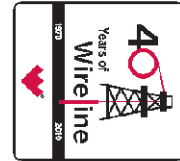




Weatherford

**ARRAY INDUCTION - RTAP
SHALLOW FOCUSED
ELECTRIC LOG**

COMPANY XTO ENERGY, INC.
WELL HOCKER #4-35
FIELD IGNACIO BLANCO/FRUITLAND COAL
PROVINCE/COUNTY LA PLATA
COUNTRY/STATE USA/COLORADO
LOCATION SHL: 0945' FNL & 1210' FEL
BHL: 0660' FNL & 0660' FEL



SEC	TWP	RGE	Other Services	Elevations:	feet
35	33N	7W	MPD/MDN	KB	6353.00
API Number	05-067-09853		Permit Number	DF	6353.00
Permanent Datum GL, Elevation	6342 feet		Drilling Measured From	KB @ 11 FEET	6342.00
Run Number	1	Date	16-NOV-2011	GL	
Depth Driller	2965.00	Depth Logger	2959.00		
First Reading	2956.00	Last Reading	200.00		
Casing Driller	290.00	Casing Logger	286.00		
Bit Size	7.875	Hole Fluid Type	LSND		
Density / Viscosity	9.80 lb/USg	PH / Fluid Loss	8.00	95.00 sec/qt	8.40 ml/30Min
Sample Source	FLOW LINE				
Rm @ Measured Temp	2.88 @ 80.0	Rmf @ Measured Temp	2.30 @ 80.0	ohm-m	
Rmc @ Measured Temp	3.46 @ 80.0	Source Rmf / Rmc	CALC	ohm-m	
Rm @ BHT	2.01 @ 116.0	Time Since Circulation	4 HRS	ohm-m	
Max Recorded Temp	116.00	Equipment Name	COMPACT	deg F	
Equipment / Base	13173	Recorded By	O. GOYZUETA	G/D JCT	
Witnessed By	L. LADOUCEUR	Service Order	3529380		

BOREHOLE RECORD

Last Edited: 16-NOV-2011 14:25

Bit Size inches	Depth From feet	Depth To feet
7.875	286.00	2959.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	286.00	24.00

REMARKS

TOOLS: SHA, MCG, MDN, MPD, MIS-D, SKJ, MFE, AND MAI RAN IN COMBINATION

HARDWARE: MPD: (1) 8 INCH PROFILE PLATE
MAI: (2) 0.5 INCH STANDOFF
MDN: (1) DUAL BOWSPRING
MIS-D: (1) DUAL BOWSPRING

2.65 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY.

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.

TIGHT PULLS, BOREHOLE SIZE, AND RUGOSITY WILL AFFECT REPEATABILITY AND DATA QUALITY.

CALIPER CHECK IN CASING PRESENTED, REFERENCE I.D. = 8.20" (8 5/8", 24 LB/FT CASING)

TOTAL HOLE VOLUME FROM TD TO SURFACE CASING = 540 CU.FT.

ANNULAR VOLUME WITH 5.5 INCH PRODUCTION CASING = 970 CU.FT.

MAXIMUM DEVIATION OF 32 DEGREES IN WELL.

ENGINEER(S): O.GOYZUETA, M. BRENNAN (JFE)

OPERATOR(S): L.STAAKE, A. ALLRED

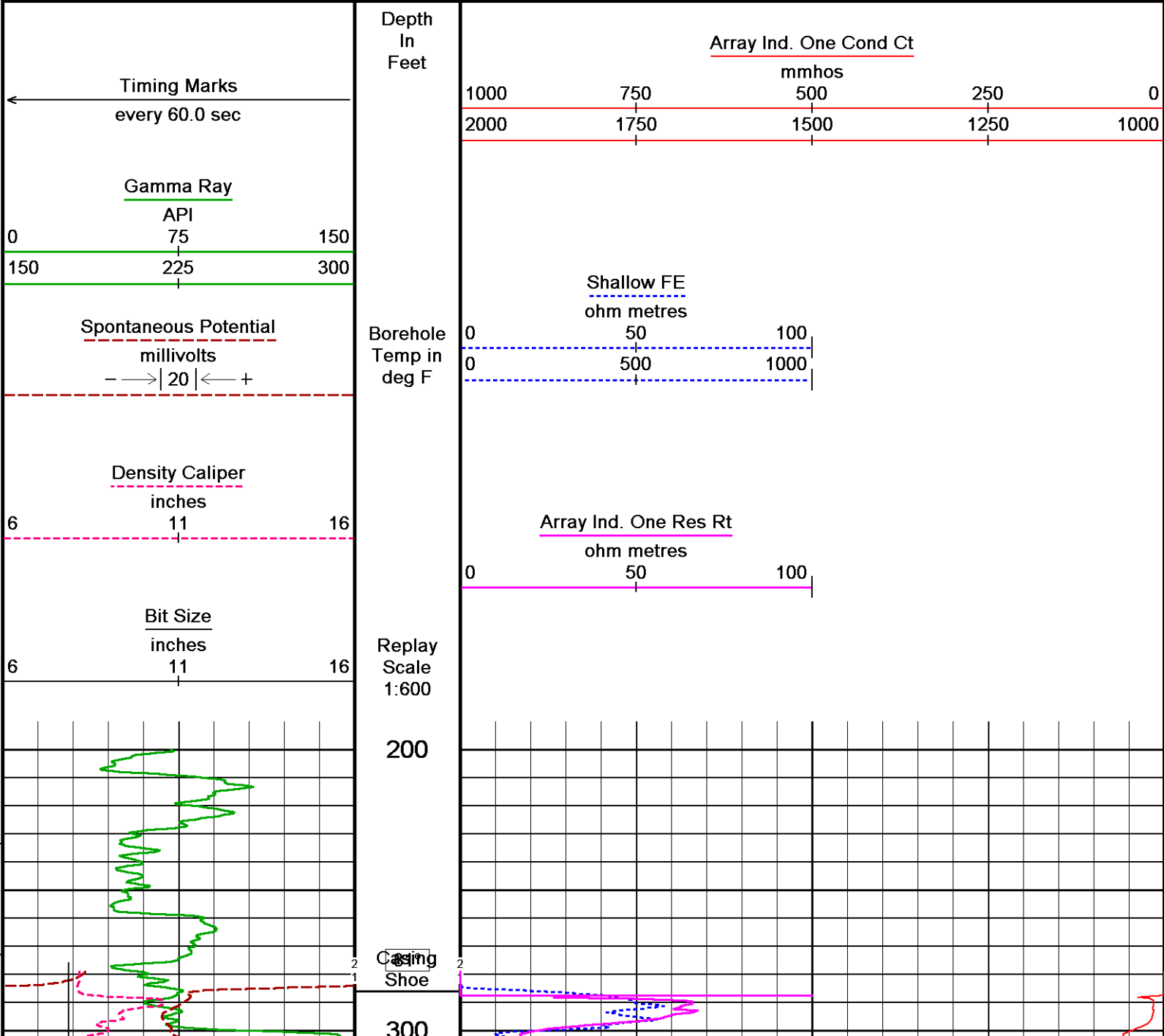
SERVICE ORDER: # 3529380

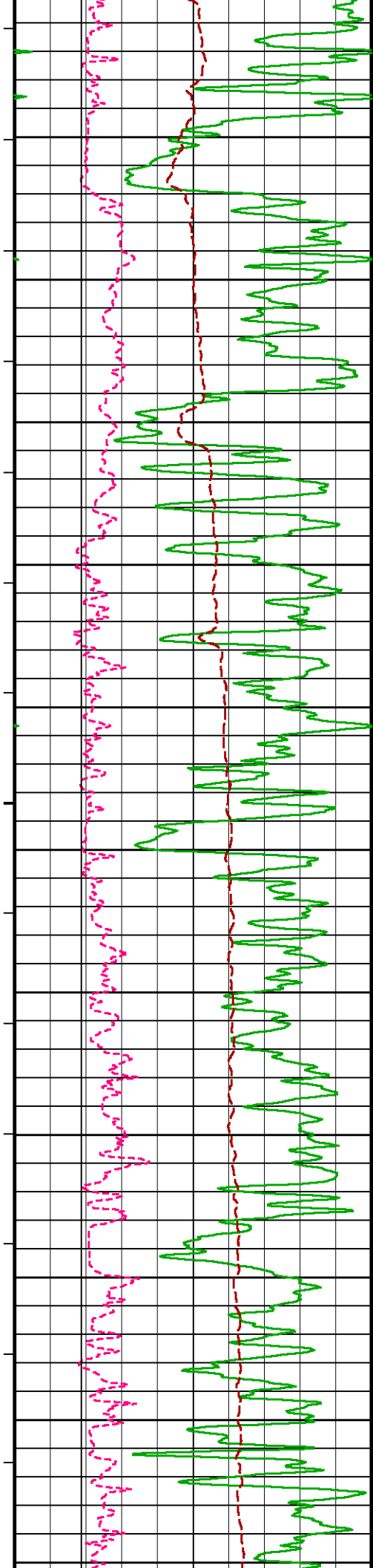
RIG: AZTEC #580

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.

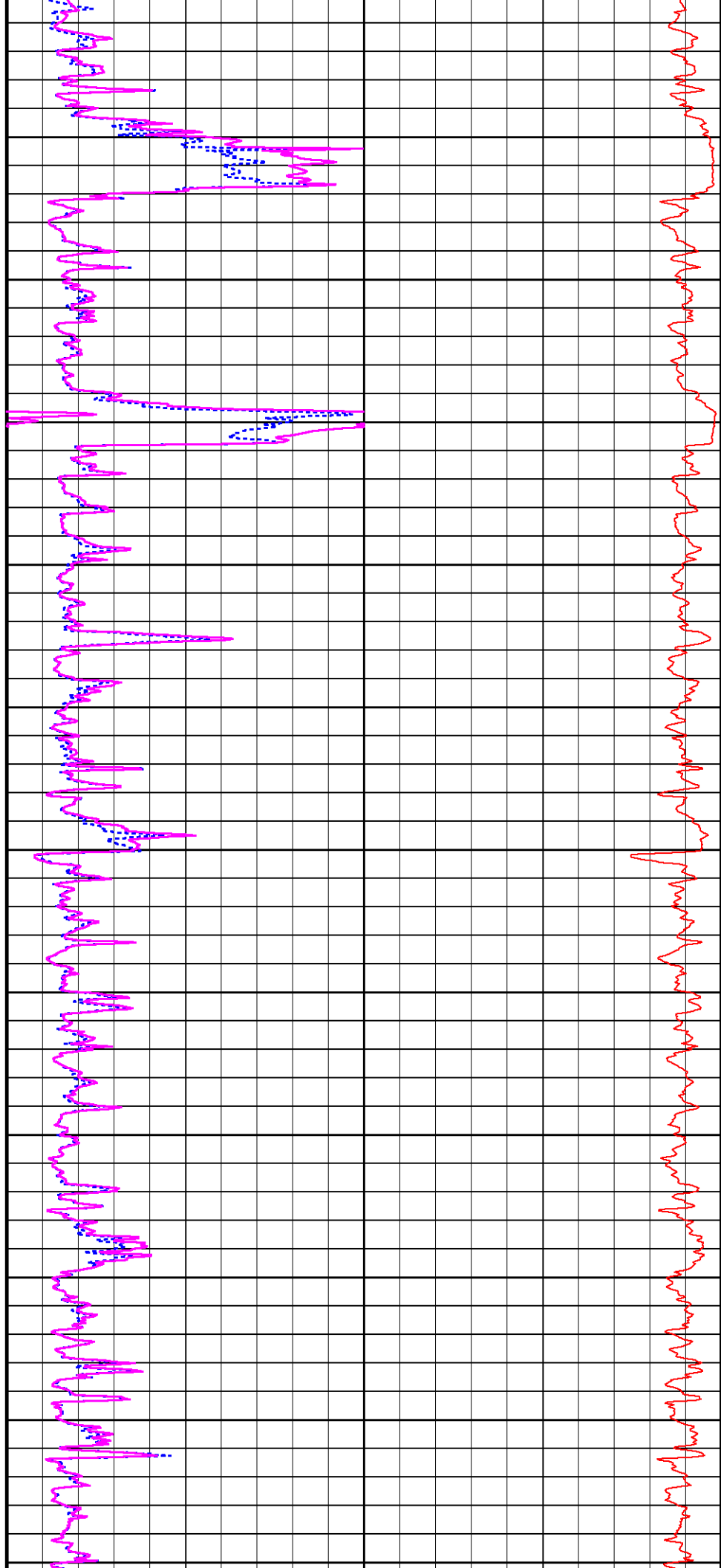
2 INCH MAIN LOG

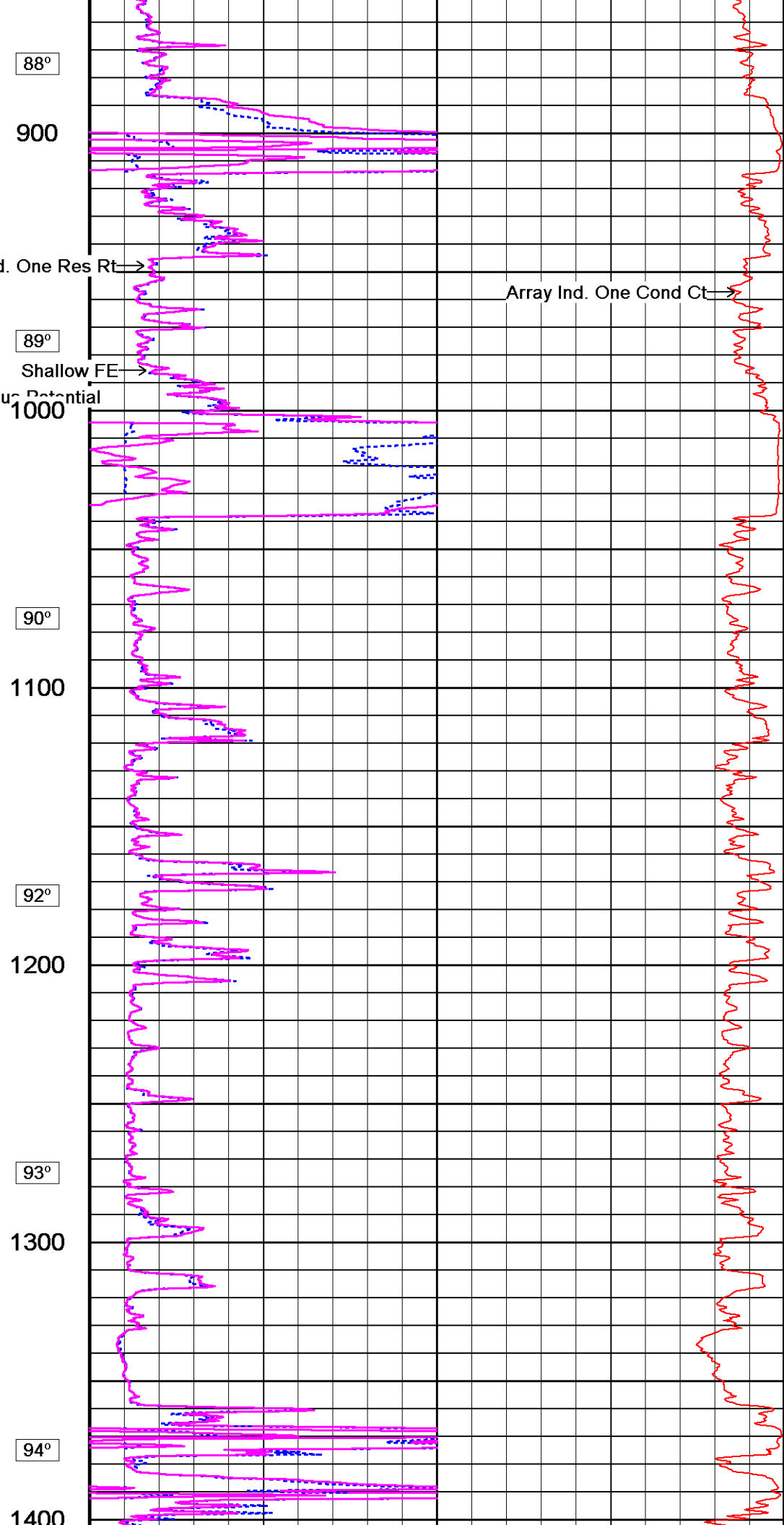
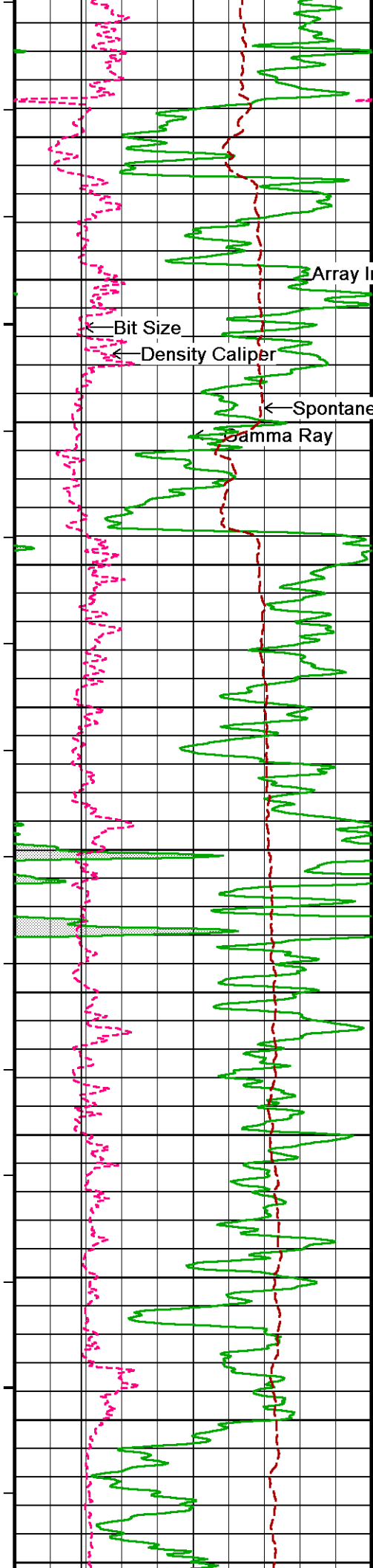
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 21-MAY-2012 12:39
 Filename: C:\LOGS\XTO\Hocker #4-35\Main.dta Recorded on 16-NOV-2011 13:03
 System Versions: Logged with 12.02.4401 Processed with 12.02.4401 Plotted with 12.02.4401

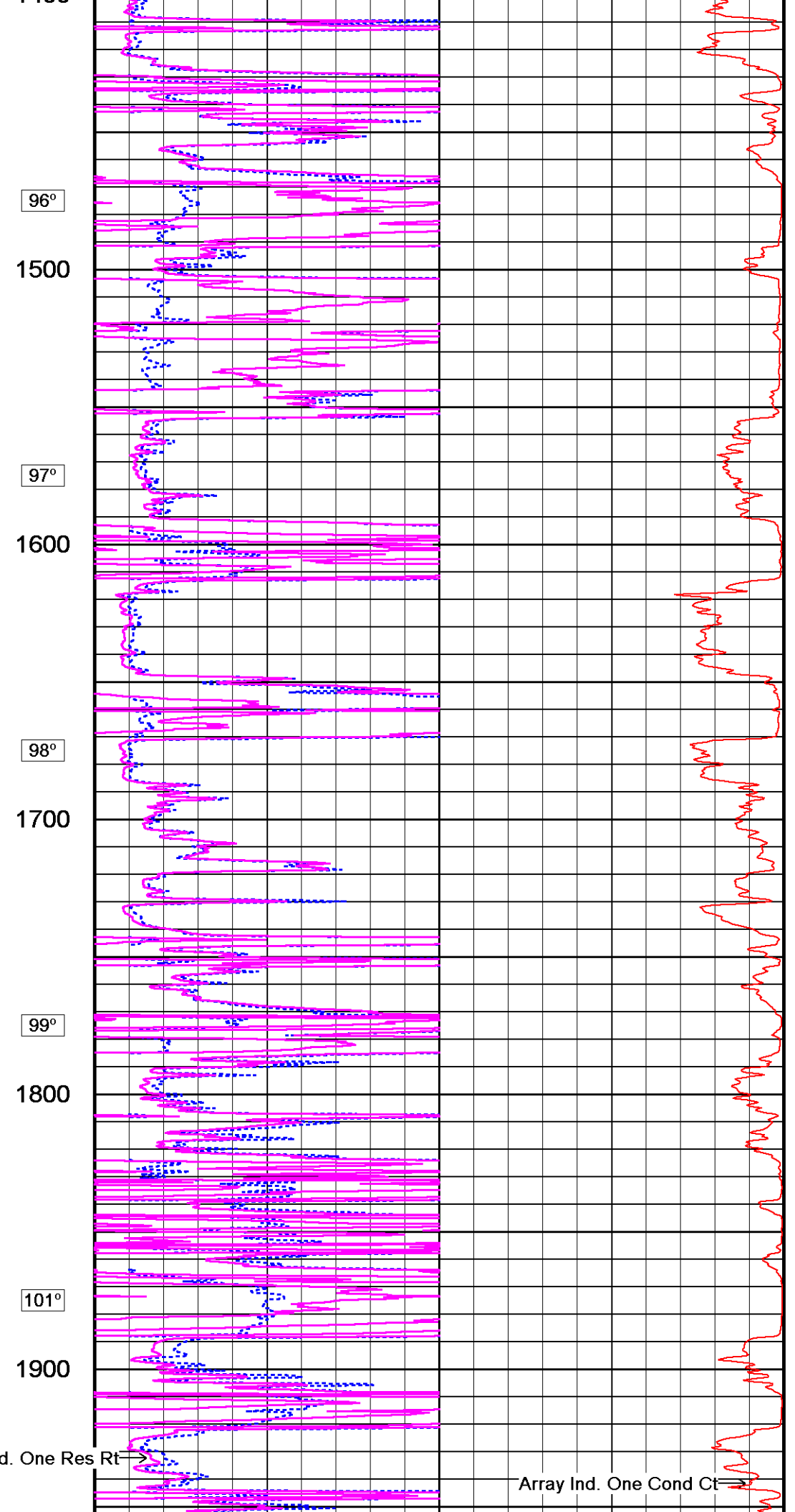
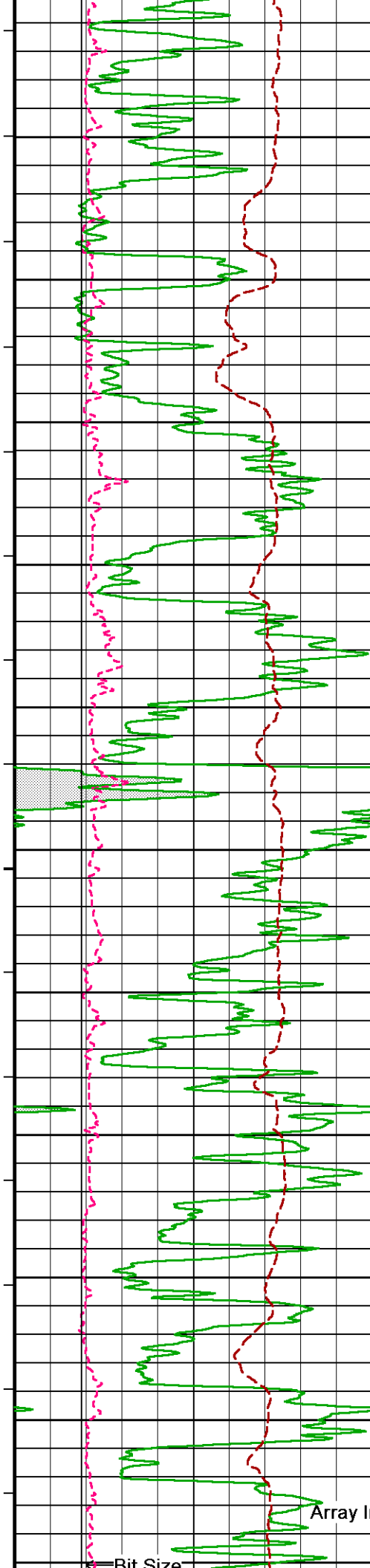




83°
400
83°
500
84°
600
86°
700
87°
800

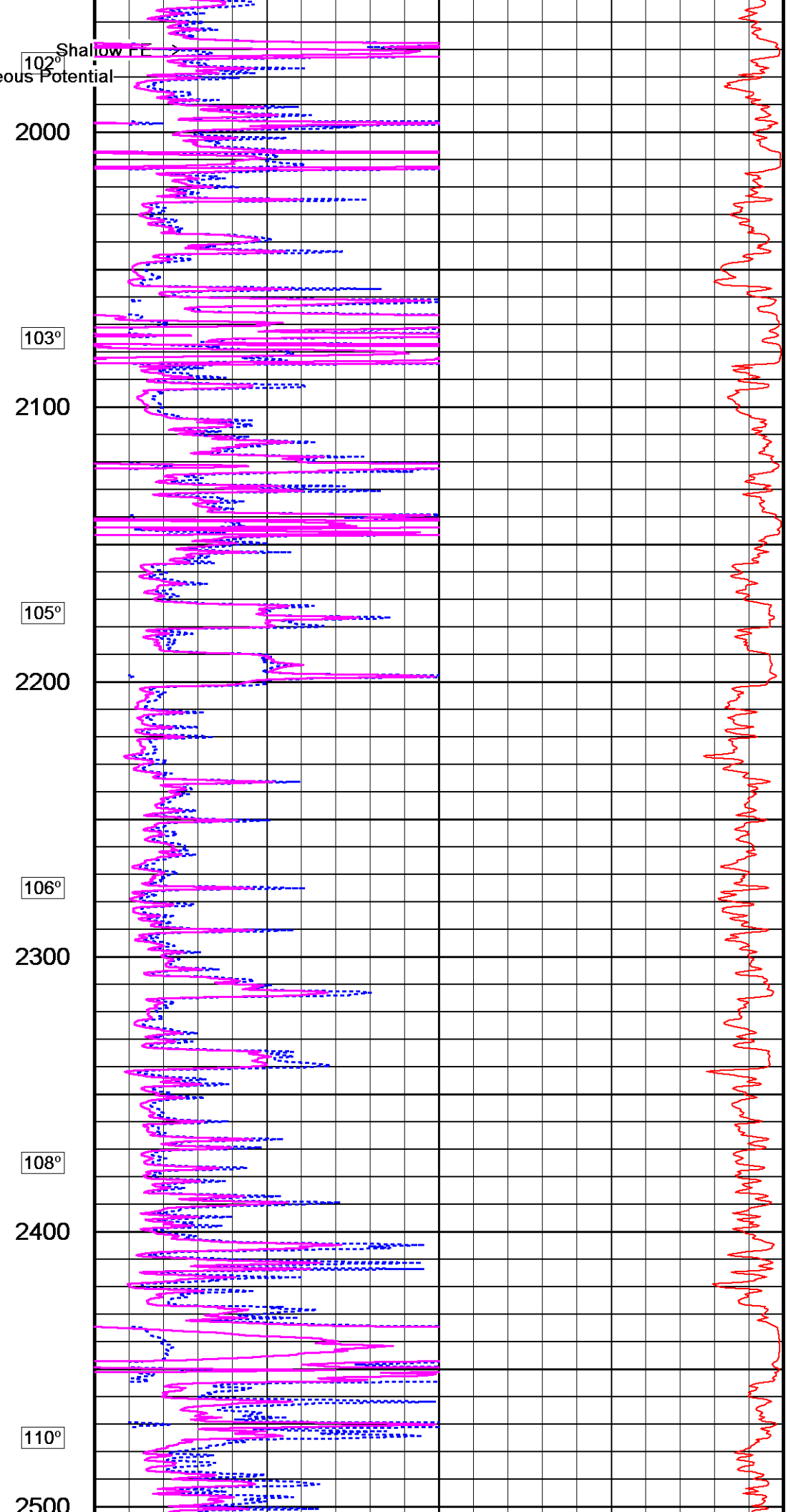
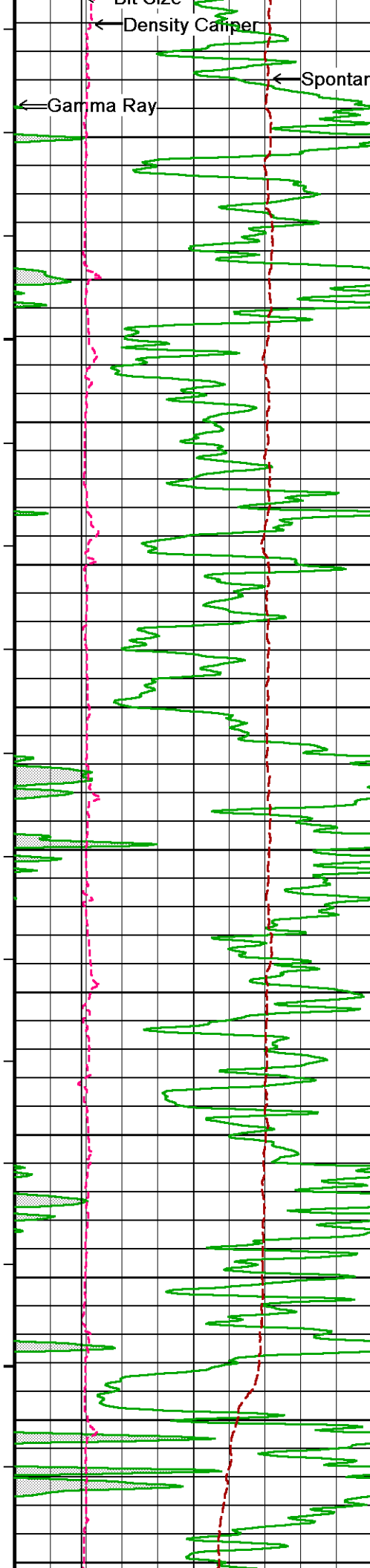


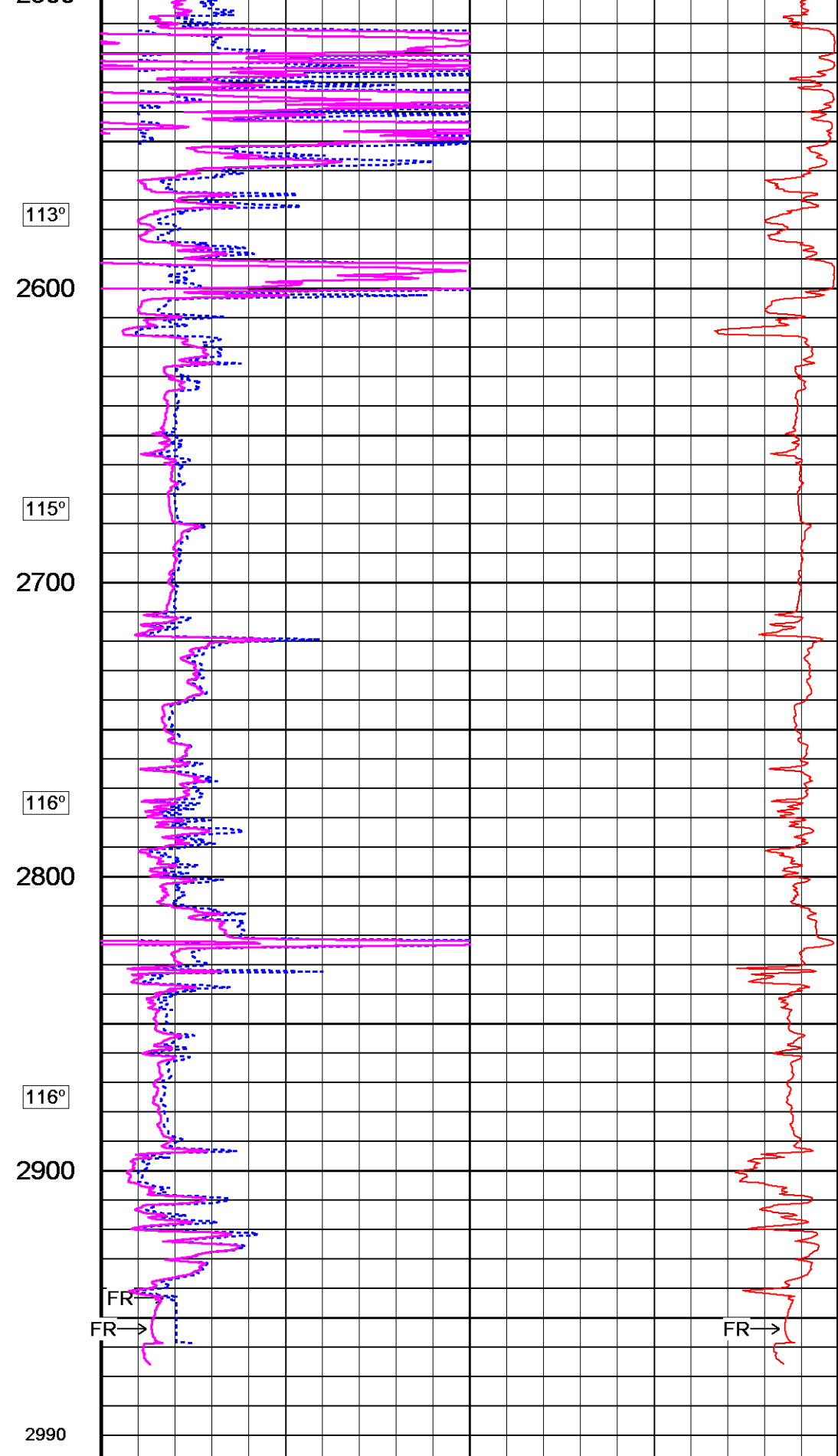
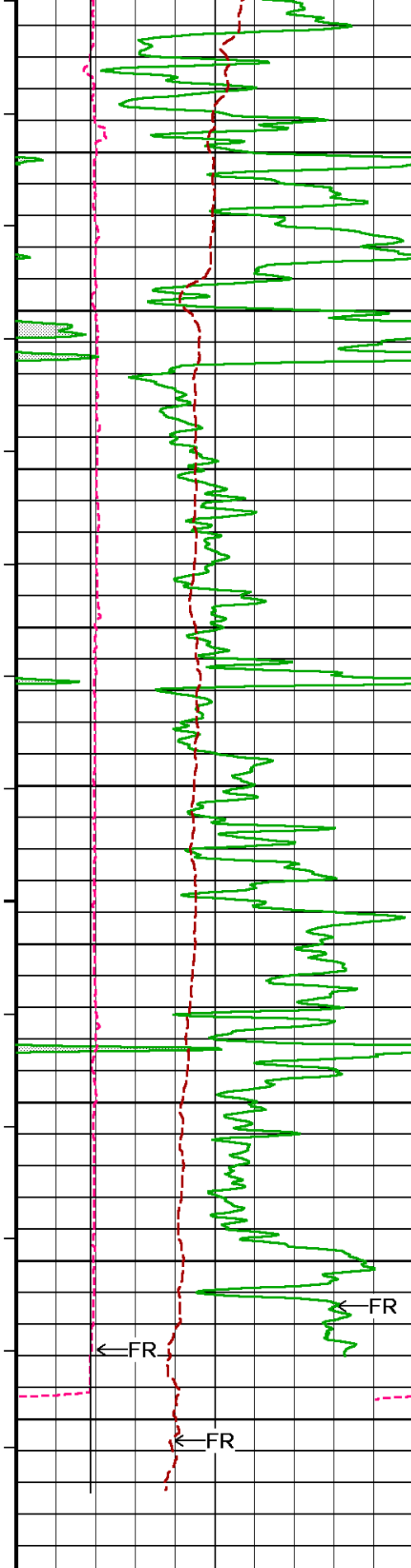




Array Ind. One Res Rt →

Array Ind. One Cond Ct →

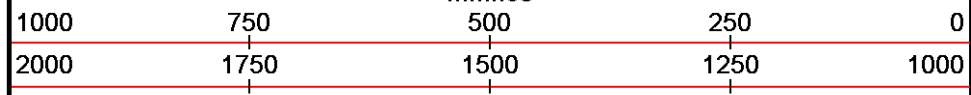




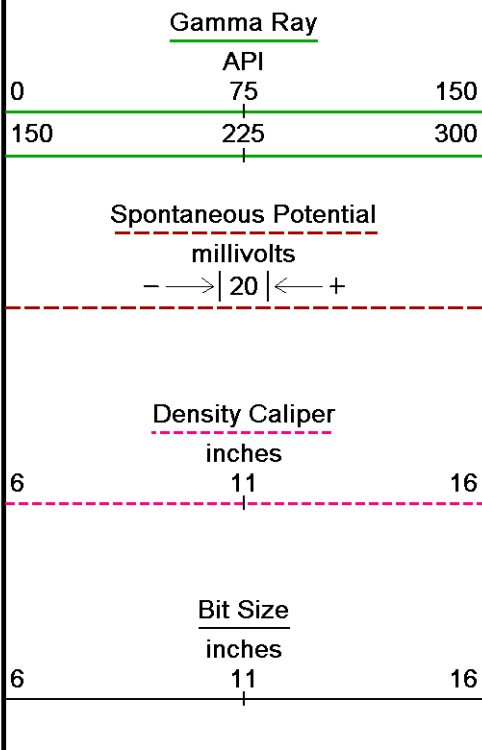
Depth
In
Feet

Array Ind. One Cond Ct

mmhos

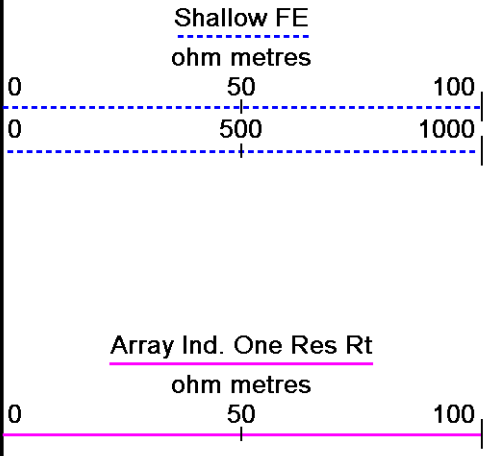


Timing Marks
every 60.0 sec



Borehole Temp in deg F

Replay Scale 1:600

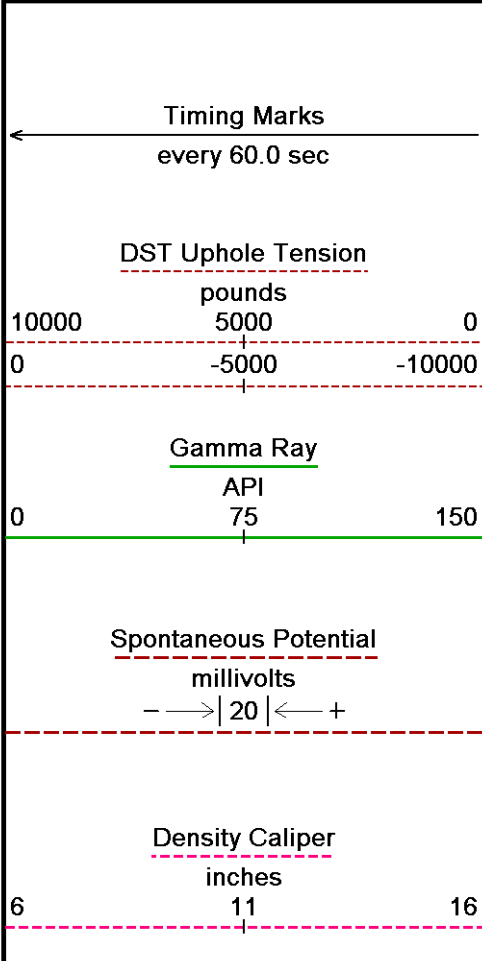


Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 21-MAY-2012 12:39
 Filename: C:\LOGS\XTO\Hocker #4-35\Main.dta
 Recorded on 16-NOV-2011 13:03
 System Versions: Logged with 12.02.4401 Processed with 12.02.4401 Plotted with 12.02.4401

↑ 2 INCH MAIN LOG ↑

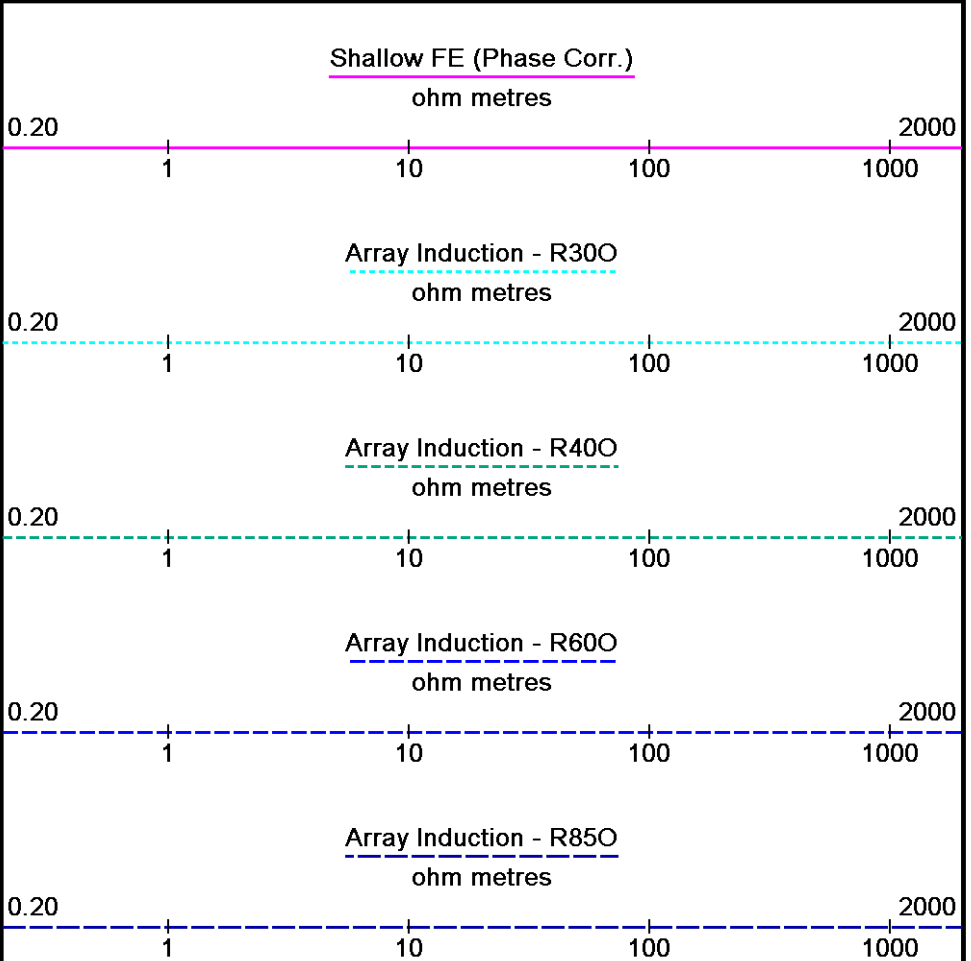
↓ 5 INCH MAIN LOG ↓

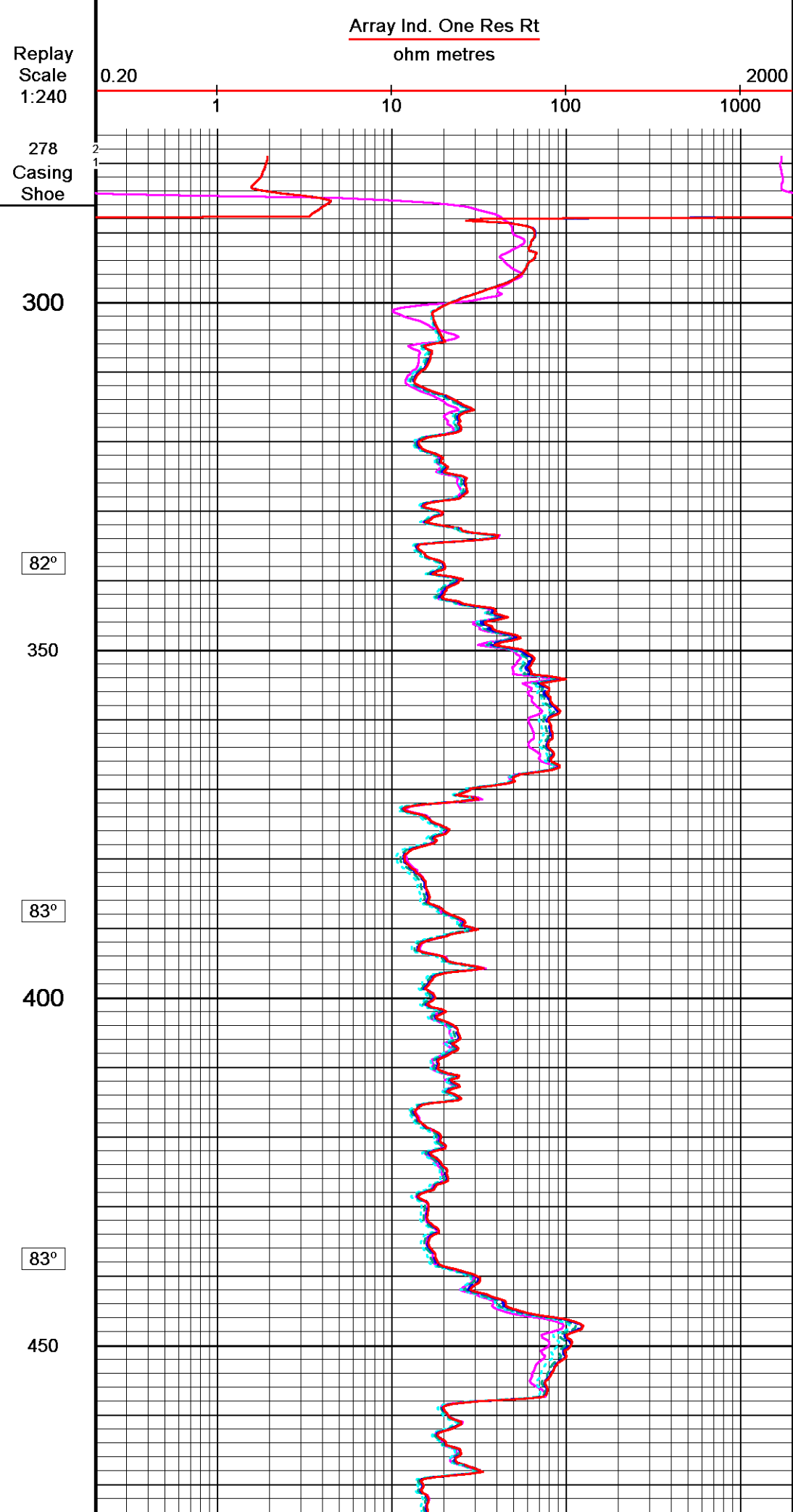
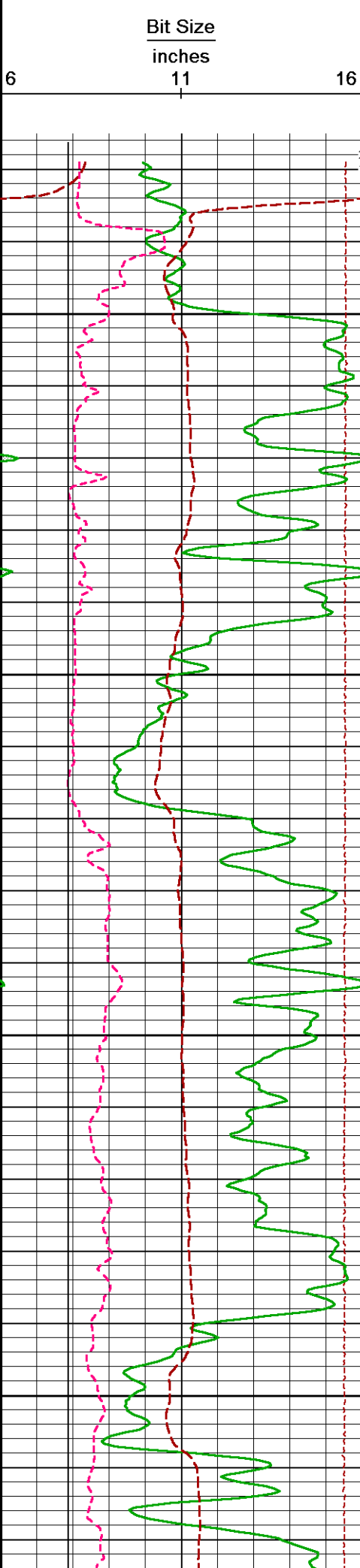
Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 21-MAY-2012 12:39
 Filename: C:\LOGS\XTO\Hocker #4-35\Main.dta
 Recorded on 16-NOV-2011 13:03
 System Versions: Logged with 12.02.4401 Processed with 12.02.4401 Plotted with 12.02.4401

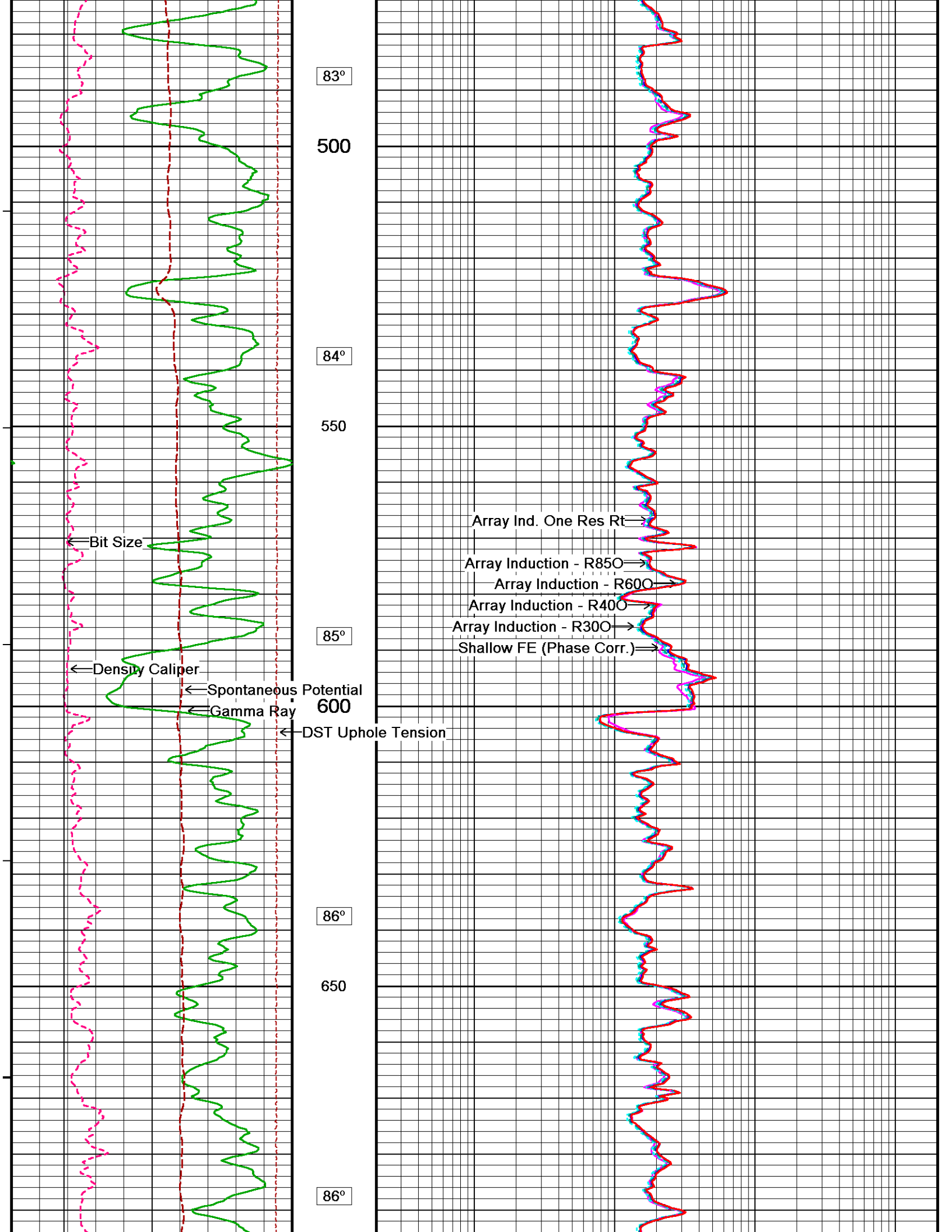


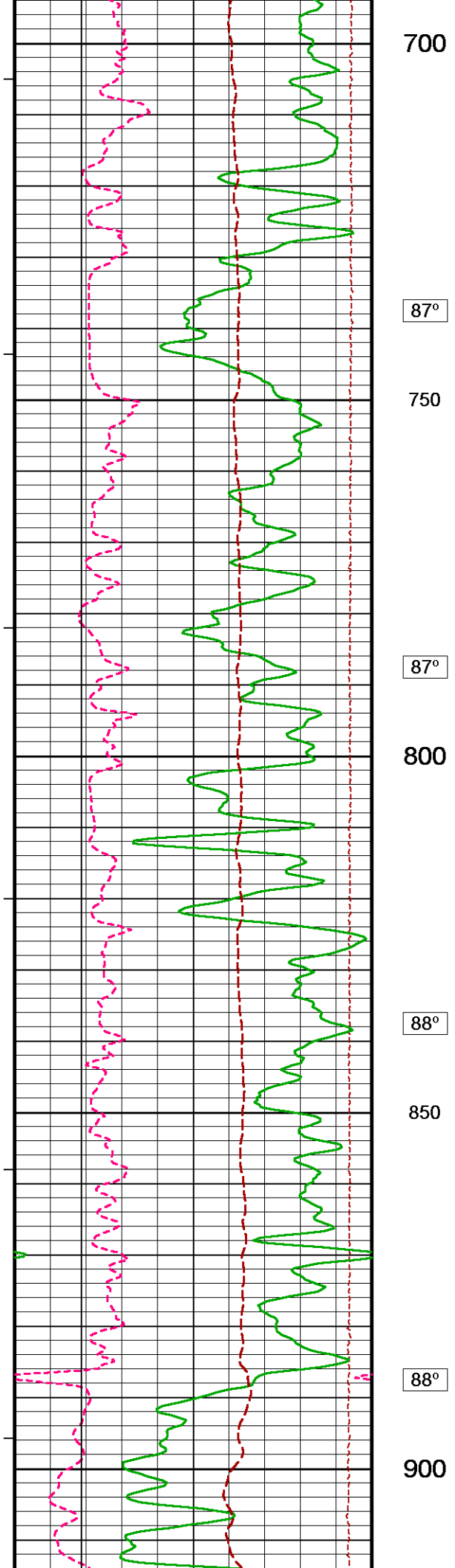
Depth In Feet

Borehole Temp in deg F









700

87°

750

87°

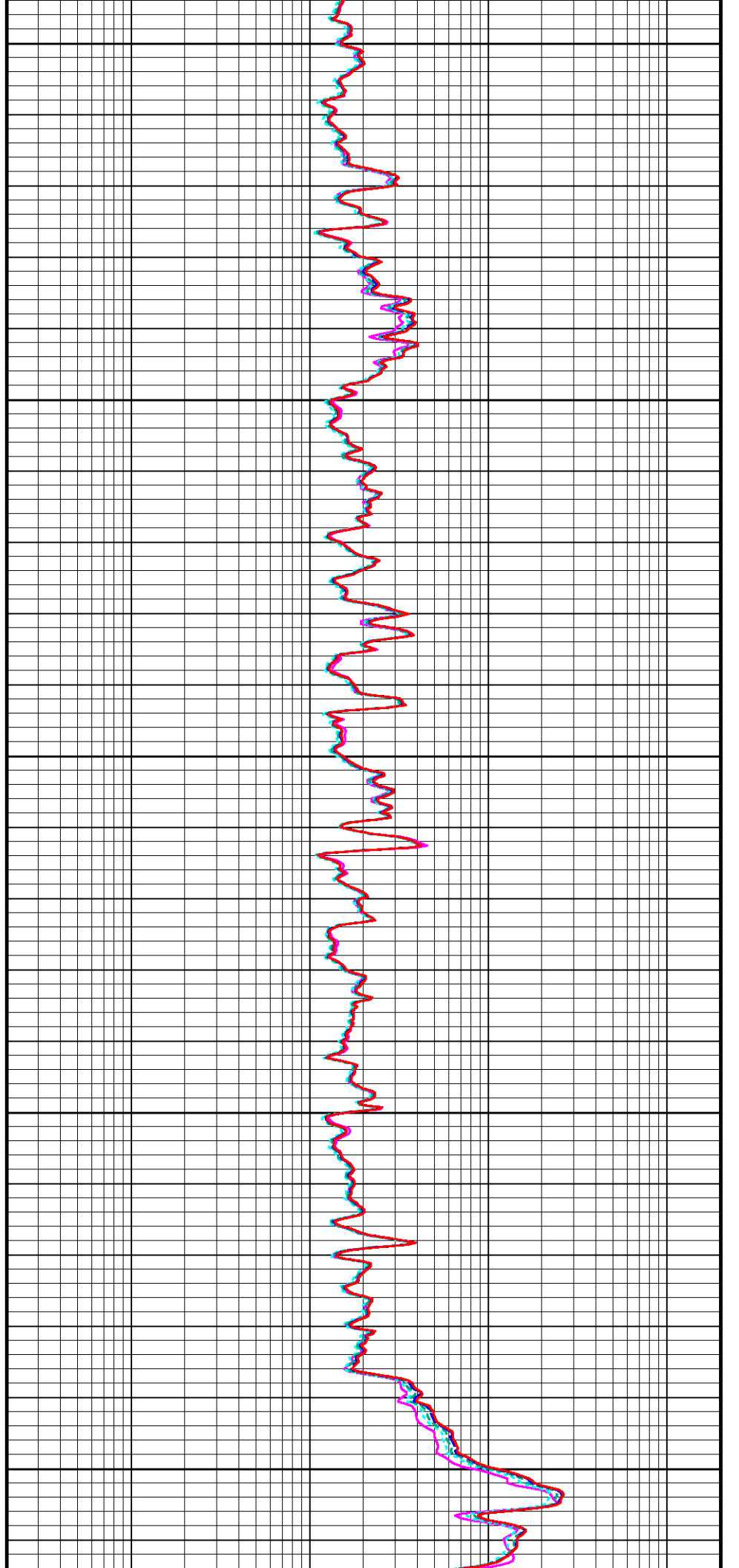
800

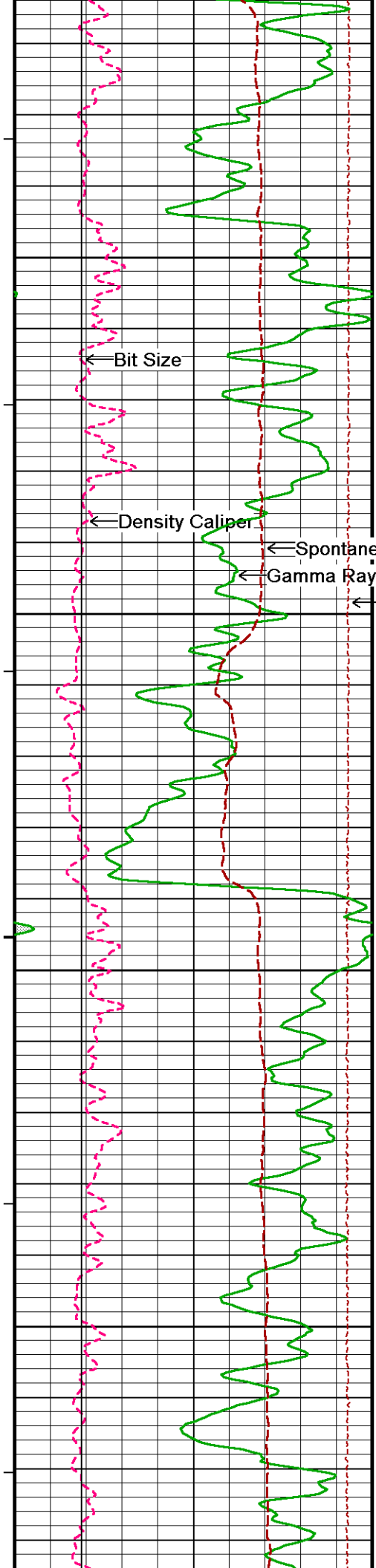
88°

850

88°

900





89°

950

← Bit Size

← Density Caliper

← Spontaneous Potential

← Gamma Ray

← DDT Hole Tension

89°

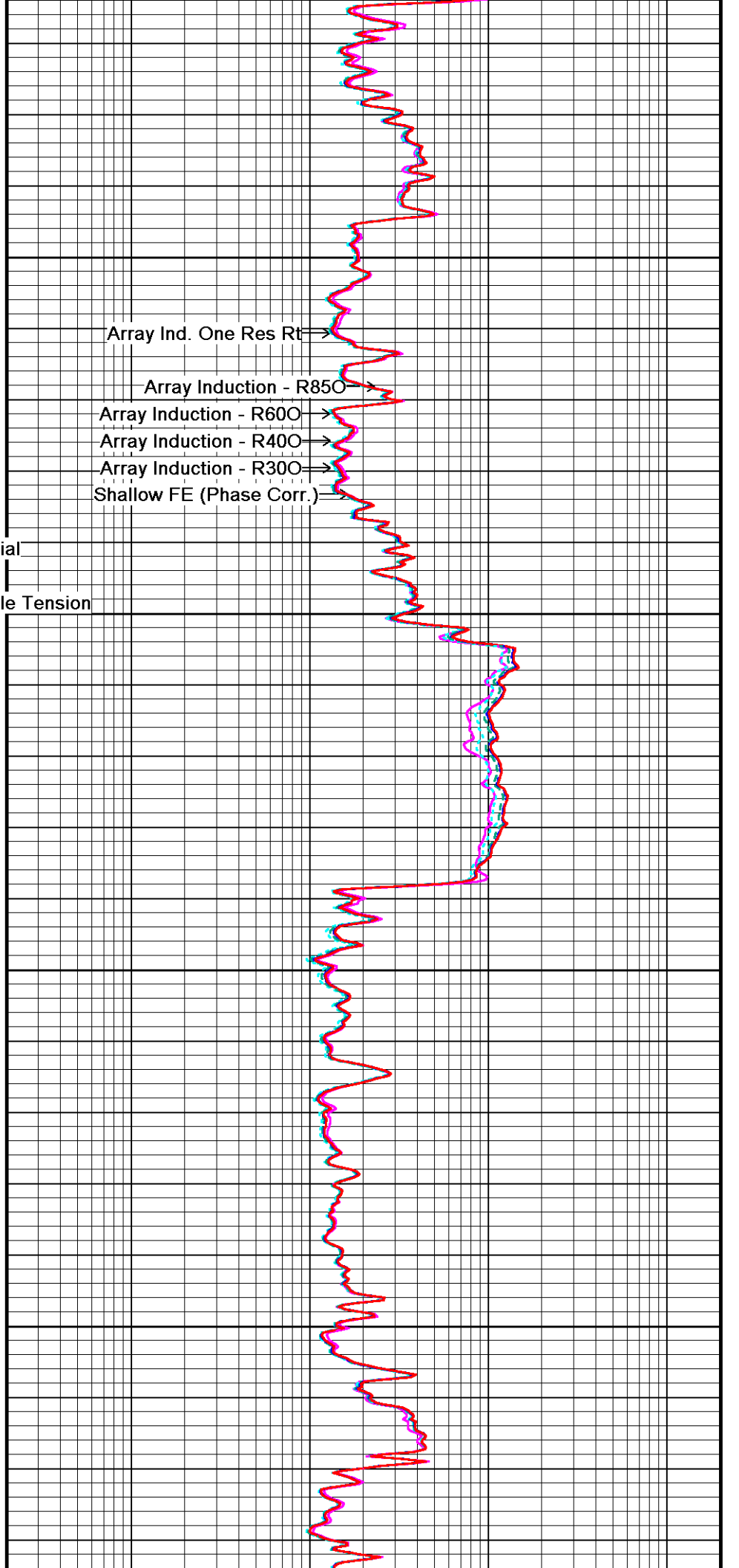
1000

90°

1050

91°

1100



Array Ind. One Res Rt

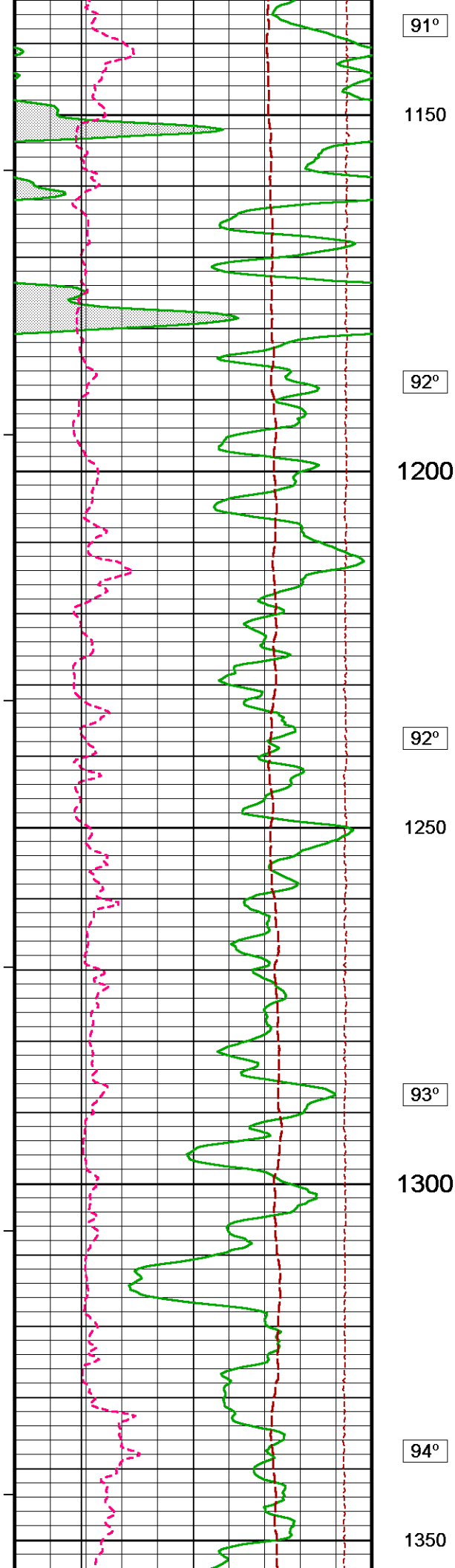
Array Induction - R850

Array Induction - R600

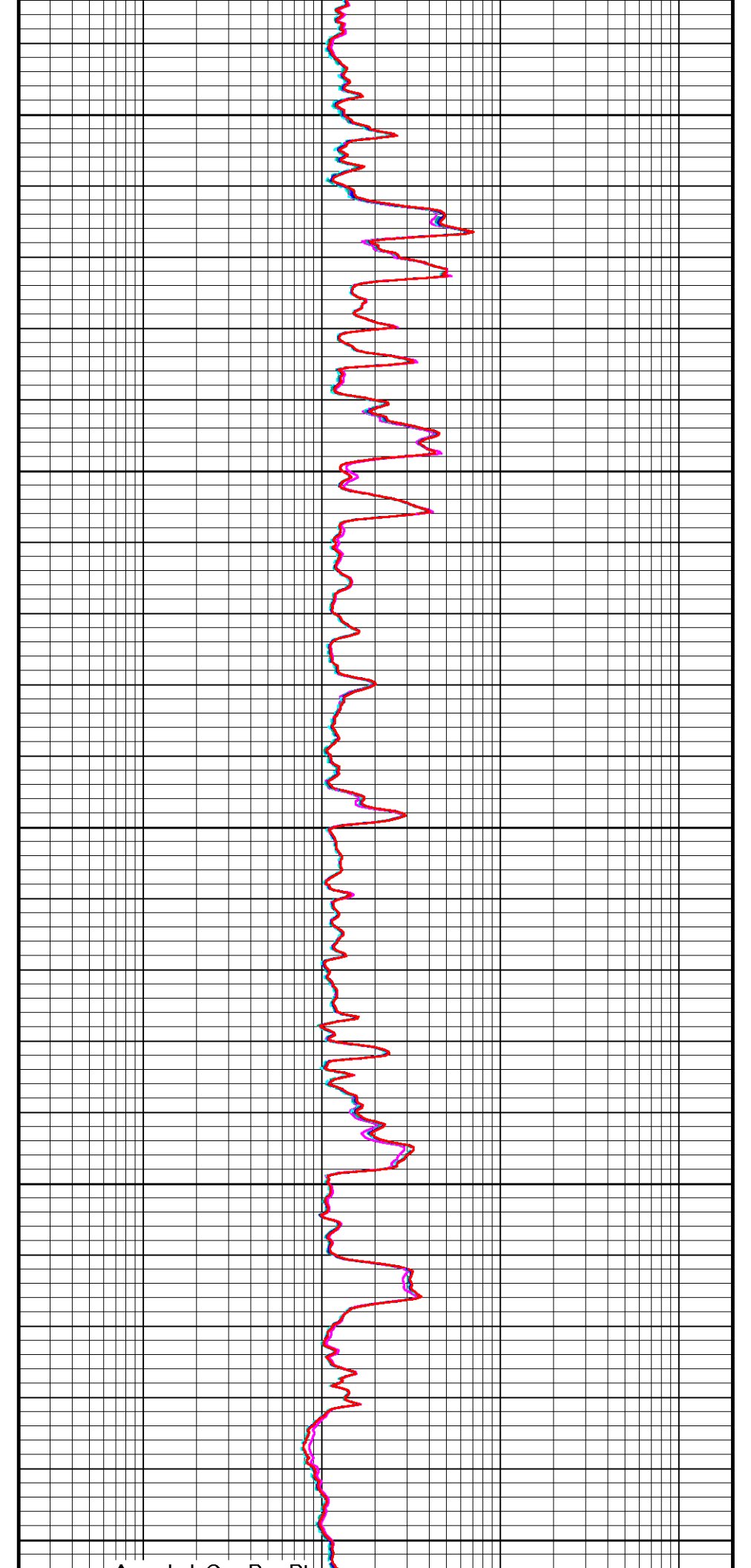
Array Induction - R400

Array Induction - R300

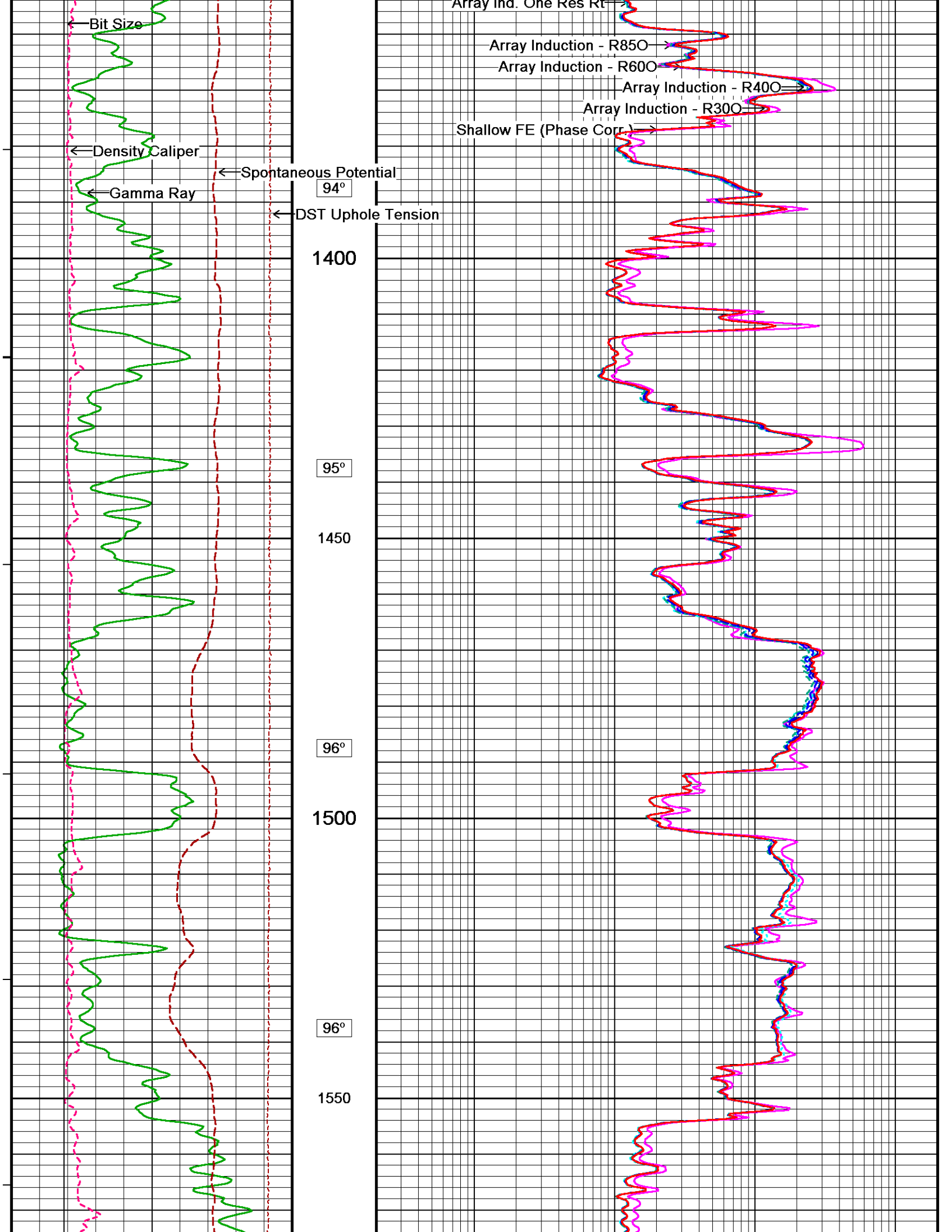
Shallow FE (Phase Corr.)

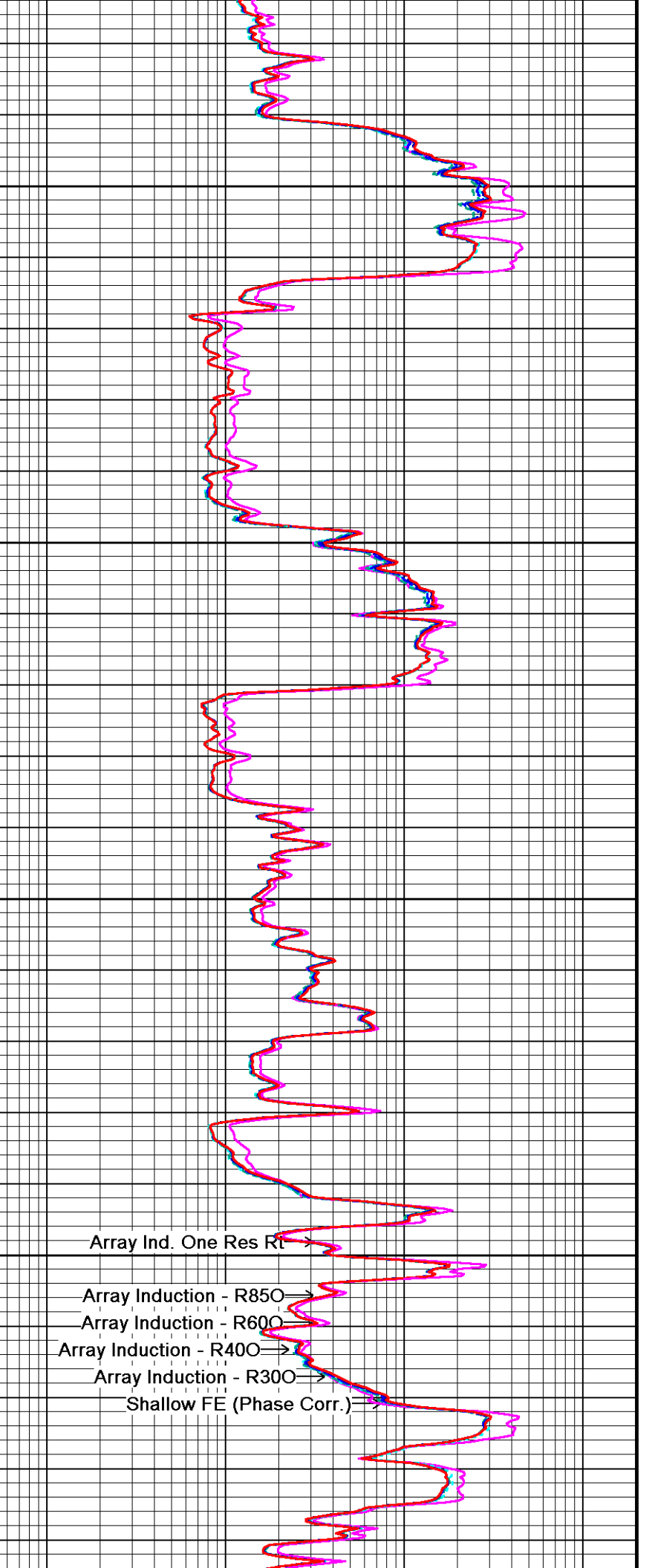
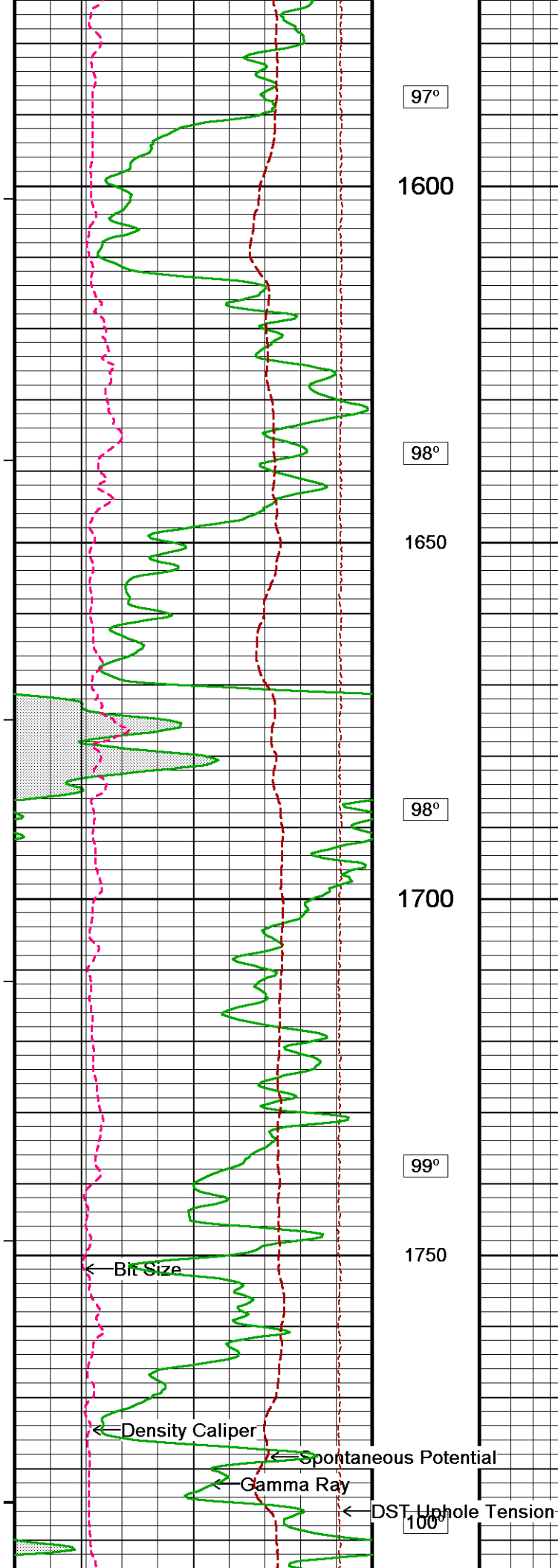


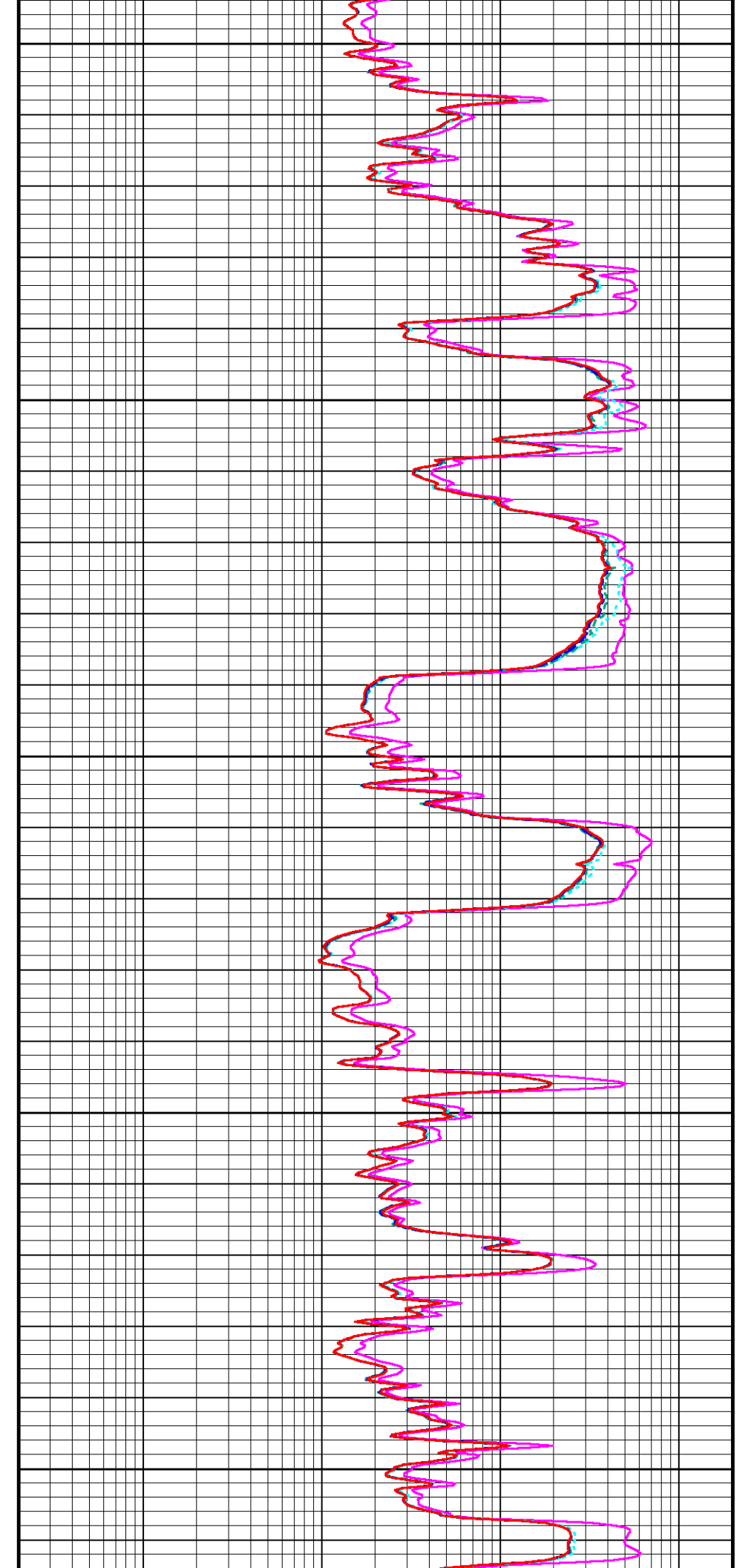
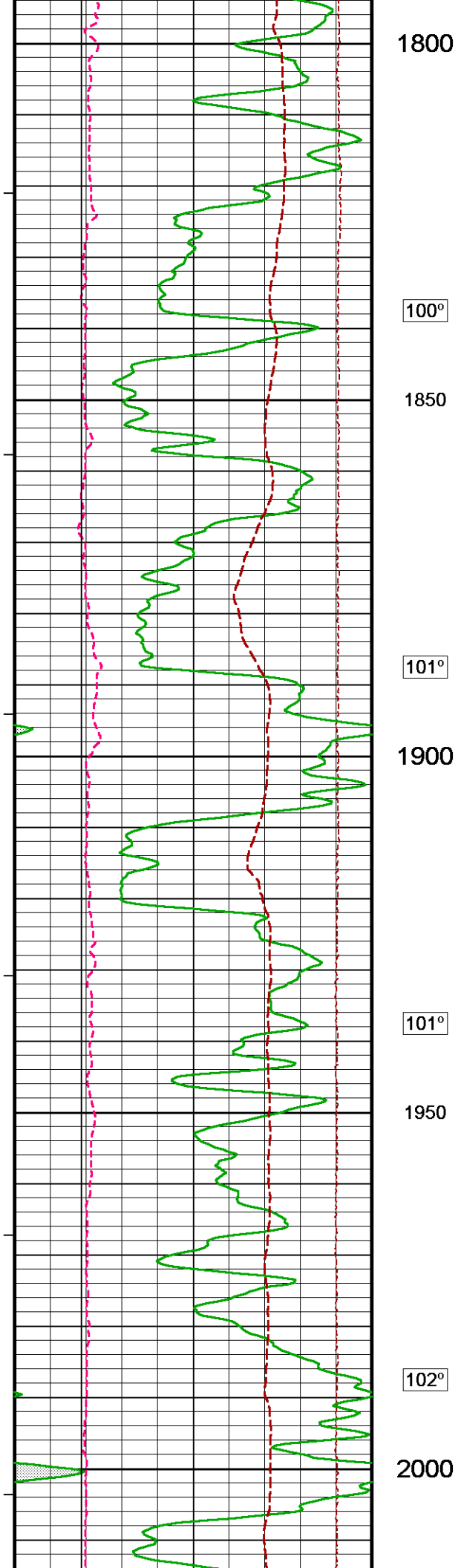
91°
1150
92°
1200
92°
1250
93°
1300
94°
1350

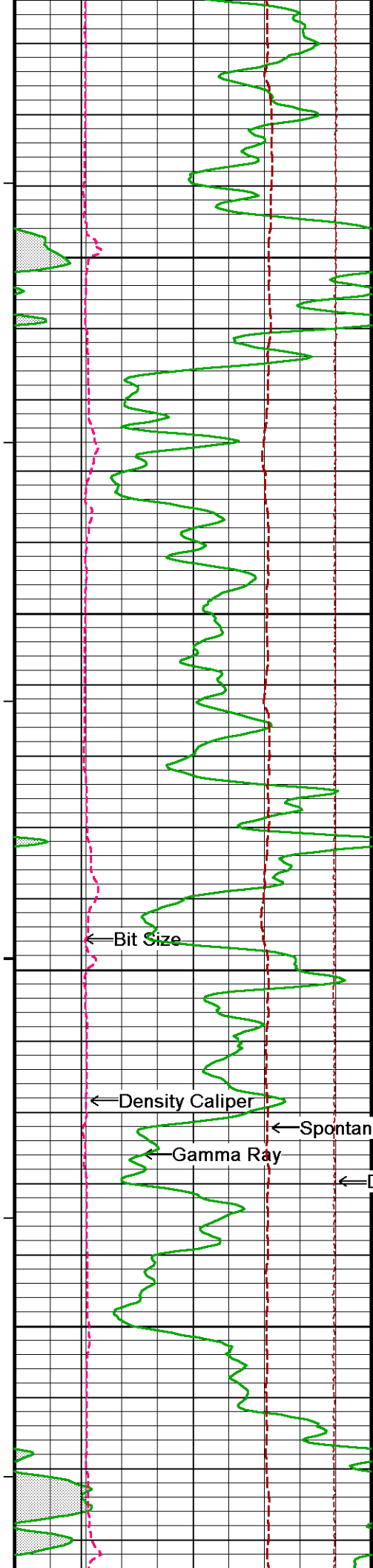


Amplitude









103°

2050

103°

2100

104°

2150

105°

2200

← Bit Size

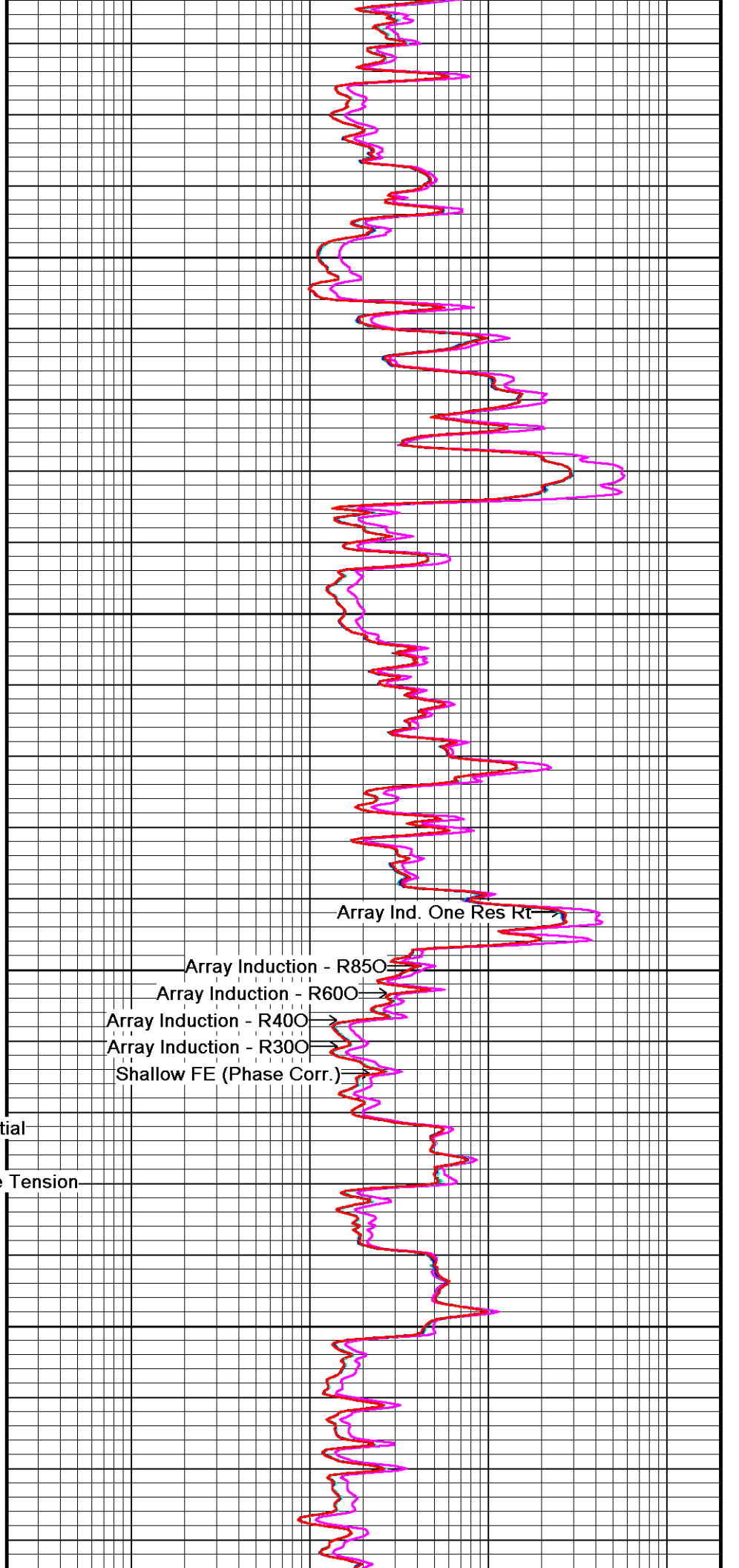
← Density Caliper

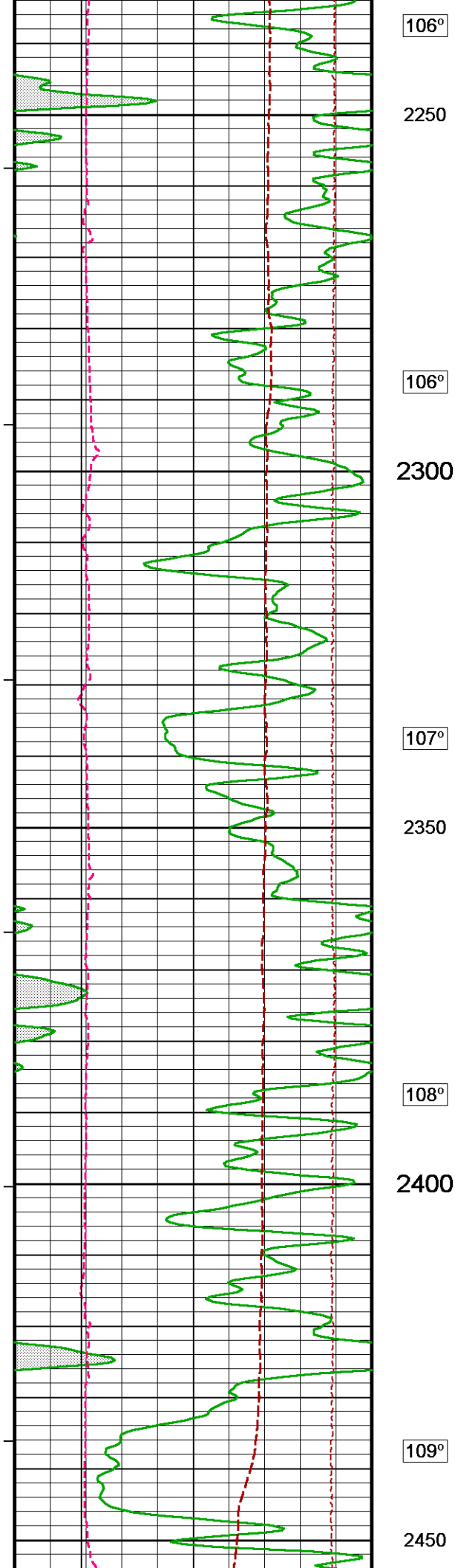
← Gamma Ray

← Spontaneous Potential

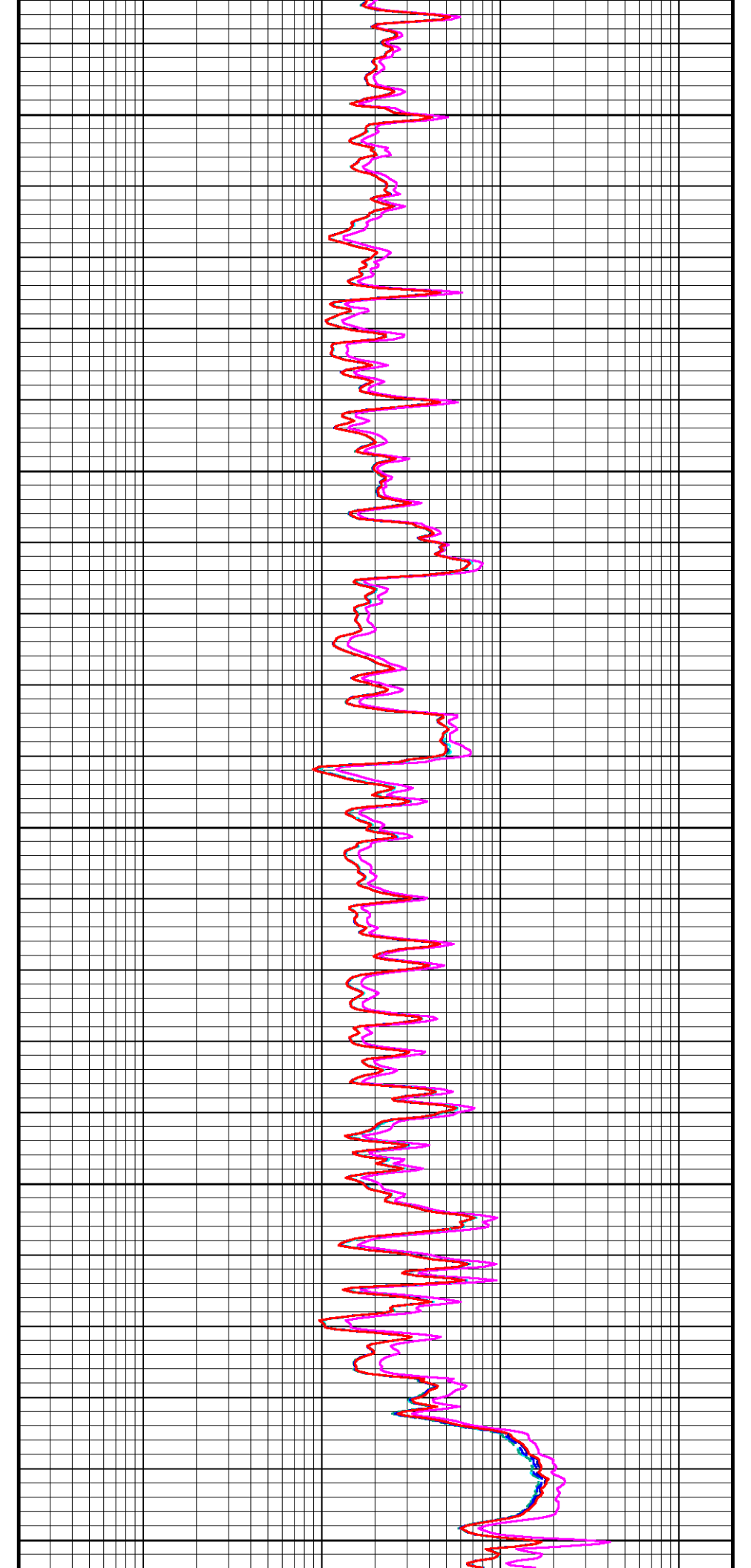
← DST Uphole Tension

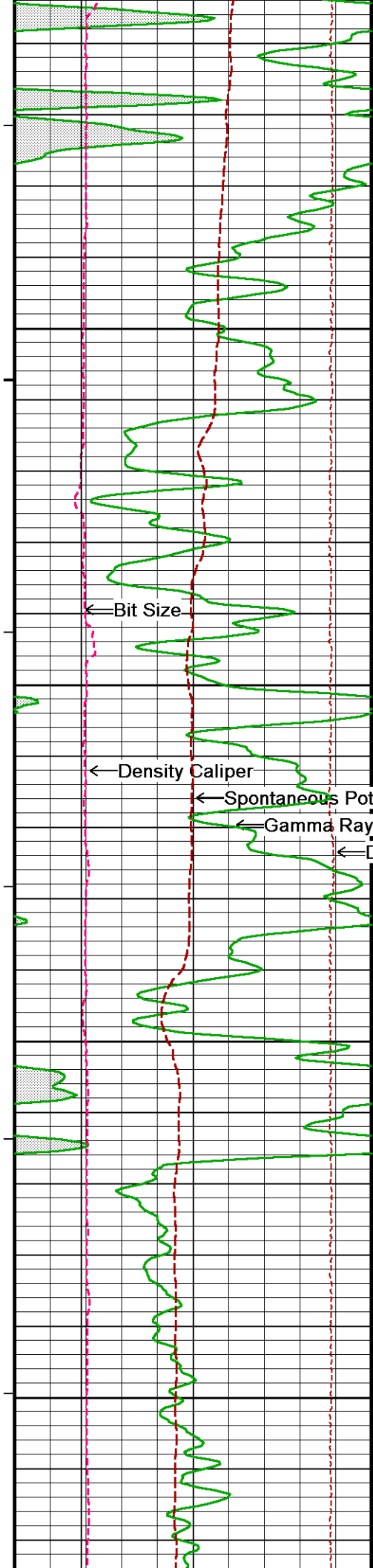
Array Ind. One Res Rt →
Array Induction - R850 →
Array Induction - R600 →
Array Induction - R400 →
Array Induction - R300 →
Shallow FE (Phase Corr.) →





106°
2250
106°
2300
107°
2350
108°
2400
109°
2450





110°

2500

112°

2550

113°

2600

115°

2650

← Bit Size

← Density Caliper

← Spontaneous Potential

← Gamma Ray

← DST Uphole Tension

Array Ind. One Res Rt

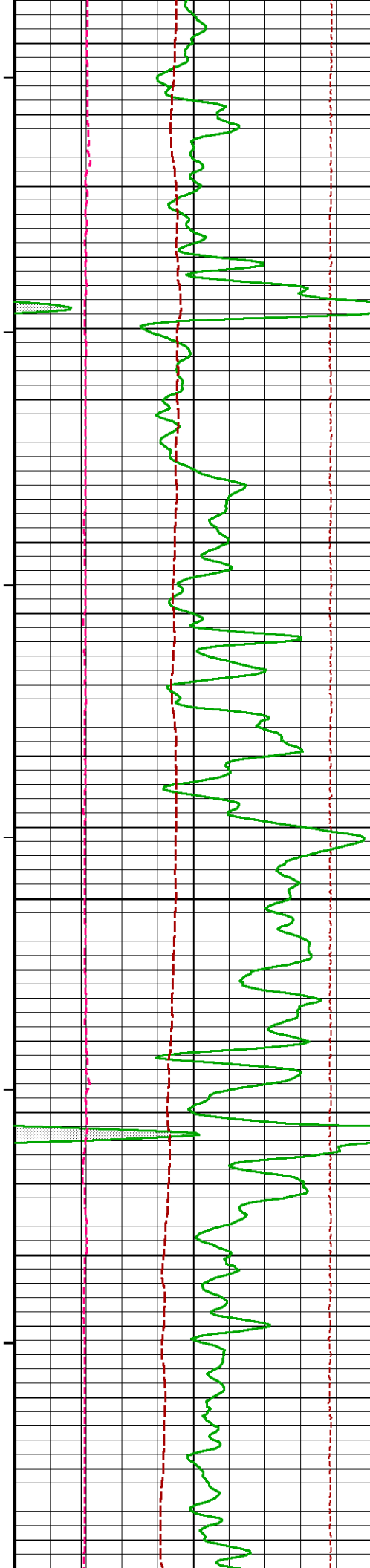
Array Induction - R850

Array Induction - R600

Array Induction - R400

Array Induction - R300

Shallow FE (Phase Corr)



116°

2700

116°

2750

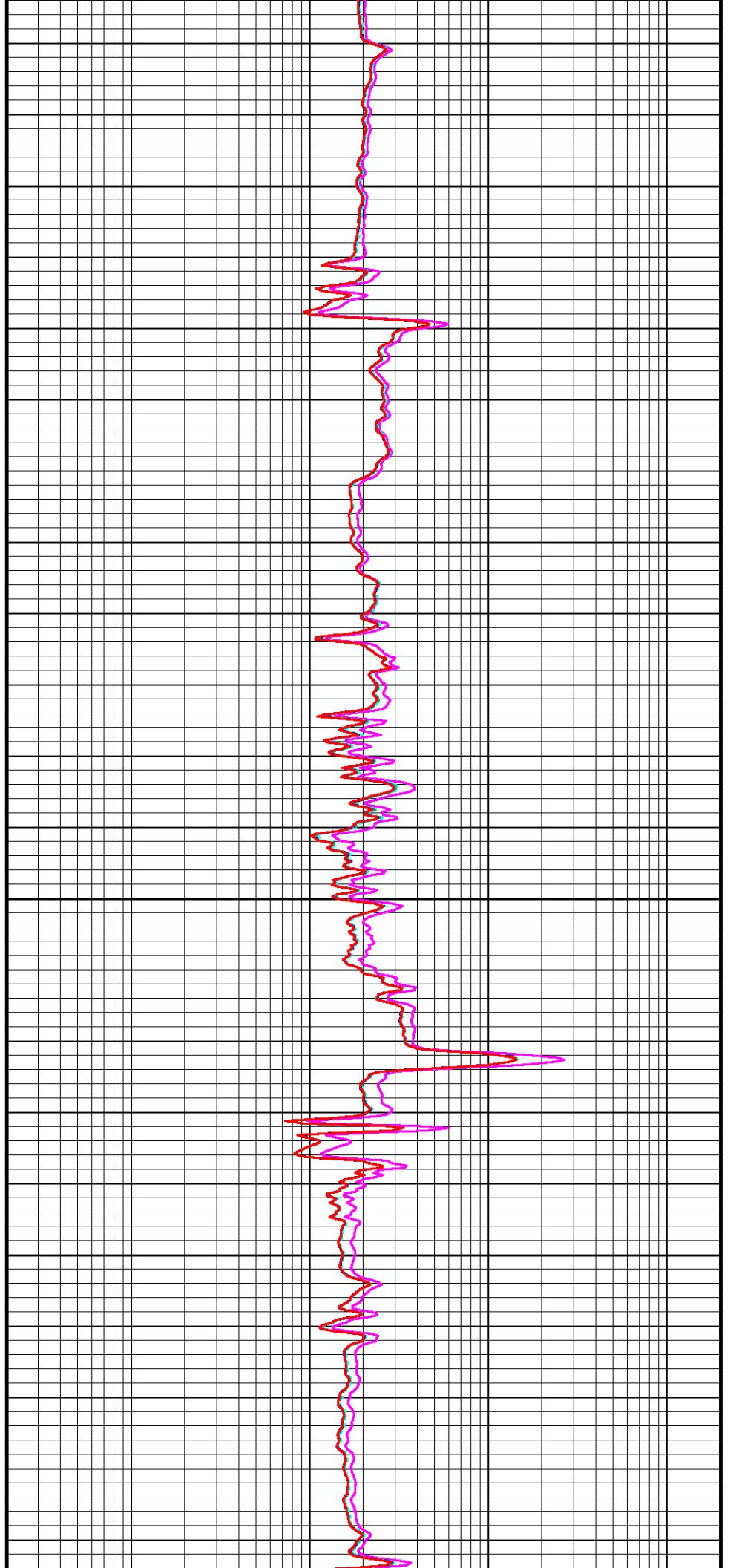
116°

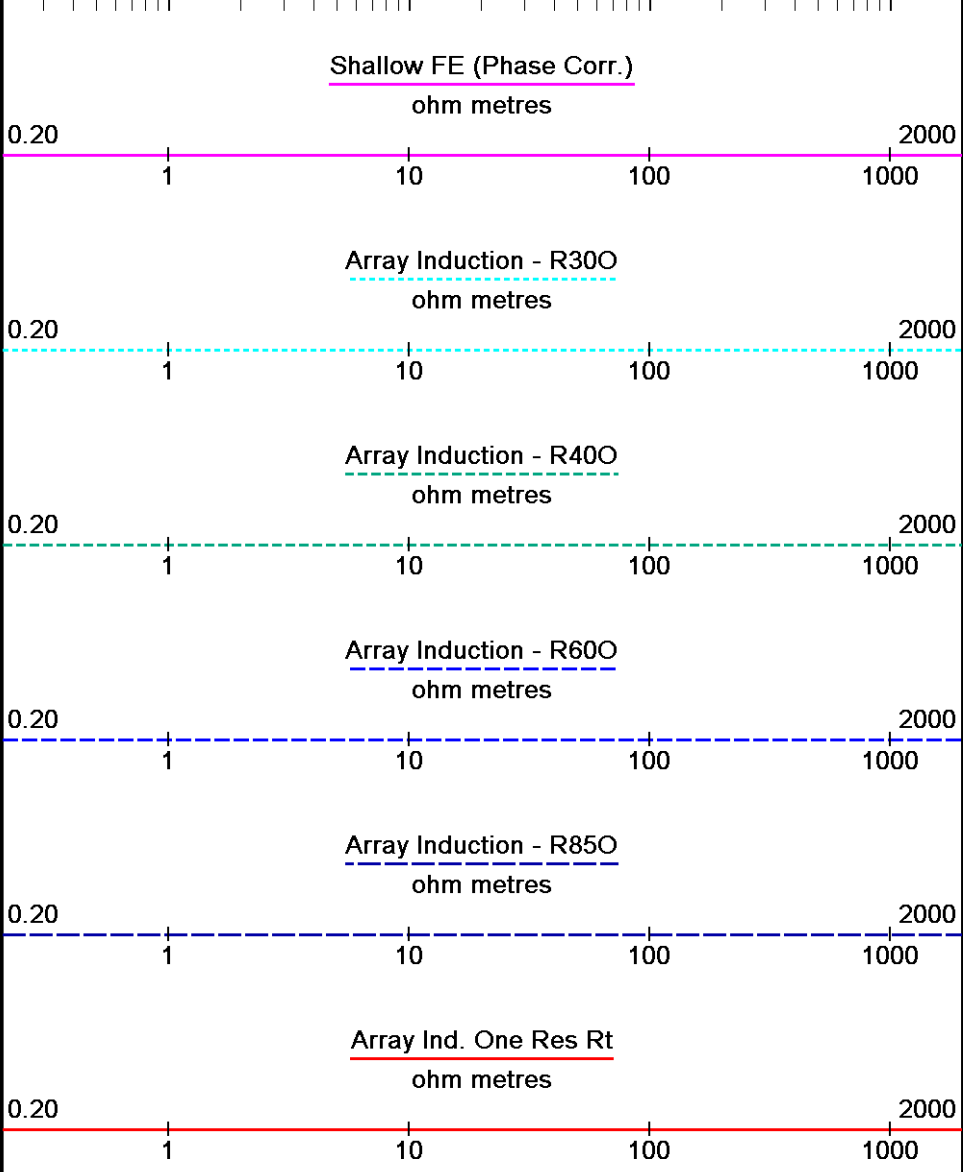
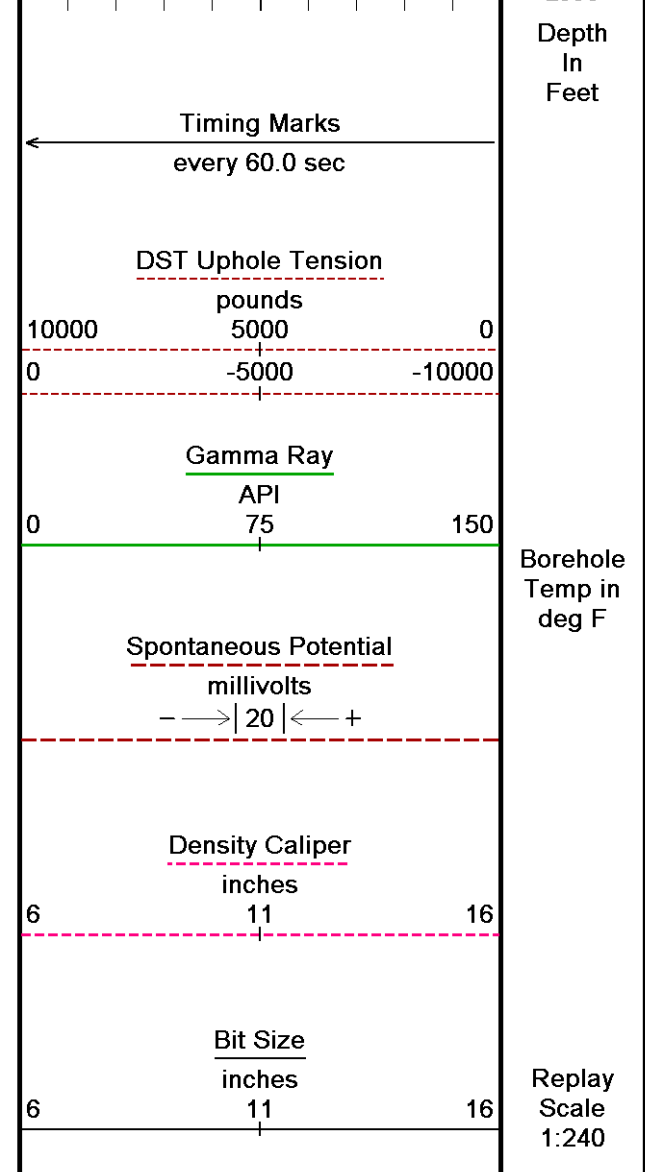
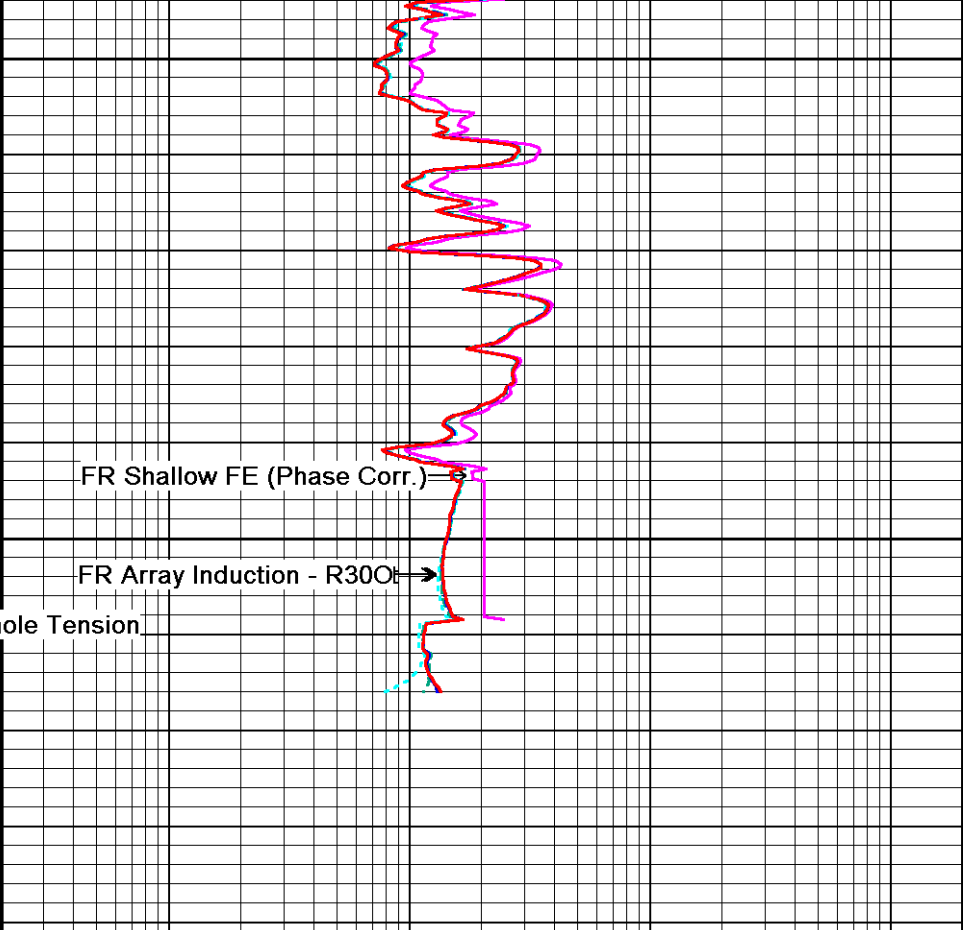
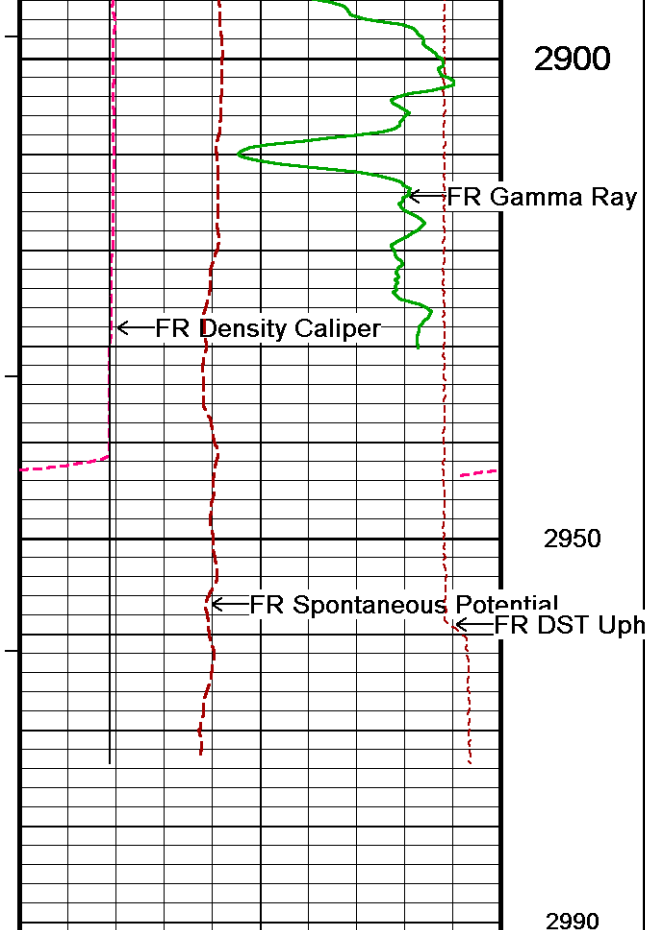
2800

116°

2850

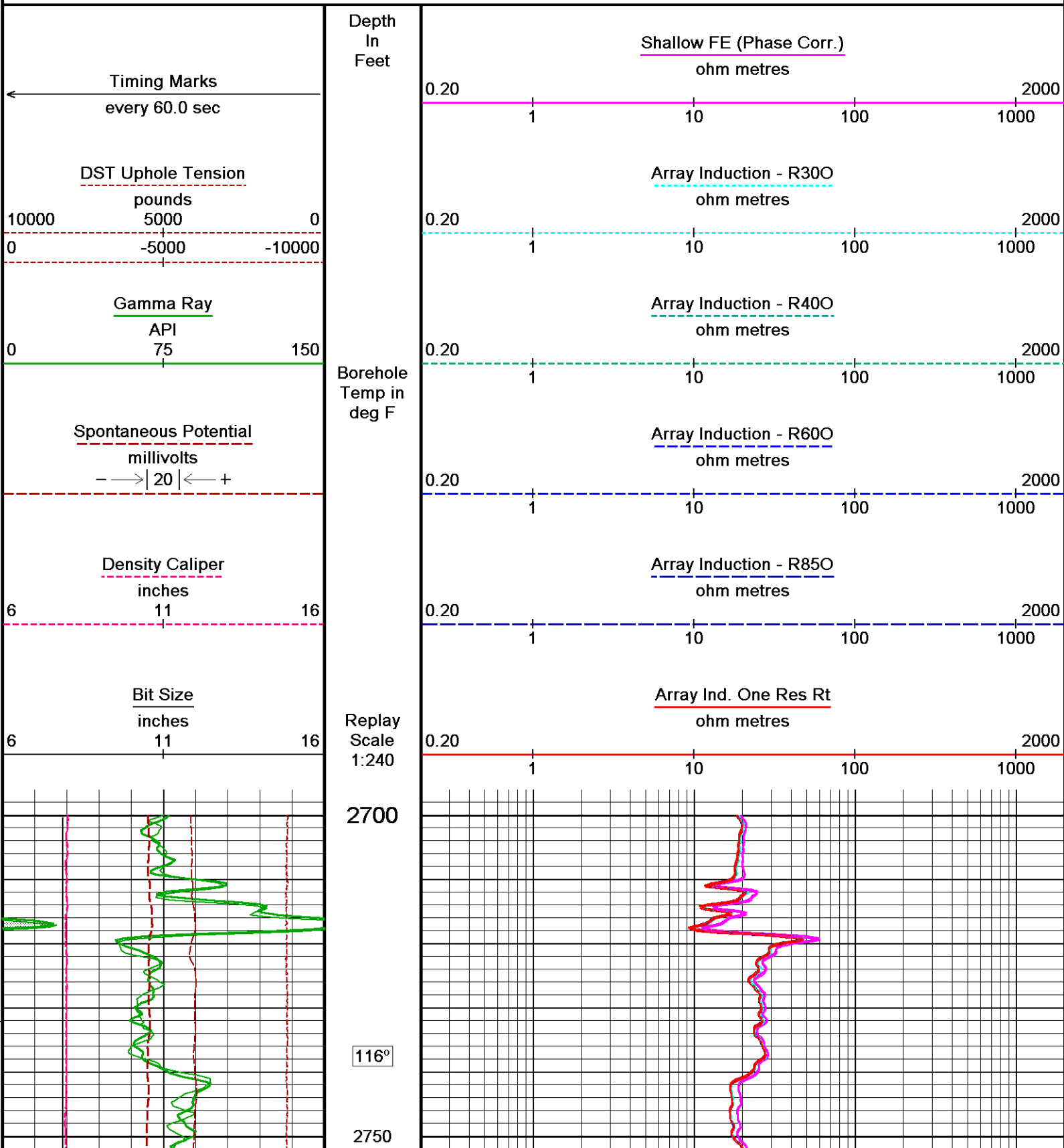
116°

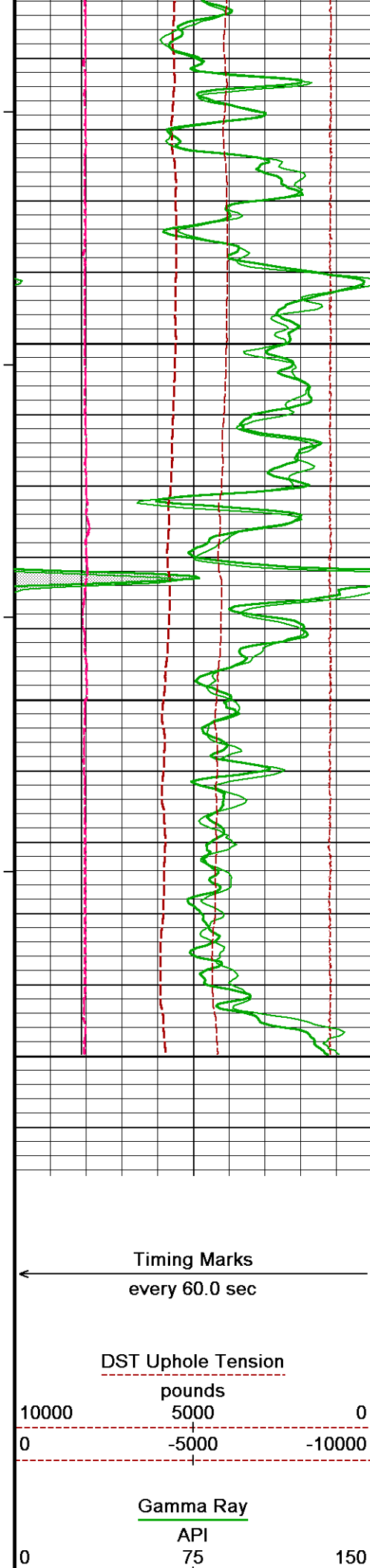




5 INCH MAIN LOG

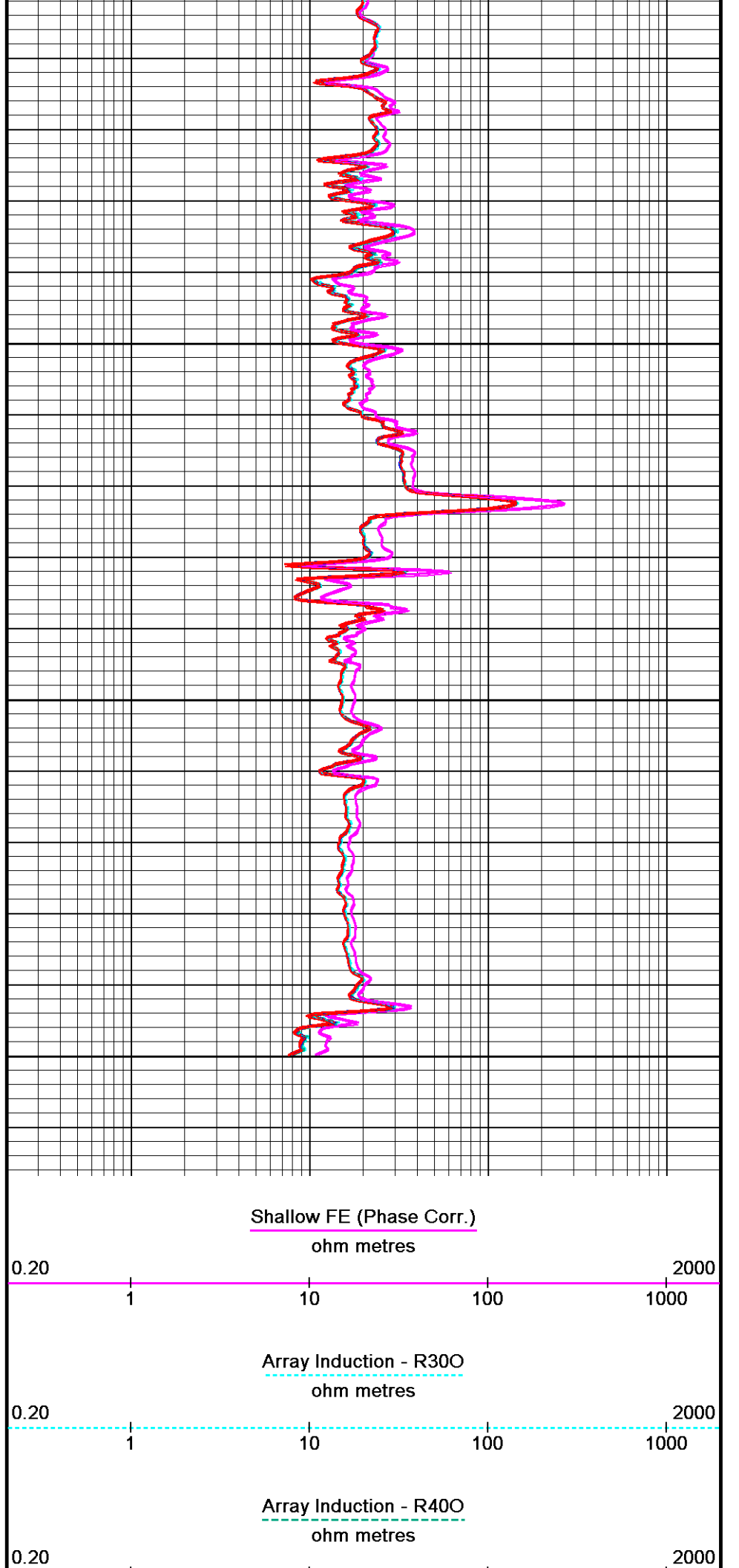
REPEAT OVERLAY

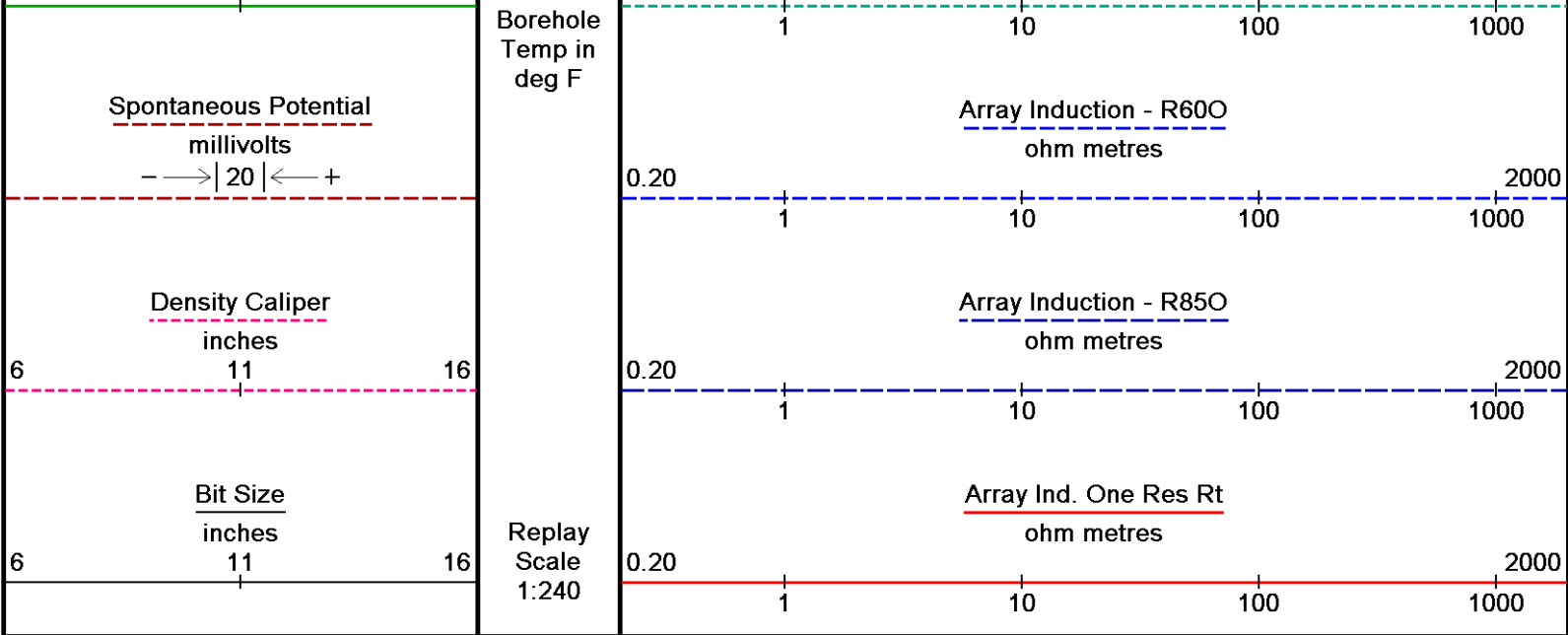




116°
2800
116°
2850
116°
2900

2914
Depth
In
Feet





Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 21-MAY-2012 12:39
 Filename: C:\LOGS\XTO\Hocker #4-35\Main.dta
 Recorded on 16-NOV-2011 13:03
 Filename: C:\LOGS\XTO\Hocker #4-35\Repeat.dta
 Recorded on 16-NOV-2011 12:48
 System Versions: Logged with 12.02.4401 Processed with 12.02.4401 Plotted with 12.02.4401

↑ REPEAT OVERLAY ↑

BEFORE SURVEY CALIBRATION

C:\LOGS\XTO\Hocker #4-35\Setup.dta

General Constants All 000 Last Edited on 16-NOV-2011 11:11

General Parameters		
Mud Resistivity	2.880	ohm-metres
Mud Resistivity Temperature	80.000	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	5.500	inches
Caliper for Differential Caliper	None	
Rwa Parameters		
Porosity used	Base Density Porosity	
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 16-NOV-2011 12:02

Reading No	Measured	Calibrated (lbs)
1	14152.14	0.00
2	15101.17	400.00

Gamma Calibration MCG-C 192 Field Calibration on 16-NOV-2011 10:04

	Measured	Calibrated (API)
Background	95	65
Calibrator (Gross)	1415	977
Calibrator (Net)	1321	912

Gamma Constants MCG-C 192 Last Edited on 14-NOV-2011 18:55

Gamma Calibrator Number	GRC-072	
Mud Density	1.17	gm/cc
Caliper Source for Processing	Density Caliper	

Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

SP Calibration MCG-C 192			Field Calibration on 16-NOV-2011 11:15
	Measured	Calibrated (mV)	
Reference 1	100.9	100.0	
Reference 2	-100.2	-100.0	

High Resolution Temperature Calibration MCG-C 192			Field Calibration on 16-NOV-2011 11:15
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	

High Resolution Temperature Constants MCG-C 192			Last Edited on 14-NOV-2011 18:55
Pre-filter Length	11		

Neutron Calibration MDN-A.B 160			Base Calibration on 27-OCT-2011 11:54	Field Check on 16-NOV-2011 10:14
Base Calibration				
	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3202	98	3714	110
Ratio	32.574		33.764	
Field Calibrator at Base			Calibrated (cps)	
			1310	1964
Ratio	0.667			
Field Check			Calibrated (cps)	
			1318	1953
Ratio	0.675			

Neutron Constants MDN-A.B 160			Last Edited on 16-NOV-2011 15:08
Neutron Source Id	1056		
Neutron Jig Number	5922		
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	7.00	cu	
Dolomite Sigma	4.70	cu	
Formation Pressure Source	None		
Formation Pressure	N/A	kpsi	
Temperature Source	None		
Temperature	N/A	degrees F	
Mud Salinity	0.00	kppm	
Formation Fluid Salinity Source	None		
Formation Fluid Salinity	N/A	kppm	
Barite Mud Correction	Not Applied		
Salinity Correction	Not Applied		

FE Calibration MFE-A.A 85			Base Calibration on 27-OCT-2011 10:52	Field Check on 16-NOV-2011 12:03
Base Calibration				
	Measured	Calibrated (ohm-m)		
Reference 1	0.0	0.0		
Reference 2	968.8	126.8		
Base Check	281.1			
Field Check	280.5			

FE Constants MFE-A.A 85			Last Edited on 16-NOV-2011 10:43
Running Mode	No Sleeve		
MFE K Factor	0.1268		
Caliper Source for FE correction	Density Caliper		
Caliper Value for FE correction	N/A	inches	

Caliper Value for FE correction: N/A
 Rm Source for FE correction: MCG External Temperature
 Temp. for Rm Corr. 0.5 inches
 Stand-off

High Resolution Temperature Calibration MAI-B.A 213

Field Calibration on 07-NOV-2011 11:24

	Measured	Calibrated(Deg F)
Lower	10.00	50.00
Upper	100.00	212.00

High Resolution Temperature Constants MAI-B.A 213

Last Edited on 07-NOV-2011 11:24

Pre-filter Length 11

Induction Calibration MAI-B.A 213

Base Calibration on 22-JAN-2007 12:35
Field Check on 16-NOV-2011 12:15

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	16.8	462.4	9.3	966.2
2	6.2	381.7	7.6	821.4
3	3.6	254.8	5.2	566.0
4	2.3	132.3	2.6	279.2

Array Temperature 73.6 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	16.1	3937.6
2	0.0	0.0	32.0	3541.4
3	0.0	0.0	30.4	3115.3
4	0.0	0.0	20.1	2097.3
Deep	0.0	0.0	18.5	2078.8
Medium	0.0	0.0	44.5	4089.7
Shallow	0.0	0.0	48.0	5161.9

Array Temperature 0.0 69.1 Deg F

Induction Constants MAI-B.A 213

Last Edited on 16-NOV-2011 14:26

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 6.0000
 Stand-off Fin Angle 60.00 degrees
 Stand-off Fin Width 0.7500 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

AFTER SURVEY CALIBRATION

C:\LOGS\XTO\Hocker #4-35\Setup.dta

Gamma Check MCG-C 192

Field Calibration on 16-NOV-2011 10:04
After Survey Check on 16-NOV-2011 15:05

	Before (API)	After (API)
Background	65	63
Calibrator (Gross)	977	975
Calibrator (Net)	912	912

Neutron Check MDN-A.B 160

Before Survey Check on 16-NOV-2011 10:14
After Survey Check on 16-NOV-2011 15:14

Near (cps)		Far (cps)		Ratio
Before	After	Before	After	
1318	1344	1953	1981	
	Before	After		
	0.675	0.678		

FE Check MFE-A.A 85

Before Survey Check 16-NOV-2011 12:03
After Survey Check on 16-NOV-2011 14:30

Before (ohm-m)	After (ohm-m)
280.5	280.5

Induction Check MAI-B.A 213

Before Survey Check on 16-NOV-2011 12:15
After Survey Check on 16-NOV-2011 14:29

Channel	Before Survey (mmho/m)		After Survey (mmho/m)		Deg F
	Low	High	Low	High	
1	16.1	3937.6	16.8	3937.7	
2	32.0	3541.4	32.3	3541.3	
3	30.4	3115.3	30.6	3115.5	
4	20.1	2097.3	20.3	2097.8	
Deep	18.5	2078.8	18.6	2079.5	
Medium	44.5	4089.7	44.7	4089.7	
Shallow	48.0	5161.9	48.4	5161.0	
Array Temperature		69.1		77.1	

Photo Density Check MPD-C.A 219

Before Survey Check on 16-NOV-2011 12:07
After Survey Check on 16-NOV-2011 14:34

Density Check

	Near		Far	
	Before	After	Before	After
	604.7	604.3	683.7	685.3

PE Check

	Before	After
WS	112.9	111.4
WH	543.4	540.7

DOWNHOLE EQUIPMENT

C:\LOGS\XTO\Hocker #4-35\Setup.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

SHA-F Compact Swivel Head Adaptor
SHA-F 82 LG: 2.74 ft WT: 26.5 lb OD: 2.24 in

Compact Comms Gamma
MCG-C 192 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Neutron
MDN-A.B 160 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in



42.77 ft

GRGC - Gamma Ray

39.87 ft

CGXT - MCG External Temperature

36.32 ft

NPRS - Sandstone Neutron Por.

Compact Density/Caliper
MPD-C.A 219 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

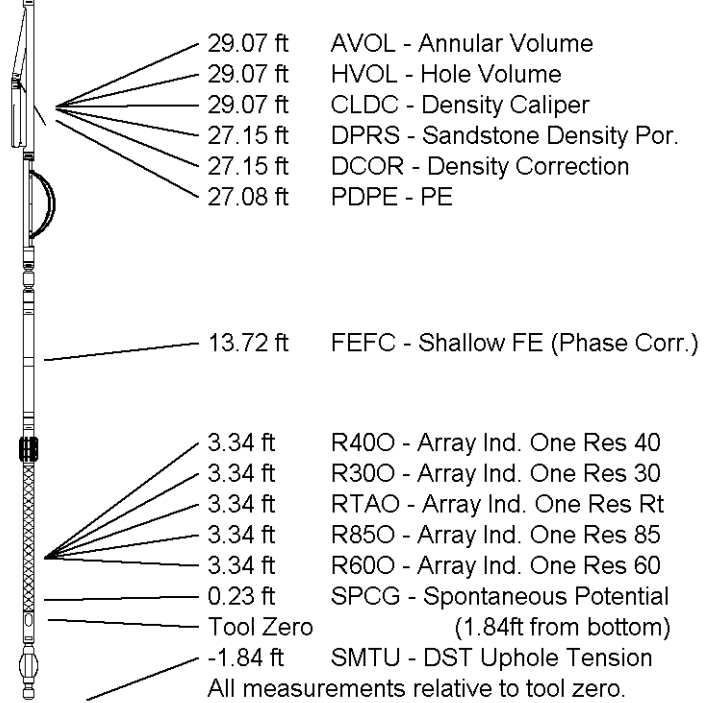
MIS-D.A Compact Inline Bowspring sub
MIS-D.A 439 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 114 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focused Electric
MFE-A.A 85 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-B.A 213 LG: 12.52 ft WT: 48.5 lb OD: 2.24 in

Total Length: 54.09 ft Weight: 401.2 lb



COMPANY XTO ENERGY, INC.
WELL HOCKER #4-35
FIELD IGNACIO BLANCO/FRUITLAND COAL
PROVINCE/COUNTY LA PLATA
COUNTRY/STATE USA/COLORADO

Elevation Kelly Bushing	6353.00	feet	First Reading	2956.00	
Elevation Drill Floor	6353.00	feet	Depth Driller	2965.00	feet
Elevation Ground Level	6342.00	feet	Depth Logger	2959.00	feet



ARRAY INDUCTION - RTAP
SHALLOW FOCUSED
ELECTRIC LOG

