Confidentiality Requested:
☐ Yes ☐ No

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

1074211

Form ACO-1
August 2013
Form must be Typed
Form must be Signed
All blanks must be Filled

WELL COMPLETION FORM
WELL HISTORY - DESCRIPTION OF WELL & LEASE

OPERATOR: License # 31885
Name: M & M Exploration, Inc.
Address 1: 4257 MAIN ST., #230
Address 2:
City: WESTMINSTER State: CO Zip: 80031 + __ __ __ __
Contact Person: Mike Austin
Phone: (303) 438-1991
CONTRACTOR: License # 33350
Name: Southwind Drilling, Inc.
Wellsite Geologist: Mike Pollok
Purchaser: ONEOK

Designate Type of Completion:

☑ New Well ☐ Re-Entry ☐ Workover

☐ Oil ☐ WSW ☐ SWD ☐ SIOW
☑ Gas ☐ D&A ☐ ENHR ☐ SIGW
☐ OG ☐ GSW ☐ Temp. Abd.
☐ CM *(Coal Bed Methane)*
☐ Cathodic ☐ Other *(Core, Expl., etc.)*:

If Workover/Re-entry: Old Well Info as follows:

Operator:
Well Name:
Original Comp. Date: Original Total Depth:

☐ Deepening ☐ Re-perf. ☐ Conv. to ENHR ☐ Conv. to SWD
☐ Plug Back ☐ Conv. to GSW ☐ Conv. to Producer

☐ Commingled Permit #:
☐ Dual Completion Permit #:
☐ SWD Permit #:
☐ ENHR Permit #:
☐ GSW Permit #:

11/3/2011	11/11/2011	1/27/2012
Spud Date or Recompletion Date	Date Reached TD	Completion Date or Recompletion Date

API No. 15 - 15-007-23790-00-00
Spot Description:
__ - __ - NW - NW Sec. 16 Twp. 34 S. R. 14 ☐ East ☑ West
660 Feet from ☑ North / ☐ South Line of Section
660 Feet from ☐ East / ☑ West Line of Section
Footages Calculated from Nearest Outside Section Corner:
☐ NE ☑ NW ☐ SE ☐ SW
GPS Location: Lat: *(e.g. xx.xxxxx)* , Long: *(e.g. -xxx.xxxxx)*
Datum: ☐ NAD27 ☐ NAD83 ☐ WGS84
County: Barber
Lease Name: Z Bar Well #: 16-4
Field Name: Aetna Gas Area
Producing Formation: Mississippian
Elevation: Ground: 1554 Kelly Bushing: 1566
Total Vertical Depth: 4950 Plug Back Total Depth: 4900
Amount of Surface Pipe Set and Cemented at: 900 Feet
Multiple Stage Cementing Collar Used? ☐ Yes ☑ No
If yes, show depth set: Feet
If Alternate II completion, cement circulated from:
feet depth to: w/ sx cmt.

Drilling Fluid Management Plan
(Data must be collected from the Reserve Pit)

Chloride content: 0 ppm Fluid volume: 0 bbls
Dewatering method used: Evaporated

Location of fluid disposal if hauled offsite:

Operator Name:
Lease Name: License #:
Quarter Sec. Twp. S. R. ☐ East ☐ West
County: Permit #:

AFFIDAVIT

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

KCC Office Use ONLY

☑ **Confidentiality Requested**
Date: 02/28/2012
☑ **Confidential Release Date:** 02/27/2014
☑ **Wireline Log Received**
☐ **Geologist Report Received**
☐ **UIC Distribution**
ALT ☑ **I** ☐ **II** ☐ **III** **Approved by:** NAOMI JAMES **Date:** 02/29/2012

[redacted] 1074211

Operator Name: M & M Exploration, Inc. Lease Name: Z Bar Well #: 16-4

Sec. 16 Twp. 34 S. R. 14 ☐ East ☑ West County: Barber

INSTRUCTIONS: Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken ☐ Yes ☑ No
(Attach Additional Sheets)

Samples Sent to Geological Survey ☑ Yes ☐ No

Cores Taken ☐ Yes ☑ No

Electric Log Run ☑ Yes ☐ No

List All E. Logs Run:

Induction
Density-Neutron/Microlog

☑ Log Formation (Top), Depth and Datum ☐ Sample

Name	Top	Datum
Penn.	2952	-1386
Heebner	3864	-2298
Cherokee	4648	-3083
Mississippian	4680	-3114

CASING RECORD ☑ New ☐ Used
Report all strings set-conductor, surface, intermediate, production, etc.

Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives
Conductor	30	20	64	70	60/40 & Class A	150	6%gel, 3%cc
Surface	12.25	8.625	24	900	65/35 & Class A	400	6%gel, 3%cc
Production	7.875	4.5	10.5	4940	AA-2	250	10%salt, 10%cal-set,.8%FLA-322

ADDITIONAL CEMENTING / SQUEEZE RECORD

Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
___ Perforate ___ Protect Casing ___ Plug Back TD ___ Plug Off Zone	-			
	-			

Did you perform a hydraulic fracturing treatment on this well? ☐ Yes ☐ No *(If No, skip questions 2 and 3)*

Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? ☐ Yes ☐ No *(If No, skip question 3)*

Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry? ☐ Yes ☐ No *(If No, fill out Page Three of the ACO-1)*

Shots Per Foot	PERFORATION RECORD - Bridge Plugs Set/Type Specify Footage of Each Interval Perforated	Acid, Fracture, Shot, Cement Squeeze Record *(Amount and Kind of Material Used)*	Depth
1	4680-4740	3000gal 15% MCA	

TUBING RECORD: Size: 2 3/8 Set At: Packer At: 4630 Liner Run: ☐ Yes ☑ No

Date of First, Resumed Production, SWD or ENHR.

Producing Method: ☐ Flowing ☐ Pumping ☐ Gas Lift ☐ Other *(Explain)*

Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity

DISPOSITION OF GAS:
☐ Vented ☑ Sold ☐ Used on Lease
(If vented, Submit ACO-18.)

METHOD OF COMPLETION:
☐ Open Hole ☑ Perf. ☐ Dually Comp. *(Submit ACO-5)* ☐ Commingled *(Submit ACO-4)*
☐ Other *(Specify)*

PRODUCTION INTERVAL:
4680-4740

Mail to: KCC - Conservation Division, 130 S. Market - Room 2078, Wichita, Kansas 67202

ALLIED CEMENTING CO., LLC. 037829

Federal Tax I.D.# 20-5975804

REMIT TO P.O. BOX 31
RUSSELL, KANSAS 67665

SERVICE POINT: Medicine Lodge KS

DATE 11 04 11	SEC. 16	TWP. 34s	RANGE 14w	CALLED OUT	ON LOCATION	JOB START	JOB FINISH 5:45 PM
LEASE Z-Bar	WELL # 16-4		LOCATION Aetna KS, 4'/4E, 1/4N, 2E, 3/4N, 1/4E, S/S			COUNTY Barber	STATE KS
OLD OR NEW (Circle one)							

CONTRACTOR South wind #
TYPE OF JOB Surface
HOLE SIZE 12 1/4 T.D. 900
CASING SIZE 8 5/8 24# DEPTH 896
TUBING SIZE DEPTH
DRILL PIPE 4 1/2 DEPTH
TOOL DEPTH
PRES. MAX 900 MINIMUM —
MEAS. LINE SHOE JOINT 42.38
CEMENT LEFT IN CSG. 42'
PERFS.
DISPLACEMENT 54 1/2 Bbls Fresh H2O

OWNER M & M Explo.

CEMENT

AMOUNT ORDERED 250 sx 65:35:6% gel + 3% cc + 0 1/4# Flosel & 150 sx class A + 3% cc + 2% gel

EQUIPMENT

PUMP TRUCK #471-302 CEMENTER D. Felio
HELPER D. Franklin
BULK TRUCK #381-250 DRIVER B.A. Miller
BULK TRUCK # DRIVER

COMMON	A 150 sx	@ 16.25	2437.50
POZMIX		@	
GEL	3 sx	@ 21.25	63.75
CHLORIDE	14 sx	@ 58.20	814.80
ASC		@	
ALW	250 sx	@ 15.00	3750.00
Flosel	62 #	@ 2.70	167.40
		@	
		@	
		@	
		@	
		@	
		@	
HANDLING	433	@ 2.25	974.25
MILEAGE	433/40/.11		1905.20
		TOTAL	10,112.90

REMARKS:

Pipe on BHm, Break Circ, Pump Spacer, Mix 250 sx Lite weight Cement, Mix 150 sx tail cement, Stop Pump, Release Plug, Start Disp. w/ Fresh H2O, Same Upshup on Plug, See Steady increase in PSI, Slow Rate, Bump Plug at 54 1/2 Bbls total Disp. Release PSI, Float Did Hold, Cement Did Circ.

SERVICE

DEPTH OF JOB	896'		
PUMP TRUCK CHARGE	1125.00		
EXTRA FOOTAGE	596	@ .95	566.20
MILEAGE	80	@ 7.00	560.00
MANIFOLD	head rental	@	200.00
Light Vehicle	80	@ 4.00	320.00
		@	
		TOTAL	2771.20

CHARGE TO: M & M Exploration
STREET
CITY STATE ZIP

PLUG & FLOAT EQUIPMENT

1 - TRP		@	112.00
1 - Basket		@	478.00
1 - AFU insert		@	382.00
		@	
		@	
		TOTAL	972.00

8 5/8

To Allied Cementing Co., LLC.
You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

SALES TAX (If Any)
TOTAL CHARGES 13,856.10
DISCOUNT 20% IF PAID IN 30 DAYS
Net 11,084.88

PRINTED NAME Ron Vratil

SIGNATURE

BASIC ENERGY SERVICES
PRESSURE PUMPING & WIRELINE

10244 NE Hwy. 61
P.O. Box 8613
Pratt, Kansas 67124
Phone 620-672-1201

FIELD SERVICE TICKET

1718 05267 A

DATE TICKET NO.

DATE OF JOB 11-12-11 DISTRICT KANSAS	NEW WELL ☒ OLD WELL ☐ PROD ☐ INJ ☐ WDW ☐ CUSTOMER ORDER NO.:
CUSTOMER M+M Exploration INC	LEASE Z BAR 16-4 WELL NO.
ADDRESS	COUNTY Barber 16-34-11 STATE KANSAS
CITY STATE	SERVICE CREW Allen, Brad, Dale
AUTHORIZED BY	JOB TYPE: 4 1/2" Long String CNW

EQUIPMENT#	HRS	EQUIPMENT#	HRS	EQUIPMENT#	HRS
28443 P.U.	1 1/2				
19960-19918	1 1/2				
19889-19842	1 1/2				

	DATE	AM/PM	TIME
TRUCK CALLED	11-12-11	AM PM	1215
ARRIVED AT JOB	11-12-11	AM PM	610
START OPERATION	11-12-11	AM PM	1000
FINISH OPERATION	11-12-11	AM PM	1130
RELEASED	11-13-11	AM PM	1230
MILES FROM STATION TO WELL	65 miles		

CONTRACT CONDITIONS: (This contract must be signed before the job is commenced or merchandise is delivered).
The undersigned is authorized to execute this contract as an agent of the customer. As such, the undersigned agrees and acknowledges that this contract for services, materials, products, and/or supplies includes all of and only those terms and conditions appearing on the front and back of this document. No additional or substitute terms and/or conditions shall become a part of this contract without the written consent of an officer of Basic Energy Services LP.

SIGNED: Ann Vinson
(WELL OWNER, OPERATOR, CONTRACTOR OR AGENT)

ITEM/PRICE REF. NO.	MATERIAL, EQUIPMENT AND SERVICES USED	UNIT	QUANTITY	UNIT PRICE	$ AMOUNT
CP105	AA2 cement	SK	300		$ 5100.00
CC102	Cell FLAKE	lb	75		$ 277.50
CC111	SALT	lb	163		$ 815.50
CC113	Gypsum	lb	1410		$ 1057.50
CC129	FLA-322	lb	226		$ 1695.00
CC201	Gilsonite	lb	1800		$ 1206.00
CF606	Latch down Plug + Baffle 4 1/2"	EA	1		$ 370.00
CF1250	Auto Fill Float Shoe 4 1/2" Blue	EA	1		$ 330.00
CF1650	Turbolizer 4 1/2" Blue	EA	8		$ 680.00
CF1900	4 1/2" Basket Blue	EA	1		$ 220.00
C704	CLA max KCL Sub	gal	4		$ 140.00
E100	Unit mileage charge Pickup	mi	65		$ 276.25
E101	Heavy Equip. mileage	mi	130		$ 910.00
E113	Bulk Delivery Charge	TM	917		$ 1466.40
CE205	Depth Charge 4001-5000	4 hrs	1		$ 2520.00
CE240	Blending & mixing Service Chg	SK	300		$ 420.00
CE504	Plug container utilization chg	Job	1		$ 250.00
S003	Service Supervisor first 8 hrs	EA	1		$ 125.00

CHEMICAL / ACID DATA:			

SUB TOTAL	DLS	$ 14,187.73
SERVICE & EQUIPMENT	%TAX ON $	
MATERIALS	%TAX ON $	
TOTAL		

SERVICE REPRESENTATIVE Allen F. Wendt

THE ABOVE MATERIAL AND SERVICE ORDERED BY CUSTOMER AND RECEIVED BY: Ann Vinson
(WELL OWNER OPERATOR CONTRACTOR OR AGENT)

FIELD SERVICE ORDER NO.

CLOUD LITHO - Abilene, TX

BASIC energy services, L.P.

TREATMENT REPORT

Customer: M+M Explor. INC	Lease No.		Date: 11-12-11		
Lease: 2 BAR	Well #: 16-4				
Field Order #: 052697A	Station: Pratt KS	Casing: 4 1/2"	Depth: 4946'	County: Barber	State: KANS.
Type Job: 4 1/2" Long String CNW		Formation: TD 4950'		Legal Description: 16-34-14	

PIPE DATA		PERFORATING DATA		FLUID USED	TREATMENT RESUME		
Casing Size: 4 1/2	Tubing Size	Shots/Ft	AA2	Acid: 25 SKS SCAVENGER	RATE	PRESS: @ 13 #	ISIP
Depth: 4946'	Depth	From	To: AA2	Pre Pad: 225 SKS @	Max: 14.8 #		5 Min.
Volume: 78 1/2 BBL	Volume	From	To: 30 SKS AA2 - R	Pad	Min		10 Min.
Max Press: 1500 #	Max Press	From	To: 20 SKS AA2 - M	Frac	Avg		15 Min.
Well Connection: P.C.	Annulus Vol.	From	To		HHP Used		Annulus Pressure
Plug Depth: 4925'	Packer Depth	From	To	Flush: DISP 2% KCL	Gas Volume		Total Load

Customer Representative: ALLAN DEATLEY | Station Manager: SCOTT | Treater: ALLEN

Service Units	28443	19889	19842	19960	19918						
Driver Names	ALLEN	BRAD	MITCHELL	DALE	PHYE						

Time	Casing Pressure	Tubing Pressure	Bbls. Pumped	Rate	Service Log SW #70
6:10 pm					ON LOC. DISCUSS SAFETY, SETUP, PLAN JOB
					LAYING DOWN KELLY, & RIG UP TO
					RUN 4 1/2" CASING. 10.5#/FT
7:35					START 4 1/2" CASING SHOE JOINT 20.60
					W/ FLOAT SHOE & L.D. BAFFLE IN COLLAR
					CENT 1-3-5-7-23-25-27-29
					BASKET TOP COLLAR #9 MARKER JOINT.
8:45					CIR W/ 60 JTS IN HOLE
9:00					START RUNNING REST OF CASING
10:10					CASING @ 4946' HOOKUP & CIR (GOOD CIR
10:40	200#		7	5	MIX 25 SKS AA2 SCAVENGER @ 13#
				5	MIX 225 SKS AA2 @ 14.8#/GAL
			61		FINISH MIX WASHOUT PUMP & LINE
11:00				6	DROP L.D. PLUG. START 2% KCL DISP
	700#			5	CAUGHT LIFT PSI W/ 47 BBLS OUT
11:15	1500#		78 1/2	4	PLUG DOWN
	0#				RELEASE PSI - (OIC)
11:30			7		PLUG RH. W/ 30 SKS AA2
11:35			5		PLUG MH W/ 20 SKS AA2
					WASH UP & RACK UP EQUIP.
12:30					JOB COMPLETE
					THANKS ALLEN, BRADLEY, DATE!

Taylor Printing, Inc. 620-672-3656

Weatherford®

ARRAY INDUCTION SHALLOW FOCUSSED ELECTRIC LOG

COMPANY	M & M EXPLORATION, INC.
WELL	Z-BAR # 16-4
FIELD	AETNA GAS AREA
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	660' FNL & 660' FWL, NW/4

40 Years of Wireline 1970 2010

SEC	TWP	RGE
16	34S	14W

Other Services
MPD/MDN
MML

API Number 15-007-23790
Permit Number

Permanent Datum G.L., Elevation 1554 feet
Log Measured From KB
Drilling Measured From K.B. @ 12 FEET

Elevations:	feet
KB	1566.00
DF	1564.00
GL	1554.00

Date	11-NOV-2011				
Run Number	ONE				
Depth Driller	4950.00	feet			
Depth Logger	4949.00	feet			
First Reading	4746.00	feet			
Last Reading	896.00	feet			
Casing Driller	896.00	feet			
Casing Logger	896.00	feet			
Bit Size	7.875	inches			
Hole Fluid Type	CHEMICAL				
Density / Viscosity	9.00	lb/USg	42.00	CP	
PH / Fluid Loss	10.00		8.00	ml/30Min	
Sample Source	FLOWLINE				
Rm @ Measured Temp	0.50 @ 45.0	ohm-m			
Rmf @ Measured Temp	0.40 @ 45.0	ohm-m			
Rmc @ Measured Temp	0.60 @ 45.0	ohm-m			
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.21 @116.0	ohm-m			
Time Since Circulation	6 HOURS				
Max Recorded Temp	116.00	deg F			
Equipment Name	COMPACT				
Equipment / Base	13096		LIB		
Recorded By	A. GIAMBALVO				
Witnessed By	BETH BROCK				
S.O. / JOB #	3534695		LB11-288		

BOREHOLE RECORD

Last Edited: 12-NOV-2011 07:21

Bit Size inches	Depth From feet	Depth To feet
7.875	896.00	4949.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	896.00	24.00

REMARKS

Tools Used: MPD, MCG, MDN, MFE, MAI, MML.
Hardware: MPD: 8 inch profile plate used. MAI, MSS and MFE: 0.5 Inch standoffs used. MDN: Dual Bowspring used.
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.
Annular volume with 4.5 inch production casing = 290 cu. ft
Service Order #3534695
Rig: Southwind # 70
Engineer: A. Giambalvo
Operator(s): N. Adame

2 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_003.dta
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Plotted on 12-NOV-2011 07:26
Recorded on 12-NOV-2011 05:15

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150

Spontaneous Potential
millivolts
− → | 20 | ← +

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:600

Array Ind. One Cond Ct
mmhos
1000 750 500 250 0
2000 1750 1500 1250 1000

Shallow FE
ohm metres
0 25 50
0 250 500

Array Ind. One Res Rt
ohm metres
0 25 50
0 250 500

Shoe
900
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
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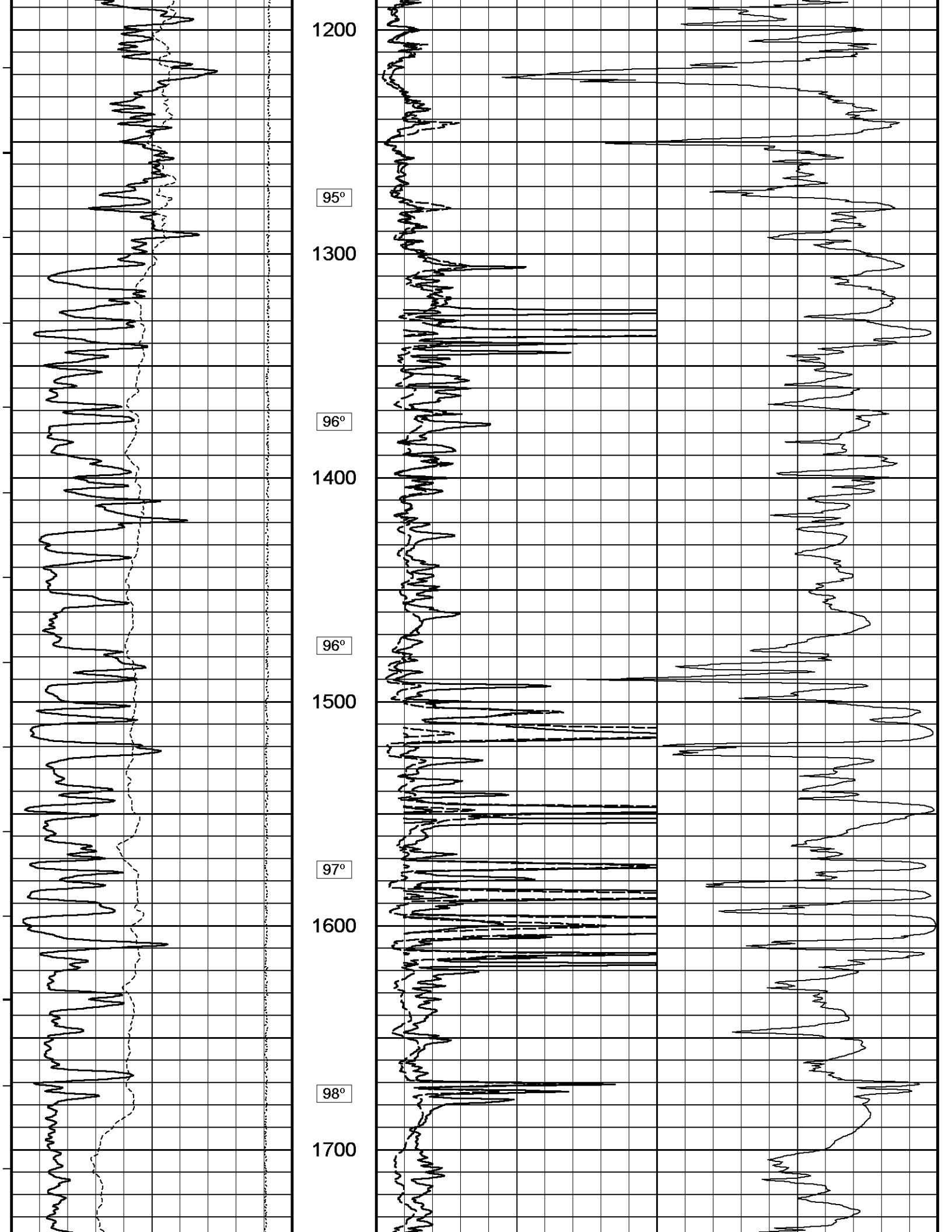
1000
94°
1100
94°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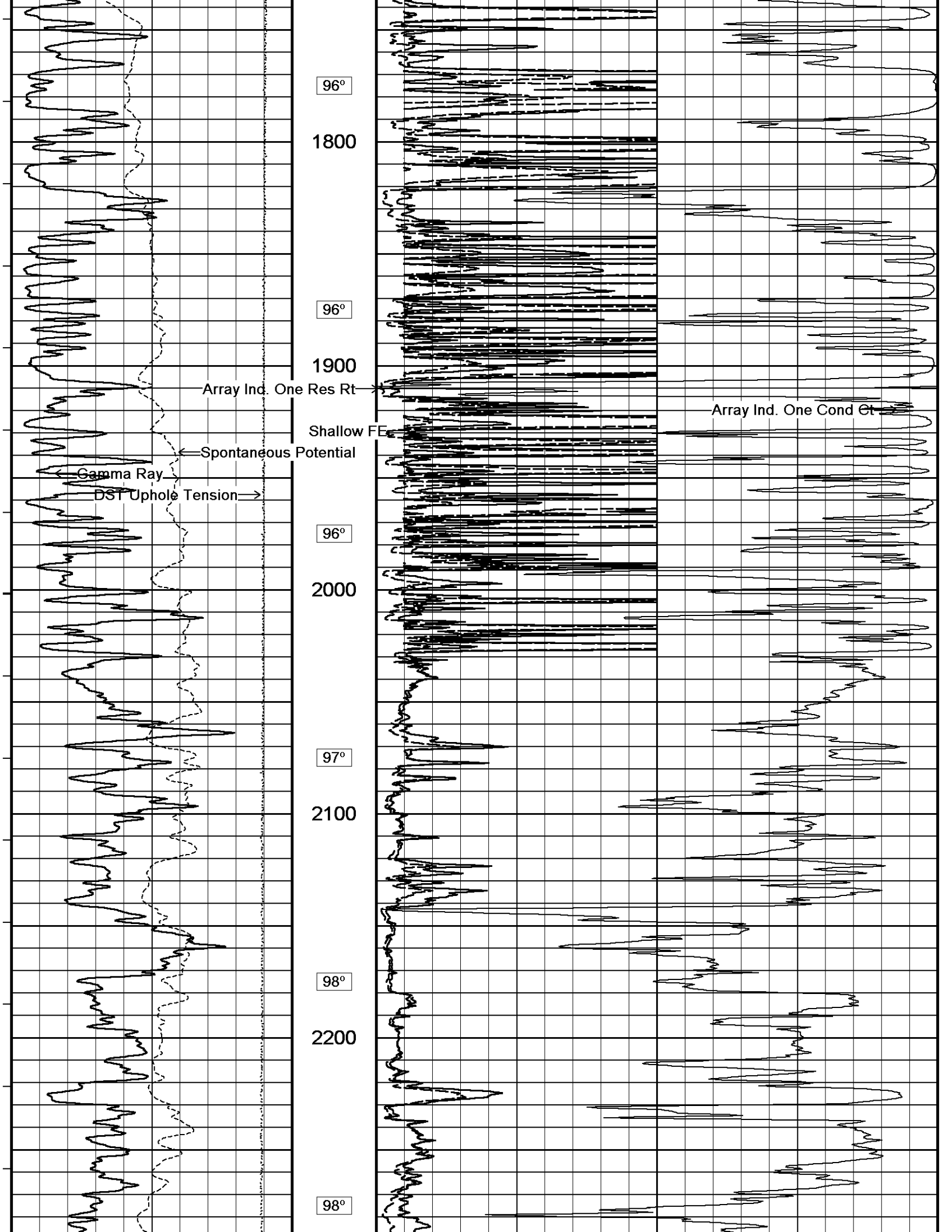
1400
96°
1500
97°
1600
98°
1700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96°
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Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
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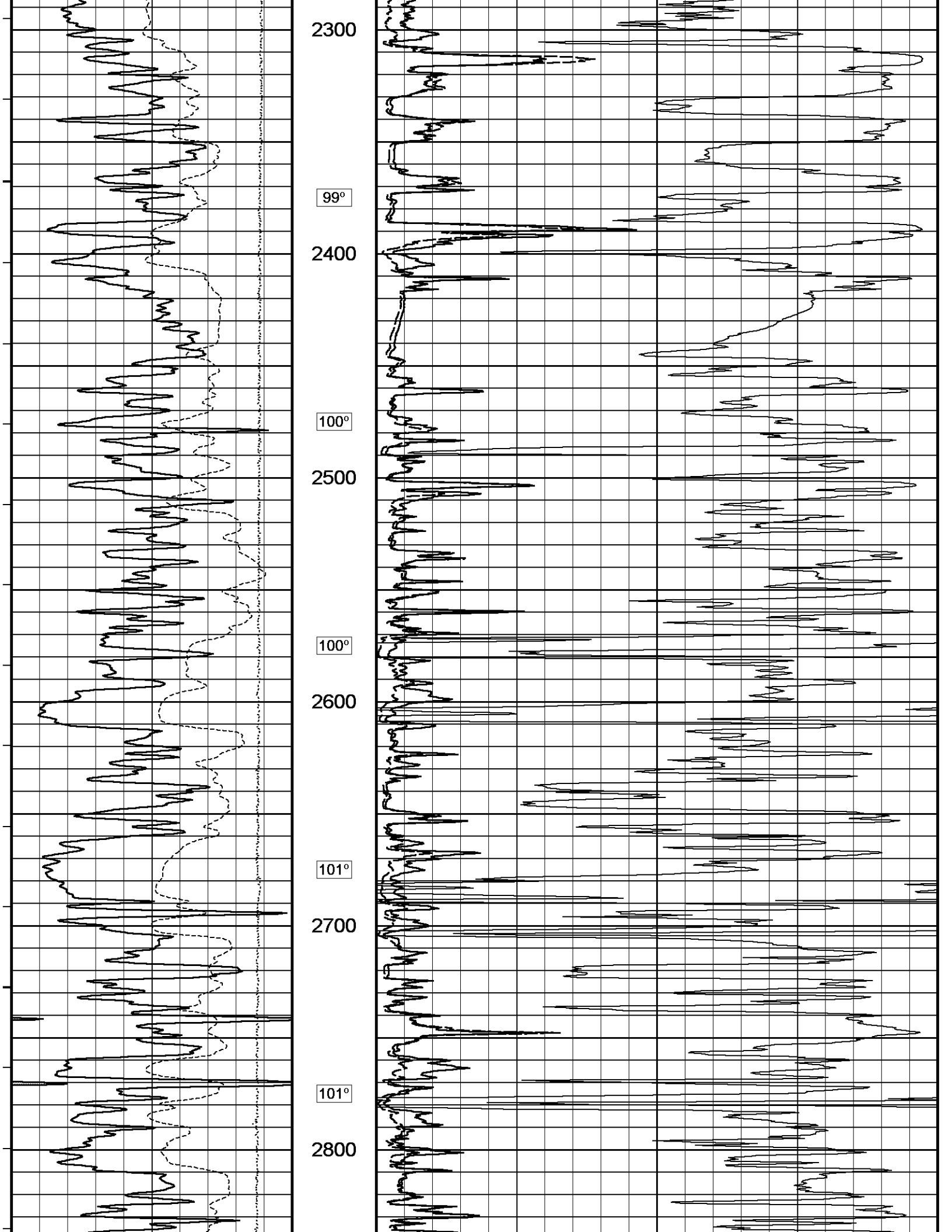
2000
97°
2100
98°
2200
98°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2600
101°
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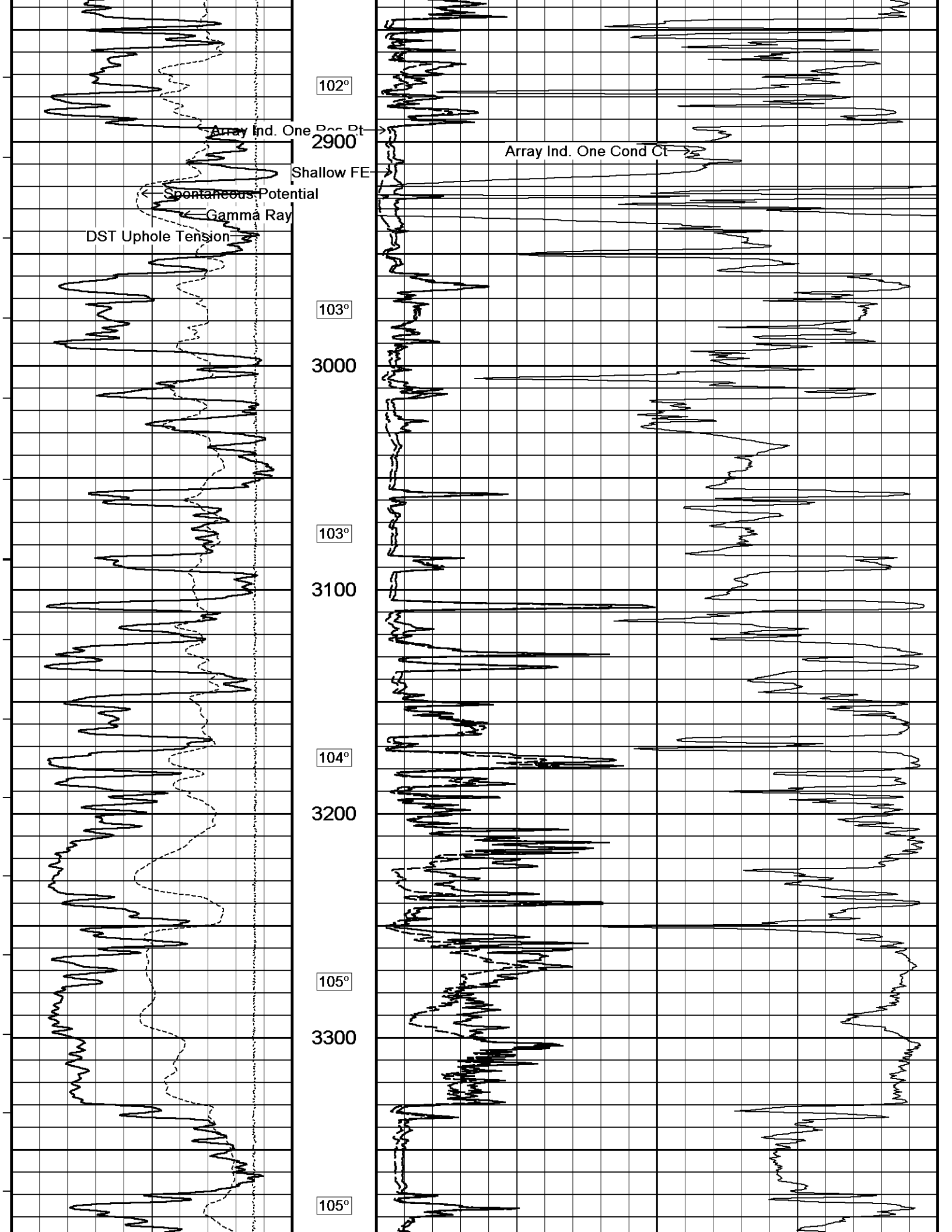
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Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
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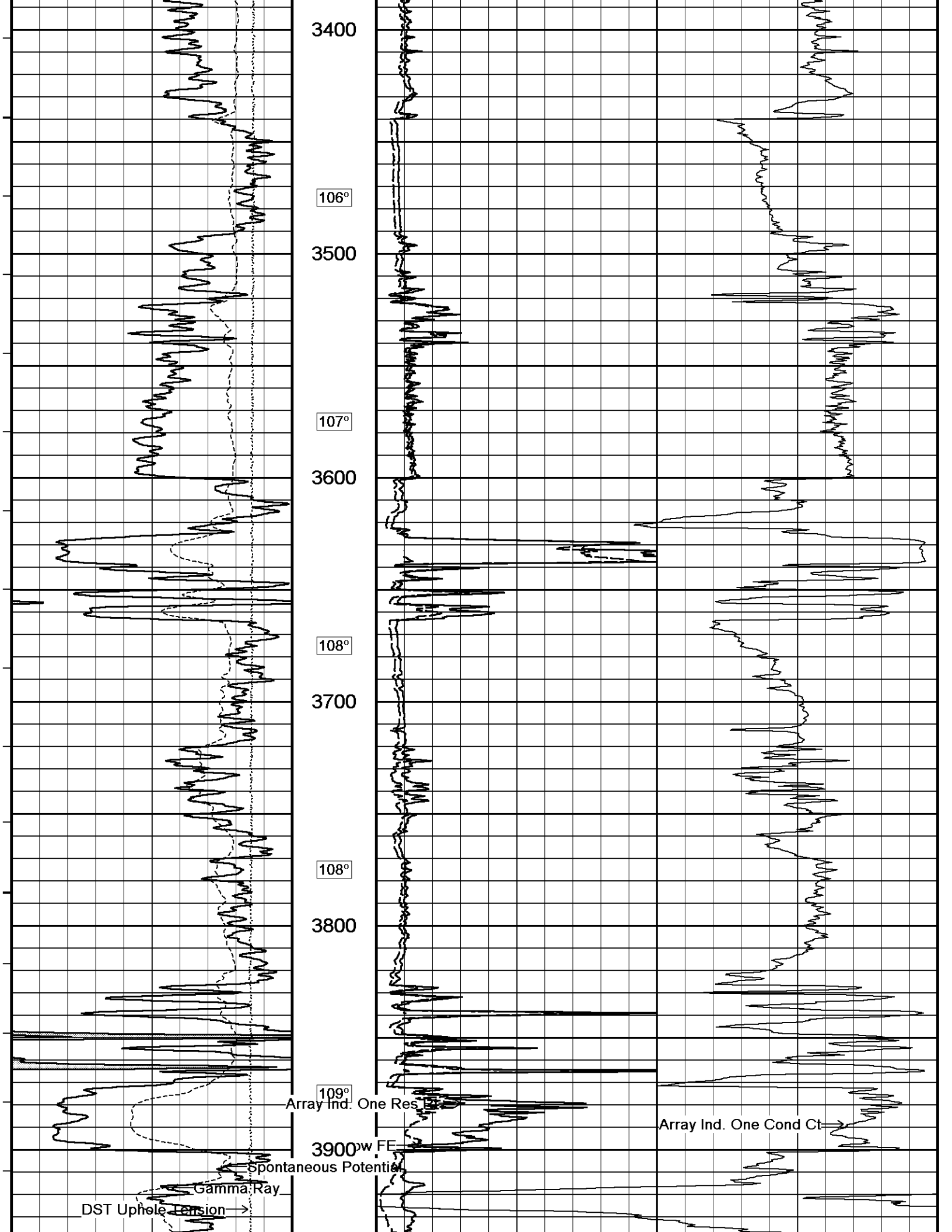
104°
3200
105°
3300
105°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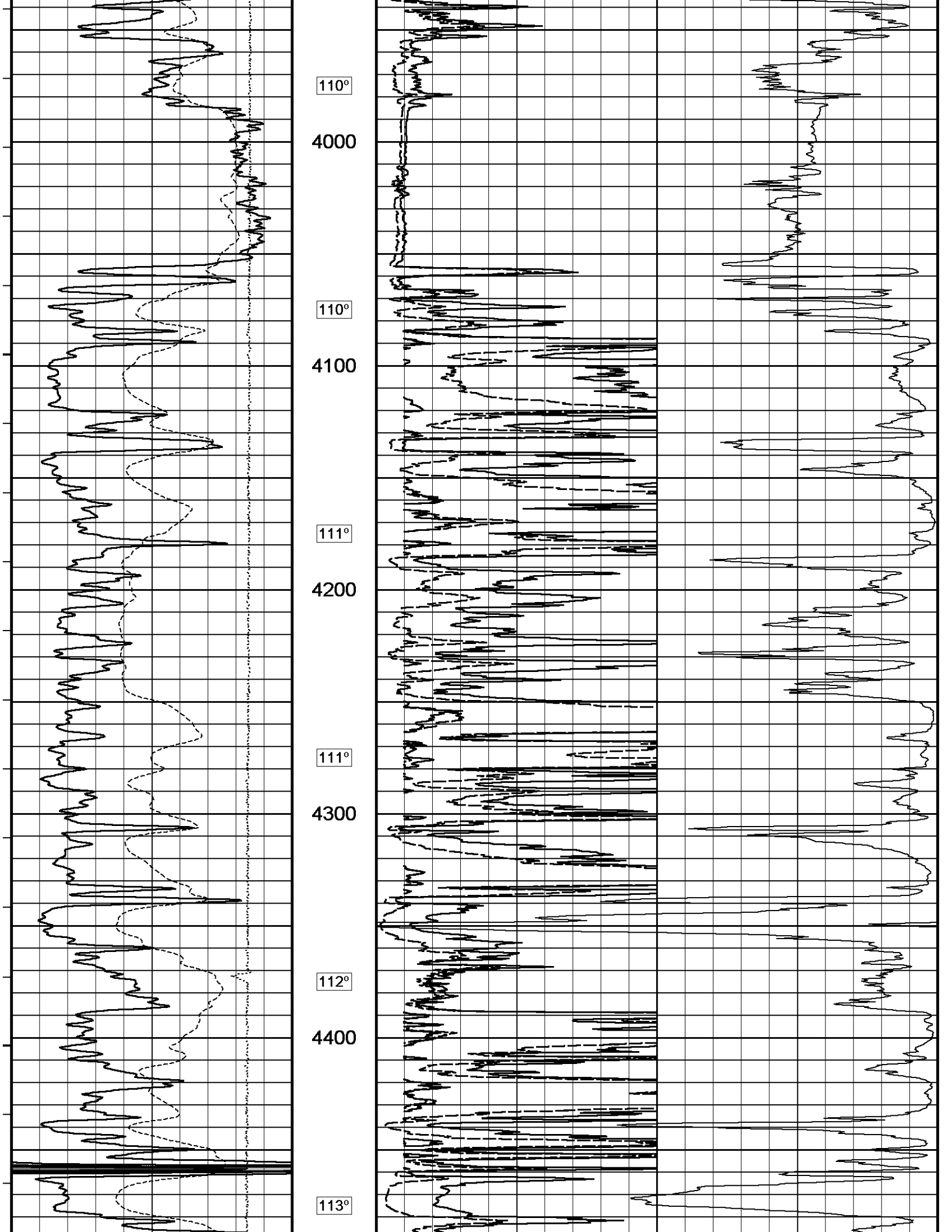
Spontaneous Potential
Gamma Ray
DST Uphole Tension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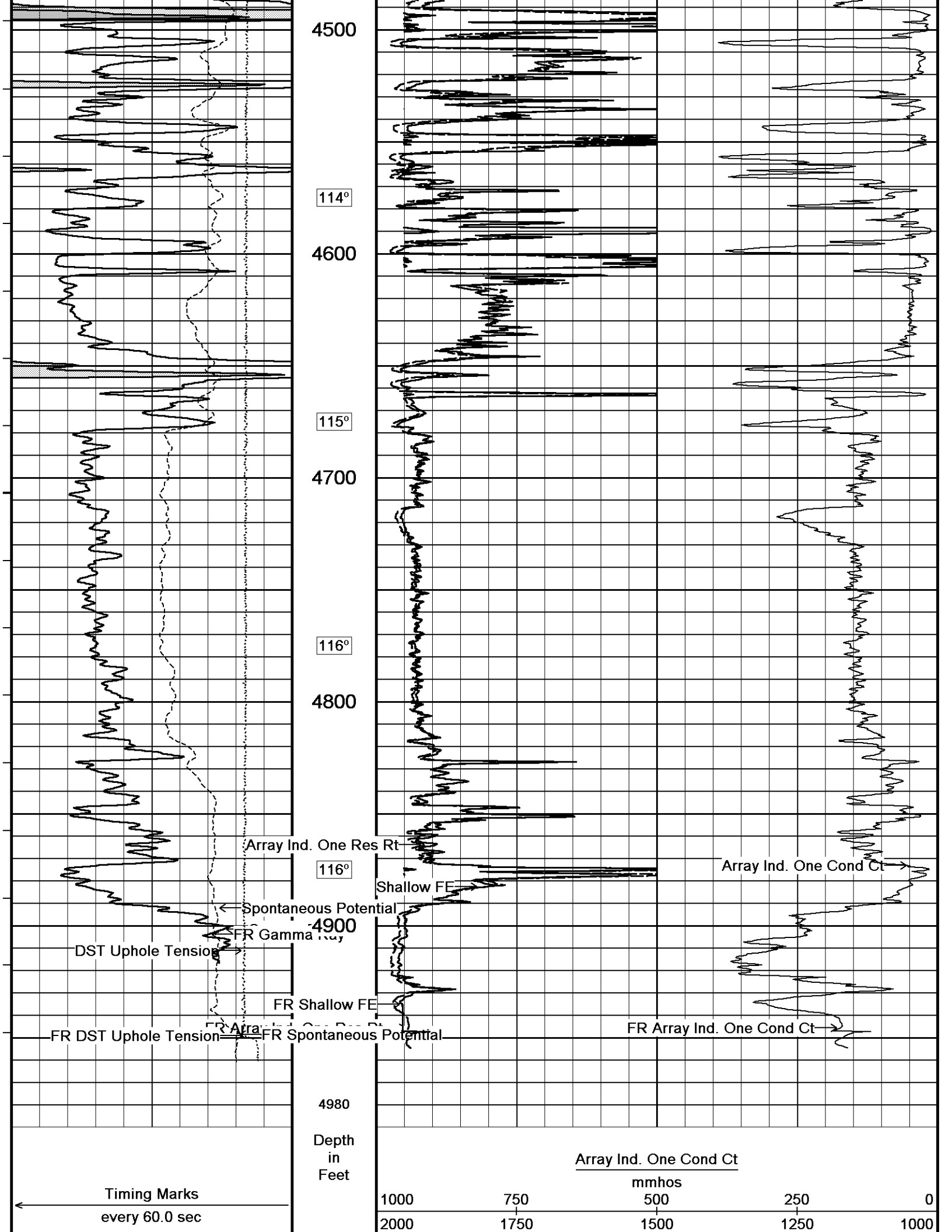
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114°
4600
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4700
116°
4800
Array Ind. One Res Rt
116°
Shallow FE
Spontaneous Potential
4900
FR Gamma Ray
DST Uphole Tension
FR Shallow FE
FR Array Ind. One Res Rt
FR DST Uphole Tension
FR Spontaneous Potential
Array Ind. One Cond Ct
FR Array Ind. One Cond Ct
4980
Depth
in
Feet
Timing Marks
every 60.0 sec
Array Ind. One Cond Ct
mmhos
1000
750
500
250
0
2000
1750
1500
1250
1000

Gamma Ray
API
0 75 150

Spontaneous Potential
millivolts
− → | 20 | ← +

DST Uphole Tension
pounds
5000 0

Borehole Temp in deg F

Replay Scale 1:600

Shallow FE
ohm metres
0 25 50
0 250 500

Array Ind. One Res Rt
ohm metres
0 25 50
0 250 500

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_003.dta
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Plotted on 12-NOV-2011 07:26
Recorded on 12-NOV-2011 05:15

2 INCH MAIN

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_003.dta
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Plotted on 12-NOV-2011 07:26
Recorded on 12-NOV-2011 05:15

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150

Spontaneous Potential
millivolts
− → | 20 | ← +

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:240

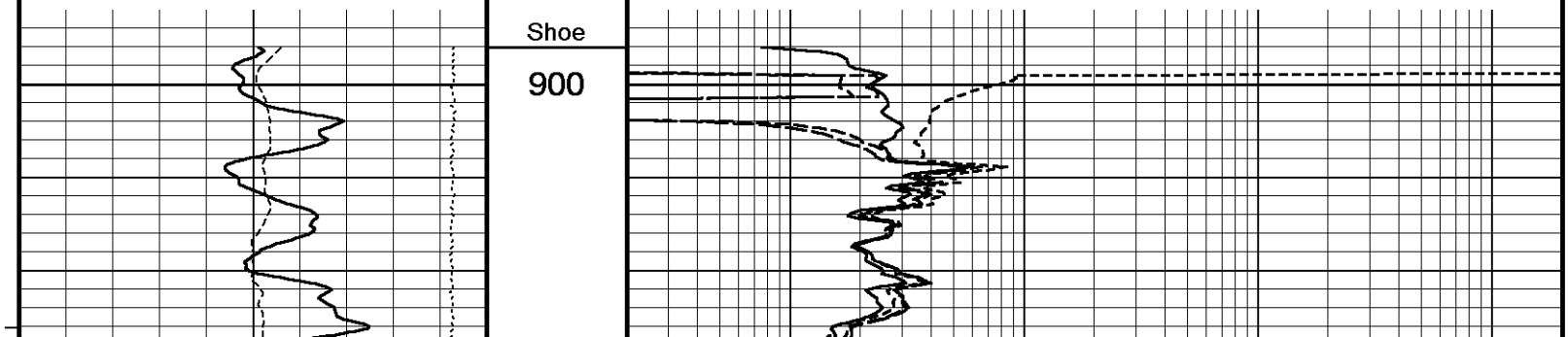
Shoe
900

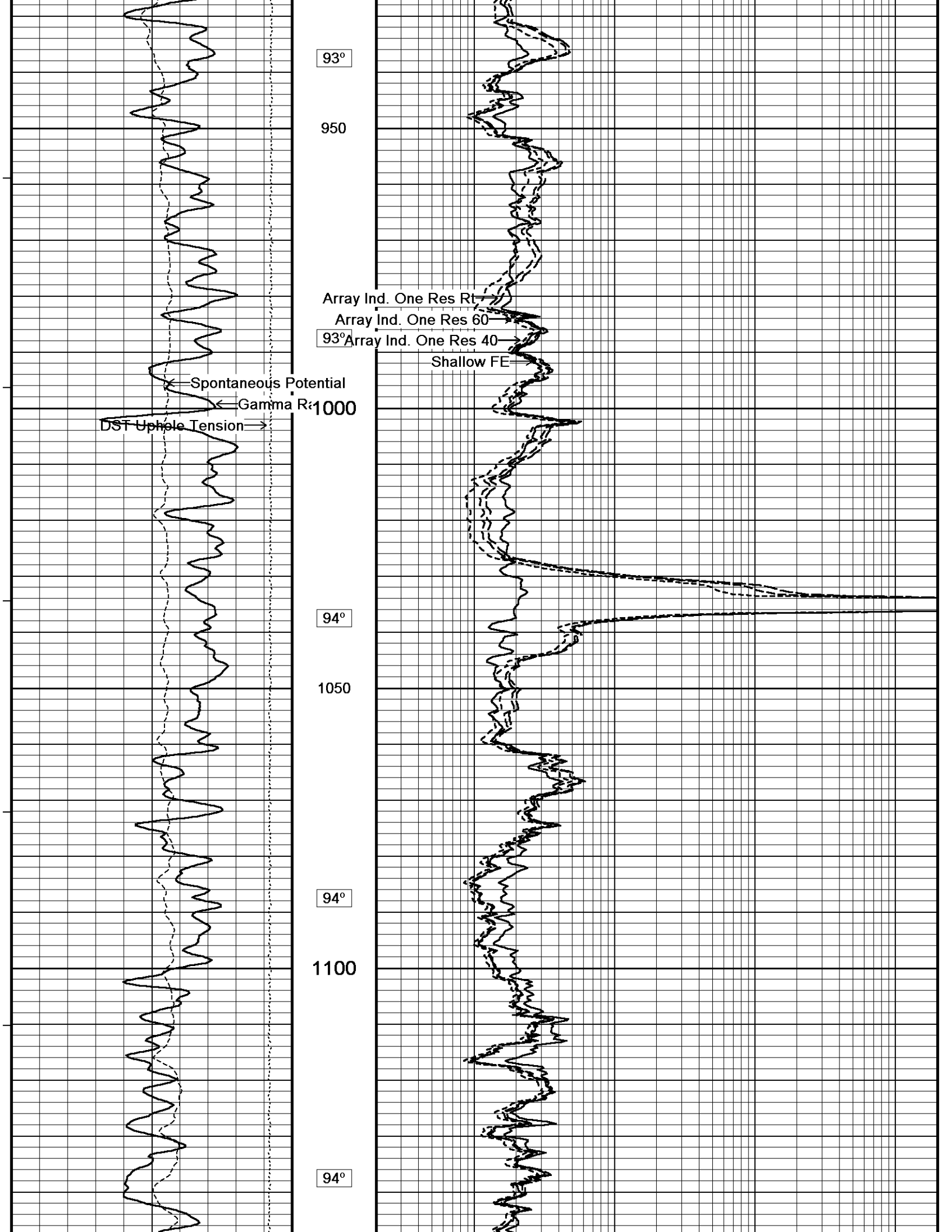
Shallow FE
ohm metres
0.20 2000
1 10 100 1000

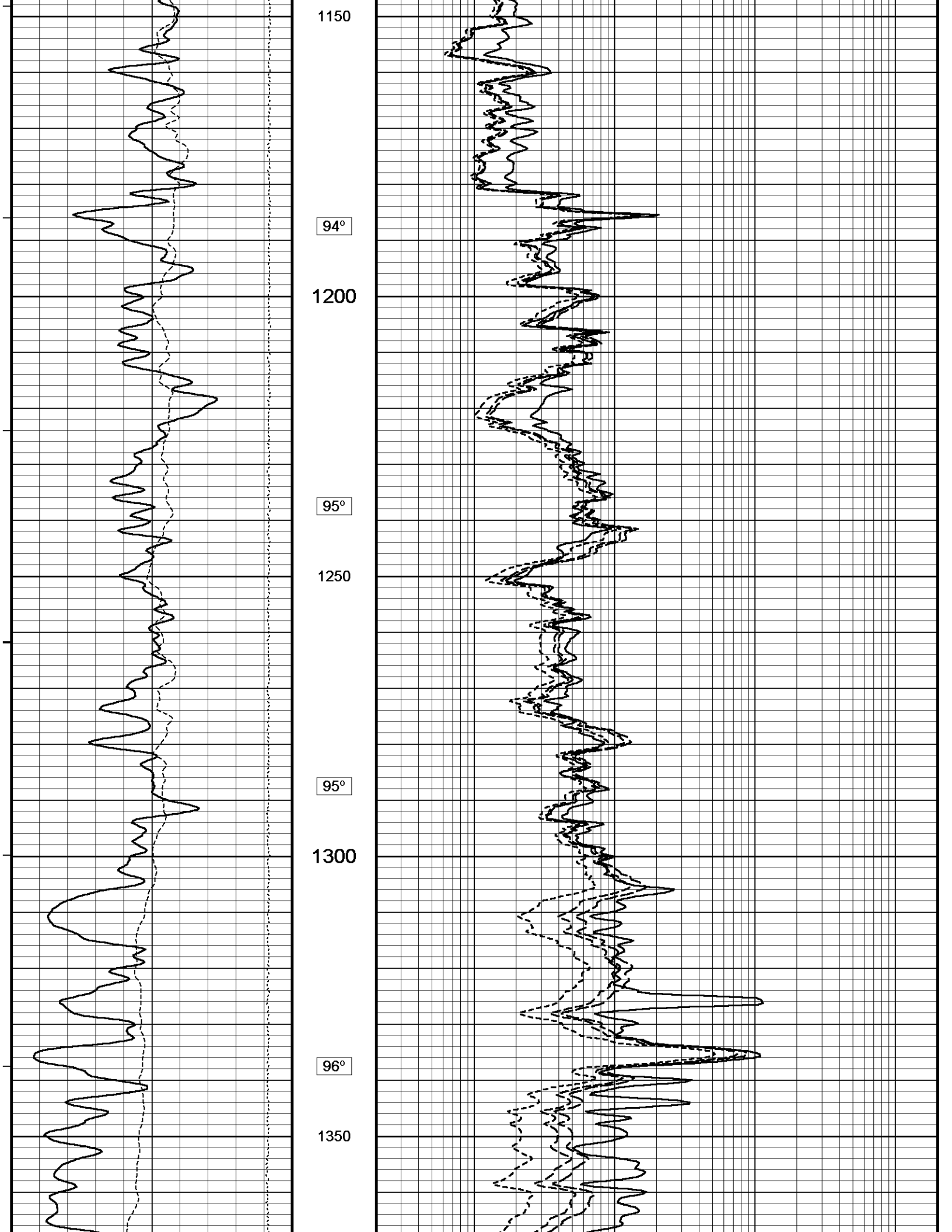
Array Ind. One Res 40
ohm metres
0.20 2000
1 10 100 1000

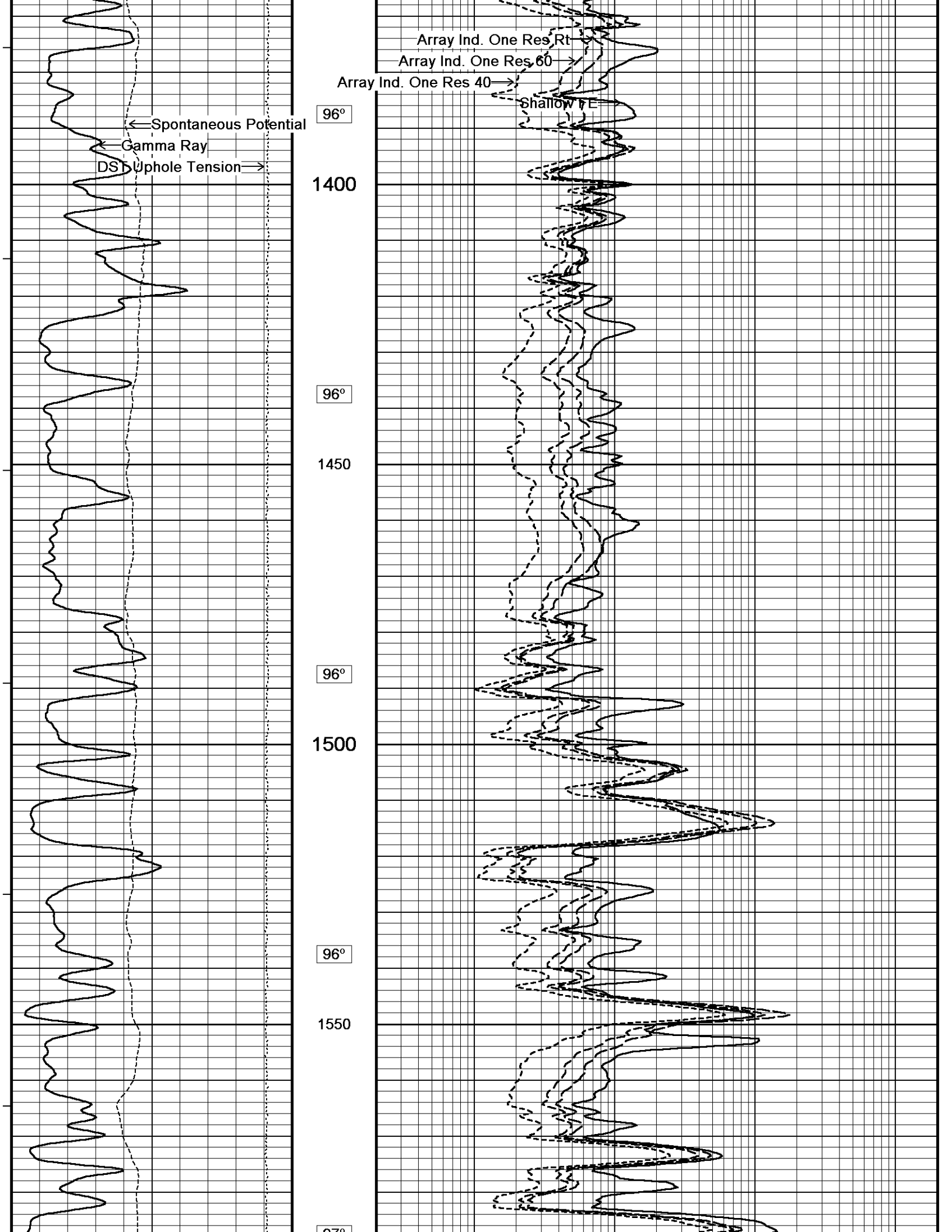
Array Ind. One Res 60
ohm metres
0.20 2000
1 10 100 1000

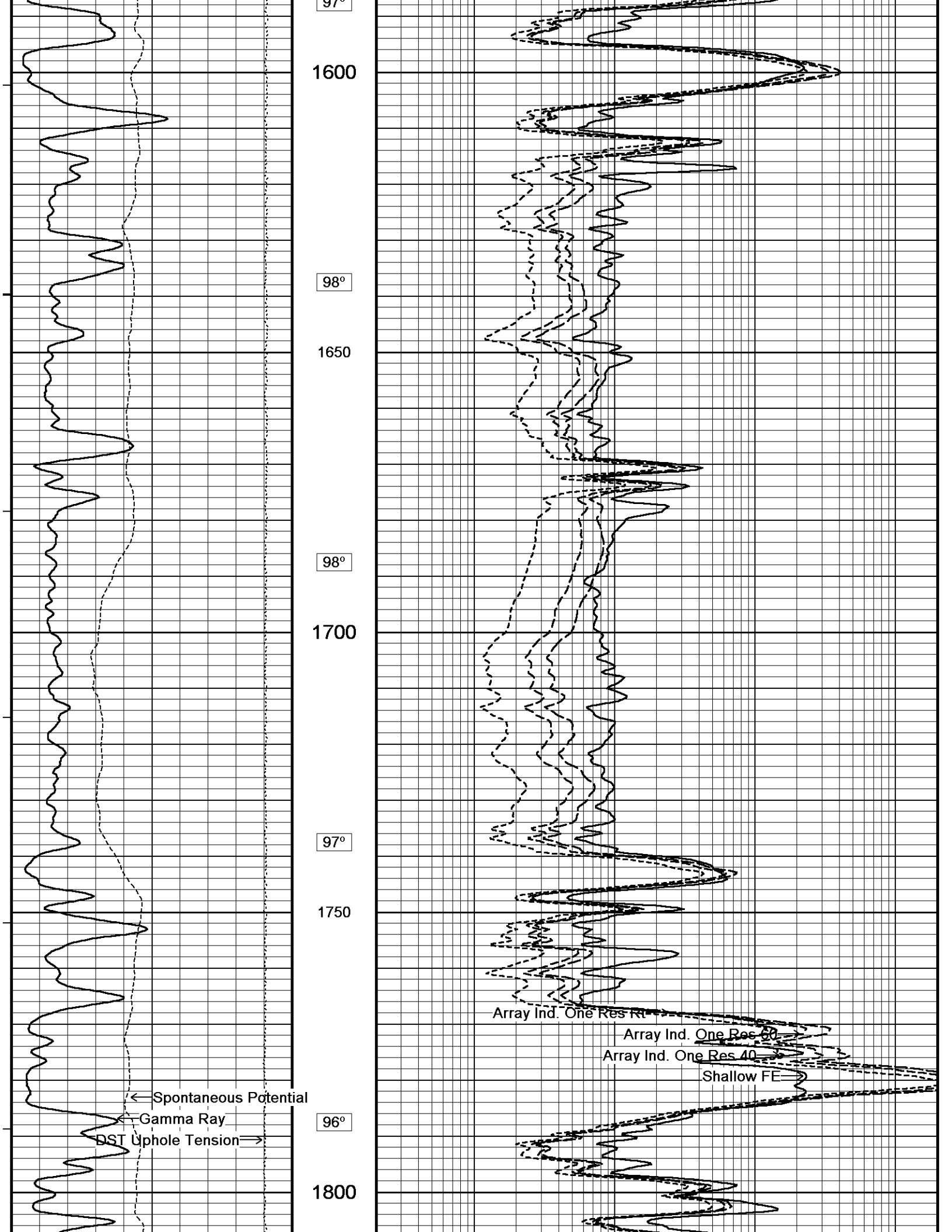
Array Ind. One Res Rt
ohm metres
0.20 2000
1 10 100 1000

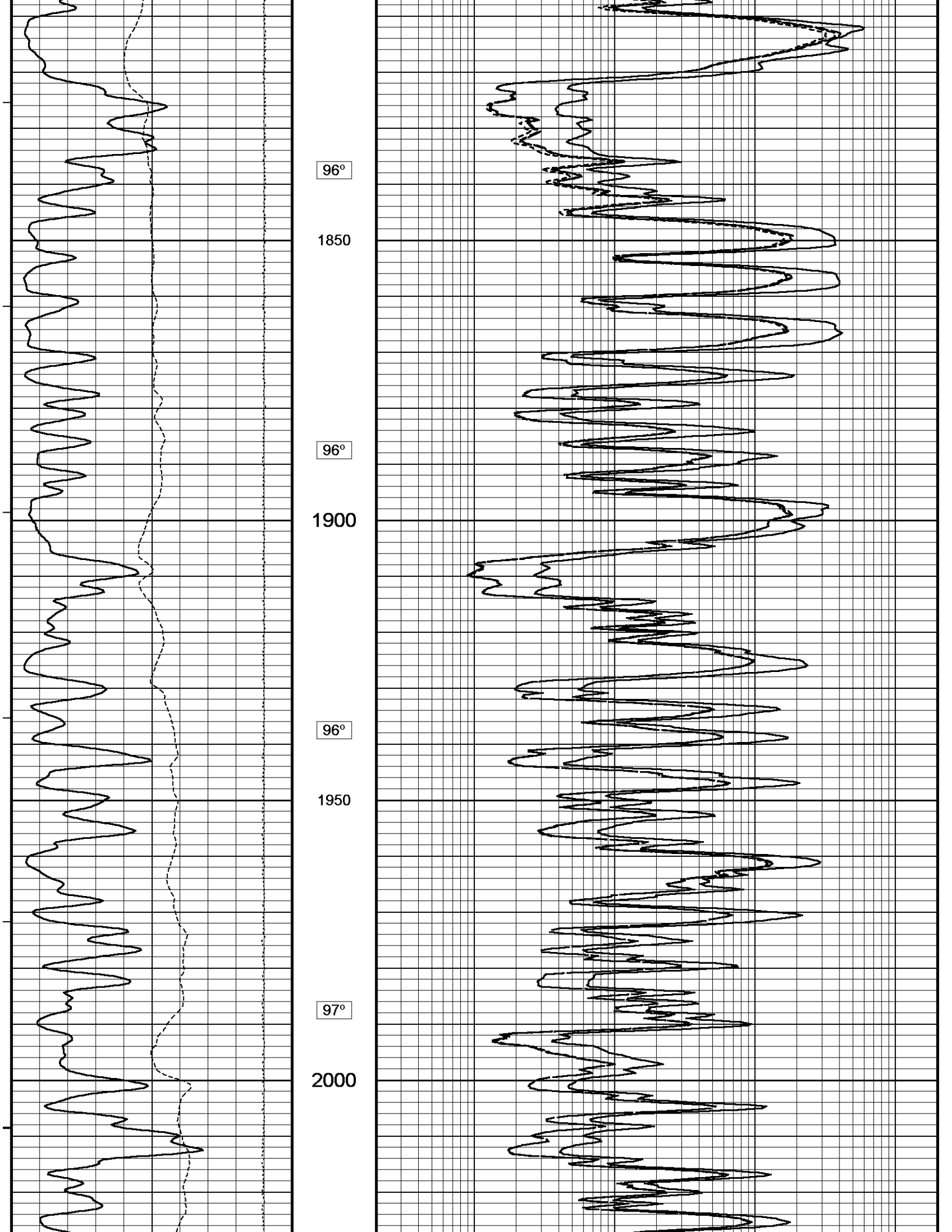


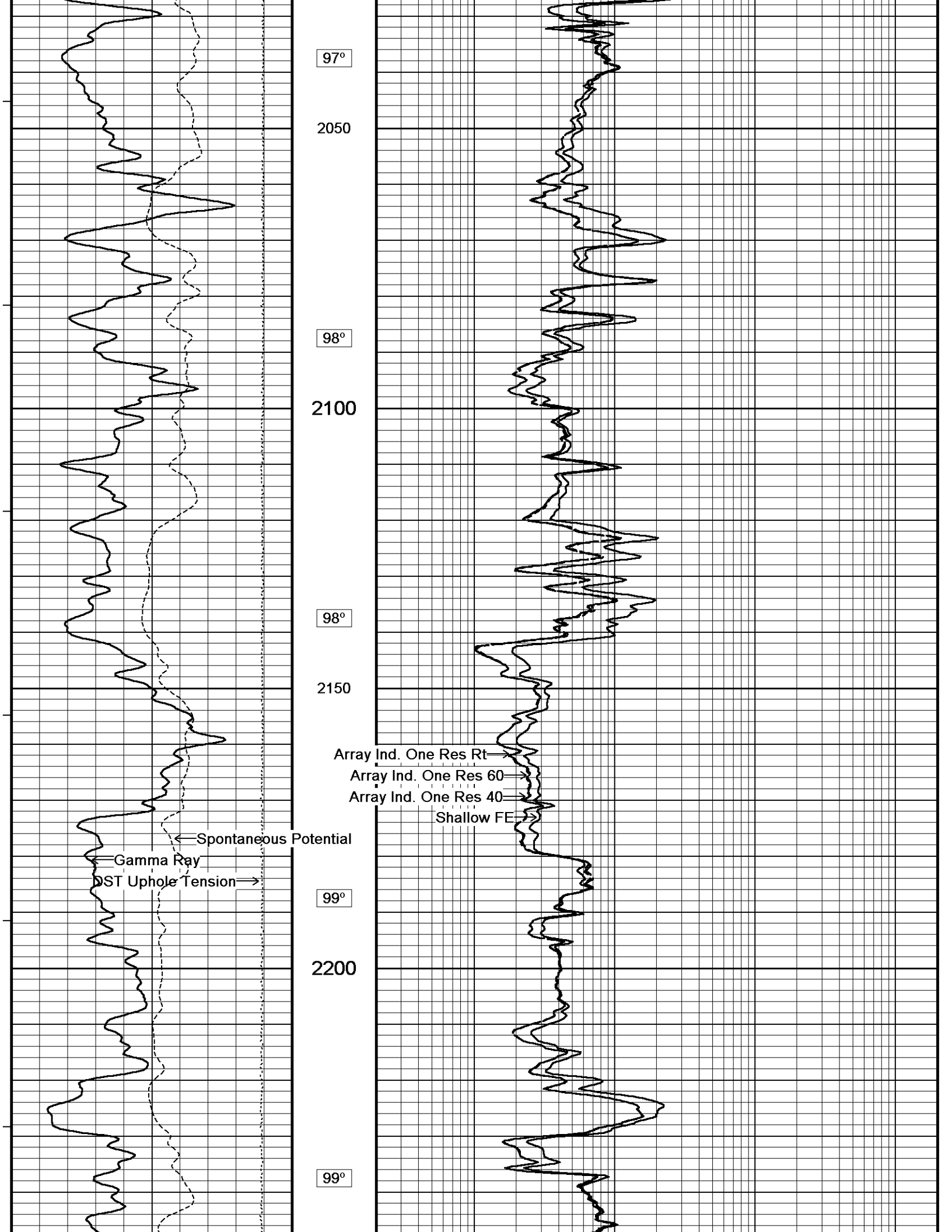

93°
950
Array Ind. One Res Rt
Array Ind. One Res 60
93°
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ra
1000
DST Uphole Tension
94°
1050
94°
1100
94°

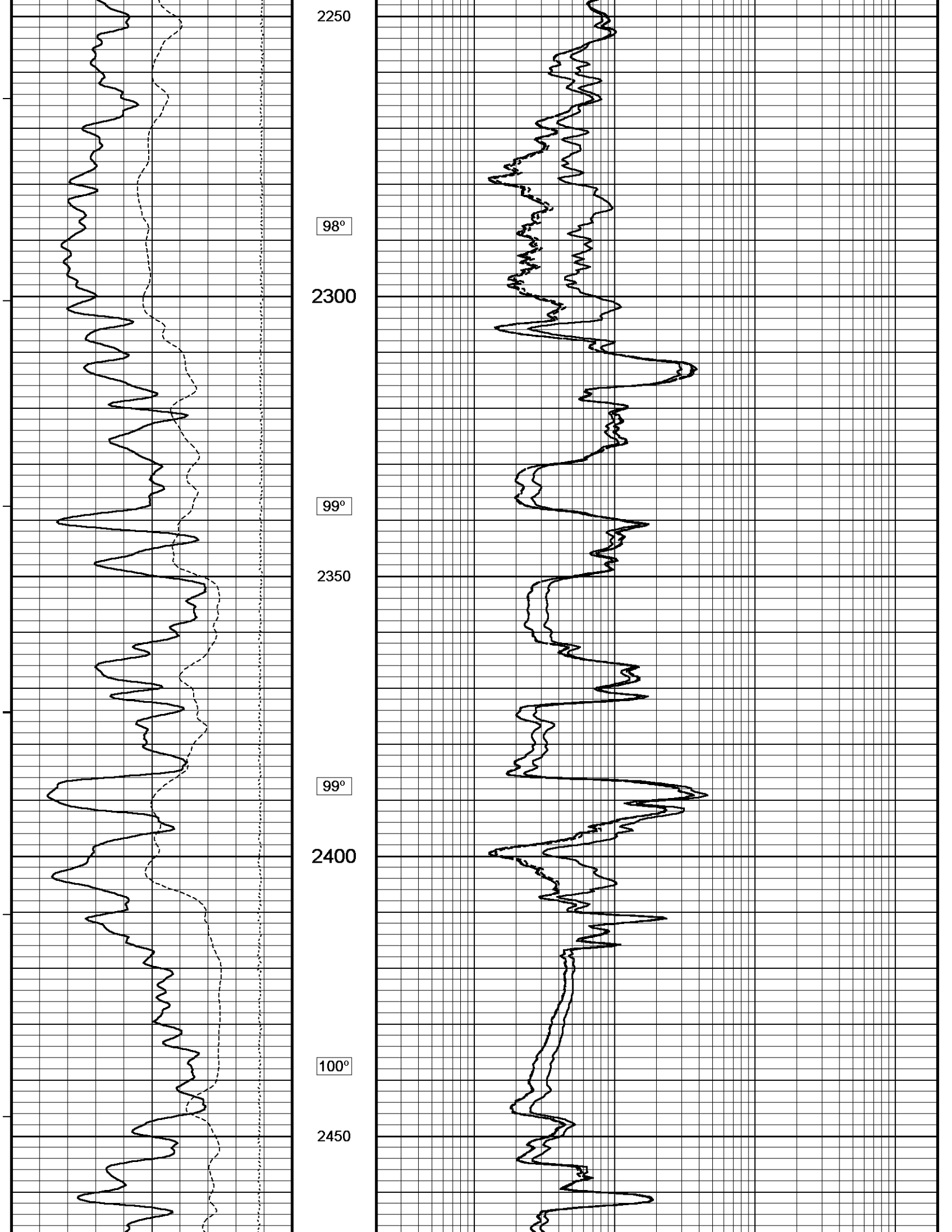

1150
94°
1200
95°
1250
95°
1300
96°
1350

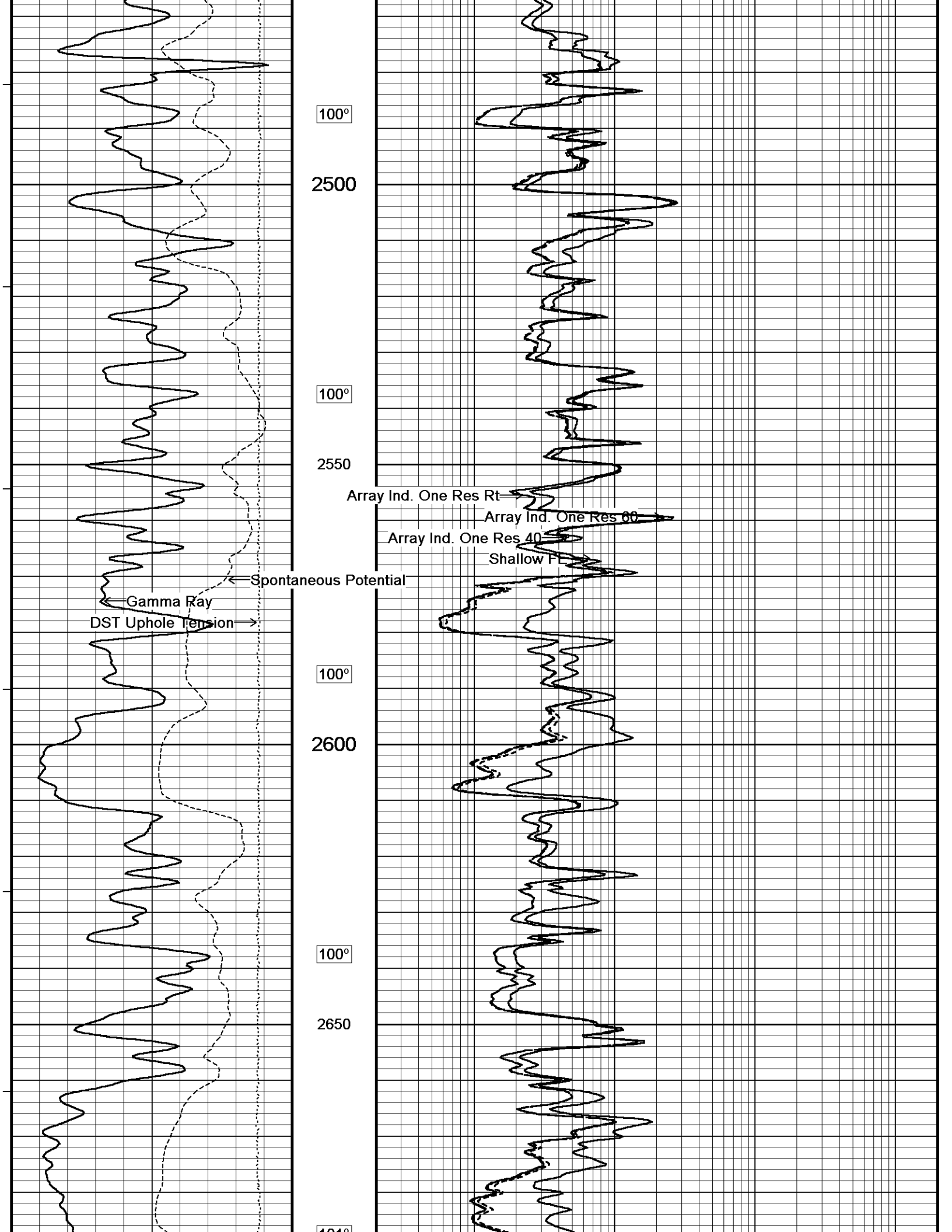

Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow LE
Spontaneous Potential
Gamma Ray
DS Uphole Tension
96°
1400
96°
1450
96°
1500
96°
1550

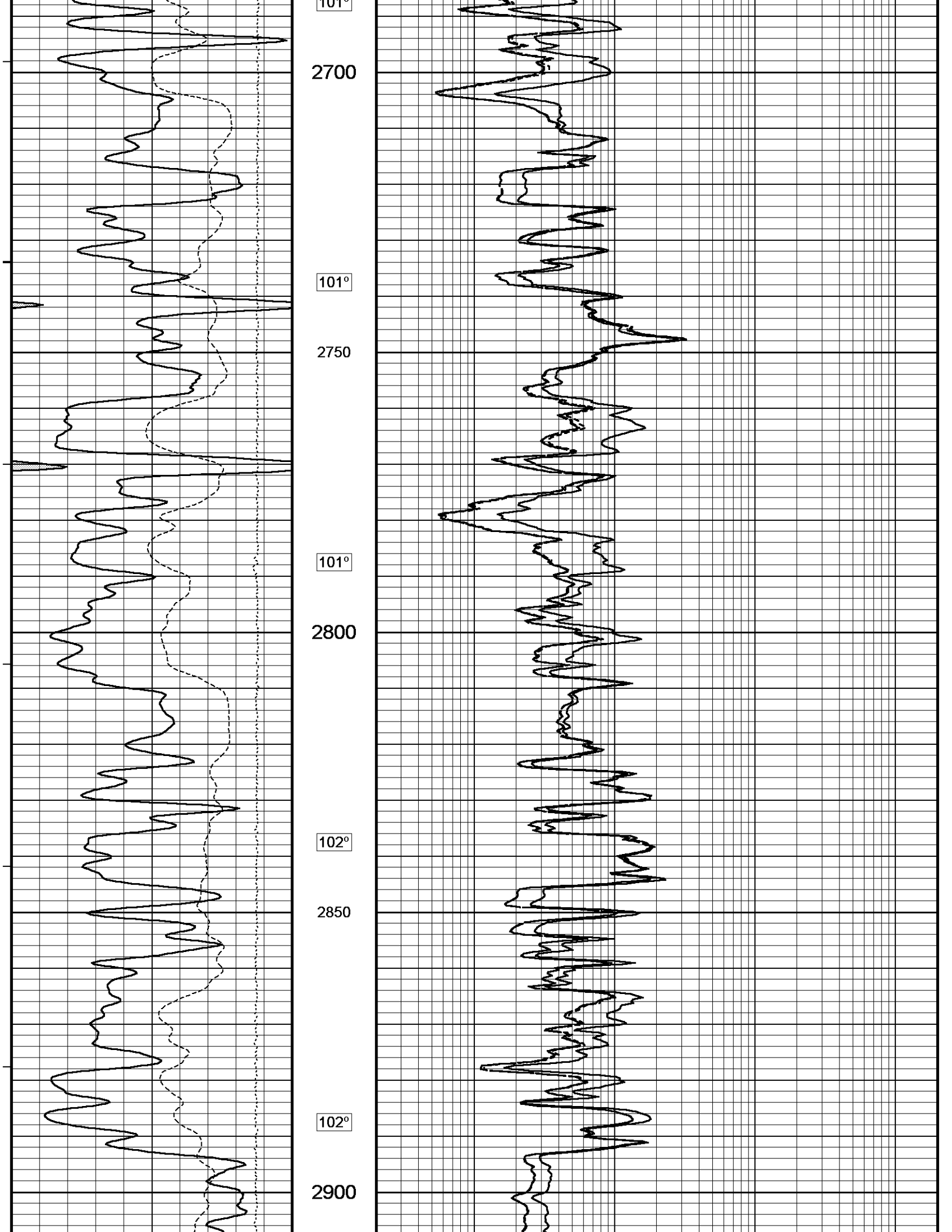

97°
1600
98°
1650
98°
1700
97°
1750
96°
1800
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE

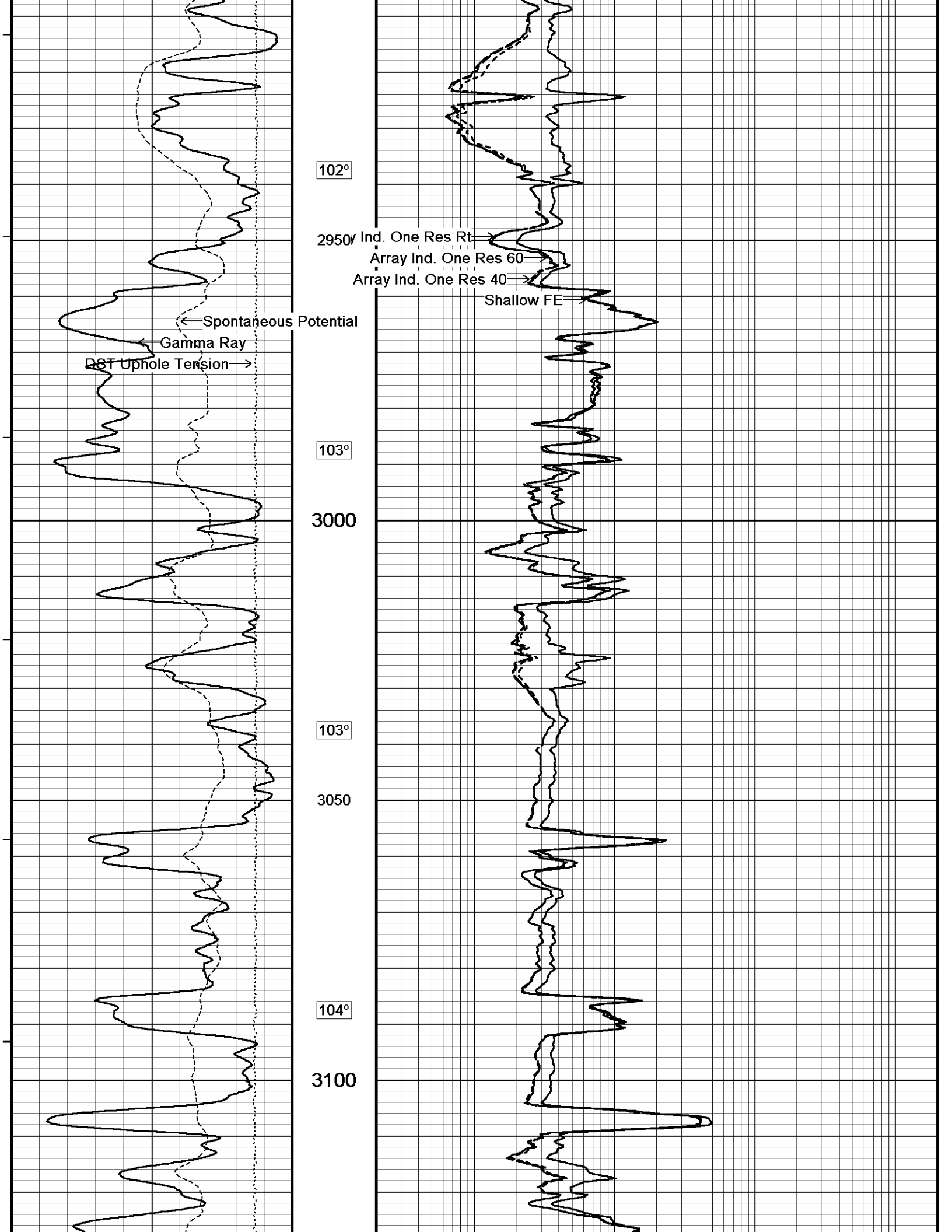

96°
1850
96°
1900
96°
1950
97°
2000

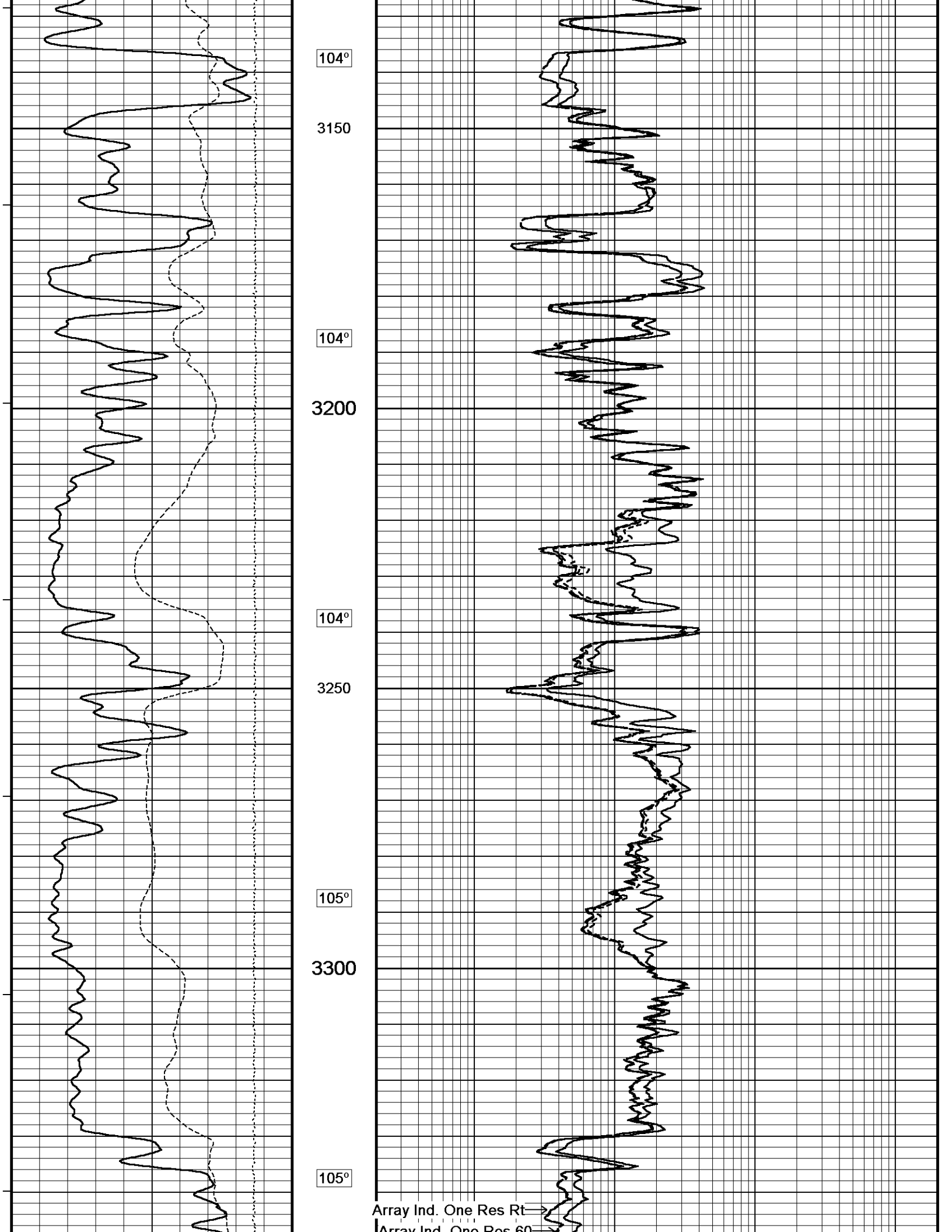

97°
2050
98°
2100
98°
2150
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
99°
2200
99°

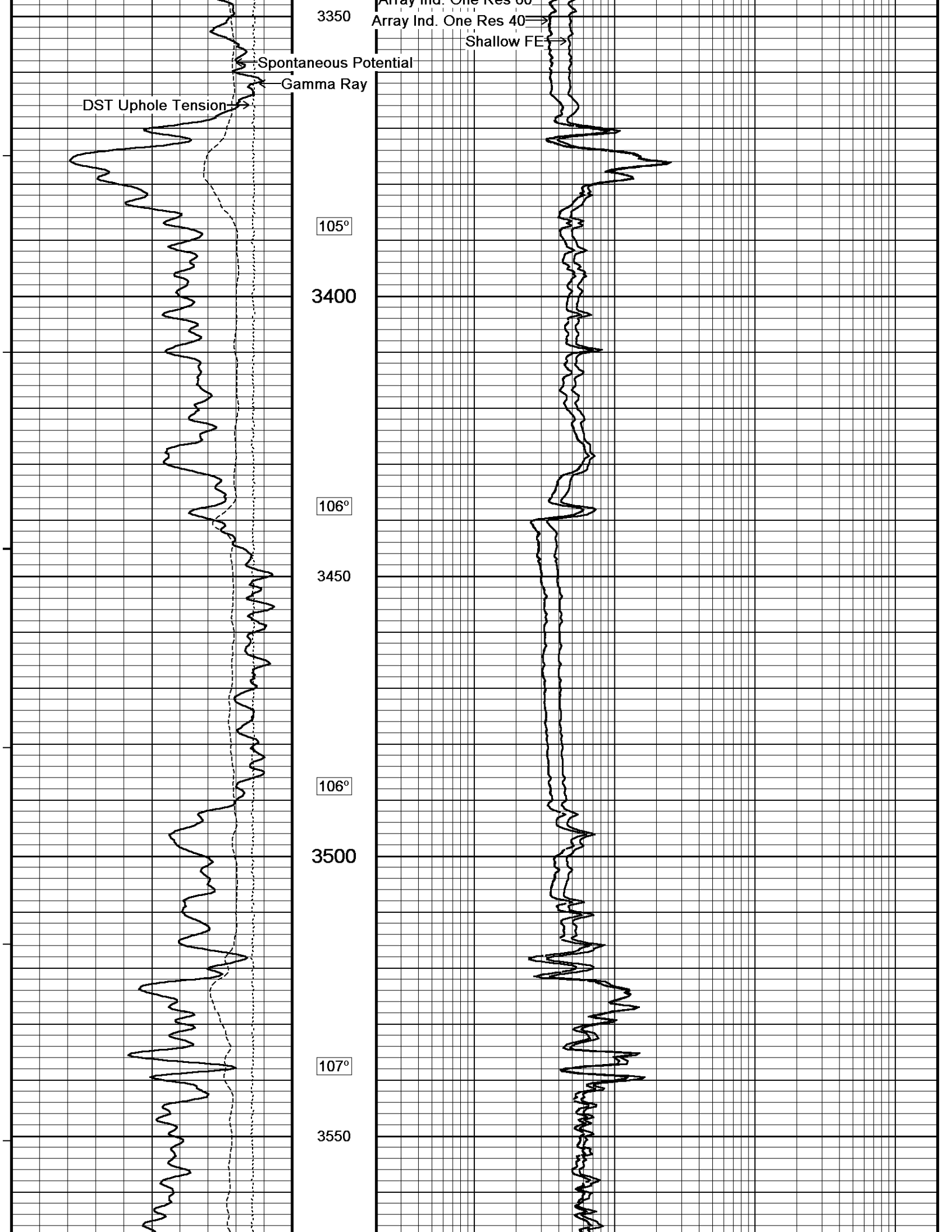

2250
98°
2300
99°
2350
99°
2400
100°
2450

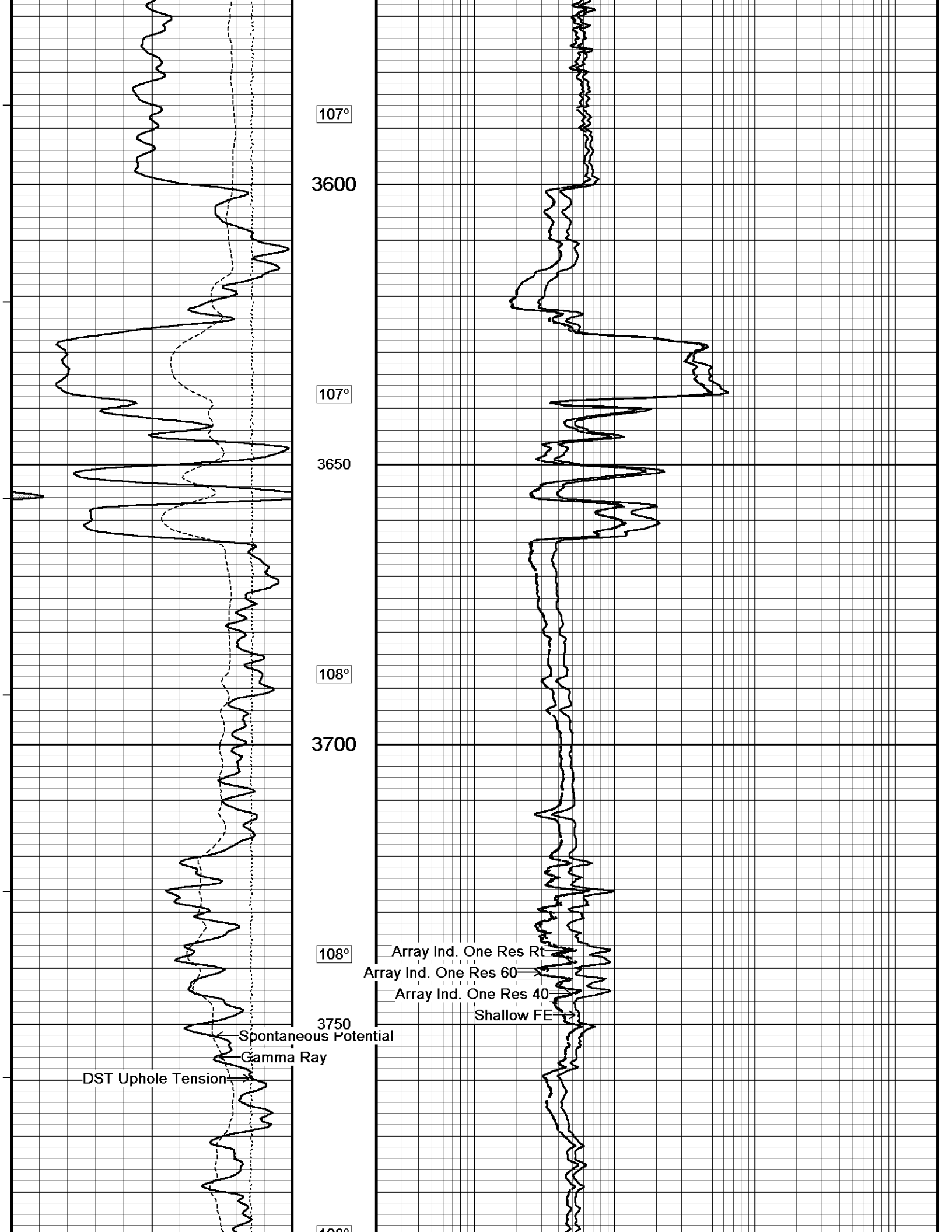

100°
2500
100°
2550
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow Ft
Spontaneous Potential
Gamma Ray
DST Uphole Tension
100°
2600
100°
2650

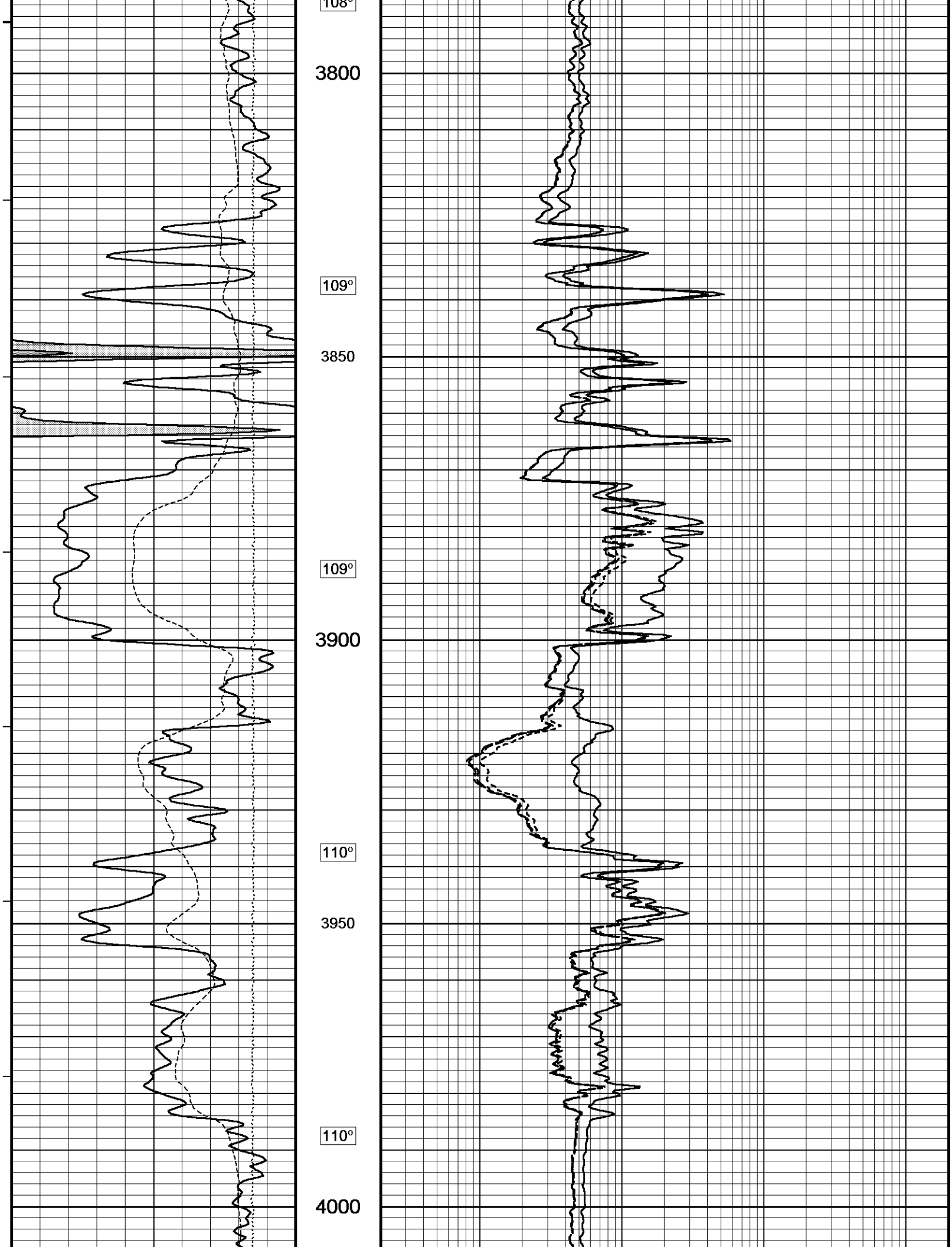

101°
2700
101°
2750
101°
2800
102°
2850
102°
2900

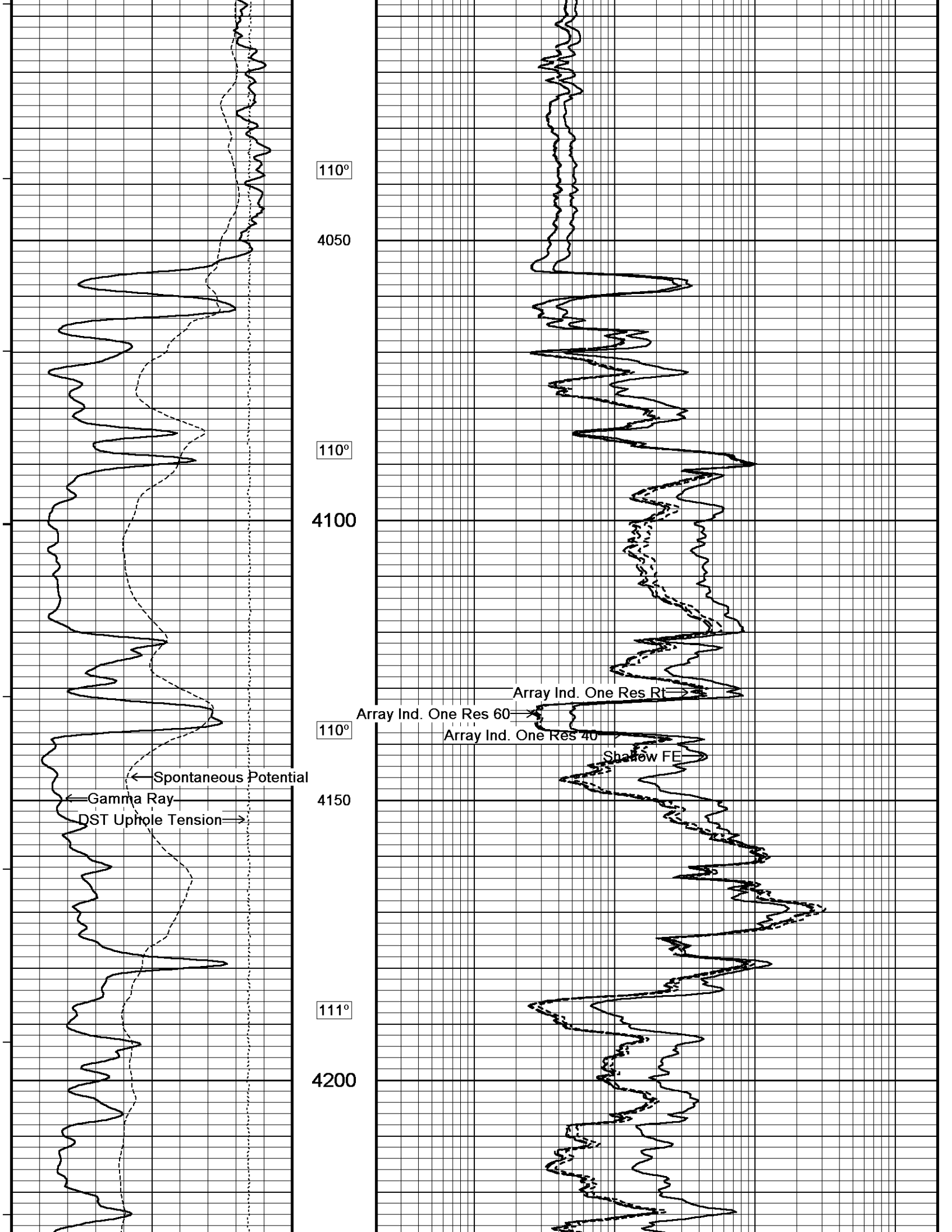

102°
2950
Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
103°
3000
103°
3050
104°
3100

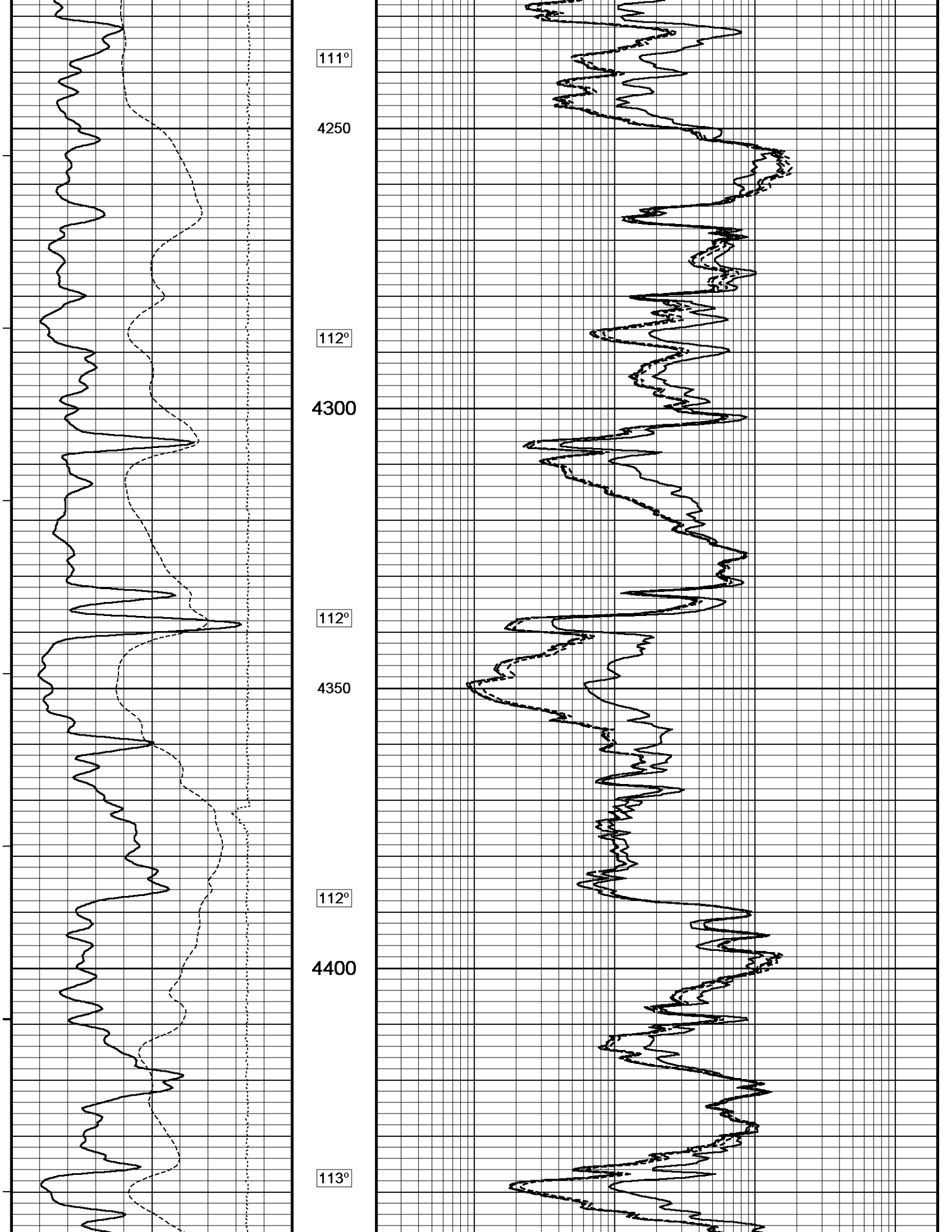

104°
3150
104°
3200
104°
3250
105°
3300
105°
Array Ind. One Res Rt
Array Ind. One Res 60

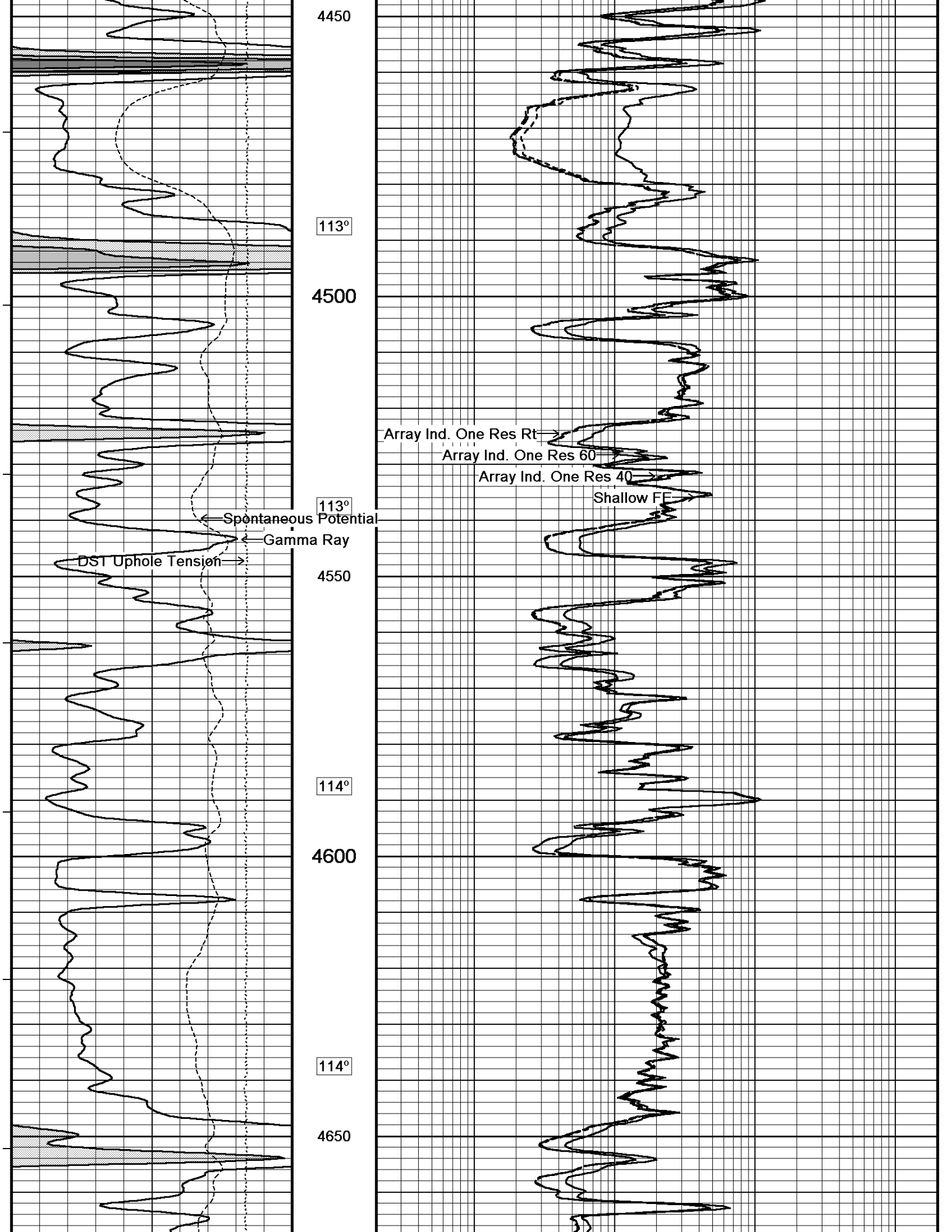

Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
3350
105°
3400
106°
3450
106°
3500
107°
3550

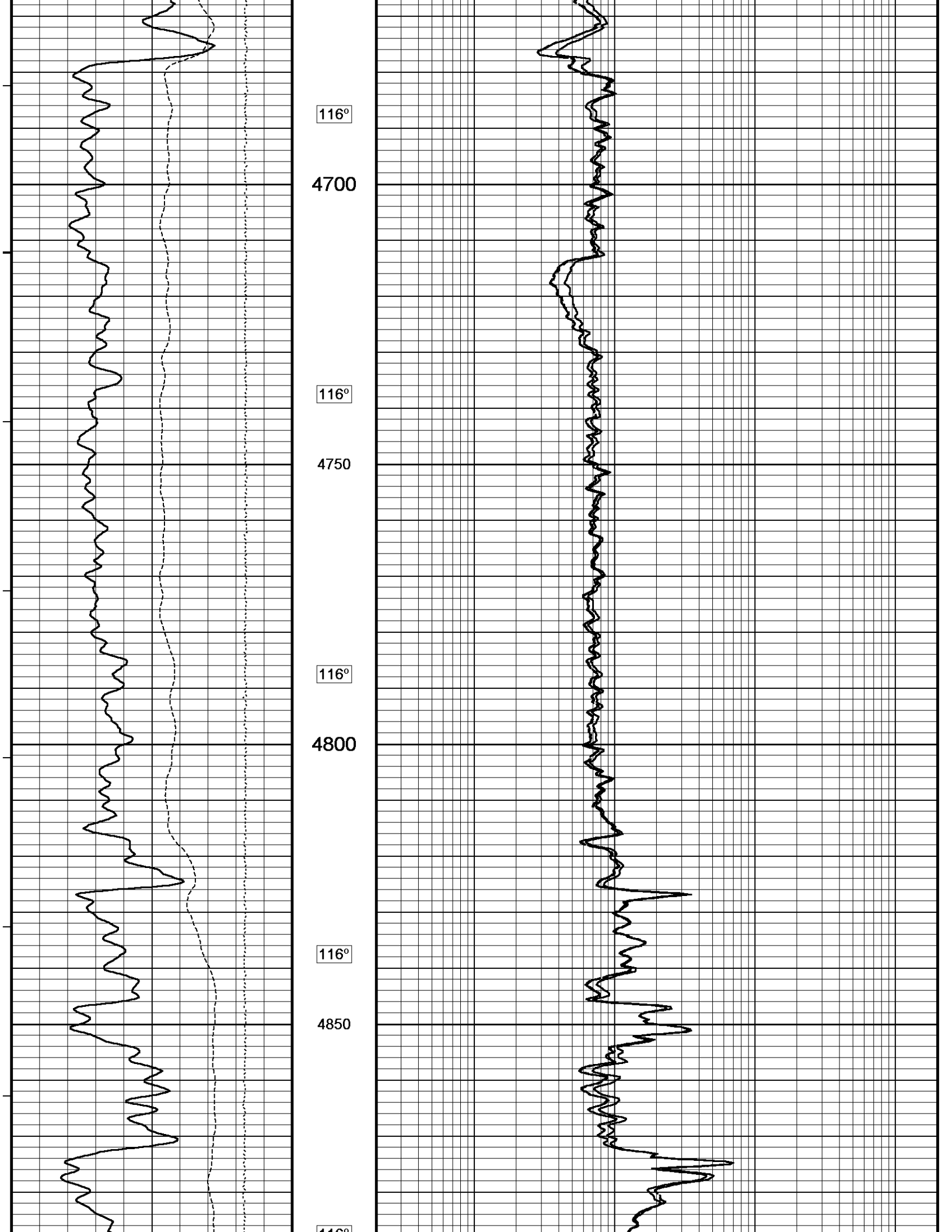

107°
3600
107°
3650
108°
3700
108°
3750
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension

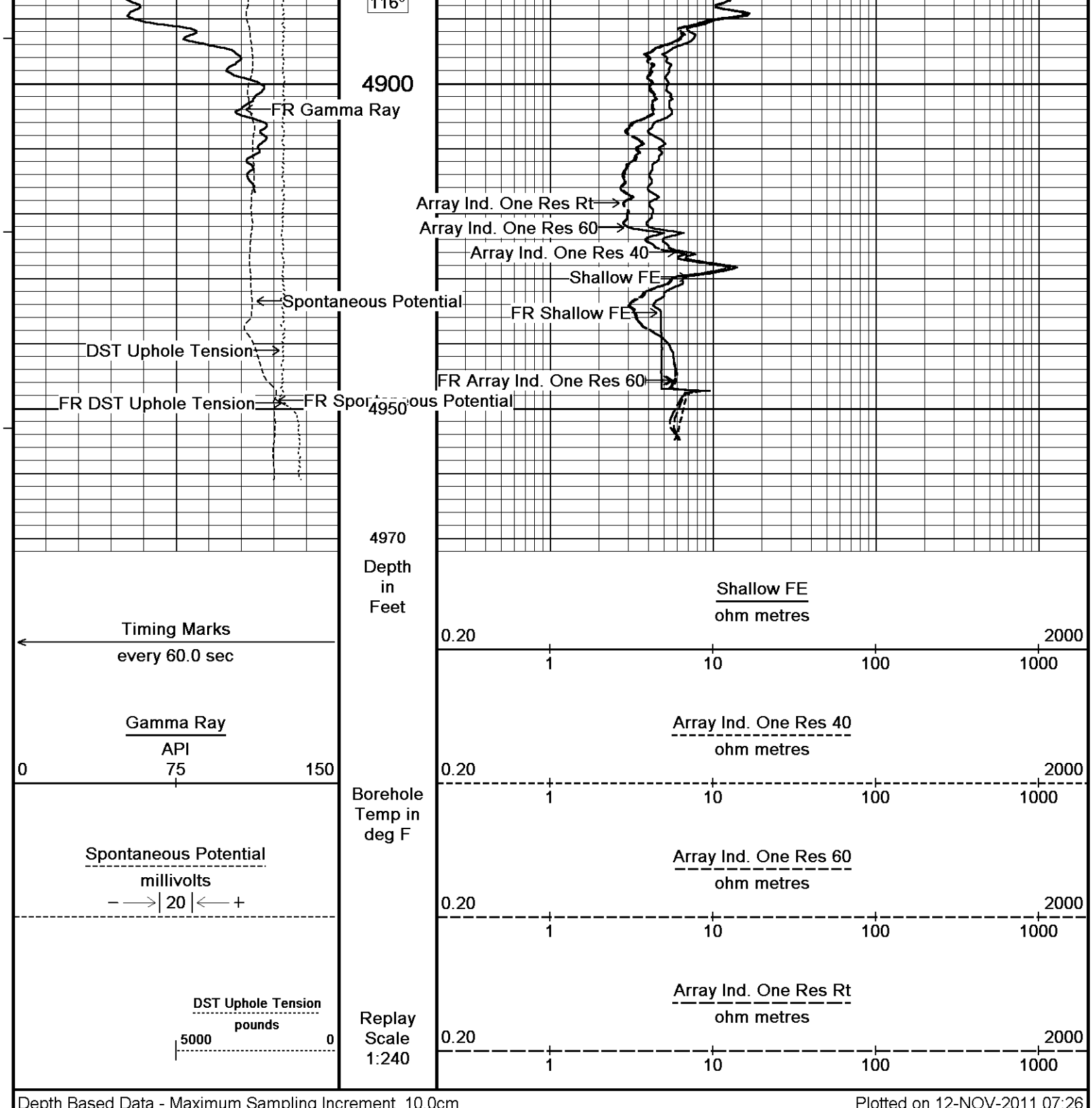

108°
3800
109°
3850
109°
3900
110°
3950
110°
4000


110°
4050
110°
4100
110°
4150
111°
4200
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension


111°
4250
112°
4300
112°
4350
112°
4400
113°


4450
113°
4500
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
113°
Spontaneous Potential
Gamma Ray
DST Uphole Tension
4550
114°
4600
114°
4650


116°
4700
116°
4750
116°
4800
116°
4850

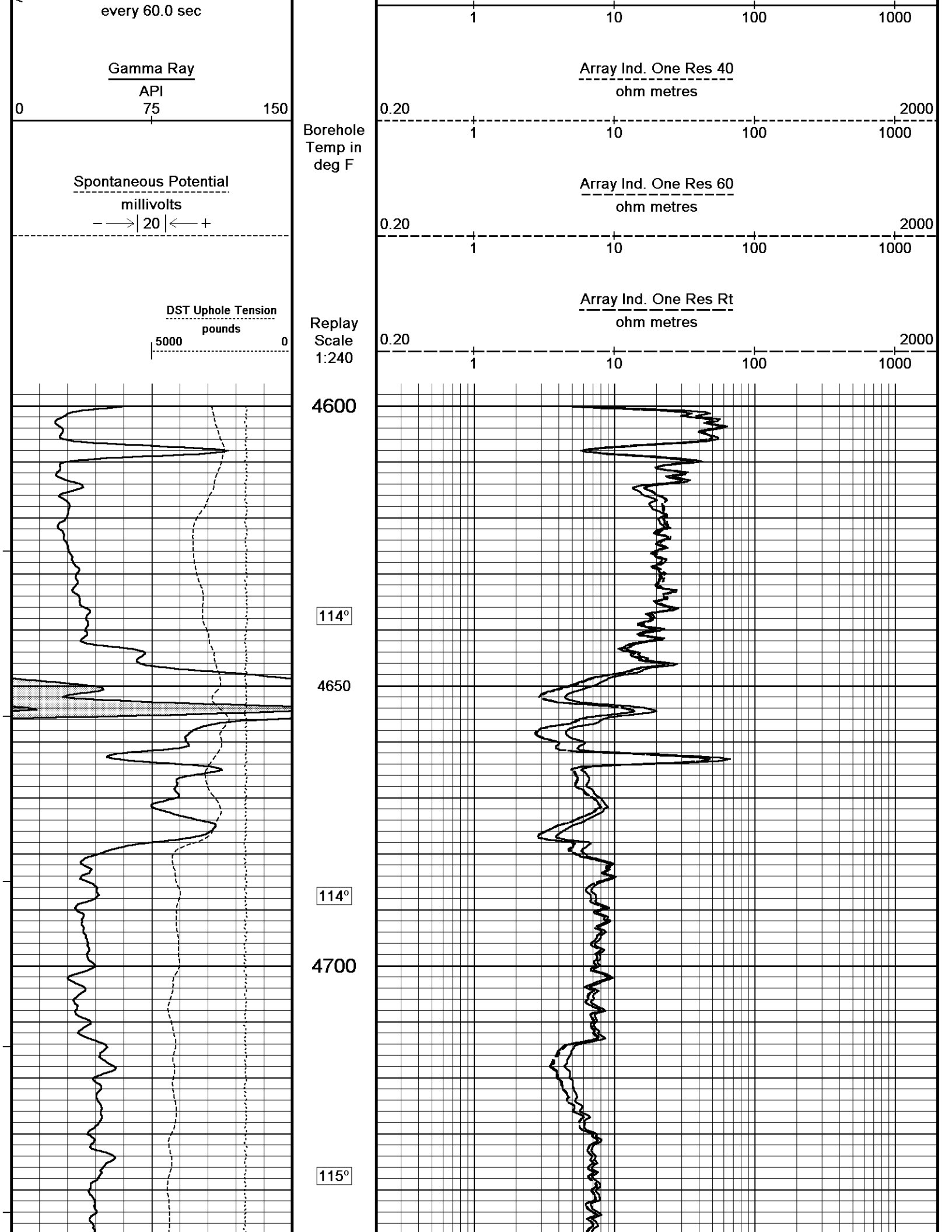


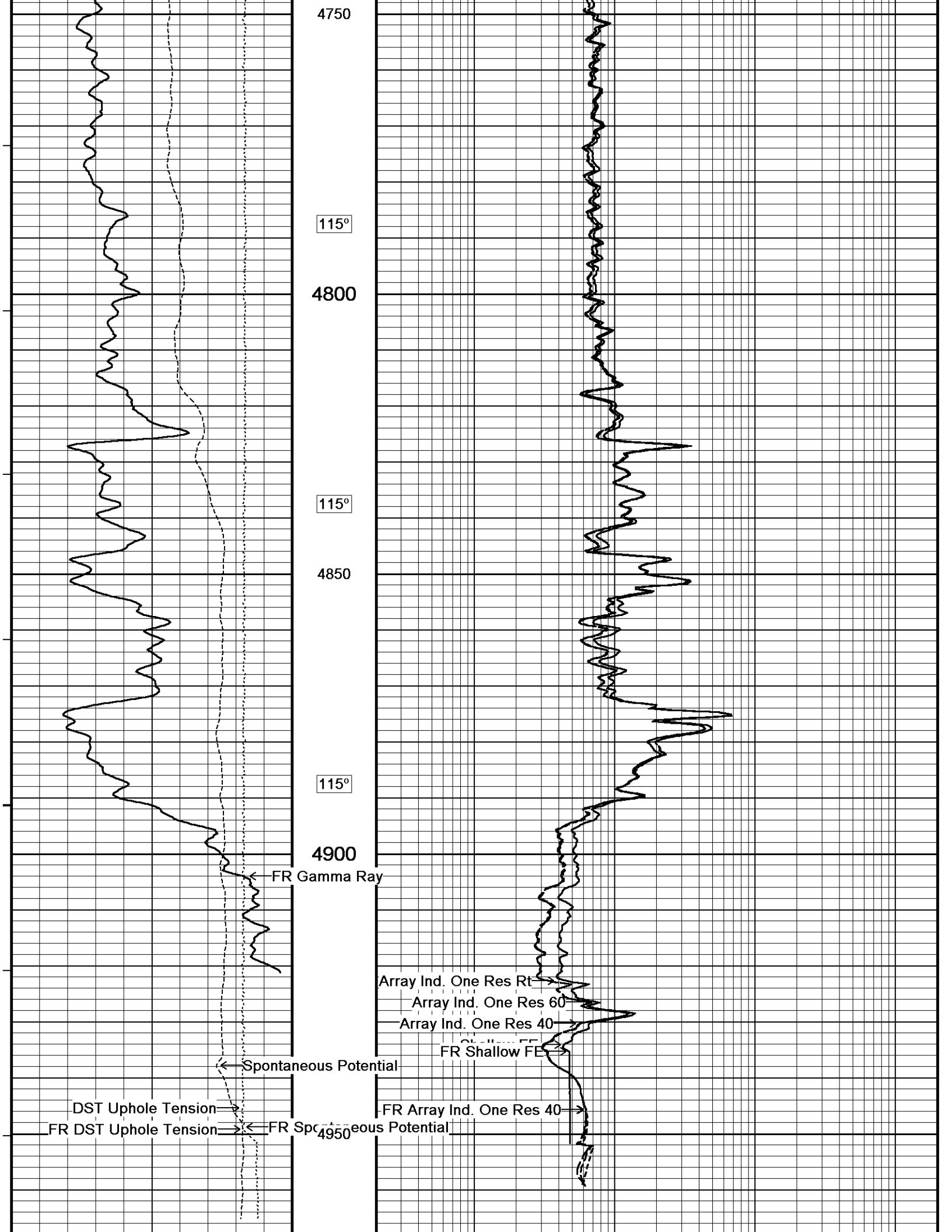
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 12-NOV-2011 07:26
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_003.dta
Recorded on 12-NOV-2011 05:15
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

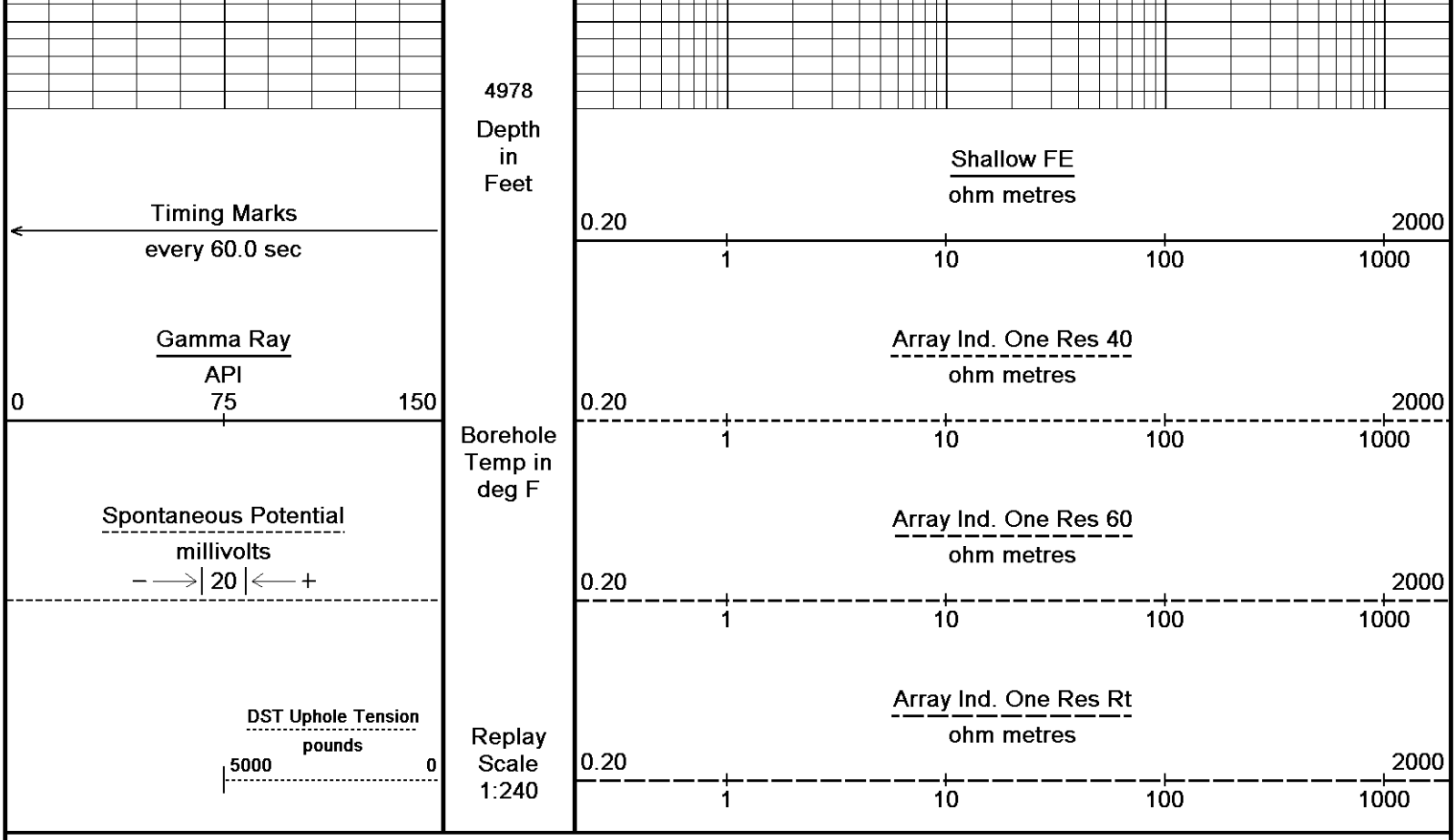
5 INCH MAIN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 12-NOV-2011 07:26
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_002.dta
Recorded on 12-NOV-2011 04:45
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044


every 60.0 sec
Gamma Ray
API
0
75
150
Spontaneous Potential
millivolts
– 20 +
DST Uphole Tension
pounds
5000
0
Borehole Temp in deg F
Replay Scale 1:240
1
10
100
1000
Array Ind. One Res 40
ohm metres
0.20
2000
Array Ind. One Res 60
ohm metres
Array Ind. One Res Rt
ohm metres
4600
114°
4650
114°
4700
115°


4750
115°
4800
115°
4850
115°
4900
FR Gamma Ray
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
FR Shallow FE
Spontaneous Potential
DST Uphole Tension
FR DST Uphole Tension
FR Array Ind. One Res 40
4950



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 12-NOV-2011 07:26
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_002.dta — Recorded on 12-NOV-2011 04:45
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_003.dta

General Constants All 000

Last Edited on 12-NOV-2011,03:02

General Parameters		
Mud Resistivity	0.500	ohm-metres
Mud Resistivity Temperature	45.000	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	4.500	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. Six Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	

Down-hole Tension Calibration SMS 0

Field Calibration on 23-OCT-2011 03:19

Reading No	Measured	Calibrated (lbs)
1	12734.06	0.00
2	13523.27	454.00

High Resolution Temperature Calibration MCG-C 84

Field Calibration on 24-JUN-2010,13:02

	Measured	Calibrated(Deg F)

Lower	50.00	50.00
Upper	75.00	75.00

High Resolution Temperature Constants MCG-C 84

Last Edited on

Pre-filter Length	11

SP Calibration MCG-C 84

Field Calibration on 28-DEC-2010 11:28

	Measured	Calibrated (mV)
Reference 1	100.3	100.0
Reference 2	-99.7	-100.0

Gamma Calibration MCG-C 84

Field Calibration on 11-NOV-2011 11:14

	Measured	Calibrated (API)
Background	70	47
Calibrator (Gross)	752	503
Calibrator (Net)	682	456

Gamma Constants MCG-C 84

Last Edited on 11-NOV-2011,22:21

Gamma Calibrator Number	grc141	
Mud Density	1.08	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Caliper Calibration MML-A 9

Base Calibration on 17-OCT-2011 11:45
Field Calibration on 11-NOV-2011 10:55

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	15145	5.98
2	18563	7.97
3	21887	9.86
4	25872	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 9

Base Calibration on 17-OCT-2011 11:28
Field Check on 11-NOV-2011 10:53

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.1	59.5	2.6	12.8
Micro Inverse	15.6	77.7	1.7	8.4

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	32.5	32.5
Micro Inverse	16.4	16.4

Micro Normal and Micro Inverse Constants MML-A 9

Last Edited on 27-OCT-2011,21:14

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	N/A	inches

Neutron Calibration MDN-A.B 39

Base Calibration on 19-OCT-2011 15:30
Field Check on 11-NOV-2011 11:01

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	2769	86	3714	110
Ratio	32.016		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	2150	3003
Ratio	0.716	

Field Check	Calibrated (cps)	
	2387	3438
Ratio	0.694	

Neutron Constants MDN-A.B 39

Last Edited on 11-NOV-2011,22:21

Neutron Source Id	N1095	
Neutron Jig Number	NECD117	
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	N/A	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-A.A 67

Base Calibration on 17-OCT-2011 10:48
Field Check on 11-NOV-2011 10:52

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	959.2	126.8
Base Check		281.2
Field Check		281.1

FE Constants MFE-A.A 67

Last Edited on 11-NOV-2011,22:22

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	0.0	inches

High Resolution Temperature Calibration MAI-A.A 188

Field Calibration on 12-AUG-2011,21:41

	Measured	Calibrated(Deg F)
Lower	32.00	32.00
Upper	68.00	68.00

High Resolution Temperature Constants MAI-A.A 188

Last Edited on 21-JUN-2011,19:05

Pre-filter Length	11

Induction Calibration MAI-A.A 188

Base Calibration on 19-OCT-2011 14:25
Field Check on 11-NOV-2011 10:50

Base Calibration

Test Loop Calibration

Channel	Measured Low	Measured High	Calibrated (mmho/m) Low	Calibrated (mmho/m) High
1	16.9	470.2	9.3	966.2
2	6.4	377.1	7.6	821.4
3	3.9	257.8	5.2	566.0
4	1.7	135.1	2.6	279.2

Array Temperature 66.3 Deg F

Channel	Base Check (mmho/m) Low	Base Check (mmho/m) High	Field Check (mmho/m) Low	Field Check (mmho/m) High
1	0.0	0.0	13.5	3866.0
2	0.0	0.0	30.0	3583.1
3	0.0	0.0	27.9	3077.5
4	0.0	0.0	19.7	2046.1

Deep	0.0	0.0	17.2	1954.5	
Medium	0.0	0.0	40.3	4113.0	
Shallow	0.0	0.0	44.8	5366.8	
Array Temperature		0.0		65.8	Deg F

Induction Constants MAI-A.A 188

Last Edited on 11-NOV-2011,22:22

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	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 64

Base Calibration on 17-OCT-2011 14:30
Field Calibration on 11-NOV-2011 11:07

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	12640	3.99
2	21101	5.98
3	30051	7.97
4	38416	9.86
5	47668	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.98	5.98

Photo Density Calibration MPD-B 64

Base Calibration on 17-OCT-2011 15:00
Field Check on 11-NOV-2011 11:05

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	58984	30451	59556	30836
Reference 2	23638	2744	24941	2541

Field Check at Base

1207.6	1404.1

Field Check

1208.6 1402.8

PE Calibration

Base Calibration	WS	Measured WH	Ratio	Calibrated Ratio
Background	221	1079		
Reference 1	21941	58780	0.376	0.371
Reference 2	6445	23501	0.278	0.272

Field Check at Base

220.8 1079.4

Field Check

221.0 1079.6

Density Constants MPD-B 64

Last Edited on 11-NOV-2011,22:22

Density Source Id	P57072B	
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	1.08	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	

DOWNHOLE EQUIPMENT

C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_003.dta

MCB-A.A 11B Tension Cablehead
MCB-A.A 162 LG: 2.40 ft WT: 19.8 lb OD: 2.24 in

Compact Comms Gamma
MCG-C 84 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

- 45.04 ft GRGC - Gamma Ray
- 42.13 ft CGXT - MCG External Temperature

Compact Micro-log
MML-A 9 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

- 35.41 ft MINV - Micro-inverse
- 35.41 ft MNRL - Micro-normal
- 36.40 ft MLTC - MML Caliper

Compact Neutron
MDN-A.B 39 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

- 30.61 ft NPRL - Limestone Neutron Por.

Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

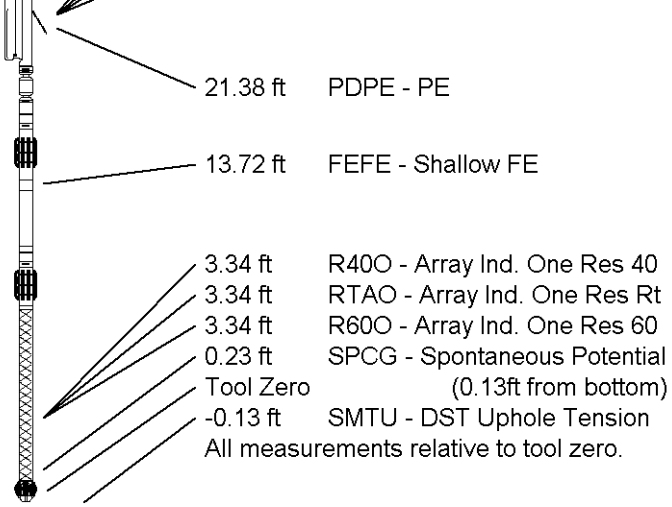
- 23.37 ft CLDC - Density Caliper
- 21.44 ft DPRL - Limestone Density Por.
- 21.44 ft DEN - Compensated Density
- 21.44 ft DCOR - Density Correction

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 91 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-A.A 67 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 188 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 52.72 ft Weight: 427.7 lb



COMPANY	M & M EXPLORATION, INC.
WELL	Z-BAR # 16-4
FIELD	AETNA GAS AREA
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	1566.00	feet	First Reading	4746.00	feet
Elevation Drill Floor	1564.00	feet	Depth Driller	4950.00	feet
Elevation Ground Level	1554.00	feet	Depth Logger	4949.00	feet

Weatherford®

ARRAY INDUCTION SHALLOW FOCUSSED ELECTRIC LOG

40 Years of Wireline 1970 2010

COMPANY	M & M EXPLORATION, INC.
WELL	Z-BAR # 16-4
FIELD	AETNA GAS AREA
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	660' FNL & 660' FWL, NW/4
SEC	16
TWP	34S
RGE	14W
API Number	15-007-23790
Permit Number	
Other Services	MPD/MDN MML
Permanent Datum G.L., Elevation 1554 feet	
Log Measured From KB	
Drilling Measured From K.B @ 12 FEET	

ARRAY INDUCTION SHALLOW FOCUSSED ELECTRIC LOG

Date	11-NOV-2011				Elevations:	
Run Number	ONE				KB	1566.00 feet
Depth Driller	4950.00	feet			DF	1564.00
Depth Logger	4949.00	feet			GL	1554.00
First Reading	4746.00	feet				
Last Reading	896.00	feet				
Casing Driller	896.00	feet				
Casing Logger	896.00	feet				
Bit Size	7.875	inches				
Hole Fluid Type	CHEMICAL					
Density/Viscosity	9.00 lb/USg	42.00 CP				
PH / Fluid Loss	10.00	8.00 ml/30Min				
Sample Source	FLOWLINE					
Rm @ Measured Temp	0.50 @ 45.0	ohm-m				
Rmf @ Measured Temp	0.40 @ 45.0	ohm-m				
Rmc @ Measured Temp	0.60 @ 45.0	ohm-m				
Source Rmf / Rmc	CALC	CALC				
Rm @ BHT	0.21 @116.0	ohm-m				
Time Since Circulation	6 HOURS					
Max Recorded Temp	116.00	deg F				
Equipment Name	COMPACT					
Equipment / Base	13096	LIB				
Recorded By	A. GIAMBALVO					
Witnessed By	BETH BROCK					
S.O. / JOB #	3634695	LB11-288				

1 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 12-NOV-2011 07:26
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_003.dta — Recorded on 12-NOV-2011 05:15
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Timing Marks every 60.0 sec

Gamma Ray API 0 75 150

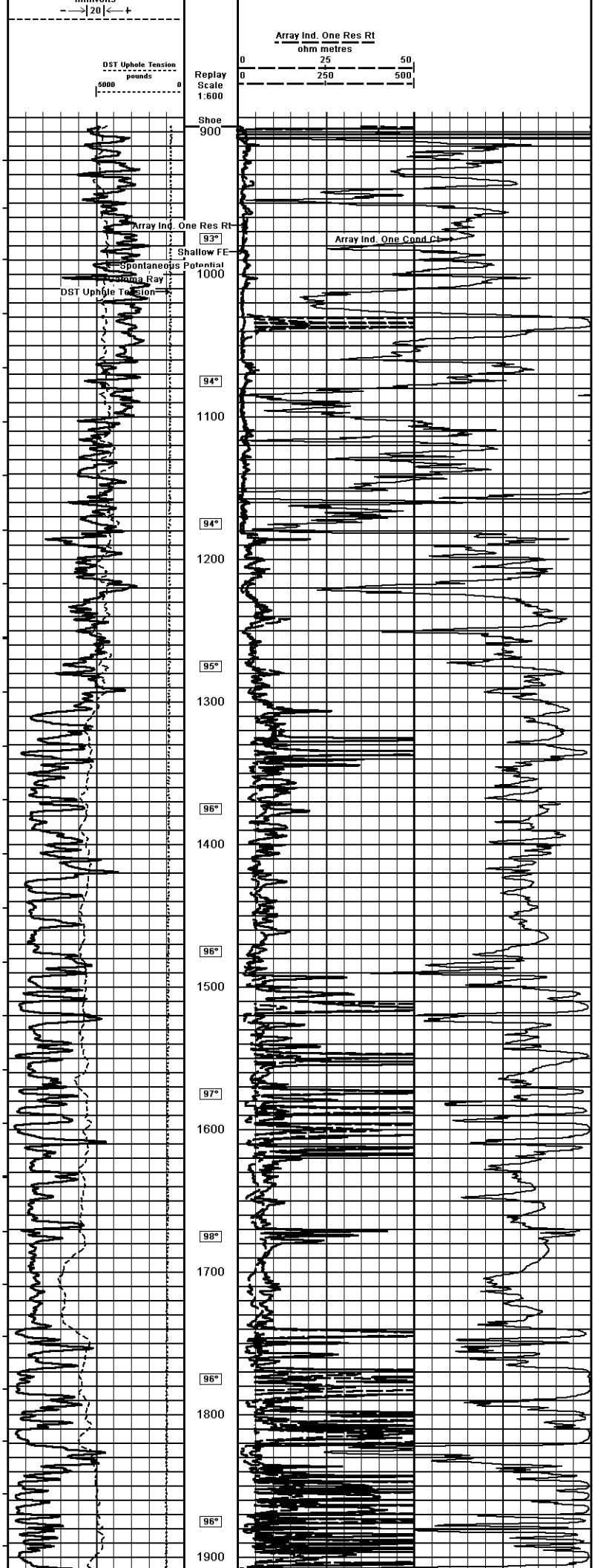
Spontaneous Potential millivolts

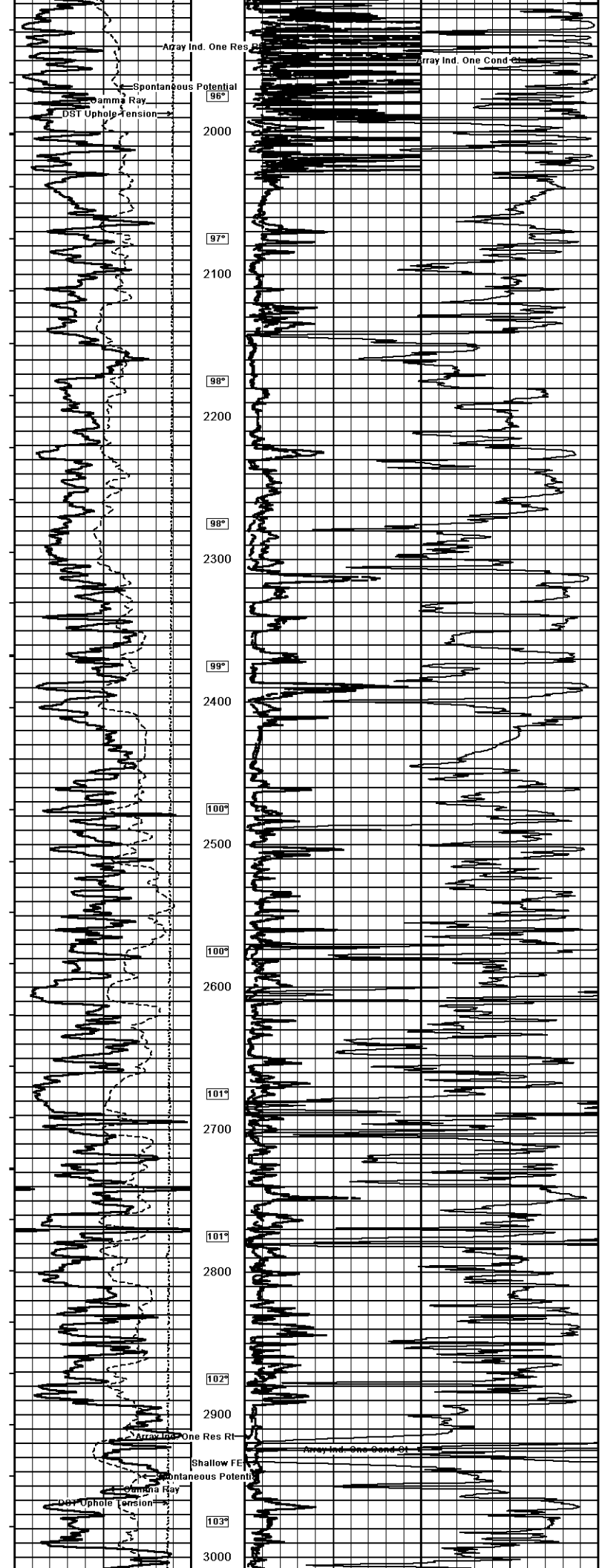
Depth in Feet

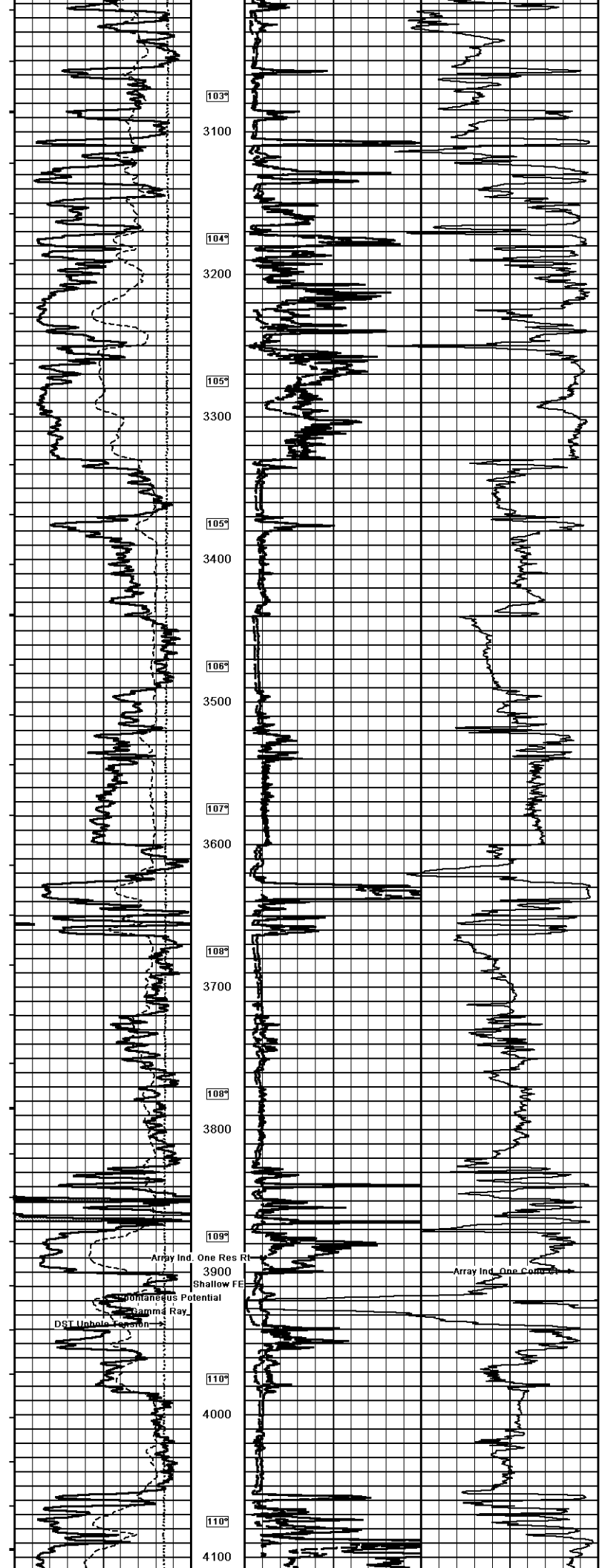
Borehole Temp in deg F

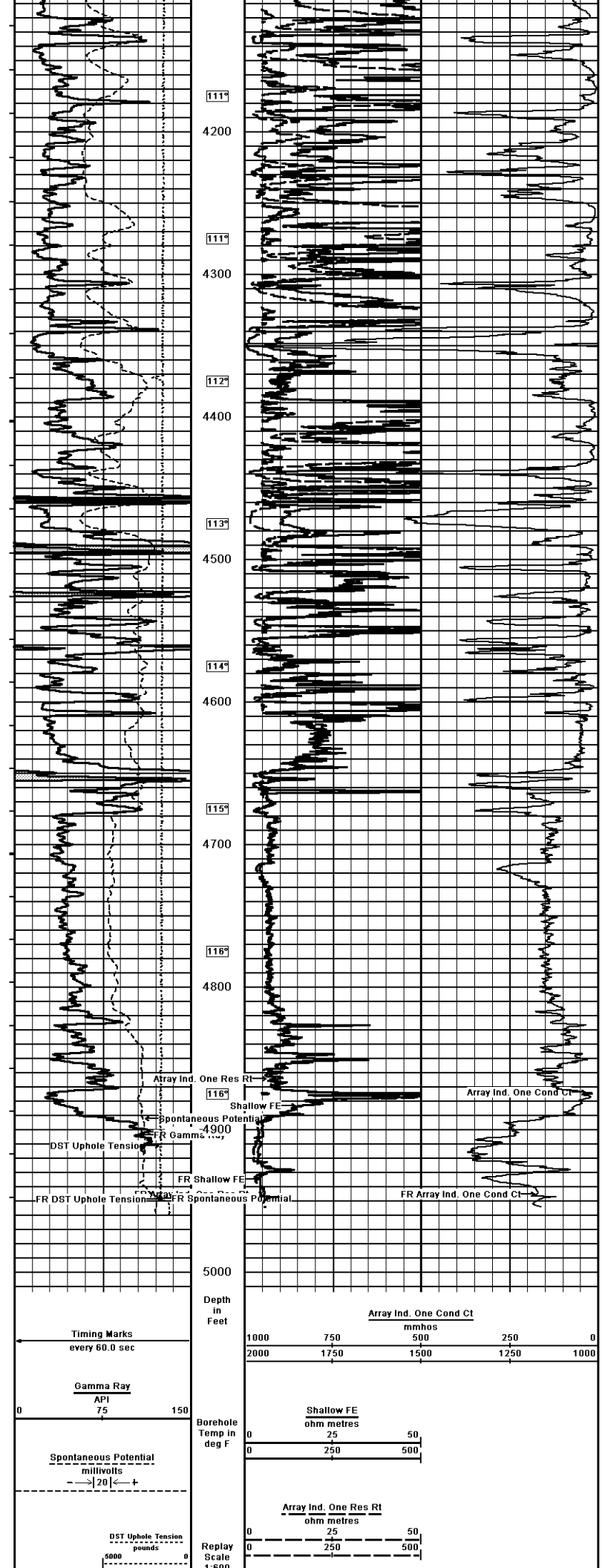
Array Ind. One Cond Ct mmhos
1000 750 500 250 0
2000 1750 1500 1250 1000

Shallow FE ohm metres
0 25 50
0 250 500


millivolts
20
DST Uphole Tension
pounds
5000
0
Array Ind. One Res Rt
ohm metres
0
25
50
0
250
500
Replay
Scale
1:600
Shoe
900
Array Ind. One Res Rt
93°
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct
1000
94°
1100
94°
1200
95°
1300
96°
1400
96°
1500
97°
1600
98°
1700
96°
1800
96°
1900


Array Ind. One Res Rt
Array Ind. One Cond Ct
Spontaneous Potential
Gamma Ray
DST Uphole Tension
96°
2000
97°
2100
98°
2200
98°
2300
99°
2400
100°
2500
100°
2600
101°
2700
101°
2800
102°
2900
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
103°
3000


103"
3100
104"
3200
105"
3300
105"
3400
106"
3500
107"
3600
108"
3700
108"
3800
109"
Array Ind. One Res Rt
3900
Shallow FE
Spontaneous Potential
Gamma Ray
DST Unhole Tension
Array Ind. One Cond
110"
4000
110"
4100


111"
4200
111"
4300
112"
4400
113"
4500
114"
4600
115"
4700
116"
4800
Array Ind. One Res Rt
116"
Shallow FE
Spontaneous Potential
4900
FR Gamma Ray
DST Uphole Tension
FR Shallow FE
FR DST Uphole Tension
FR Spontaneous Potential
FR Array Ind. One Cond Ct
Array Ind. One Cond Ct
5000
Depth in Feet
Timing Marks every 60.0 sec
Gamma Ray API 0 75 150
Spontaneous Potential millivolts −→|20|←+
DST Uphole Tension pounds 5000 0
Array Ind. One Cond Ct mmhos 1000 750 500 250 0 2000 1750 1500 1250 1000
Shallow FE ohm metres 0 25 50 0 250 500
Borehole Temp in deg F
Array Ind. One Res Rt ohm metres 0 25 50 0 250 500
Replay Scale 1:600

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 12-NOV-2011 07:26
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_003.dta — Recorded on 12-NOV-2011 05:15
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

1 INCH MAIN

COMPANY	M & M EXPLORATION, INC.
WELL	Z-BAR # 16-4
FIELD	AETNA GAS AREA
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	1566.00	feet	First Reading	4746.00	feet
Elevation Drill Floor	1564.00	feet	Depth Driller	4950.00	feet
Elevation Ground Level	1554.00	feet	Depth Logger	4949.00	feet

Weatherford

ARRAY INDUCTION
SHALLOW FOCUSSED
ELECTRIC LOG

40 Wireline

Weatherford®

COMPACT PHOTO DENSITY COMPENSATED NEUTRON MICRORESISTIVITY LOG

COMPANY	M & M EXPLORATION, INC.
WELL	Z-BAR # 16-4
FIELD	AETNA GAS AREA
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	660' FNL & 660' FWL, NW/4

40 Years of Wireline 1970 2010

SEC	TWP	RGE	Other Services
16	34S	14W	MAI/MFE

API Number 15-007-23790
Permit Number

Permanent Datum G.L., Elevation 1554 feet
Log Measured From KB
Drilling Measured From K.B. @ 12 FEET

Elevations:	feet
KB	1566.00
DF	1564.00
GL	1554.00

Date	11-NOV-2011				
Run Number	ONE				
Depth Driller	4950.00	feet			
Depth Logger	4949.00	feet			
First Reading	4726.00	feet			
Last Reading	3800.00	feet			
Casing Driller	896.00	feet			
Casing Logger	896.00	feet			
Bit Size	7.875	inches			
Hole Fluid Type	CHEMICAL				
Density / Viscosity	9.00 lb/USg		42.00 CP		
PH / Fluid Loss	10.00		8.00 ml/30Min		
Sample Source	FLOWLINE				
Rm @ Measured Temp	0.50 @ 45.0	ohm-m			
Rmf @ Measured Temp	0.40 @ 45.0	ohm-m			
Rmc @ Measured Temp	0.60 @ 45.0	ohm-m			
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.21 @116.0	ohm-m			
Time Since Circulation	6 HOURS				
Max Recorded Temp	116.00	deg F			
Equipment Name	COMPACT				
Equipment / Base	13096		LIB		
Recorded By	A. GIAMBALVO				
Witnessed By	BETH BROCK				
S.O. / JOB #	3534695			LB11-288	

BOREHOLE RECORD

Last Edited: 12-NOV-2011 07:21

Bit Size inches	Depth From feet	Depth To feet
7.875	896.00	4949.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	896.00	24.00

REMARKS

Tools Used: MPD, MCG, MDN, MFE, MAI, MML.
Hardware: MPD: 8 inch profile plate used. MAI, MSS and MFE: 0.5 Inch standoffs used. MDN: Dual Bowspring used.
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.
Annular volume with 4.5 inch production casing = cu. ft
Service Order #3534695
Rig: Southwind # 70
Engineer: A. Giambalvo
Operator(s): N. Adame

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_003.dta
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Plotted on 12-NOV-2011 07:22
Recorded on 12-NOV-2011 05:15

Timing Marks
every 60.0 sec

Depth in Feet

Limestone Neutron Por.
percent
30 20 10 0 -10

Gamma Ray
API
0 75 150

Borehole Temp in deg F

Limestone Density Por.
percent
30 20 10 0 -10

HVI every 10 cu ft

Density Caliper
inches
6 11 16

PE
barns/electron
0 5 10

Density Correction
grams/cc
-0.25 0 0.25

Annular Integral every 10 cu ft

Bit Size
inches
6 11 16

Micro-normal
ohm metres
0 10

DST Uphole Tension
pounds
5000 0

Micro-inverse
ohm metres
0 10

Replay Scale 1:240

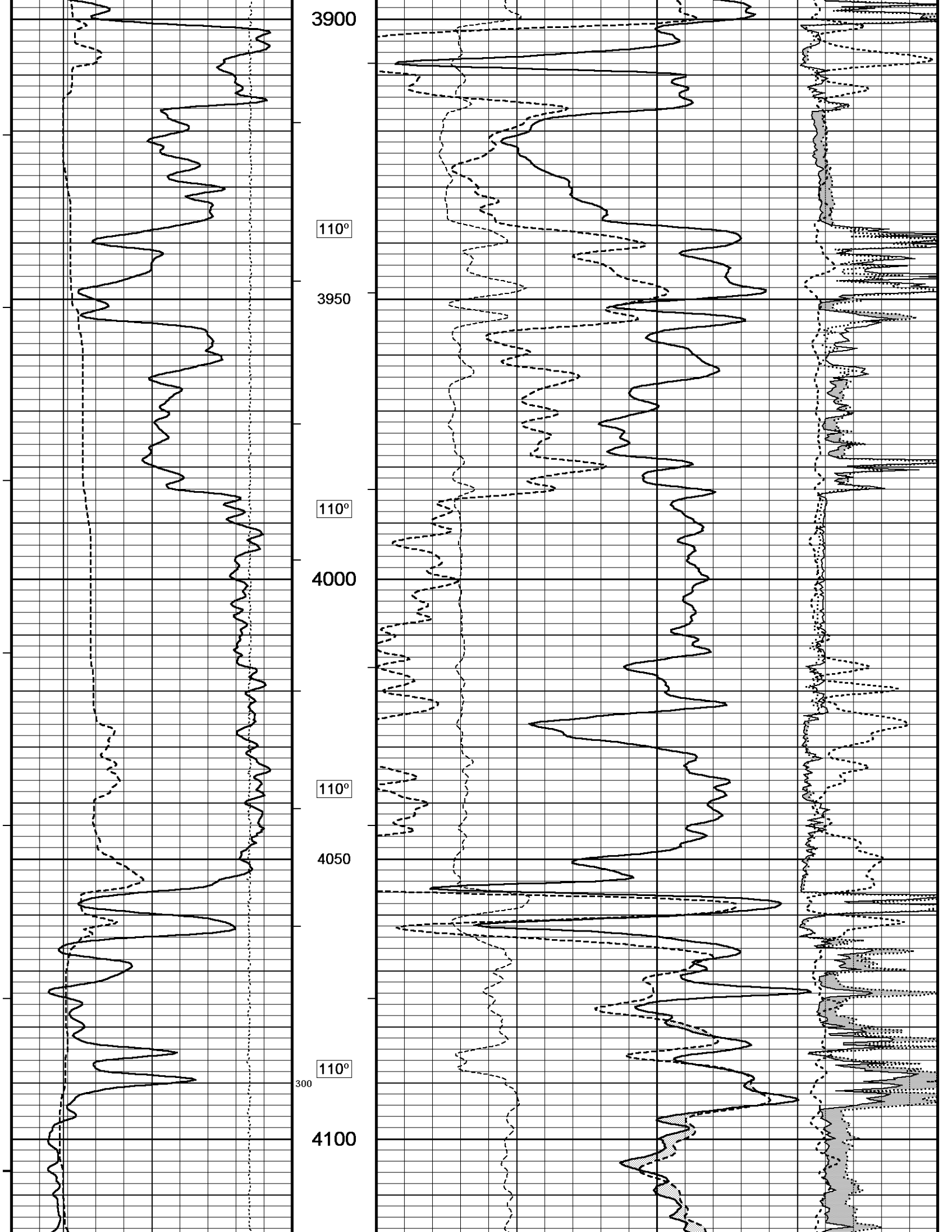
3800

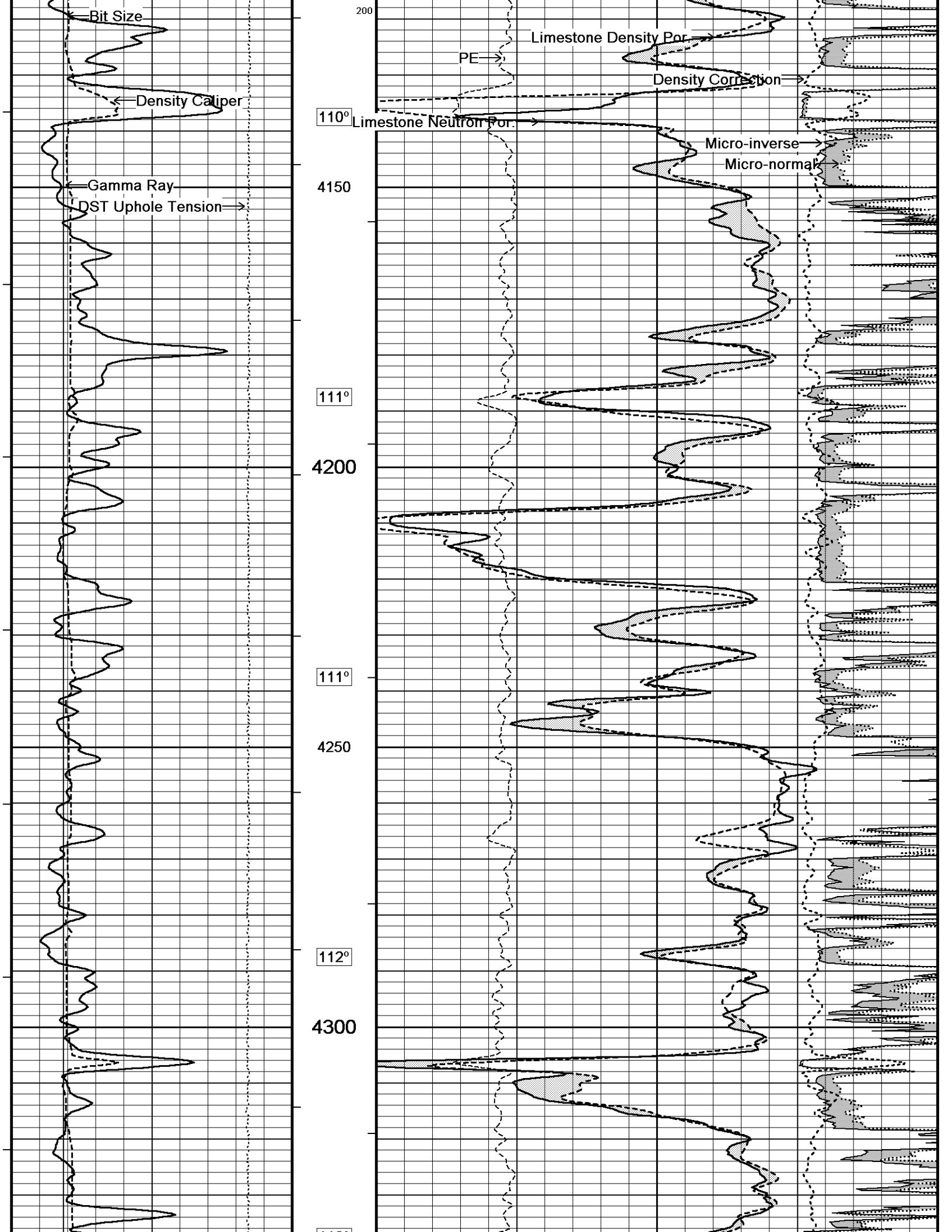
400

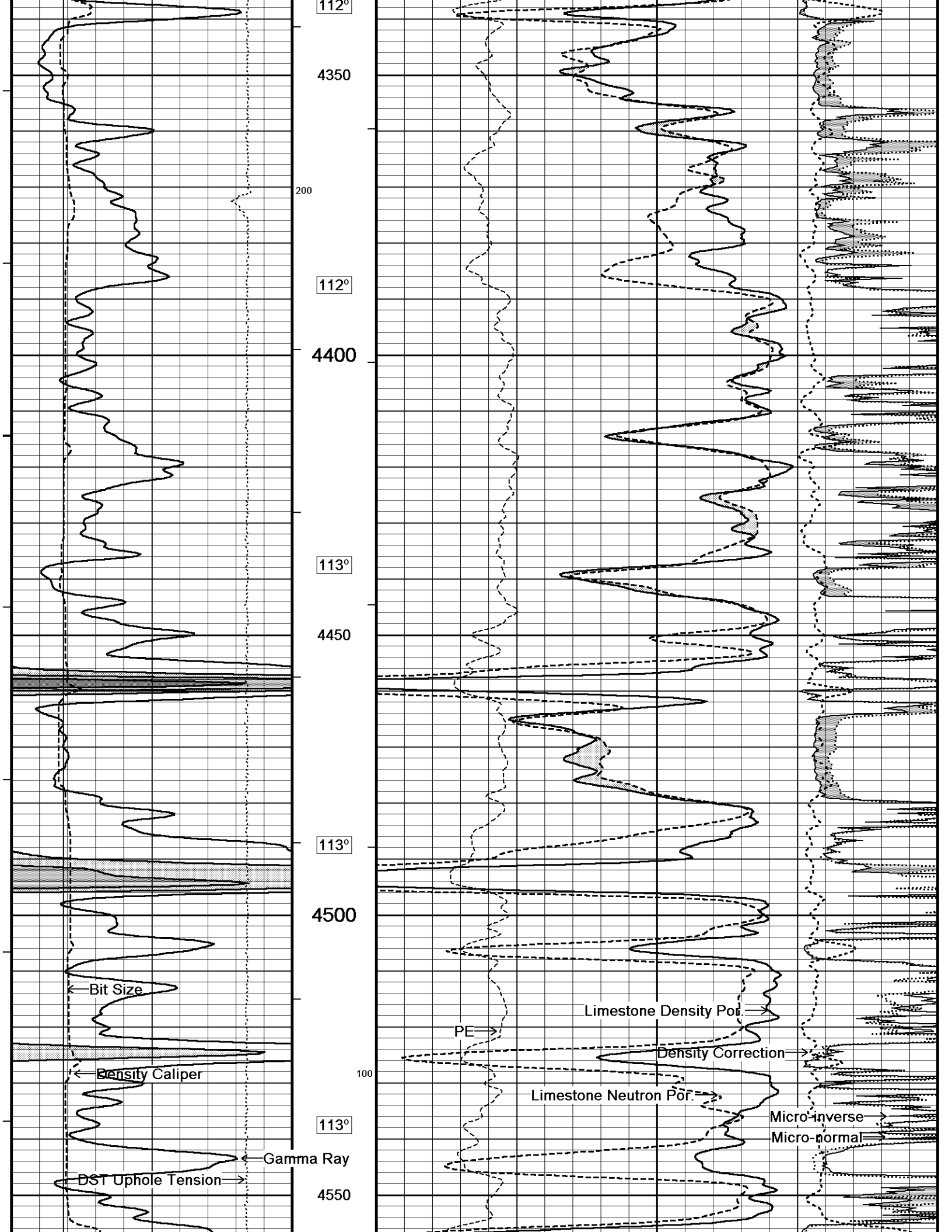
109°

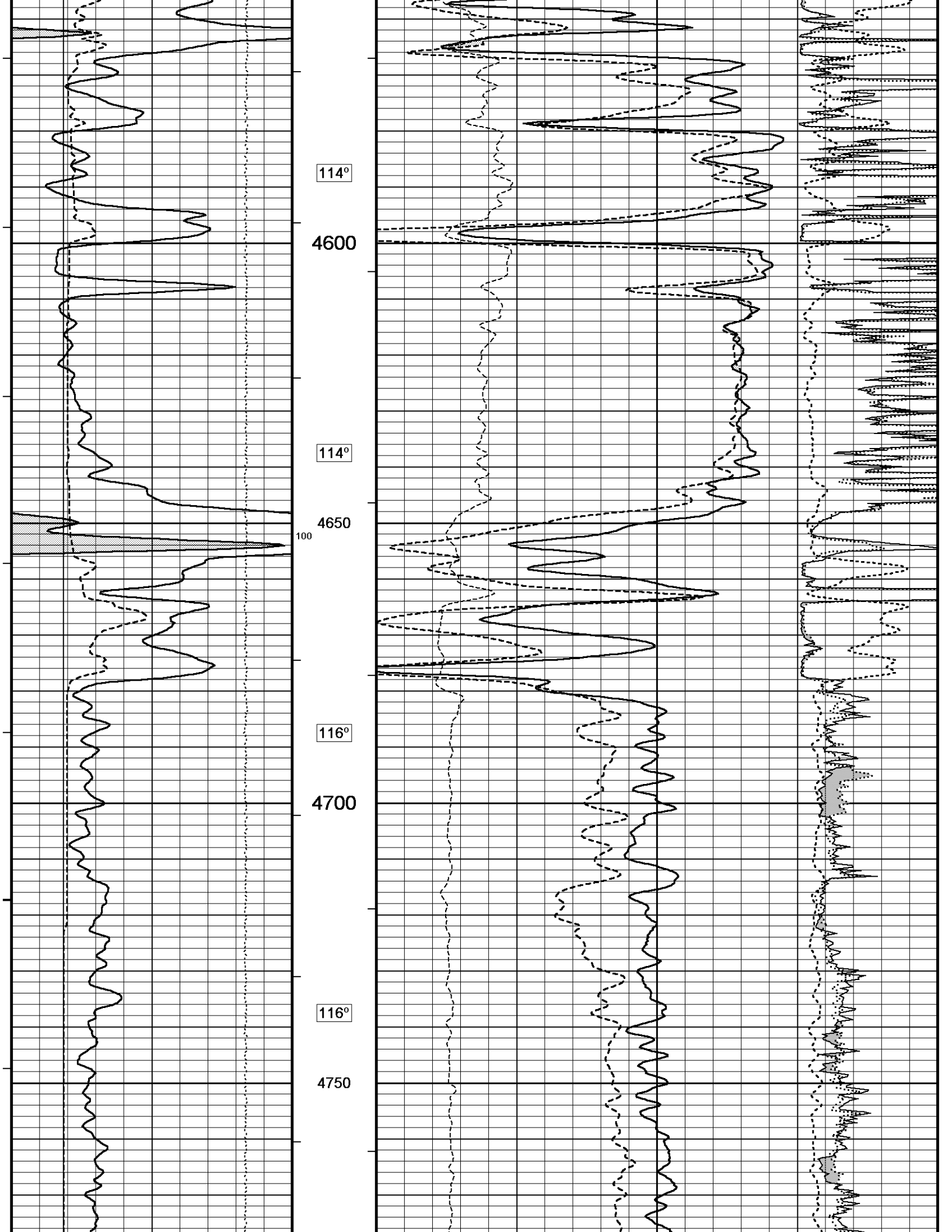
3850

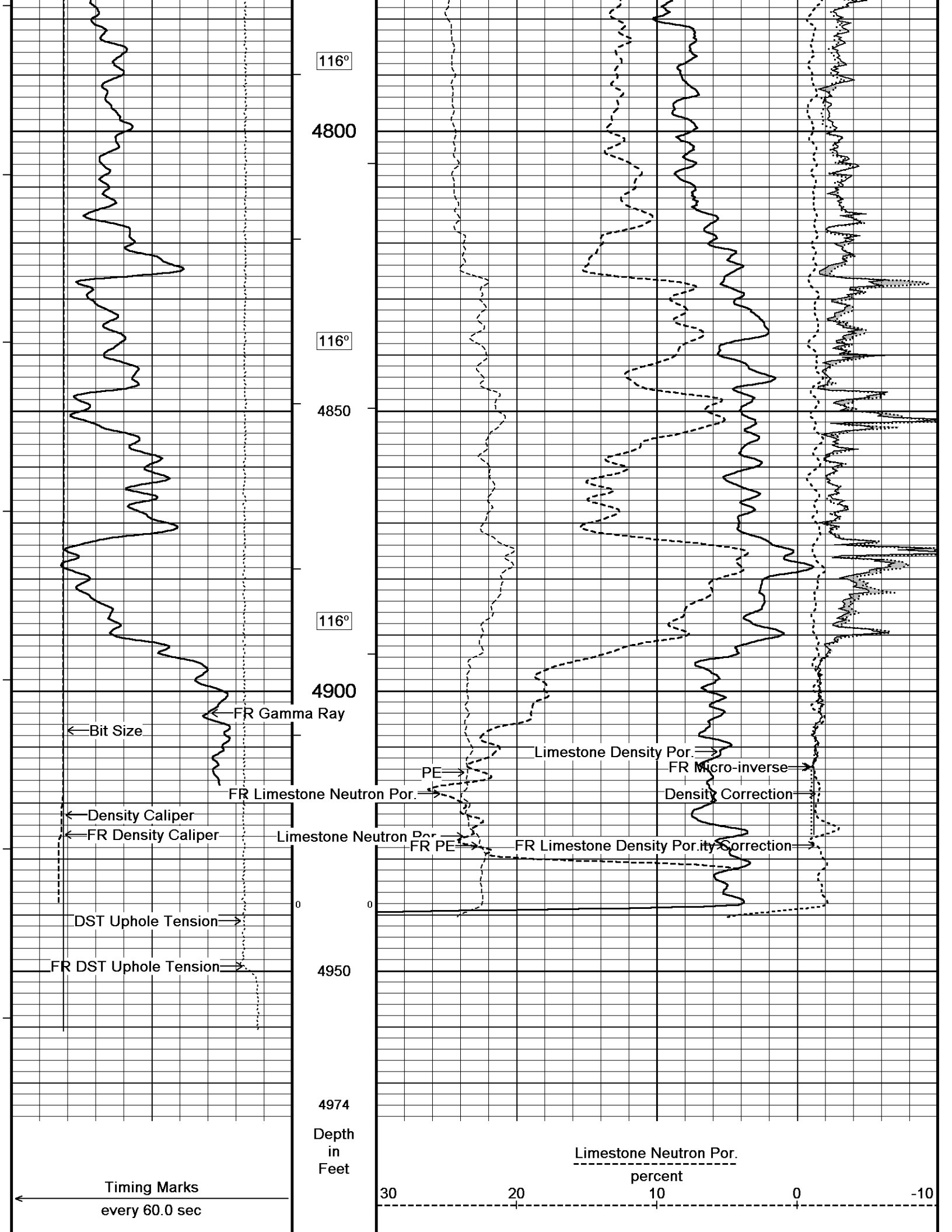
109°

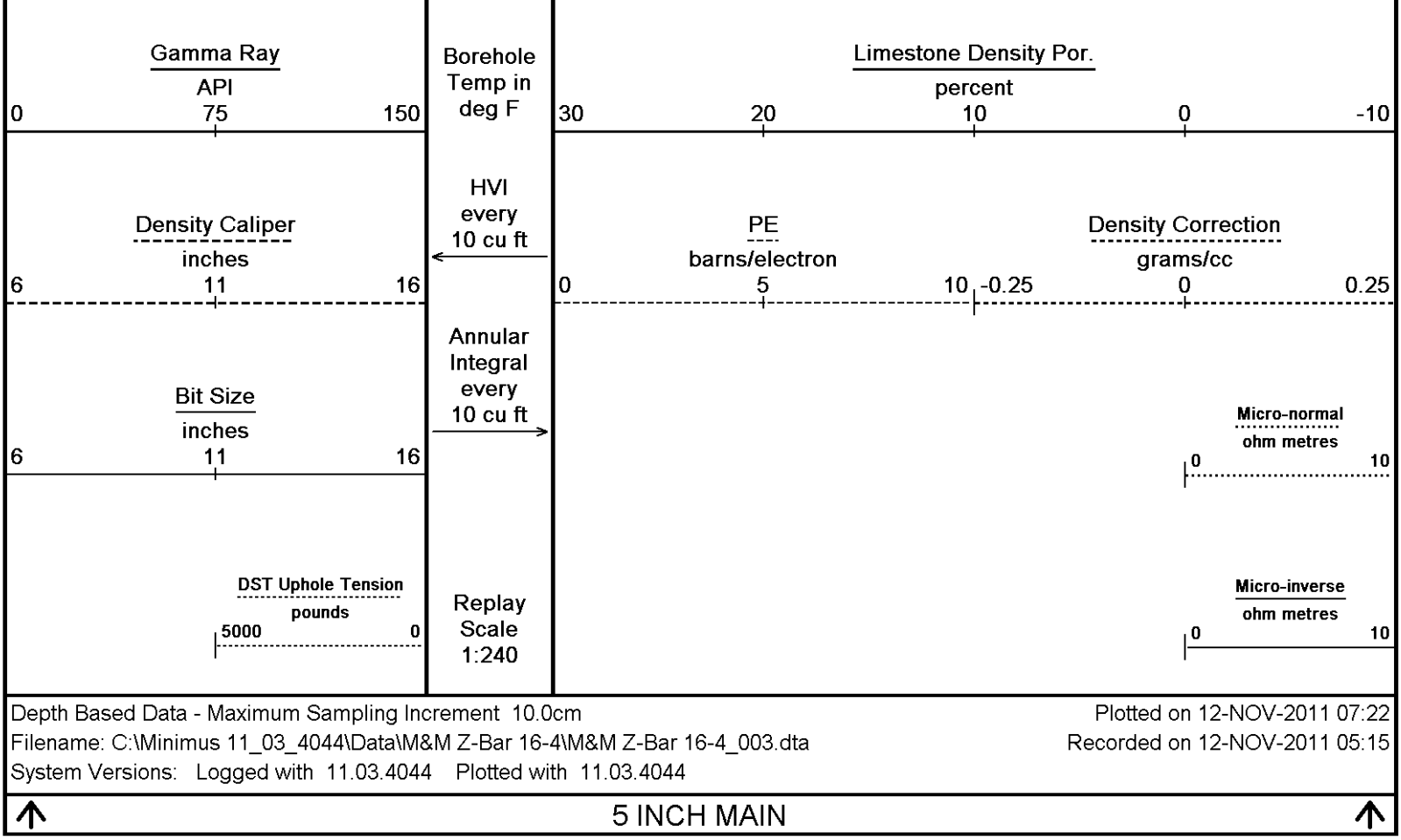

3900
110°
3950
110°
4000
110°
4050
110°
300
4100

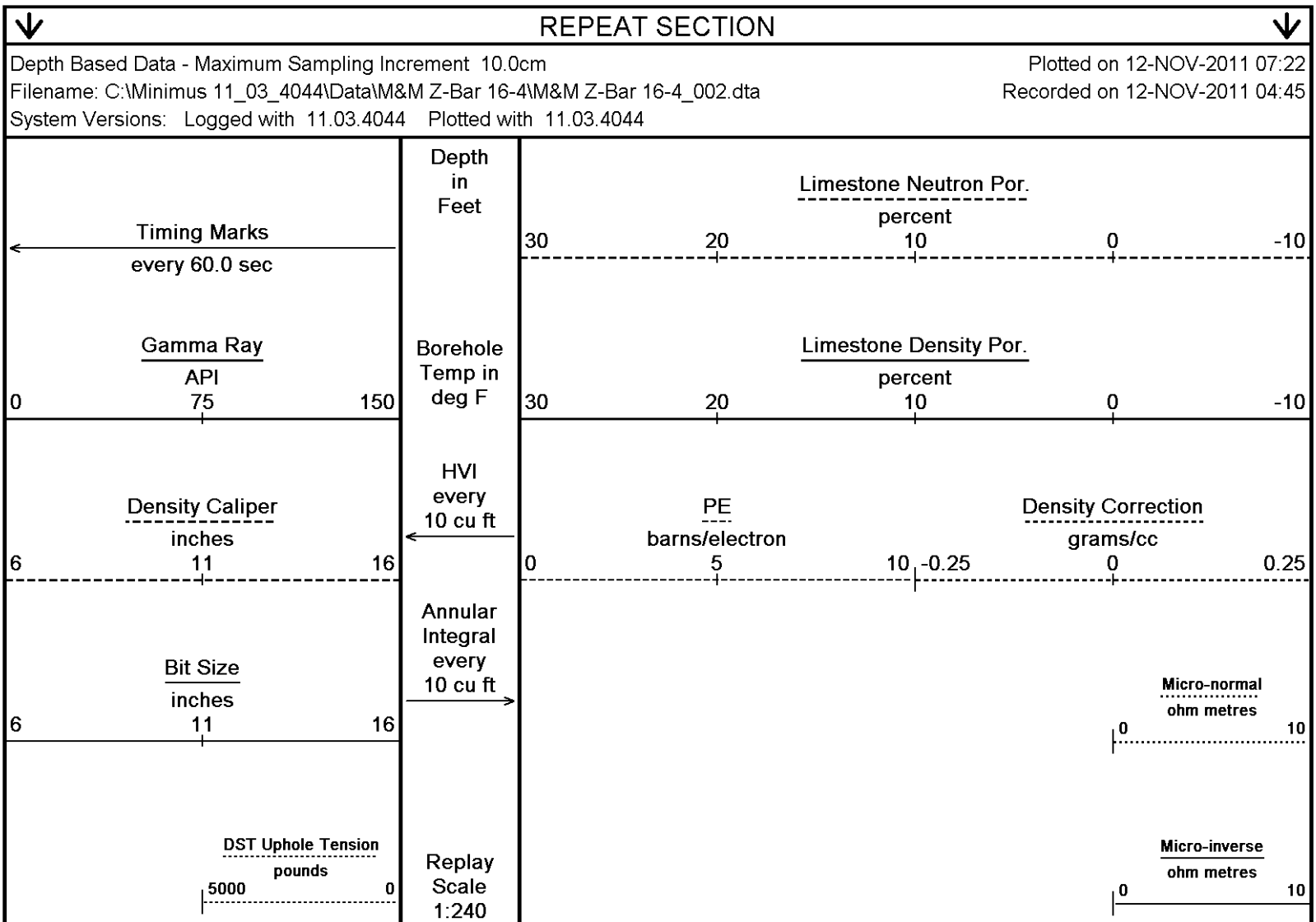

Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
200
Limestone Density Por.
PE
Density Correction
110°
Limestone Neutron Por.
Micro-inverse
Micro-normal
4150
111°
4200
111°
4250
112°
4300

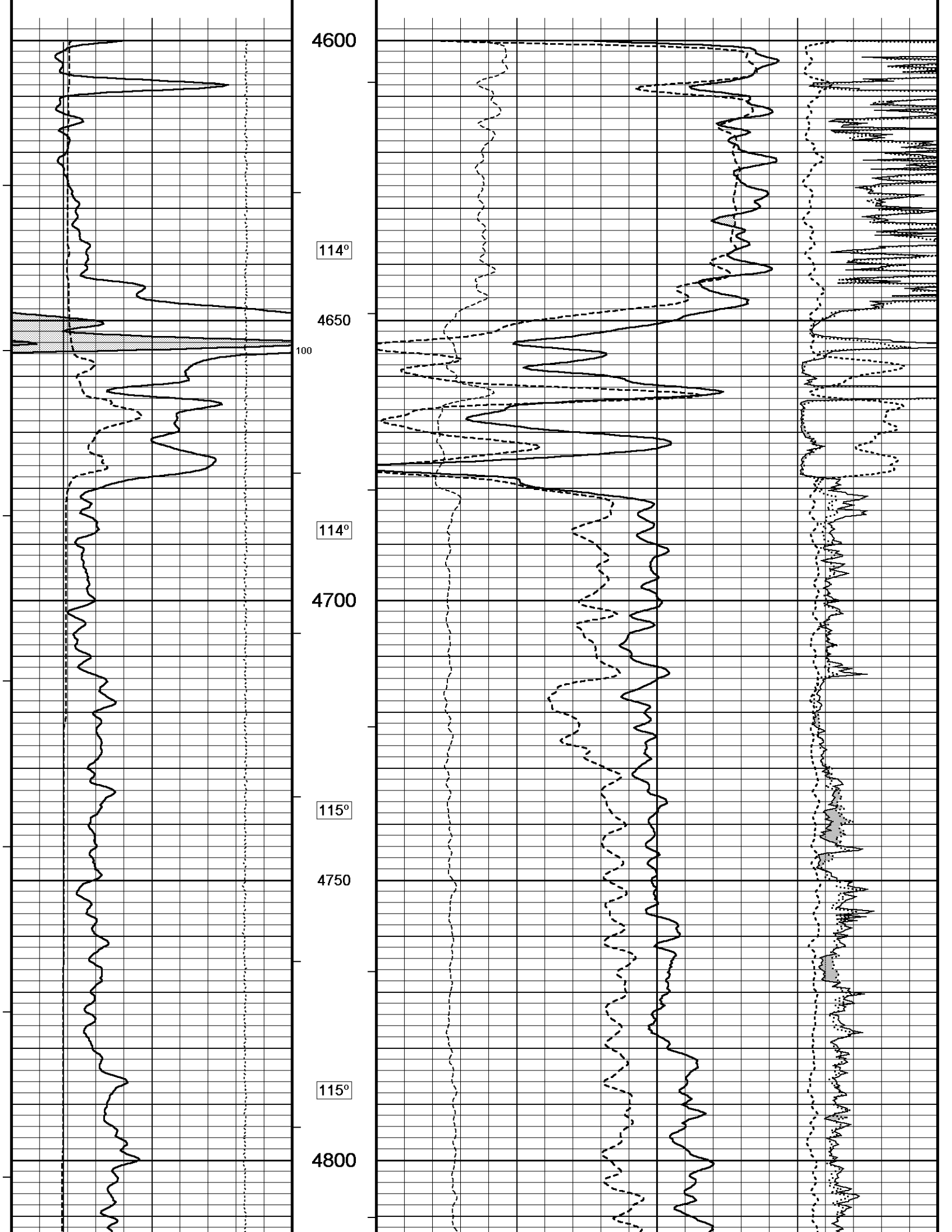

112°
4350
200
112°
4400
113°
4450
113°
4500
Bit Size
Density Caliper
100
113°
Gamma Ray
DST Uphole Tension
4550
Limestone Density Por.
PE
Density Correction
Limestone Neutron Por.
Micro-inverse
Micro-normal

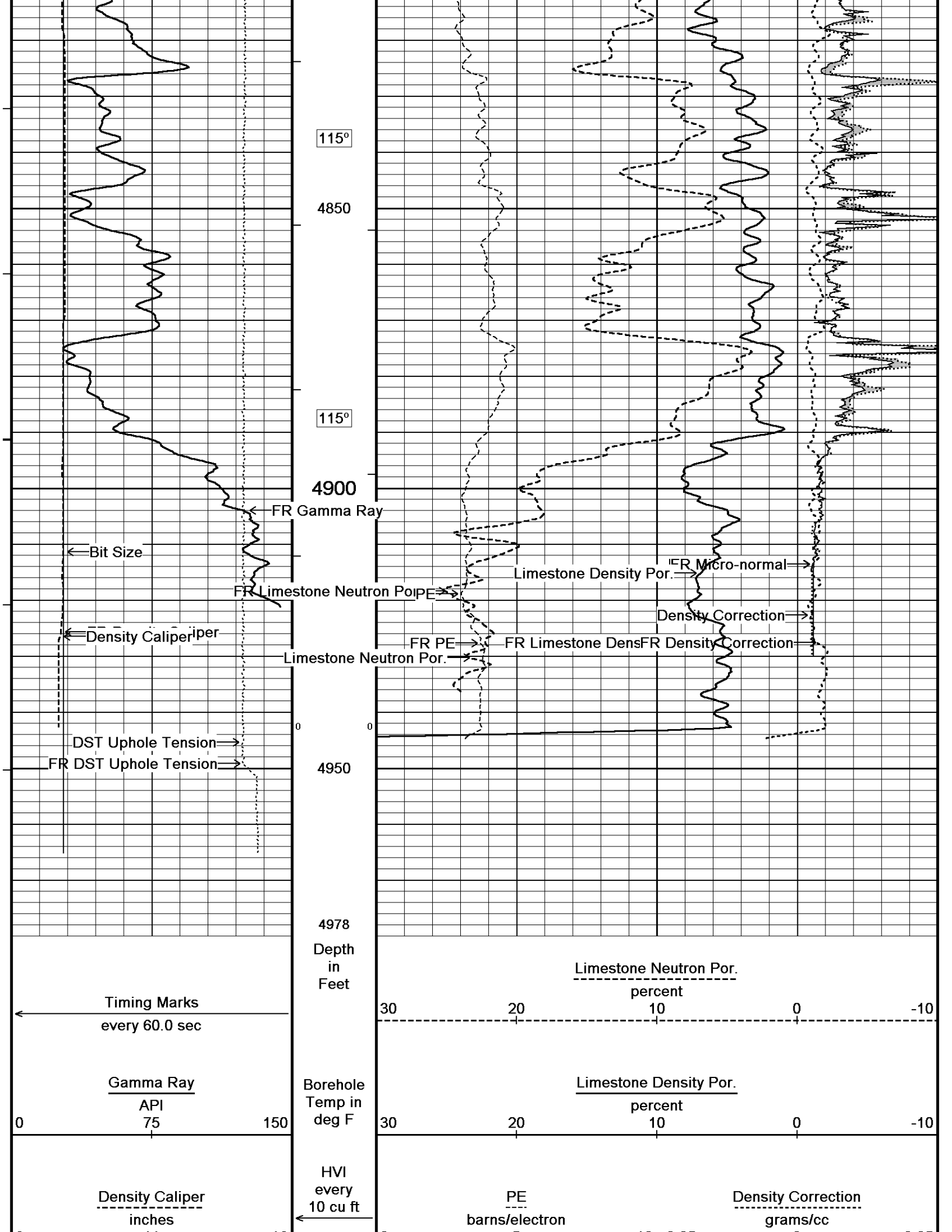

114°
4600
114°
4650
100
116°
4700
116°
4750

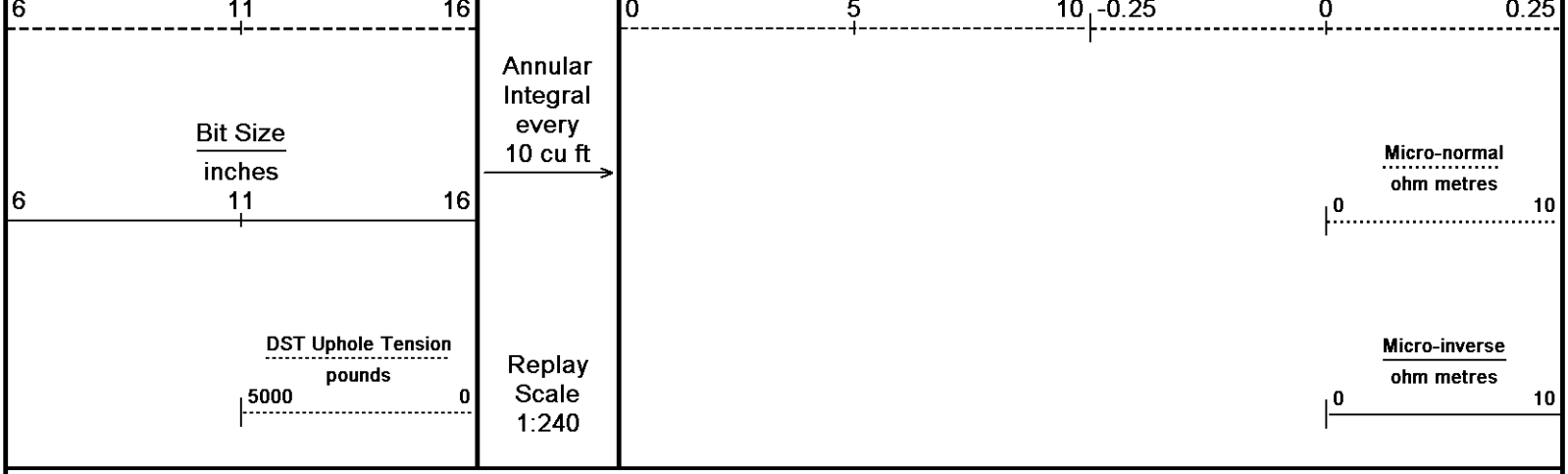

116°
4800
116°
4850
116°
4900
FR Gamma Ray
Bit Size
Density Caliper
FR Density Caliper
DST Uphole Tension
FR DST Uphole Tension
PE
FR Limestone Neutron Por.
Limestone Neutron Por.
FR PE
Limestone Density Por.
FR Micro-inverse
Density Correction
FR Limestone Density Por.ity Correction
0
0
4950
4974
Depth
in
Feet
Timing Marks
every 60.0 sec
Limestone Neutron Por.
percent
30
20
10
0
-10


Gamma Ray
API
0
75
150
Borehole Temp in deg F
Limestone Density Por.
percent
30
20
10
0
-10
HVI every 10 cu ft
Density Caliper
inches
6
11
16
PE
barns/electron
0
5
10
Density Correction
grams/cc
-0.25
0
0.25
Annular Integral every 10 cu ft
Bit Size
inches
6
11
16
Micro-normal
ohm metres
0
10
DST Uphole Tension
pounds
5000
0
Replay Scale 1:240
Micro-inverse
ohm metres
0
10
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 12-NOV-2011 07:22
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_003.dta
Recorded on 12-NOV-2011 05:15
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044
5 INCH MAIN


REPEAT SECTION
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 12-NOV-2011 07:22
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_002.dta
Recorded on 12-NOV-2011 04:45
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044
Depth in Feet
Timing Marks
every 60.0 sec
Limestone Neutron Por.
percent
30
20
10
0
-10
Gamma Ray
API
0
75
150
Borehole Temp in deg F
Limestone Density Por.
percent
30
20
10
0
-10
HVI every 10 cu ft
Density Caliper
inches
6
11
16
PE
barns/electron
0
5
10
Density Correction
grams/cc
-0.25
0
0.25
Annular Integral every 10 cu ft
Bit Size
inches
6
11
16
Micro-normal
ohm metres
0
10
DST Uphole Tension
pounds
5000
0
Replay Scale 1:240
Micro-inverse
ohm metres
0
10


4600
114°
4650
100
114°
4700
115°
4750
115°
4800


115°
4850
115°
4900
FR Gamma Ray
Bit Size
FR Limestone Neutron Por
Density Caliper
Limestone Neutron Por.
DST Uphole Tension
FR DST Uphole Tension
4950
4978
Depth in Feet
Timing Marks every 60.0 sec
Gamma Ray API 0 75 150
Borehole Temp in deg F
HVI every 10 cu ft
Density Caliper inches
Limestone Neutron Por. percent 30 20 10 0 -10
Limestone Density Por. percent 30 20 10 0 -10
FR Micro-normal
Limestone Density Por.
PE
Density Correction
FR PE
FR Limestone Dens
FR Density Correction
PE barns/electron
Density Correction grams/cc

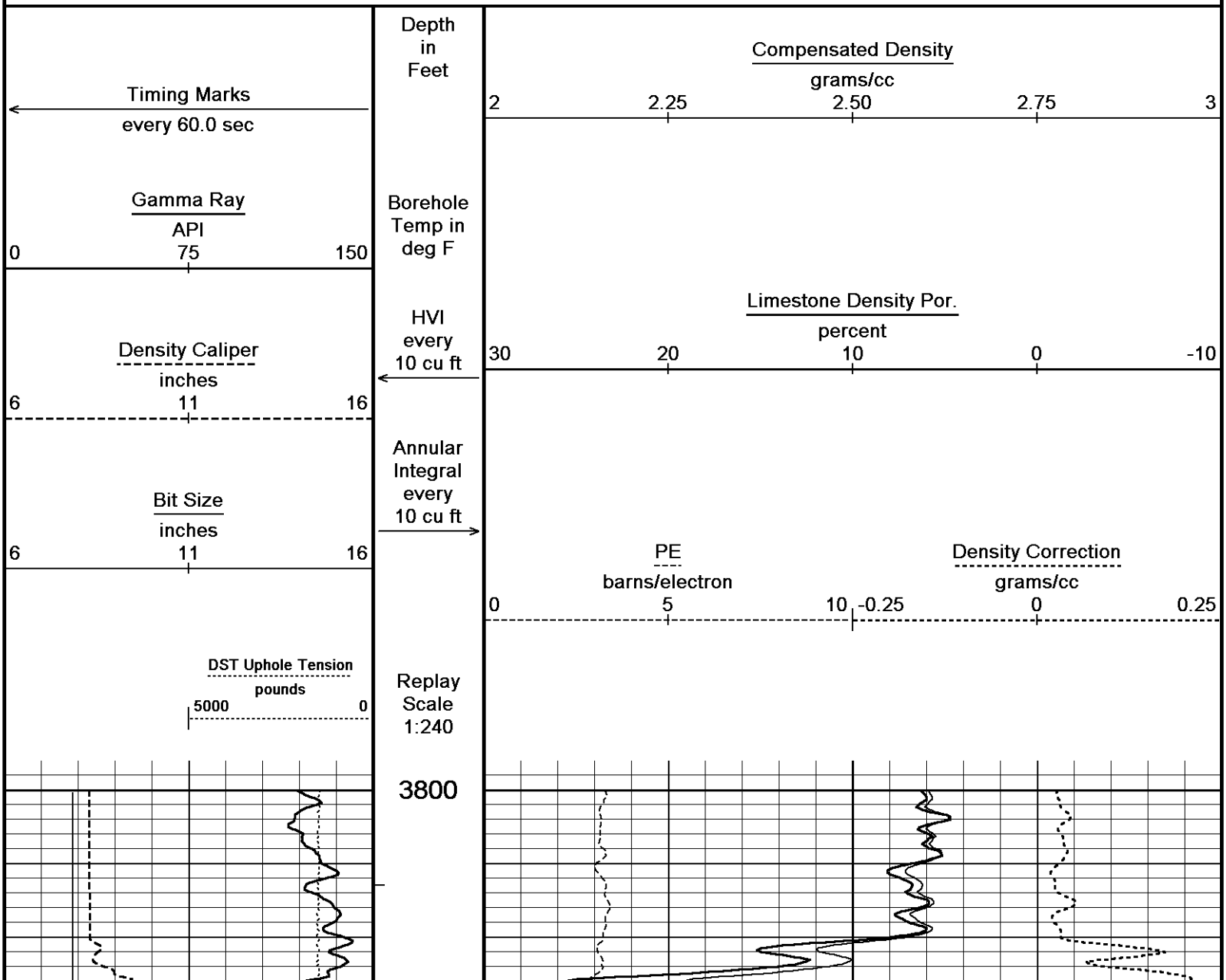


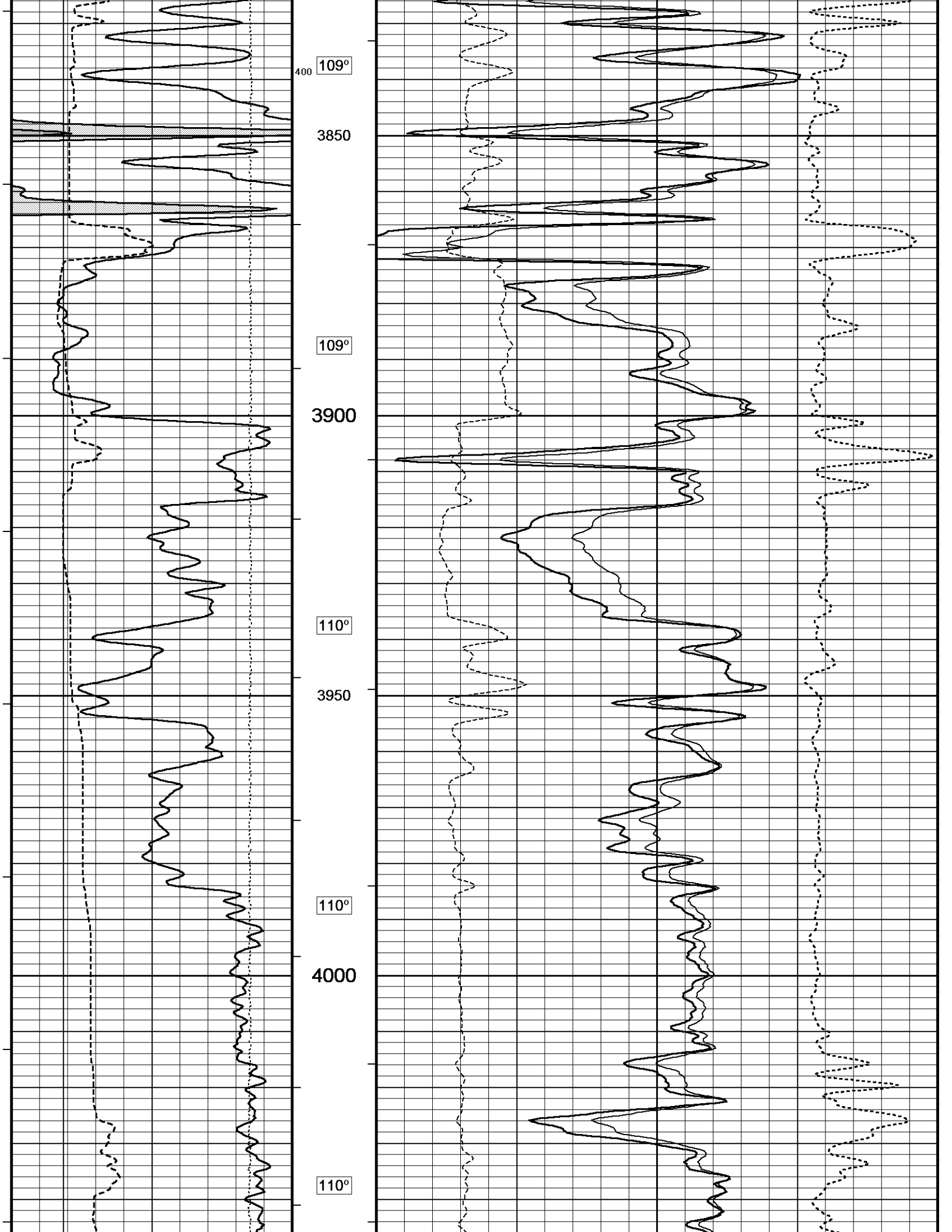
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 12-NOV-2011 07:22
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_002.dta
Recorded on 12-NOV-2011 04:45
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

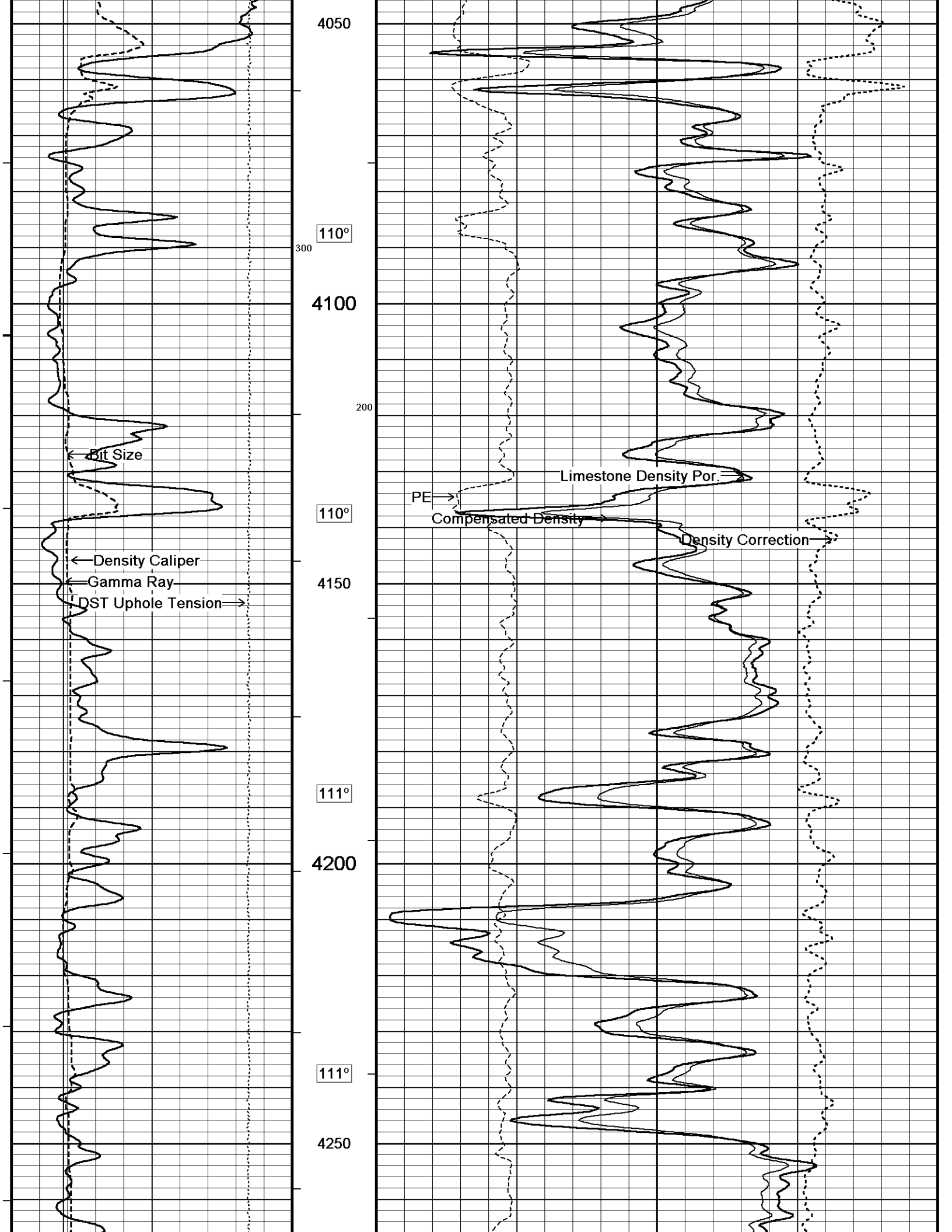
REPEAT SECTION

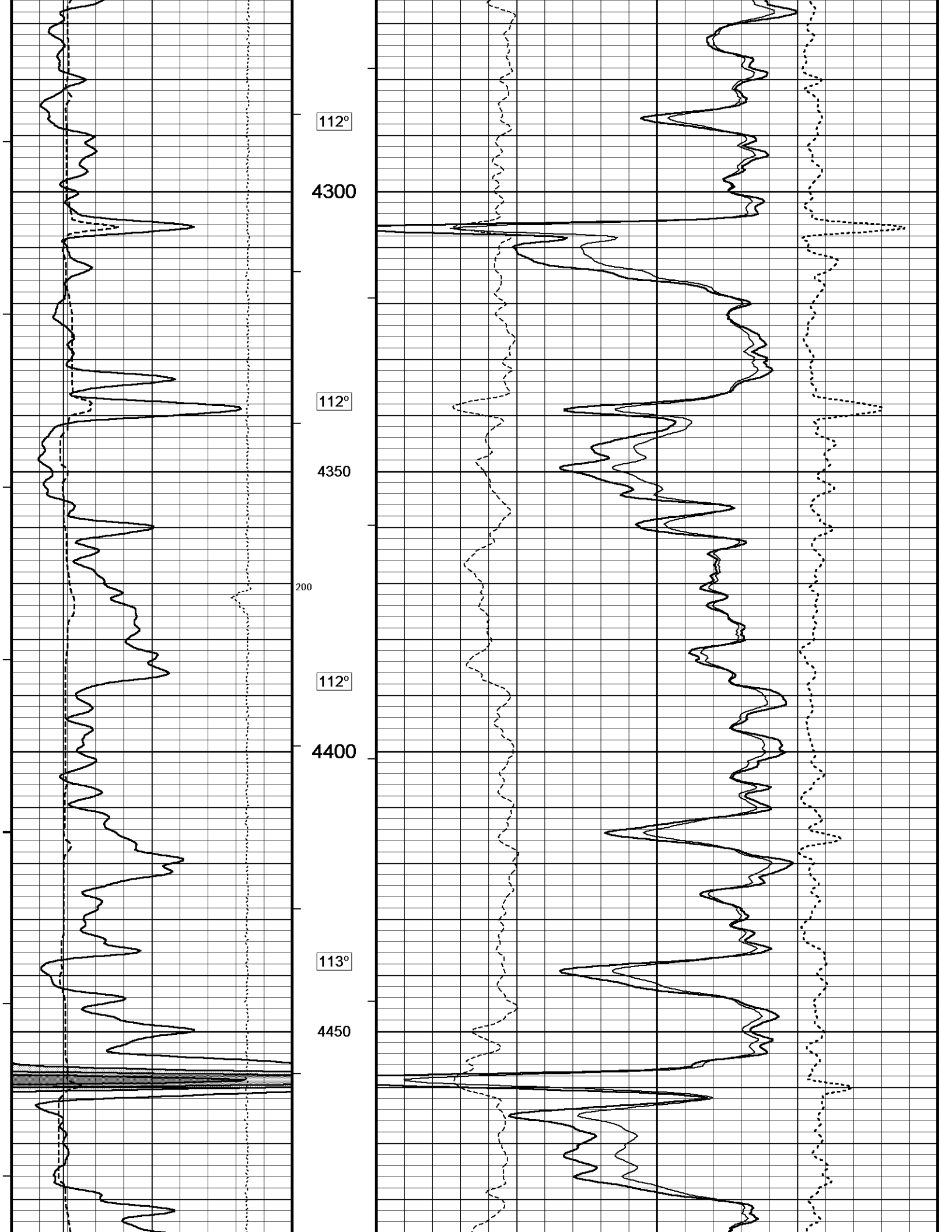
5 INCH MAIN

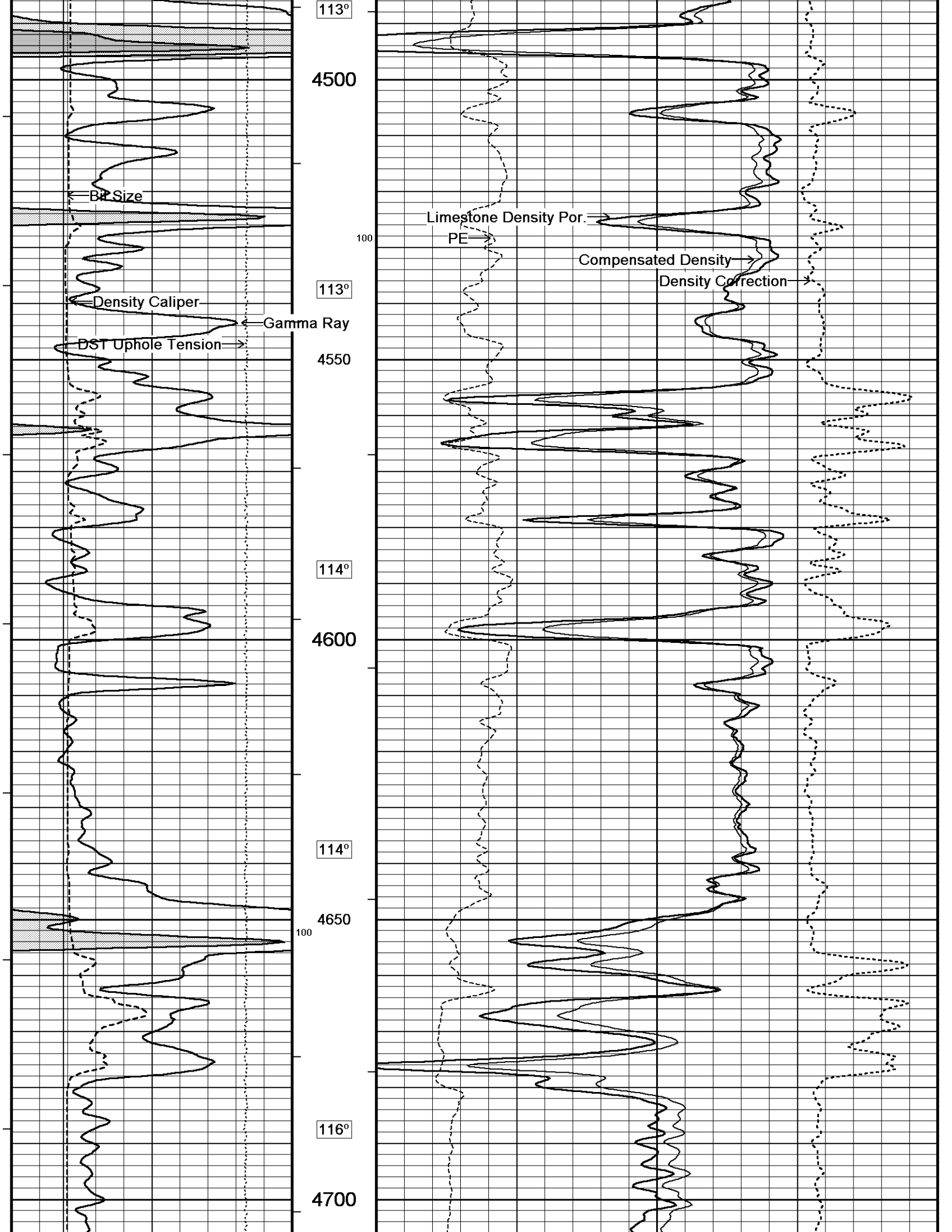
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 12-NOV-2011 07:22
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_003.dta
Recorded on 12-NOV-2011 05:15
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

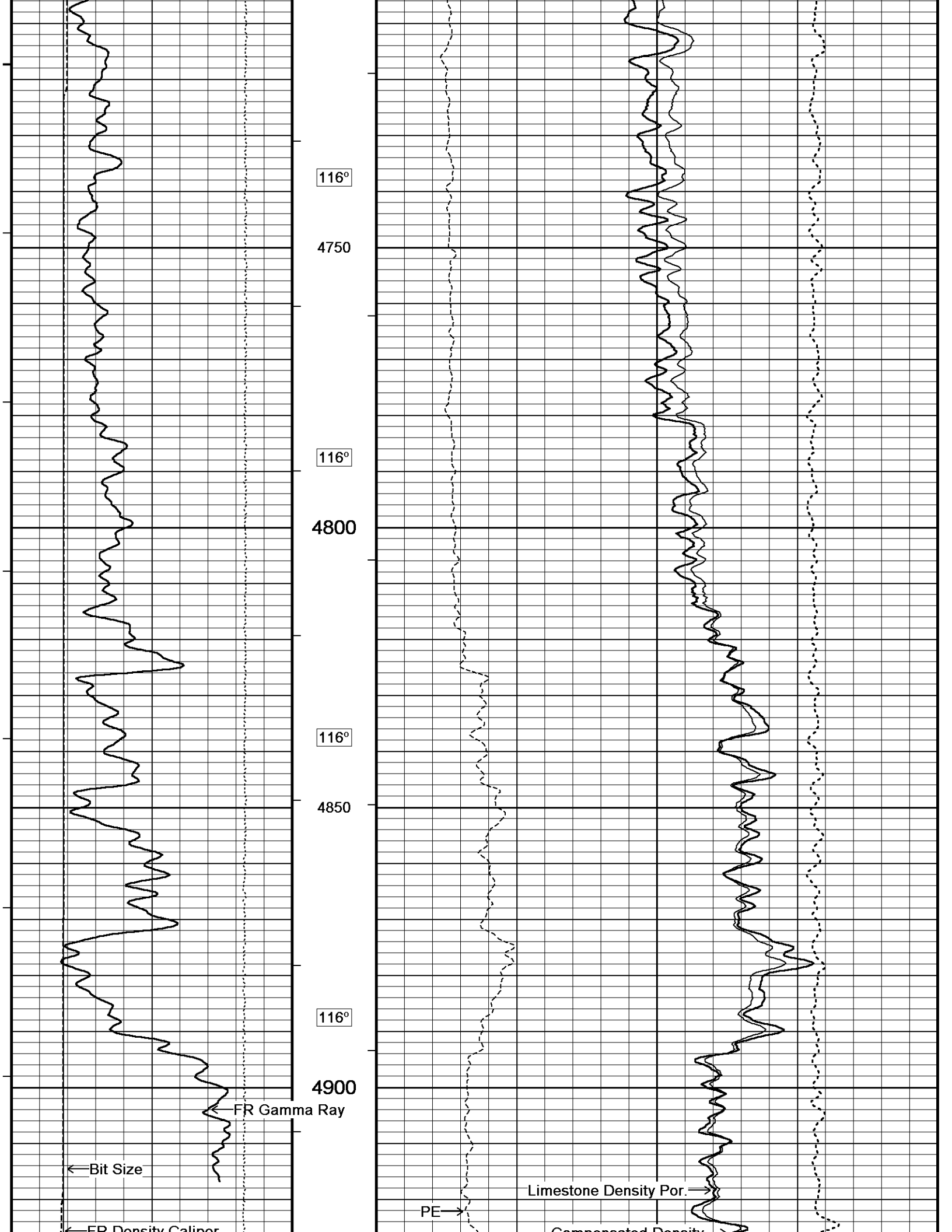


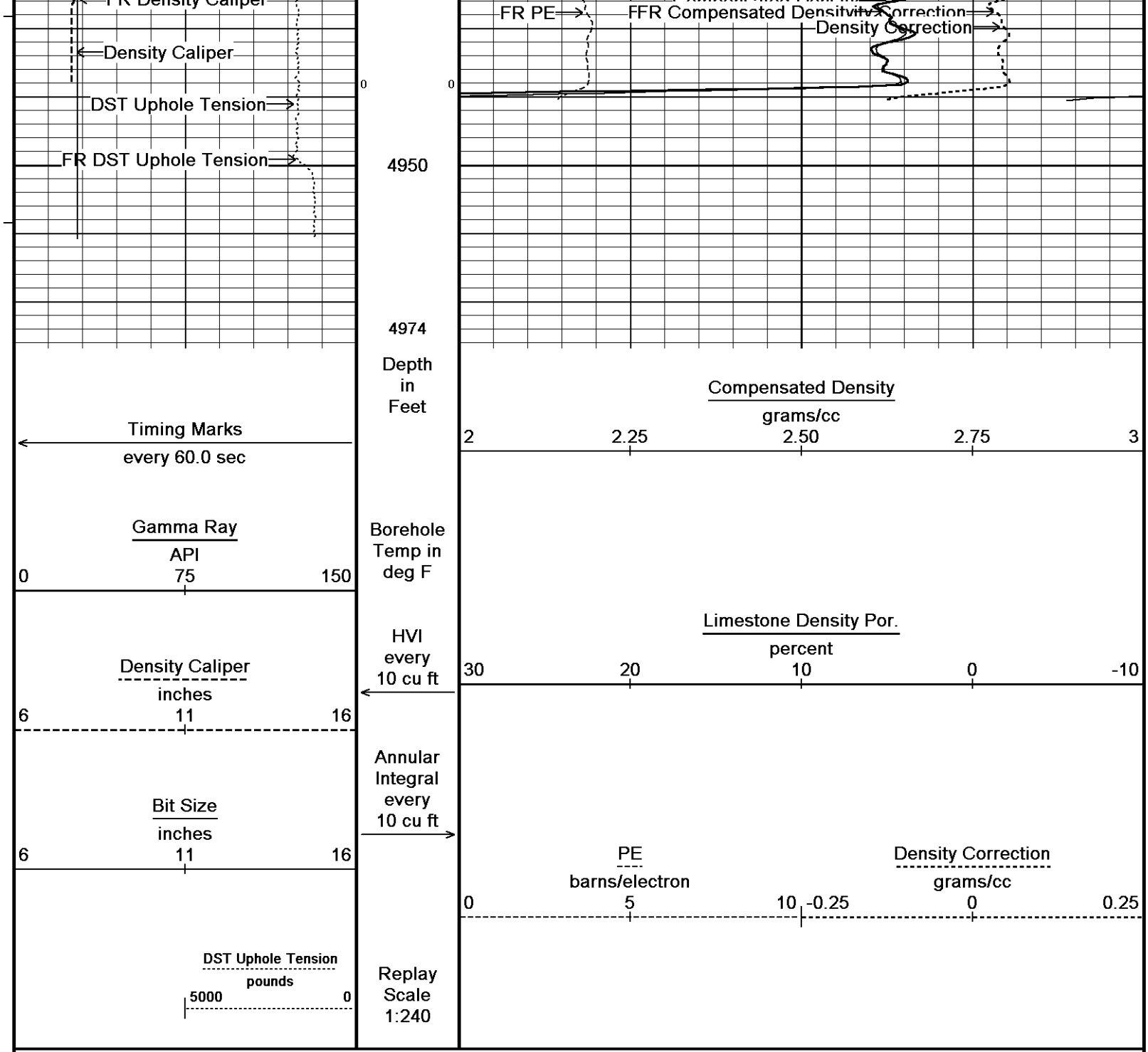

400
109°
3850
109°
3900
110°
3950
110°
4000
110°


4050
110°
300
4100
200
Bit Size
Limestone Density Por
PE
110°
Compensated Density
Density Correction
Density Caliper
Gamma Ray
4150
DST Uphole Tension
111°
4200
111°
4250


112°
4300
112°
4350
200
112°
4400
113°
4450


113°
4500
Bit Size
Limestone Density Por.
100
PE
Compensated Density
Density Correction
113°
Density Caliper
Gamma Ray
DST Uphole Tension
4550
114°
4600
114°
4650
100
116°
4700


116°
4750
116°
4800
116°
4850
116°
4900
FR Gamma Ray
Bit Size
FR Density Caliper
PE
Limestone Density Por.
Compensated Density

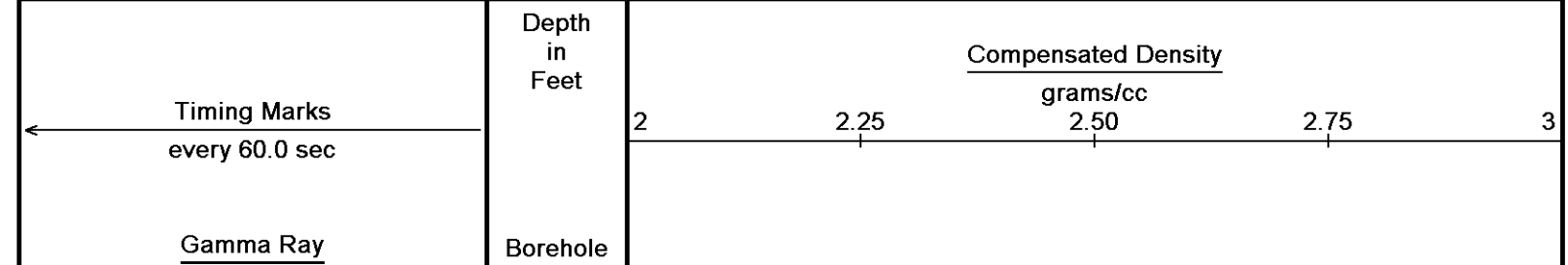


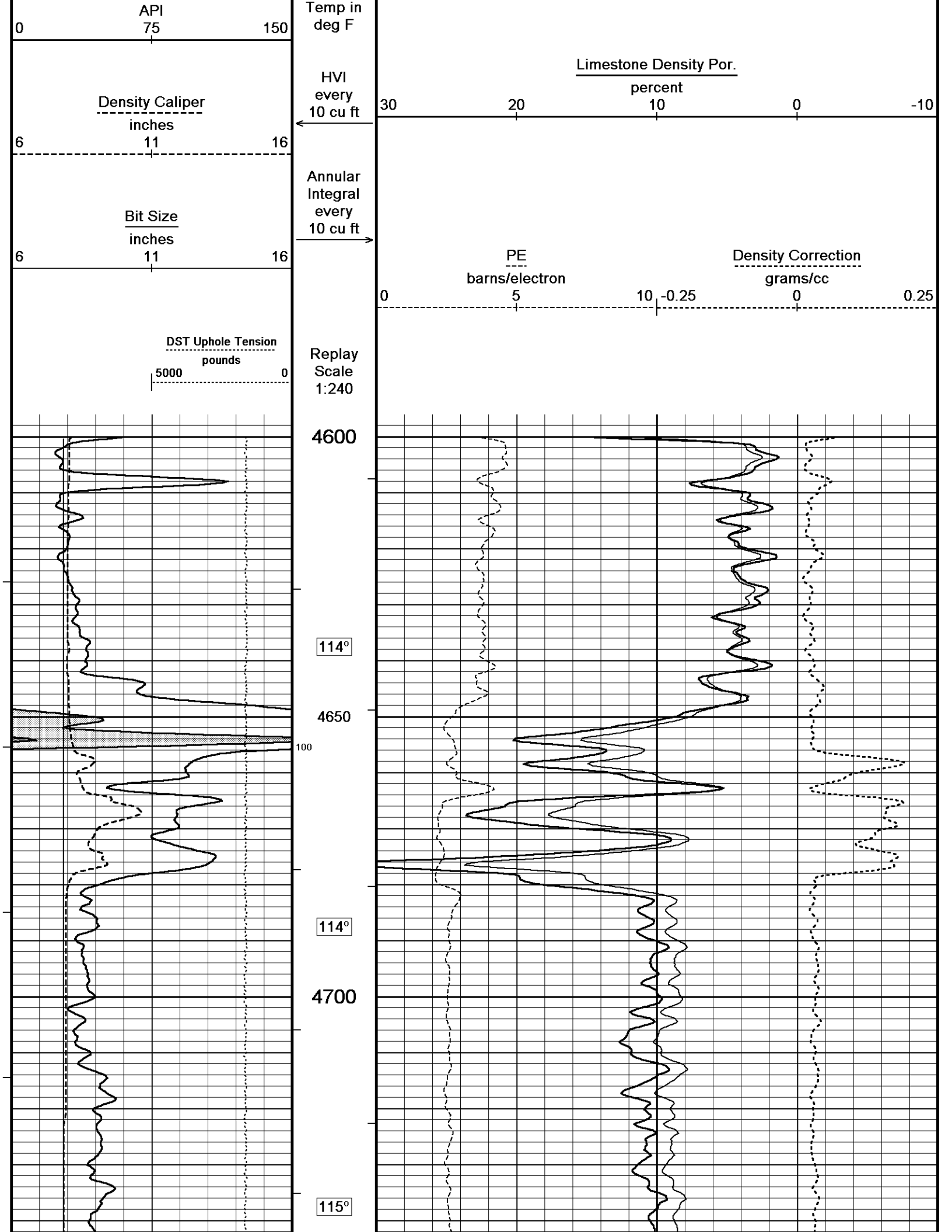
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 12-NOV-2011 07:22
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_003.dta
Recorded on 12-NOV-2011 05:15
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

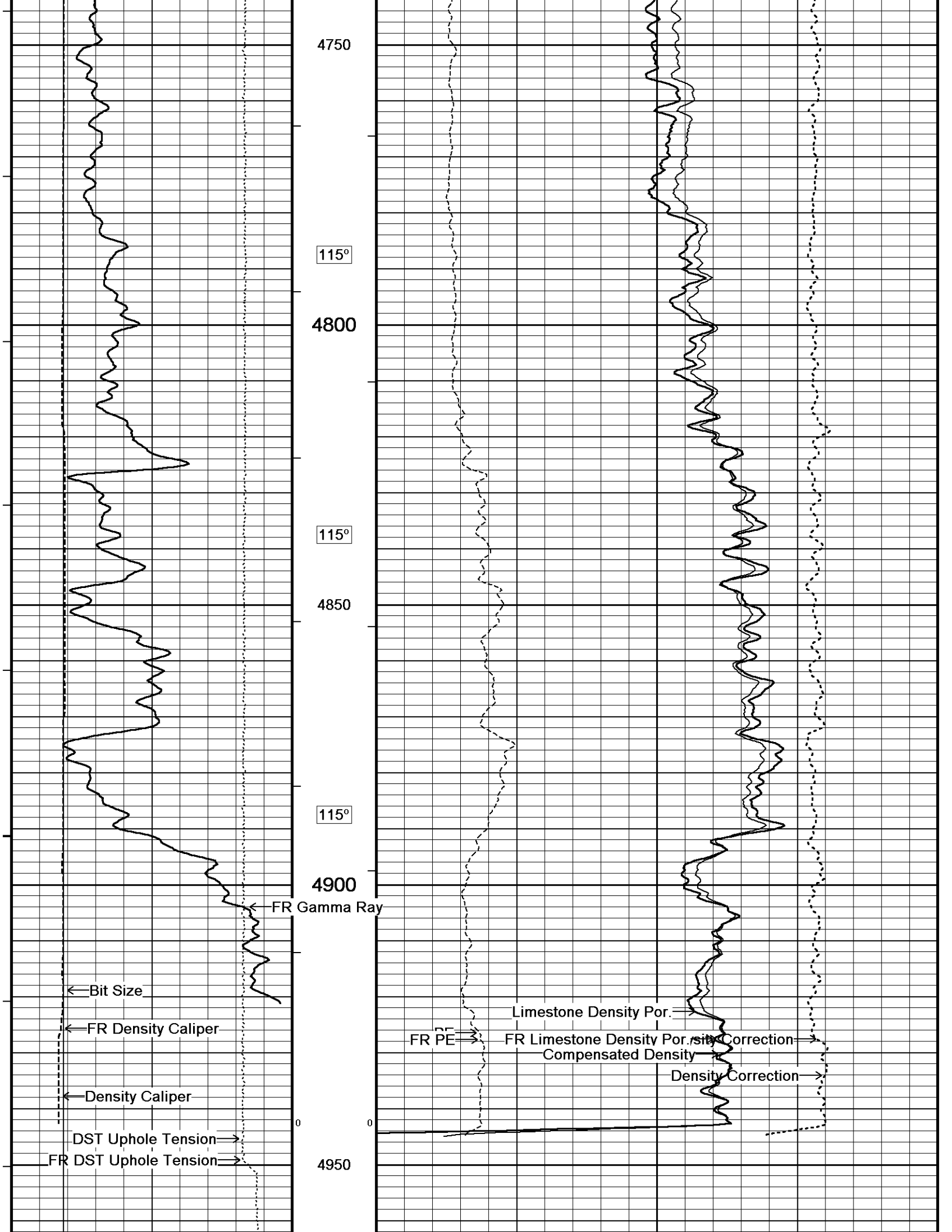
5 INCH MAIN

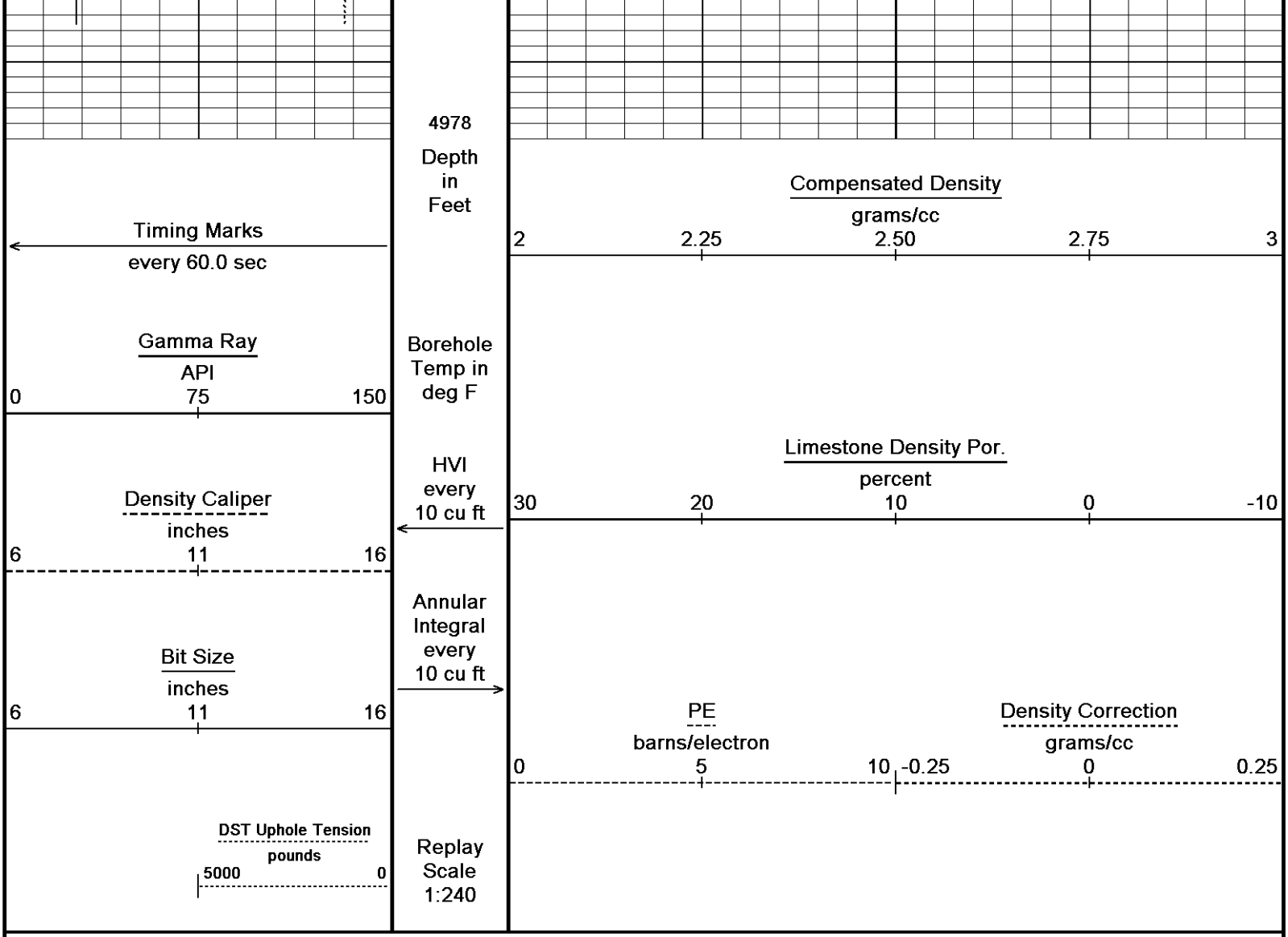
REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 12-NOV-2011 07:22
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_002.dta
Recorded on 12-NOV-2011 04:45
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044




API
0
75
150
Temp in deg F
HVI every 10 cu ft
Limestone Density Por.
percent
30
20
10
0
-10
Density Caliper
inches
6
11
16
Annular Integral every 10 cu ft
Bit Size
inches
6
11
16
PE
barns/electron
0
5
10
Density Correction
grams/cc
-0.25
0
0.25
DST Uphole Tension
pounds
5000
0
Replay Scale 1:240
4600
114°
4650
100
114°
4700
115°


4750
115°
4800
115°
4850
115°
4900
FR Gamma Ray
Bit Size
FR Density Caliper
Density Caliper
DST Uphole Tension
FR DST Uphole Tension
0
4950
0
FR PE
Limestone Density Por.
FR Limestone Density Porosity Correction
Compensated Density
Density Correction



Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 12-NOV-2011 07:22
Filename: C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_002.dta
Recorded on 12-NOV-2011 04:45
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_003.dta

General Constants All 000

Last Edited on 12-NOV-2011,03:02

General Parameters		
Mud Resistivity	0.500	ohm-metres
Mud Resistivity Temperature	45.000	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	4.500	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. Six Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	

Down-hole Tension Calibration SMS 0

Down Hole Tension Calibration SMS 3

Field Calibration on 23-OCT-2011 03:19

Reading No	Measured	Calibrated (lbs)
1	12734.06	0.00
2	13523.27	454.00

High Resolution Temperature Calibration MCG-C 84

Field Calibration on 24-JUN-2010,13:02

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

High Resolution Temperature Constants MCG-C 84

Last Edited on

Pre-filter Length	11

SP Calibration MCG-C 84

Field Calibration on 28-DEC-2010 11:28

	Measured	Calibrated (mV)
Reference 1	100.3	100.0
Reference 2	-99.7	-100.0

Gamma Calibration MCG-C 84

Field Calibration on 11-NOV-2011 11:14

	Measured	Calibrated (API)
Background	70	47
Calibrator (Gross)	752	503
Calibrator (Net)	682	456

Gamma Constants MCG-C 84

Last Edited on 11-NOV-2011,22:21

Gamma Calibrator Number	grc141	
Mud Density	1.08	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Caliper Calibration MML-A 9

Base Calibration on 17-OCT-2011 11:45
Field Calibration on 11-NOV-2011 10:55

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	15145	5.98
2	18563	7.97
3	21887	9.86
4	25872	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 9

Base Calibration on 17-OCT-2011 11:28
Field Check on 11-NOV-2011 10:53

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.1	59.5	2.6	12.8
Micro Inverse	15.6	77.7	1.7	8.4

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	32.5	32.5
Micro Inverse	16.4	16.4

Micro Normal and Micro Inverse Constants MML-A 9

Last Edited on 27-OCT-2011,21:14

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	N/A	inches

Neutron Calibration MDN-A.B 39

Base Calibration on 19-OCT-2011 15:30
Field Check on 11-NOV-2011 11:01

Base Calibration

	Measured	Calibrated (cps)

	Near	Far	Near	Far
	2769	86	3714	110
Ratio	32.016		33.764	

Field Calibrator at Base	Calibrated (cps)		
	2150	3003	
Ratio	0.716		

Field Check	Calibrated (cps)		
	2387	3438	
Ratio	0.694		

Neutron Constants MDN-A.B 39

Last Edited on 11-NOV-2011,22:21

Neutron Source Id	N1095	
Neutron Jig Number	NECD117	
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	N/A	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-A.A 67

Base Calibration on 17-OCT-2011 10:48
Field Check on 11-NOV-2011 10:52

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	959.2	126.8
Base Check		281.2
Field Check		281.1

FE Constants MFE-A.A 67

Last Edited on 11-NOV-2011,22:22

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	0.0	inches

High Resolution Temperature Calibration MAI-A.A 188

Field Calibration on 12-AUG-2011,21:41

	Measured	Calibrated(Deg F)
Lower	32.00	32.00
Upper	68.00	68.00

High Resolution Temperature Constants MAI-A.A 188

Last Edited on 21-JUN-2011,19:05

Pre-filter Length	11

Induction Calibration MAI-A.A 188

Base Calibration on 19-OCT-2011 14:25
Field Check on 11-NOV-2011 10:50

Base Calibration

Test Loop Calibration	Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High
1	16.9	470.2	9.3	966.2
2	6.4	377.1	7.6	821.4
3	3.9	257.8	5.2	566.0
4	1.7	135.1	2.6	279.2

Array Temperature	66.3	Deg F	

Channel	Base Check (mmho/m) Low	Base Check (mmho/m) High	Field Check (mmho/m) Low	Field Check (mmho/m) High	
1	0.0	0.0	13.5	3866.0	
2	0.0	0.0	30.0	3583.1	
3	0.0	0.0	27.9	3077.5	
4	0.0	0.0	19.7	2046.1	
Deep	0.0	0.0	17.2	1954.5	
Medium	0.0	0.0	40.3	4113.0	
Shallow	0.0	0.0	44.8	5366.8	
Array Temperature		0.0		65.8	Deg F

Induction Constants MAI-A.A 188

Last Edited on 11-NOV-2011,22:22

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	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 64

Base Calibration on 17-OCT-2011 14:30
Field Calibration on 11-NOV-2011 11:07

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	12640	3.99
2	21101	5.98
3	30051	7.97
4	38416	9.86
5	47668	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.98	5.98

Photo Density Calibration MPD-B 64

Base Calibration on 17-OCT-2011 15:00
Field Check on 11-NOV-2011 11:05

Density Calibration

Density Calibration

Base Calibration	Measured Near	Measured Far	Calibrated (sdu) Near	Calibrated (sdu) Far
Reference 1	58984	30451	59556	30836
Reference 2	23638	2744	24941	2541
Field Check at Base	1207.6	1404.1		
Field Check	1208.6	1402.8		

PE Calibration

Base Calibration	WS	Measured WH	Measured Ratio	Calibrated Ratio
Background	221	1079		
Reference 1	21941	58780	0.376	0.371
Reference 2	6445	23501	0.278	0.272
Field Check at Base	220.8	1079.4		
Field Check	221.0	1079.6		

Density Constants MPD-B 64

Last Edited on 11-NOV-2011,22:22

Density Source Id	P57072B	
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	1.08	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	

DOWNHOLE EQUIPMENT

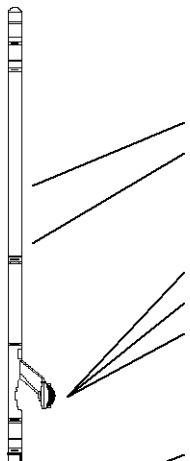
C:\Minimus 11_03_4044\Data\M&M Z-Bar 16-4\M&M Z-Bar 16-4_003.dta

MCB-A.A 11B Tension Cablehead
MCB-A.A 162 LG: 2.40 ft WT: 19.8 lb OD: 2.24 in

Compact Comms Gamma
MCG-C 84 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 9 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Neutron



45.04 ft GRGC - Gamma Ray
42.13 ft CGXT - MCG External Temperature

35.41 ft MINV - Micro-inverse
35.41 ft MNRL - Micro-normal
36.40 ft MLTC - MML Caliper

30.61 ft NPRL - Limestone Neutron Por

MDN-A.B 39 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

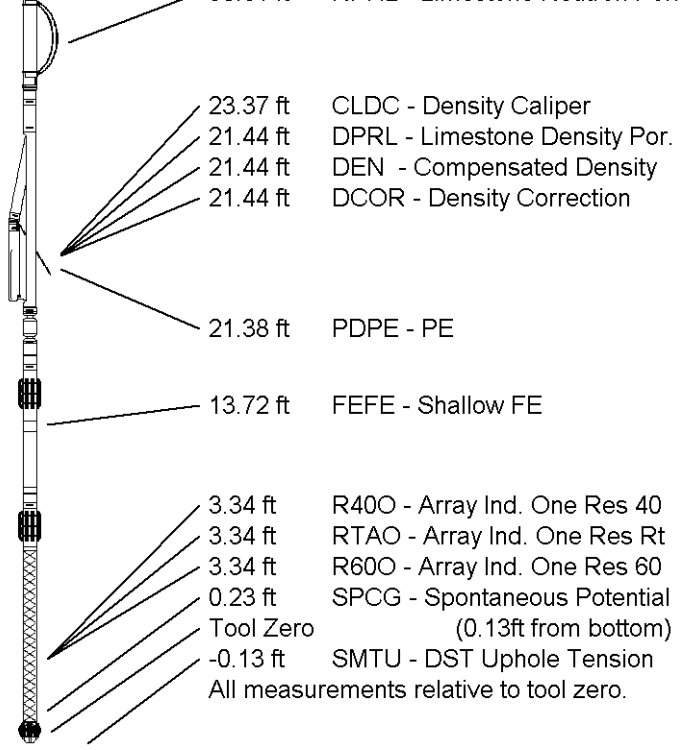
Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 91 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-A.A 67 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 188 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 52.72 ft Weight: 427.7 lb



23.37 ft	CLDC - Density Caliper
21.44 ft	DPRL - Limestone Density Por.
21.44 ft	DEN - Compensated Density
21.44 ft	DCOR - Density Correction
21.38 ft	PDPE - PE
13.72 ft	FEFE - Shallow FE
3.34 ft	R40O - Array Ind. One Res 40
3.34 ft	RTAO - Array Ind. One Res Rt
3.34 ft	R60O - Array Ind. One Res 60
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	M & M EXPLORATION, INC.
WELL	Z-BAR # 16-4
FIELD	AETNA GAS AREA
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	1566.00	feet	First Reading	4726.00	feet
Elevation Drill Floor	1564.00	feet	Depth Driller	4950.00	feet
Elevation Ground Level	1554.00	feet	Depth Logger	4949.00	feet

Weatherford®

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG

40 Years of Wireline 1970 2010

Scale 1:240 (5"=100') Imperial

Well Name:	M & M Exploration, Inc.		Z-Bar 16-4
Location:	16-T34S-R14W		Barber County, KS
Licence Number:	15-007-23790	Region:	Aetna NE
Spud Date:	11/3/2011	Drilling Completed:	11/11/11
Surface Coordinates:	660' FNL & 660' FWL, NW/4		
Bottom Hole Coordinates:	AS Above		
Ground Elevation (ft):	1554'	K.B. Elevation (ft):	1566'
Logged Interval (ft):	3750' To: 4950'	Total Depth (ft):	4950'
Formation:	Pennsylvanian & Mississippian		
Type of Drilling Fluid:	Chemial MUD		

Printed by MUD.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: M & M Exploration, Inc.
Address: Attn: Mike Austin
4257 Main Street, Suite 230
Westminster, Co 80031

GEOLOGIST

Name: Mike Pollok
Company: MAP Exploration, Inc.
Address: P.O. Box 106
Purcell, OK 73080

Comments

Southwind Rig #70
Mudlogging Unit #13
Mudlogger: Beth Brock

ROCK TYPES

Anhy
Bent
Brec
Cht
Clyst
Coal
Congl
Dol
Gyp
Igne
Lmst
Meta
Mrlst
Salt
Shale
Shcol
Shgy
Sltst
Ss
Till
sdy sh
calc sh
shale
carb sh

ACCESSORIES

MINERAL

Anhy
Arggrn
Arg
Bent
Bit
Brecfrag
Calc
Carb
Chtdk
Chtlt
Dol
Feldspar
Ferrpel
Ferr
Glau
Gyp
Hvymin
Kaol
Marl
Minxl
Nodule
Phos
Pyr
Salt
Sandy
Silt
Sil
Sulphur
Tuff

FOSSIL

Algae
Amph
Belm
Biocist
Brach
Bryozoa
Cephal
Coral
Crin
Echin
Fish
Foram
Fossil
Gastro
Oolite
Ostra
Pelec
Pellet
Pisolite
Plant
Strom

STRINGER

Anhy
Arg
Bent
Coal
Dol
Gyp
Ls
Mrst
Sltstrg
Ssstrg

TEXTURE

Boundst
Chalky
Cryxln
Earthy
Finexln
Grainst
Lithogr
Microxln
Mudst
Packst
Wackest

OTHER SYMBOLS

POROSITY TYPE

Earthy
Fenest
Fracture
Inter
Moldic
Organic
Pinpoint
Vuggy

SORTING

Well
Moderate
Poor

ROUNDING

Rounded
Subrnd
Subang
Angular

OIL SHOWS

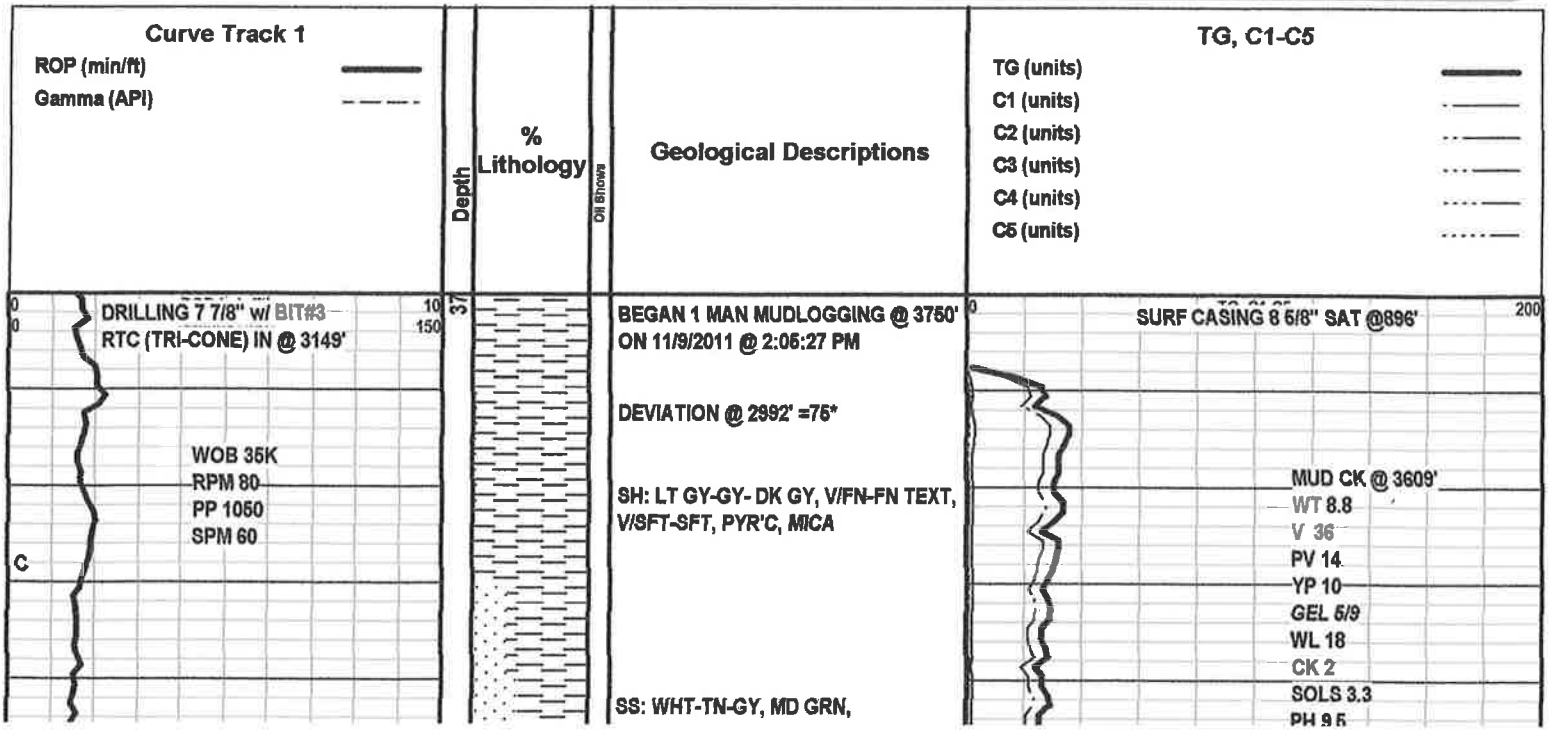
Even
Spotted
Ques
Dead

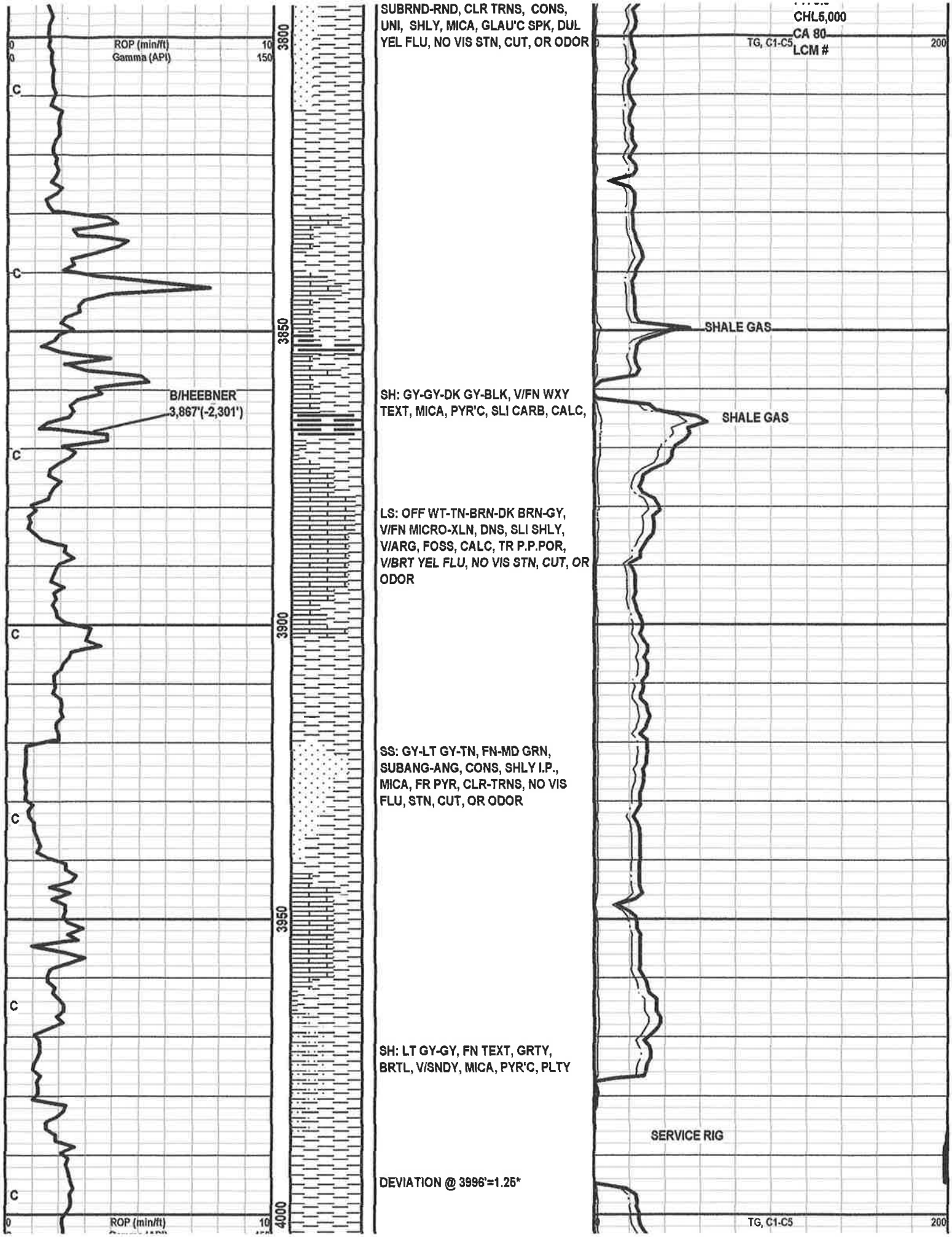
INTERVALS

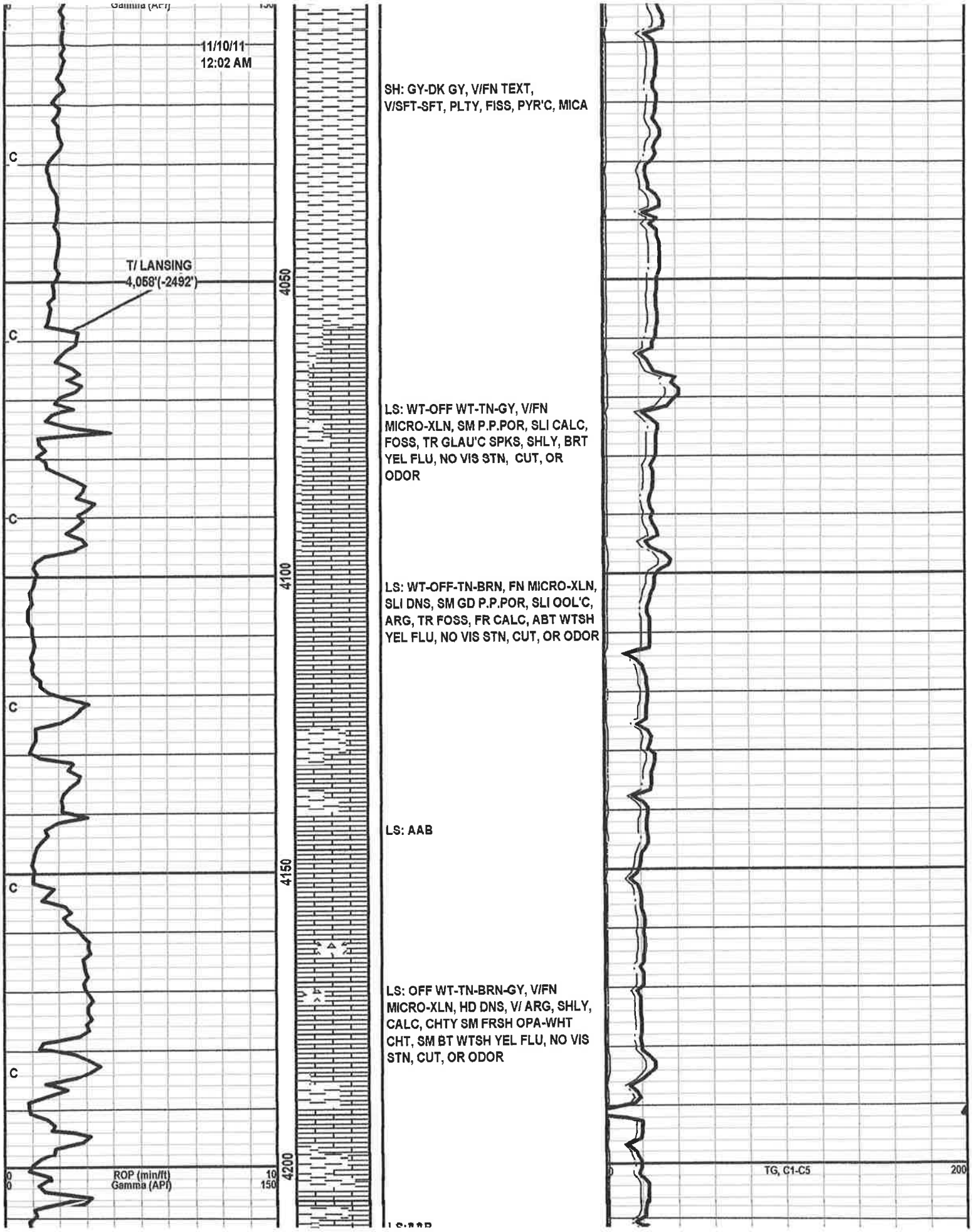
Core
Dst

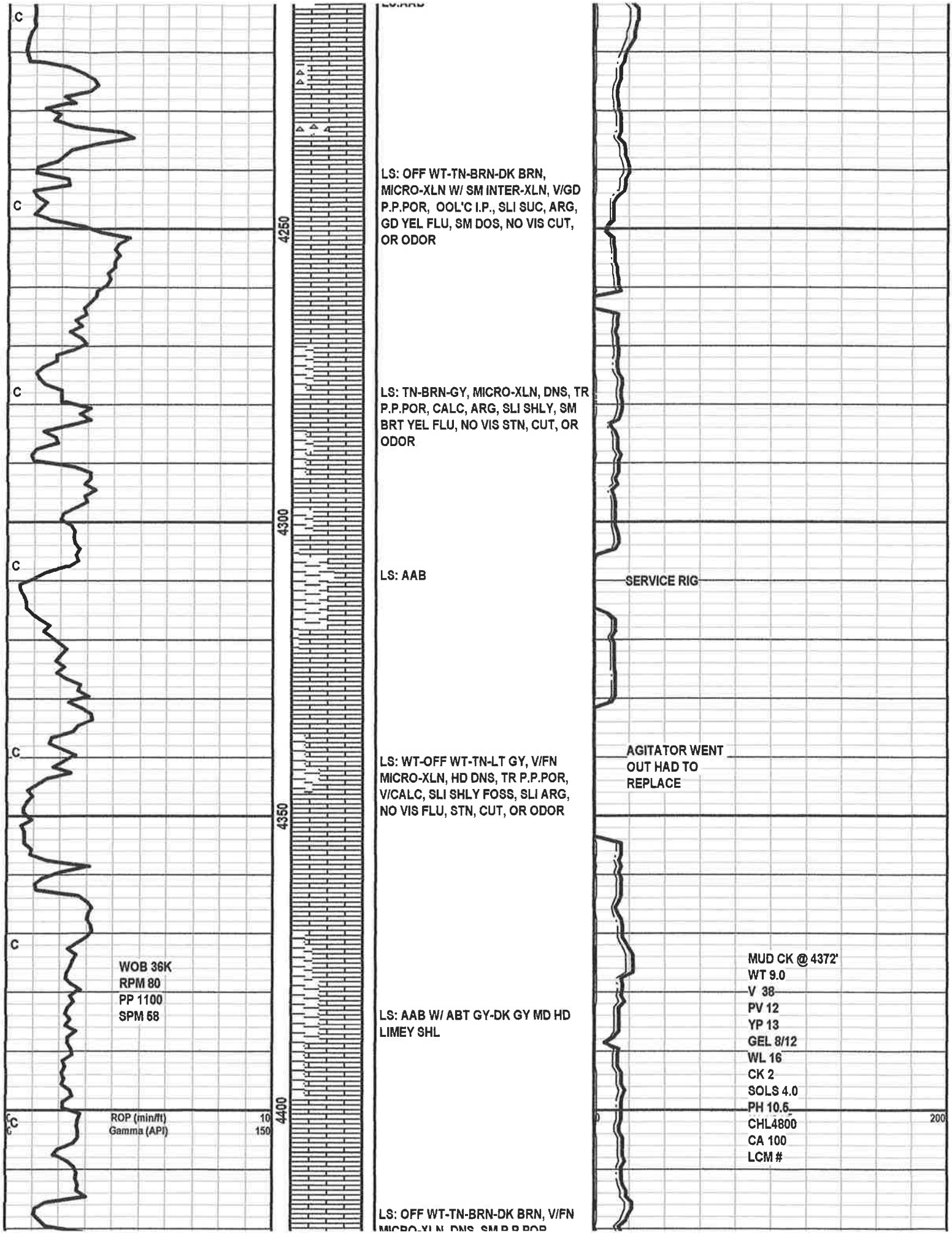
EVENTS

Rft
Sidewall




ROP (min/ft)
Gamma (API)
0
10
0
150
C
3800
3850
3900
3950
4000
B/HEEBNER
3,867'(-2,301')
ROP (min/ft)
0
10
SUBRND-RND, CLR TRNS, CONS, UNI, SHLY, MICA, GLAU'C SPK, DUL YEL FLU, NO VIS STN, CUT, OR ODOR
SH: GY-GY-DK GY-BLK, V/FN WXY TEXT, MICA, PYR'C, SLI CARB, CALC,
LS: OFF WT-TN-BRN-DK BRN-GY, V/FN MICRO-XLN, DNS, SLI SHLY, V/ARG, FOSS, CALC, TR P.P.POR, V/BRT YEL FLU, NO VIS STN, CUT, OR ODOR
SS: GY-LT GY-TN, FN-MD GRN, SUBANG-ANG, CONS, SHLY I.P., MICA, FR PYR, CLR-TRNS, NO VIS FLU, STN, CUT, OR ODOR
SH: LT GY-GY, FN TEXT, GRTY, BRTL, V/SNDY, MICA, PYR'C, PLTY
DEVIATION @ 3996'=1.25*
CHL5,000
CA 80
LCM #
TG, C1-C5
0
200
SHALE GAS
SHALE GAS
SERVICE RIG
TG, C1-C5
0
200


Gamma (API)
11/10/11
12:02 AM
T/ LANSING
4,058'(-2492')
C
C
C
C
C
C
4050
4100
4150
4200
SH: GY-DK GY, V/FN TEXT, V/SFT-SFT, PLTY, FISS, PYR'C, MICA
LS: WT-OFF WT-TN-GY, V/FN MICRO-XLN, SM P.P.POR, SLI CALC, FOSS, TR GLAU'C SPKS, SHLY, BRT YEL FLU, NO VIS STN, CUT, OR ODOR
LS: WT-OFF-TN-BRN, FN MICRO-XLN, SLI DNS, SM GD P.P.POR, SLI OOL'C, ARG, TR FOSS, FR CALC, ABT WTSH YEL FLU, NO VIS STN, CUT, OR ODOR
LS: AAB
LS: OFF WT-TN-BRN-GY, V/FN MICRO-XLN, HD DNS, V/ ARG, SHLY, CALC, CHTY SM FRSH OPA-WHT CHT, SM BT WTSH YEL FLU, NO VIS STN, CUT, OR ODOR
ROP (min/ft)
Gamma (API)
150
TG, C1-C5
200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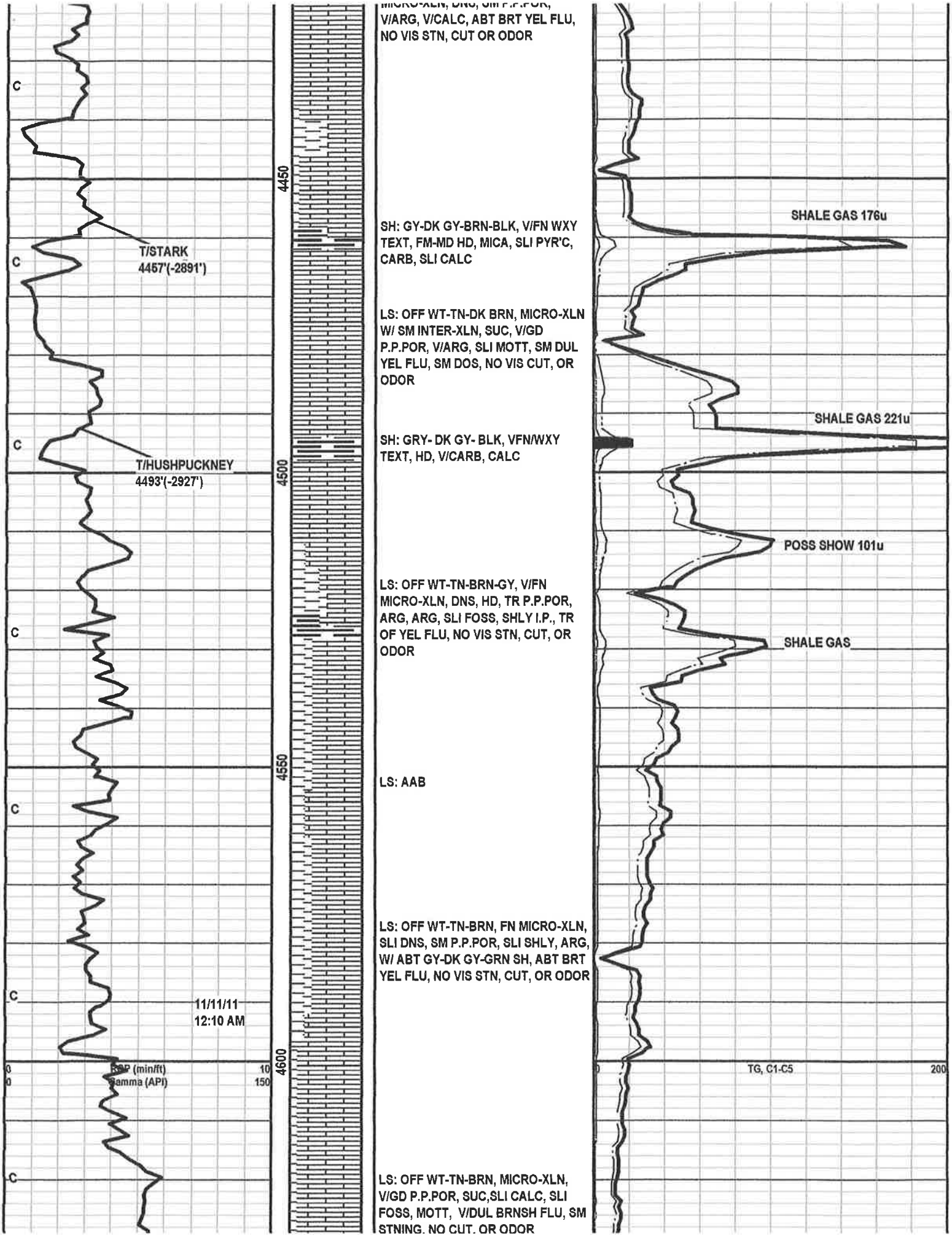
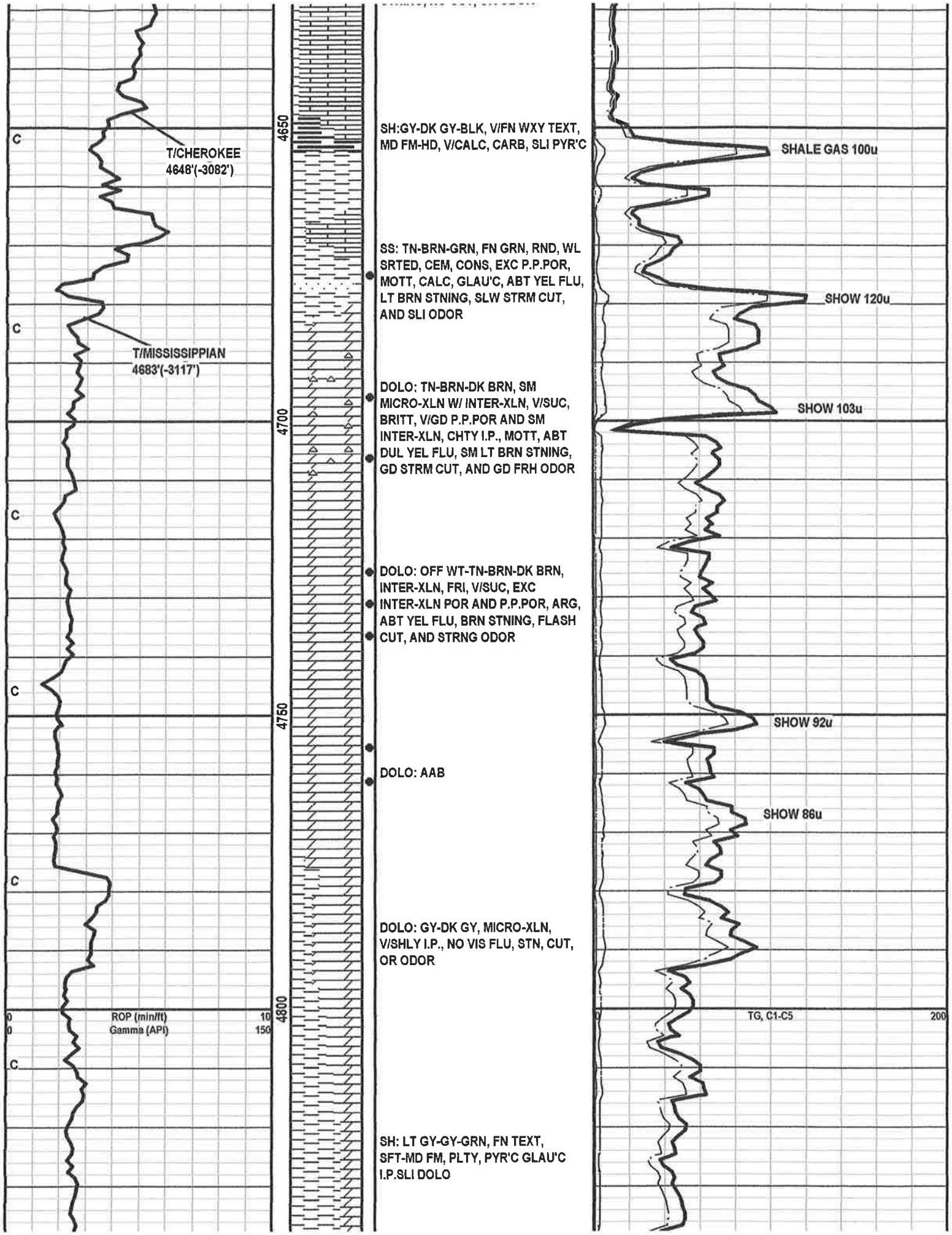
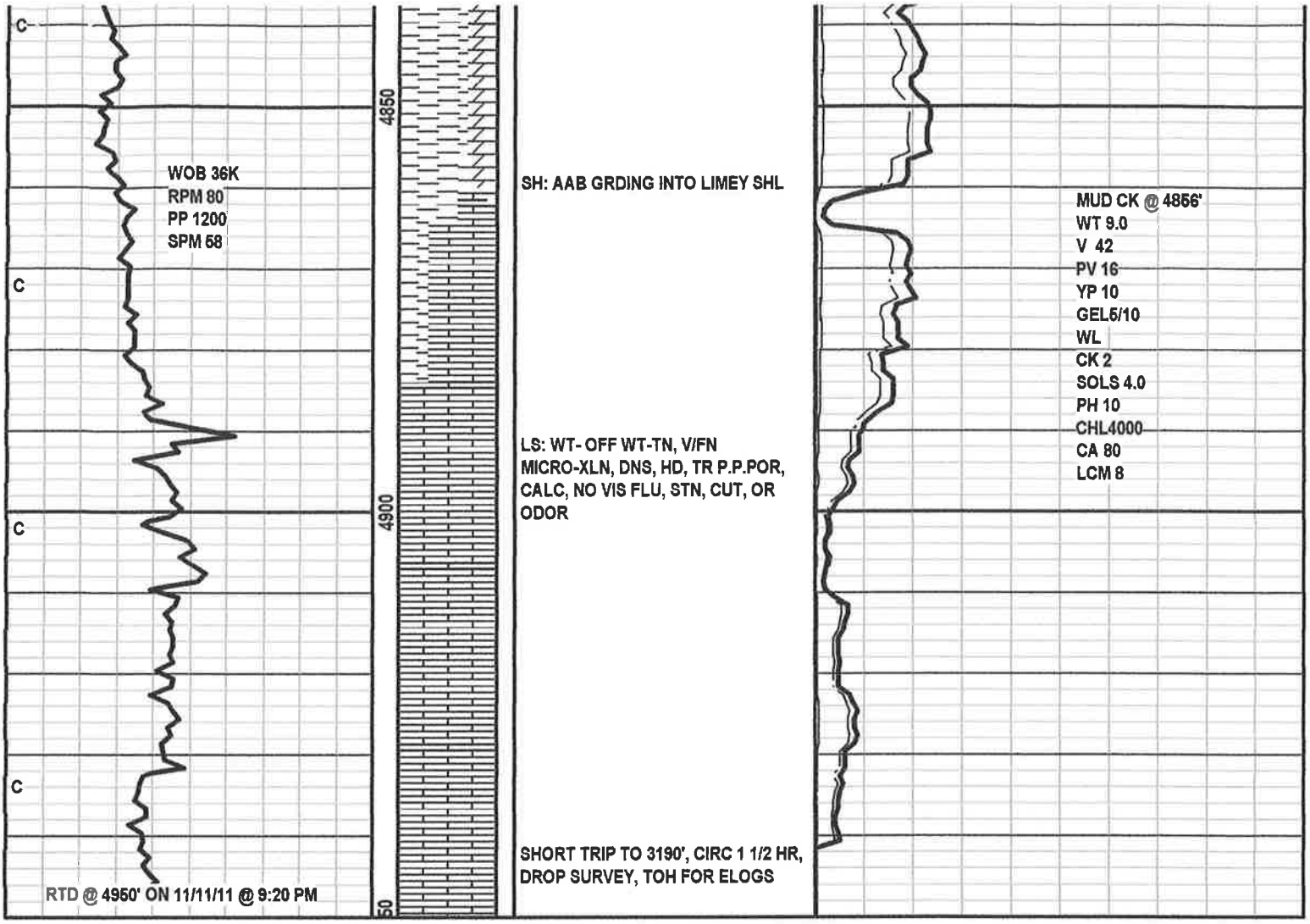
C
C
WOB 36K
RPM 80
PP 1100
SPM 58
ROP (min/ft) 10
Gamma (API) 150
4250
4300
4350
4400
LS: OFF WT-TN-BRN-DK BRN, MICRO-XLN W/ SM INTER-XLN, V/GD P.P.POR, OOL'C I.P., SLI SUC, ARG, GD YEL FLU, SM DOS, NO VIS CUT, OR ODOR
LS: TN-BRN-GY, MICRO-XLN, DNS, TR P.P.POR, CALC, ARG, SLI SHLY, SM BRT YEL FLU, NO VIS STN, CUT, OR ODOR
LS: AAB
LS: WT-OFF WT-TN-LT GY, V/FN MICRO-XLN, HD DNS, TR P.P.POR, V/CALC, SLI SHLY FOSS, SLI ARG, NO VIS FLU, STN, CUT, OR ODOR
LS: AAB W/ ABT GY-DK GY MD HD LIMEY SHL
LS: OFF WT-TN-BRN-DK BRN, V/FN
SERVICE RIG
AGITATOR WENT OUT HAD TO REPLACE
MUD CK @ 4372'
WT 9.0
V 38
PV 12
YP 13
GEL 8/12
WL 16
CK 2
SOLS 4.0
PH 10.5
CHL4800
CA 100
LCM #
200


C
T/STARK
4457'(-2891')
C
T/HUSHPUCKNEY
4493'(-2927')
C
C
C
C
11/11/11
12:10 AM
ROP (min/ft)
Gamma (API)
0
0
10
150
4450
4500
4550
4600
MICRO-XLN, DNS, SM P.P.POR,
V/ARG, V/CALC, ABT BRT YEL FLU,
NO VIS STN, CUT OR ODOR
SH: GY-DK GY-BRN-BLK, V/FN WXY
TEXT, FM-MD HD, MICA, SLI PYR'C,
CARB, SLI CALC
LS: OFF WT-TN-DK BRN, MICRO-XLN
W/ SM INTER-XLN, SUC, V/GD
P.P.POR, V/ARG, SLI MOTT, SM DUL
YEL FLU, SM DOS, NO VIS CUT, OR
ODOR
SH: GRY- DK GY- BLK, VFN/WXY
TEXT, HD, V/CARB, CALC
LS: OFF WT-TN-BRN-GY, V/FN
MICRO-XLN, DNS, HD, TR P.P.POR,
ARG, ARG, SLI FOSS, SHLY I.P., TR
OF YEL FLU, NO VIS STN, CUT, OR
ODOR
LS: AAB
LS: OFF WT-TN-BRN, FN MICRO-XLN,
SLI DNS, SM P.P.POR, SLI SHLY, ARG,
W/ ABT GY-DK GY-GRN SH, ABT BRT
YEL FLU, NO VIS STN, CUT, OR ODOR
LS: OFF WT-TN-BRN, MICRO-XLN,
V/GD P.P.POR, SUC,SLI CALC, SLI
FOSS, MOTT, V/DUL BRNSH FLU, SM
STNING. NO CUT. OR ODOR
SHALE GAS 176u
SHALE GAS 221u
POSS SHOW 101u
SHALE GAS
0
TG, C1-C5
200


T/CHEROKEE
4648'(-3082')
T/MISSISSIPPIAN
4683'(-3117')
C
C
C
C
C
C
4650
4700
4750
4800
ROP (min/ft)
Gamma (API)
0
0
10
150
SH:GY-DK GY-BLK, V/FN WXY TEXT, MD FM-HD, V/CALC, CARB, SLI PYR'C
SS: TN-BRN-GRN, FN GRN, RND, WL SRTED, CEM, CONS, EXC P.P.POR, MOTT, CALC, GLAU'C, ABT YEL FLU, LT BRN STNING, SLW STRM CUT, AND SLI ODOR
DOLO: TN-BRN-DK BRN, SM MICRO-XLN W/ INTER-XLN, V/SUC, BRITT, V/GD P.P.POR AND SM INTER-XLN, CHTY I.P., MOTT, ABT DUL YEL FLU, SM LT BRN STNING, GD STRM CUT, AND GD FRH ODOR
DOLO: OFF WT-TN-BRN-DK BRN, INTER-XLN, FRI, V/SUC, EXC INTER-XLN POR AND P.P.POR, ARG, ABT YEL FLU, BRN STNING, FLASH CUT, AND STRNG ODOR
DOLO: AAB
DOLO: GY-DK GY, MICRO-XLN, V/SHLY I.P., NO VIS FLU, STN, CUT, OR ODOR
SH: LT GY-GY-GRN, FN TEXT, SFT-MD FM, PLTY, PYR'C GLAU'C I.P.SLI DOLO
SHALE GAS 100u
SHOW 120u
SHOW 103u
SHOW 92u
SHOW 86u
0
TG, C1-C5
200


C
WOB 36K
RPM 80
PP 1200
SPM 58
C
C
C
RTD @ 4950' ON 11/11/11 @ 9:20 PM
4850
4900
50
SH: AAB GRDING INTO LIMEY SHL
LS: WT- OFF WT-TN, V/FN MICRO-XLN, DNS, HD, TR P.P.POR, CALC, NO VIS FLU, STN, CUT, OR ODOR
SHORT TRIP TO 3190', CIRC 1 1/2 HR, DROP SURVEY, TOH FOR ELOGS
MUD CK @ 4856'
WT 9.0
V 42
PV 16
YP 10
GEL5/10
WL
CK 2
SOLS 4.0
PH 10
CHL4000
CA 80
LCM 8

ALLIED CEMENTING CO., LLC. 037884

Federal Tax I.D.# 20-5975804

REMIT TO P.O. BOX 31
RUSSELL, KANSAS 67665

SERVICE POINT:
Medicine Lodge Ks

DATE 10-25-11	SEC. 16	TWP. 34S	RANGE 14W	CALLED OUT	ON LOCATION 2:00 pm	JOB START 3:30 pm	JOB FINISH 4:00 pm
LEASE Z Bar	WELL # 16-4		LOCATION Aetna & Coldwater Rd, 4.2 E			COUNTY Barber	STATE KS
OLD OR (NEW) (Circle one)			6/10 N, 2.1 E, 8 N, 4/10 E, S/into				

CONTRACTOR Big Buckeye Rotary Drilling
TYPE OF JOB Conductor
HOLE SIZE 30" T.D. 70'
CASING SIZE 20" DEPTH 70'
TUBING SIZE DEPTH
DRILL PIPE DEPTH
TOOL DEPTH
PRES. MAX MINIMUM
MEAS. LINE SHOE JOINT
CEMENT LEFT IN CSG. 15'
PERFS.
DISPLACEMENT 19½ bbls of Freshwater

OWNER Mam Exploration

CEMENT

AMOUNT ORDERED 100sx 65:35:6% Gel 3% CC & ¼ # Flosel, 50 C/195 A + 2% CC 150 sx CC

EQUIPMENT

PUMP TRUCK CEMENTER Dean F.
#414-302 HELPER Ron G
BULK TRUCK
381-250 DRIVER Matt T.
BULK TRUCK
DRIVER

COMMON A	50 sx	@ 16.25	812.50
POZMIX		@	
GEL		@	
CHLORIDE	5 sx	@ 58.20	291.00
ASC		@	
ALW	100 sx	@ 15.00	1500.00
Floseal	25#	@ 2.70	67.50
		@	
		@	
		@	
		@	
		@	
		@	
HANDLING	161	@ 2.25	362.25
MILEAGE	161/40/-11		708.40
		TOTAL	3741.65

REMARKS:

Pipe on bottom & break circulation, mix 100sx lead cement, mix 50sx tail cement. Displace 19½ bbls freshwater, Shut in Cement did circulate

SERVICE

DEPTH OF JOB	70'		
PUMP TRUCK CHARGE			1125.00
EXTRA FOOTAGE		@	
MILEAGE	80	@ 7.00	560.00
MANIFOLD		@	
light vehicle	80	@ 4.00	320.00
		@	
		TOTAL	2005.00

CHARGE TO: Mam Exploration
STREET
CITY STATE ZIP

PLUG & FLOAT EQUIPMENT

none

	@	
	@	
	@	
	@	
	@	
TOTAL		

To Allied Cementing Co., LLC.
You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

SALES TAX (If Any)
TOTAL CHARGES 5746.65
DISCOUNT 20% IF PAID IN 30 DAYS
Net 4597.32

PRINTED NAME X [illegible]
SIGNATURE X [signature]

Thank you!!!

Conservation Division
Finney State Office Building
130 S. Market, Rm. 2078
Wichita, KS 67202-3802

Kansas
Corporation Commission

Phone: 316-337-6200
Fax: 316-337-6211
http://kcc.ks.gov/

February 28, 2012

Mike Austin
M & M Exploration, Inc.
4257 MAIN ST., #230
WESTMINSTER, CO 80031

Re: ACO1
API 15-007-23790-00-00
Z Bar 16-4
NW/4 Sec.16-34S-14W
Barber County, Kansas

Dear Production Department:

We are herewith requesting that the Well Completion Form ACO-1 and attached information for the subject well be held confidential for a period of two years.

Should you have any questions or need additional information regarding subject well, please contact our office.

Respectfully,
Mike Austin