



Weatherford[®]

**ARRAY INDUCTION
SHALLOW FOCUSED**

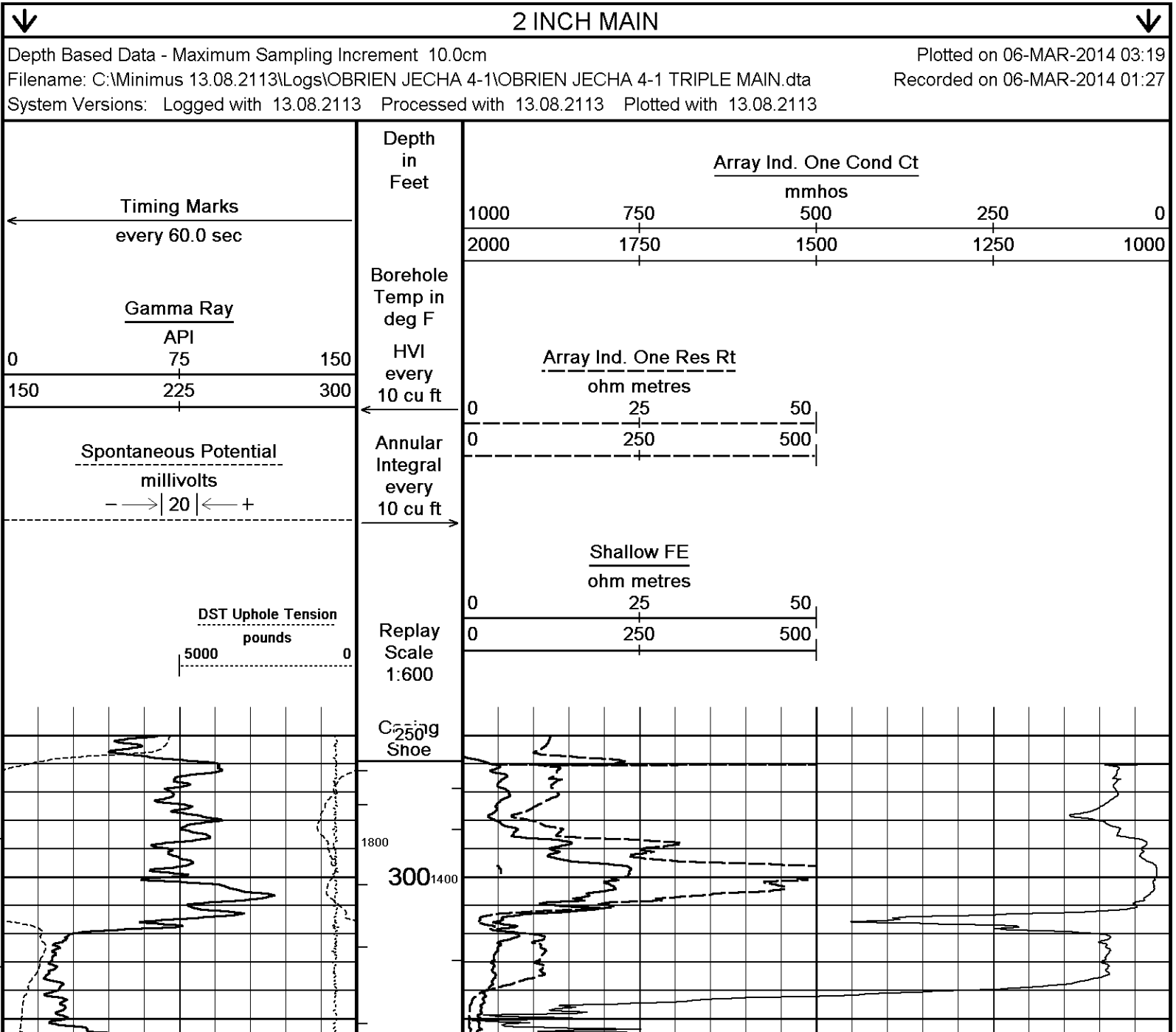
COMPANY			O'BRIEN RESOURCES, LLC		
WELL			JECHA 4-1		
FIELD			WILDCAT		
PROVINCE/COUNTY			RUSH		
COUNTRY/STATE			U.S.A. / KANSAS		
LOCATION			2400' FNL & 1850' FWL OF THE SE SW SE NW		
SEC 4	TWP 19S	RGE 17W	Other Services		
Latitude			MPD/MDN	MML	
Longitude			MAI/MFE		
API Number	15-165-22058		MSS		
Permanent Datum GL, Elevation 2053 feet					
Log Measured From KB			Elevations: KB 2058.00 DF 2056.00 GL 2053.00		
Drilling Measured From KB @ 5 FEET					
Date	05-MAR-2014				
Run Number	ONE				
Service Order	5872-81241285				
Depth Driller	3851.00		feet		
Depth Logger	3851.00		feet		
First Reading	3848.00		feet		
Last Reading	259.00		feet		
Casing Driller	259.00		feet		
Casing Logger	259.00		feet		
Bit Size	7.875		inches		
Hole Fluid Type	CHEM				
Density / Viscosity	9.40 lb/USg		50.00 CP		
PH / Fluid Loss	9.50		6.80 ml/30Min		
Sample Source	PIT				
Rm @ Measured Temp	1.0 @ 48.0		ohm-m		
Rmf @ Measured Temp	0.80 @ 48.0		ohm-m		
Rmc @ Measured Temp	1.20 @ 48.0		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.48 @ 99.0		ohm-m		
Time Since Circulation	4 HRS				
Max Recorded Temp	99.00		deg F		
Equipment / Base	13057		LIB		
Recorded By	D. COLE				
Witnessed By	K. TALBOTT		A. BRITTAN		
JOB #	LB 14-064				

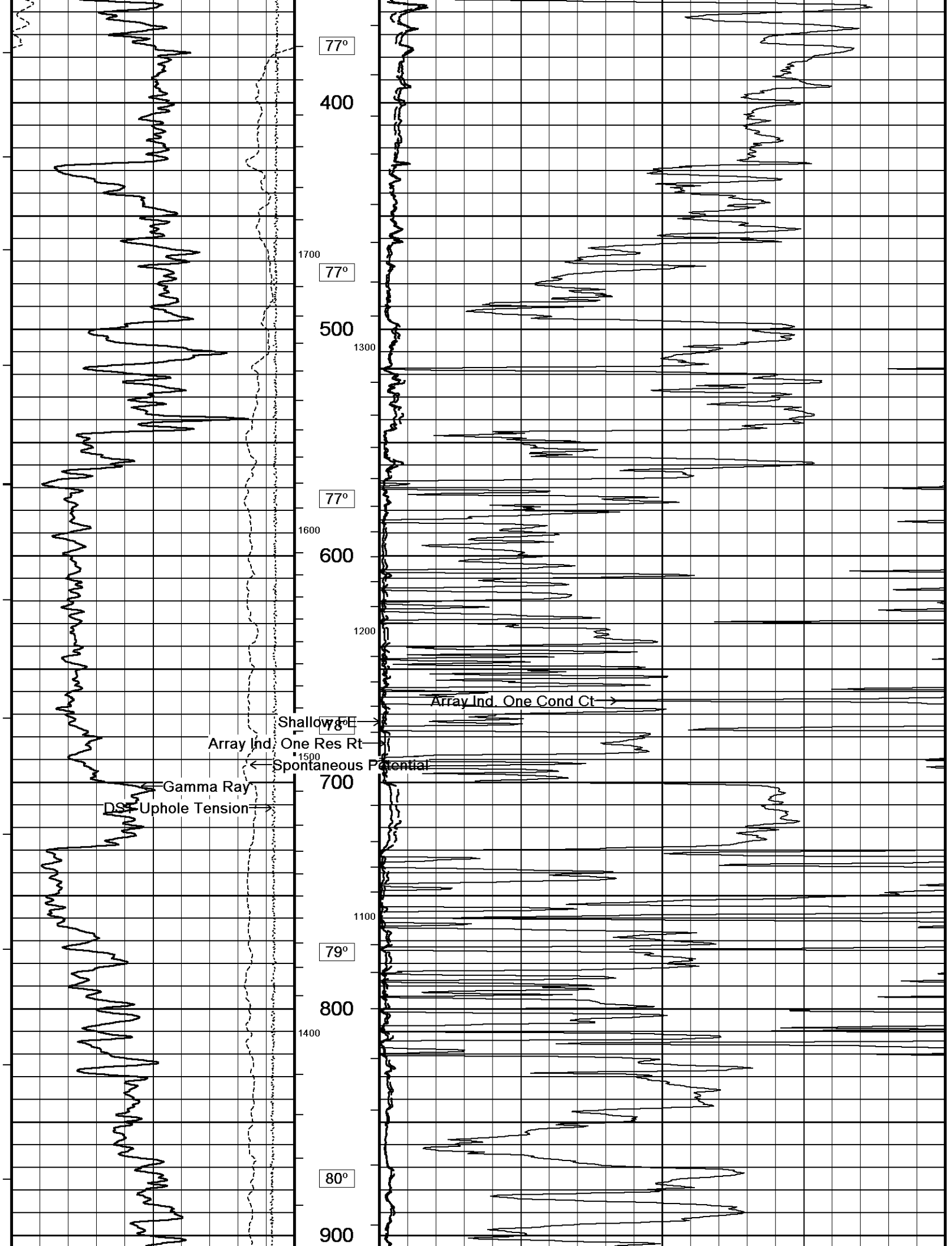
BOREHOLE RECORD			Last Edited: 05-MAR-2014 20:13	
Bit Size inches	Depth From feet		Depth To feet	
7.875	259.00		3851.00	
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
CASING	8.625	0.00	259.00	24.00

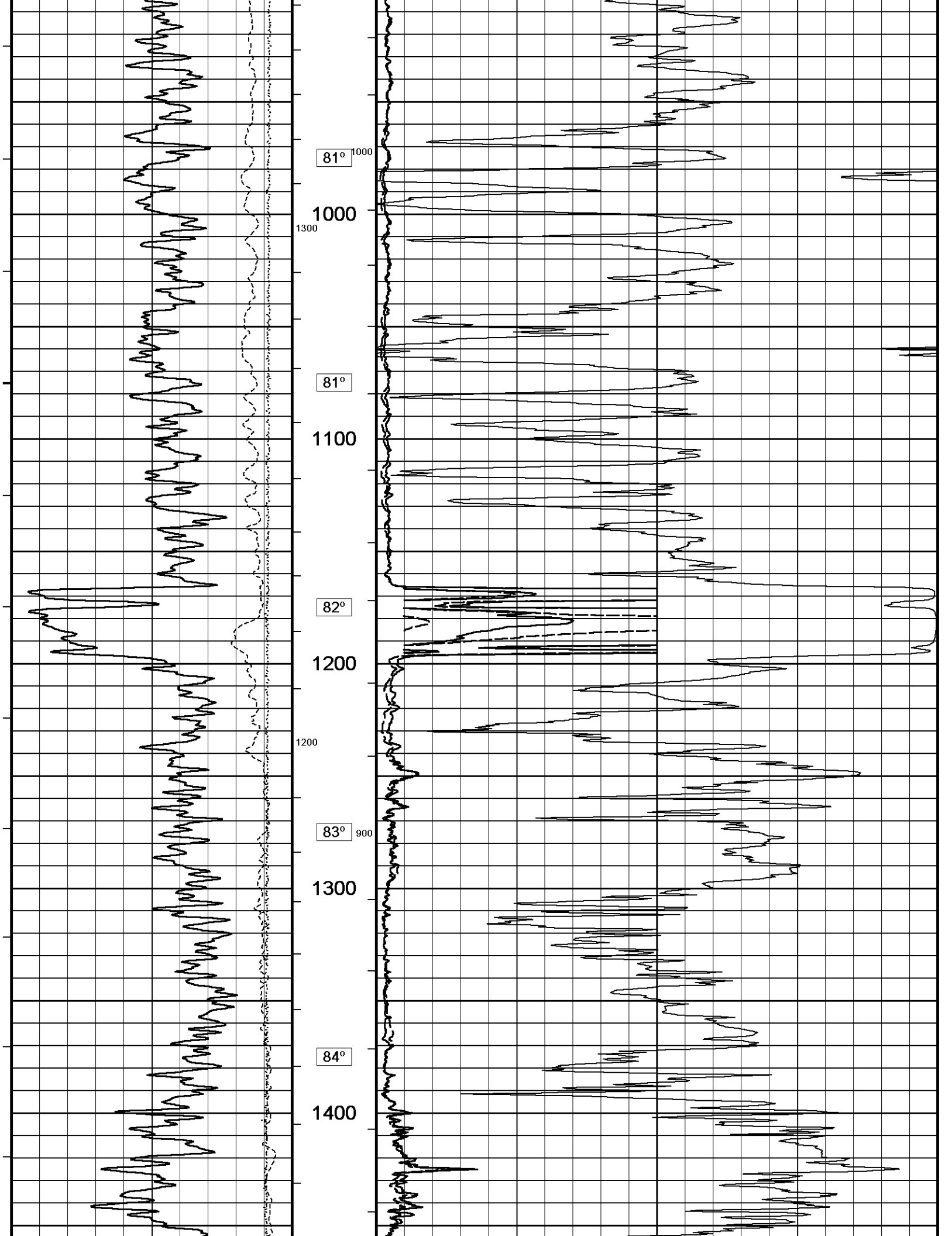
REMARKS
- SOFTWARE ISSUE: WLS 13.08.211.
- RUN ONE: MCG ANS MSS RAN IN COMBINATION. - HARDWARE: TWO 0.5 INCH STANDOFFS USED ON MSS.
- RUN TWO: MCG, MML, MDN, MPD, MFE AND MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 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 2800: 415 CU.FT.

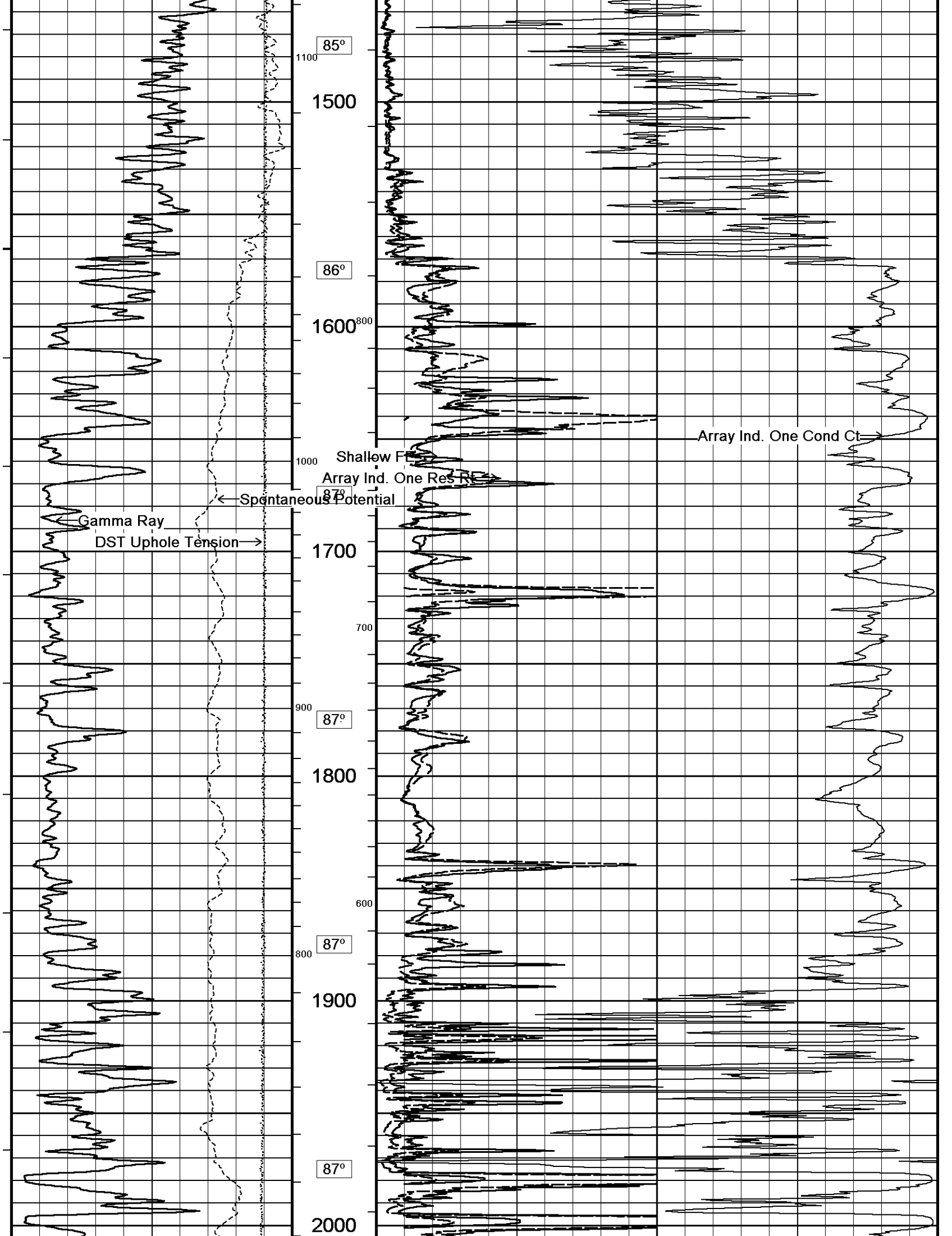
- ANNULAR HOLE VOLUME WITH 4.5 INCH PRODUCTION CASING FROM TD TO 2800: 300 CU.FT.
- RIG: MURFIN 16
- ENGINEER: D. COLE.
- OPERATOR: C. RAMIREZ.

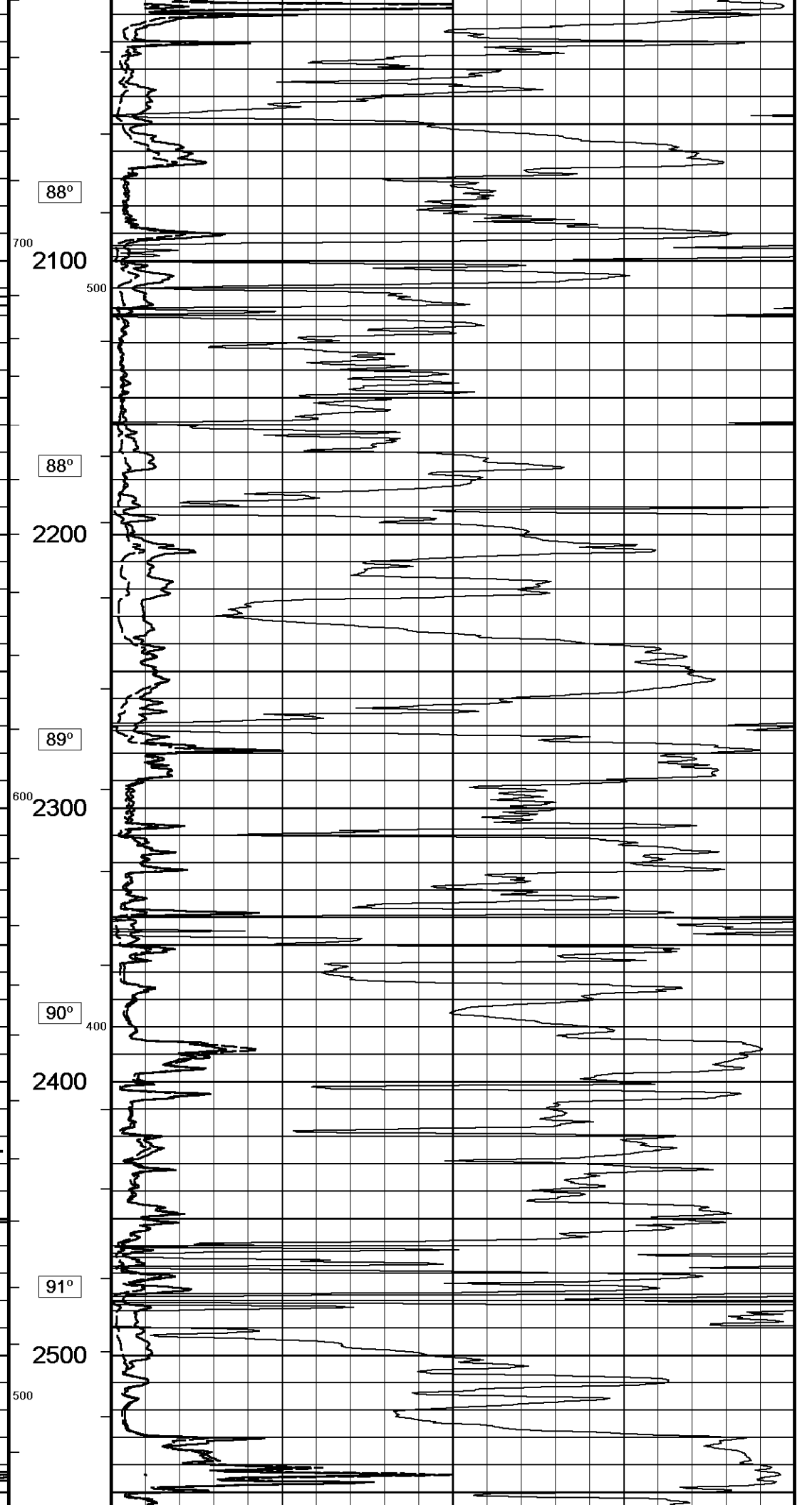
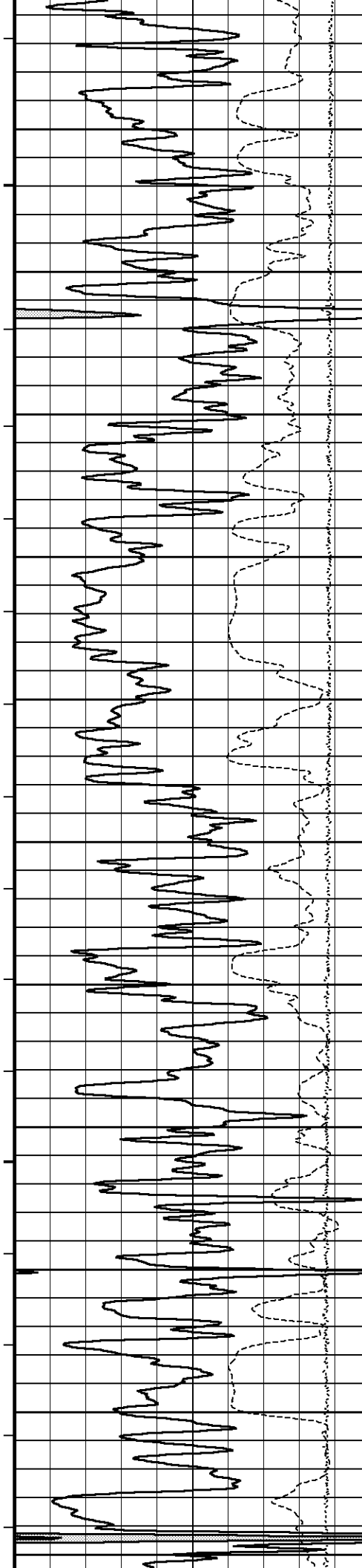
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will 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.

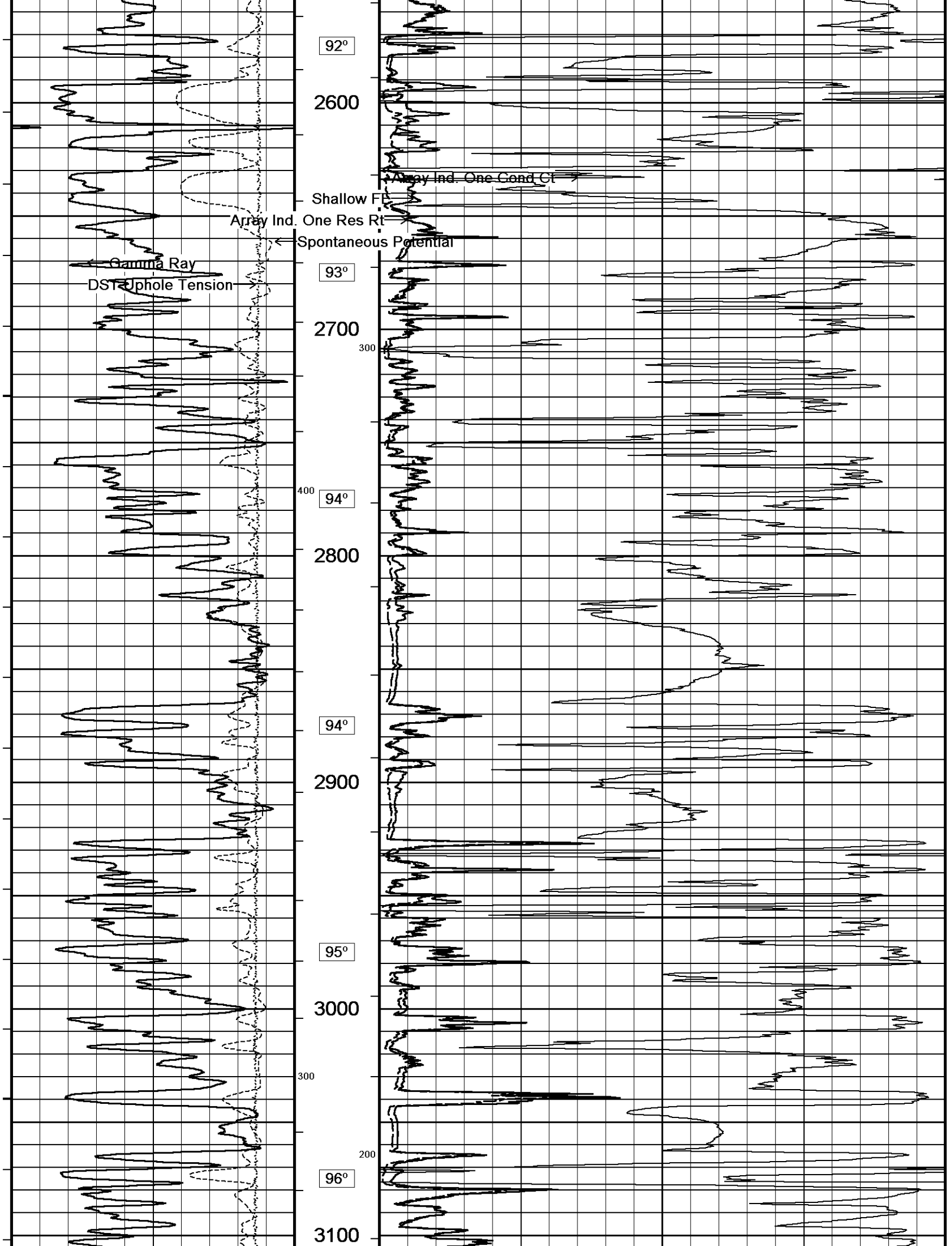


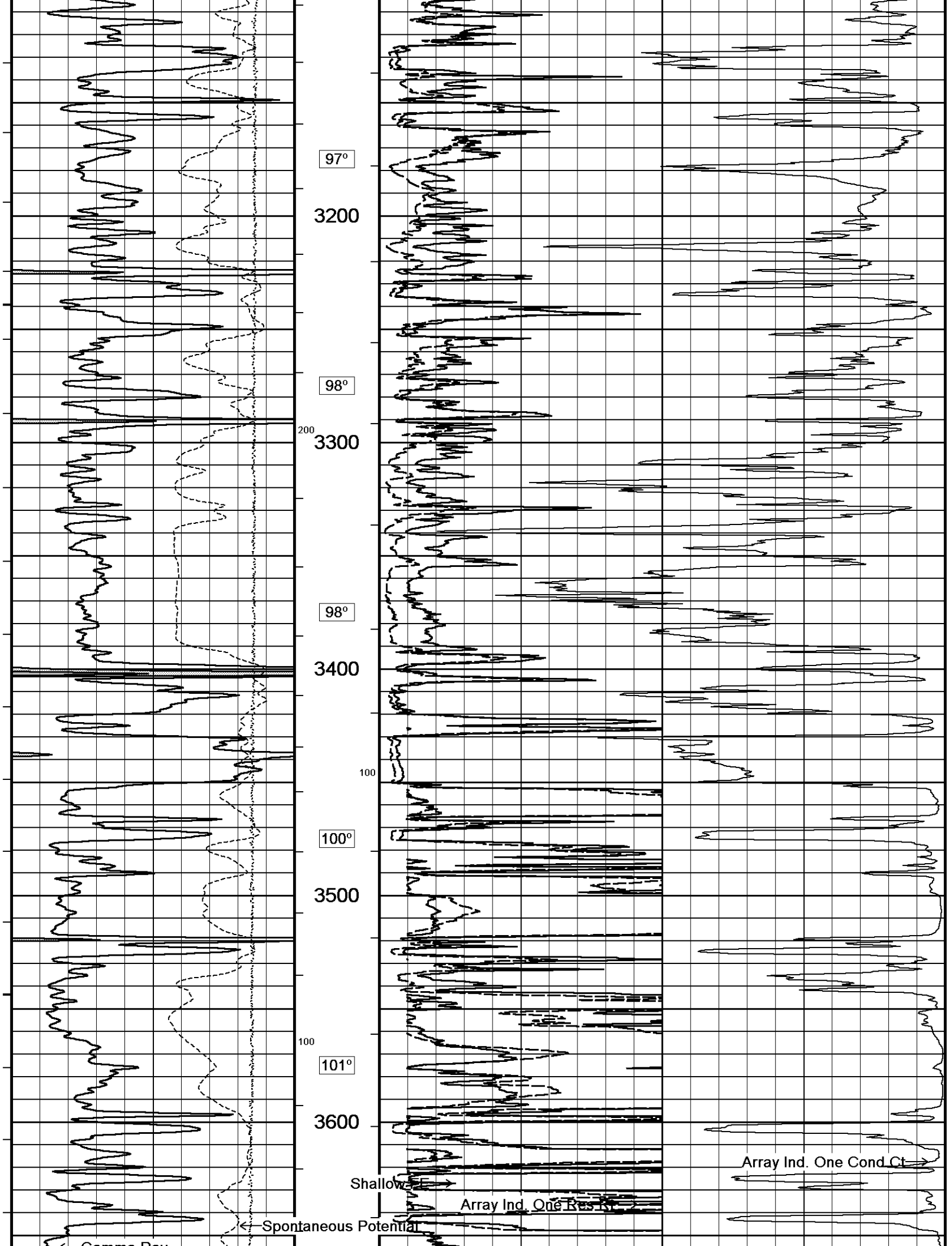


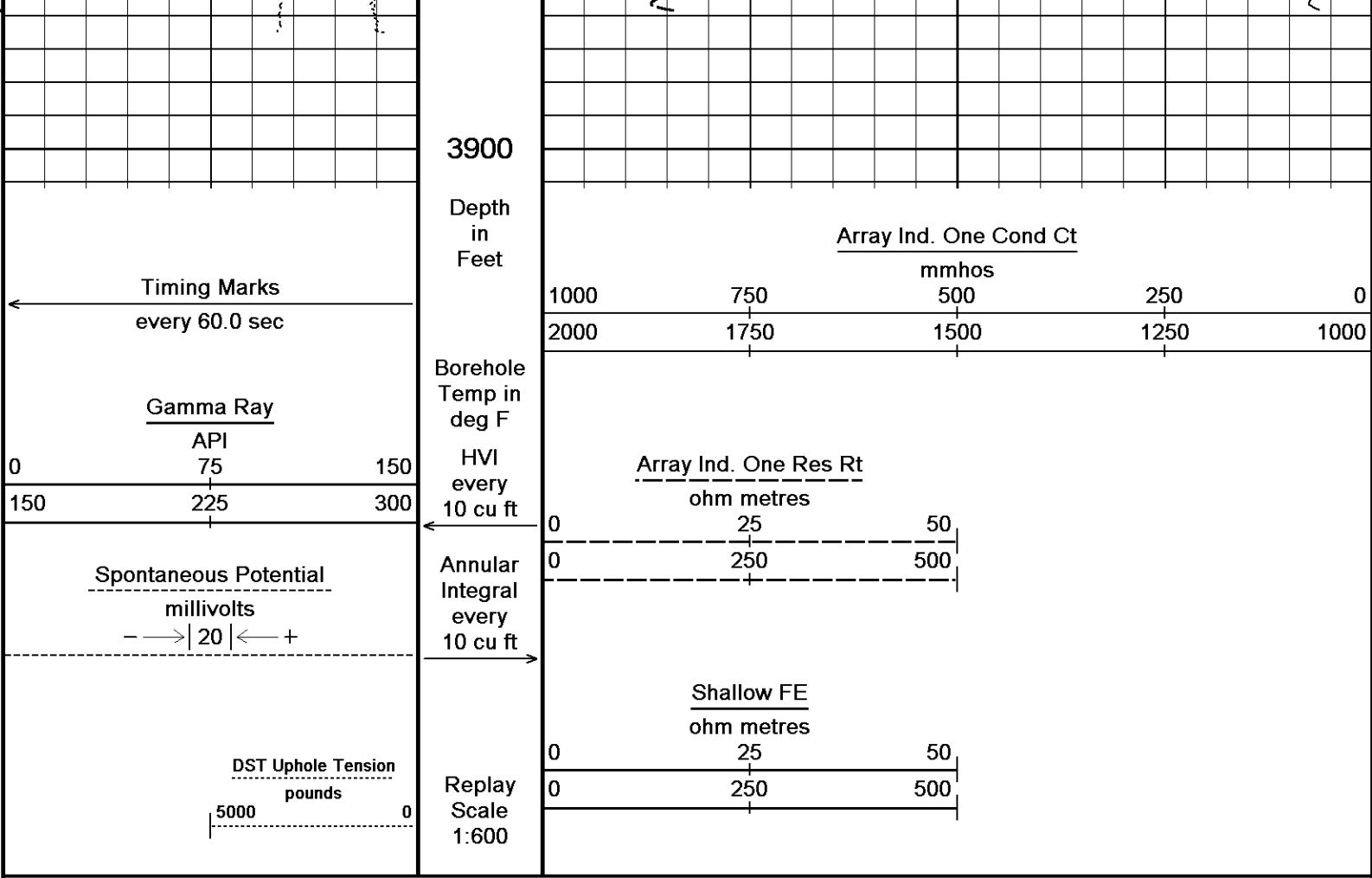
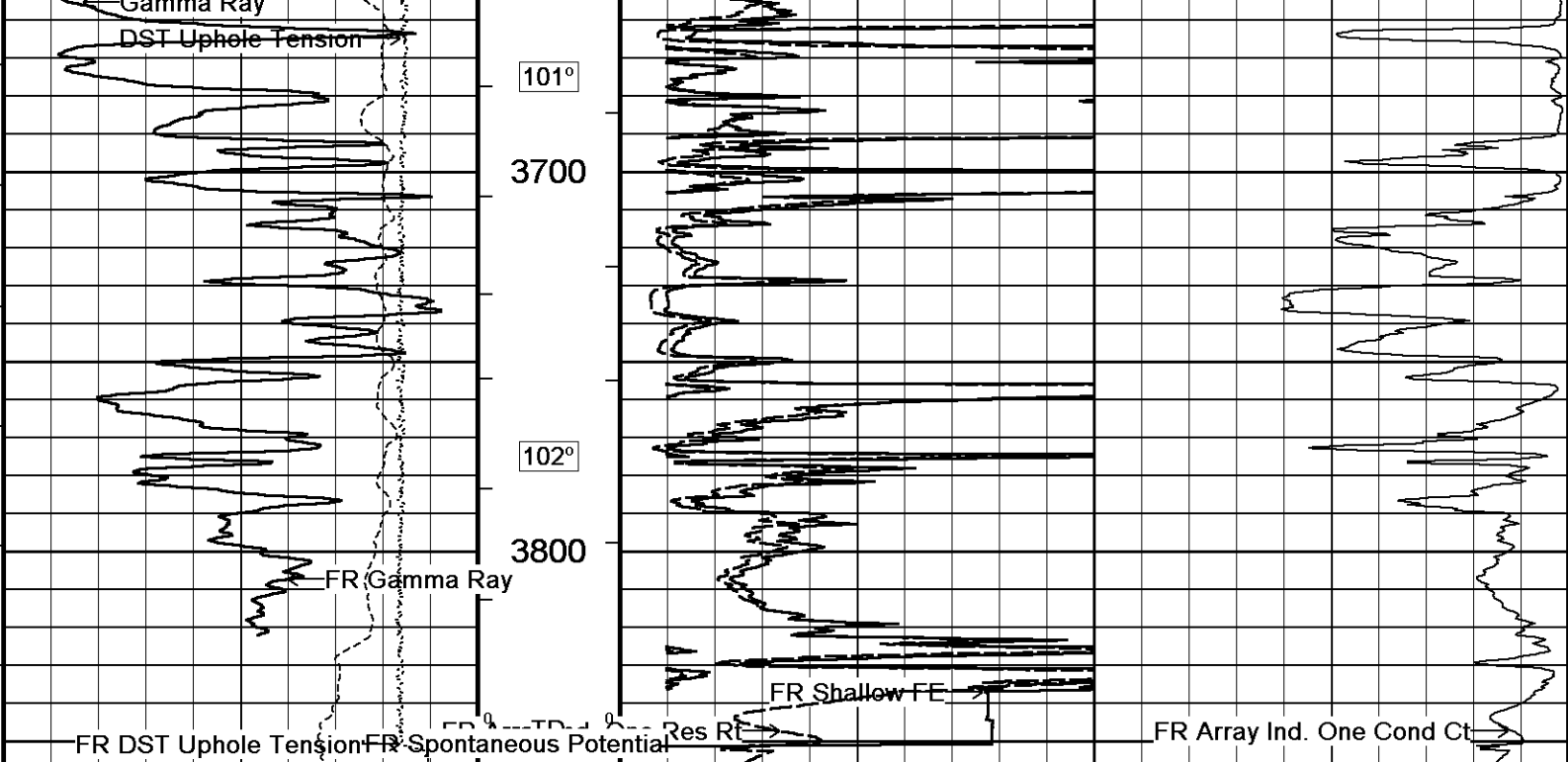


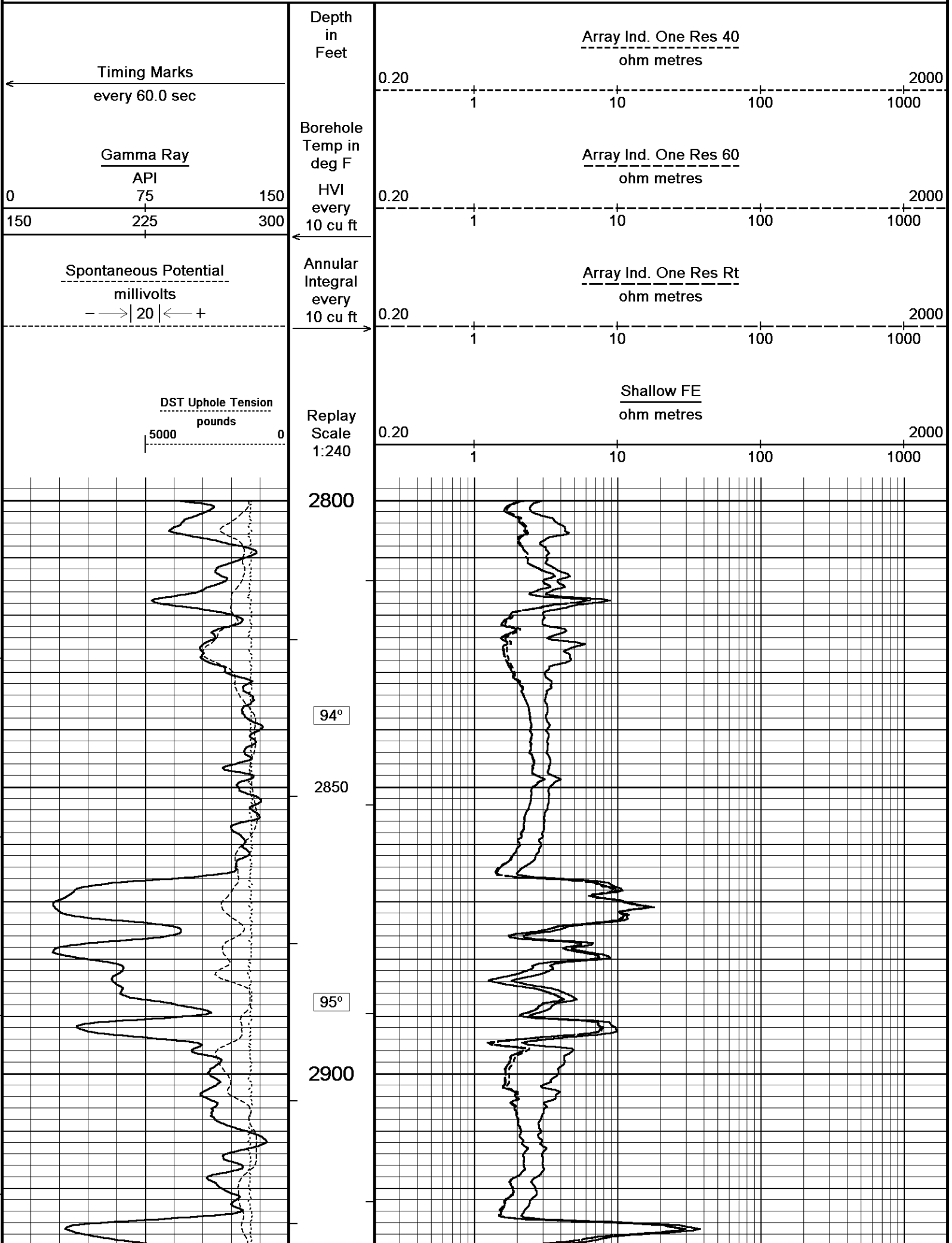


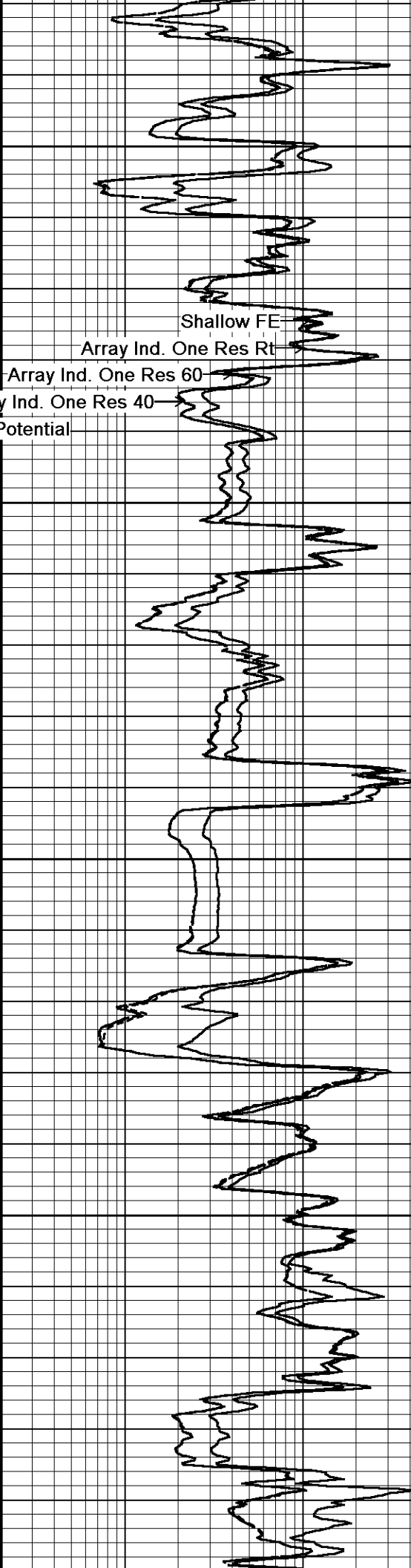
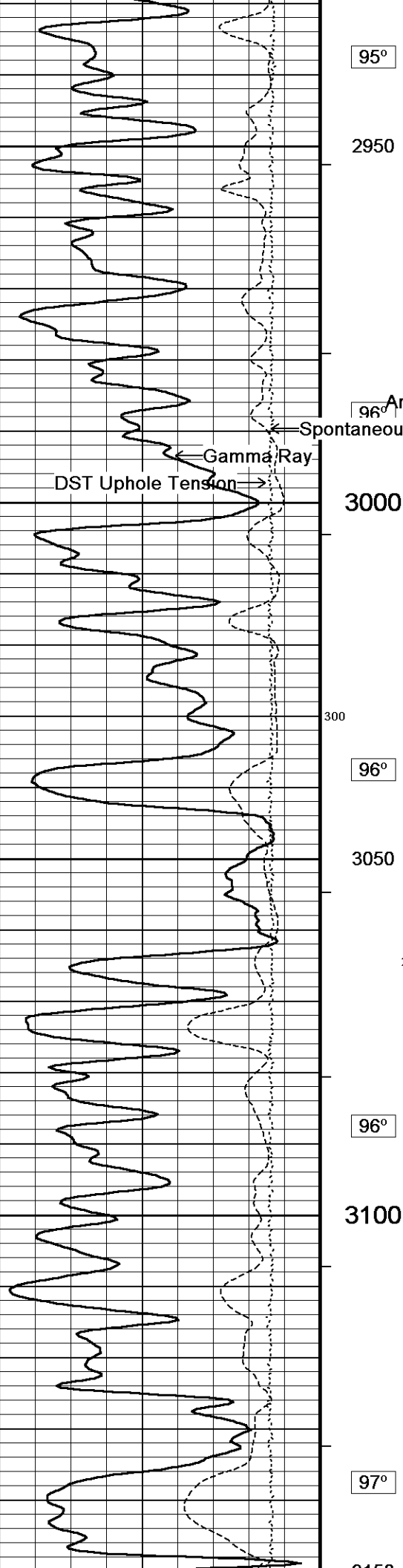


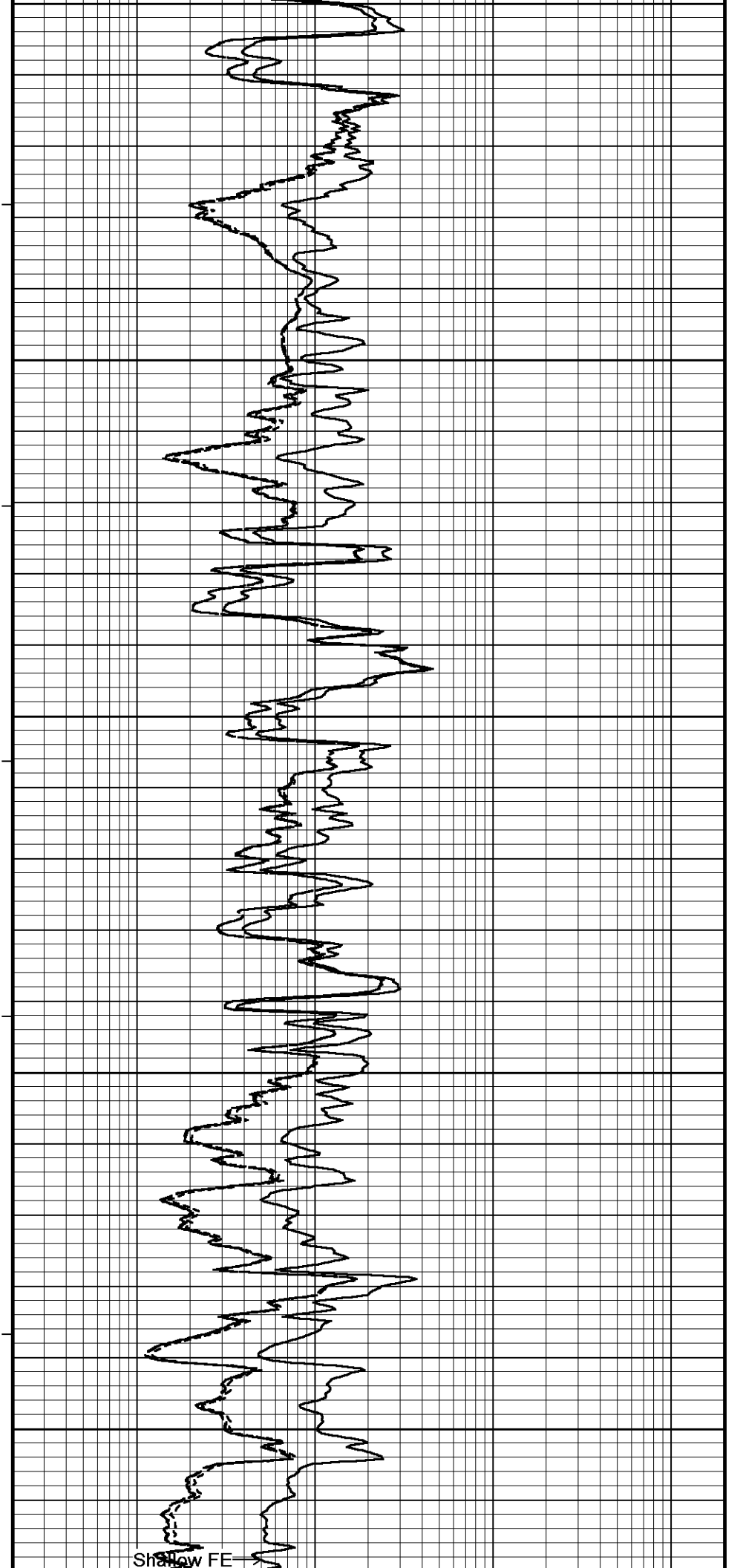
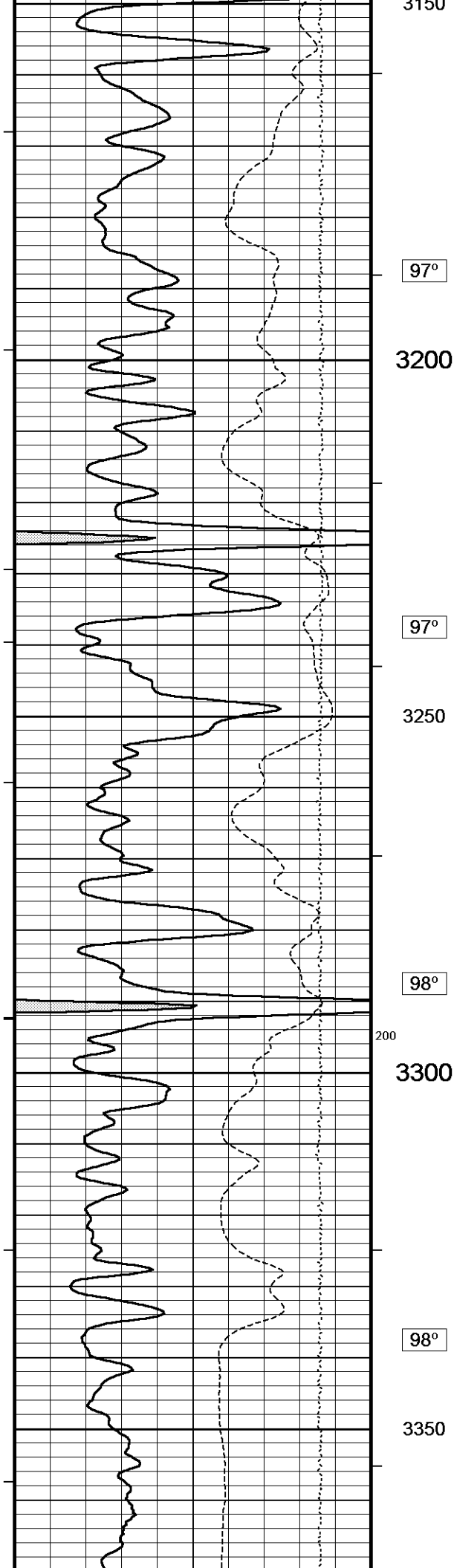




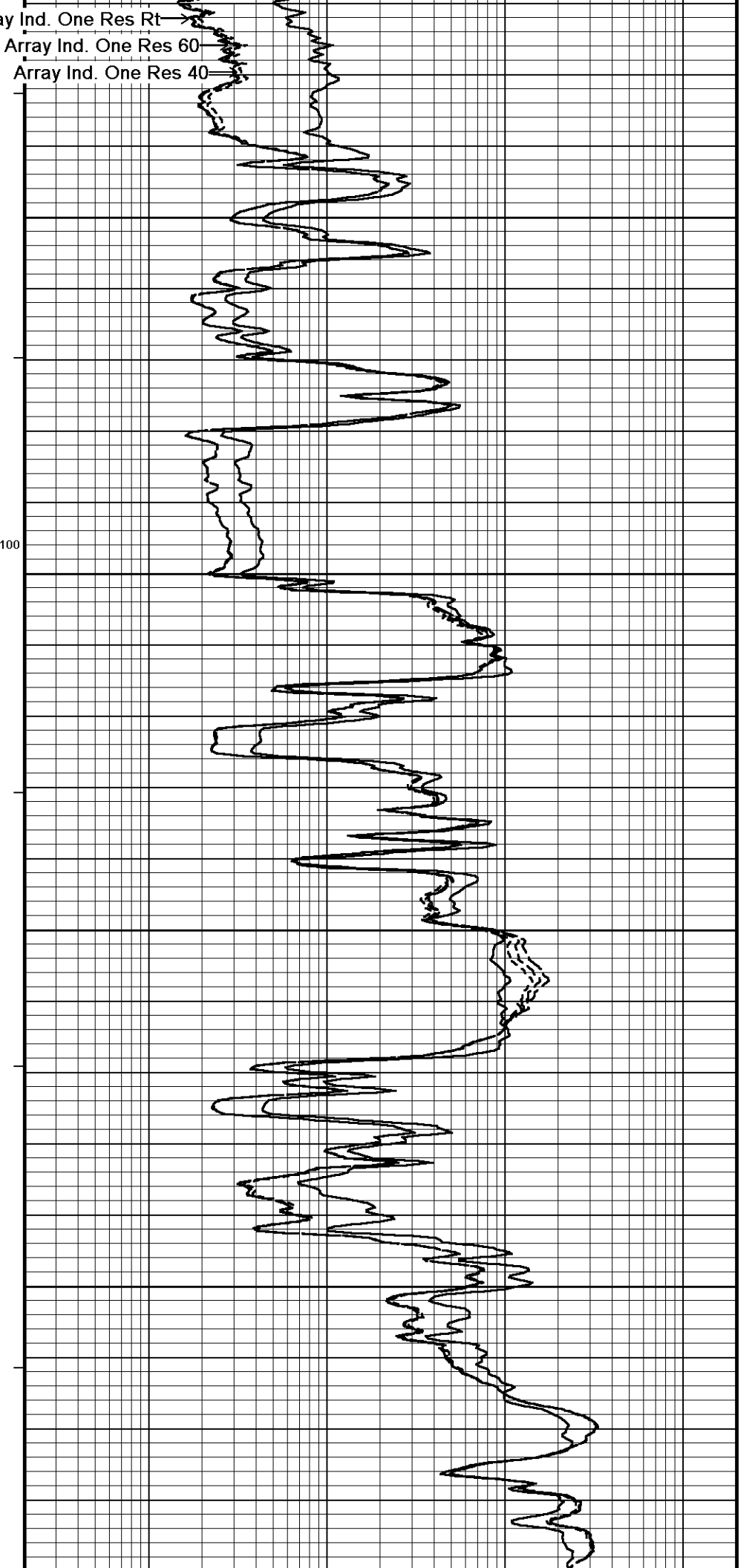
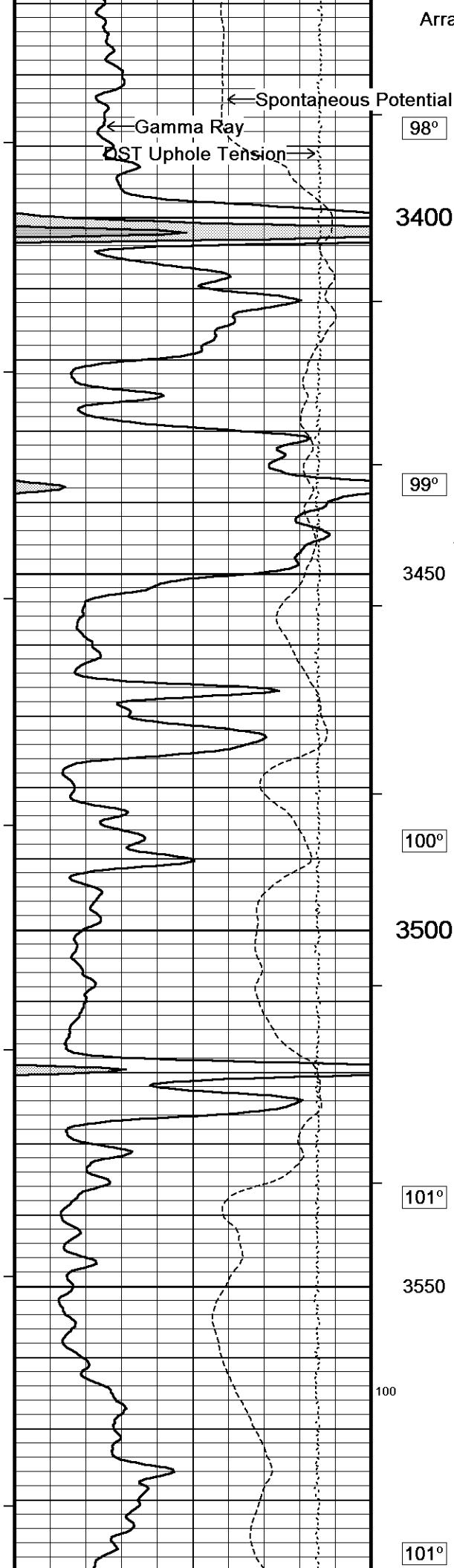


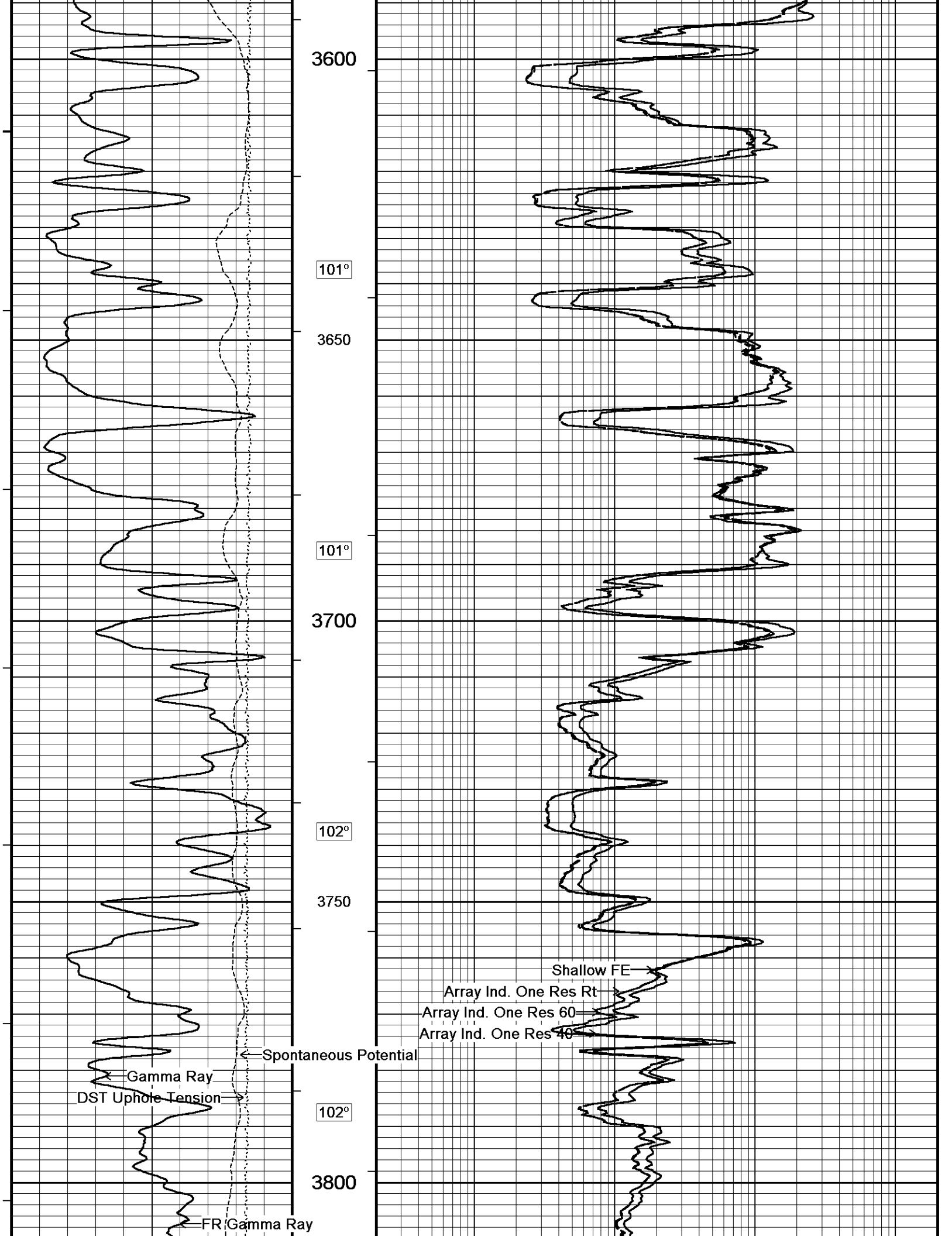


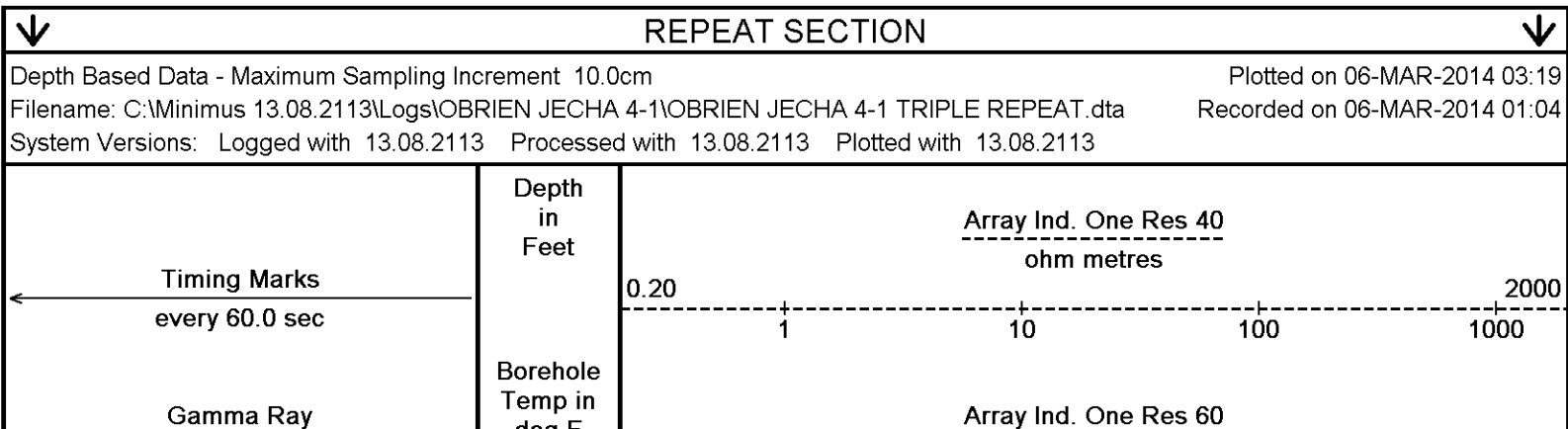
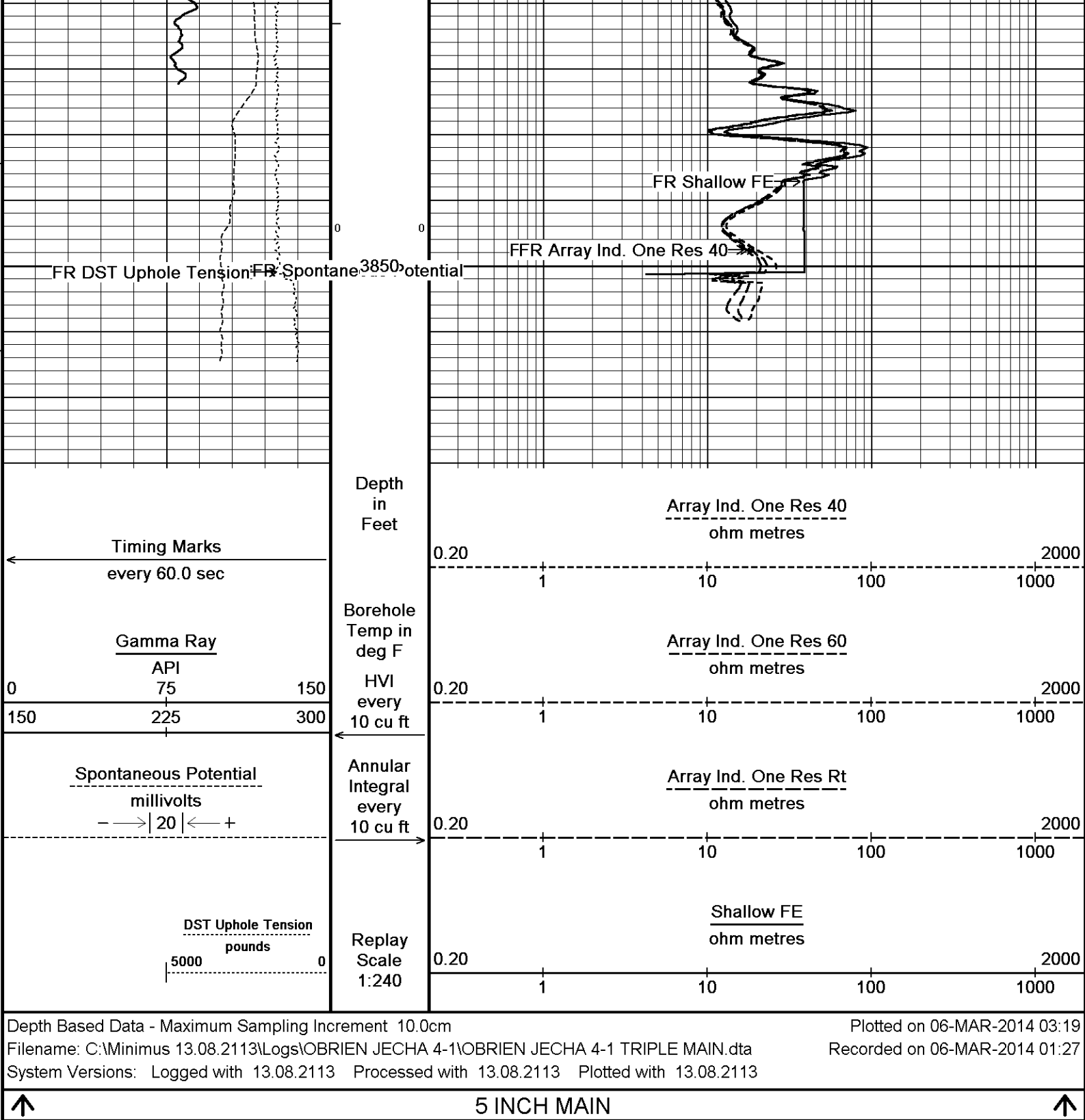


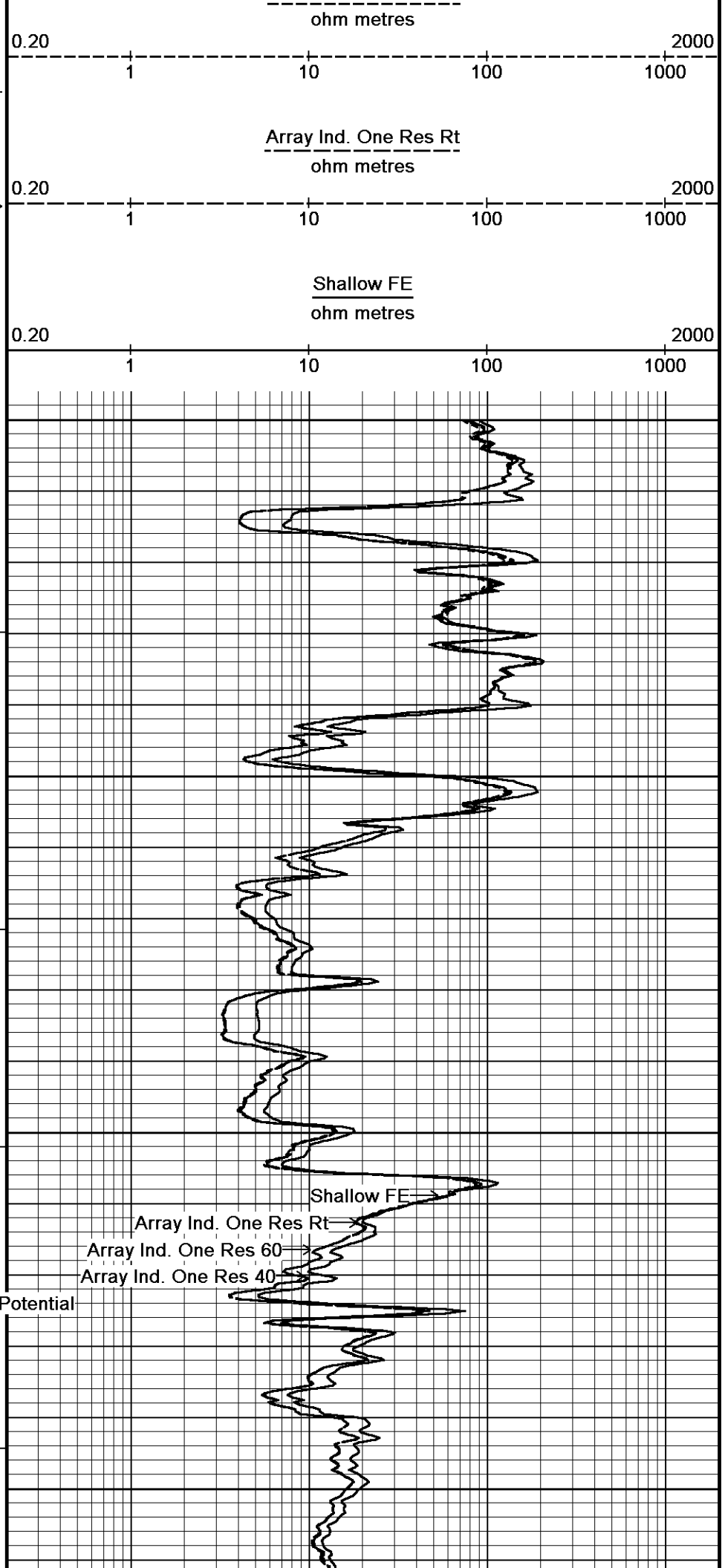
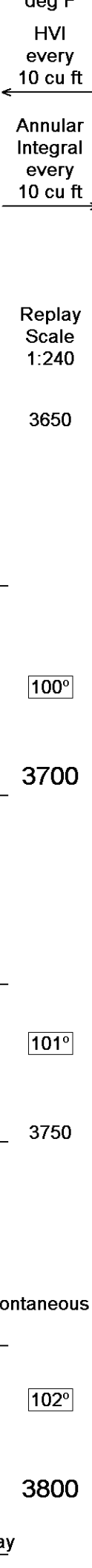
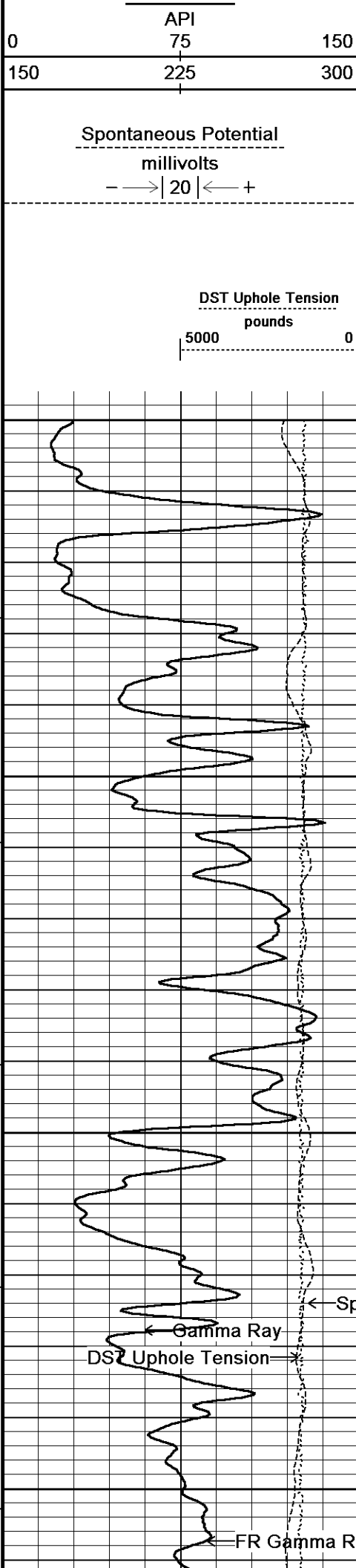


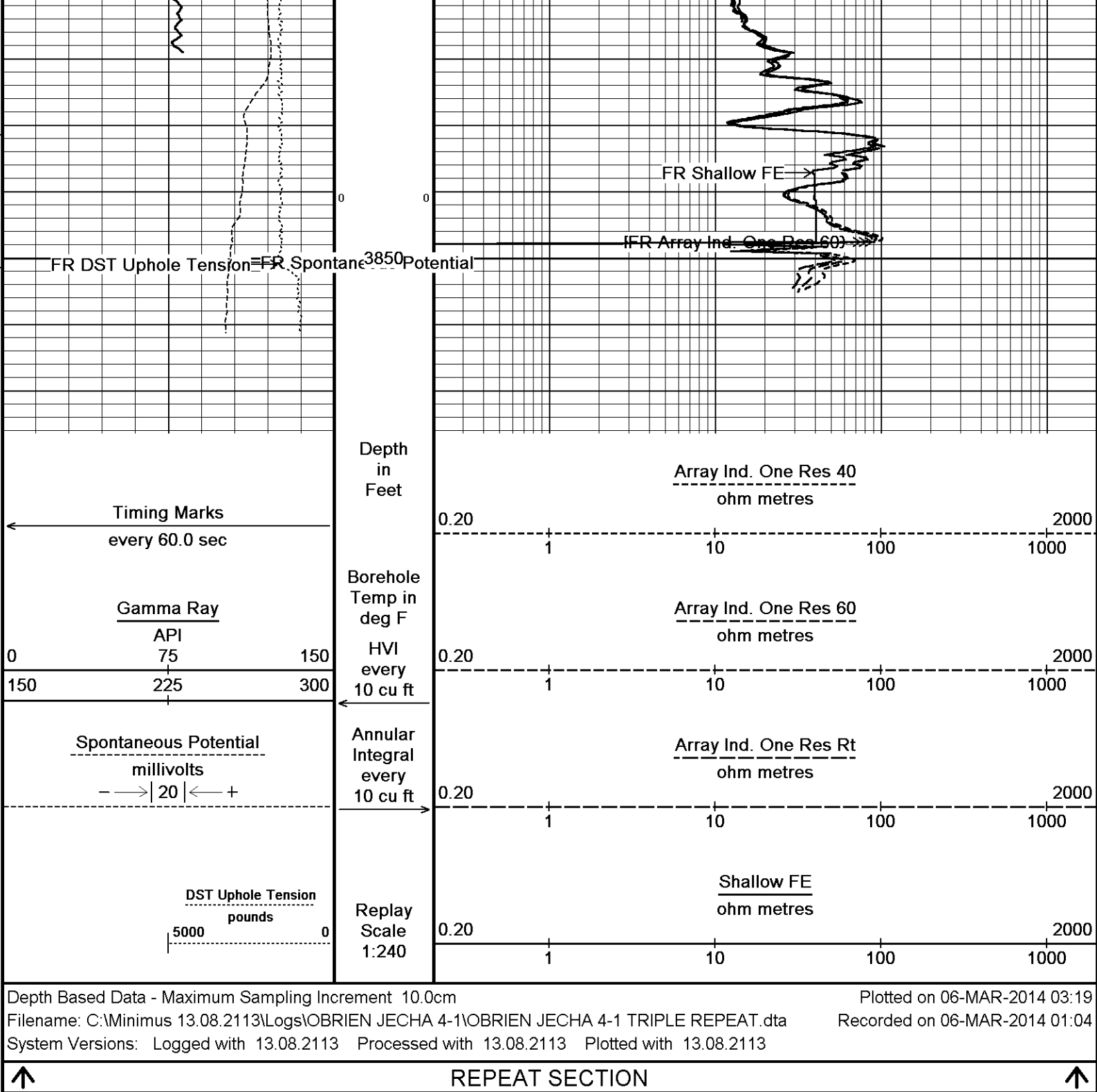
Shallow FE →











BEFORE SURVEY CALIBRATION		
C:\Minimus 13.08.2113\Logs\OBRIEN JECHA 4-1\OBRIEN JECHA 4-1 TRIPLE REPEAT.dta		
General Constants All 000		Last Edited on 06-MAR-2014,00:28
General Parameters		
Mud Resistivity	1.000	ohm-metres
Mud Resistivity Temperature	48.000	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	4.500	inches

Annular Volume Diameter	4.000	inches
Caliper for Differential Caliper		MMR Caliper
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. Four Res Rt	
RWA Constant A		0.610
RWA Constant M		2.150
SW/APOR Tool Source		0.000

Gamma Calibration	MCG-D.K 443		Field Calibration on 05-MAR-2014,20:49
	Measured	Calibrated (API)	
Background	75	48	
Calibrator (Gross)	1215	773	
Calibrator (Net)	1140	725	

Gamma Constants	MCG-D.K 443		Last Edited on 06-MAR-2014,00:28
Gamma Calibrator Number	GRC38		
Mud Density	1.12	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Centred		
Concentration of KCl		kppm	
K Mud Type	Chloride		
K Mud Concentration	0.00	%	

High Resolution Temperature Calibration	MCG-D.K 443		Field Calibration on 05-MAR-2014,20:50
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	

High Resolution Temperature Constants	MCG-D.K 443		Last Edited on 05-MAR-2014,20:50
Pre-filter Length	11		

FE Calibration	MFE-B.J 352		Base Calibration on 05-MAR-2014 09:29 Field Check on 05-MAR-2014 09:34
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	963.3	126.8	
Base Check		281.7	
Field Check		281.7	

FE Constants	MFE-B.J 352		Last Edited on 06-MAR-2014,00:29
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	Constant Value		
Temp. for Rm Corr.	N/A		
Stand-off	Centred	inches	

Induction Calibration	MAI-A.A 45		Base Calibration on 21-MAY-2013,16:47 Field Check on 04-MAR-2014 03:38
Base Calibration			
Test Loop Calibration			
Channel	Measured	Calibrated (mmho/m)	
	Low	High	Low
1	14.4	472.6	9.3
2	5.7	374.0	7.6
3	3.4	261.2	5.2
4	2.5	133.9	2.6
Array Temperature	0.0	Deg F	
Channel	Base Check (mmho/m)	Field Check (mmho/m)	
	Low	High	Low
1			18.9
2			31.9
3			33.2
4			33.2

3	28.8	3049.1
4	18.4	2079.0
Deep	16.2	1911.2
Medium	42.7	4060.0
Shallow	49.9	5481.8
Array Temperature	64.7	Deg F

Induction Constants MAI-A.A 45

Last Edited on 06-MAR-2014,00:29

Induction Model	RtAP-WBM		
Caliper for Borehole Corr.	Density Caliper		
Hole Size for Borehole Correction	N/A	inches	
Tool Centred	No		
Stand-off Type	Fin		
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 31

Base Calibration on 05-MAR-2014 10:47

Field Calibration on 06-MAR-2014,03:11

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	18528	3.99
2	26688	5.98
3	34842	7.97
4	43098	9.86
5	52480	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.94	7.71

DOWNHOLE EQUIPMENT

C:\Minimus 13.08.2113\Logs\OBRIEN JECHA 4-1\OBRIEN JECHA 4-1 TRIPLE REPEAT.dta

MCB-A 11B Tension Cablehead
MCB-A 170 LG: 2.18 ft WT: 19.8 lb OD: 2.240 in



Compact Comms Gamma
MCG-D.K 443 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-A 11 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

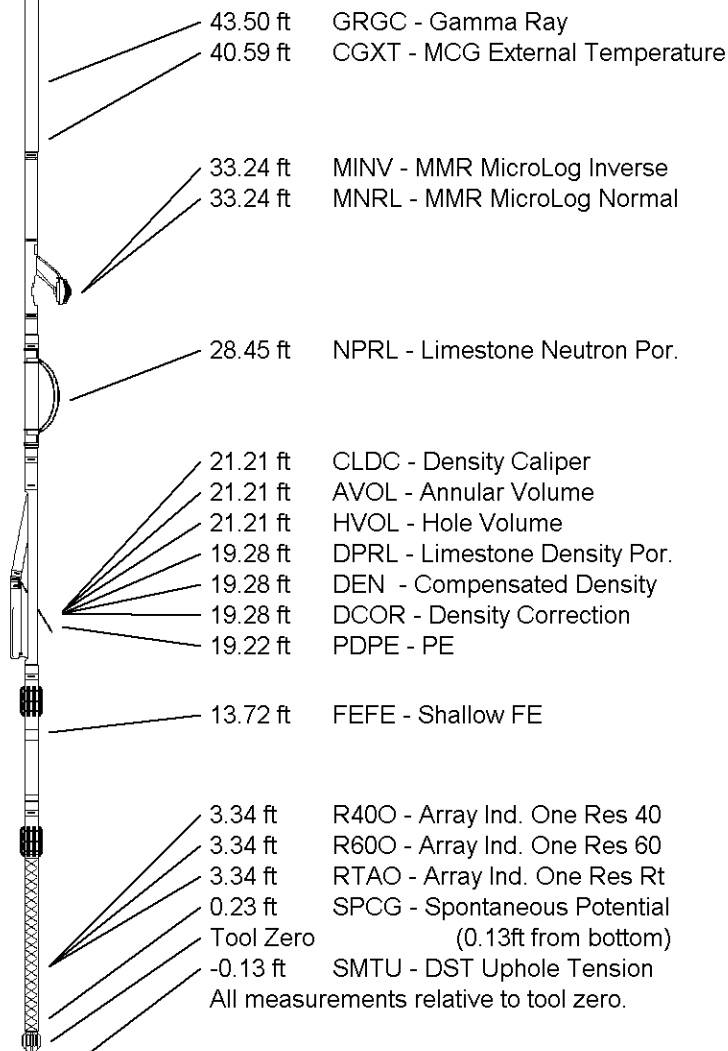
Compact Neutron
MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focused Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Induction
MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 50.96 ft Weight: 403.4 lb



COMPANY O'BRIEN RESOURCES, LLC
WELL JECHA 4-1
FIELD WILDCAT
PROVINCE/COUNTY RUSH
COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	2058.00	feet	First Reading	3848.00	feet
Elevation Drill Floor	2056.00	feet	Depth Driller	3851.00	feet
Elevation Ground Level	2053.00	feet	Depth Logger	3851.00	feet



ARRAY INDUCTION
SHALLOW FOCUSED

Weatherford®

Weatherford		ARRAY SHALLOW
COMPANY	O'BRIEN RESOURCES, LLC	
WELL	JECHA 4-1	
FIELD	WILDCAT	
PROVINCE/COUNTY	RUSH	
COUNTRY/STATE	U.S.A. / KANSAS	
LOCATION	2400' FWL & 1850' FWL OF	
SEC. 4	TYP. 135' REC. 170'	
DATE	15-105-2203	
LOG NUMBER	15-105-2203	
LOG DESCRIPTION	15-105-2203	
LOG MEASURED FROM	LOG @ 5 FEET	
LOG MEASURED FROM	LOG @ 5 FEET	
DATE	05-MAR-2014	
SERVICE ORDER	587281241285	
DEPTH DRILLER	3851.00	feet
DEPTH LOGGER	3851.00	feet
FIRST READING	3848.00	feet
LAST READING	293.00	feet
CASING DRILLER	293.00	feet
CASING LOGGER	293.00	feet
BIT SIZE	7.875	inches
HOLE FLUID TYPE	CHEM	
DENSITY/VISCOSITY	9.40 lb/lb	50.00 CP
PH/FUNCTION LOSS	9.50	6.80 m/30min
SAMPLE SOURCE	PIT	
RTM @ MEASURED TEMP	1.0 @ 48.0	ohm-m
RTM @ MEASURED TEMP	0.80 @ 48.0	ohm-m
RTM @ MEASURED TEMP	1.20 @ 48.0	ohm-m
SOURCE RTM / FMC	CALC	CALC
RTM @ BHT	0.48 @ 99.0	ohm-m
TIME SINCE CIRCULATION	4 HRS	
MAX RECORDED TEMP	99.00	deg F
EQUIPMENT / BASE	13057	LIB
RECORDED BY	D. COLE	
INDEXED BY	K. TALBOT	
LOG #	14-064	

Y INDUCTION
OW FOCUSED

THE SE SW SE NW

MML

Standard:
HGB 2059.00
CP 2059.00
CL 2059.00

A. BRITAIN

1 INCH MAIN

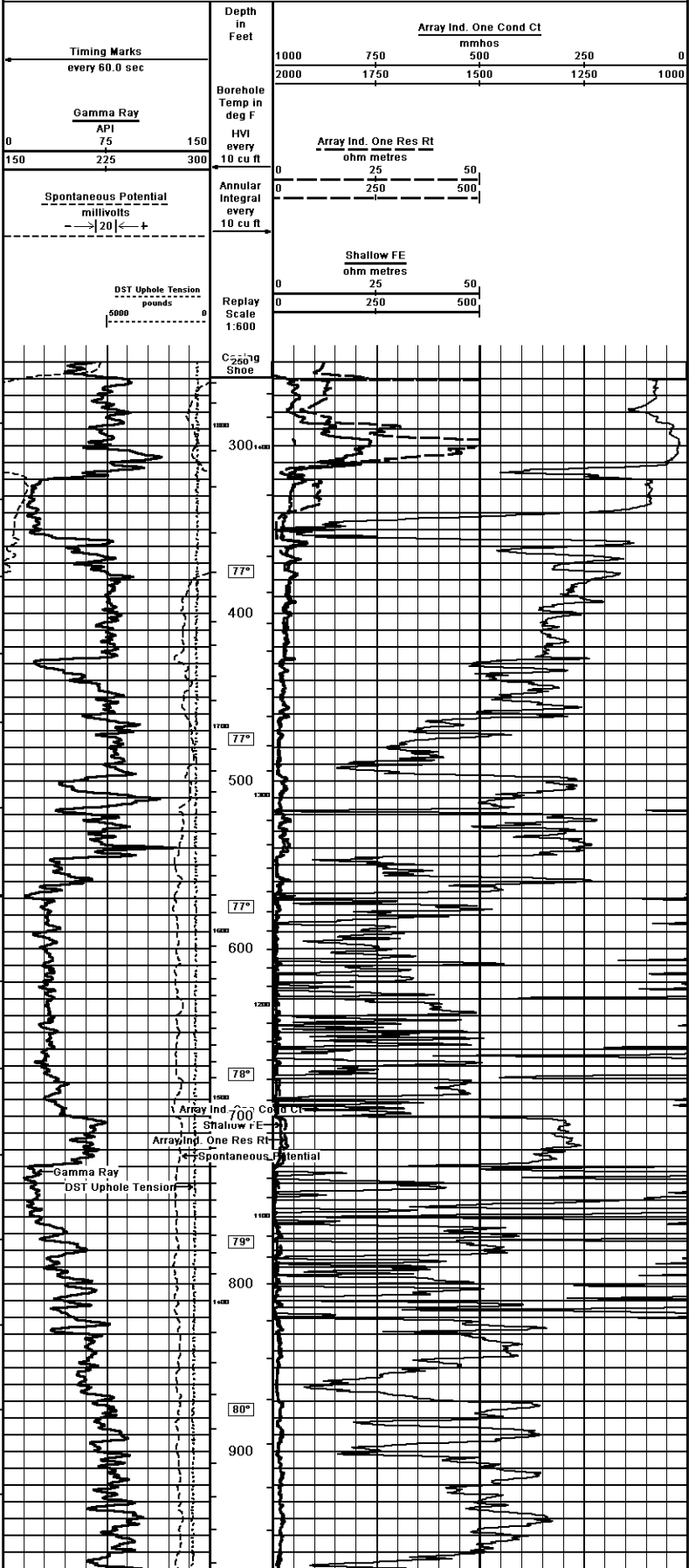
Depth Based Data - Maximum Sampling Increment 10.0cm

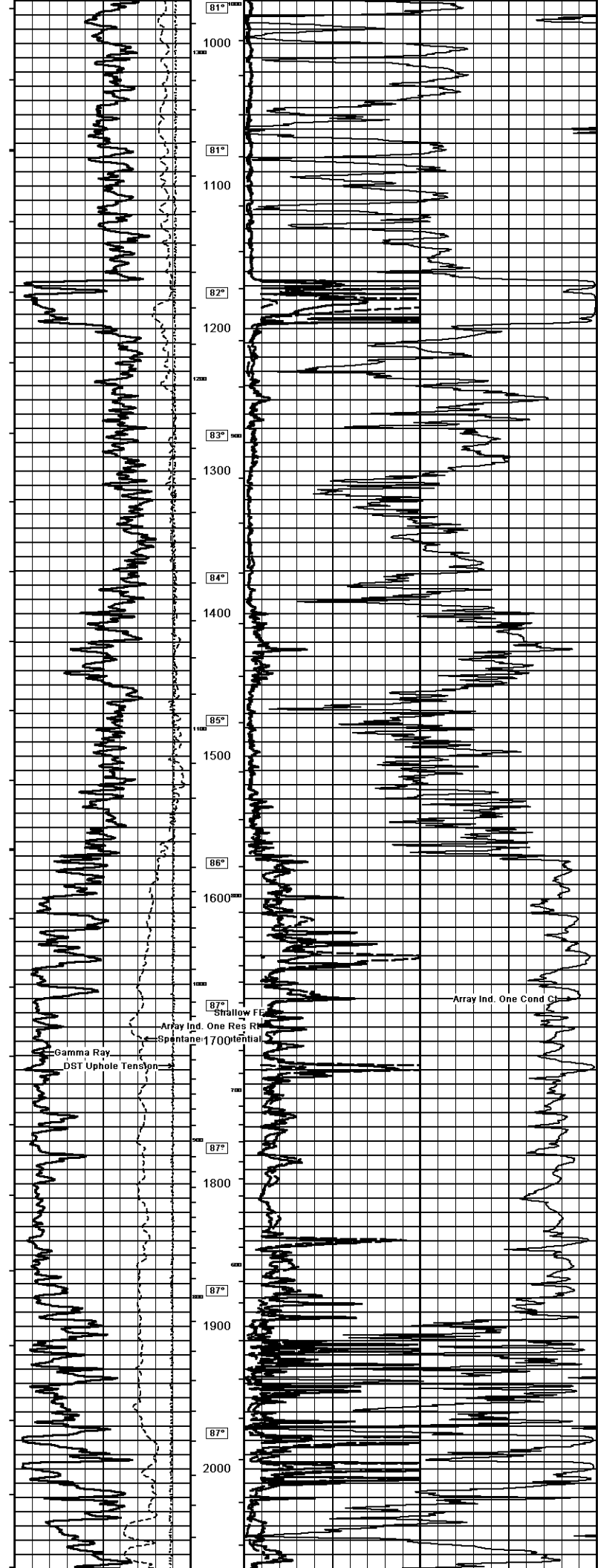
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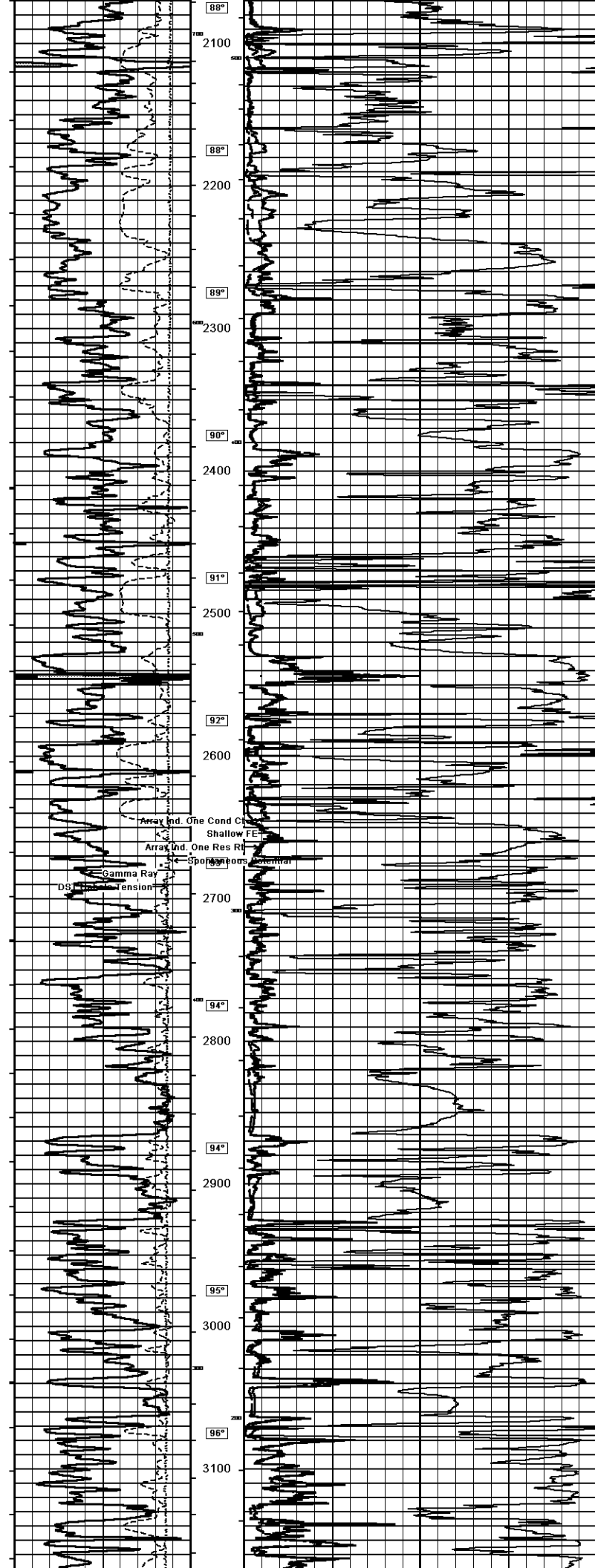
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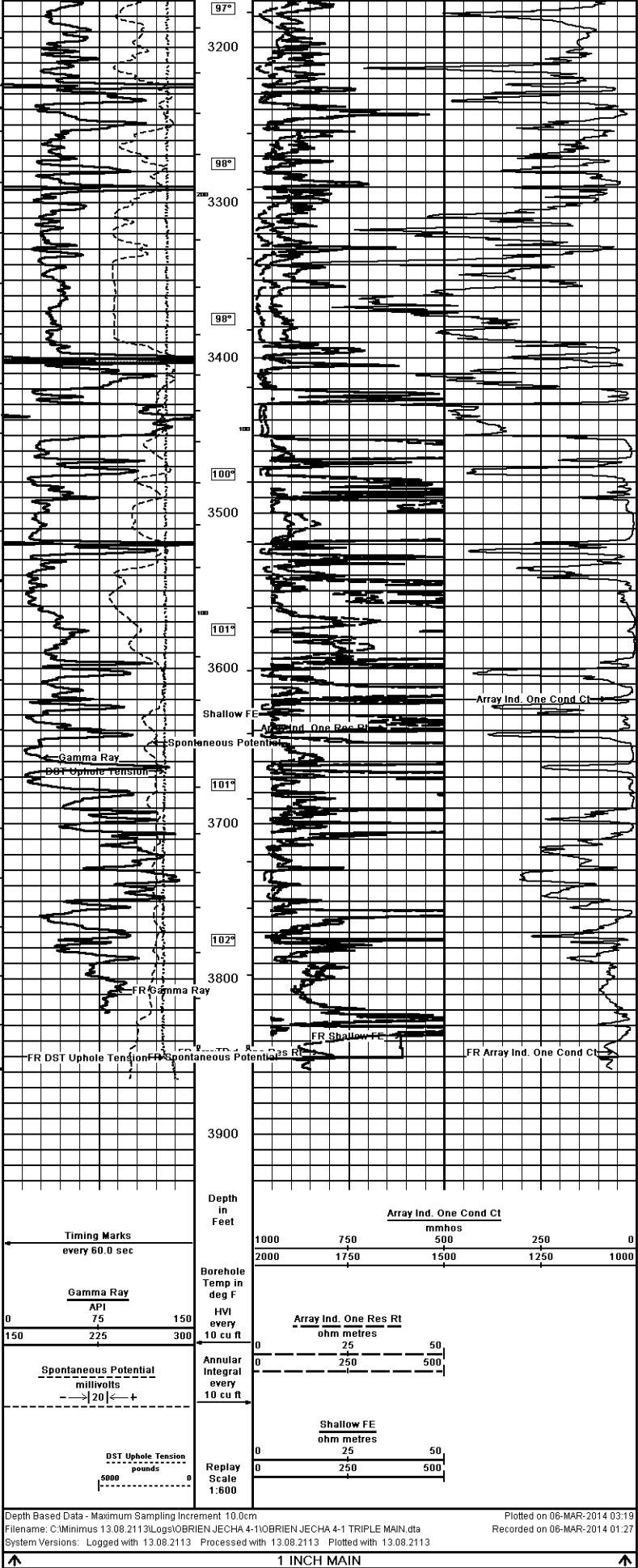
Recorded on 06-MAR-2014 01:27

System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113









COMPANY	O'BRIEN RESOURCES, LLC
WELL	JECHA 4-1
FIELD	WILDCAT
PROVINCE/COUNTY	RUSH
COUNTRY/STATE	U.S.A. / KANSAS
Elevation Kelly Bushing	2058.00 feet
Elevation Casing	2052.00 feet
First Reading	3848.00 feet
Second Reading	3844.00 feet

Elevation Off Flood	2056.00	feet	Depth Dimer	3851.00	feet
Elevation Ground Level	2053.00	feet	Depth Logger	3851.00	feet



ARRAY INDUCTION
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