Weatherford®

ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

COMPANY	RED OAK ENERGY, INC.
WELL	ST-SI UNIT #1-30
FIELD	WILDCAT
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	199' FNL & 2284' FWL

SEC 30	TWP 17S	RGE 33W	Other Services
Latitude			MDN/MPD MML
Longitude			MSS
API Number	15-171-21168		

Permanent Datum GL, Elevation 3083 feet	Elevations:	feet
Log Measured From KB	KB	3088.00
Drilling Measured From KB @ 5 feet	DF	3087.00
	GL	3083.00

Date	07-JUL-2016			
Run Number	ONE			
Service Order	7577-155028408			
Depth Driller	4929.00	feet		
Depth Logger	4928.00	feet		
First Reading	4925.00	feet		
Last Reading	260.00	feet		
Casing Driller	261.00	feet		
Casing Logger	260.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	9.20 lb/USg	53.00 CP		
PH / Fluid Loss	10.00	8.00 ml/30Min		
Sample Source	FLOW LINE			
Rm @ Measured Temp	0.54 @ 75.0	ohm-m		
Rmf @ Measured Temp	0.43 @ 75.0	ohm-m		
Rmc @ Measured Temp	0.64 @ 75.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.34 @123.0	ohm-m		
Time Since Circulation	3 HOURS			
Max Recorded Temp	123.00	deg F		
Equipment / Base	13096	OKC		
Recorded By	JEFFREY RANDLE			
Witnessed By	SEAN DEENIHAN			

BOREHOLE RECORD

Last Edited: 07-JUL-2016 18:30

Bit Size inches	Depth From feet	Depth To feet
12.250	0.00	270.00
7.875	270.00	4929.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	261.00	24.00

REMARKS

- SOFTWARE ISSUE: WLS 15.03.5939.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION.
  - HARDWARE: DUAL BOWSPRING USED ON MDN.
  0.5 INCH STANDOFF USED ON MFE.
  TWO 0.5 INCH STANDOFFS USED ON MSS.
  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 SURFACE CASING: 2447 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING: 1689 CU.FT.

- ANNULAR HOLE VOLUME WITH 9.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING: 1089 CU.FT.

- MUD PROPERTIES: LCM: 2#
  Cl-: 6200 PPM

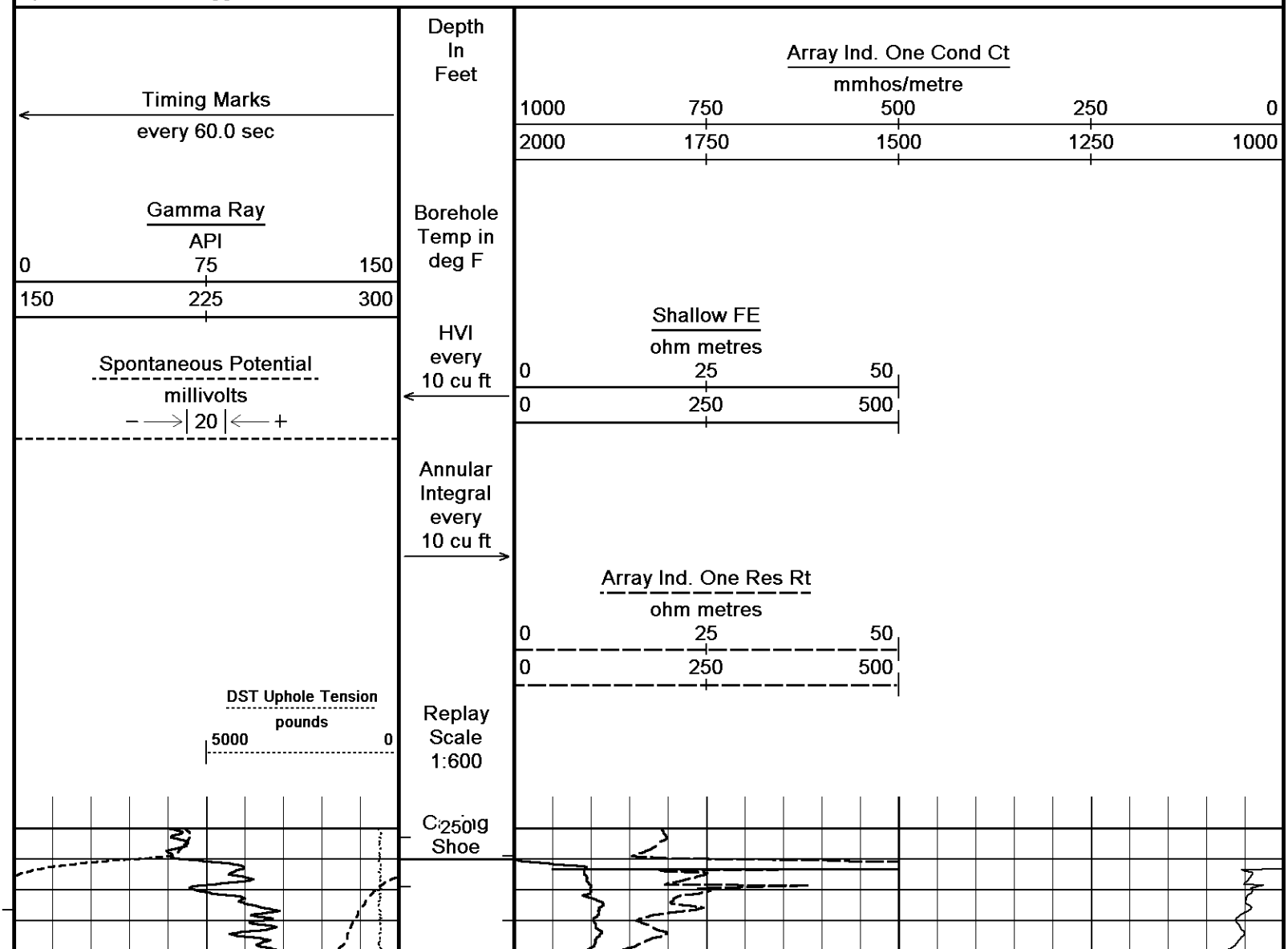
- RIG: WW DRILLING RIG #2.

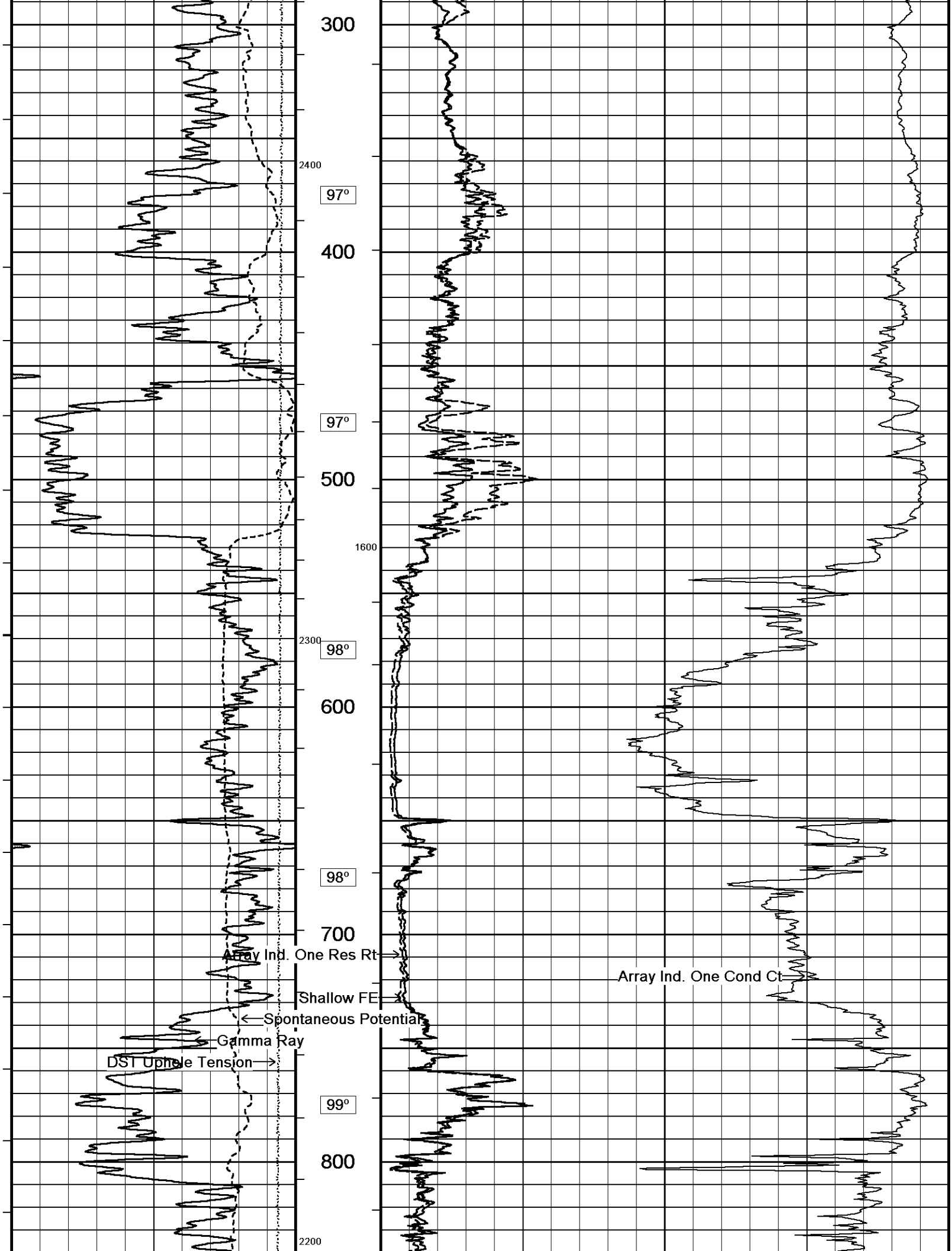
- ENGINEER: J. RANDLE.

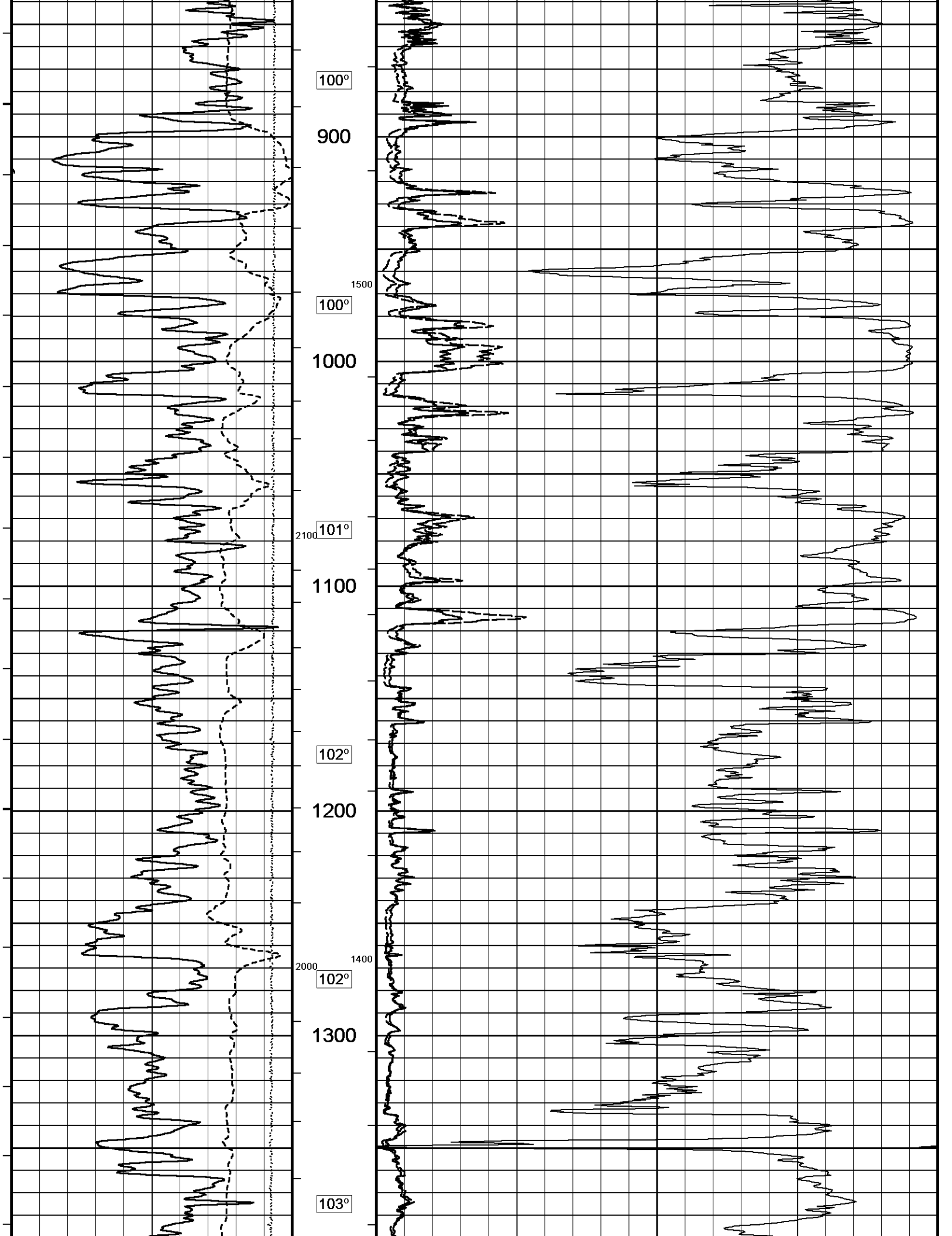
- OPERATOR: J. LaPOINT.

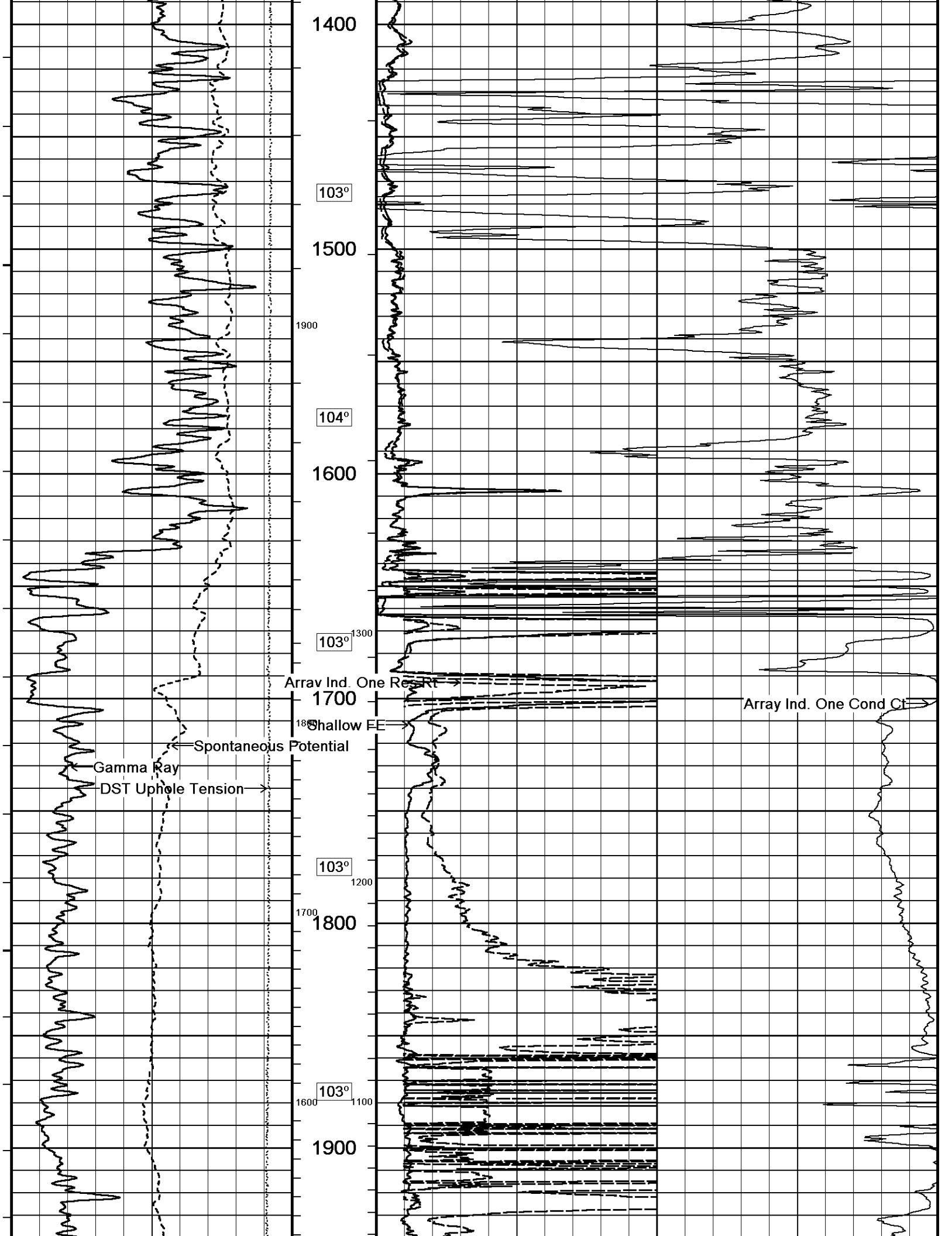
2 INCH MAIN

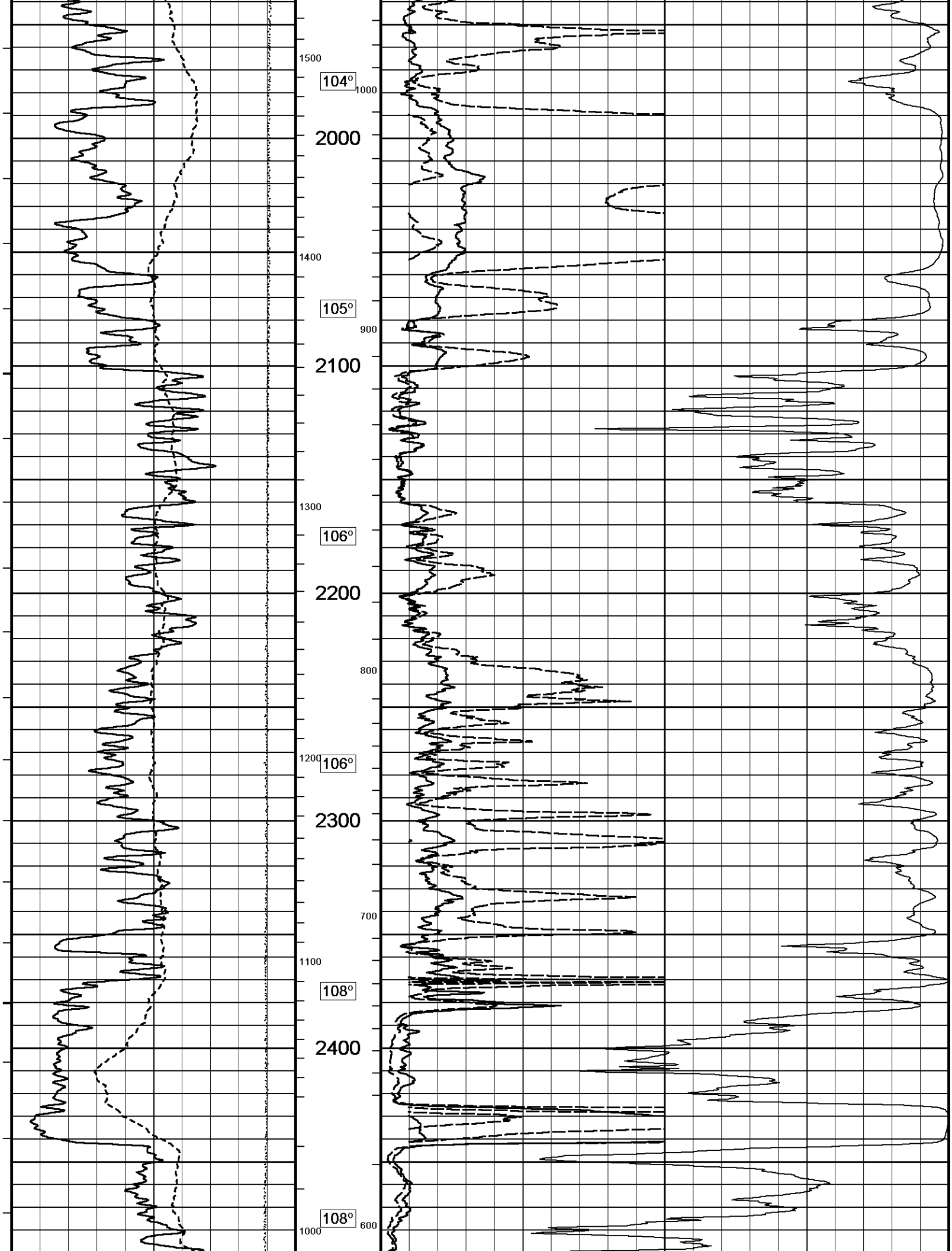
Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 07-JUL-2016 23:14
Filename: C:\Minimus 15.03.5939\Logs\Red Oak ST-SI Unit #1-30\Red Oak ST-SI Unit #1-30 Main.dta — Recorded on 07-JUL-2016 19:32
System Versions: Logged with 15.03.5939 Plotted with 15.03.5939

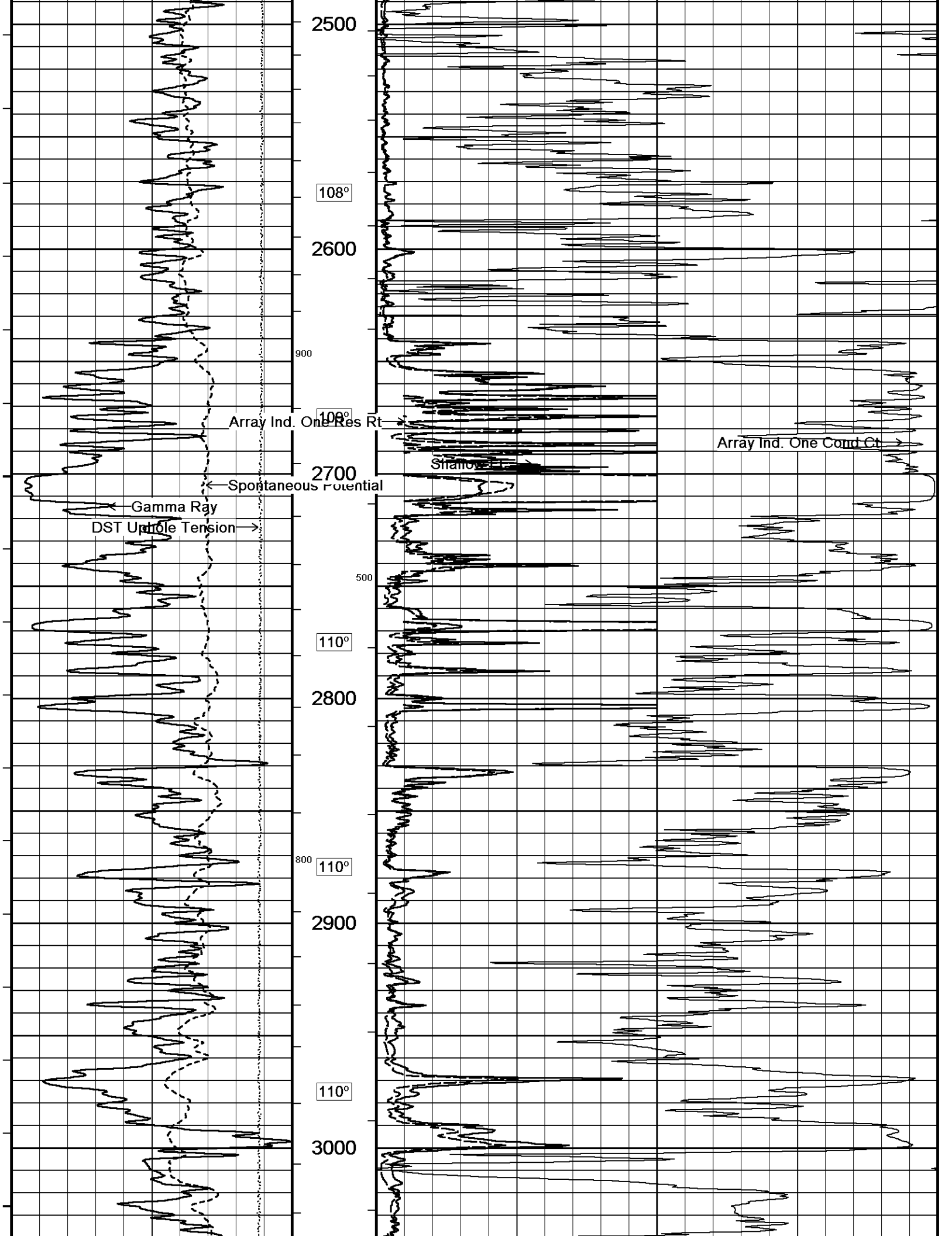


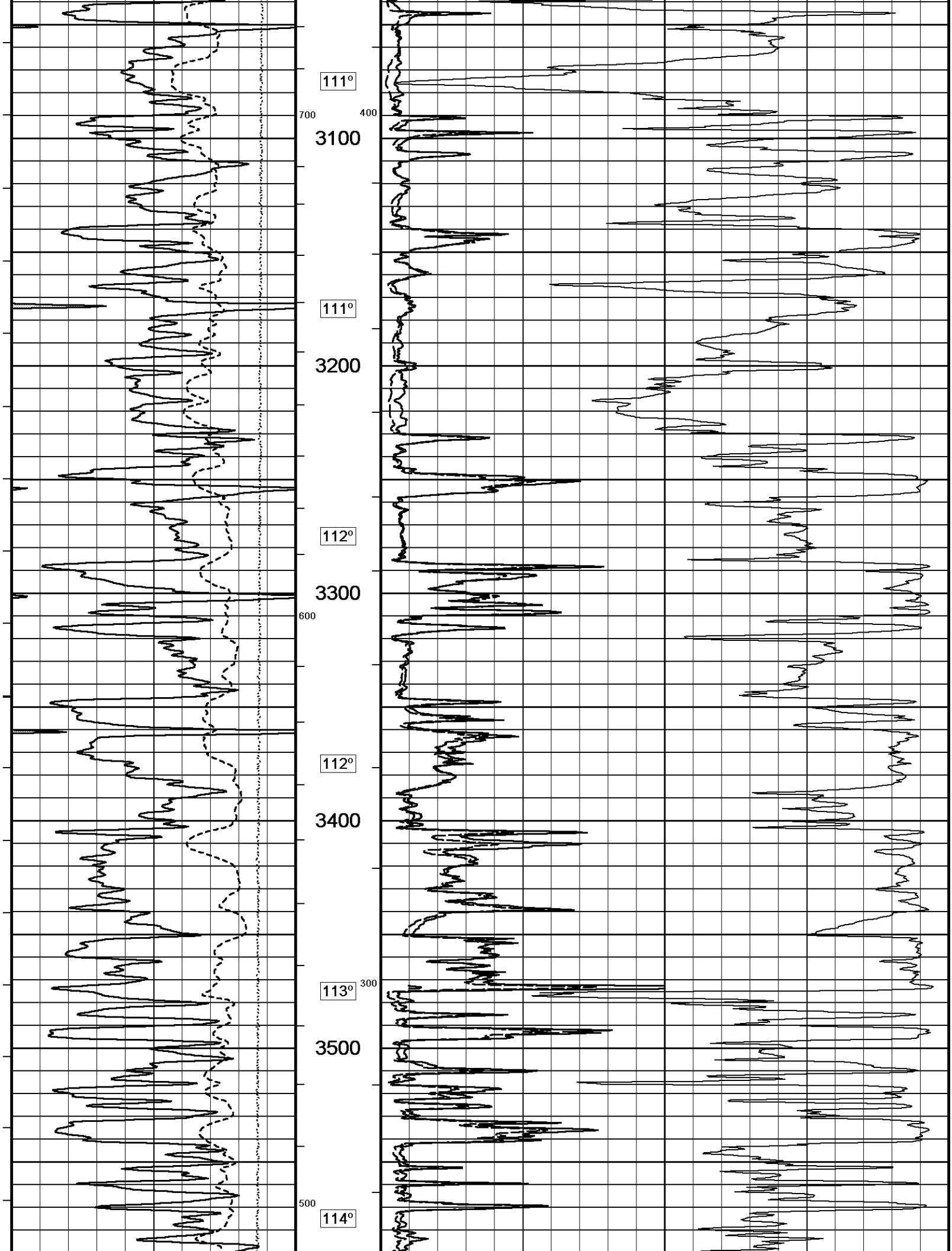

300
2400
97°
400
97°
500
1600
2300
98°
600
98°
700
Array Ind. One Res Rt
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
99°
800
2200
Array Ind. One Cond Ct

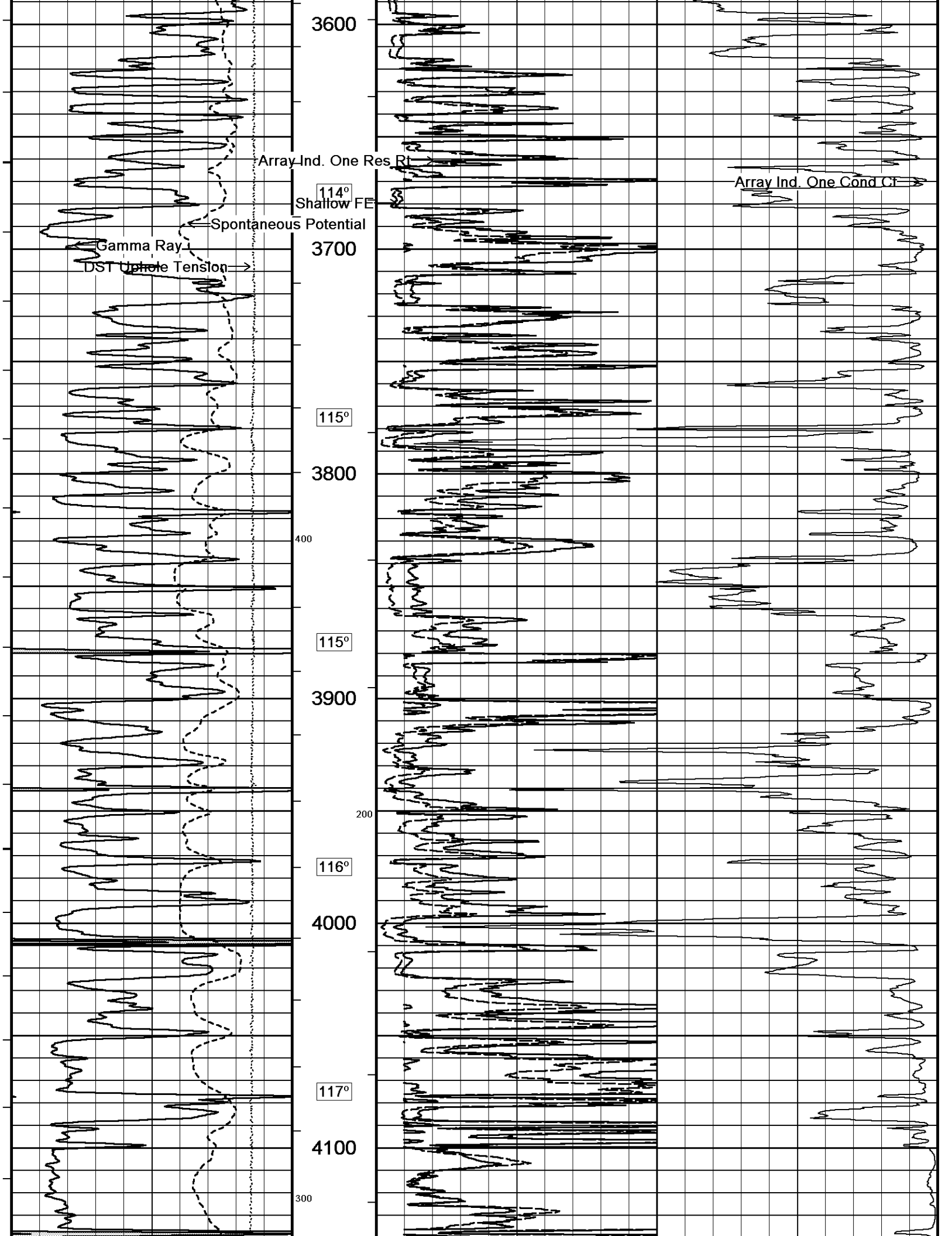

100°
900
1500
100°
1000
2100
101°
1100
102°
1200
2000
1400
102°
1300
103°

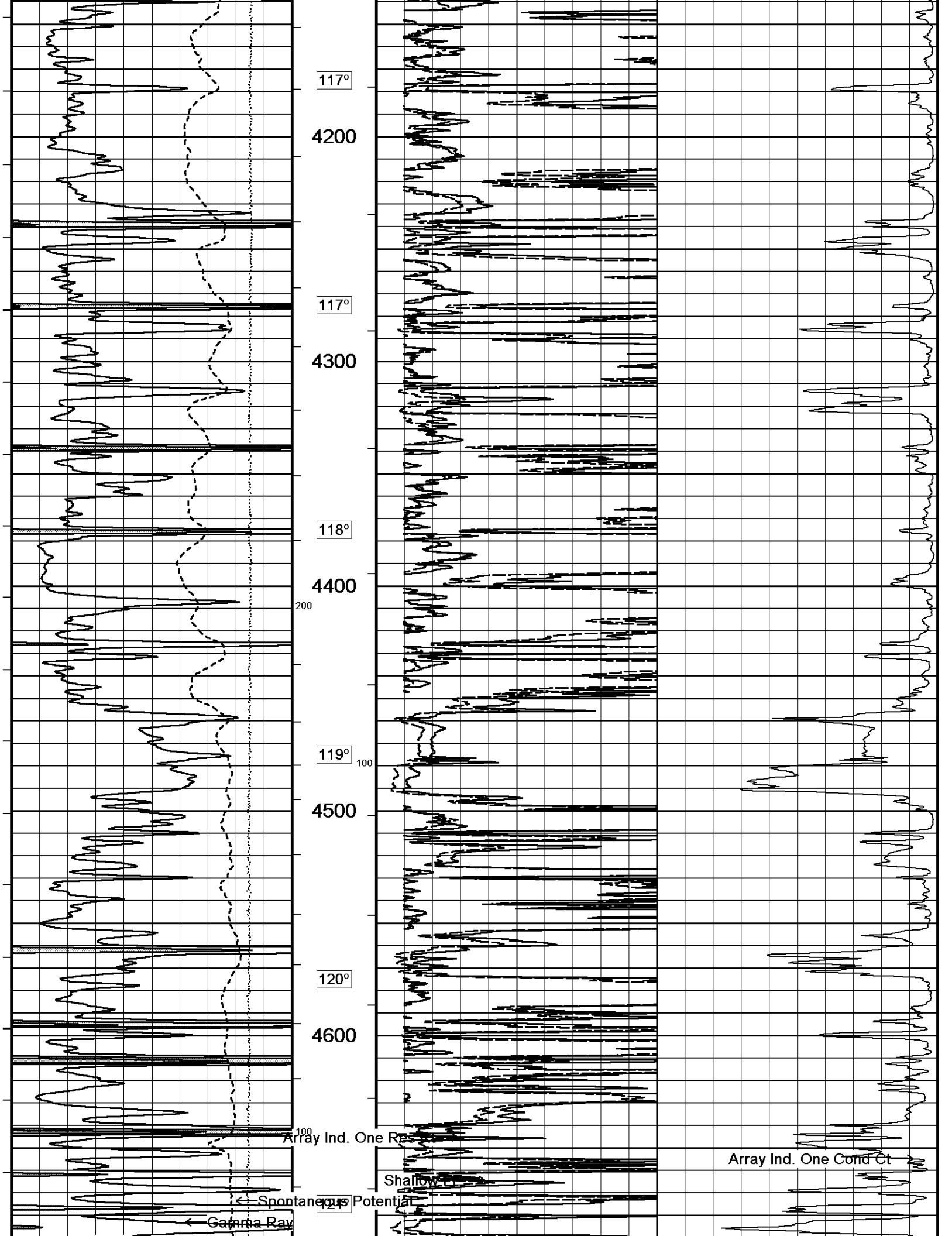

1400
103°
1500
1900
104°
1600
103°
1300
Array Ind. One Res Rt
1700
Array Ind. One Cond Ct
1800
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
103°
1200
1700
1800
103°
1600
1100
1900

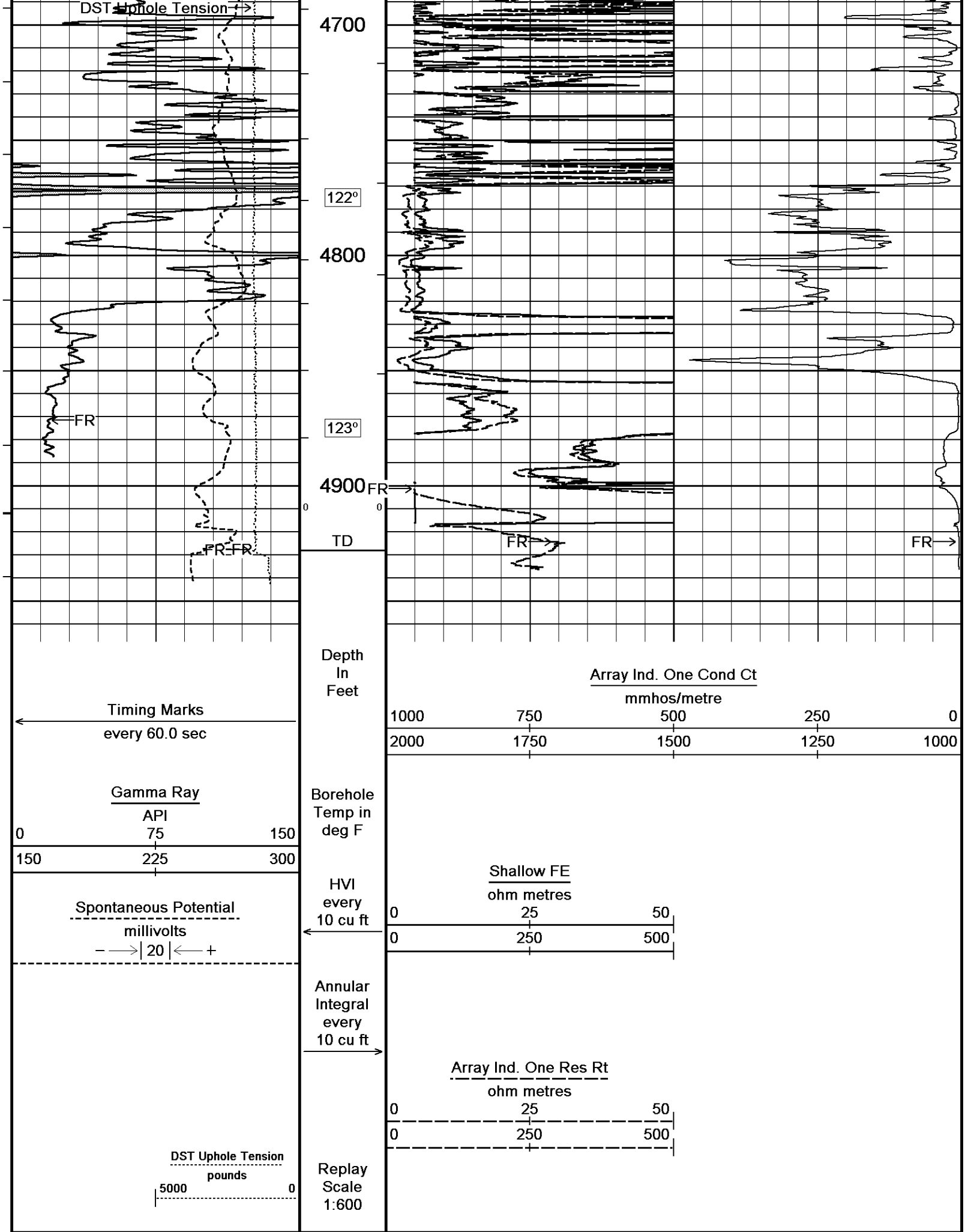

1500
104°
1000
2000
1400
105°
900
2100
1300
106°
2200
800
1200
106°
2300
700
1100
108°
2400
1000
108°
600


2500
108°
2600
900
108°
Array Ind. One Res Rt
Array Ind. One Cond Ct
2700
Spontaneous Potential
Gamma Ray
DST Uphole Tension
500
110°
2800
800
110°
2900
110°
3000


111°
700
400
3100
111°
3200
112°
3300
600
112°
3400
113°
300
3500
500
114°


3600
Array Ind. One Res Rt
114°
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
3700
115°
3800
400
115°
3900
200
116°
4000
117°
4100
300
Array Ind. One Cond Cf


117°
4200
117°
4300
118°
4400
200
119°
100
4500
120°
4600
100
Array Ind. One Res Ct
Array Ind. One Cond Ct
Shallow Ct
Spontaneous Potential
Gamma Ray



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 07-JUL-2016 23:14

Filename: C:\Minimus 15.03.5939\Logs\Red Oak ST-SL Unit #1-30\Red Oak ST-SL Unit #1-30 Main.dta

Recorded on 07-JUL-2016 19:32

System Versions: Logged with 15.03.5939 Plotted with 15.03.5939

2 INCH MAIN

5 INCH MAIN - ANHYDRITE

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 07-JUL-2016 23:14

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System Versions: Logged with 15.03.5939 Plotted with 15.03.5939

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
− → | 20 | ← +

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

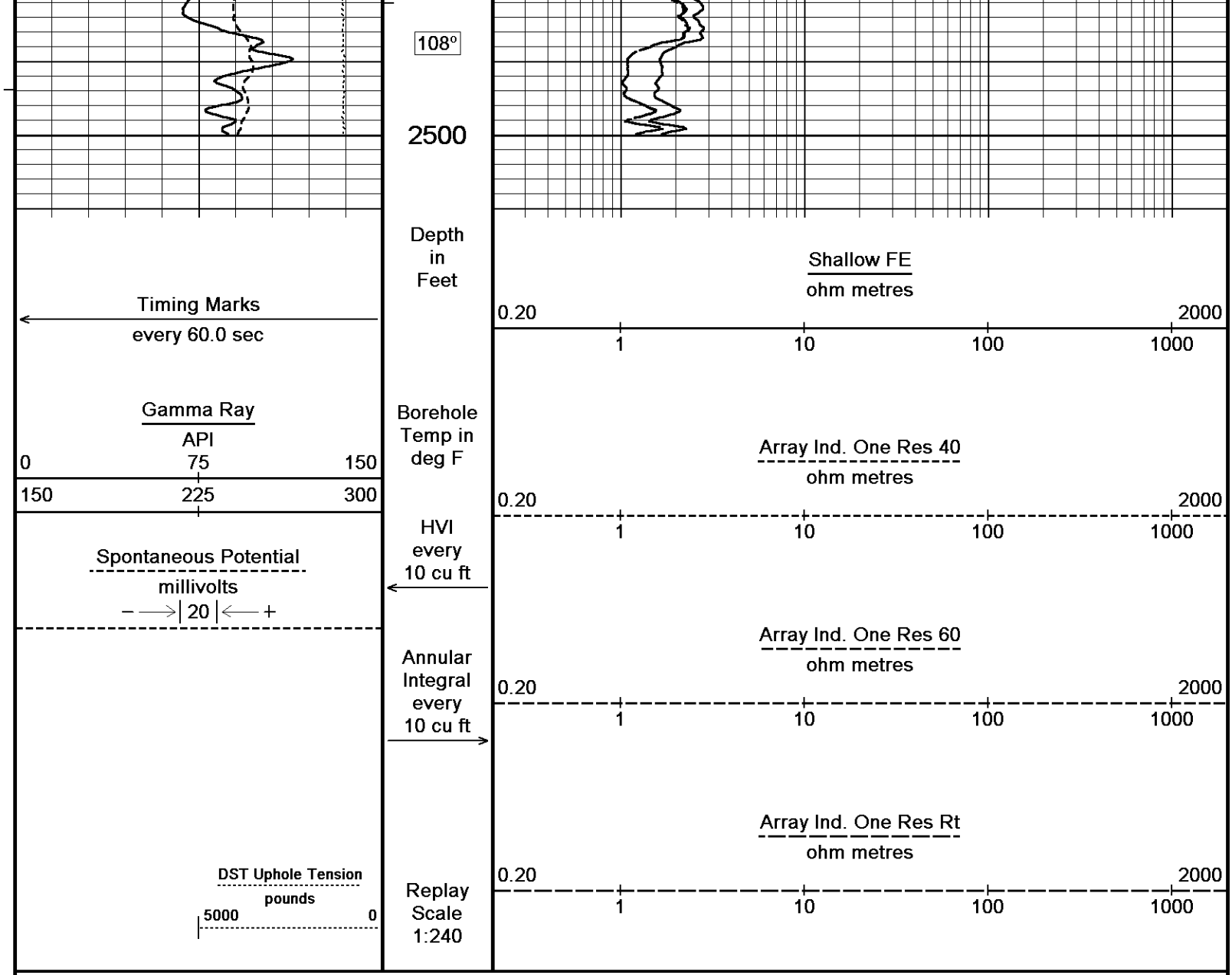
Array Ind. One Res Rt
ohm metres
0.20 2000
1 10 100 1000

2400

108°

2450

Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 07-JUL-2016 23:14
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5 INCH MAIN - ANHYDRITE

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 07-JUL-2016 23:14
Filename: C:\Minimus 15.03.5939\Logs\Red Oak ST-SI Unit #1-30\Red Oak ST-SI Unit #1-30 Main.dta — Recorded on 07-JUL-2016 19:32
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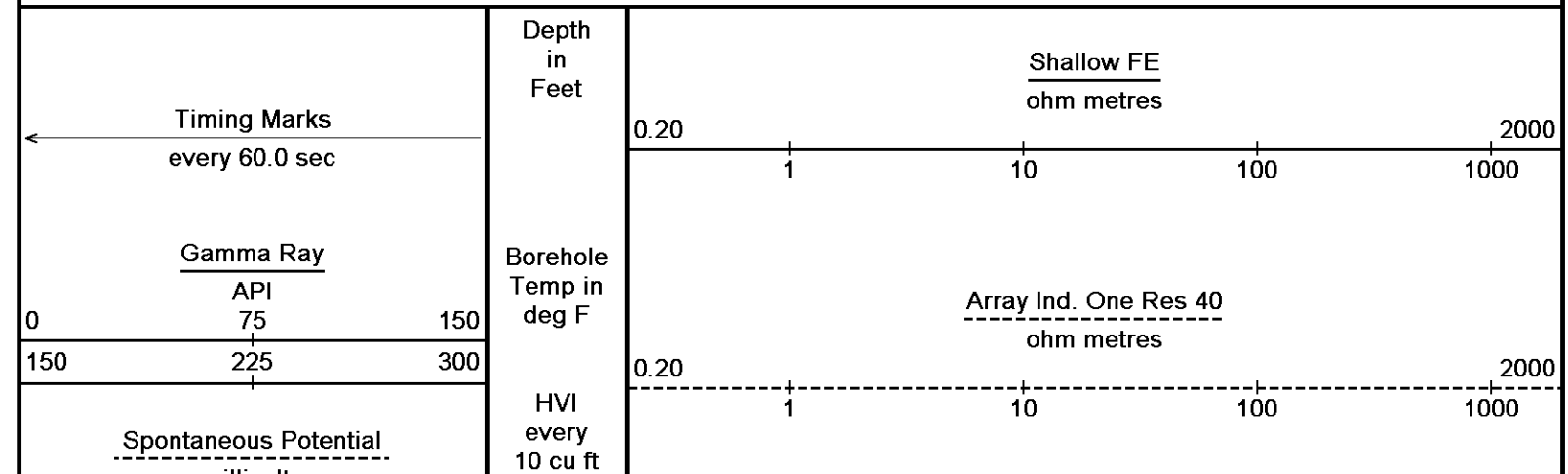
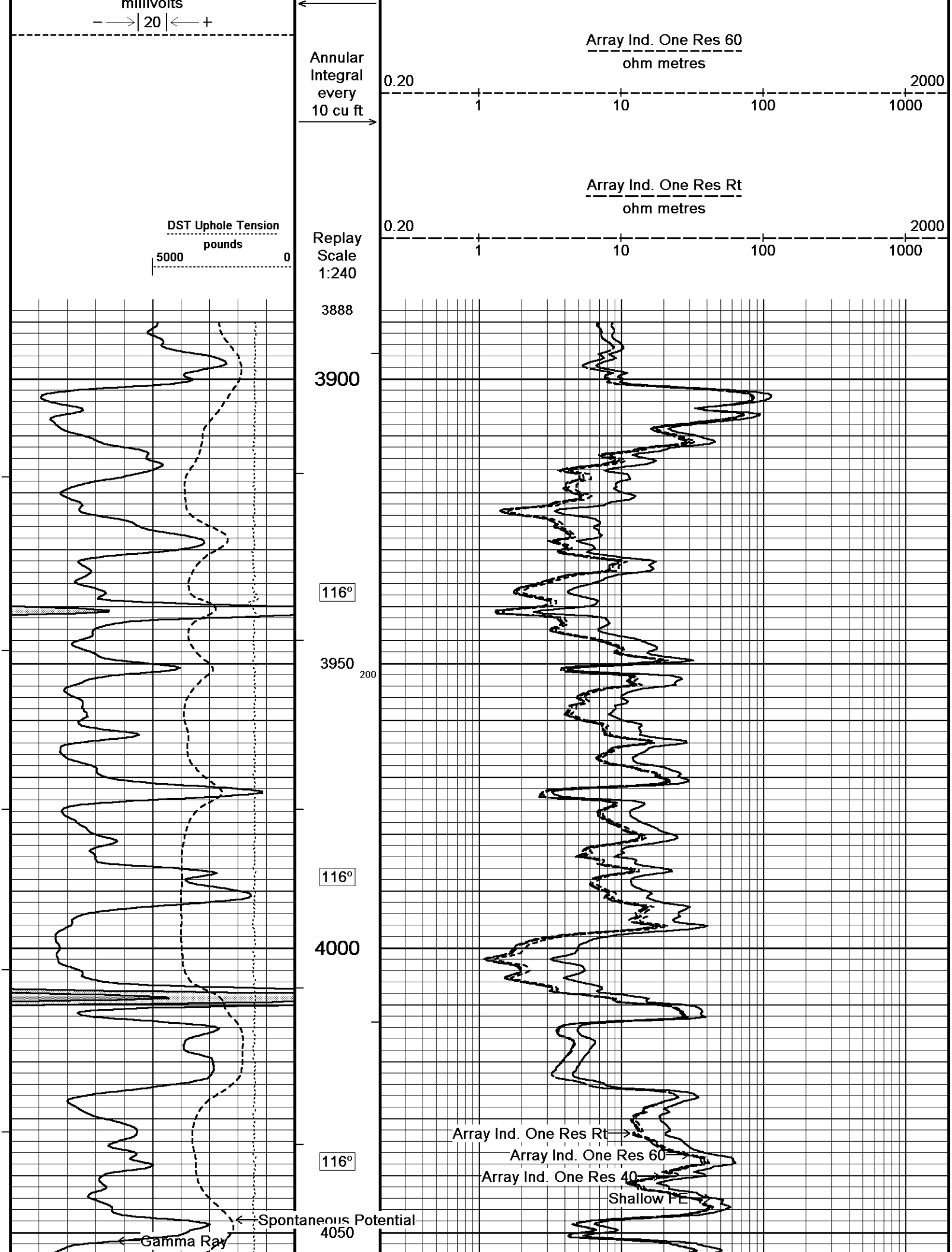
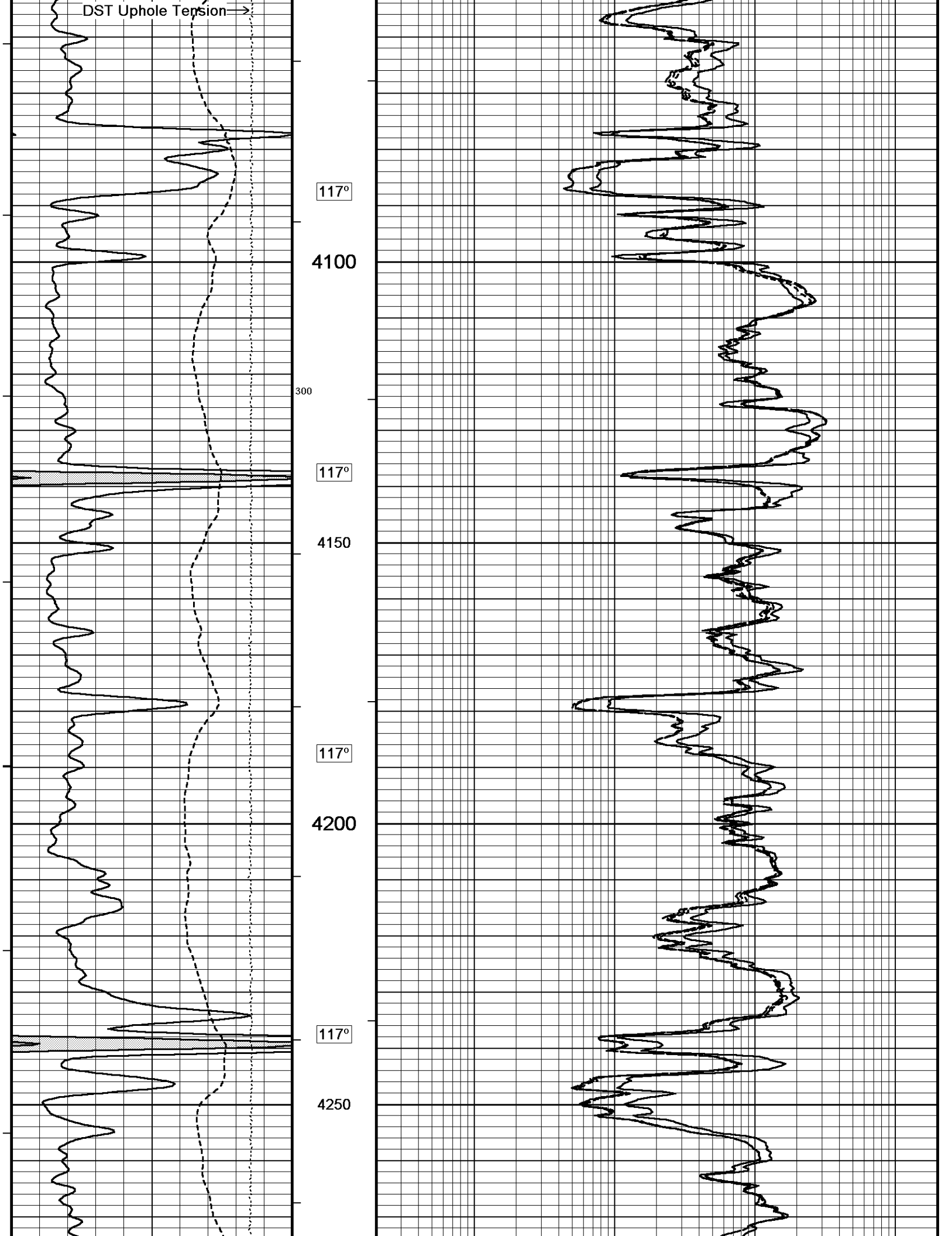
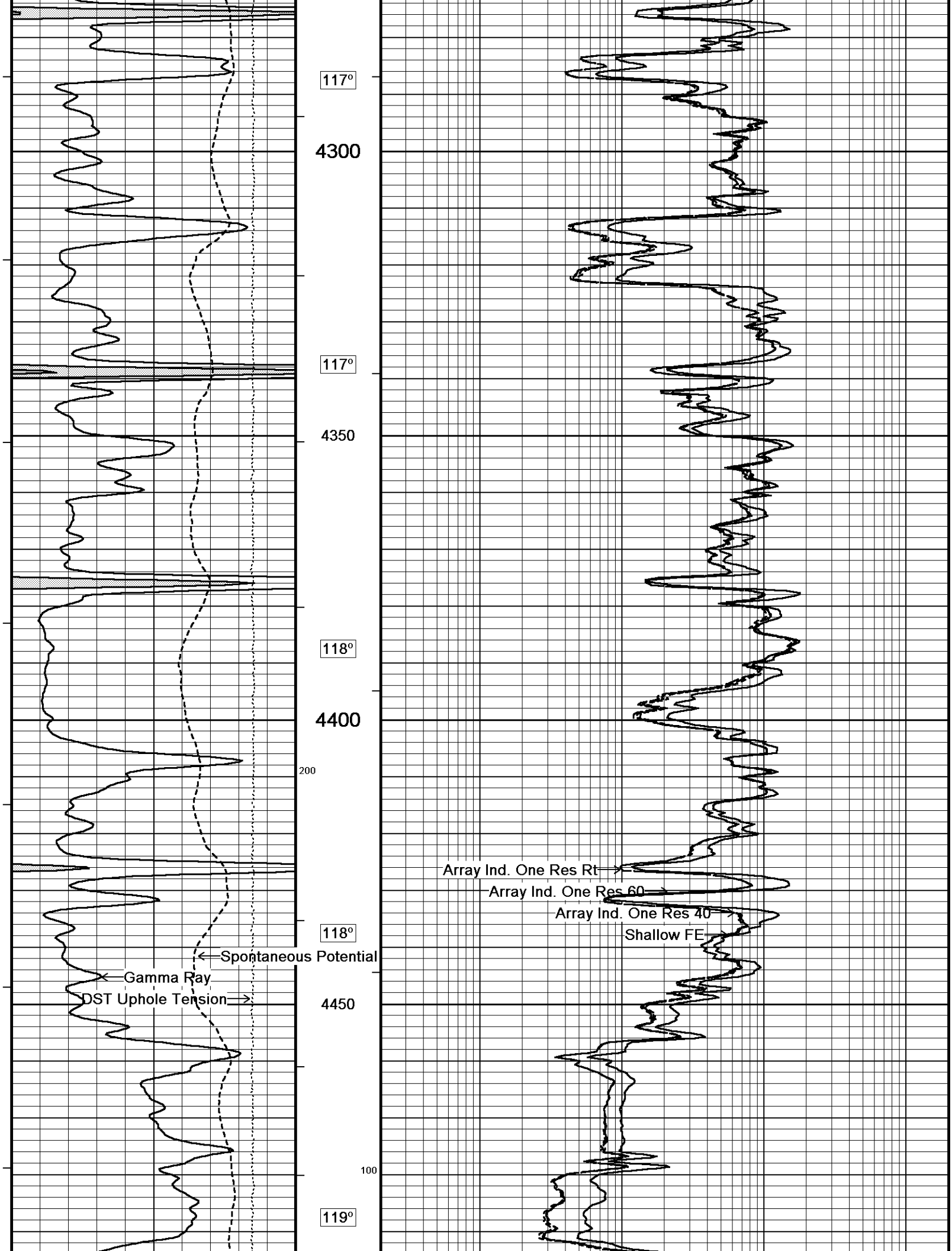
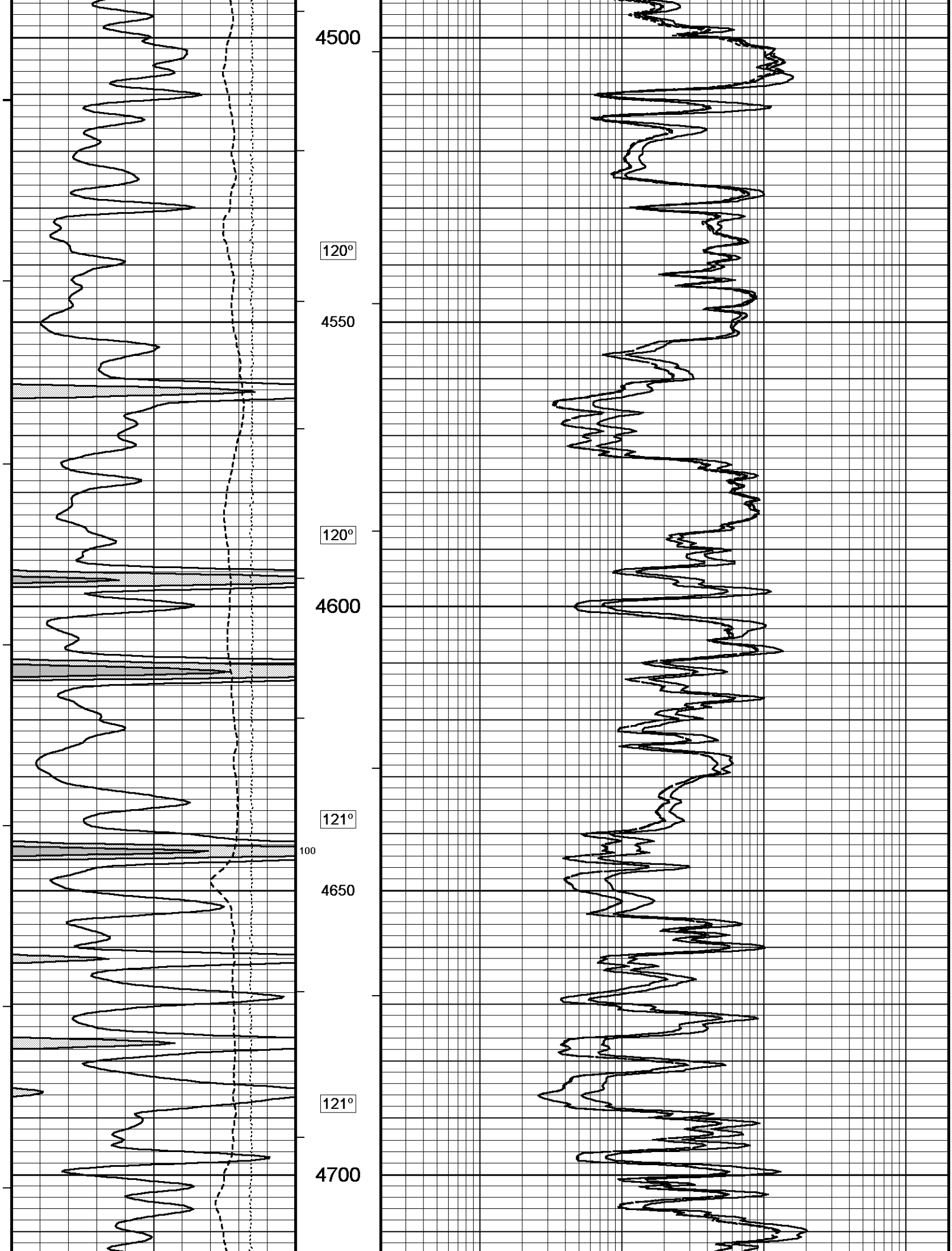
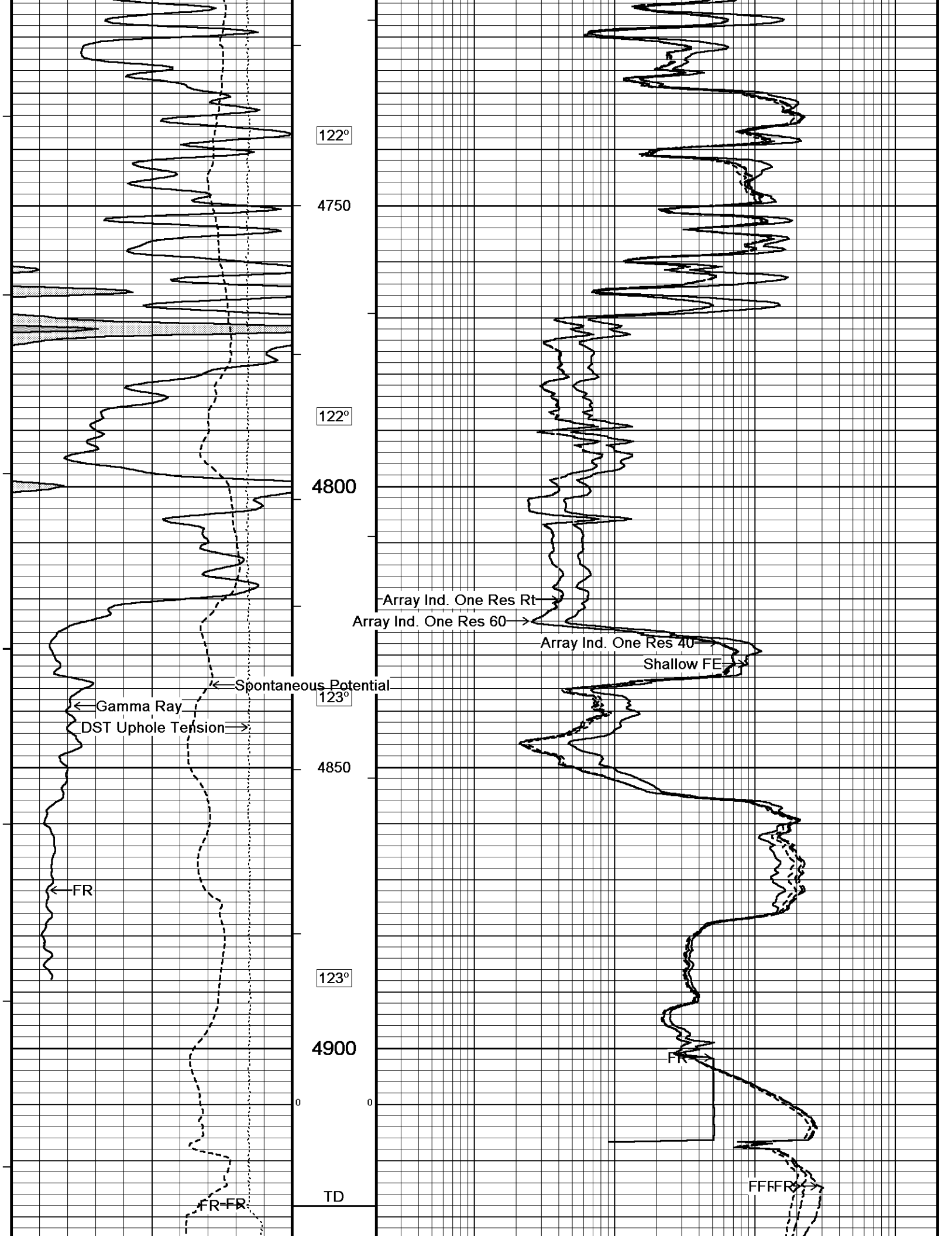


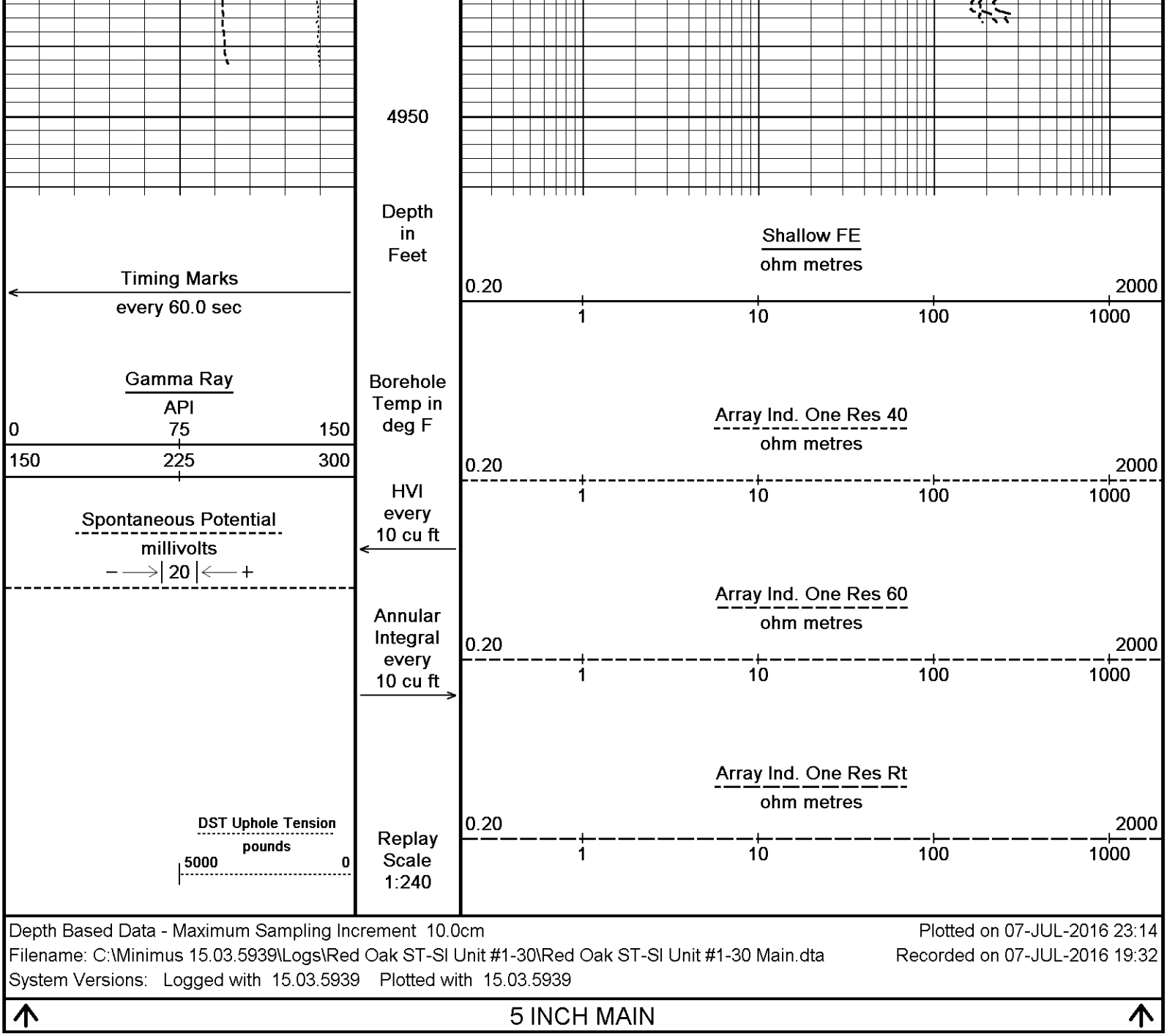

millivolts
– 20 +
Annular Integral every 10 cu ft
Array Ind. One Res 60
ohm metres
0.20
2000
1
10
100
1000
Array Ind. One Res Rt
ohm metres
0.20
2000
1
10
100
1000
DST Uphole Tension
pounds
5000
0
Replay Scale 1:240
3888
3900
116°
3950
200
116°
4000
116°
4050
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray


DST Uphole Tension
117°
4100
300
117°
4150
117°
4200
117°
4250


117°
4300
117°
4350
118°
4400
200
118°
Spontaneous Potential
Gamma Ray
DST Uphole Tension
4450
100
119°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE


4500
120°
4550
120°
4600
121°
100
4650
121°
4700


122°
4750
122°
4800
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
123°
Gamma Ray
DST Uphole Tension
4850
FR
123°
4900
FR
0
0
FFFFR
TD
FR-FR



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 07-JUL-2016 23:14
Filename: C:\Minimus 15.03.5939\Logs\Red Oak ST-SI Unit #1-30\Red Oak ST-SI Unit #1-30 Main.dta — Recorded on 07-JUL-2016 19:32
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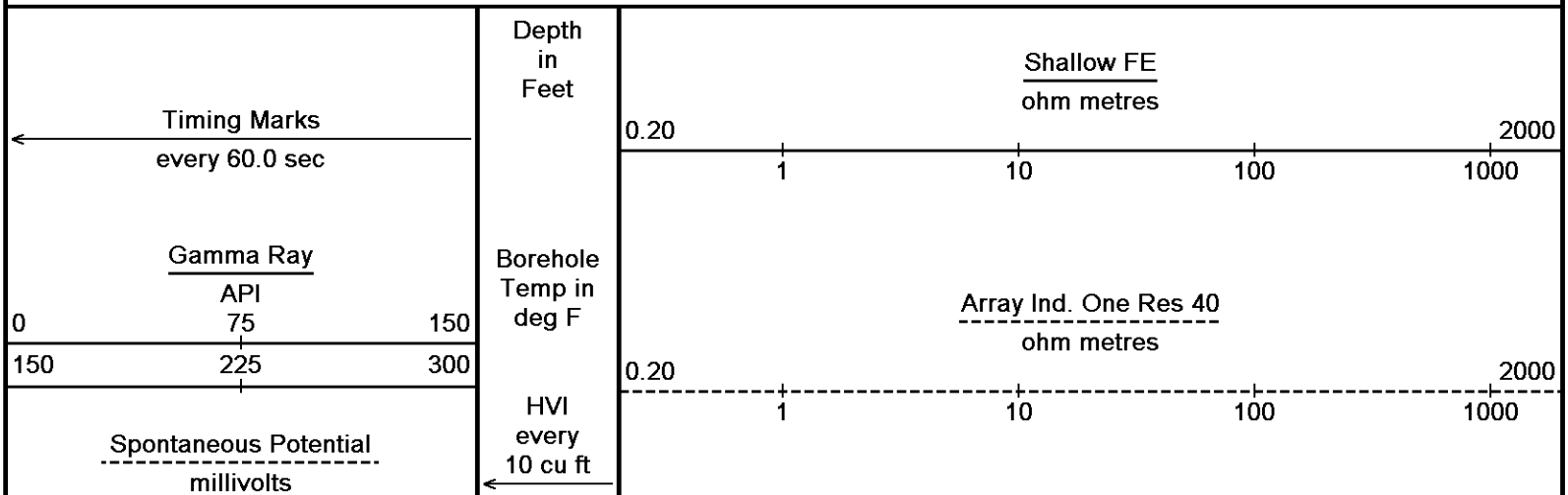
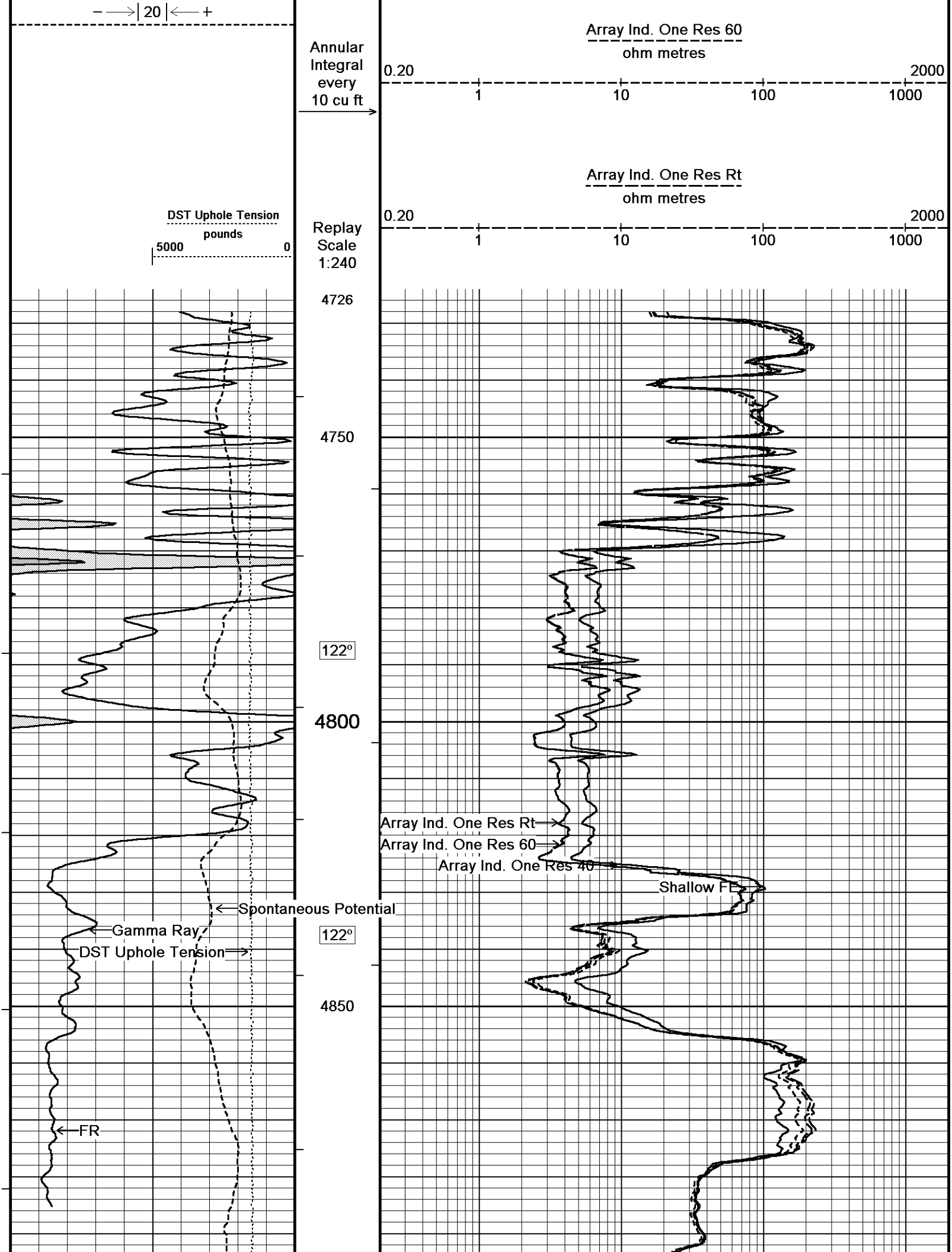
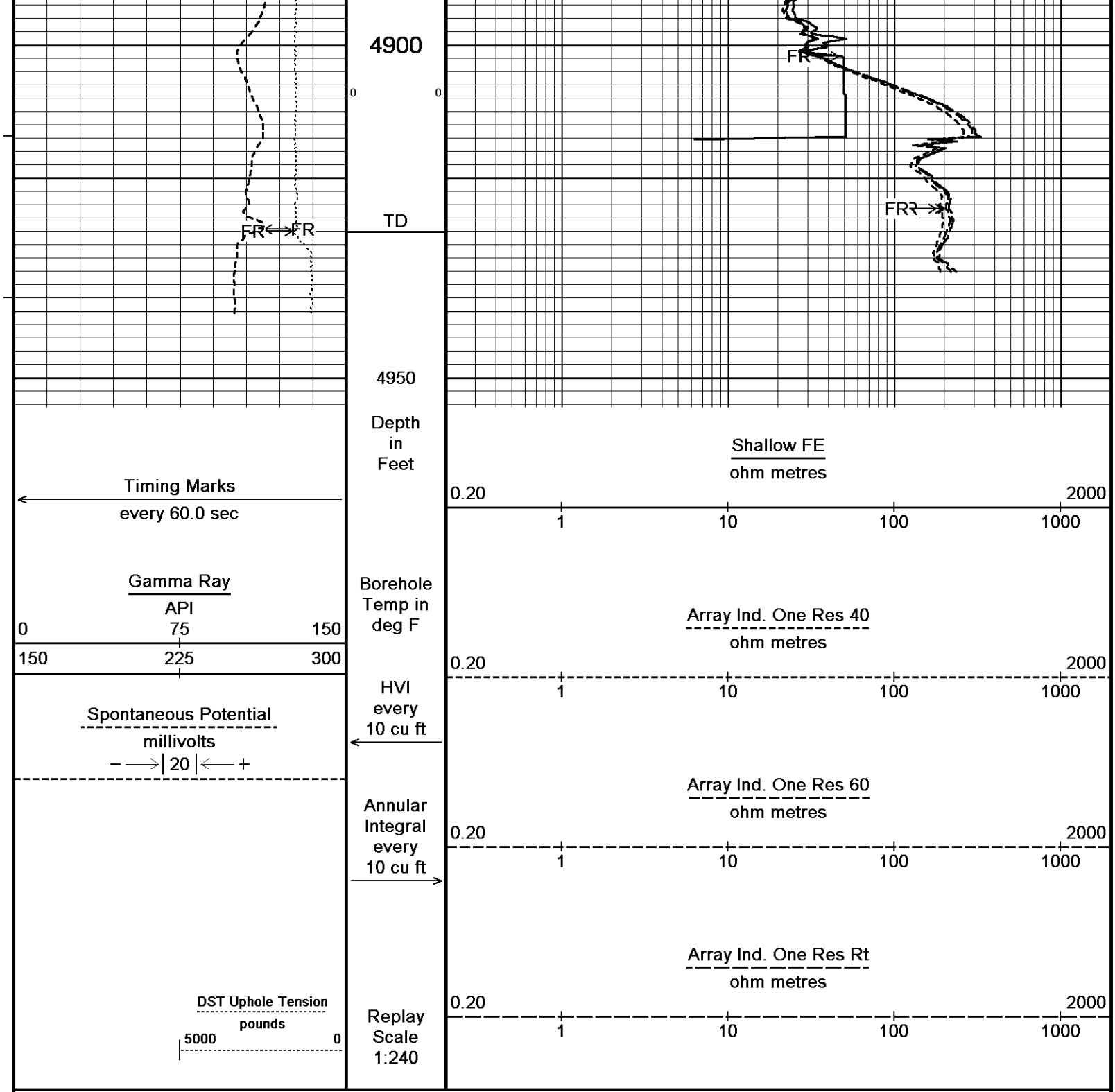
5 INCH MAIN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 07-JUL-2016 23:14
Filename: C:\Minimus 15.03.5939\Logs\Red Oak ST-SI Unit #1...\Red Oak ST-SI Unit #1-30 Repeat.dta — Recorded on 07-JUL-2016 19:14
System Versions: Logged with 15.03.5939 Plotted with 15.03.5939




– 20 +
Annular Integral every 10 cu ft
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
DST Uphole Tension
pounds
5000
0
Replay Scale 1:240
4726
4750
122°
4800
122°
4850
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
FR



Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 07-JUL-2016 23:14
Filename: C:\Minimus 15.03.5939\Logs\Red Oak ST-SI Unit #1...\Red Oak ST-SI Unit #1-30 Repeat.dta
Recorded on 07-JUL-2016 19:14
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REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 15.03.5939\Logs\Red Oak ST-SI Unit #1-30\Red Oak ST-SI Unit #1-30 Repeat.dta

General Constants All 000
Last Edited on 07-JUL-2016,18:00

General Parameters

Mud Resistivity	0.540	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	MMR Caliper	

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

Down-hole Tension Calibration SMS 0

Field Calibration on 07-JUL-2016 18:22

Reading No	Measured	Calibrated (lbs)
1	1056.01	0.00
2	-1326.30	480.60

Gamma Calibration MCG-C 84

Field Calibration on 07-JUL-2016 14:26

	Measured	Calibrated (API)
Background	70	46
Calibrator (Gross)	759	502
Calibrator (Net)	689	456

Gamma Calibration Tolerances MCG-C 84

		1.40	1.475	1.55	
Ratio	1.511				Counts/API

Gamma Constants MCG-C 84

Last Edited on 07-JUL-2016,18:00

Gamma Calibrator Number	MCGGRCC141	
GRC-M Calibrator Jig in Use?	NO	
Inactive Background Jig in Use?	NO	
Mud Density	1.10	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Potassium Equivalence	Chloride	
K Mud Concentration	0.00	%

SP Calibration MCG-C 84

Field Calibration on 07-JUL-2016 14:15

	Measured	Calibrated (mV)
Reference 1	104.6	100.1
Reference 2	-95.7	-98.8

High Resolution Temperature Calibration MCG-C 84

Field Calibration on 22-JUL-2014,11:40

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

High Resolution Temperature Constants MCG-C 84

Last Edited on 09-SEP-2014,02:23

Pre-filter Length	11

Micro Normal and Micro Inverse Calibration MMR-C.A 247

Base Calibration on 22-MAY-2016 16:59
Field Check on 07-JUL-2016 13:49

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	10.2	49.9	5.1	25.6
Micro Inverse	10.0	49.5	3.4	16.9

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	93.6	93.6
Micro Inverse	62.2	62.2

Micro Normal & Micro Inverse Calibration Tolerance MMR-C.A 247

		-5%	10.0	+5%				-5%	50.0	+5%	
Micro Normal Res. 1	10.2				ohm	Micro Normal Res. 2	49.9				ohm

Micro Inverse Res. 1	10.0	-5% 10.0 +5%	ohm	Micro Inverse Res. 2	49.5	-5% 50.0 +5% ohm

Micro Normal Base Check	93.6	-2% 93.21 +2%	ohm-m
Micro Inverse Base Check	62.2	-2% 62.10 +2%	ohm-m
Micro Normal Field Check	93.6	-2% 93.6 +2%	ohm-m
Micro Inverse Field Check	62.2	-2% 62.2 +2%	ohm-m

Micro Normal and Micro Inverse Constants MMR-C.A 247

Last Edited on 26-JUN-2016,15:44

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	0.0000	inches

Caliper Calibration MMR-C.A 247

Base Calibration on 22-MAY-2016 16:40
Field Calibration on 07-JUL-2016 13:51

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14762	5.98
2	18067	7.97
3	21325	9.86
4	25277	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
8.02	7.97

Caliper Calibration Tolerances MMR-C.A 247

Short Arm Field Cal.	8.02	7.77 7.97 8.17	in

Micro-Resistivity Caliper Constants MMR-C.A 247

Last Edited on

Sonde Configuration Resistivity Mode

Neutron Calibration MDN-A.B 66

Base Calibration on 22-MAY-2016,18:15
Field Check on 07-JUL-2016 14:30

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3116	97	3714	110
Ratio	32.277		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	2061	3028
Ratio	0.681	

Field Check

	Calibrated (cps)	
	2133	3061
Ratio	0.697	

Neutron Calibration Tolerances MDN-A.B 66

Ratio	32.277	-5% 33 +5%	
Base Check	0.681	0.65 0.7 0.75	
Field Check	0.697	0.661 0.681 0.701	

Neutron Constants MDN-A.B 66

Last Edited on 07-JUL-2016,14:26

Neutron Source Id	P0204NN	
Neutron Jig Number	NJ5736	
Air Hole Processing	Legacy	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches

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	N/A	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	N/A	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-B.J 352

Base Calibration on 22-MAY-2016 16:12
Field Check on 07-JUL-2016 13:47

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	972.3	126.8
Base Check		278.7
Field Check		278.7

FE Calibration Tolerances MFE-B.J 352

Reference 2	972.3	-3% 980.0 +3%	ohm
Base Check	278.7	-2% 277.0 +2%	ohm-m
Field Check	278.7	-2% 278.7 +2%	ohm-m

FE Constants MFE-B.J 352

Last Edited on 07-JUL-2016,13:46

Running Mode	No Sleeve	
MFE K Factor	0.1268	
Borehole Correction Constants		
Sonde Position	0.5	inches
Hole Size Source	Density Caliper	
Hole Size Constant Value	N/A	inches
Rm Source	Global Value: Temperature Corrected	
Temp. for Rm Corr.	MCG External Temperature	

Sonic Constants MSS-A.A 55

Last Edited on 07-JUL-2016,13:42

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)
	N/A	N/A	N/A	N/A	N/A

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)	Depth (ft)
N/A	N/A	N/A	
N/A	N/A	N/A	0.00
N/A	N/A	N/A	0.00
N/A	N/A	N/A	0.00
N/A	N/A	N/A	0.00
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 111

Base Calibration on 05-AUG-2014,09:34
Field Check on 07-JUL-2016 13:46

Base Calibration

Test Loop Calibration

Channel	Measured Low	Measured High	Calibrated (mmho/m) Low	Calibrated (mmho/m) High
1	17.6	473.6	9.3	966.2
2	6.4	385.9	7.6	821.4
3	3.2	264.0	5.2	566.0
4	2.1	135.5	2.6	279.2

Array Temperature 23.0 Deg F

Test Loop Calibration Verified 22-MAY-2016,17:59

Channel	Base Check (mmho/m) Low	Base Check (mmho/m) High	Field Check (mmho/m) Low	Field Check (mmho/m) High
1	12.1	3873.0	10.7	3867.6
2	29.8	3528.1	27.7	3522.3
3	29.1	3021.3	27.2	3016.2
4	19.1	2058.5	17.8	2055.0
Deep	17.7	1962.1	16.5	1958.8
Medium	43.1	3976.4	40.4	3969.4
Shallow	44.4	5232.7	41.4	5224.1
Array Temperature		65.8		87.7 Deg F

Induction Calibration Tolerances MAI-A.A 111

Low Conductivity 1	17.6	13.0 17.0 21.0	mmho/m	High Conductivity 1	473.6	430.0 475.0 520.0	mmho/m
Low Conductivity 2	6.4	4.5 6.0 7.5	mmho/m	High Conductivity 2	385.9	345.0 385.0 425.0	mmho/m
Low Conductivity 3	3.2	1.0 3.5 6.0	mmho/m	High Conductivity 3	264.0	240.0 260.0 280.0	mmho/m
Low Conductivity 4	2.1	0.0 2.0 4.0	mmho/m	High Conductivity 4	135.5	120.0 135.0 150.0	mmho/m
Background Vx 1	0.0	-110.0 -32.5 45.0	mmho/m	Phase Check Loop 1	0.0	-2.0 0.0 2.0	%
Background Vx 2	0.0	-35.0 20.0 75.0	mmho/m	Phase Check Loop 2	0.0	-2.0 0.0 2.0	%
		-60.0 2.5 65.0				-2.0 0.0 2.0	

Background Vx 3	0.0	-50.0 -17.5 15.0	mmho/m Phase Check Loop 3	0.0	-2.0 0.0 2.0 %
Background Vx 4	0.0		mmho/m Phase Check Loop 4	0.0	%

Induction Constants MAI-A.A 111

Last Edited on 07-JUL-2016,13:43

Induction Model	RtAP-WBM	
Borehole Correction Constants		
Tool Centred	No	
Hole Size Source	Density Caliper	
Hole Size Constant Value	N/A	inches
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
Rm Source	Global Value: Temperature Corrected	
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
Symmetrised Receiver Gains		
Receiver 1	1.00	
Receiver 2	1.00	
Receiver 3	1.00	
Receiver 4	1.00	
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 111

Field Calibration on 24-NOV-2014,10:23

	Measured	Calibrated(Deg F)
Lower	10.00	10.00
Upper	100.00	100.00

High Resolution Temperature Constants MAI-A.A 111

Last Edited on 26-JUN-2014,15:06

Pre-filter Length	11

Photo Density Calibration MPD-B 104

Base Calibration on 22-MAY-2016 17:45
Field Check on 07-JUL-2016 13:57

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Background	1148	1338		
Reference 1	49789	23977	59556	30836
Reference 2	20127	2423	24941	2541

Field Check at Base

Field Check at Base

	1148.2	1337.6

Field Check

	1146.2	1331.8

PE Calibration

Base Calibration

	WS	Measured WH	Ratio	Calibrated Ratio
Background	211	1025		
Reference 1	20854	49612	0.425	0.371
Reference 2	5819	19993	0.296	0.272

Field Check at Base

	211.2	1025.1

Field Check

	210.6	1022.8

Photo Density Calibration Tolerances MPD-B 104

Near Density Ratio	2.56	-5% 2.52 +5%	Far Density Ratio	20.85	-5% 21.00 +5%
PE Calibration	0.121	0.089 0.110 0.131			
Near Den. Field Check	1146.2	-3% 1148.2 +3%	Far Den. Field Check	1331.8	-3% 1337.6 +3%
PE WS Field Check	210.6	-6% 211.2 +6%	PE WH Field Check	1022.8	-6% 1025.1 +6%

Density Constants MPD-B 104

Last Edited on 07-JUL-2016,17:59

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	1.10	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

Caliper Calibration MPD-B 104

Base Calibration on 22-MAY-2016 17:26
Field Calibration on 07-JUL-2016 13:58

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13598	3.99
2	22432	5.98
3	31029	7.97
4	39246	9.86
5	48339	11.92
6	N/A	N/A

Field Calibration

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

Caliper Calibration Tolerances MPD-B 104

7.77 7.97 8.17

Short Arm Field Cal.	7.97					in

DOWNHOLE EQUIPMENT

C:\Minimus 15.03.5939\Logs\Red Oak ST-SI Unit #1-30\Red Oak ST-SI Unit #1-30 Repeat.dta

Cablehead, 11 pin
CBH-CA 155 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Comms Gamma
MCG-C 84 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-C.A 247 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

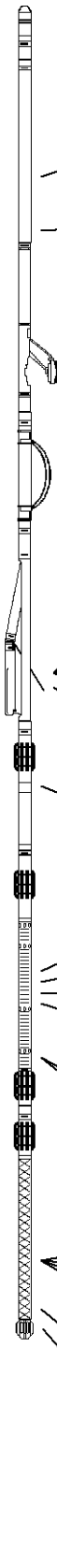
Compact Density/Caliper
MPD-B 104 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

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

Compact Sonic
MSS-A.A 55 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in

Compact Induction
MAI-A.A 111 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 63.70 ft Weight: 480.6 lb



56.02 ft	GRGC - MCG Gamma Ray
53.11 ft	CGXT - MCG External Temperature
46.76 ft	MBTC - MMR Caliper
45.76 ft	MINV - MMR MicroLog Inverse
45.76 ft	MNRL - MMR MicroLog Normal
40.97 ft	NPRL - Limestone Neutron Por.
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
31.74 ft	PDPE - PE
26.24 ft	FEFE - Shallow FE
16.96 ft	TR11 - 4' Transit Time
16.46 ft	TR21 - 3' Transit Time
15.95 ft	TR12 - 6' Transit Time
15.46 ft	TR22 - 5' Transit Time
12.96 ft	SPRL - Wyllie Lime. Sonic Por.
12.96 ft	DT35 - 3-5' Compensated Sonic
3.34 ft	R40O - Array Ind. One Res 40
3.34 ft	R60O - Array Ind. One Res 60
3.34 ft	CTAO - Array Ind. One Cond Ct
3.34 ft	RTAO - Array Ind. One Res Rt
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.

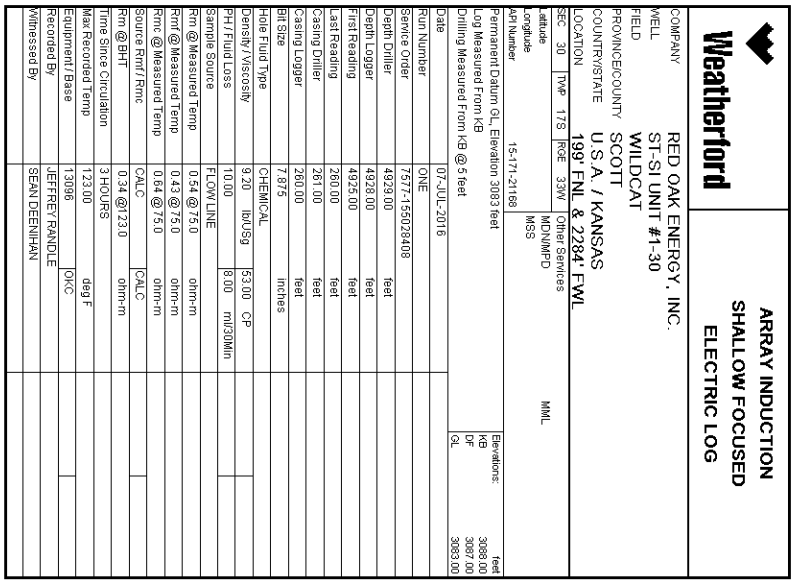
COMPANY	RED OAK ENERGY, INC.
WELL	ST-SI UNIT #1-30

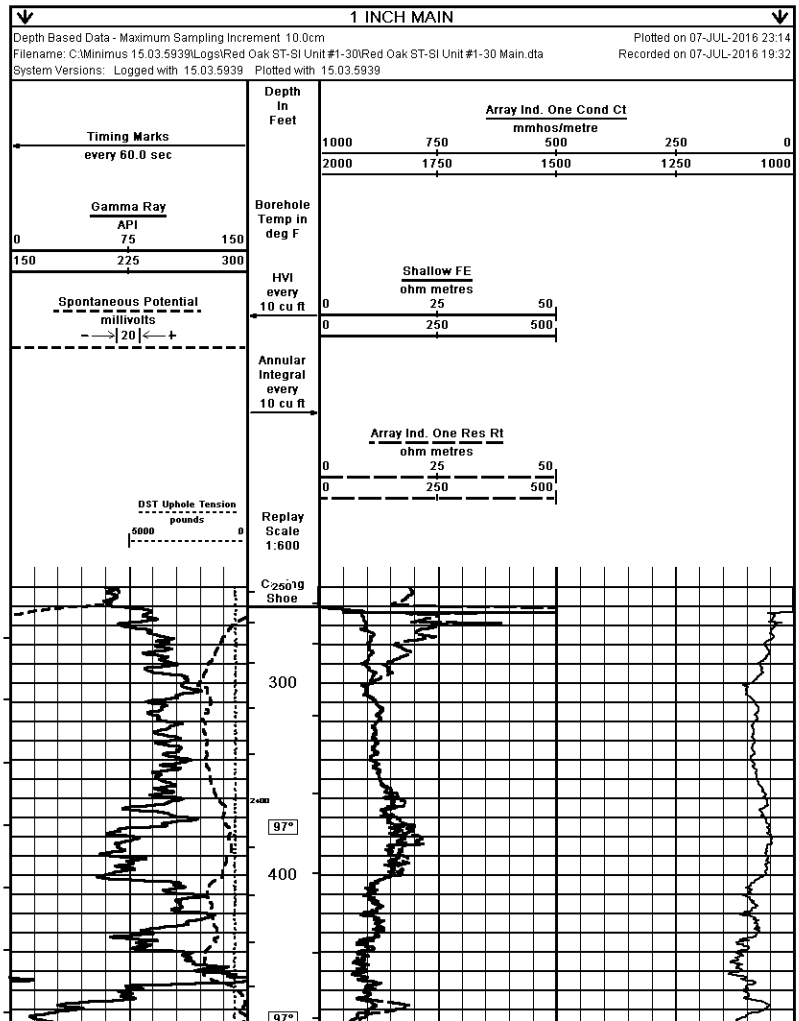
FIELD	WILDCAT
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

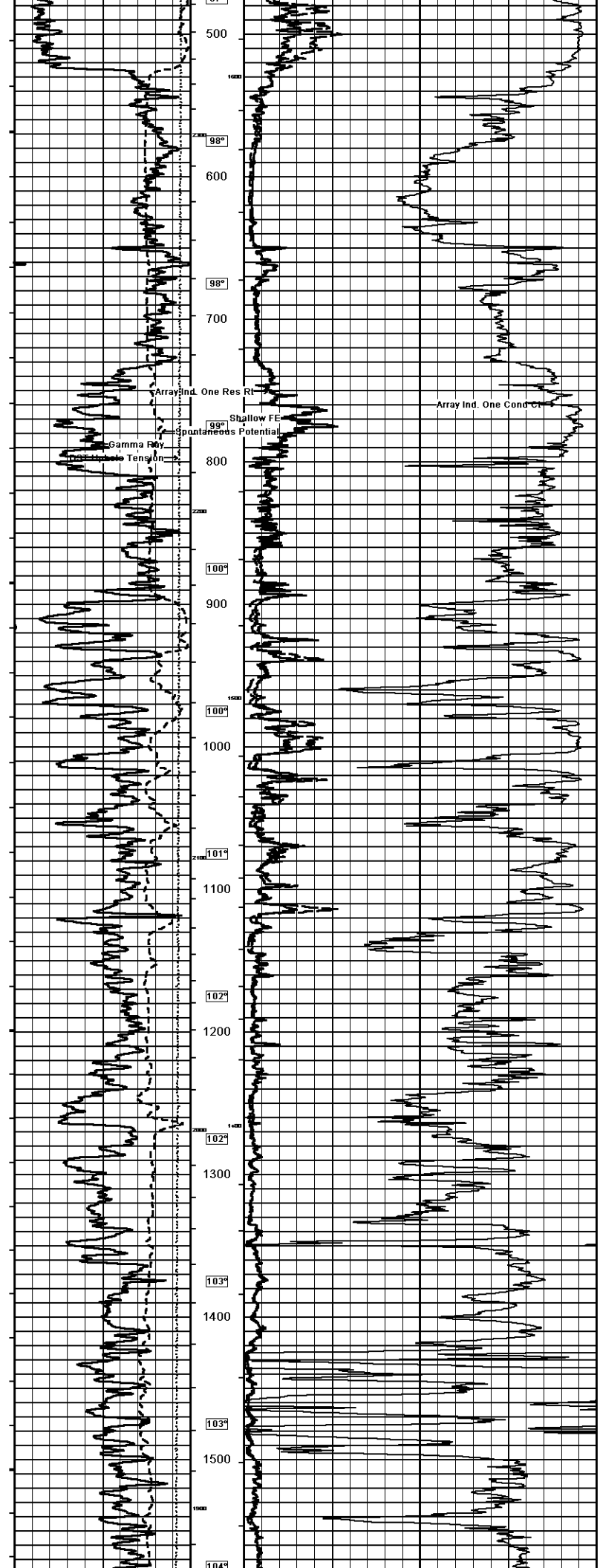
Elevation Kelly Bushing	3088.00	feet	First Reading	4925.00	feet
Elevation Drill Floor	3087.00	feet	Depth Driller	4929.00	feet
Elevation Ground Level	3083.00	feet	Depth Logger	4928.00	feet

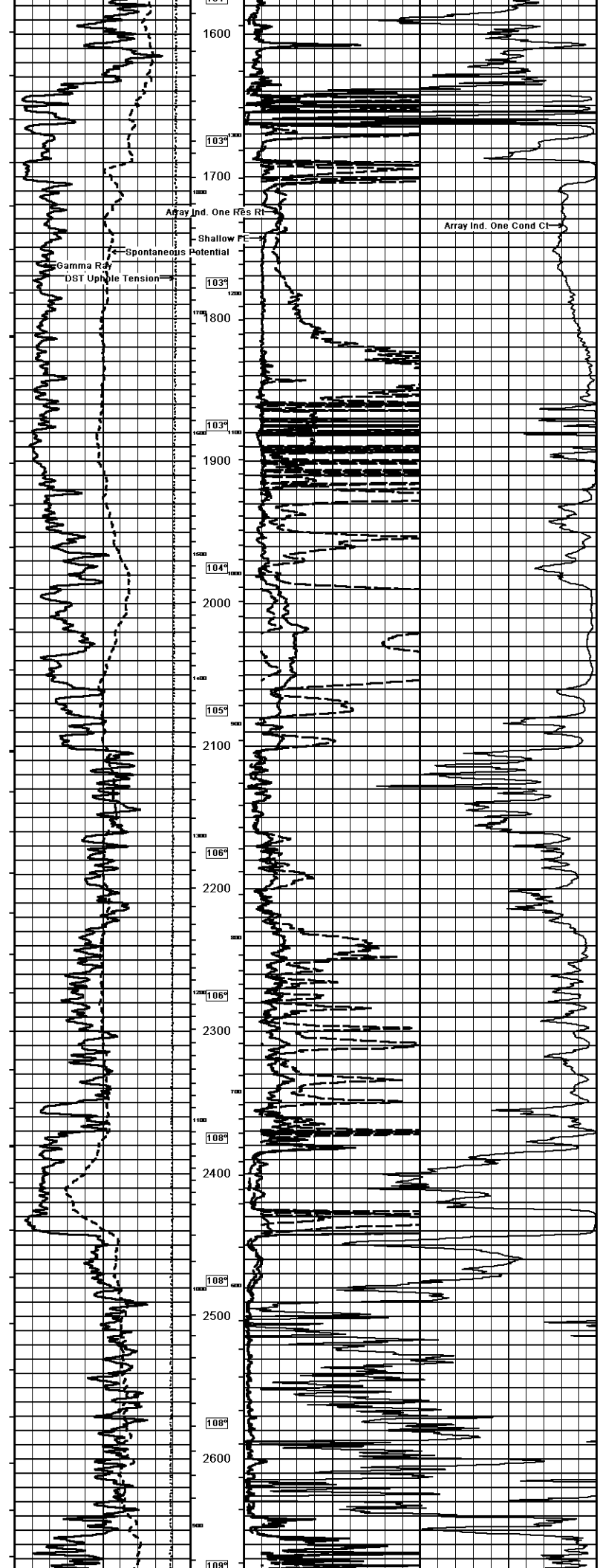
Weatherford®

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG






500
98°
600
98°
700
Array Ind. One Res Rt
Shallow FE
99°
Spontaneous Potential
Gamma Ray
Cable Tension
800
100°
900
100°
1000
101°
1100
102°
1200
102°
1300
103°
1400
103°
1500
104°
Array Ind. One Cond Ct


1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
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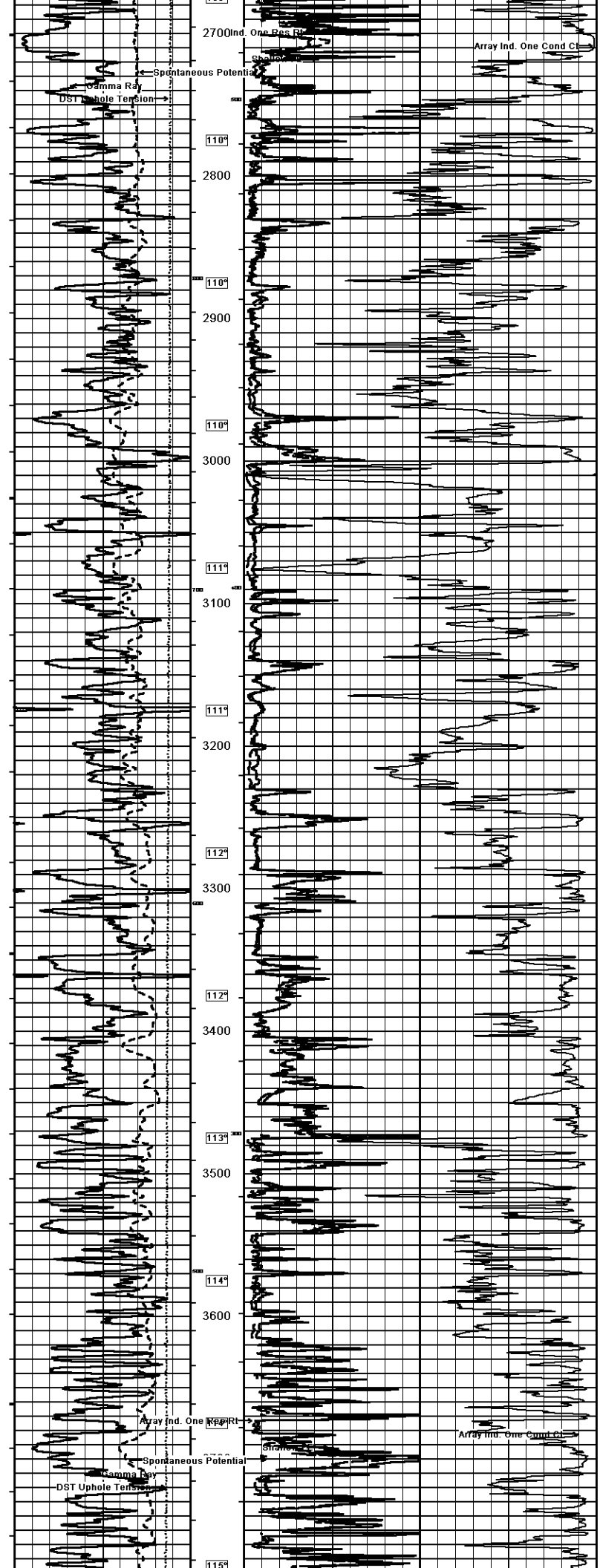
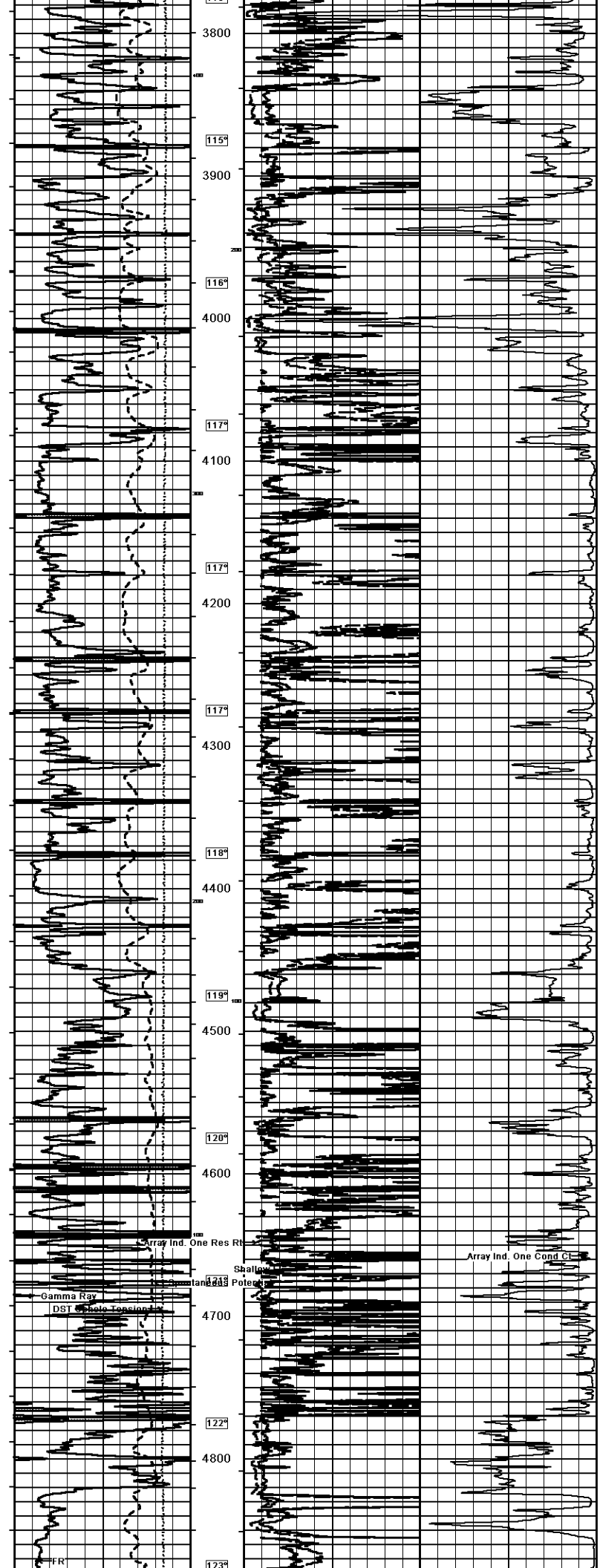
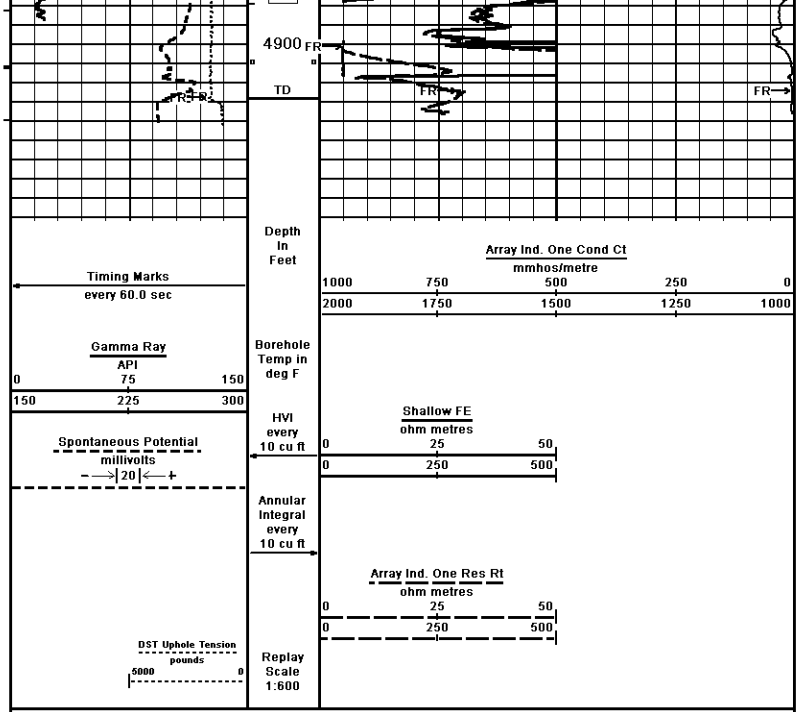
Shallow Fl
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct


Ind. One Res Rt
Array Ind. One Cond Ct
Spontaneous Potential
Gamma Ray
DST Uphole Tension
2700
110°
2800
110°
2900
110°
3000
111°
3100
111°
3200
112°
3300
112°
3400
113°
3500
114°
3600
Array Ind. One Res Rt
Array Ind. One Cond Ct
Spontaneous Potential
Gamma Ray
DST Uphole Tension
115°


3800
115°
3900
116°
4000
117°
4100
117°
4200
117°
4300
118°
4400
119°
4500
120°
4600
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow
Spontaneous Potential
4700
Gamma Ray
DST Wheelo Tension lbs
122°
4800
123°



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 07-JUL-2016 23:14

Filename: C:\Minimus 15.03.5939\Logs\Red Oak ST-SI Unit #1-30\Red Oak ST-SI Unit #1-30 Main.dta — Recorded on 07-JUL-2016 19:32

System Versions: Logged with 15.03.5939 Plotted with 15.03.5939

1 INCH MAIN

COMPANY	RED OAK ENERGY, INC.
WELL	ST-SI UNIT #1-30
FIELD	WILDCAT
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3088.00	feet	First Reading	4925.00	feet
Elevation Drill Floor	3087.00	feet	Depth Driller	4929.00	feet
Elevation Ground Level	3083.00	feet	Depth Logger	4928.00	feet

Weatherford

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG