



Weatherford[®]

**ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG**

COMPANY	SHAKESPEARE OIL. CO., INC.		
WELL	CAMPBELL 4-17		
FIELD	WILDCAT		
PROVINCE/COUNTY	LOGAN		
COUNTRY/STATE	U.S.A. / KANSAS		
LOCATION	850' FSL & 2000' FEL		
PERMIT NUMBER	SE NW SW SE		
SEC 17	TWP 13S	RGE 32W	Other Services
Latitude			MPD/MDN
Longitude			MSS
API Number	15-109-21293		
Permanent Datum GL, Elevation	3033 feet		
Log Measured From	KB		
Drilling Measured From	KB @ 10 FEET		
Date	11-JUN-2014		
Run Number	ONE		
Service Order	5872-89695834		
Depth Driller	4720.00	feet	
Depth Logger	4716.00	feet	
First Reading	4713.00	feet	
Last Reading	264.00	feet	
Casing Driller	268.00	feet	
Casing Logger	264.00	feet	
Bit Size	7.875	inches	
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.30 lb/USg	65.00 CP	
PH / Fluid Loss	10.50	8.80 ml/30Min	
Sample Source	MUDDPIT		
Rm @ Measured Temp	0.64 @ 93.0	ohm-m	
Rmf @ Measured Temp	0.51 @ 93.0	ohm-m	
Rmc @ Measured Temp	0.77 @ 93.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.52 @ 113.0	ohm-m	
Time Since Circulation	5 HOURS		
Max Recorded Temp	113.00	deg F	
Equipment / Base	13244	LIB	
Recorded By	D. COLE		
Witnessed By	T. PRIEST		
JOB #	LB14-178		

Elevations:	feet
KB	3043.00
DF	3041.00
GL	3033.00

BOREHOLE RECORD Last Edited: 11-JUN-2014 14:01

Bit Size inches	Depth From feet	Depth To feet
7.875	268.00	4720.00

CASING RECORD

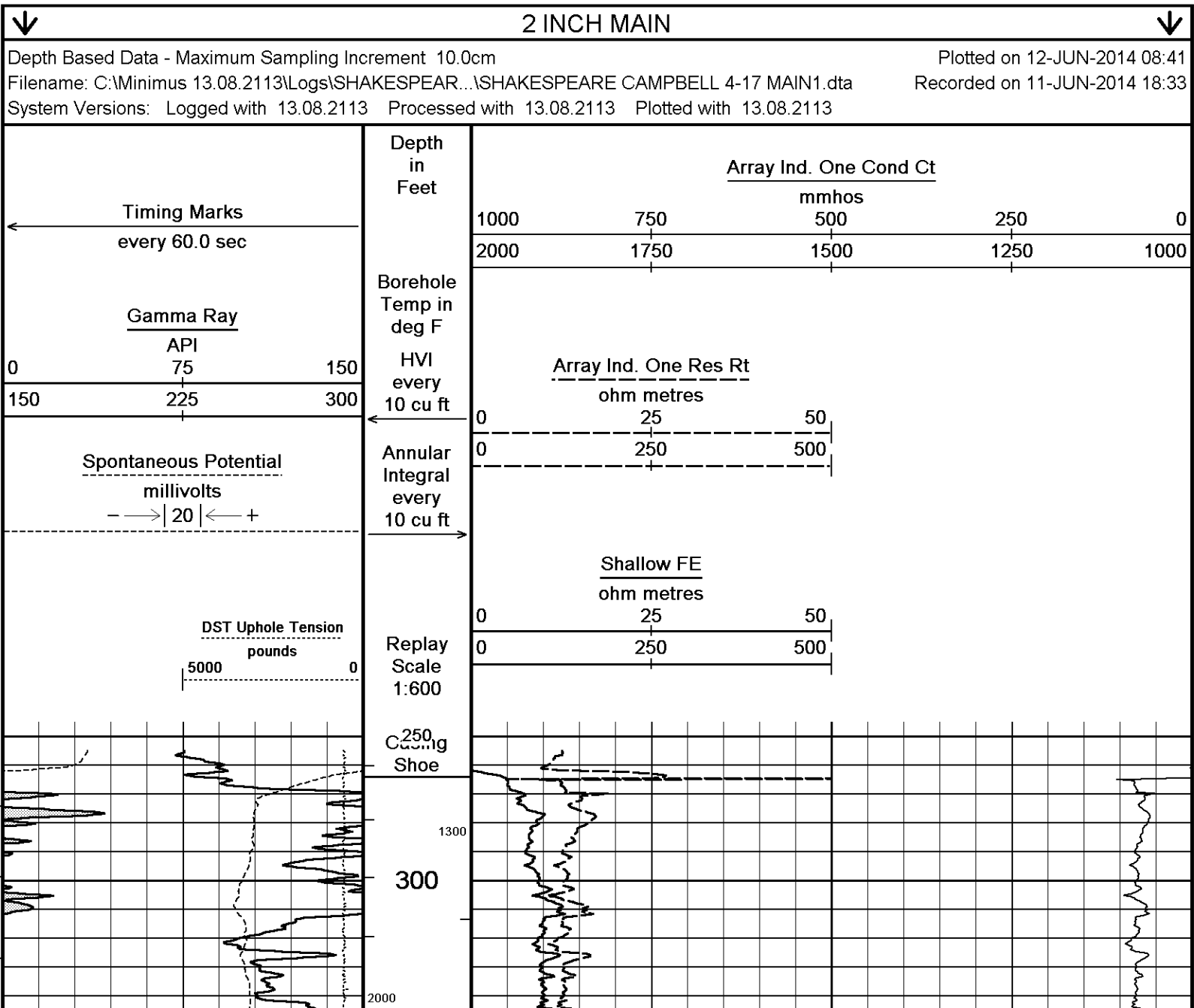
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
CASING	8.625	0.00	268.00	24.00

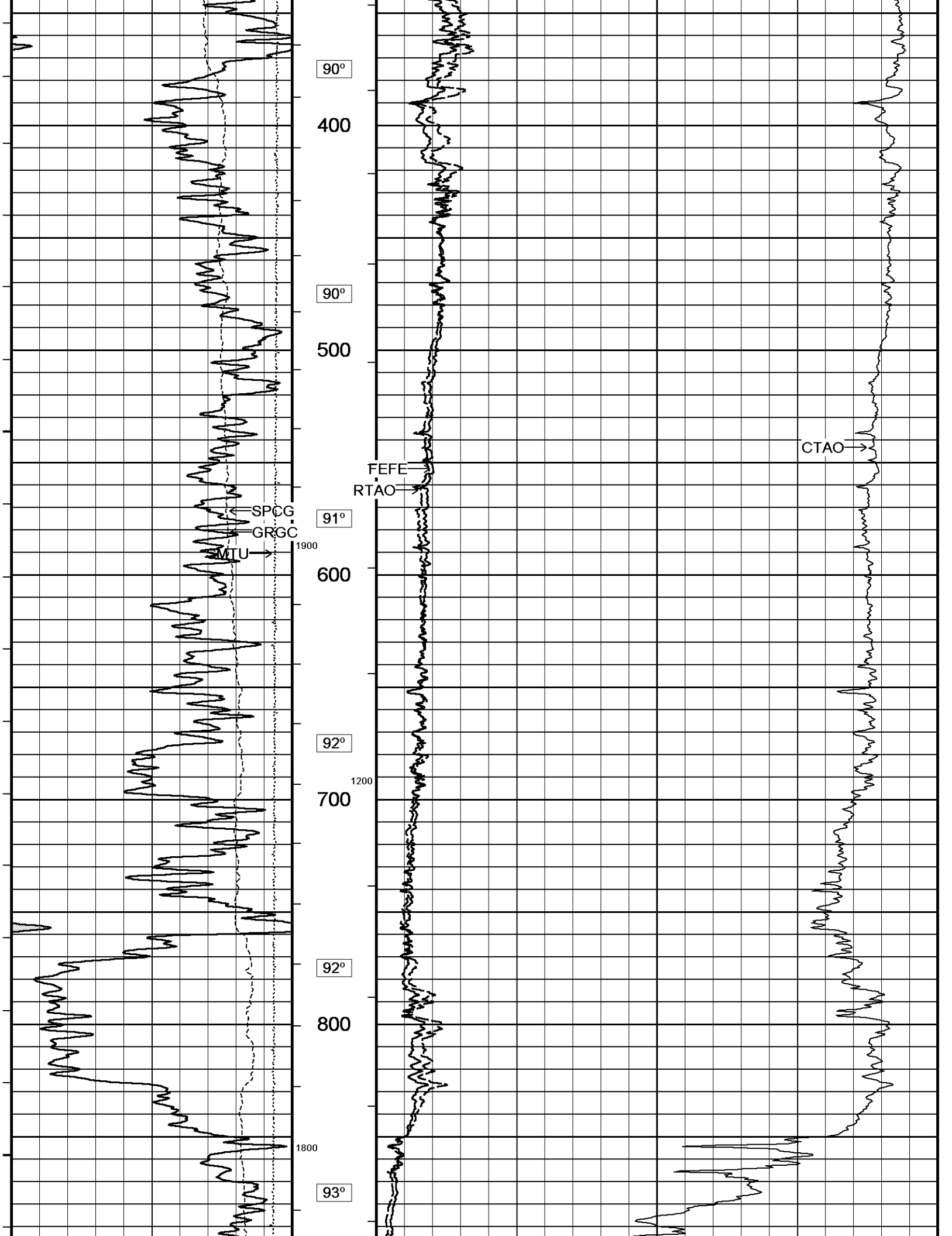
REMARKS

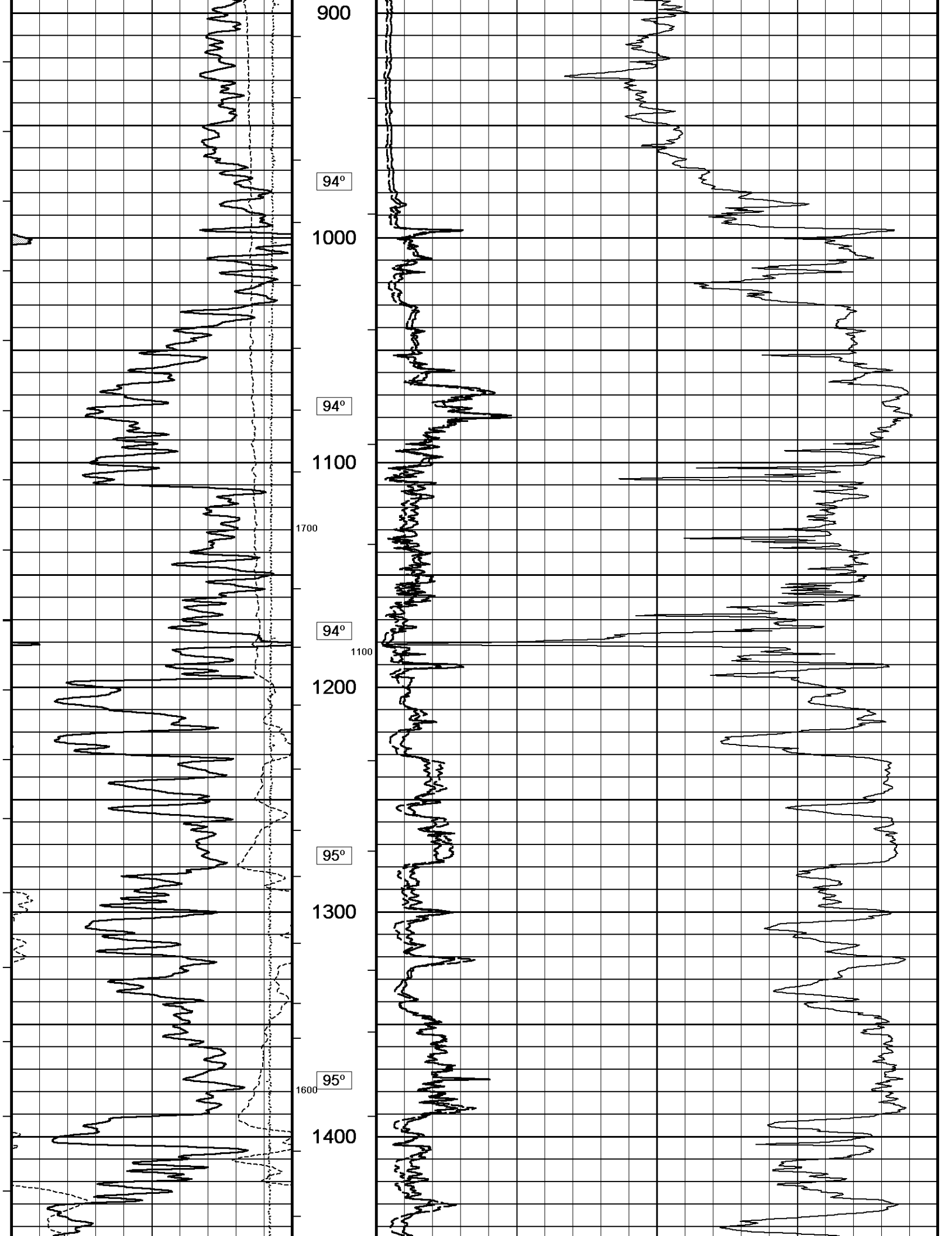
- SOFTWARE ISSUE: WLS 13.08.2113
- TOOLSTRING: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION
- HARDWARE:
 - MDN: DUAL BOWSPRING ECCENTRALIZER
 - MFE: 1 X 0.5 INCH STANDOFF
 - MSS: 2 X 0.5 INCH STANDOFF
 - MAI: 2 X 0.5 INCH STANDOFF
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY
- 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 3800 FEET: 370 CU.FT.

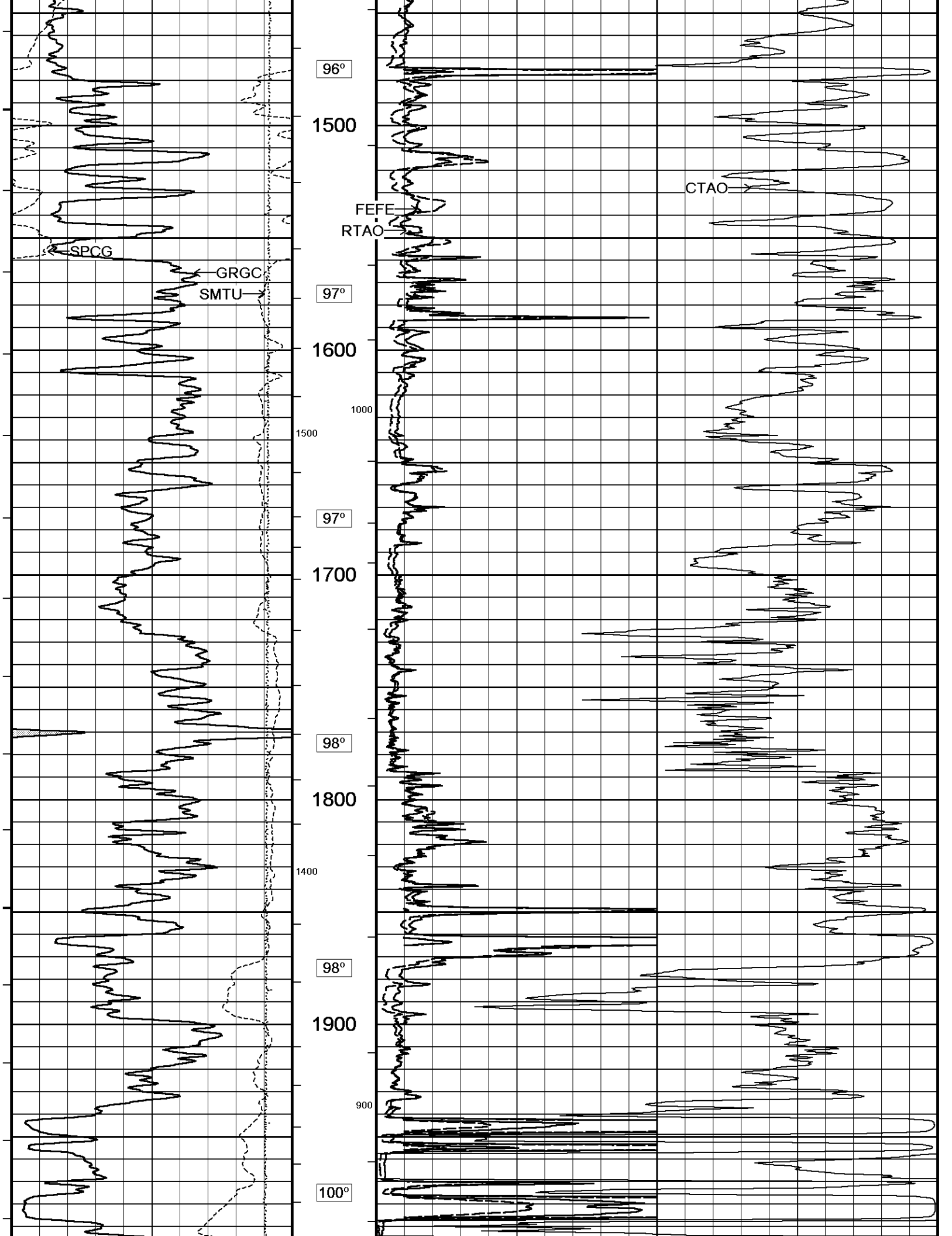
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO 3800 FEET: 220 CU.FT.
- RIG: HD DRILLING
- ENGINEER: D. COLE
- OPERATOR: K. RINEHART AND D. ALVARADO
- CHLORIDES: 3500

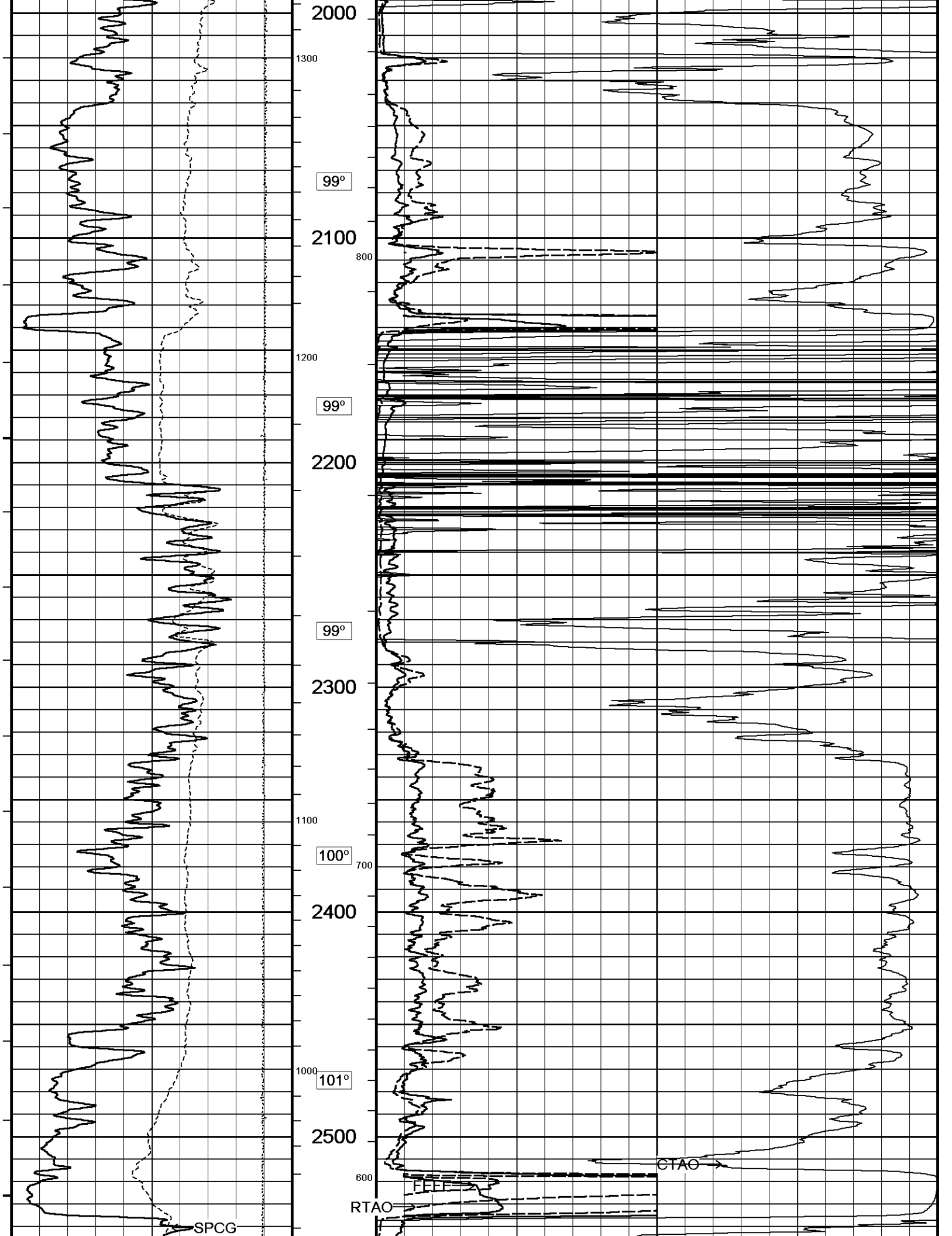
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.





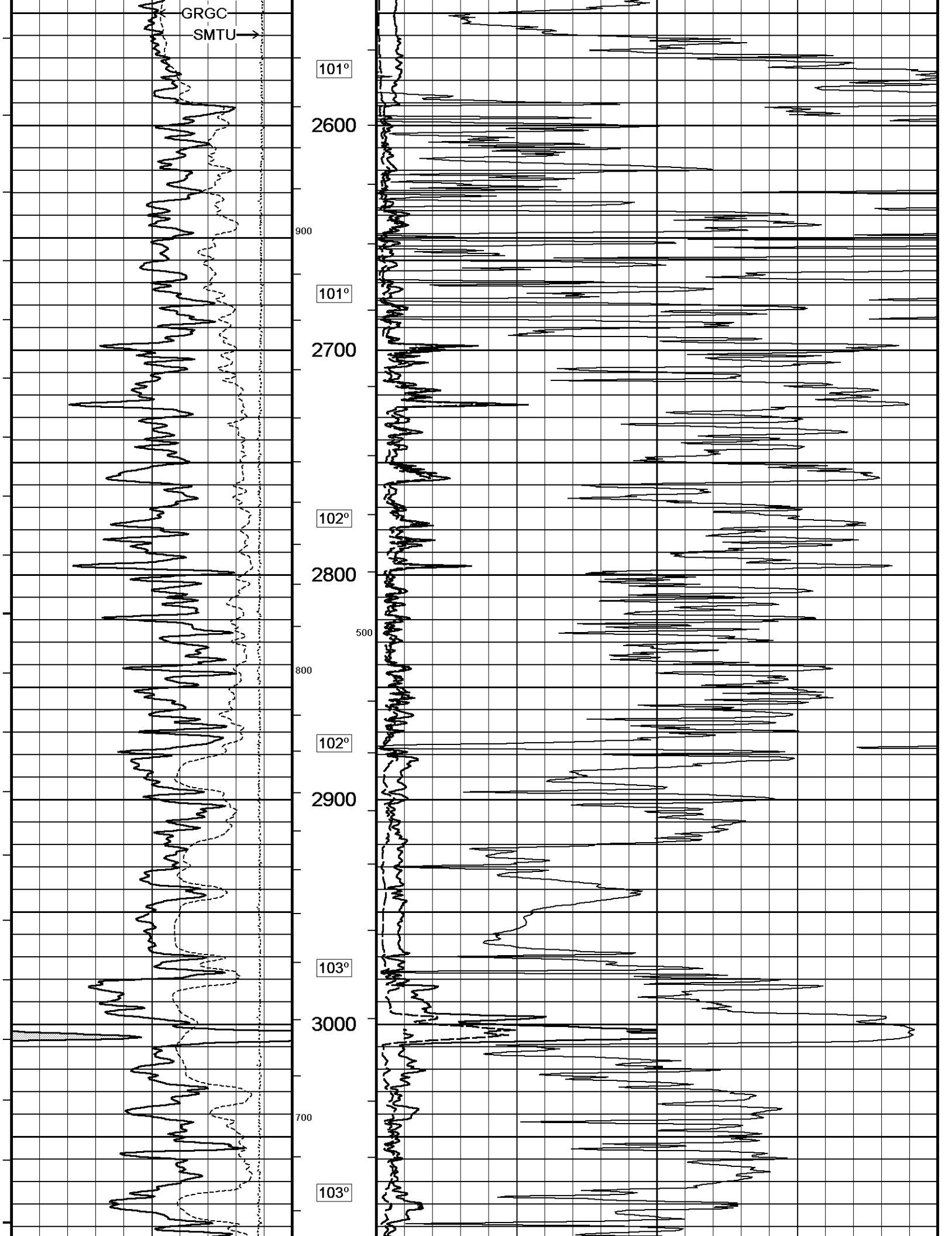


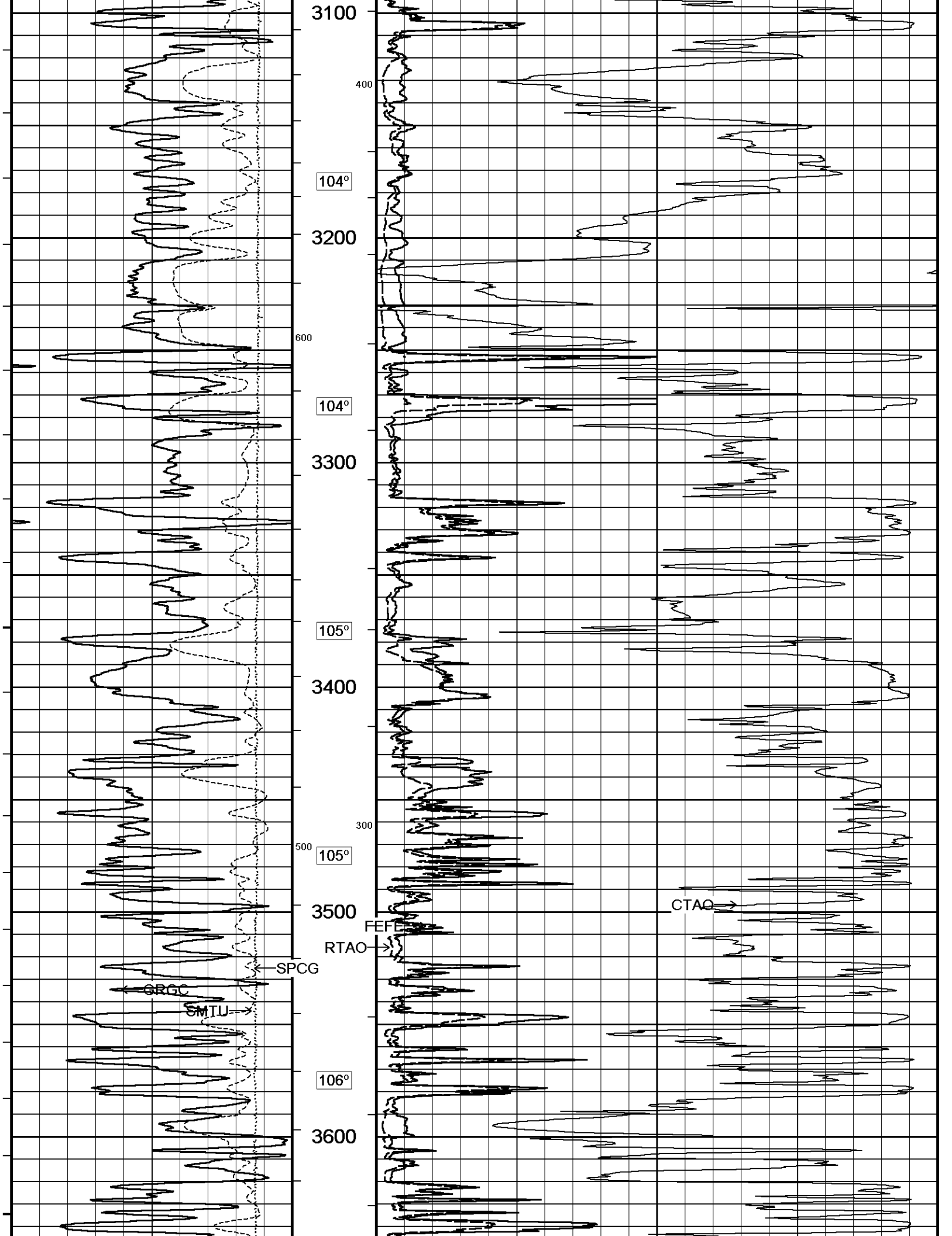


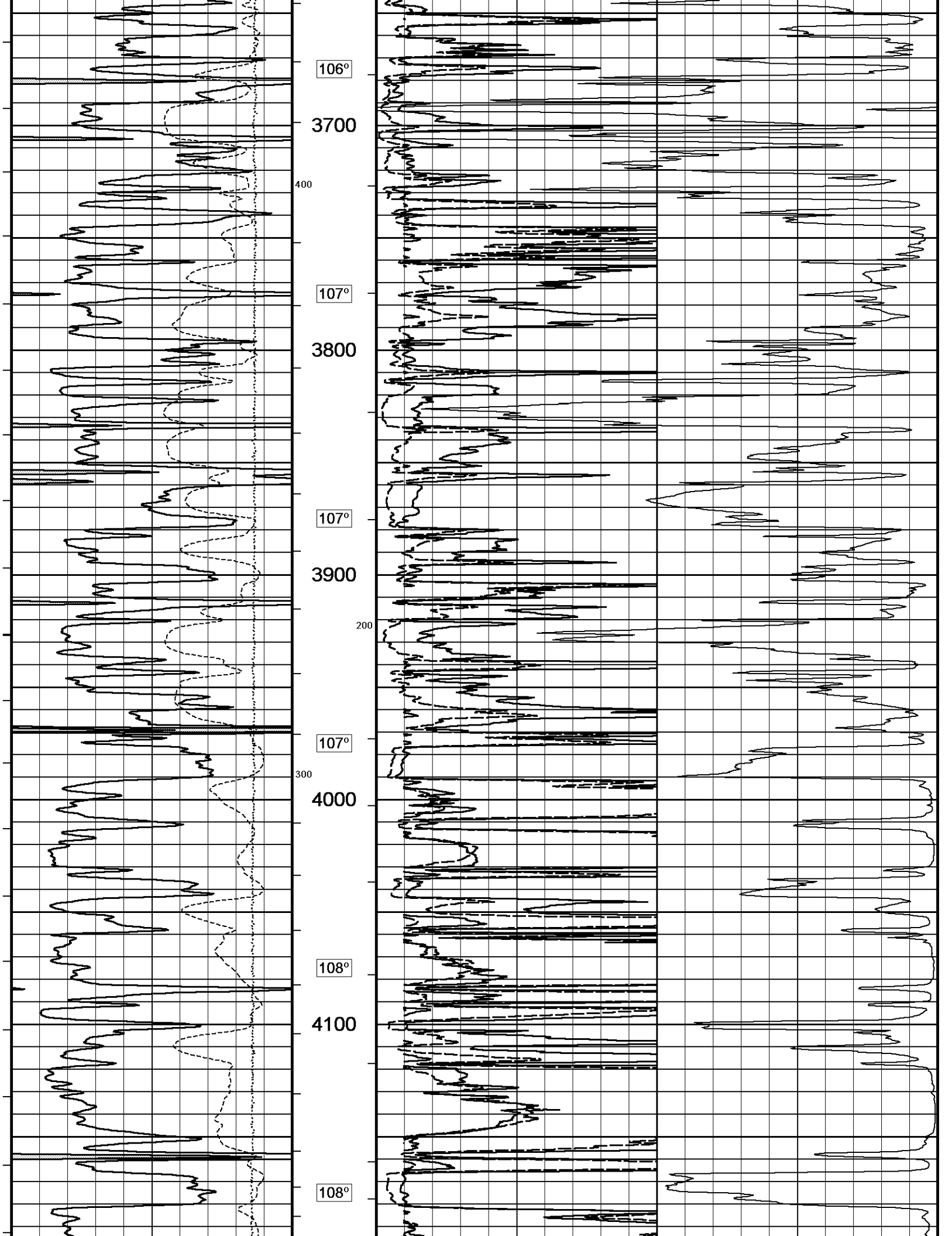


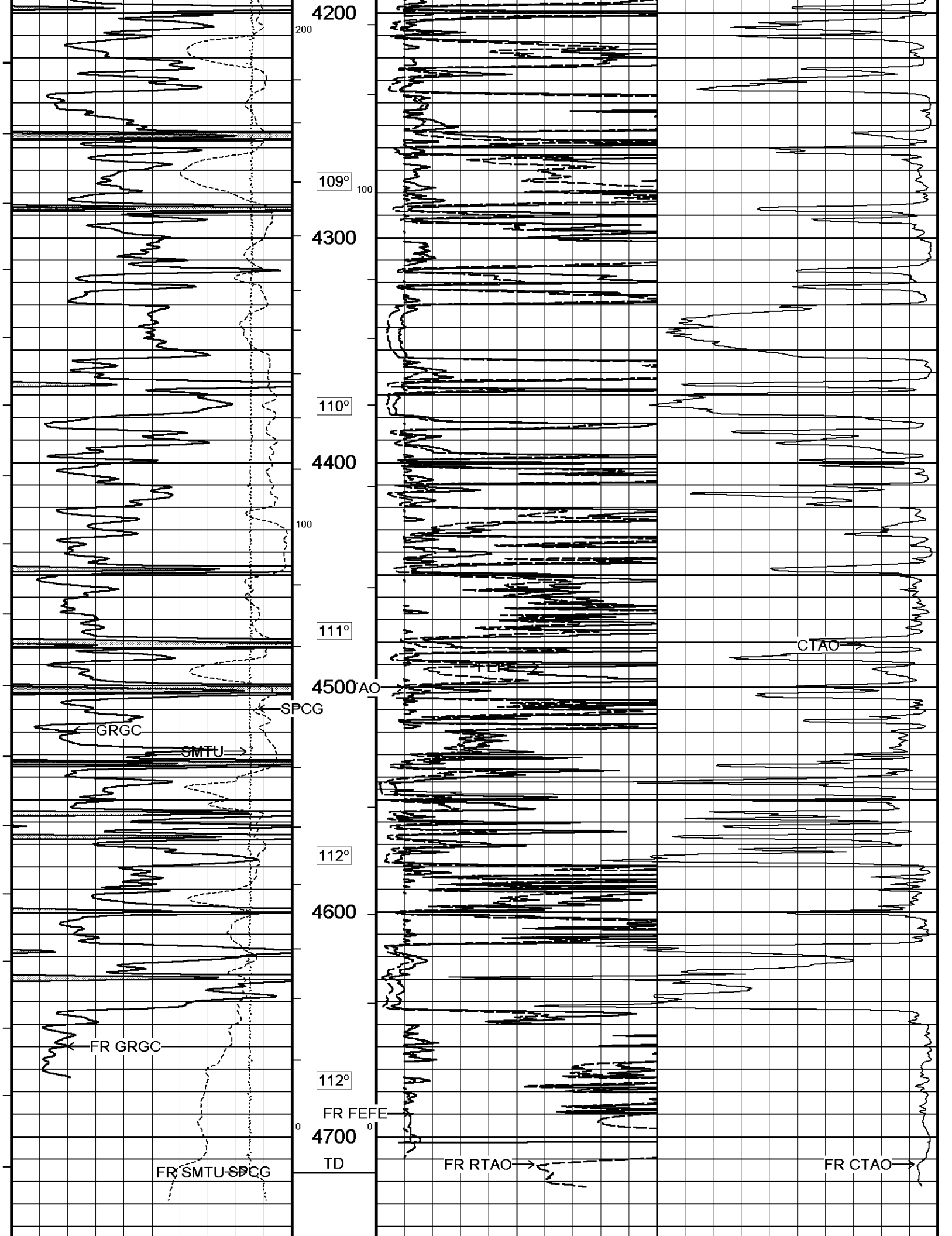
GRGC
SMTU →

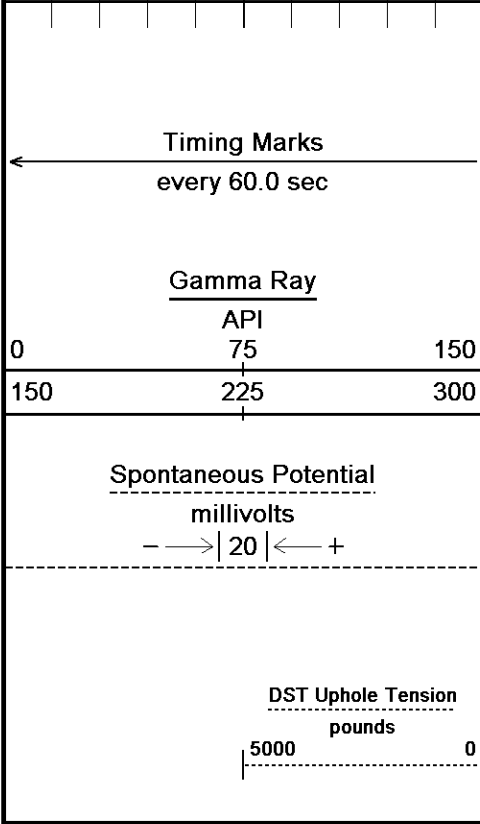
101°
2600
900
101°
2700
102°
2800
500
800
102°
2900
103°
3000
700
103°











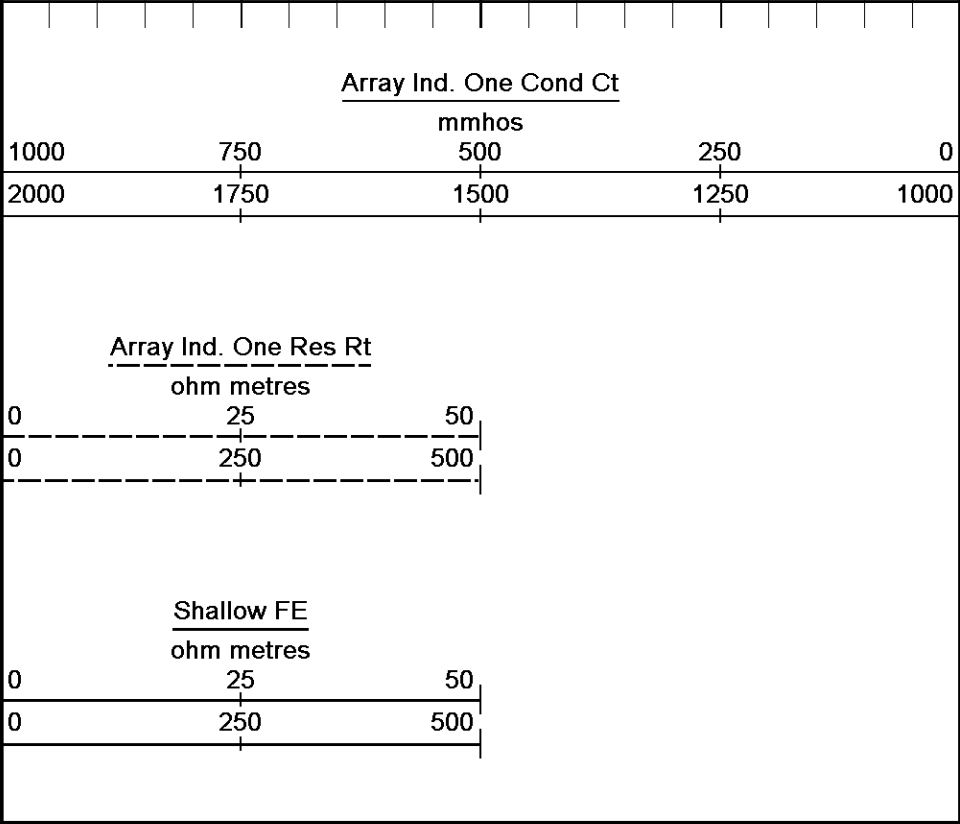
Depth in Feet

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:600

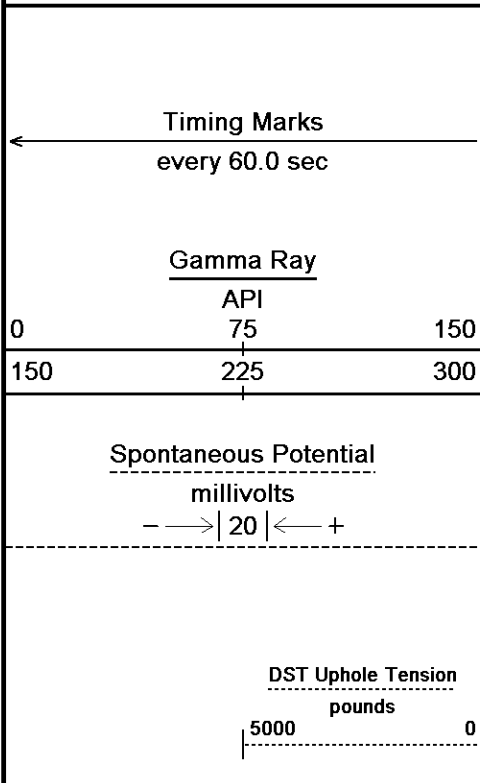


Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 12-JUN-2014 08:41
 Filename: C:\Minimus 13.08.2113\Logs\SHAKESPEAR...\SHAKESPEARE CAMPBELL 4-17 MAIN1.dta Recorded on 11-JUN-2014 18:33
 System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113

↑ 2 INCH MAIN ↑

↓ 5 INCH MAIN ↓

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 12-JUN-2014 08:41
 Filename: C:\Minimus 13.08.2113\Logs\SHAKESPEAR...\SHAKESPEARE CAMPBELL 4-17 MAIN1.dta Recorded on 11-JUN-2014 18:33
 System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113



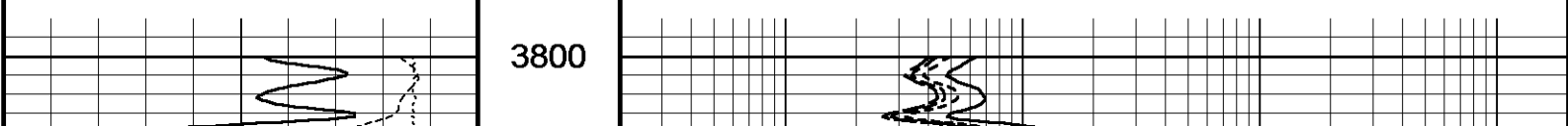
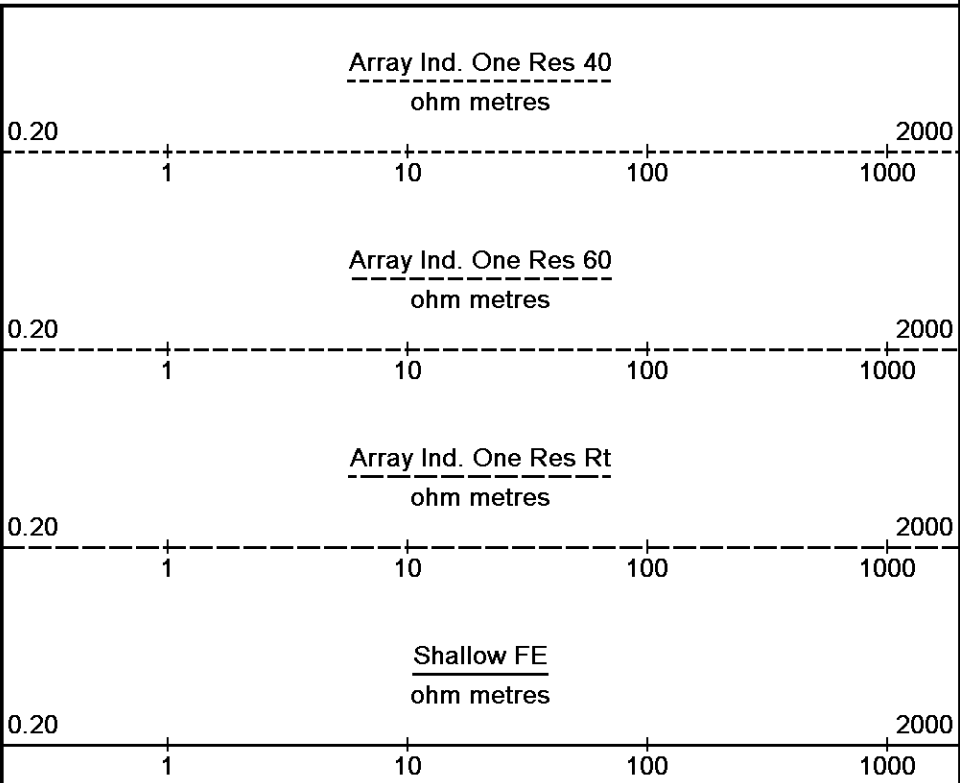
Depth in Feet

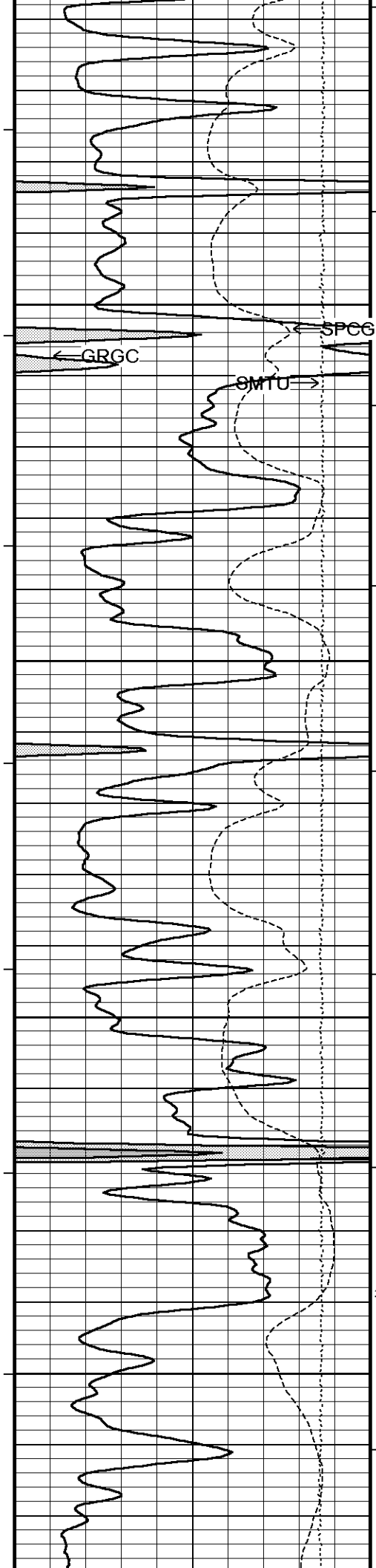
Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:240





107°

3850

SPCG

GRGC

GMTU

107°

3900

200

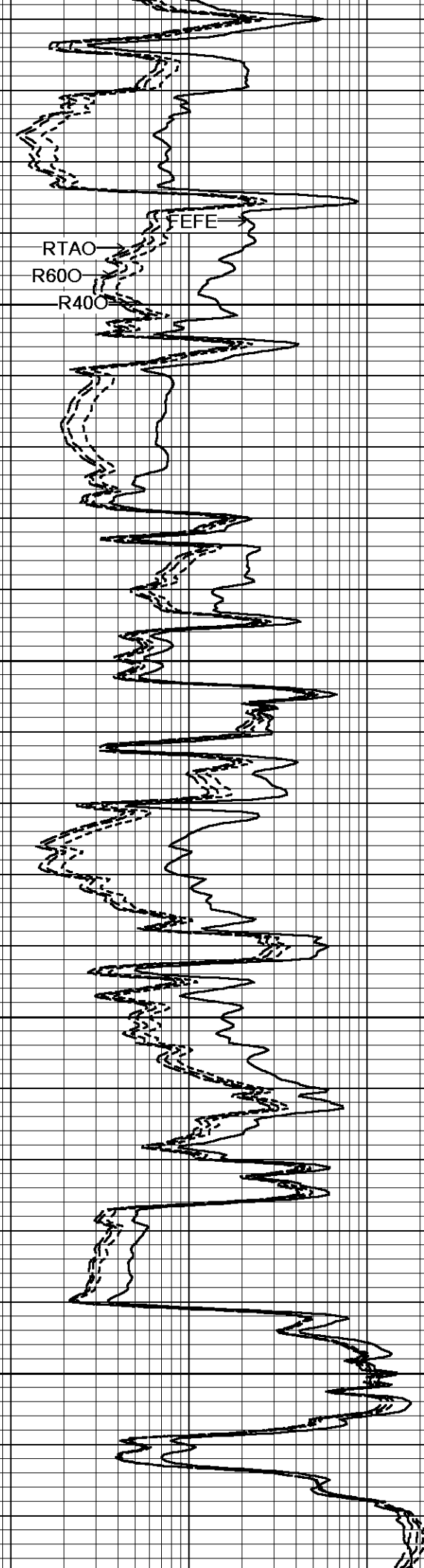
107°

3950

107°

4000

300

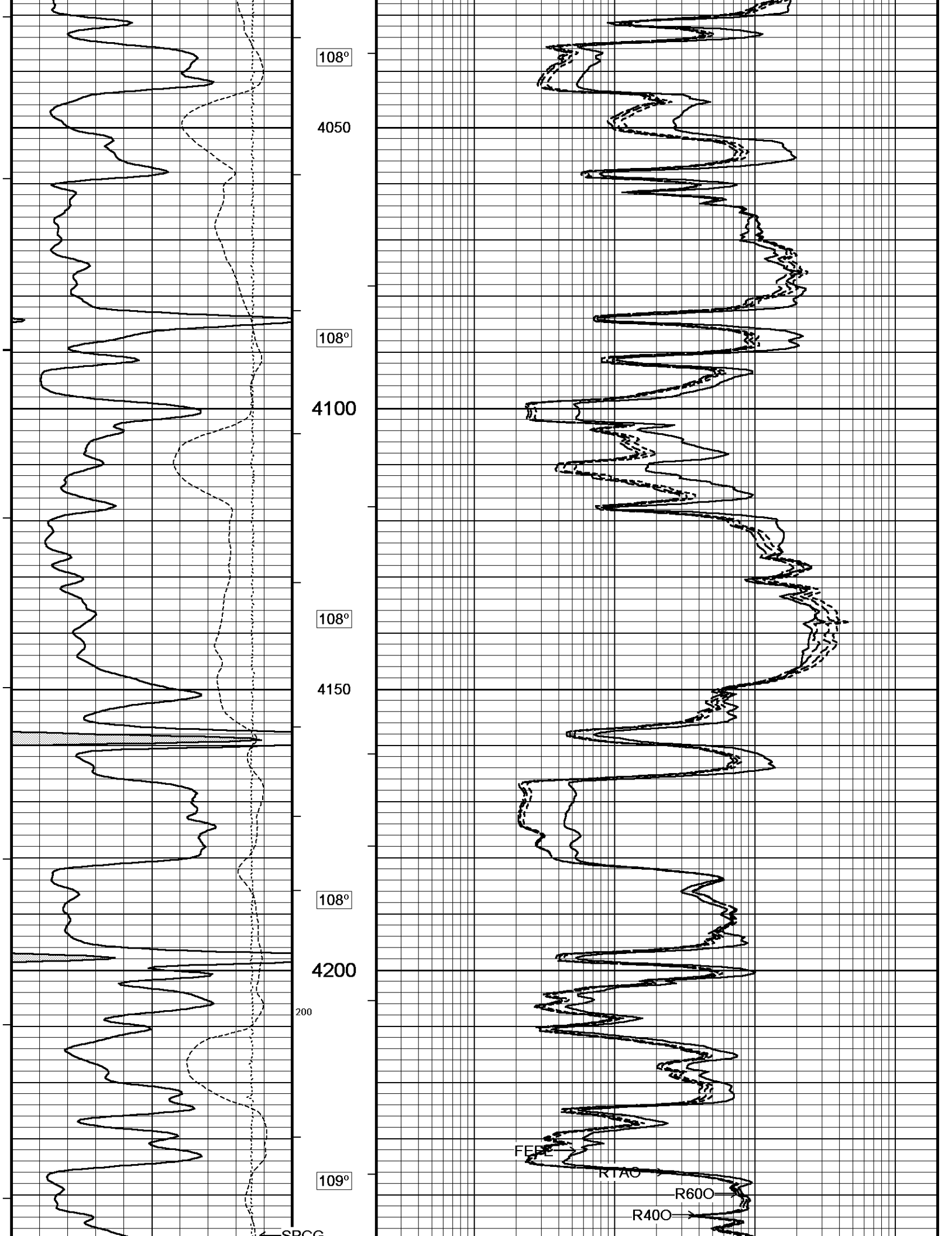


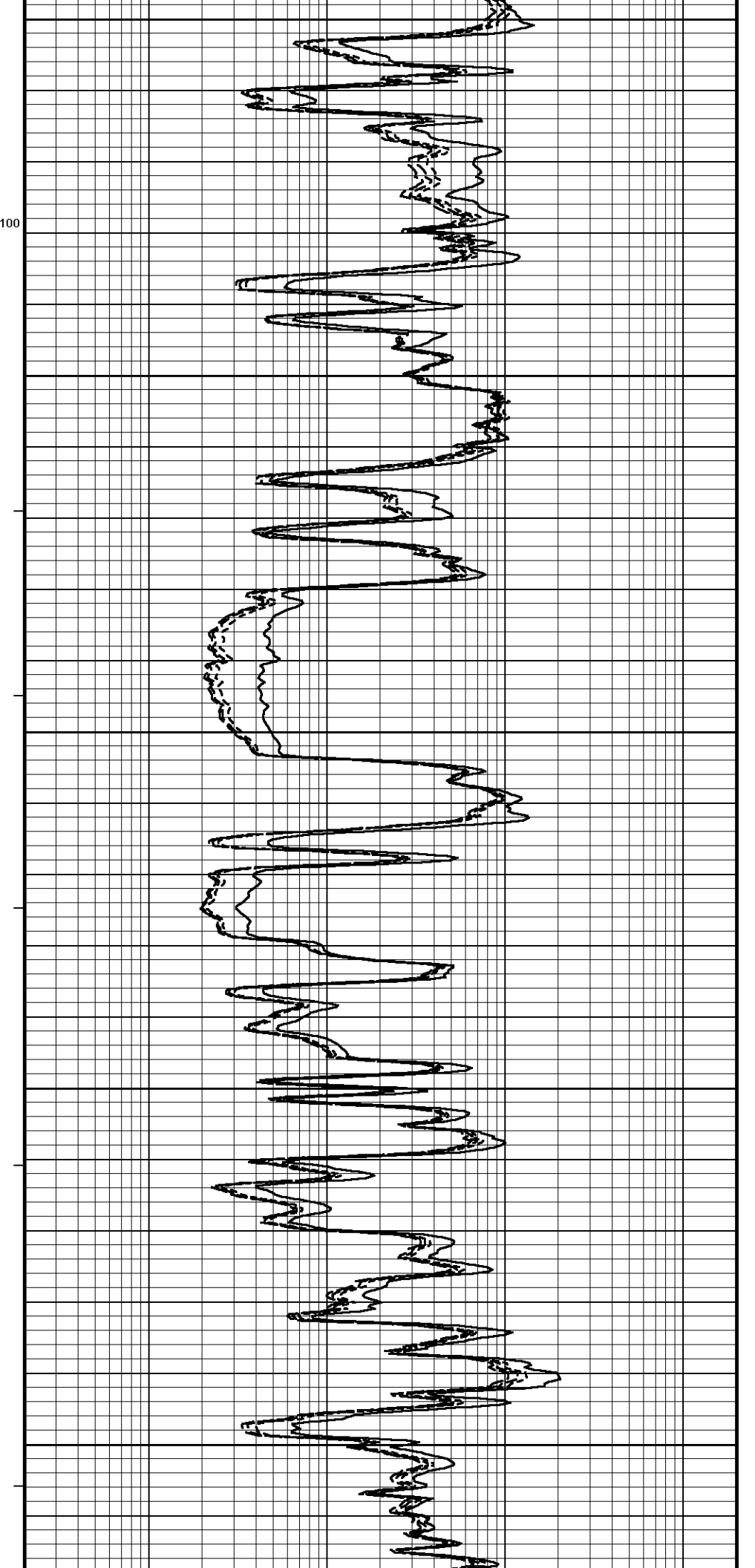
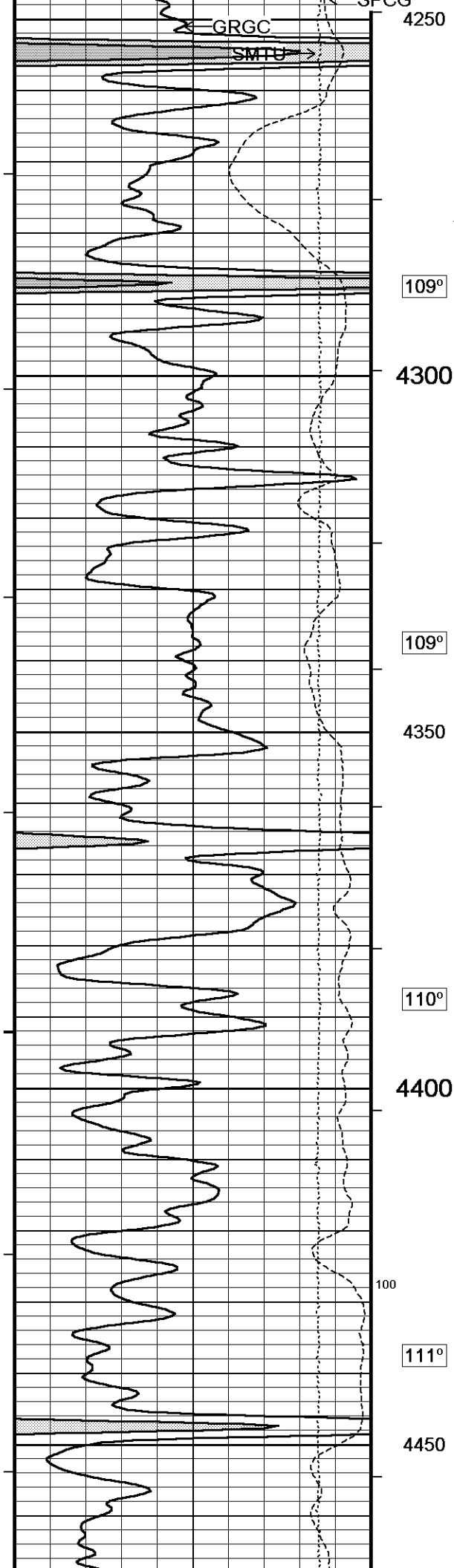
FEFE

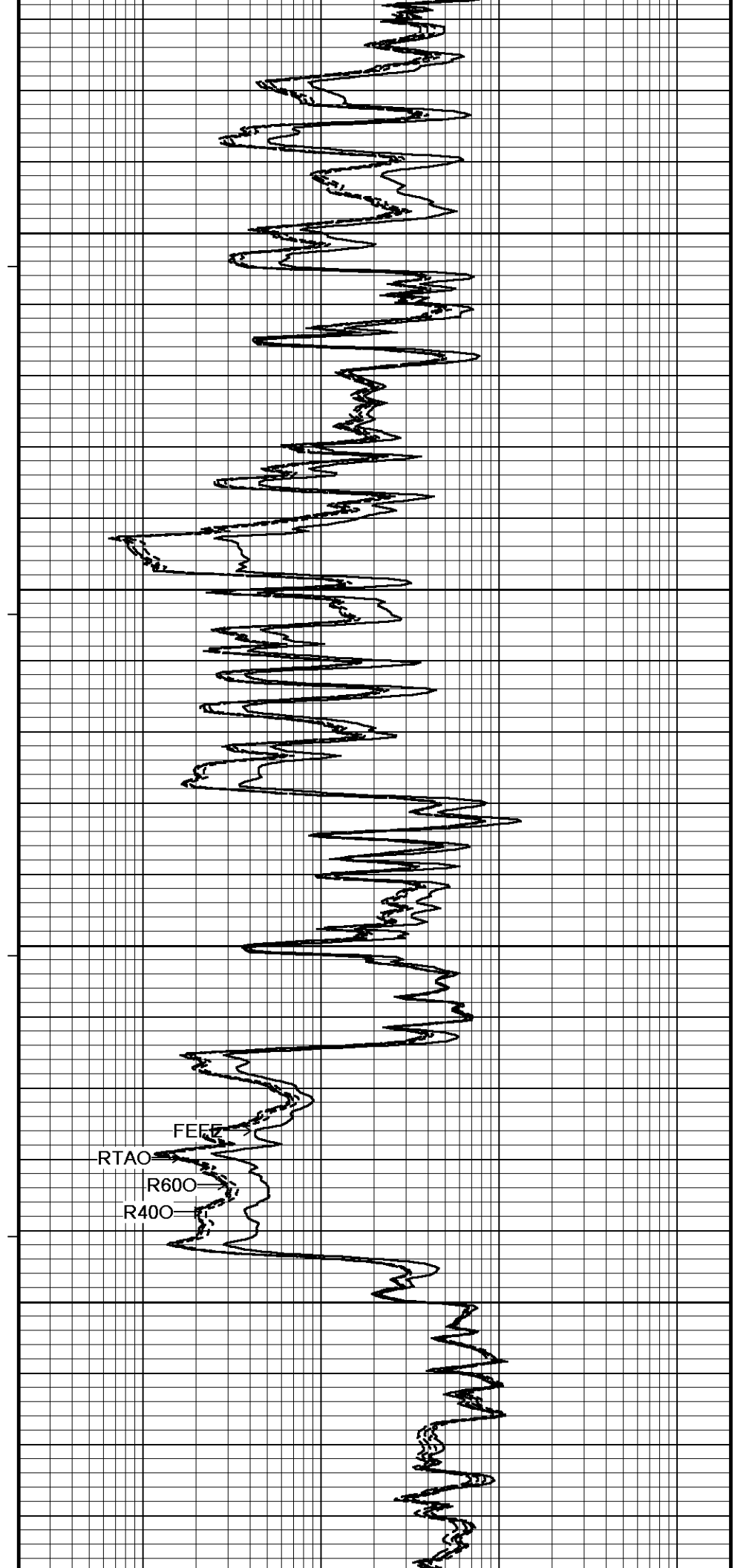
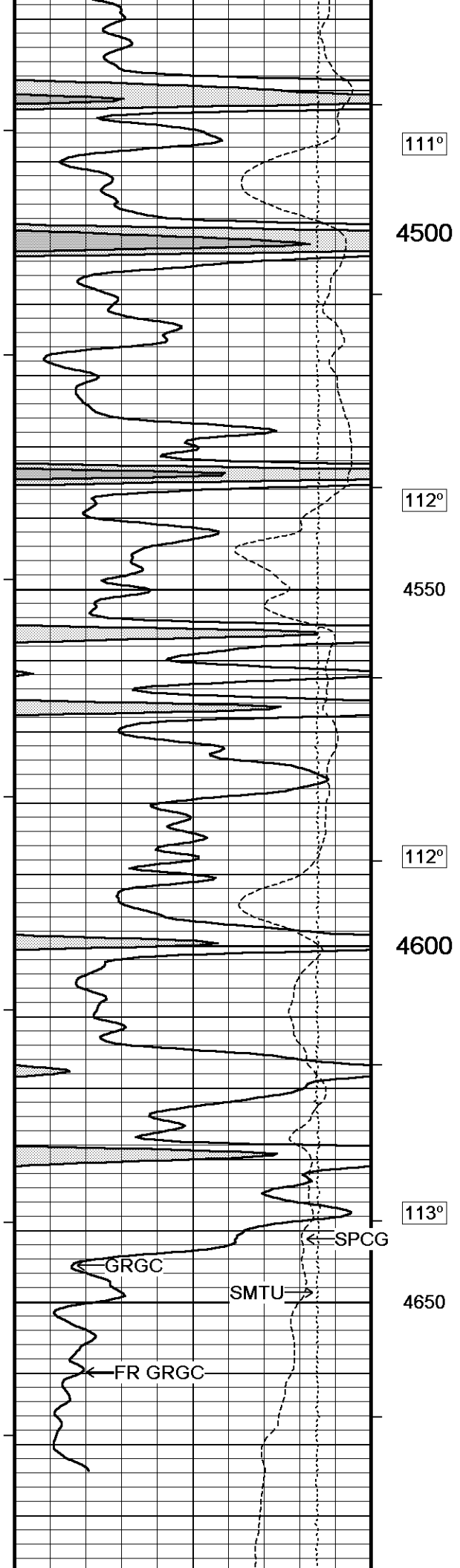
RTAO

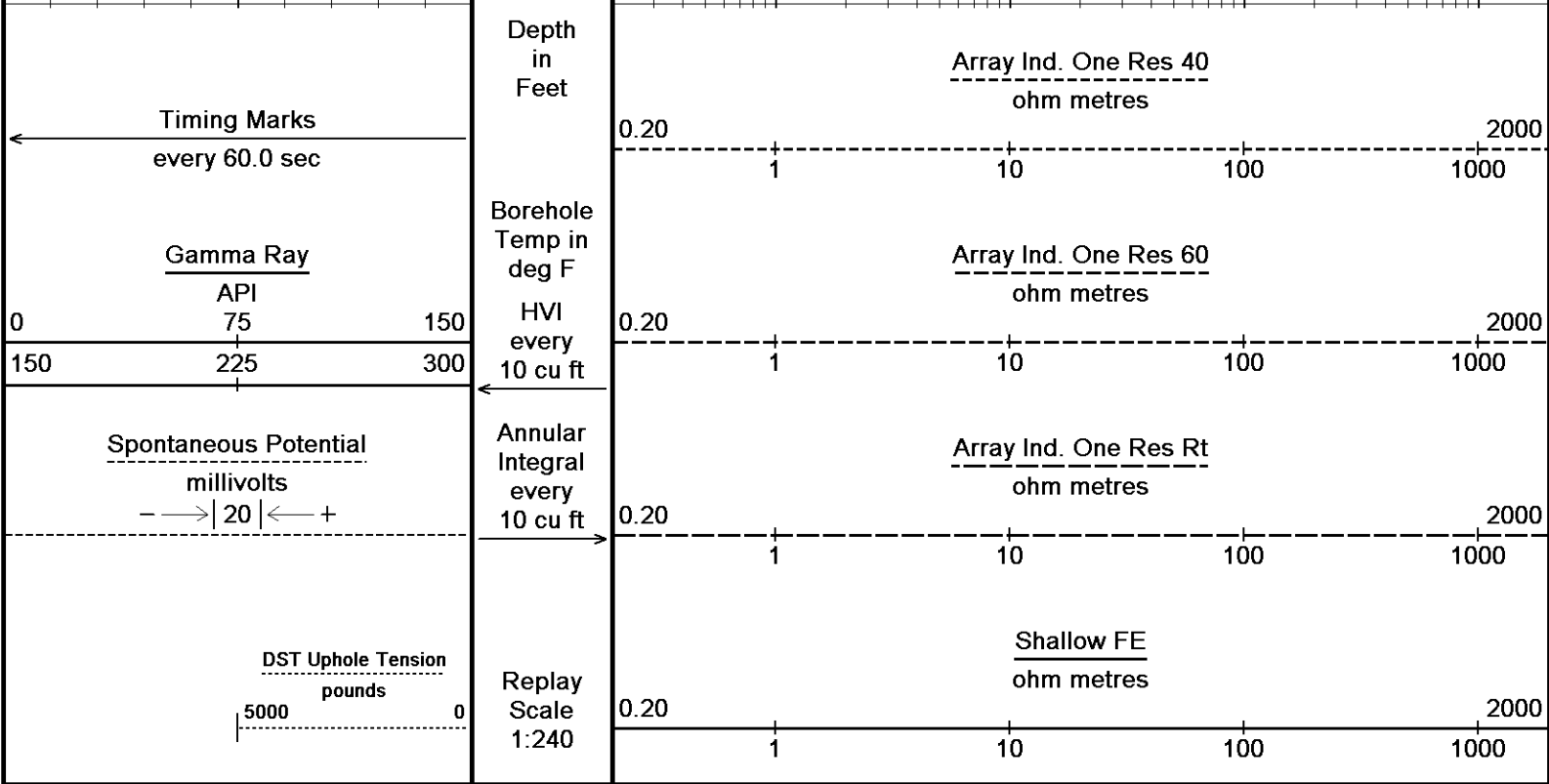
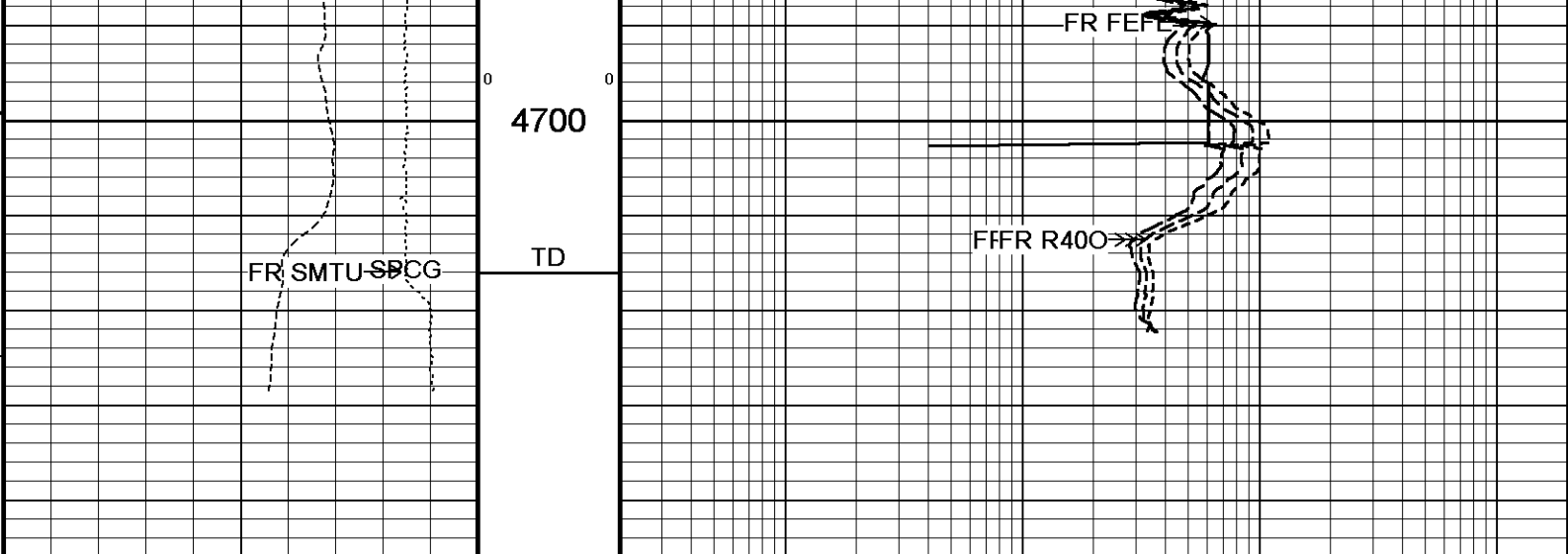
R600

R400







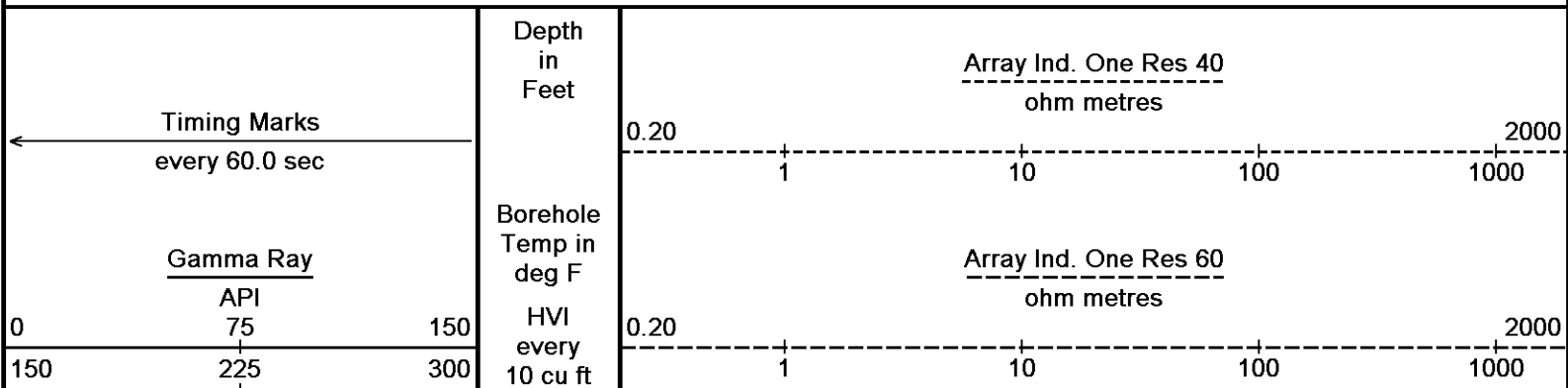


Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 12-JUN-2014 08:41
 Filename: C:\Minimus 13.08.2113\Log\SHAKESPEAR...SHAKESPEARE CAMPBELL 4-17 MAIN1.dta Recorded on 11-JUN-2014 18:33
 System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113

↑ 5 INCH MAIN ↑

↓ REPEAT SECTION ↓

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 12-JUN-2014 08:41
 Filename: C:\Minimus 13.08.2113\Log\SHAKESPE...SHAKESPEARE CAMPBELL 4-17 REPEAT1.dta Recorded on 11-JUN-2014 18:11
 System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113



Spontaneous Potential

millivolts

- -> | 20 | <- +

Annular
Integral
every
10 cu ft

Array Ind. One Res Rt

ohm metres

0.20 1 10 100 1000 2000

DST Uphole Tension

pounds

5000 0

Replay
Scale
1:240

Shallow FE

ohm metres

0.20 1 10 100 1000 2000

4218

4250

109°

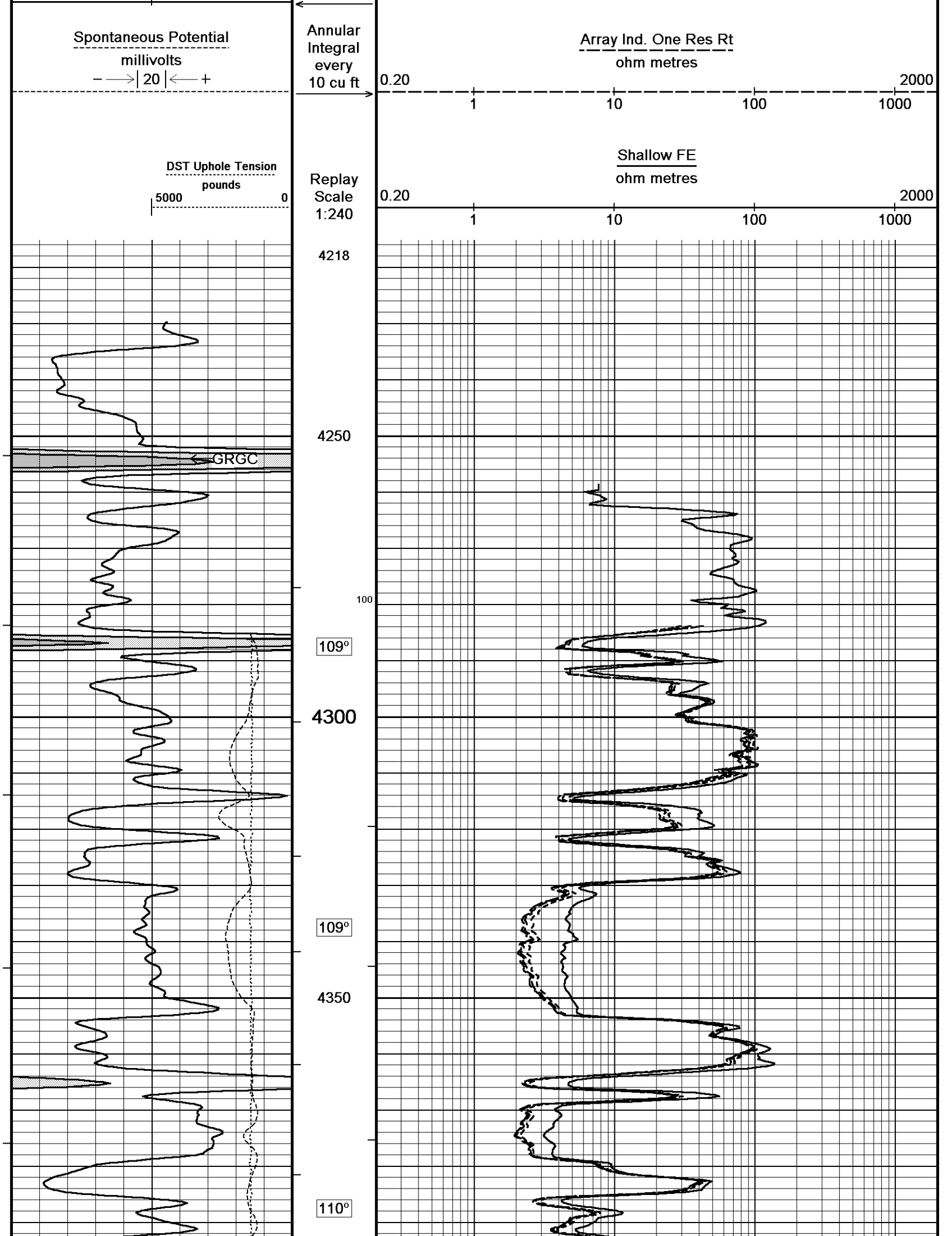
4300

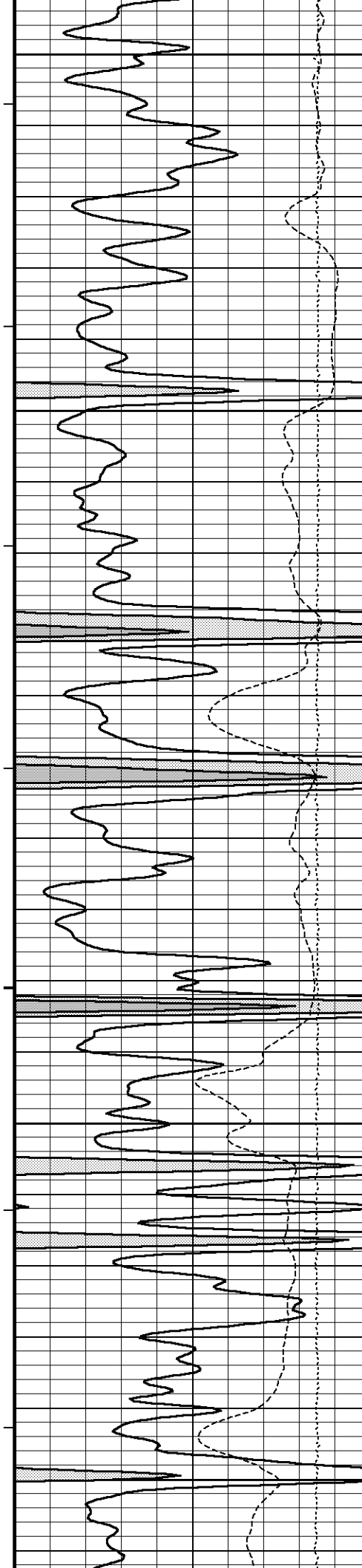
109°

4350

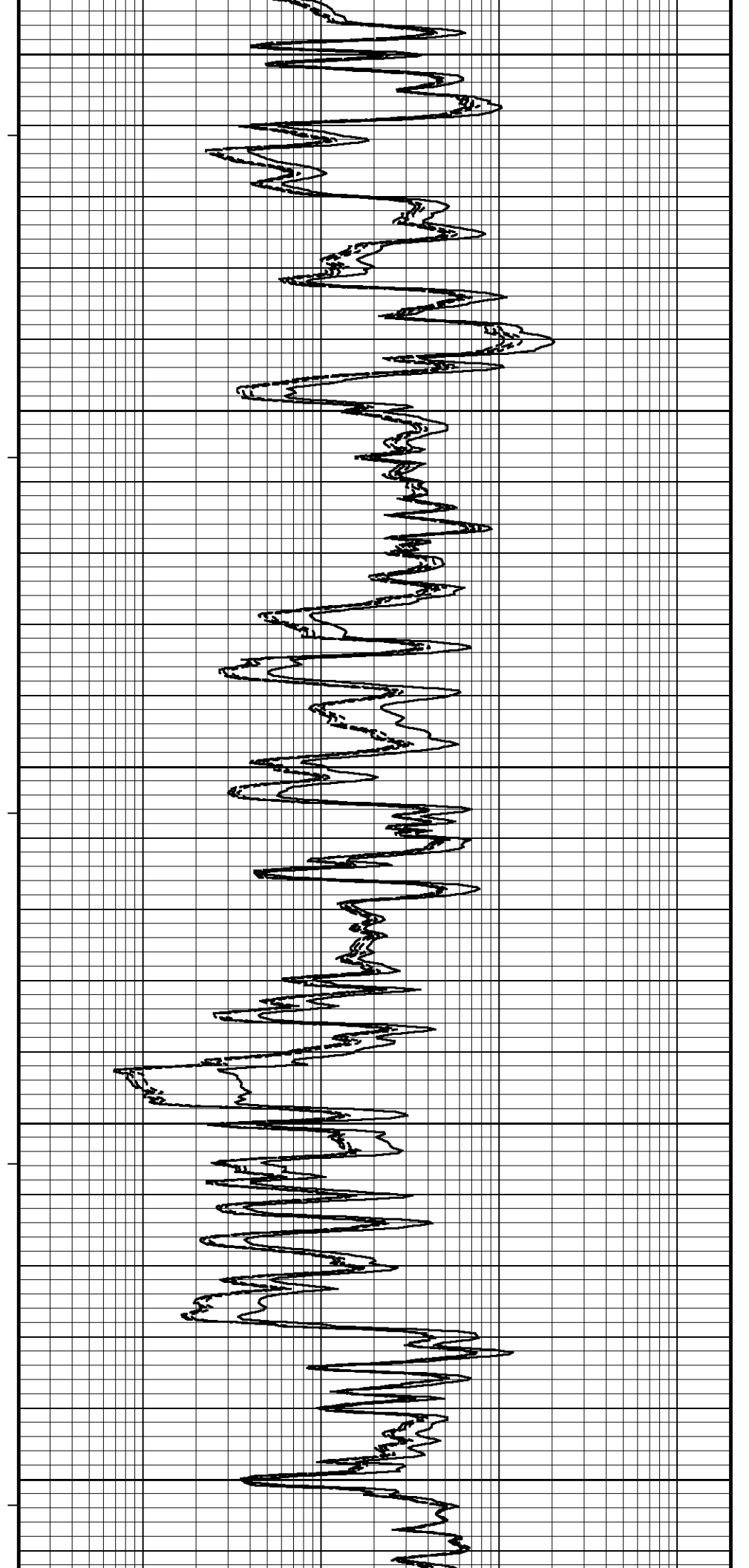
110°

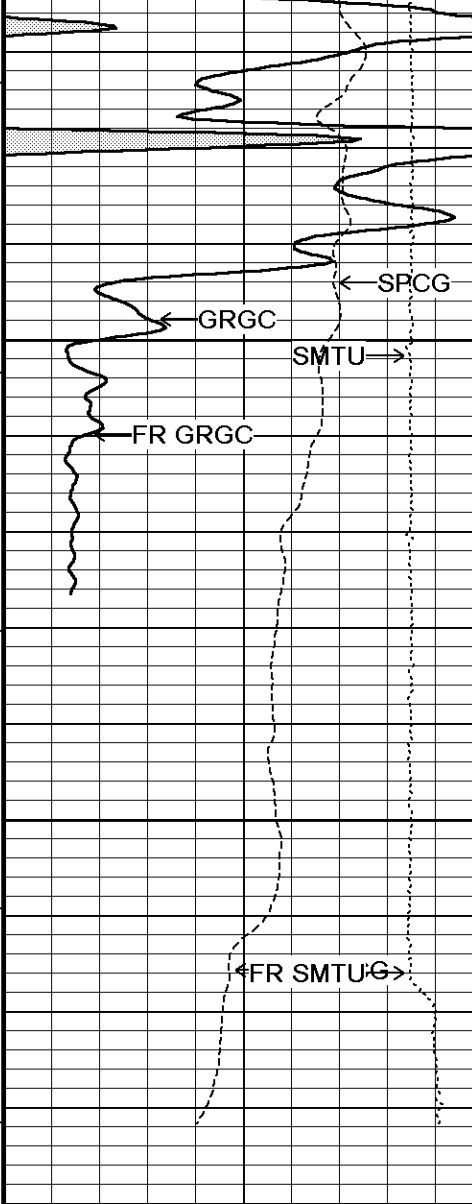
← GRGC





4400
100
110°
4450
111°
4500
111°
4550
111°
4600
112°



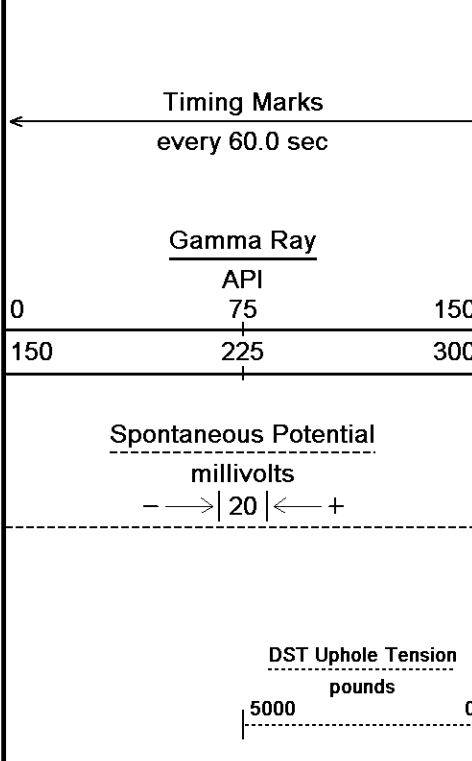
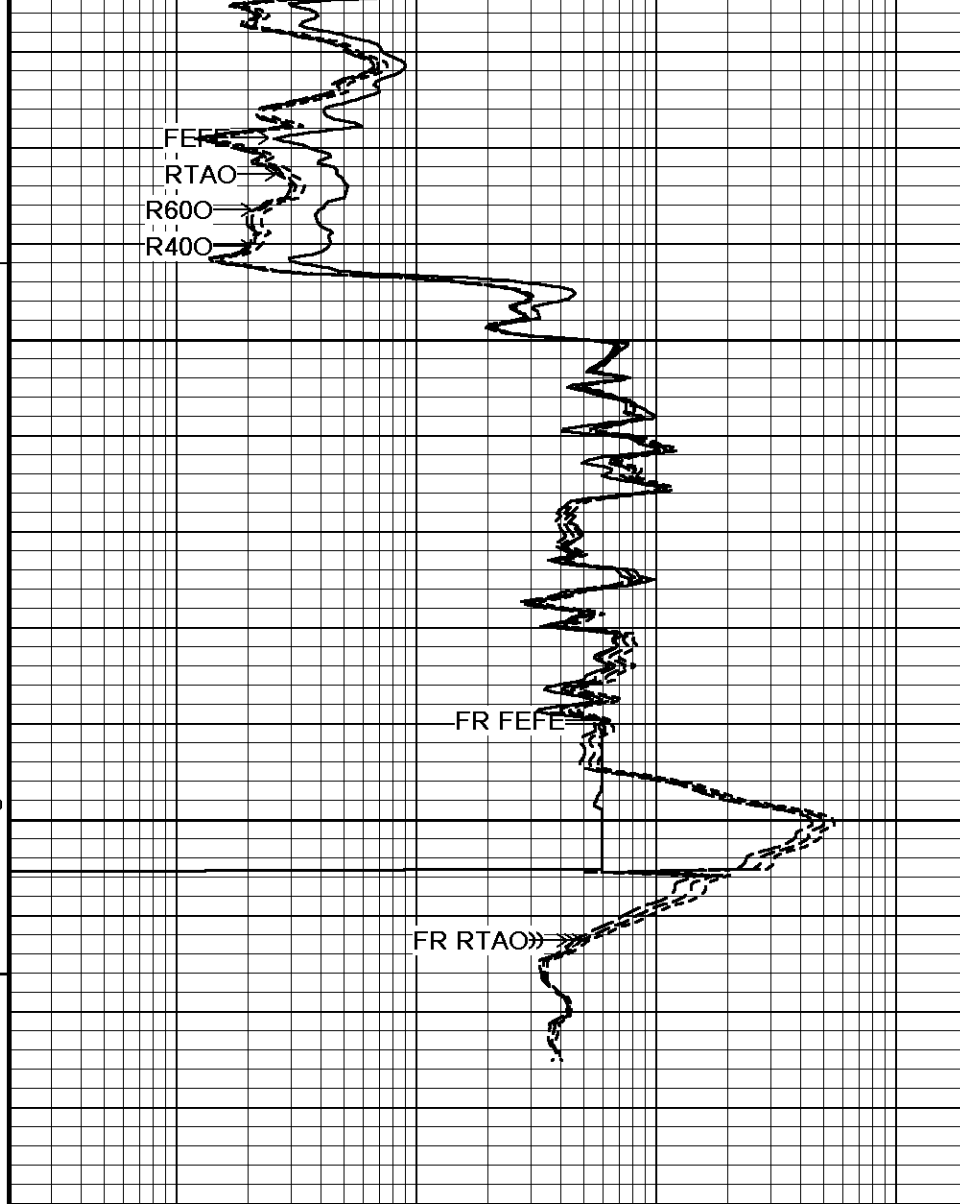


112°

4650

4700

TD

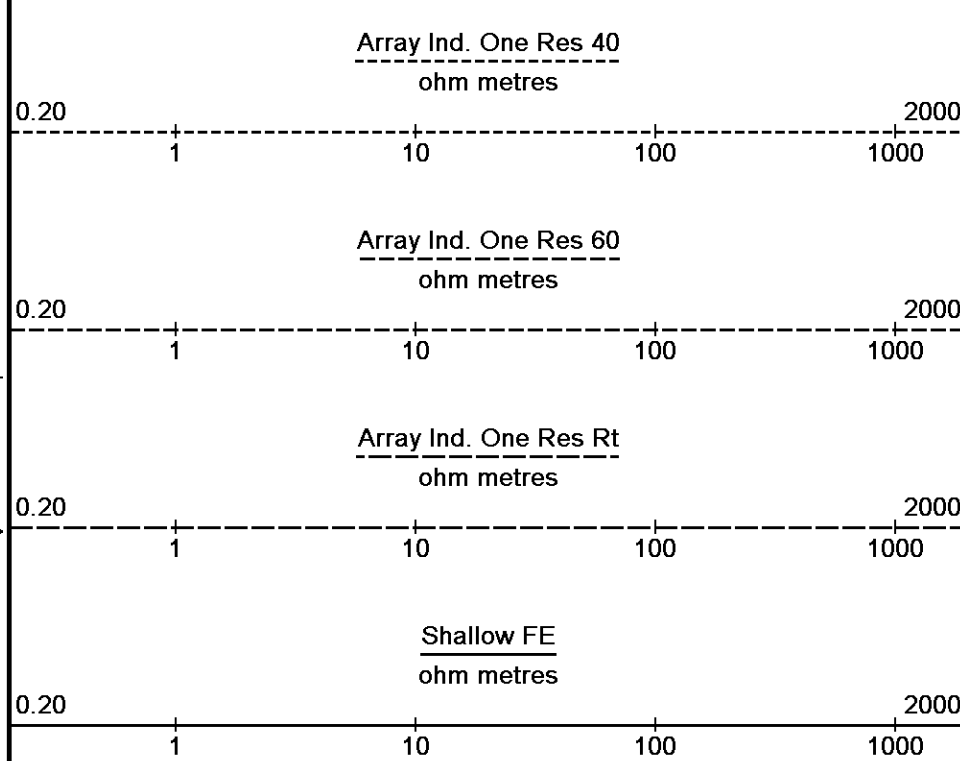


Depth in Feet

Borehole Temp in deg F
HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:240





REPEAT SECTION



BEFORE SURVEY CALIBRATION

C:\Minimus 13.08.2113\Logs\SHAKESPEARE CAMPBELL 4-17\SHAKESPEARE CAMPBELL 4-17 REPEAT.dta

General Constants All 000

Last Edited on 11-JUN-2014,17:41

General Parameters

Mud Resistivity	0.640	ohm-metres
Mud Resistivity Temperature	93.000	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	MMR Caliper	

Rwa Parameters

Porosity used	Crossplot Porosity
Resistivity used	Array Ind. One Res Rt
RWA Constant A	0.610
RWA Constant M	2.150
SW/APOR Tool Source	0.000

High Resolution Temperature Calibration MCG-C 208

Field Calibration on 23-JAN-2014,17:11

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

High Resolution Temperature Constants MCG-C 208

Last Edited on 23-JAN-2014,17:11

Pre-filter Length	11
-------------------	----

Gamma Calibration MCG-C 208

Field Calibration on 04-JUN-2014 10:53

	Measured	Calibrated (API)
Background	68	46
Calibrator (Gross)	1134	771
Calibrator (Net)	1067	725

Gamma Constants MCG-C 208

Last Edited on 10-JUN-2014,13:26

Gamma Calibrator Number	GRC038	
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	%

FE Calibration MFE-A.A 55

Base Calibration on 10-MAY-2014 09:55

Field Check on 04-JUN-2014 10:26

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	952.2	126.8
Base Check		281.3
Field Check		281.3

FE Constants MFE-A.A 55

Last Edited on 10-JUN-2014,13:26

Running Mode	No Sleeve
MFE K Factor	0.1268
Caliper Source for FE correction	Density Caliper

Caliper Value for FE correction	Density Caliper	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 5

Base Calibration on 21-JAN-2014,09:50

Field Check on 04-JUN-2014 10:24

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	16.3	470.8	9.3	966.2
2	5.6	376.1	7.6	821.4
3	2.6	266.1	5.2	566.0
4	1.6	130.0	2.6	279.2

Array Temperature 71.1 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			15.3	3863.0
2			31.7	3590.9
3			29.7	2971.5
4			20.7	2126.3
Deep			18.4	1912.3
Medium			42.9	3861.3
Shallow			47.2	5372.6

Array Temperature 79.2 Deg F

Induction Constants MAI-A.A 5

Last Edited on 10-JUN-2014,13:27

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	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-D.A 480

Base Calibration on 08-MAY-2014 14:36

Field Calibration on 04-JUN-2014 10:32

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	17491	3.99
2	27463	5.98
3	37484	7.97
4	47415	9.86
5	58518	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.98	7.97

DOWNHOLE EQUIPMENT

C:\Minimus 13.08.2113\Logs\SHAKESPEARE CAMPBELL 4-17\SHAKESPEARE CAMPBELL 4-17 REPEAT.dta

Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-C.A 248 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron
MDN-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

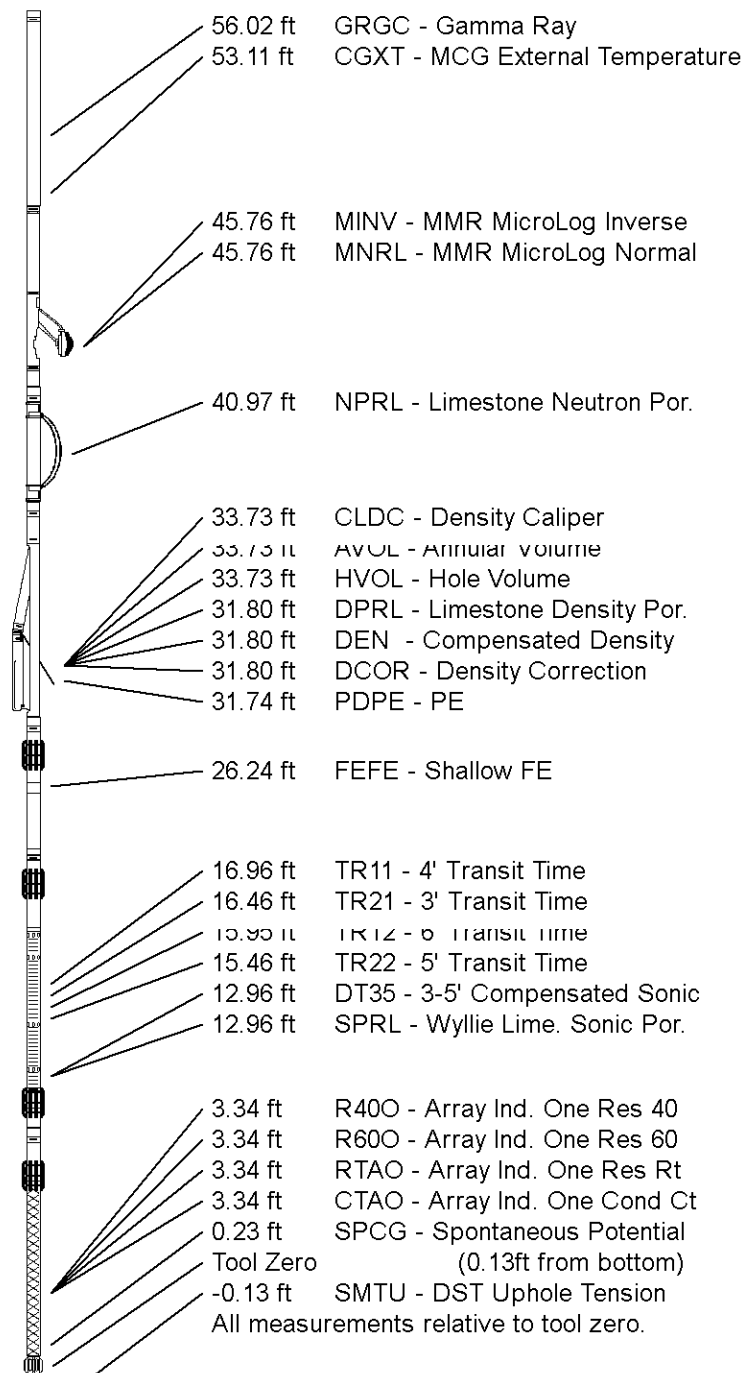
Compact Density/Caliper
MPD-D.A 480 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Sonic
MSS-A.A 73 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in

Compact Induction
MAI-A.A 5 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 61.30 ft Weight: 456.4 lb



COMPANY
WELL

SHAKESPEARE OIL. CO., INC.
CAMPBELL 4-17

FIELD WILDCAT
 PROVINCE/COUNTY LOGAN
 COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	3043.00	feet	First Reading	4713.00	feet
Elevation Drill Floor	3041.00	feet	Depth Driller	4720.00	feet
Elevation Ground Level	3033.00	feet	Depth Logger	4716.00	feet

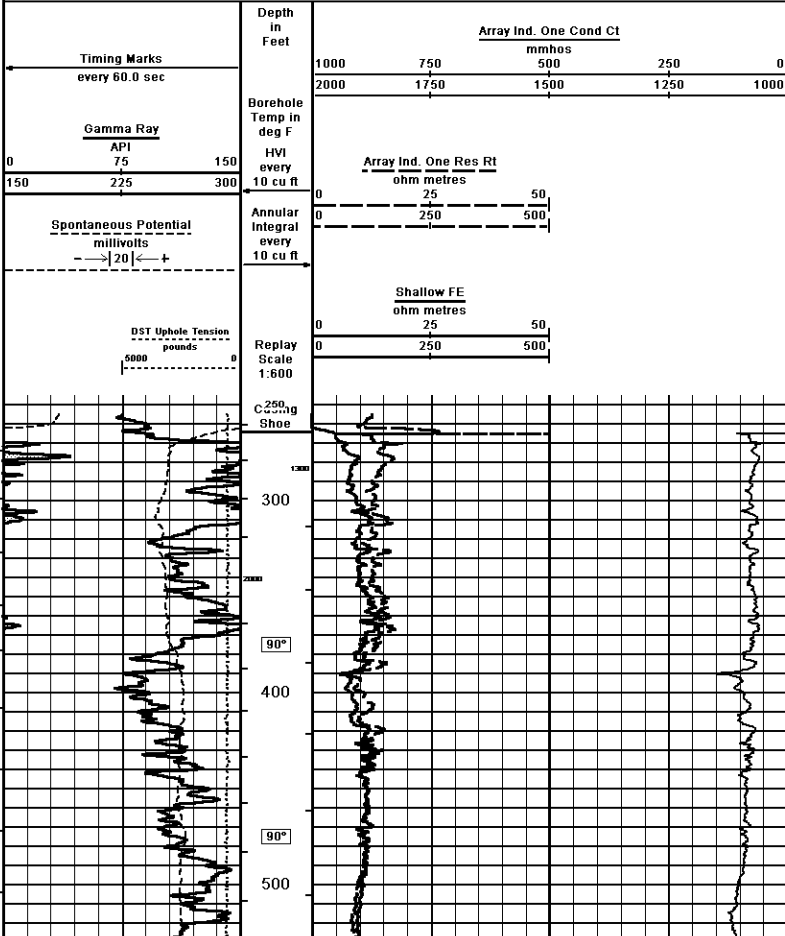


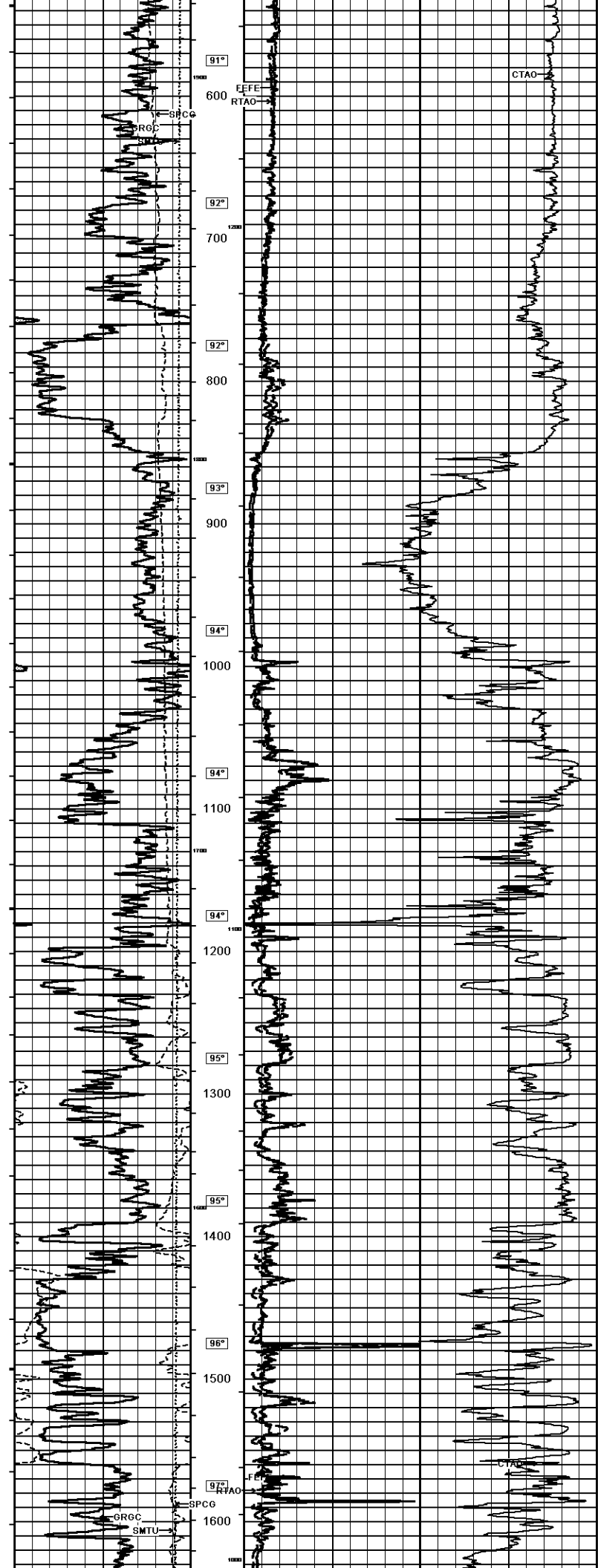
Weatherford[®]

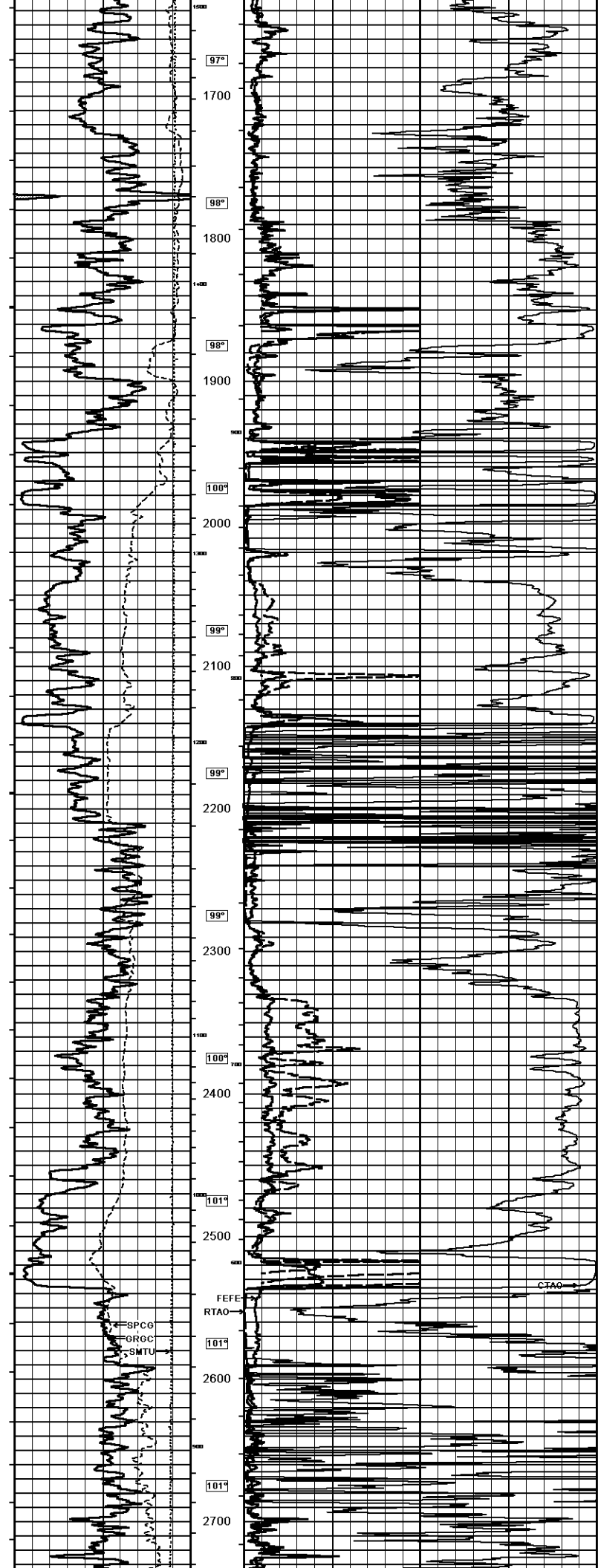
ARRAY INDUCTION
 SHALLOW FOCUSED
 ELECTRIC LOG

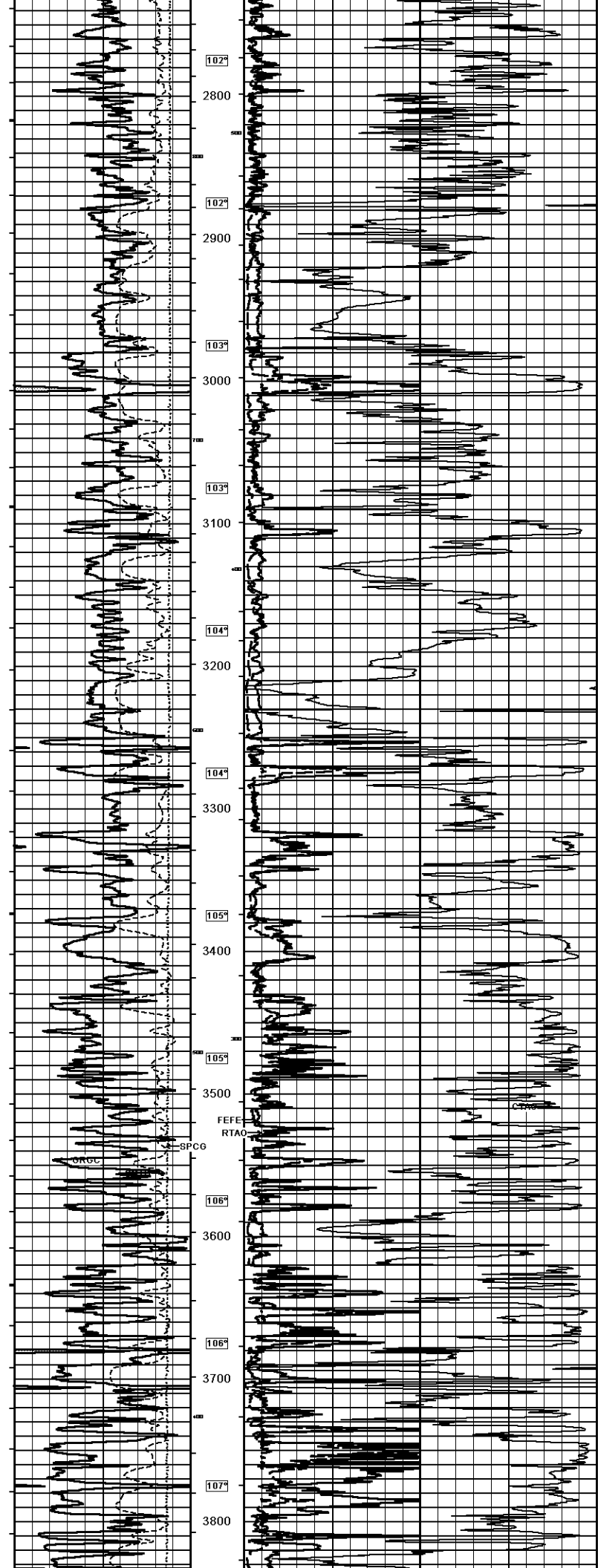
		ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG	
Weatherford		COMPANY: SHAKESPEARE OIL CO., INC. WELL: CAMPBELL 4-17 FIELD: WILDCAT PROVINCE/COUNTY: LOGAN COUNTRY/STATE: U.S.A. / KANSAS LOCATION: 850' FSL & 2000' FEL PERMIT NUMBER: SE MW, SW, SE SEC: T7 TYP: 13S RBE: 32W Operator Services Longitude: 15-109-21293 Latitude: 97-04-01010 MMS MHIL	
Permanent Datum GL, Elevation 3033 feet Log Measured From NB @ 10 FEET Drilling Measured From NB @ 10 FEET		Run Number: ONE Service Order: 587238982634 Depth Driller: 4720.00 feet Depth Logger: 4716.00 feet First Reading: 4713.00 feet Last Reading: 264.00 feet Casing Driller: 264.00 feet Casing Logger: 264.00 feet Bit Size: 7.875 inches Hole Fluid Type: CHEMICAL Density/Viscosity: 9.30 IND/Sg 65.00 CP PH / Fluid Loss: 10.50 8.80 ml/30min Sample Source: MUDPIT Rim @ Measured Temp: 0.64 @ 33.0 ohm-m Rim @ Measured Temp: 0.51 @ 33.0 ohm-m Rim @ Measured Temp: 0.77 @ 33.0 ohm-m Source Rim / Rim: CALC Rim @ BHT: 0.62 @ 13.0 ohm-m Time Since Circulation: 5 HOURS Max Recorded Temp: 113.00 deg F Equipment Base: 13224 LUB Recorded by: D. COLE Witnessed by: T. PREST Date: 11-JUN-2014 Log # : 1E141718 UOB # :	

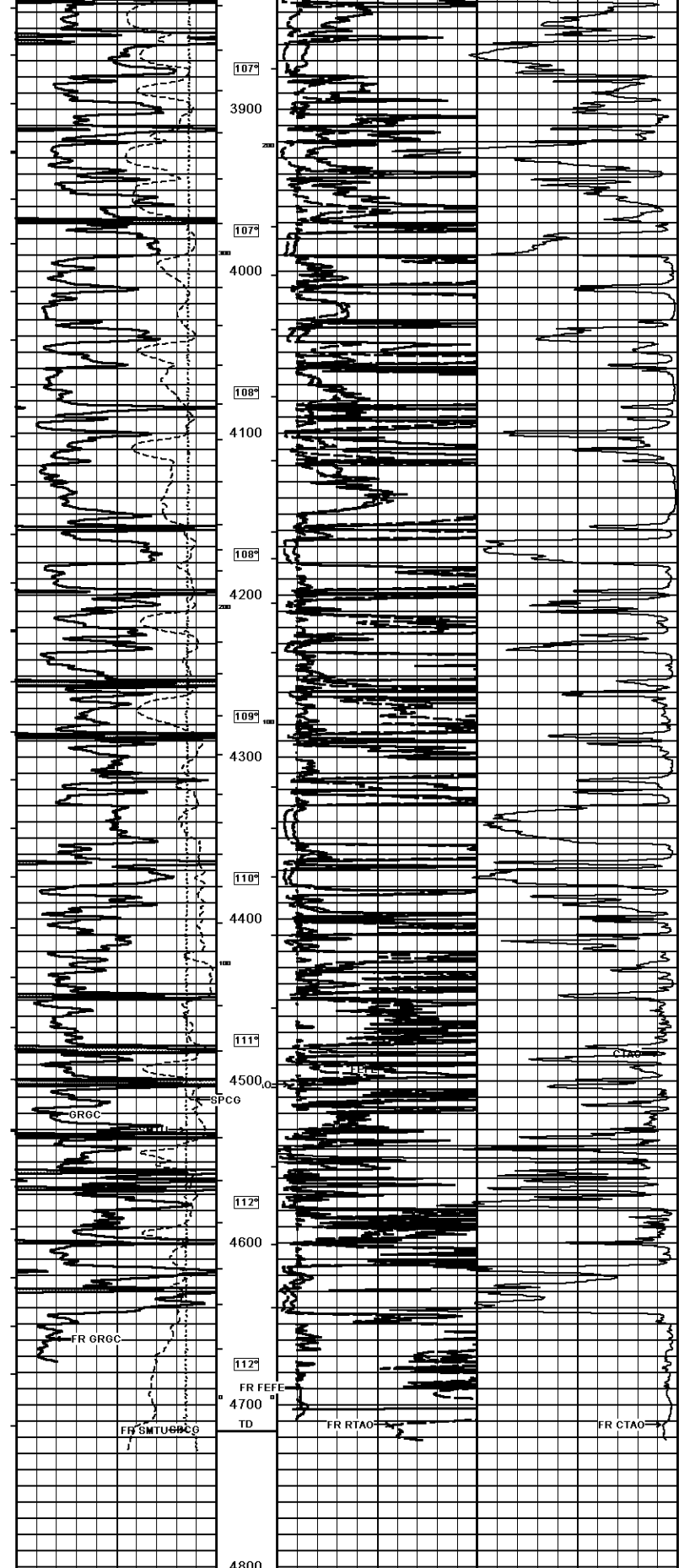
1 INCH MAIN
 Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 12-JUN-2014 08:41
 Filename: C:\Minimus 13.08.2113\Log\SHAKESPEARE CA.1\SHAKESPEARE CAMPBELL 4-17 MAIN1.dta
 Recorded on 11-JUN-2014 18:33
 System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113











Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

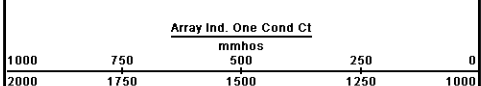
Spontaneous Potential
millivolts

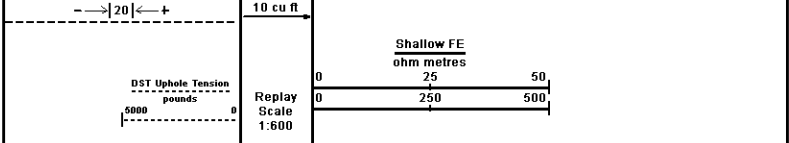
Depth in Feet

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every






Depth Based Data - Maximum Sampling Increment: 10.0cm
 Plotted on 12-JUN-2014 08:41
 Filename: C:\Minimus 13.08.2113\Logs\SHAKESPEARE CA.\SHAKESPEARE CAMPBELL 4-17 MAIN1.dta
 Recorded on 11-JUN-2014 18:33
 System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113

1 INCH MAIN

COMPANY	SHAKESPEARE OIL. CO., INC.				
WELL	CAMPBELL 4-17				
FIELD	WILDCAT				
PROVINCE/COUNTY	LOGAN				
COUNTRY/STATE	U.S.A. / KANSAS				
Elevation Kelly Bushing	3043.00	feet	First Reading	4713.00	feet
Elevation Drill Floor	3041.00	feet	Depth Driller	4720.00	feet
Elevation Ground Level	3033.00	feet	Depth Logger	4716.00	feet



ARRAY INDUCTION
 SHALLOW FOCUSED
 ELECTRIC LOG