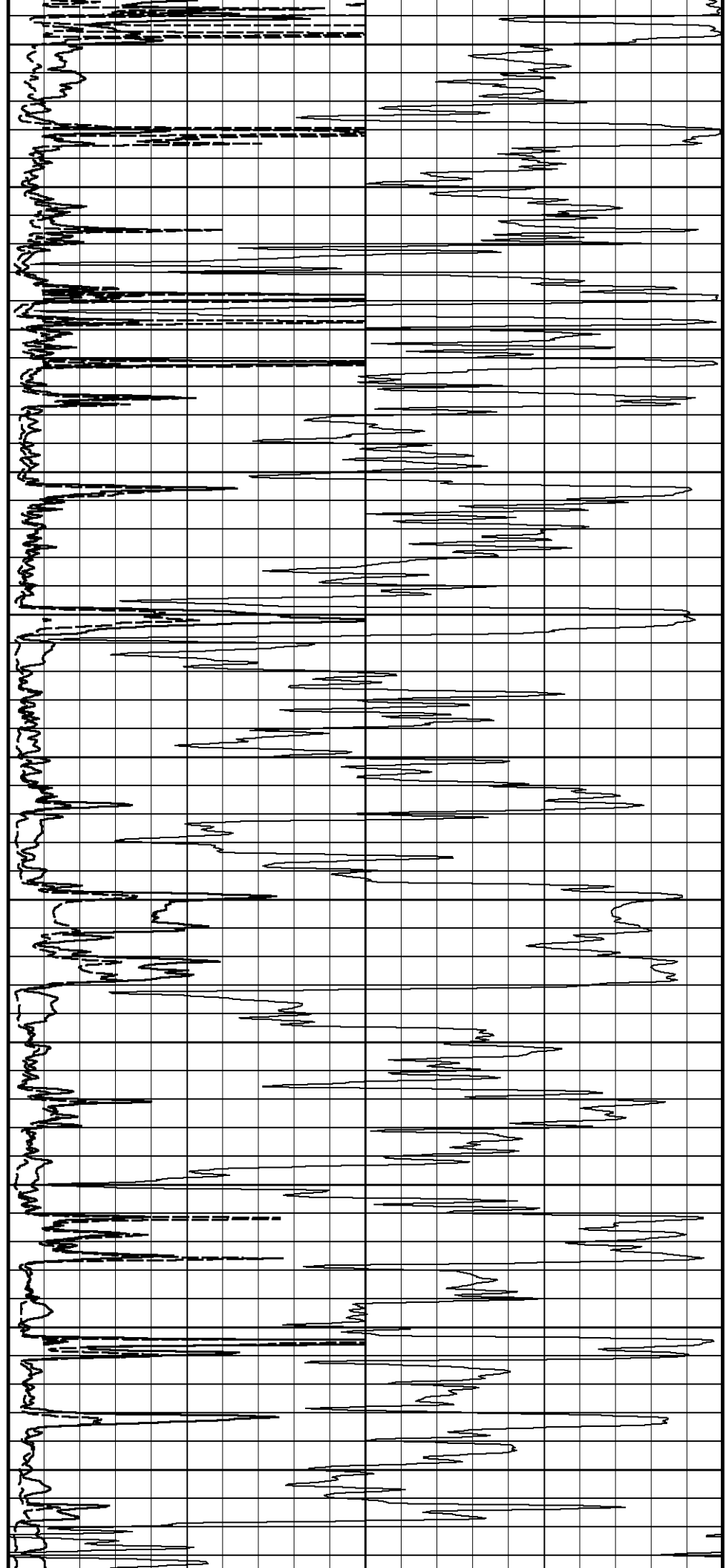
2900

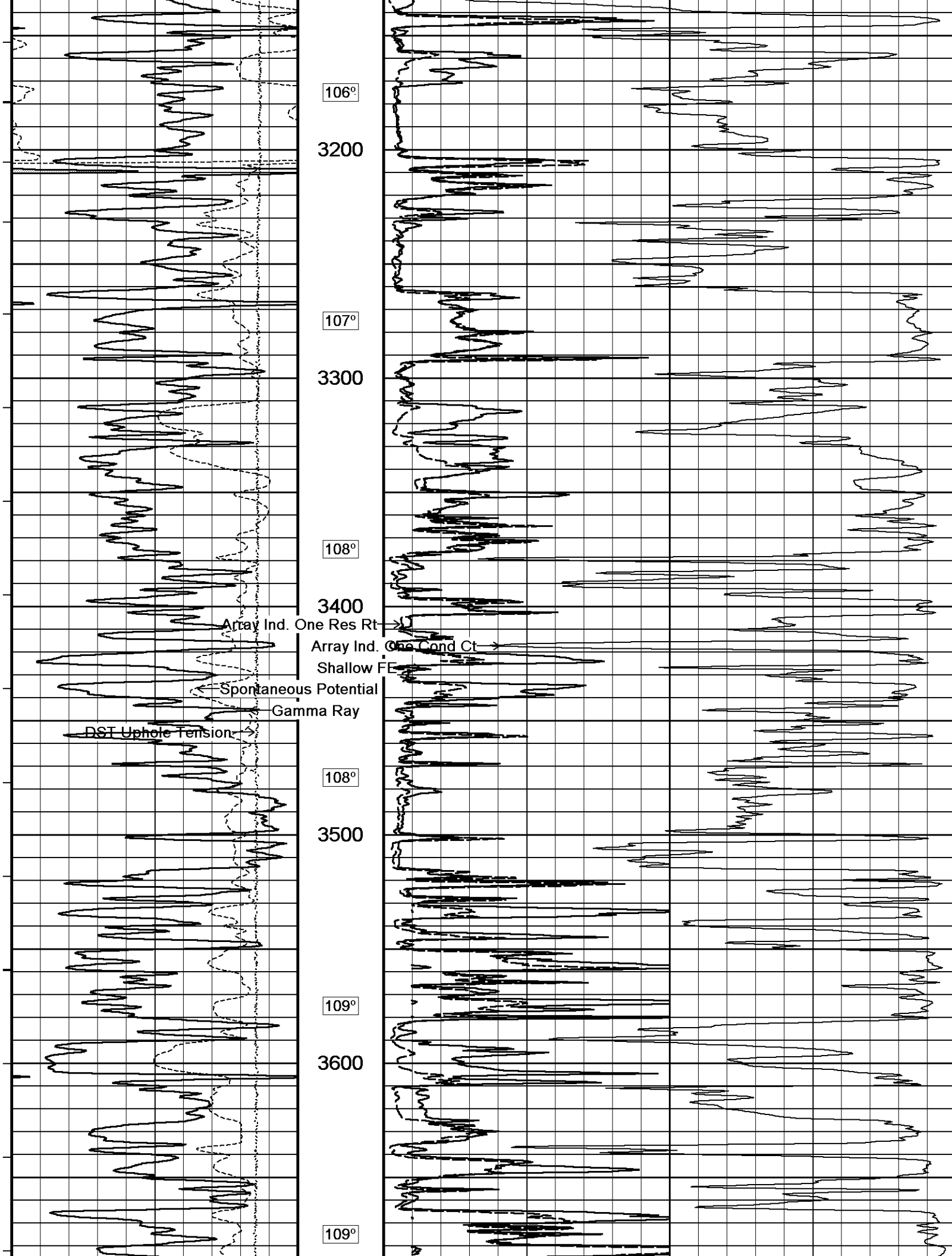
106°

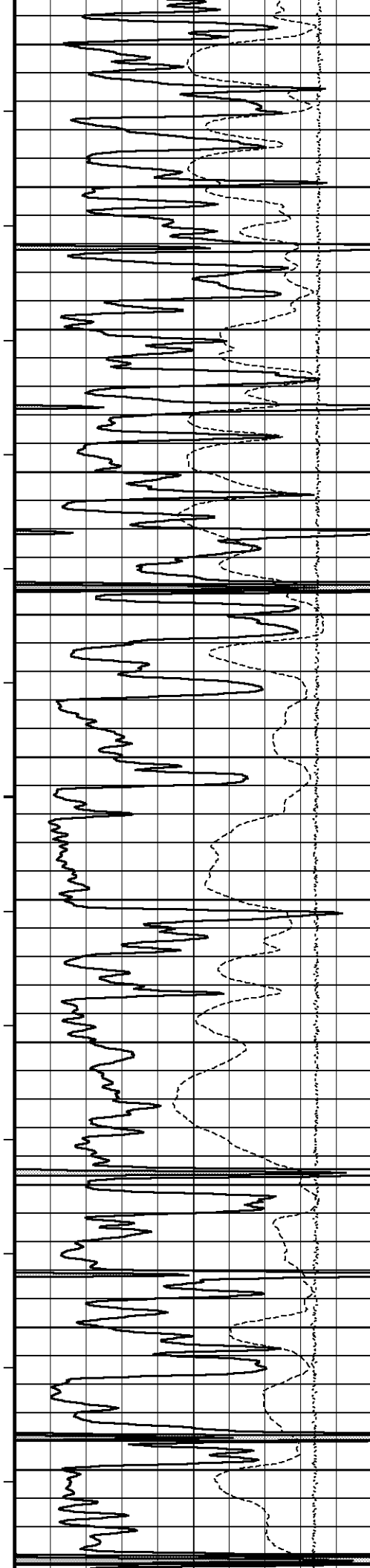
3000

106°

3100







3700

110°

3800

110°

3900

111°

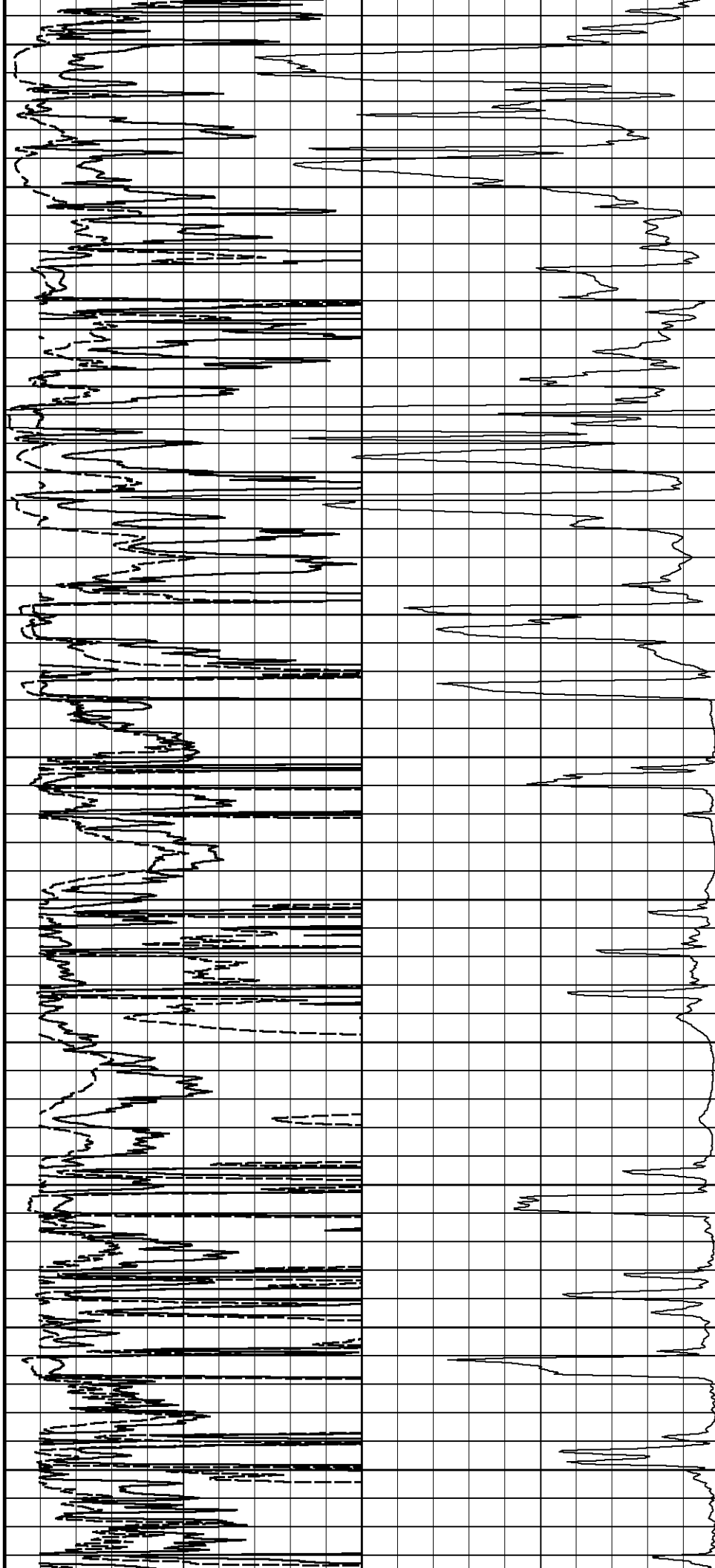
4000

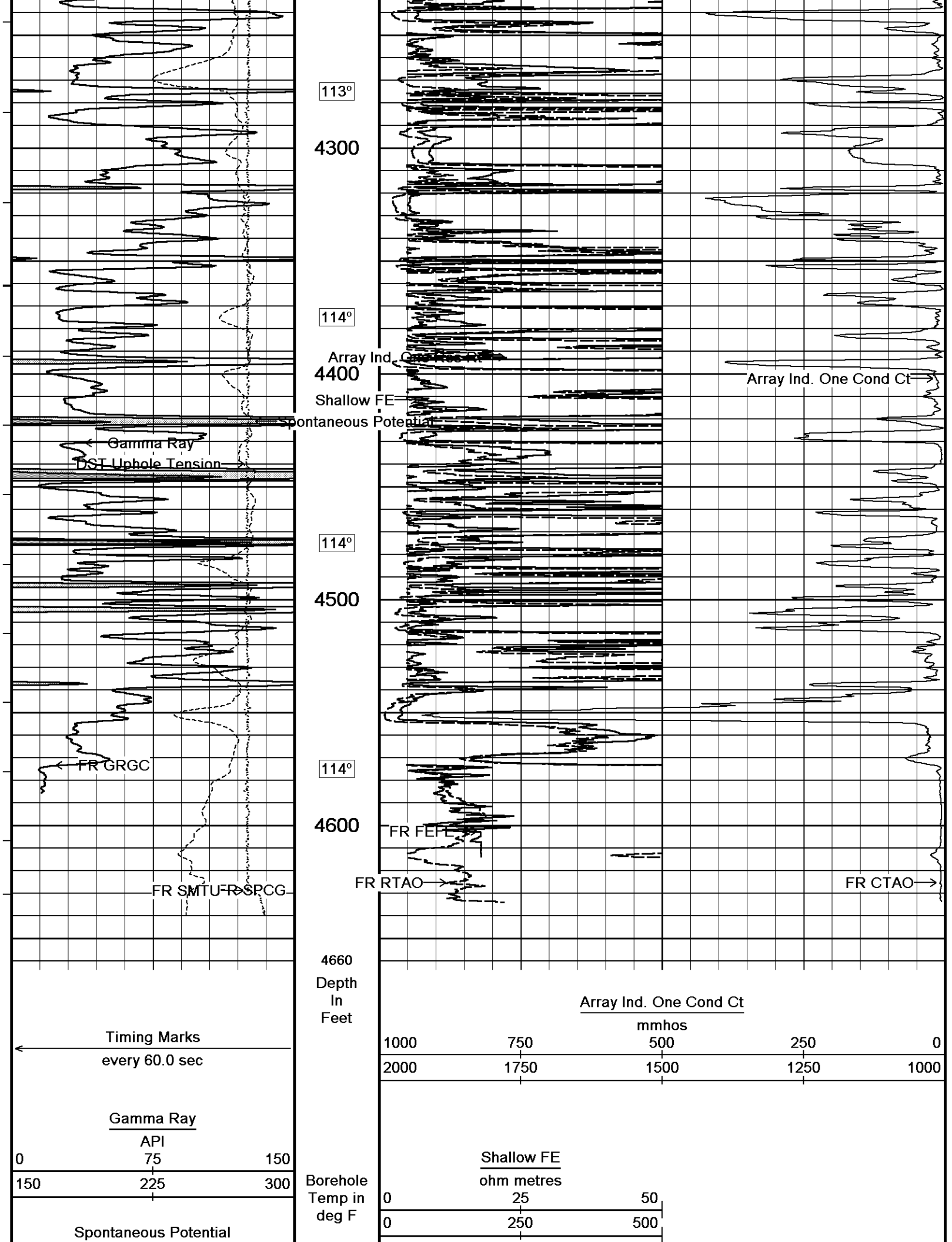
112°

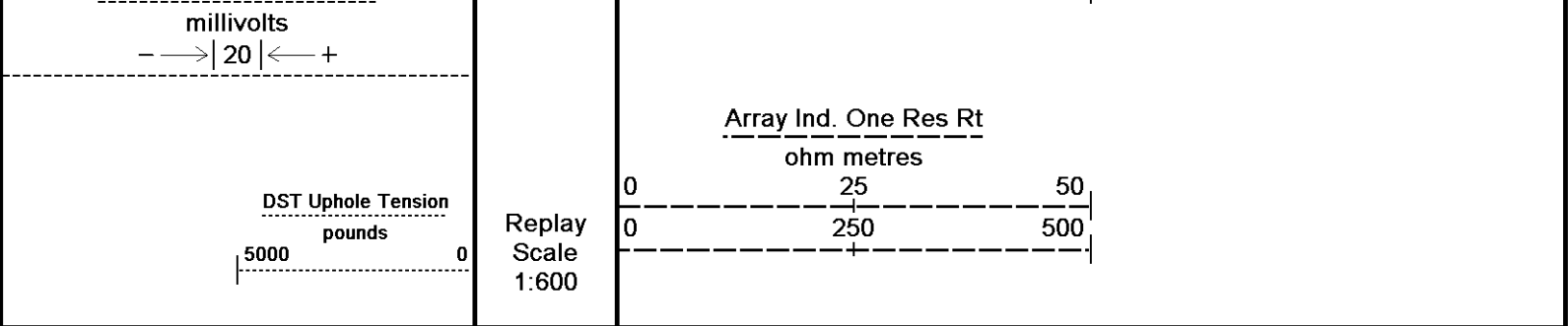
4100

112°

4200





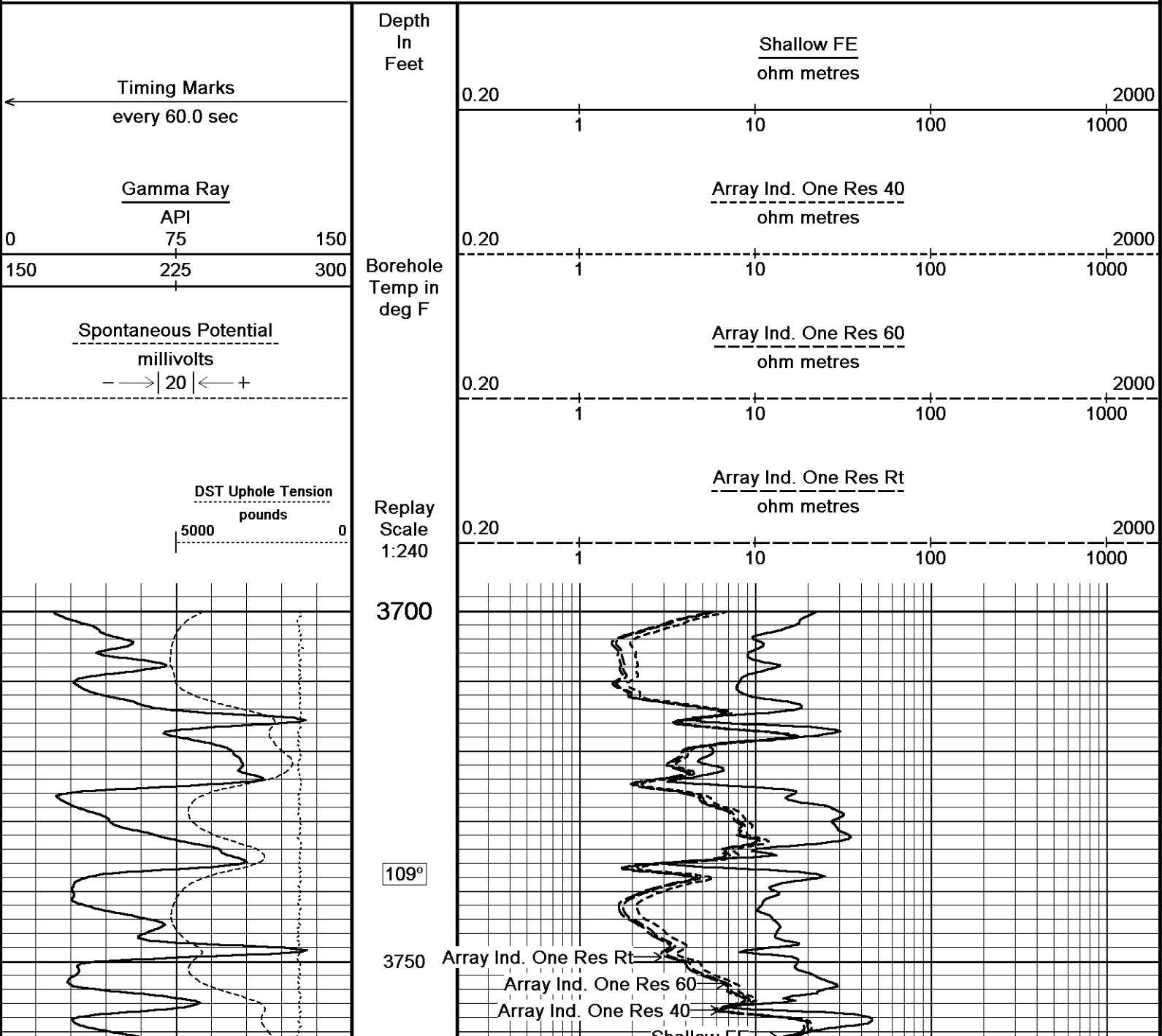


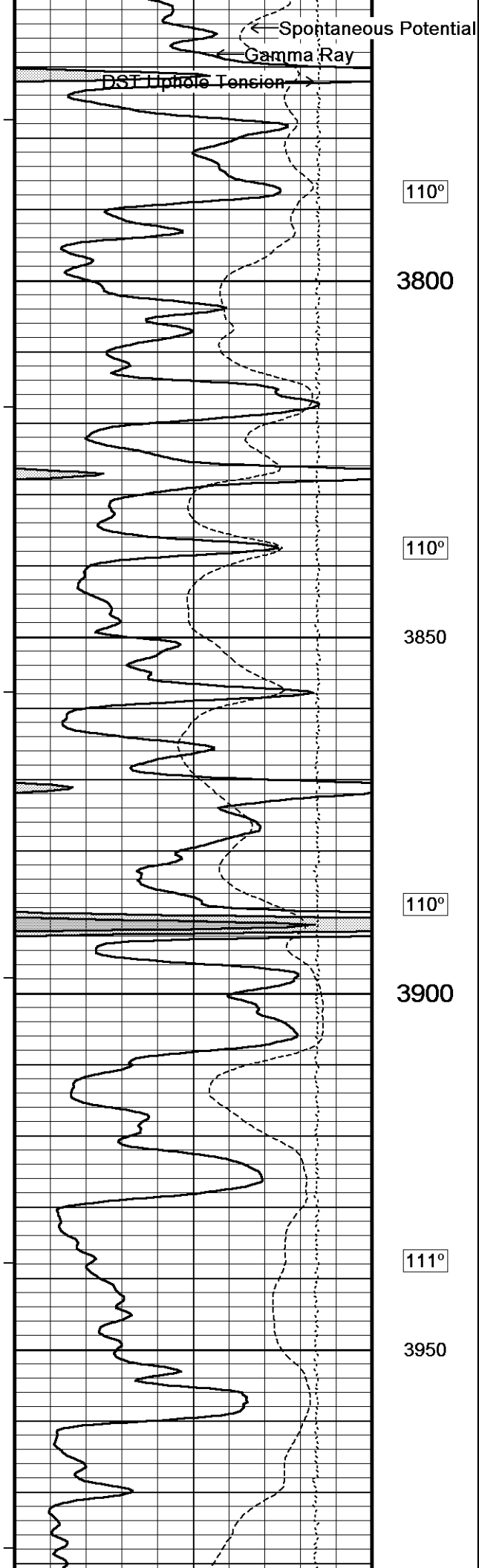
Depth Based Data - Maximum Sampling Increment 10.0cm	Plotted on 26-AUG-2013 12:01
Filename: C:\Minimus 13.05.9583\Log\Shakespeare York #1-2\Shakespeare York #1-2_002.dta	Recorded on 26-AUG-2013 09:23
System Versions: Logged with 13.05.9583 Plotted with 13.05.9583	

↑	2 INCH MAIN	↑
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↓	5 INCH MAIN	↓
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Depth Based Data - Maximum Sampling Increment 10.0cm	Plotted on 26-AUG-2013 12:01
Filename: C:\Minimus 13.05.9583\Log\Shakespeare York #1-2\Shakespeare York #1-2_002.dta	Recorded on 26-AUG-2013 09:23
System Versions: Logged with 13.05.9583 Plotted with 13.05.9583	





110°

3800

110°

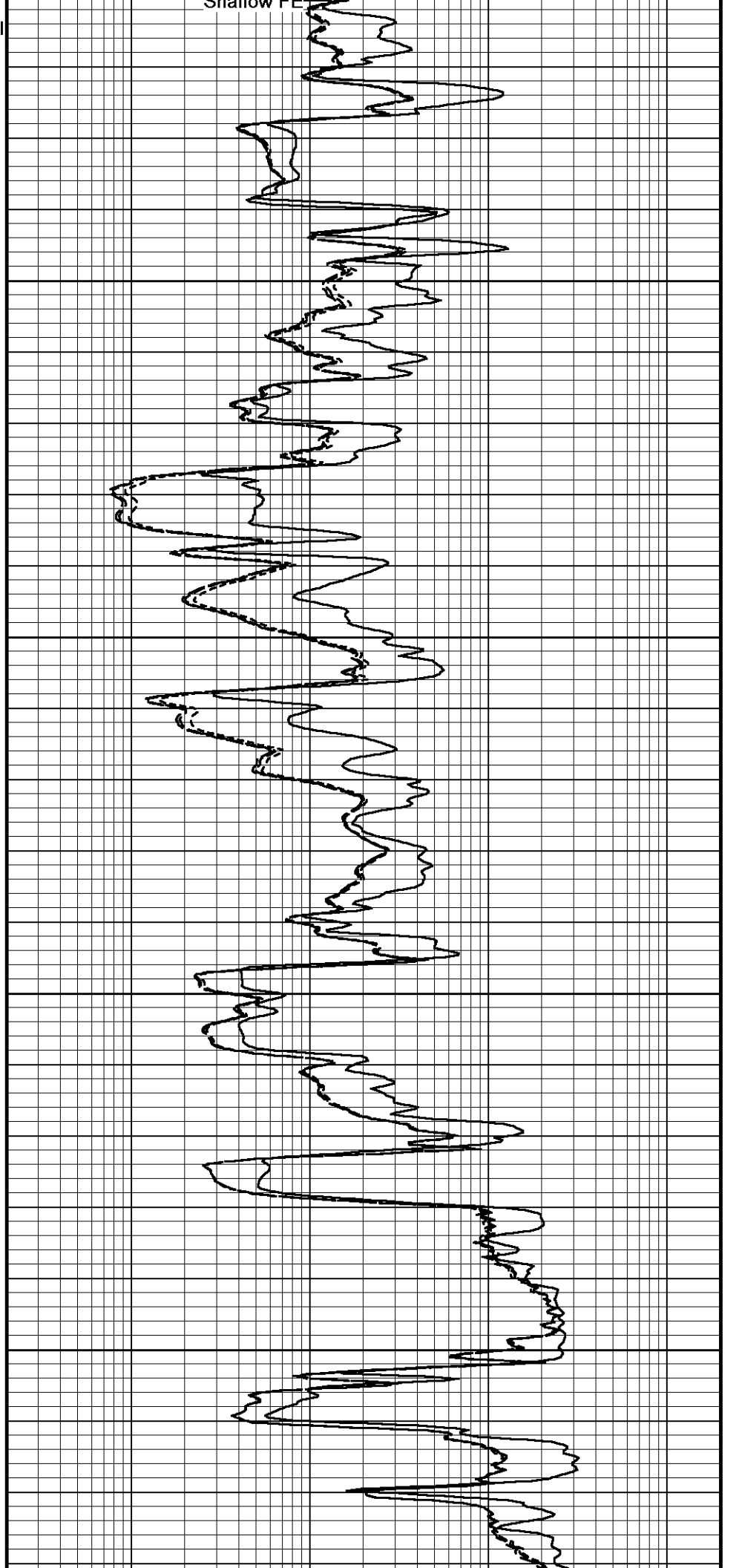
3850

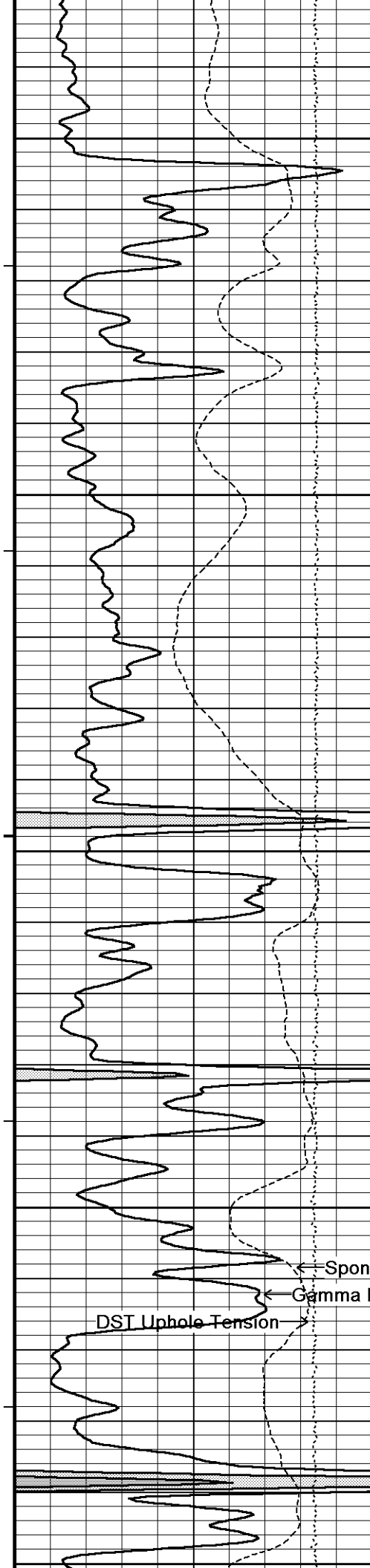
110°

3900

111°

3950





111°

4000

111°

4050

112°

4100

112°

4150

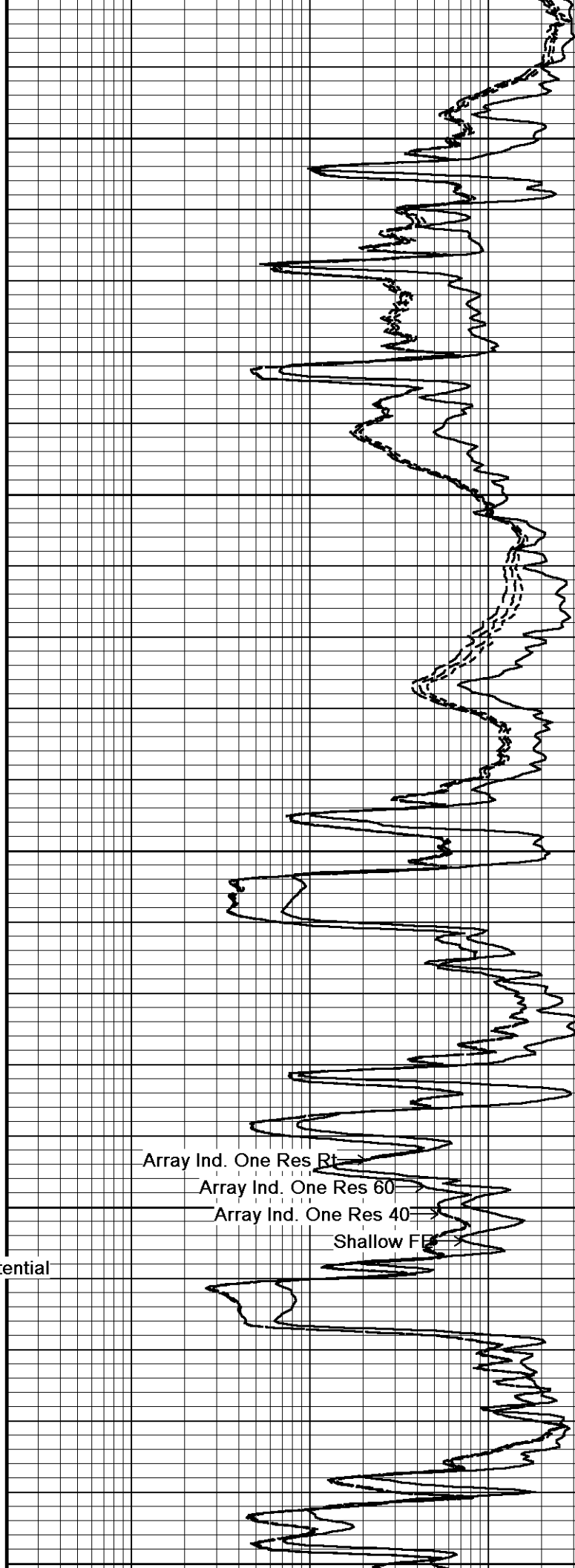
← Spontaneous Potential

← Gamma Ray

DST Uphole Tension →

113°

4200

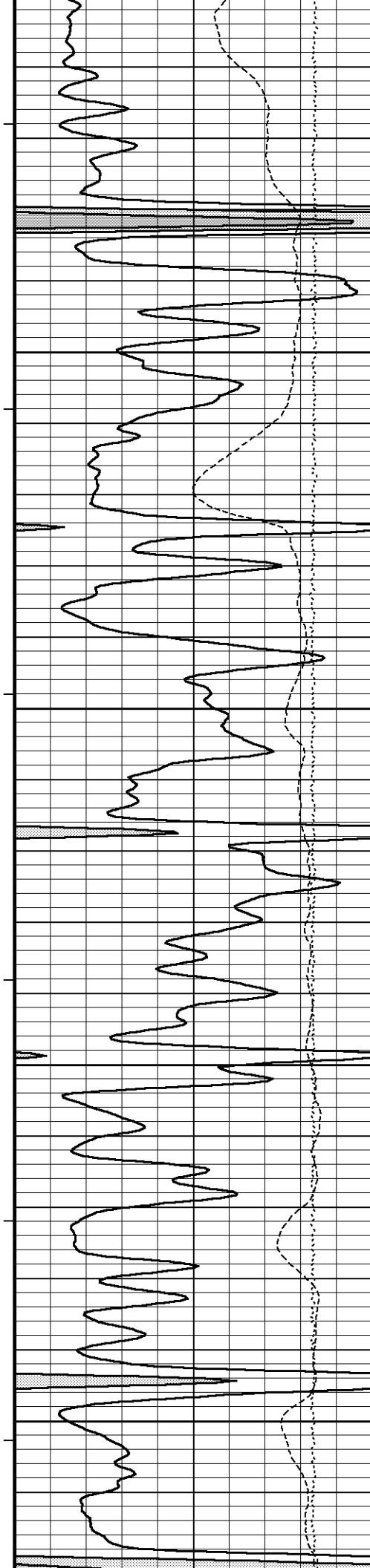


Array Ind. One Res RT

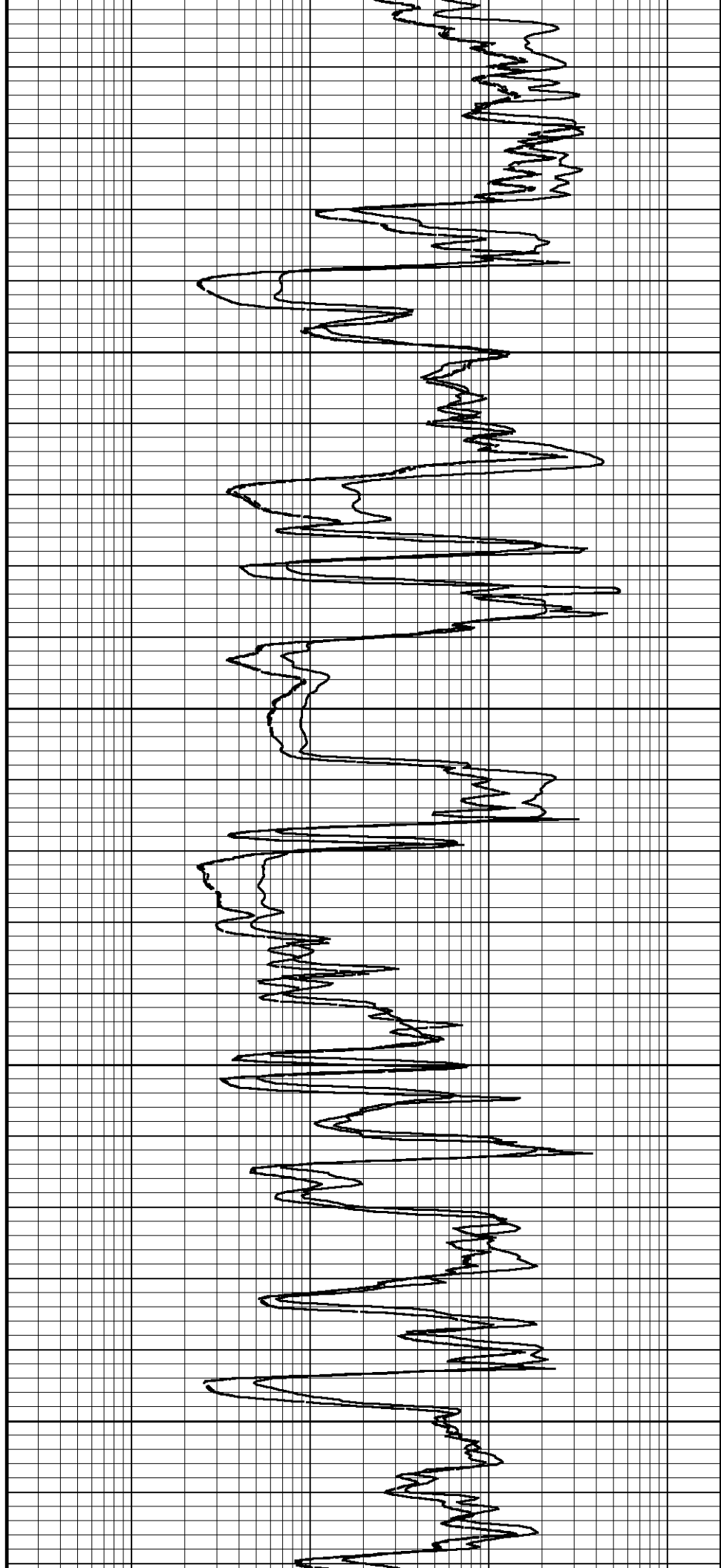
Array Ind. One Res 60

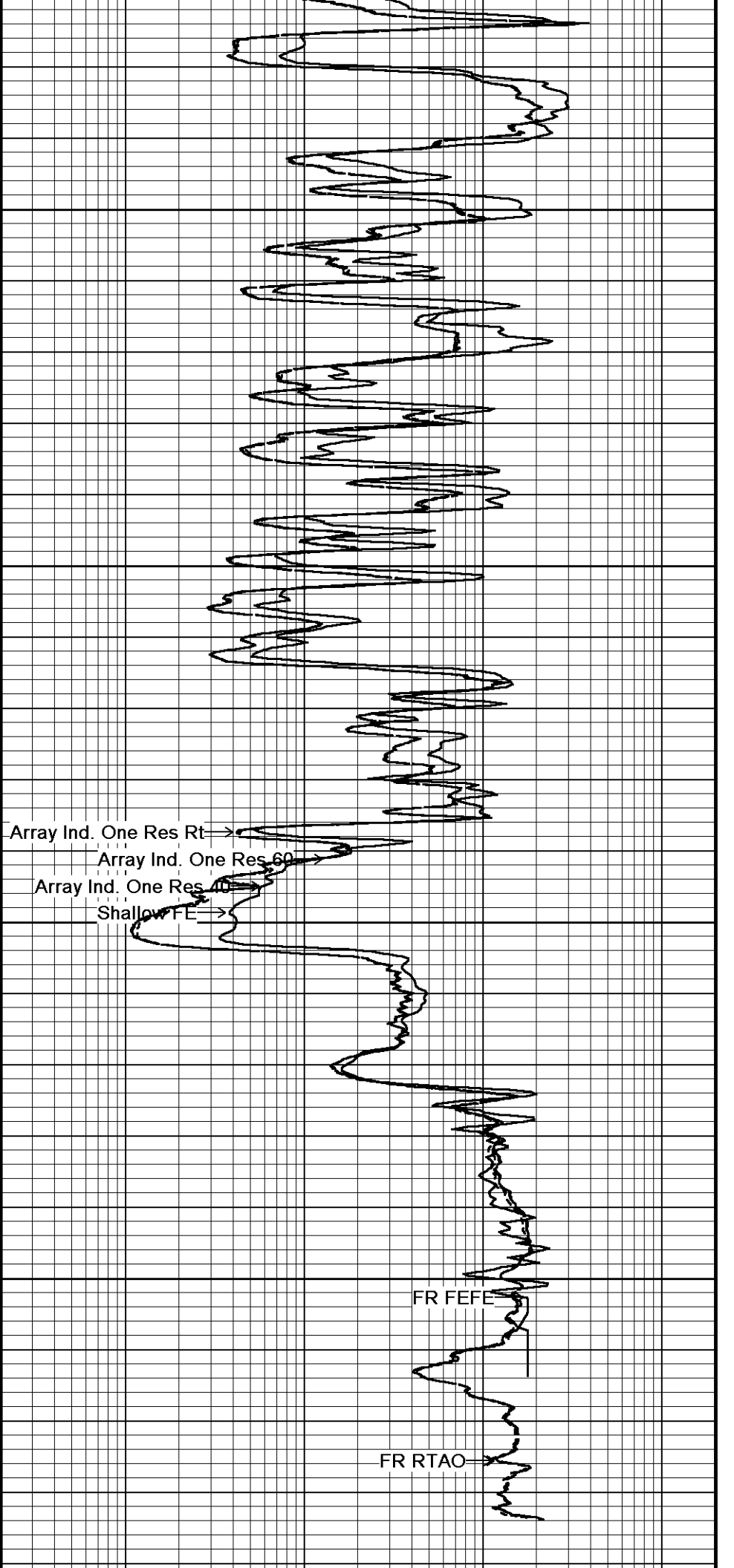
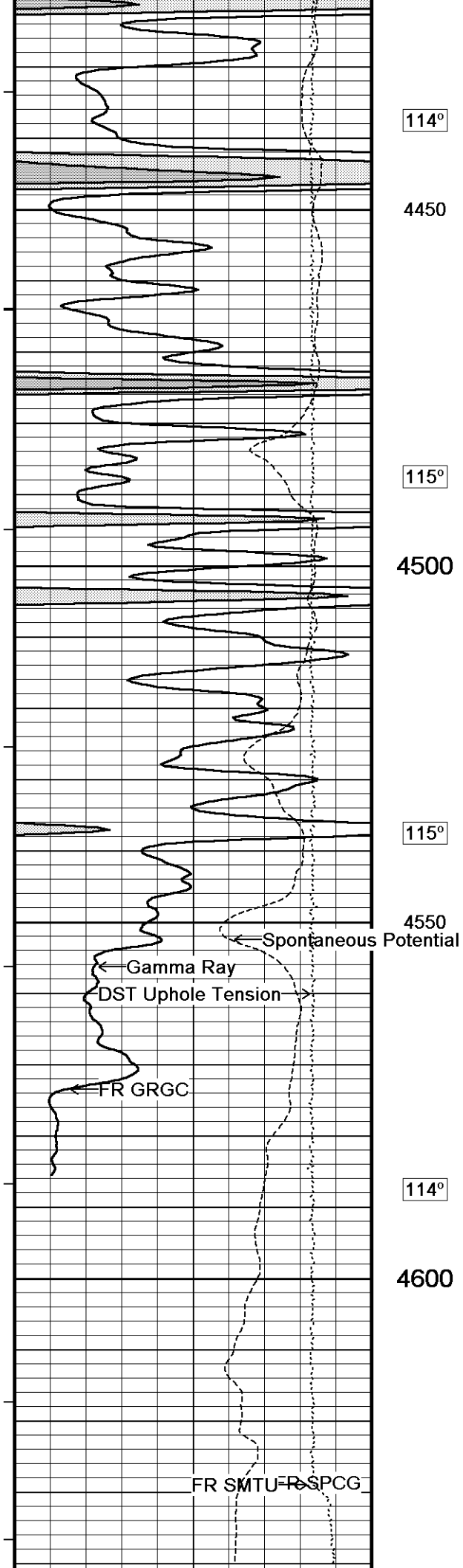
Array Ind. One Res 40

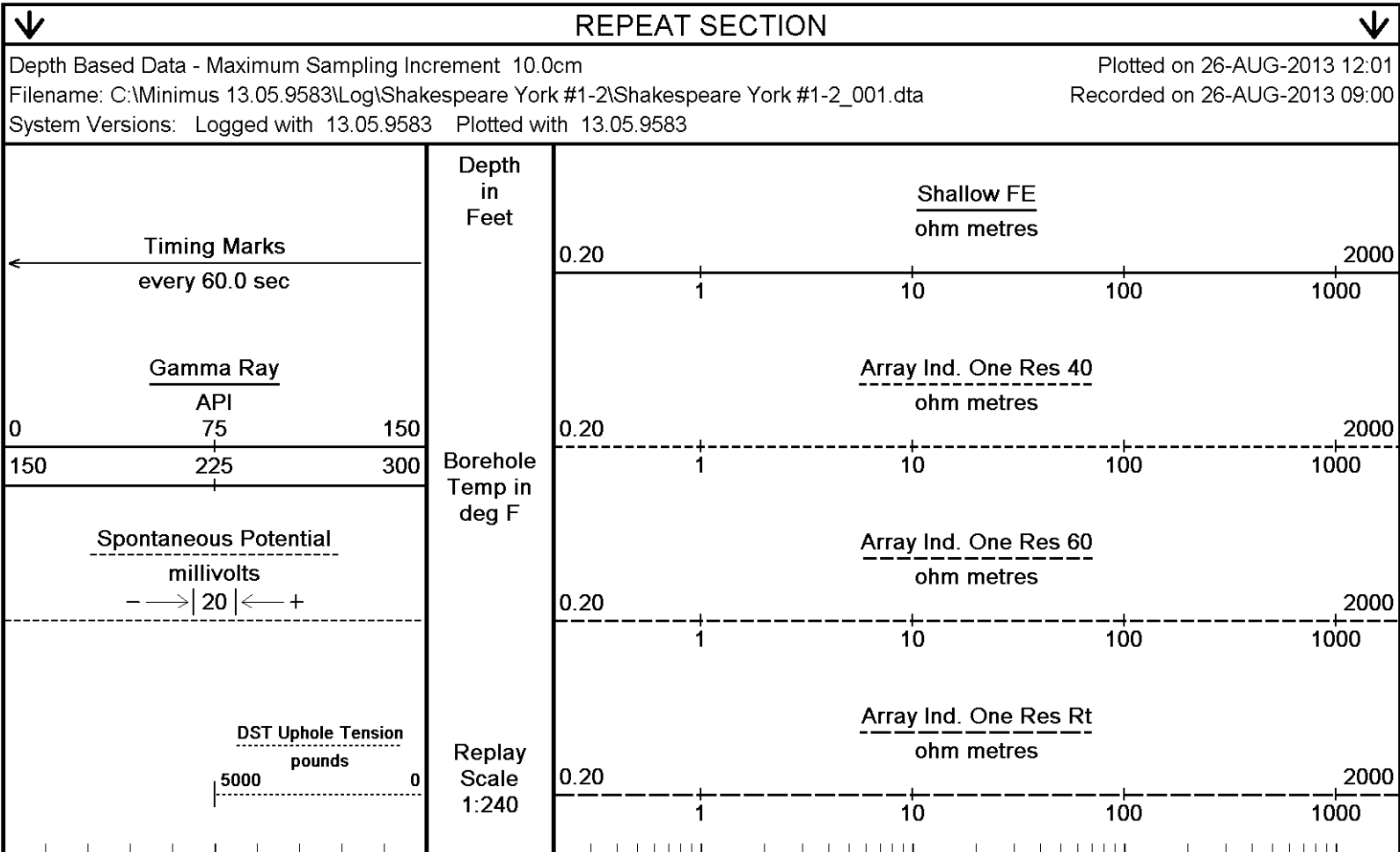
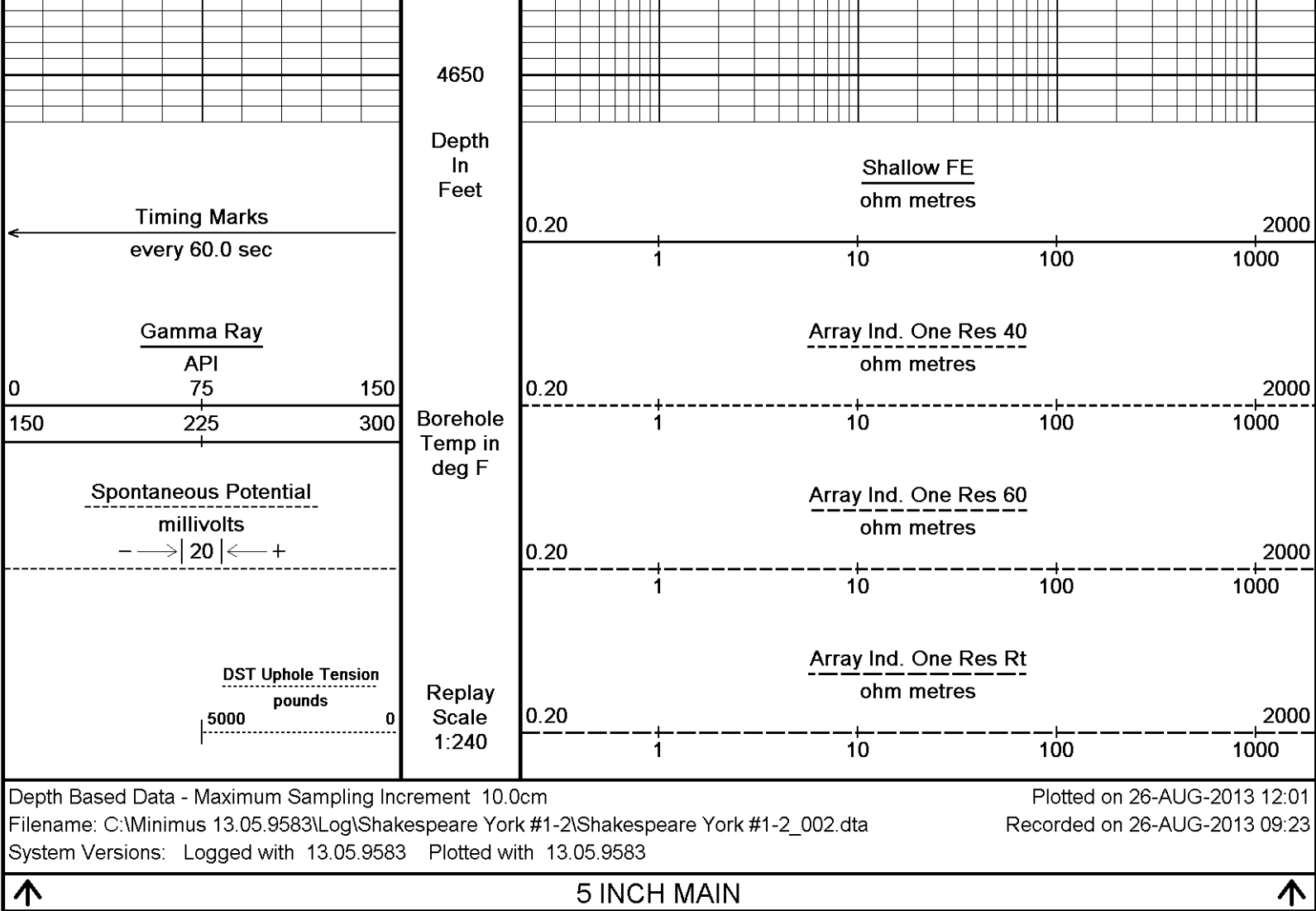
Shallow FEF

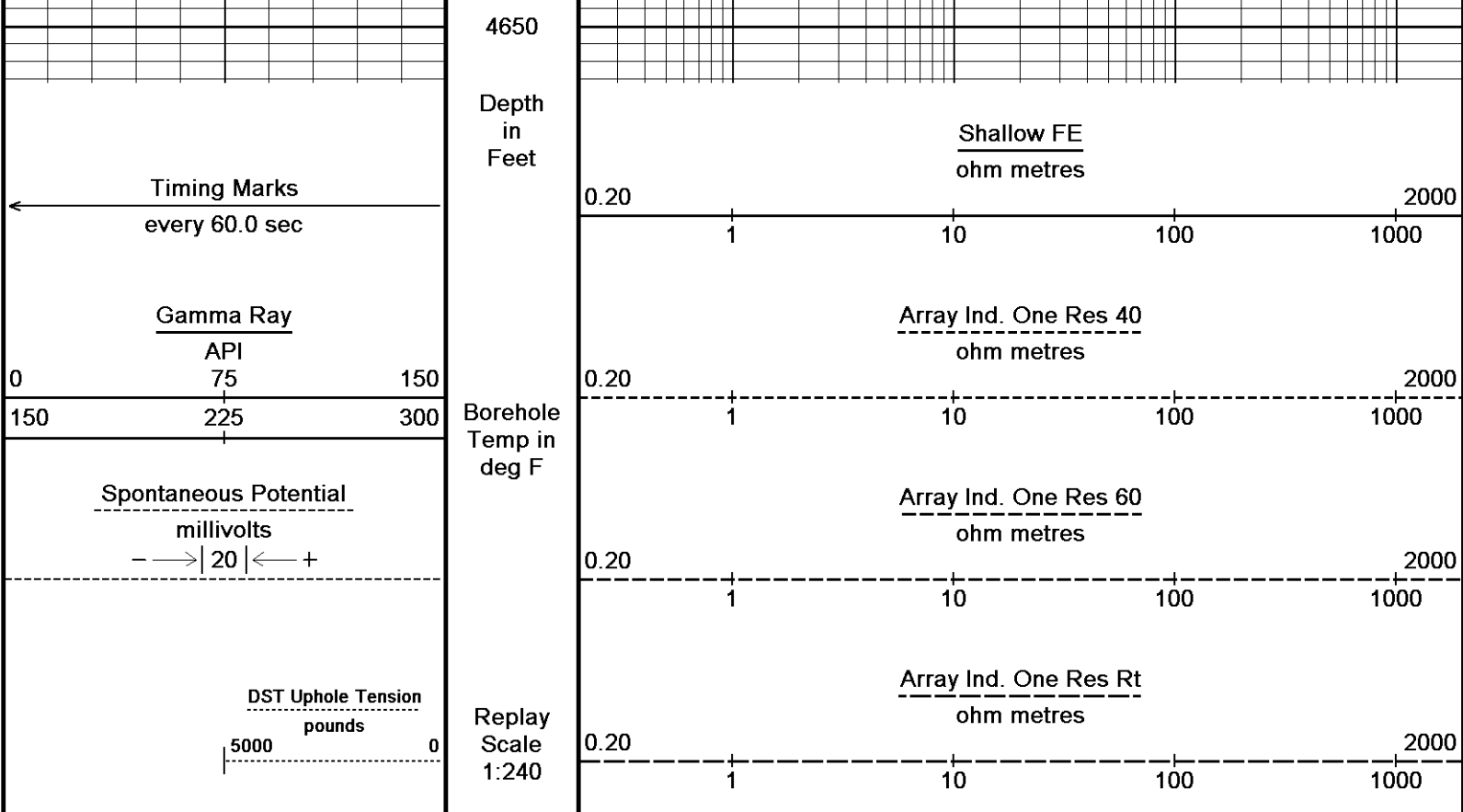


1200
113°
4250
112°
4300
113°
4350
114°
4400









Depth Based Data - Maximum Sampling Increment 10.0cm		Plotted on 26-AUG-2013 12:01
Filename: C:\Minimus 13.05.9583\Log\Shakespeare York #1-2\Shakespeare York #1-2_001.dta		Recorded on 26-AUG-2013 09:00
System Versions: Logged with 13.05.9583 Plotted with 13.05.9583		

↑	REPEAT SECTION	↑
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BEFORE SURVEY CALIBRATION			
C:\Minimus 13.05.9583\Log\Shakespeare York #1-2\Shakespeare York #1-2_002.dta			
General Constants All 000		Last Edited on 26-AUG-2013,08:25	
General Parameters			
Mud Resistivity	1.620	ohm-metres	
Mud Resistivity Temperature	75.000	degrees F	
Water Level	0.000	feet	
Borehole Fluid 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. Six Res Rt		
RWA Constant A	1.000		
RWA Constant M	2.000		
SW/APOR Tool Source	0.000		
Down-hole Tension Calibration SMS 0		Field Calibration on 26-AUG-2013 07:59	
Reading No	Measured	Calibrated (lbs)	
1	13268.39	0.00	
2	13791.97	471.80	
Gamma Calibration MCG-D.K 469		Field Calibration on 20-AUG-2013 09:30	
	Measured	Calibrated (API)	

Background	71	48
Calibrator (Gross)	1141	773
Calibrator (Net)	1070	725
Gamma Constants MCG-D.K 469		Last Edited on 23-AUG-2013,22:32
Gamma Calibrator Number	GRC38	
Mud Density	1.11	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%
High Resolution Temperature Calibration MCG-D.K 469		Field Calibration on 18-AUG-2013,02:35
	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	100.00	100.00
High Resolution Temperature Constants MCG-D.K 469		Last Edited on 18-AUG-2013,02:35
Pre-filter Length	11	
SP Calibration MCG-D.K 469		Field Calibration on 18-AUG-2013,02:35
	Measured	Calibrated (mV)
Reference 1	105.8	100.0
Reference 2	-94.3	-100.0
Caliper Calibration MML-A 3		Base Calibration on 15-AUG-2013 08:50 Field Calibration on 20-AUG-2013 09:51
Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	14887	5.98
2	18120	7.97
3	21042	9.86
4	25322	11.92
5	0	0.00
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.97	5.98
Micro Normal and Micro Inverse Calibration MML-A 3		Base Calibration on 15-AUG-2013 09:16 Field Check on 20-AUG-2013 09:19
Base Calibration		
Channel	Resistor 1	Measured Resistor 2
Micro Normal	12.3	60.3
Micro Inverse	15.7	78.4
Channel	Resistor 1	Calibrated (ohm-m) Resistor 2
Micro Normal	5.0	25.0
Micro Inverse	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 3		Last Edited on 20-AUG-2013,09:17
Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	1.0000	
Micro Inverse K Factor	1.0000	
Standoff Offset	N/A	inches
Neutron Calibration MDN-A.B 66		Base Calibration on 31-JUL-2013 10:25 Field Check on 20-AUG-2013 09:35
Base Calibration		
	Measured	Calibrated (cps)
	Near Far	Near Far
	3180 99	3714 110
Ratio	32.180	33.764
Field Calibrator at Base		Calibrated (cps)
		1617 2323

Ratio	0.696
Field Check	Calibrated (cps)
	1624 2337
Ratio	0.694

Neutron Constants MDN-A.B 66		Last Edited on 20-AUG-2013,09:30	
Neutron Source Id	P0204NN		
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	0.00	kpsi	
Temperature Source	Constant Value		
Temperature	68.00	degrees F	
Mud Salinity	0.00	kppm	
Salinity Correction	Not Applied		
Formation Fluid Salinity Source	None		
Formation Fluid Salinity	0.00	kppm	
Barite Mud Correction	Not Applied		

FE Calibration MFE-B.J 353		Base Calibration on 15-AUG-2013 09:33 Field Check on 20-AUG-2013 09:12	
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	964.1	126.8	
Base Check		280.9	
Field Check		281.0	

FE Constants MFE-B.J 353		Last Edited on 20-AUG-2013,09:11	
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-A.A 55		Last Edited on 18-AUG-2013,09:24	
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	Not 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 167

Base Calibration on 19-APR-2013,13:41
Field Check on 20-AUG-2013 09:11

Base Calibration

Test Loop Calibration	Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	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)		Field Check (mmho/m)	
	Low	High	Low	High
1			13.2	3838.4
2			29.6	3476.1
3			29.2	3052.2
4			19.8	2081.0
Deep			18.6	2048.3
Medium			42.3	3990.2
Shallow			43.0	5053.0

Array Temperature 76.3 Deg F

Induction Constants MAI-A.A 167

Last Edited on 22-AUG-2013,16:31

Induction Model	RtAP-NC	
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	60.00	degrees
Stand-off Fin Width	0.5000	inches
Borehole Corr. Rm Source	Temperature Corr	
Temp. for Rm Corr	MGG External Temperature	

Temp. for Km Cor.		MOO External Temperature	0.0020	mhos/metre
Squasher Start			N/A	mhos/metre
Squasher Offset				
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 18-AUG-2013,02:21	
	Measured	Calibrated(Deg F)		
Lower	50.00	50.00		
Upper	75.00	75.00		

High Resolution Temperature Constants MAI-A.A 167		Last Edited on 18-AUG-2013,02:21	
Pre-filter Length	11		

Caliper Calibration MPD-B 64			Base Calibration on 15-AUG-2013 14:54	
			Field Calibration on 20-AUG-2013 09:48	
Base Calibration				
Reading No	Measured		Calibrator Size (in)	
1	16560		3.99	
2	24992		5.98	
3	32880		7.97	
4	41184		9.86	
5	50688		11.92	
6	N/A		N/A	
Field Calibration				
	Measured Caliper (in)		Actual Caliper (in)	
	5.79		5.98	

Photo Density Calibration MPD-B 64				Base Calibration on 15-AUG-2013 14:37	
				Field Check on 20-AUG-2013 09:16	
Density Calibration					
Base Calibration		Measured		Calibrated (sdu)	
		Near	Far	Near	Far
	Reference 1	60206	33560	59556	30836
	Reference 2	25378	2915	24941	2541
Field Check at Base					
		1155.1	1345.7		
Field Check					
		1158.0	1349.3		
PE Calibration					
Base Calibration		Measured		Calibrated	
	WS	WH	Ratio	Ratio	
	Background	211	1029		
	Reference 1	22957	60005	0.386	0.371
	Reference 2	22214	25000	0.270	0.270

Field Check at Base

211.2 1028.9

Field Check

209.8 1032.0

Density Constants MPD-B 64

Last Edited on 23-AUG-2013,22:32

Density Source Id	18235B	
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	1.11	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 (m)
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 13.05.9583\Log\Shakespeare York #1-2\Shakespeare York #1-2_002.dta

3/8" Triple Cone Cable Head (MCB C A)

MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

Compact Comms Gamma

MCG-D.K 469 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log

MML-A 3 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

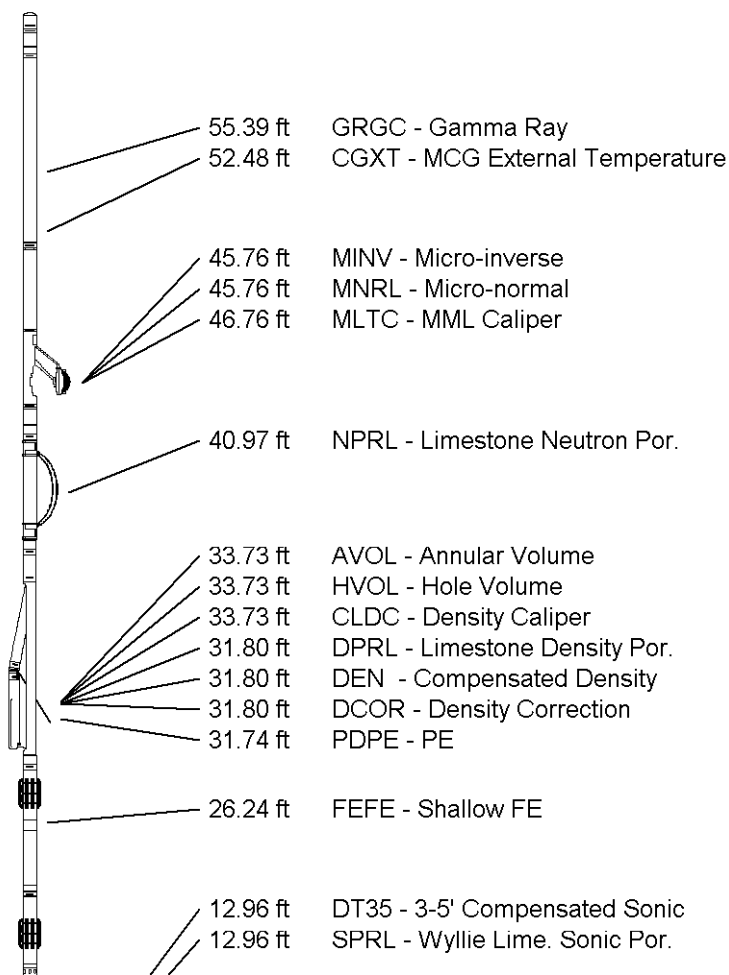
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric

MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

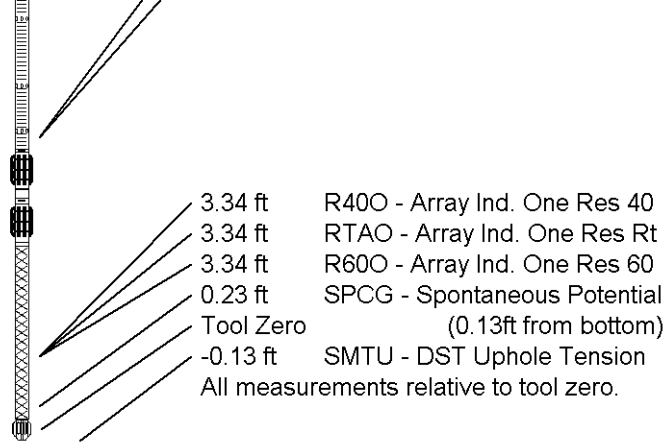
Compact Sonic

MSS-A.A 55 LG: 12.52 ft WT: 72.8 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: 62.25 ft Weight: 471.8 lb



COMPANY SHAKESPEARE OIL CO, INC.
WELL YORK #1-2
FIELD WILDCAT
PROVINCE/COUNTY SCOTT
COUNTRY/STATE UNITED STATES / KANSAS

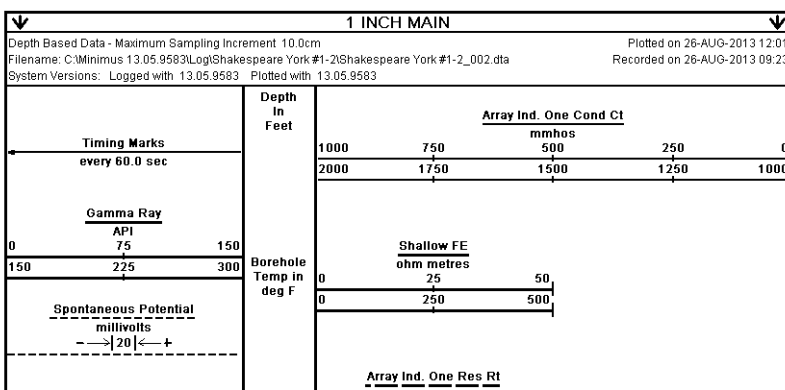
Elevation Kelly Bushing	2876.00	feet	First Reading	4626.00	feet
Elevation Drill Floor	2874.00	feet	Depth Driller	4630.00	feet
Elevation Ground Level	2866.00	feet	Depth Logger	4629.00	feet

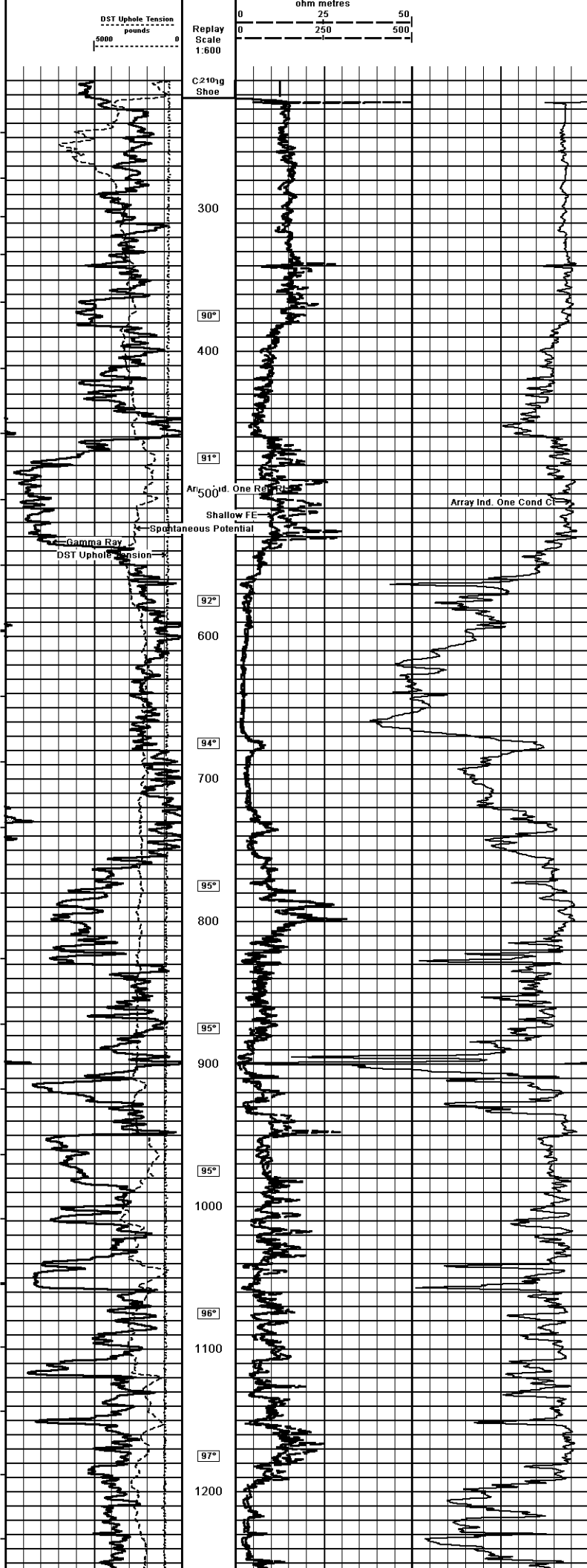


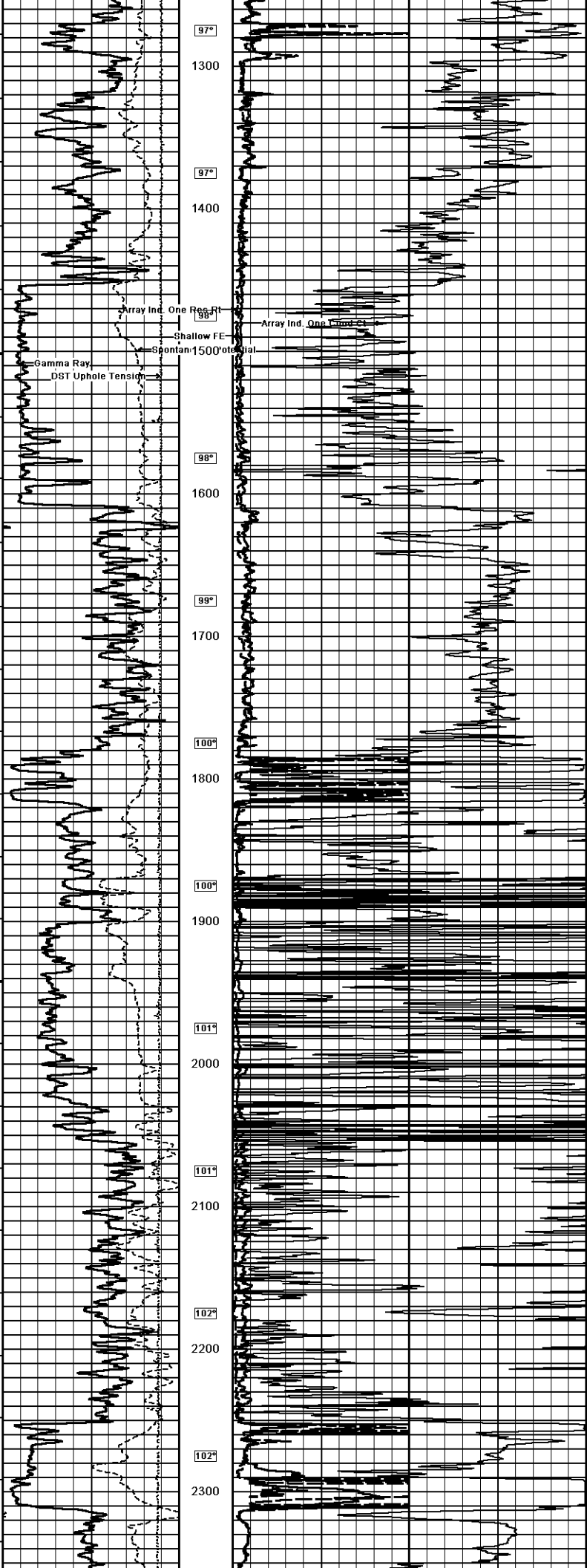
ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

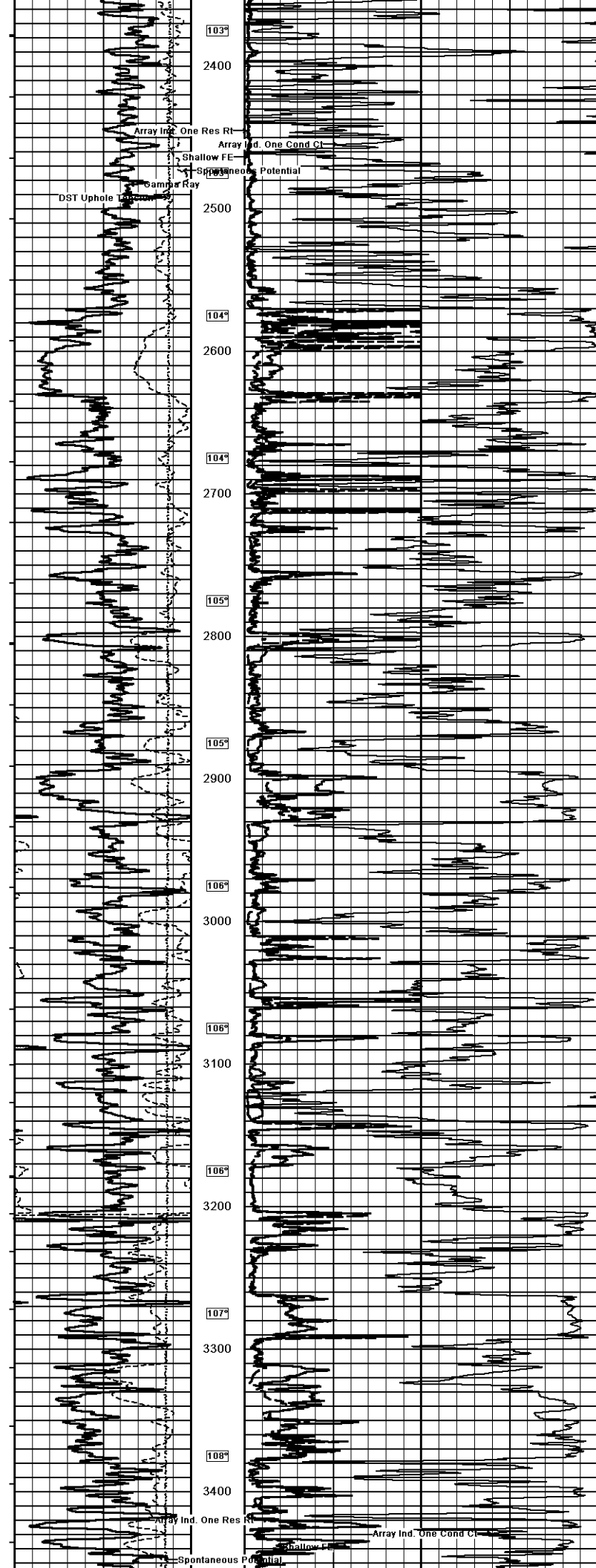
Weatherford

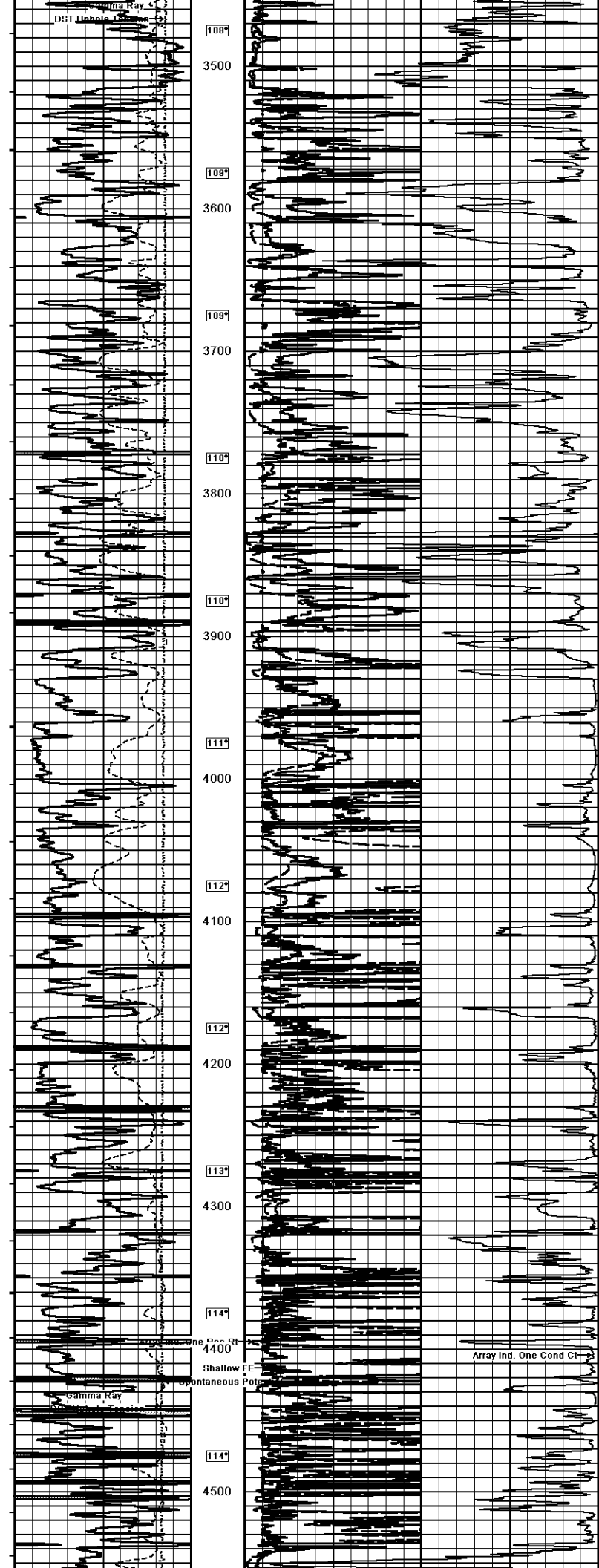
Weatherford		ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG	
COMPANY	SHAKESPEARE OIL CO, INC.	WELL	YORK #1-2
FIELD	WILDCAT	PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	UNITED STATES / KANSAS	LOCATION	1734' FSL & 1348' FEL
LOG TYPE	FACE	LOG TYPE	FACE
LOG NUMBER	15-171-20897	LOG NUMBER	15-171-20897
LOG MEASURED FROM	KB @ 10 FEET	LOG MEASURED FROM	KB @ 10 FEET
DATE	26-AUG-2013	DATE	26-AUG-2013
RUN NUMBER	ONE	RUN NUMBER	ONE
SERVICE ORDER	3541074	SERVICE ORDER	3541074
DEPTH DRILLER	4630.00	DEPTH DRILLER	4630.00
DEPTH LOGGER	4630.00	DEPTH LOGGER	4630.00
FIRST READING	4626.00	FIRST READING	4626.00
LAST READING	4626.00	LAST READING	4626.00
CASING DRILLER	226.00	CASING DRILLER	226.00
CASING LOGGER	222.00	CASING LOGGER	222.00
BIT SIZE	7.880	BIT SIZE	7.880
HOLE FLUID TYPE	CHEMICAL	HOLE FLUID TYPE	CHEMICAL
DENSITY/VISCOSITY	9.30 lb/USg	DENSITY/VISCOSITY	9.30 lb/USg
PH/FLUID LOSS	10.50	PH/FLUID LOSS	10.50
SAMPLE SOURCE	MUDPIT	SAMPLE SOURCE	MUDPIT
RTM @ MEASURED TEMP	1.82 @ 75.0	RTM @ MEASURED TEMP	1.82 @ 75.0
RTM @ MEASURED TEMP	1.28 @ 75.0	RTM @ MEASURED TEMP	1.28 @ 75.0
RTM @ MEASURED TEMP	1.94 @ 75.0	RTM @ MEASURED TEMP	1.94 @ 75.0
SOURCE RTM / RTM	CALC	SOURCE RTM / RTM	CALC
RTM @ BHT	1.06 @ 15.0	RTM @ BHT	1.06 @ 15.0
TIME SINCE CIRCULATION	4 HOURS	TIME SINCE CIRCULATION	4 HOURS
MAX RECORDED TEMP	115.00	MAX RECORDED TEMP	115.00
EQUIPMENT / BASE	173006	EQUIPMENT / BASE	173006
RECORDED BY	IV STAMBAUGH	RECORDED BY	IV STAMBAUGH
TRANSMITTED BY	TIM FRIEST	TRANSMITTED BY	TIM FRIEST
LOG#	LE13-235	LOG#	LE13-235

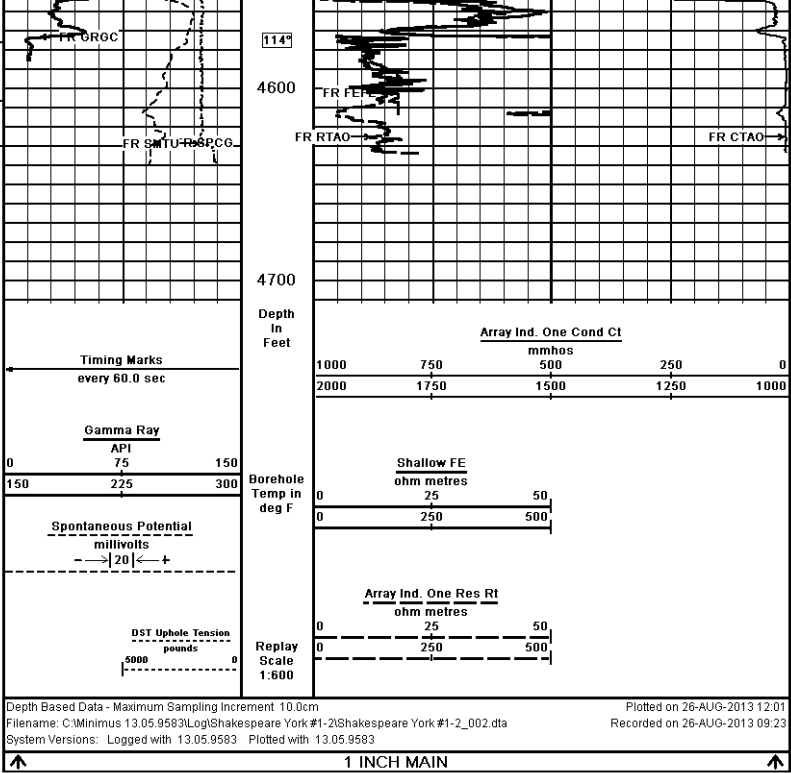












COMPANY		SHAKESPEARE OIL CO, INC.			
WELL		YORK #1-2			
FIELD		WILDCAT			
PROVINCE/COUNTY		SCOTT			
COUNTRY/STATE		UNITED STATES / KANSAS			
Elevation Kelly Bushing	2876.00	feet	First Reading	4626.00	feet
Elevation Drill Floor	2874.00	feet	Depth Driller	4630.00	feet
Elevation Ground Level	2866.00	feet	Depth Logger	4629.00	feet
		ARRAY INDUCTION			
Weatherford		SHALLOW FOCUSED			
		ELECTRIC LOG			