Confidentiality Requested:
☐ Yes ☐ No

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

1102734

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 # 31819
Name: Cholla Production, LLC
Address 1: 7851 S ELATI ST STE 201
Address 2:
City: LITTLETON State: CO Zip: 80120 + 8081
Contact Person: Emily Hundley-Goff
Phone: (303) 623-4565
CONTRACTOR: License # 33575
Name: WW Drilling, LLC
Wellsite Geologist: Bill Goff
Purchaser:

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 #:

11/16/2012	11/26/2012	2/18/2013
Spud Date or Recompletion Date	Date Reached TD	Completion Date or Recompletion Date

API No. 15 - 15-171-20916-00-00
Spot Description:
SW NW NW NE Sec. 32 Twp. 19 S. R. 33 ☐ East ☑ West
400 Feet from ☑ North / ☐ South Line of Section
2549 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: Scott
Lease Name: Bontrager RT Well #: 1-32
Field Name:
Producing Formation: Morrow
Elevation: Ground: 2986 Kelly Bushing: 2991
Total Vertical Depth: 4790 Plug Back Total Depth:
Amount of Surface Pipe Set and Cemented at: 259 Feet
Multiple Stage Cementing Collar Used? ☑ Yes ☐ No
If yes, show depth set: 2237 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: 16000 ppm Fluid volume: 1000 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: 03/14/2013
☑ **Confidential Release Date:** 03/14/2015
☑ **Wireline Log Received**
☐ **Geologist Report Received**
☐ **UIC Distribution**
ALT ☐ I ☑ II ☐ III **Approved by:** NAOMI JAMES **Date:** 03/15/2013

1102734

Operator Name: Cholla Production, LLC Lease Name: Bontrager RT Well #: 1-32

Sec. 32 Twp. 19 S. R. 33 ☐ East ☑ West County: Scott

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:

Attached

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

Name	Top	Datum
T/ANHY	2206	+780
Heebner	3857	-871
Lansing	3905	-919
BKC	4337	-1349
Marmaton	4364	-1379
Morrow	4641	-1655
Mississippian	4690	-1704

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
Surface	12.25	8.625	23	259	Common	175	3%CC,2%Gel
Production	7.875	5.5	15.5	4783	EA2	175	

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	2237-2237	SMD	270	
	-			

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
4	4701'-06'	1500 gal 15% Non-E DFE acid	4701'-06'
	4701'-06'	1500 gal 20% SGA DFE acid + 750 gal 2% KCLwater	4701'-06'
	4701'-06'	30bbls 4% KCL water + salt water	4701'-06'
4	4656'-66'	200gal 7 1/2% HCL, 420gal Ammonium Chloride water, 750 gal 7 1/2 %/3% HF acid and 500 gal Ammonium	4656'-66'

TUBING RECORD: Size:	Set At:	Packer At:	Liner Run:
2.375	4706'	S.N. @ 4685'	☑ Yes ☐ No

Date of First, Resumed Production, SWD or ENHR. 02/18/2013

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

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:

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

Form	ACO1 - Well Completion
Operator	Cholla Production, LLC
Well Name	Bontrager RT 1-32
Doc ID	1102734

All Electric Logs Run

DEN NEU MIC
INDUC
MicroLog
Repeat

CONSOLIDATED
Oil Well Services, LLC

PO Box 884, Chanute, KS 66720
620-431-9210 or 800-467-8676

TICKET NUMBER 37282
LOCATION Oakley KS
FOREMAN Miles Shaw
~~Walt Dartel~~

FIELD TICKET & TREATMENT REPORT
CEMENT

DATE	CUSTOMER #	WELL NAME & NUMBER	SECTION	TOWNSHIP	RANGE	COUNTY
11-16-12	2582	Bontrager RT # 1-32	32	19S	33W	Scott KS

CUSTOMER: Cholla Production — Scott City S to RD 70, 4½ W, S.S
MAILING ADDRESS:
CITY: STATE: ZIP CODE:

TRUCK #	DRIVER	TRUCK #	DRIVER
463	Jerry Y		
693	Mitty M		

JOB TYPE Surface HOLE SIZE 12 ¼" HOLE DEPTH 260' CASING SIZE & WEIGHT 8 5/8" 23 #
CASING DEPTH 260.42 DRILL PIPE TUBING OTHER
SLURRY WEIGHT 14.8 # SLURRY VOL 1.36 WATER gal/sk CEMENT LEFT in CASING 20'
DISPLACEMENT 15bbls DISPLACEMENT PSI MIX PSI RATE

REMARKS: Safety meeting and rig up on WW drilling #8 Circulate Casing mix 175 SKs Common Class A cement with 3% Calcium + 2% gel displaced 15bbls water Shut in Cement did Circulate Appra 4bbk to pit

Thanks Miles + Crew

ACCOUNT CODE	QUANITY or UNITS	DESCRIPTION of SERVICES or PRODUCT	UNIT PRICE	TOTAL
5401S	1	PUMP CHARGE	1085.00	1085.00
5406	50	MILEAGE	5.00	250.00
5407A	8.22 Ton	Ton mileage delivery	1.67	686.50
11045	175 sks	Common Class A Cement	17.65	3088.75
1102	493 #	Calcium Chloride	.89	438.77
1118B	329 #	Bentonite gel	.25	82.25
			Subtotal	5631.27
		less 10% discount		563.13
			Subtotal	5068.14
			SALES TAX	269.66
			ESTIMATED TOTAL	5337.80

Completed

Ravin 3737

AUTHORIZTION Mac Boge TITLE Pusher DATE 11-16-12

I acknowledge that the payment terms, unless specifically amended in writing on the front of the form or in the customer's account records, at our office, and conditions of service on the back of this form are in effect for services identified on this form.

254682

JOB LOG

SWIFT Services, Inc.

DATE 26 NOV 12 PAGE NO.

CUSTOMER CHOLLA PRODUCTION | WELL NO. 1-32 | LEASE BONTRAGER BT | JOB TYPE 5½ LONGSTRING | TICKET NO. 23707

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS T	PUMPS C	PRESSURE (PSI) TUBING	PRESSURE (PSI) CASING	DESCRIPTION OF OPERATION AND MATERIALS
	1200							ON LOCATION
	1330							START PIPE 5½ - 15.5#
								RTD @ 4790 SET @ 4783
								SHOE JT. 21.17'
								CENTRALIZERS 1, 3, 5, 7, 9, 15, 62
								BASKETS 63, 95
								DV TOOL Top of #63 @ 2237'
	0330							DROP BALL CIRCULATE
	0455	6½	12		↓		300	Pump 500 gal MUD FLUSH
		6½	20		↓		300	Pump 20 Bbl KCL FLUSH
	0503	4½	42		↓			MIX 175 sx EA2
	0516							WASH OUT Pump & LINES
	0518	6½			↓			START DISPLACING PLUG
	0538	∅	114		↓		1500	PLUG DOWN PSI up LATCH PLUG IN
	0540				↓			RELEASE PSI - DRY
	0542							DROP DV BOMB OPENING TOOL
	0552				↓		1100	OPEN DV TOOL
	0553	6½	20		↓		200	Pump 20 Bbl KCL FLUSH
	0556		7		↓			PLUG RH (30 sx)
	0559	6½	150		↓			MIX 270 sx SMD
	0628							WASH OUT Pump & LINES.
	0630	6½						START DISPLACING DV CLOSING TOOL/PLUG
	0639	∅	53½		↓		1500	PLUG DOWN - CLOSE DV TOOL
	0641				↓			RELEASE PSI - DRY - CIRCULATE 20 sx TO PIT
	0645							WASH TRUCK
	0730							JOB COMPLETE
								THANKS #115
								JASON JEFF DOUG JEREMY

DRILL STEM TEST REPORT

Cholla Production, LLC

7851 S Elati St. STE 201
Littleton, Co 80120

ATTN: Bill Goff

32 19s 33w Scott, Ks

Bontrager RT 1-32

Job Ticket: 49773 **DST#: 1**

Test Start: 2012.11.21 @ 00:57:00

GENERAL INFORMATION:

Formation: **Kansas City**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 03:04:00
Time Test Ended: 07:37:45

Test Type: Conventional Bottom Hole (Initial)
Tester: Bradley Walter
Unit No: 53

Interval: 4125.00 ft (KB) To 4172.00 ft (KB) (TVD)
Total Depth: 4172.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

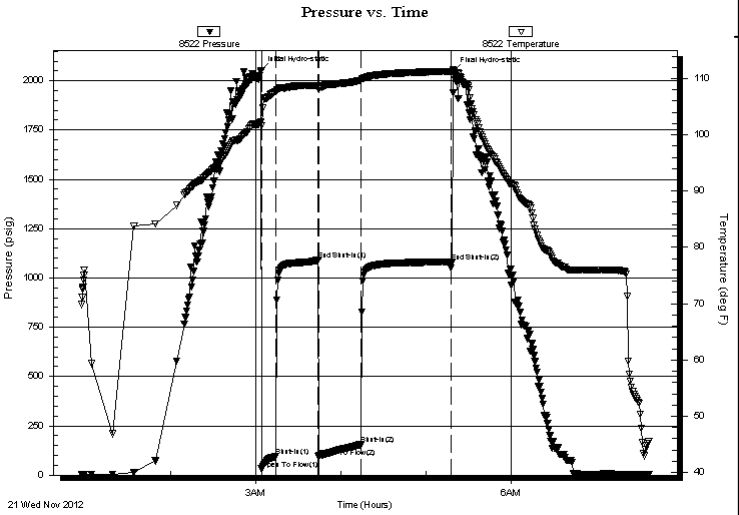
Reference Elevations: 2991.00 ft (KB)
2986.00 ft (CF)
KB to GR/CF: 5.00 ft

Serial #: 8522 **Outside**

Press@RunDepth: 154.88 psig @ 4126.00 ft (KB)
Start Date: 2012.11.21 End Date: 2012.11.21
Start Time: 00:57:05 End Time: 07:37:44

Capacity: 8000.00 psig
Last Calib.: 2012.11.21
Time On Btm: 2012.11.21 @ 03:03:45
Time Off Btm: 2012.11.21 @ 05:19:30

TEST COMMENT: IF: 9" blow .
ISI: No return.
FF: BOB @ 18 min.
FSI: No return.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2053.01	102.19	Initial Hydro-static
1	31.73	101.60	Open To Flow (1)
11	95.26	107.74	Shut-In(1)
41	1090.11	108.70	End Shut-In(1)
41	92.87	108.14	Open To Flow (2)
71	154.88	109.71	Shut-In(2)
134	1080.76	111.28	End Shut-In(2)
136	2044.99	111.62	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
240.00	mcw 45m 55w (oil spots)	2.24
3.00	free oil	0.04
0.00	60' Gassy oder	0.00

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

DRILL STEM TEST REPORT

FLUID SUMMARY

Cholla Production, LLC

7851 S Elati St. STE 201
Littleton, Co 80120

ATTN: Bill Goff

32 19s 33w Scott, Ks

Bontrager RT 1-32

Job Ticket: 49773 **DST#: 1**

Test Start: 2012.11.21 @ 00:57:00

Mud and Cushion Information

Mud Type:	Gel Chem	Cushion Type:		Oil API:	0 deg API
Mud Weight:	9.00 lb/gal	Cushion Length:	ft	Water Salinity:	51000 ppm
Viscosity:	55.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	7.99 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	3400.00 ppm				
Filter Cake:	1.00 inches				

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
240.00	mcw 45m 55w (oil spots)	2.237
3.00	free oil	0.042
0.00	60' Gassy oder	0.000

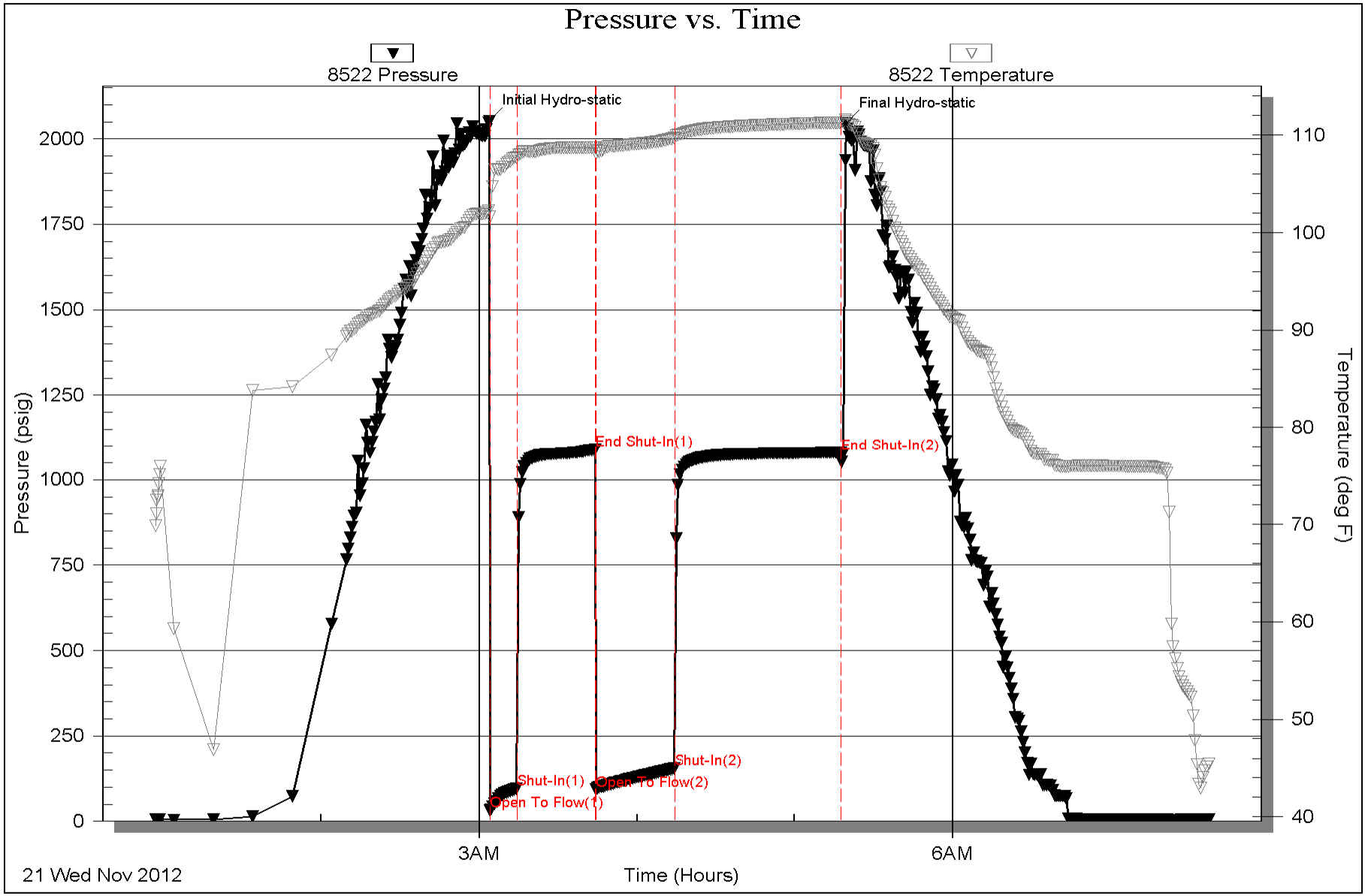
Total Length: 243.00 ft Total Volume: 2.279 bbl

Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:

Laboratory Name: Laboratory Location:

Recovery Comments: rw is .230 @ 45 = 51,000ppm
Sampler 100mL M 100mL O 1800mL W 325psi

Serial #: 8522 **Outside** Cholla Production, LLC Bontrager RT 1-32 DST Test Number: 1



Trilobite Testing, Inc Ref. No: 49773 Printed: 2012.11.21 @ 11:21:36

DRILL STEM TEST REPORT

Cholla Production, LLC

7851 S Elati St. STE 201
Littleton, Co 80120

ATTN: Bill Goff

32 19s 33w Scott, Ks

Bontrager RT 1-32

Job Ticket: 042338 **DST#: 5**

Test Start: 2012.11.24 @ 15:32:00

GENERAL INFORMATION:

Formation: **Morrow**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 17:44:45
Time Test Ended: 23:07:00

Test Type: Conventional Bottom Hole (Reset)
Tester: Bradley Walter
Unit No: 53

Interval: 4610.00 ft (KB) To 4675.00 ft (KB) (TVD)
Total Depth: 4675.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

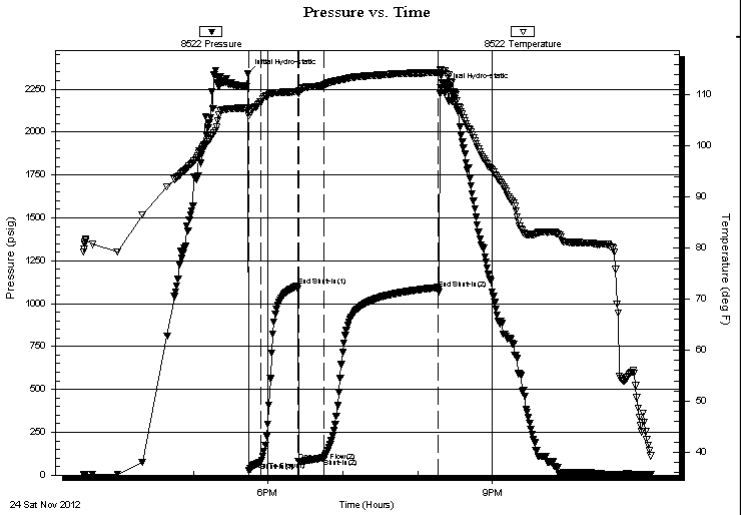
Reference Elevations: 2991.00 ft (KB)
2986.00 ft (CF)
KB to GR/CF: 5.00 ft

Serial #: 8522 **Outside**

Press@RunDepth: 100.72 psig @ 4611.00 ft (KB)
Start Date: 2012.11.24 End Date: 2012.11.24
Start Time: 15:32:05 End Time: 23:06:59

Capacity: 8000.00 psig
Last Calib.: 2012.11.24
Time On Btm: 2012.11.24 @ 17:43:45
Time Off Btm: 2012.11.24 @ 20:18:15

TEST COMMENT: IF: 6 1/2" blow .
ISI: No return.
FF: BOB @ 4 min.
FSI: Surface return blow .



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2337.95	107.28	Initial Hydro-static
1	27.27	105.90	Open To Flow (1)
11	74.37	108.64	Shut-In(1)
40	1103.02	110.61	End Shut-In(1)
41	80.01	110.29	Open To Flow (2)
61	100.72	111.94	Shut-In(2)
153	1085.94	114.37	End Shut-In(2)
155	2257.38	114.83	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
200.00	gocm 30g 40m 30o	1.68
0.00	290' GIP	0.00

* Recovery from multiple tests

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

DRILL STEM TEST REPORT

FLUID SUMMARY

Cholla Production, LLC

7851 S Elati St. STE 201
Littleton, Co 80120

ATTN: Bill Goff

32 19s 33w Scott, Ks

Bontrager RT 1-32

Job Ticket: 042338 **DST#: 5**

Test Start: 2012.11.24 @ 15:32:00

Mud and Cushion Information

Mud Type:	Gel Chem	Cushion Type:		Oil API:	0 deg API
Mud Weight:	9.00 lb/gal	Cushion Length:	ft	Water Salinity:	0 ppm
Viscosity:	55.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	7.95 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	3400.00 ppm				
Filter Cake:	1.00 inches				

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
200.00	gocm 30g 40m 30o	1.676
0.00	290' GIP	0.000

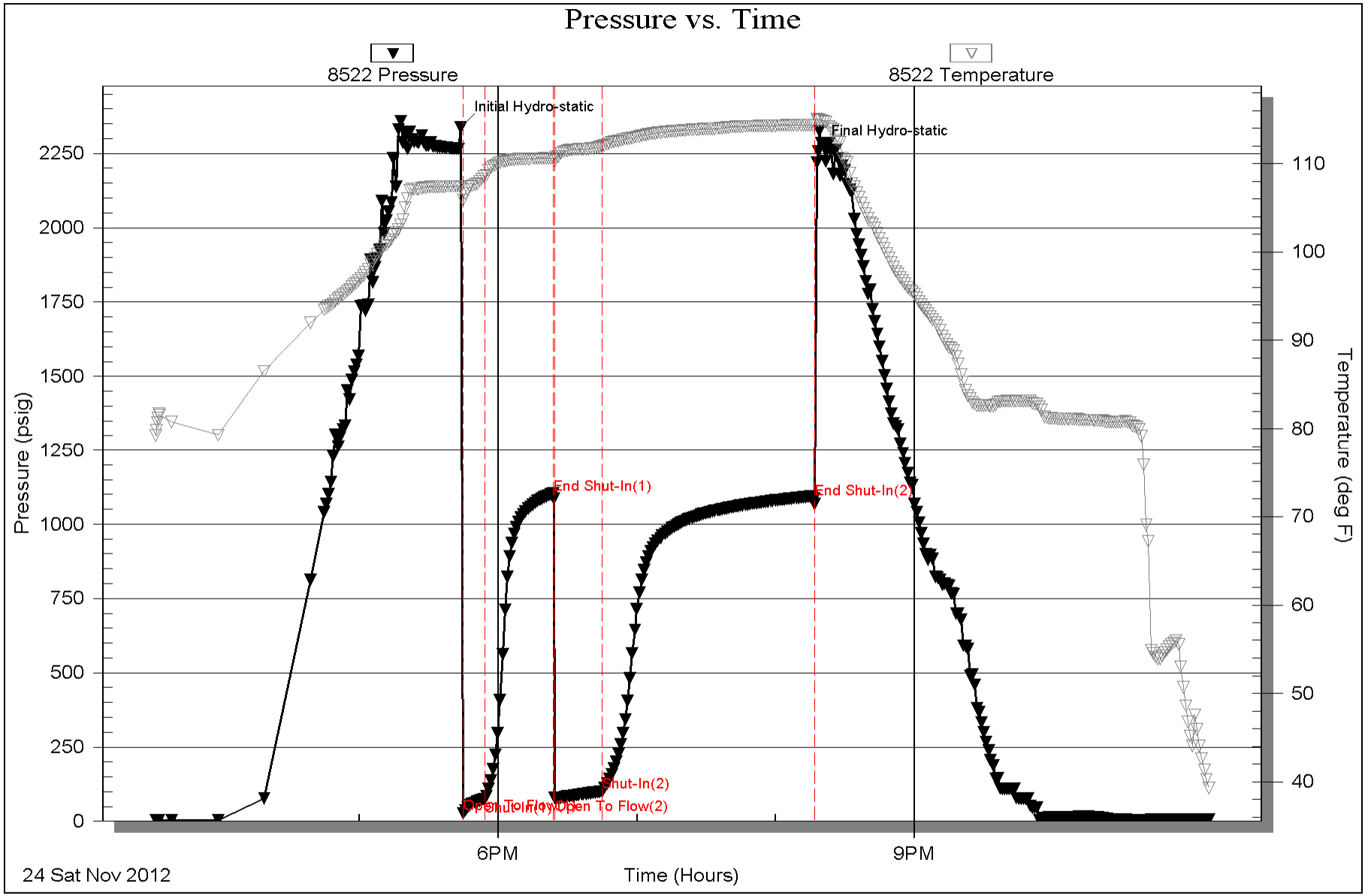
Total Length: 200.00 ft Total Volume: 1.676 bbl

Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:

Laboratory Name: Laboratory Location:

Recovery Comments: Sampler - 725 psi - 4 Cubic Ft Gas - 400ml Mud - 1600ml Oil

Serial #: 8522 **Outside** Cholla Production, LLC Bontrager RT 1-32 DST Test Number: 5



Trilobite Testing, Inc Ref. No: 042338 Printed: 2012.11.25 @ 06:55:48

Weatherford®

COMPACT PHOTO DENSITY COMPENSATED NEUTRON MICRORESISTIVITY LOG

COMPANY	CHOLLA PRODUCTION LLC.
WELL	BONTRAGER RT #1-32
FIELD	GRUBEN EAST
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	400' FNL & 2549' FEL

SEC	TWP	RGE	Other Services
32	19S	33W	MAI/MFE

API Number 15-171-20916
Permit Number

Permanent Datum G.L., Elevation 2986 feet
Log Measured From KB
Drilling Measured From K.B. @ 5 FEET

Elevations:	feet
KB	2991.00
DF	2990.00
GL	2986.00

Date	25-NOV-2012			
Run Number	ONE			
Service Order	3538952			
Depth Driller	4790.00	feet		
Depth Logger	4788.00	feet		
First Reading	4769.00	feet		
Last Reading	3500.00	feet		
Casing Driller	259.00	feet		
Casing Logger	260.00	inches		
Bit Size	7.875			
Hole Fluid Type	CHEMICAL	lb/USg		
Density / Viscosity	9.40 lb/USg	50.00 CP		
PH / Fluid Loss	9.00	9.00		
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.87 @ 80.0	ohm-m		
Rmf @ Measured Temp	0.70 @ 80.0	ohm-m		
Rmc @ Measured Temp	1.04 @ 80.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.64 @108.0	ohm-m		
Time Since Circulation	3 HOURS			
Max Recorded Temp	108.00	deg F		
Equipment / Base	13057	LIB		
Recorded By	R. HOFFMAN			
Witnessed By	BILL GOFF			
S.O.# / JOB#	LB12-308			

BOREHOLE RECORD

Last Edited: 26-NOV-2012 15:43

Bit Size inches	Depth From feet	Depth To feet
7.875	260.00	4788.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	260.00	24.00

REMARKS

Tools Used: MCG, MML, MDN, MPD, MFE, MAI ran in combination.
Hardware: MPD: 8 inch profile plate used. MAI 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.
Total hole volume from TD to Surface casing= 2061 cubic feet
Annular volume with 5.5 inch production casing from TD to 3500ft.= 248 cubic feet
Service order #3538952
Rig: WW #2
Engineer: R. Hoffman
Operator(s): B. Johnson

employees. These interpretations are also subject to our general terms and conditions in our price schedule.

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Main.dta
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Plotted on 26-NOV-2012 17:05
Recorded on 25-NOV-2012 14:32

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Density Caliper
inches
6 11 16

Bit Size
inches
6 11 16

Depth in Feet

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:240

Limestone Neutron Por.
percent
30 20 10 0 -10

Limestone Density Por.
percent
30 20 10 0 -10

PE
barns/electron
0 5 10

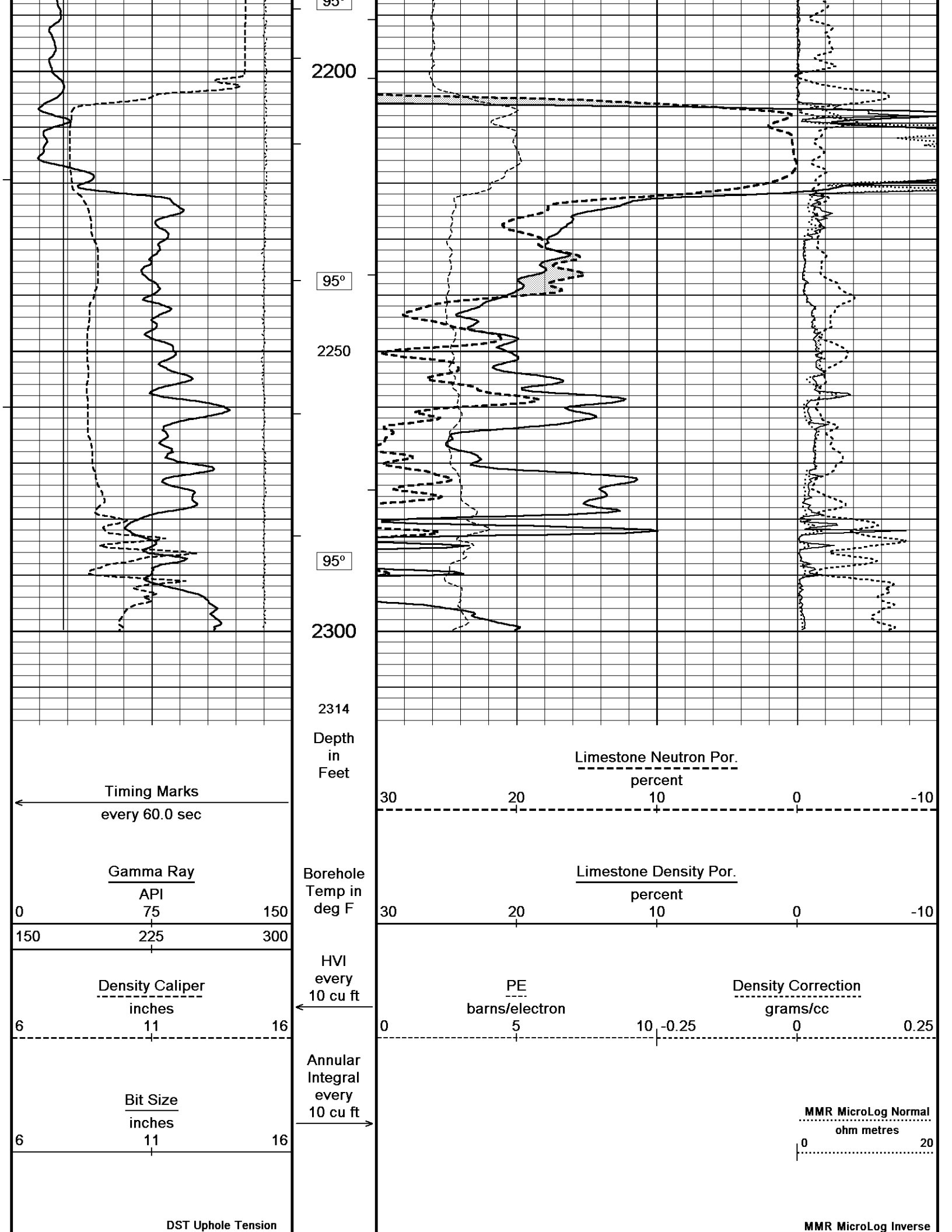
Density Correction
grams/cc
-0.25 0 0.25

MMR MicroLog Normal
ohm metres
0 20

MMR MicroLog Inverse
ohm metres
0 20

DST Uphole Tension
pounds
5000 0

2100
100
95°
100 2150
95°


95°
2200
95°
2250
95°
2300
2314
Depth
in
Feet
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
150
225
300
Density Caliper
inches
6
11
16
Bit Size
inches
6
11
16
DST Uphole Tension
Borehole
Temp in
deg F
HVI
every
10 cu ft
Annular
Integral
every
10 cu ft
Limestone Neutron Por.
percent
30
20
10
0
-10
Limestone Density Por.
percent
30
20
10
0
-10
PE
barns/electron
0
5
10
Density Correction
grams/cc
-0.25
0
0.25
MMR MicroLog Normal
ohm metres
0
20
MMR MicroLog Inverse

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Main.dta
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492
Plotted on 26-NOV-2012 17:05
Recorded on 25-NOV-2012 14:32

5 INCH MAIN

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Main.dta
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492
Plotted on 26-NOV-2012 17:05
Recorded on 25-NOV-2012 14:32

Timing Marks
every 60.0 sec

Depth in Feet

Limestone Neutron Por.
percent
30 20 10 0 -10

Gamma Ray
API
0 75 150
150 225 300

Borehole Temp in deg F

Limestone Density Por.
percent
30 20 10 0 -10

Density Caliper
inches
6 11 16

HVI every 10 cu ft

PE
barns/electron
0 5 10

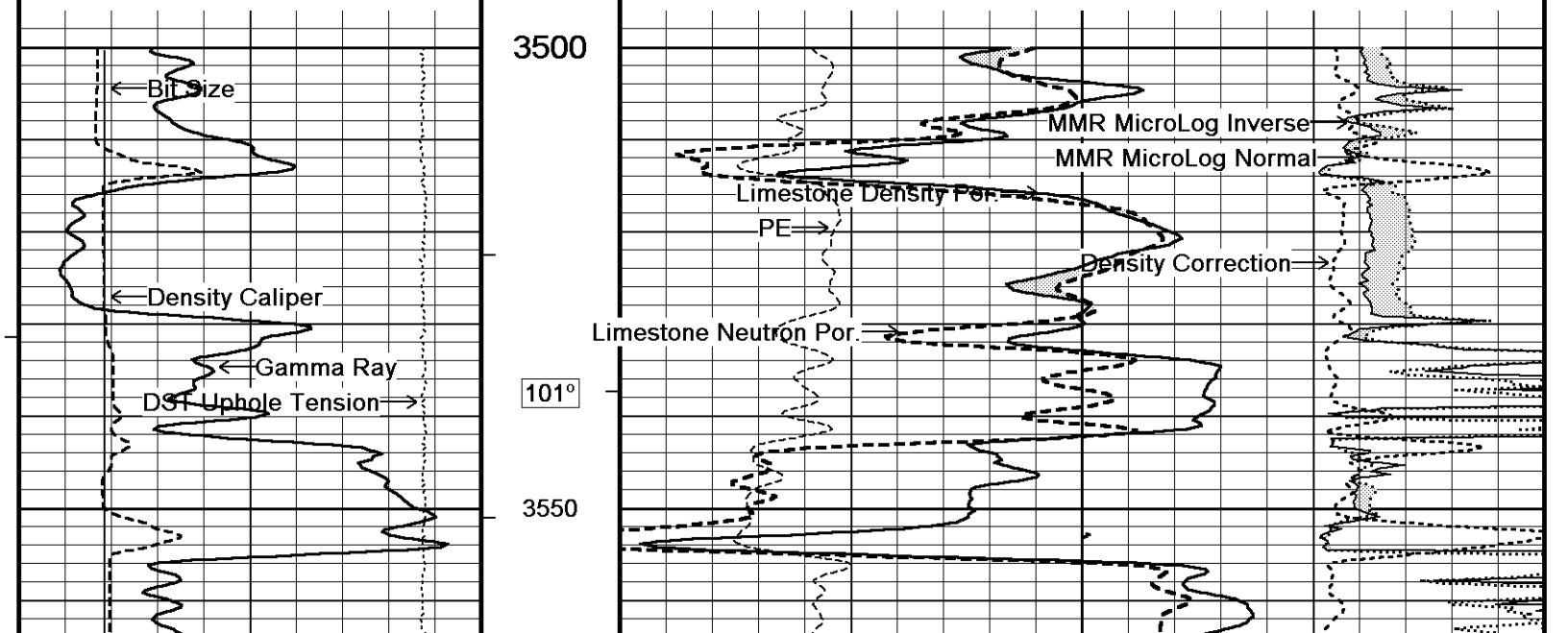
Density Correction
grams/cc
-0.25 0 0.25

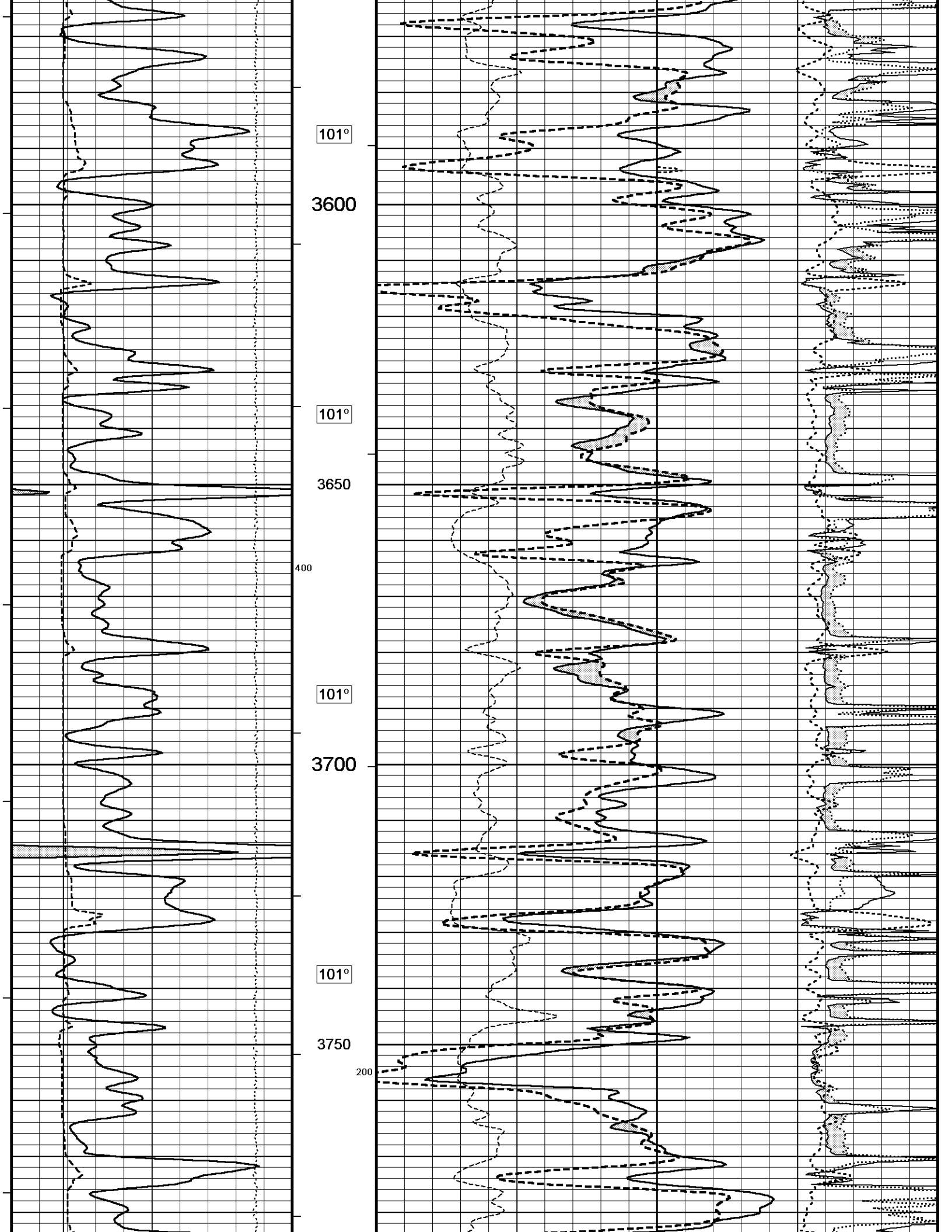
Annular Integral every 10 cu ft

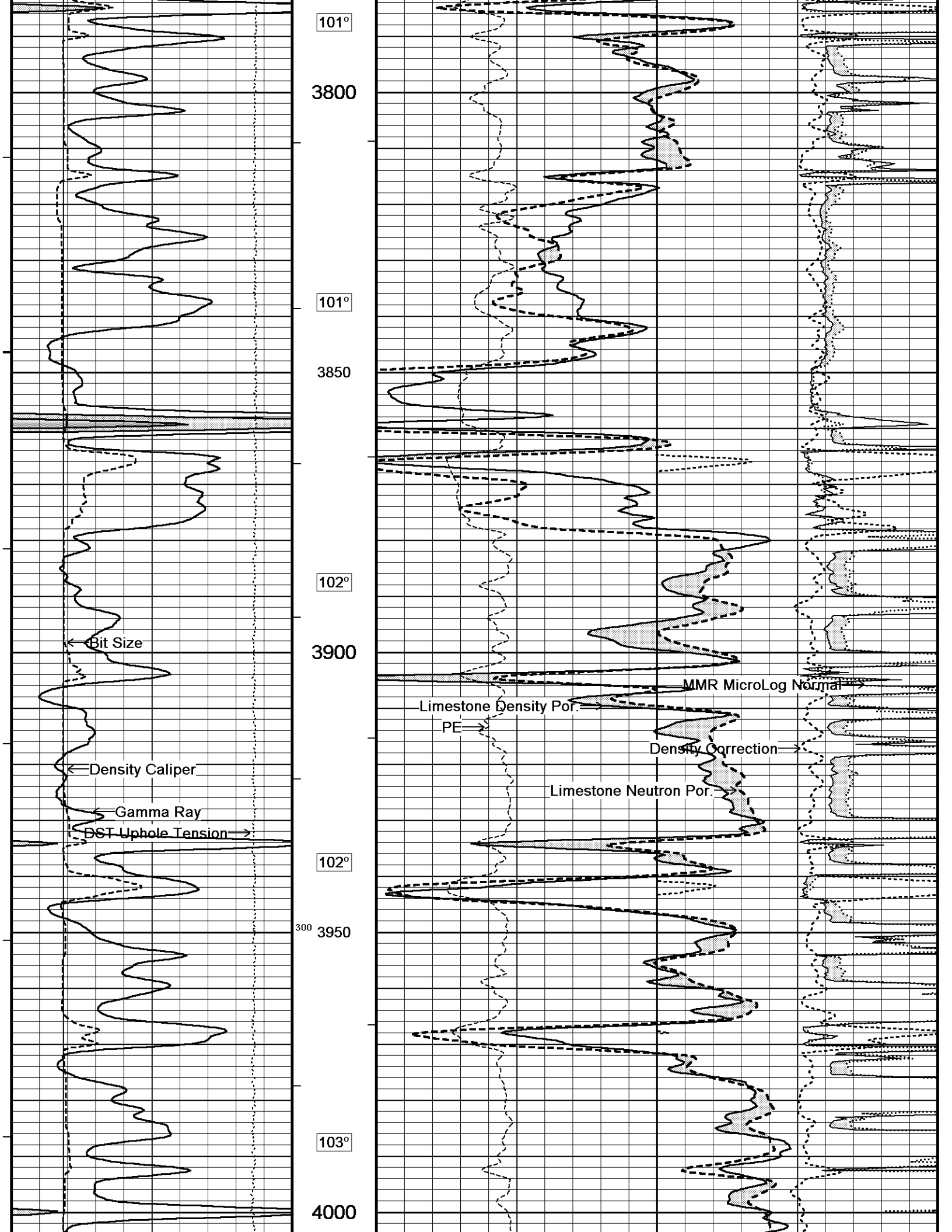
Bit Size
inches
6 11 16

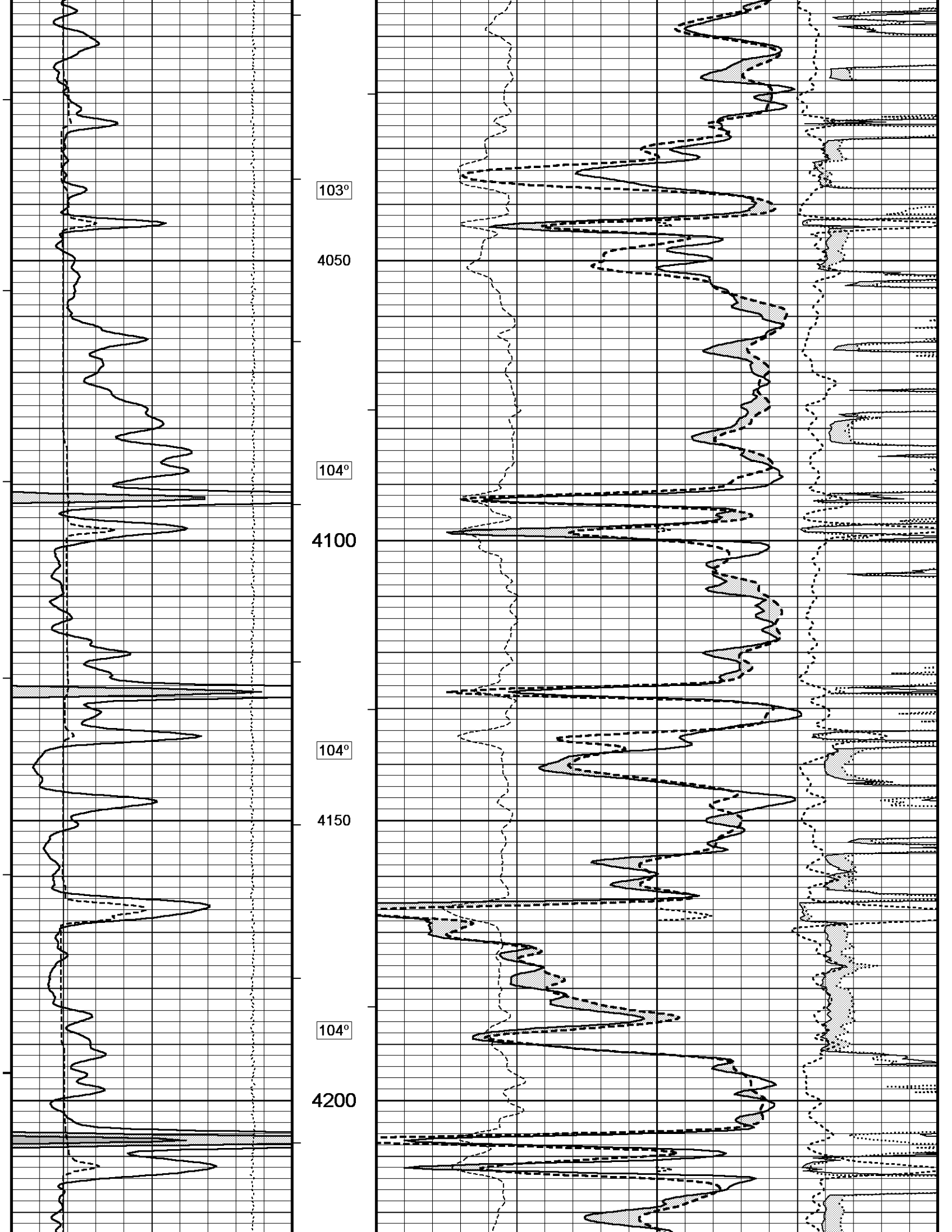
MMR MicroLog Normal
ohm metres
0 20

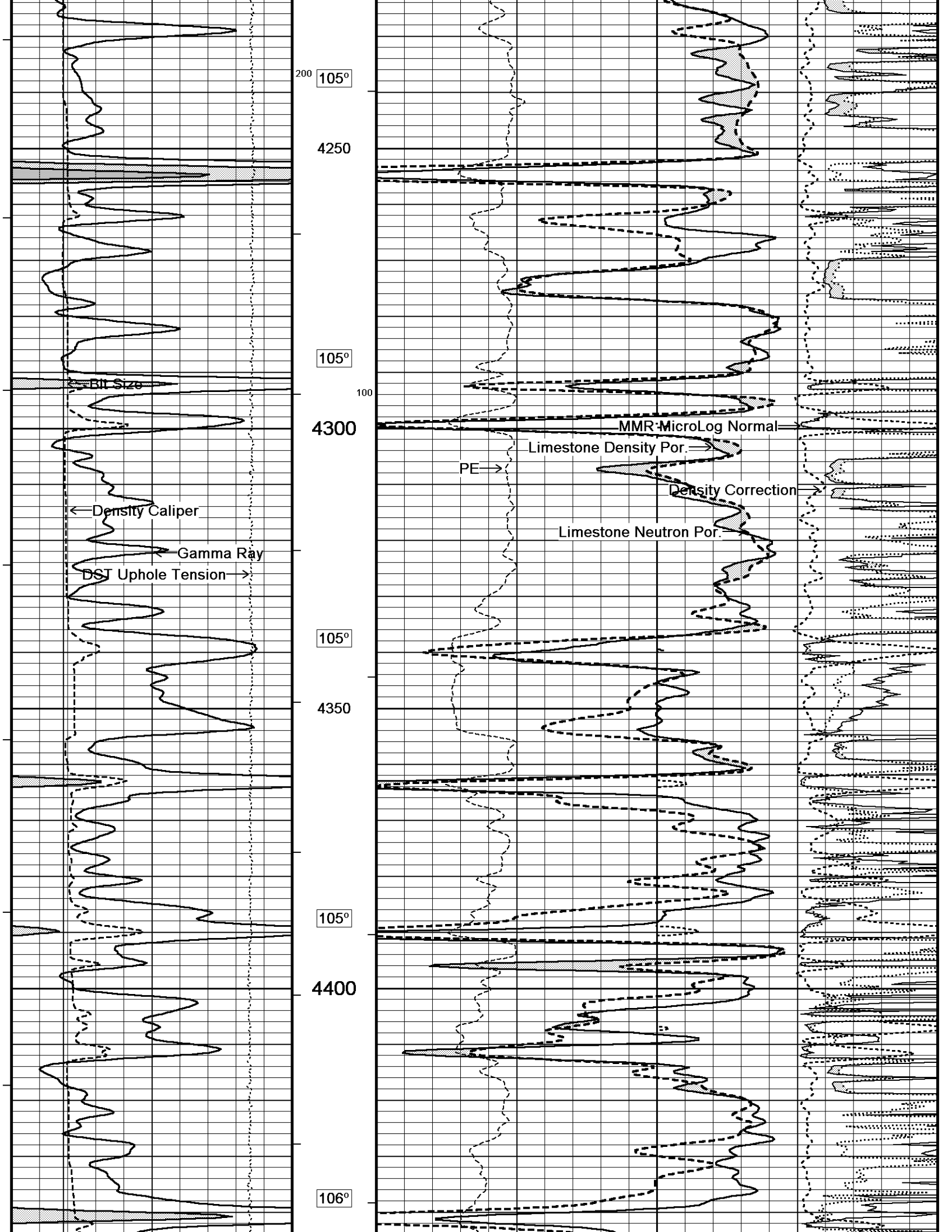
DST Uphole Tension
pounds
5000 0
Replay Scale 1:240
MMR MicroLog Inverse
ohm metres
0 20

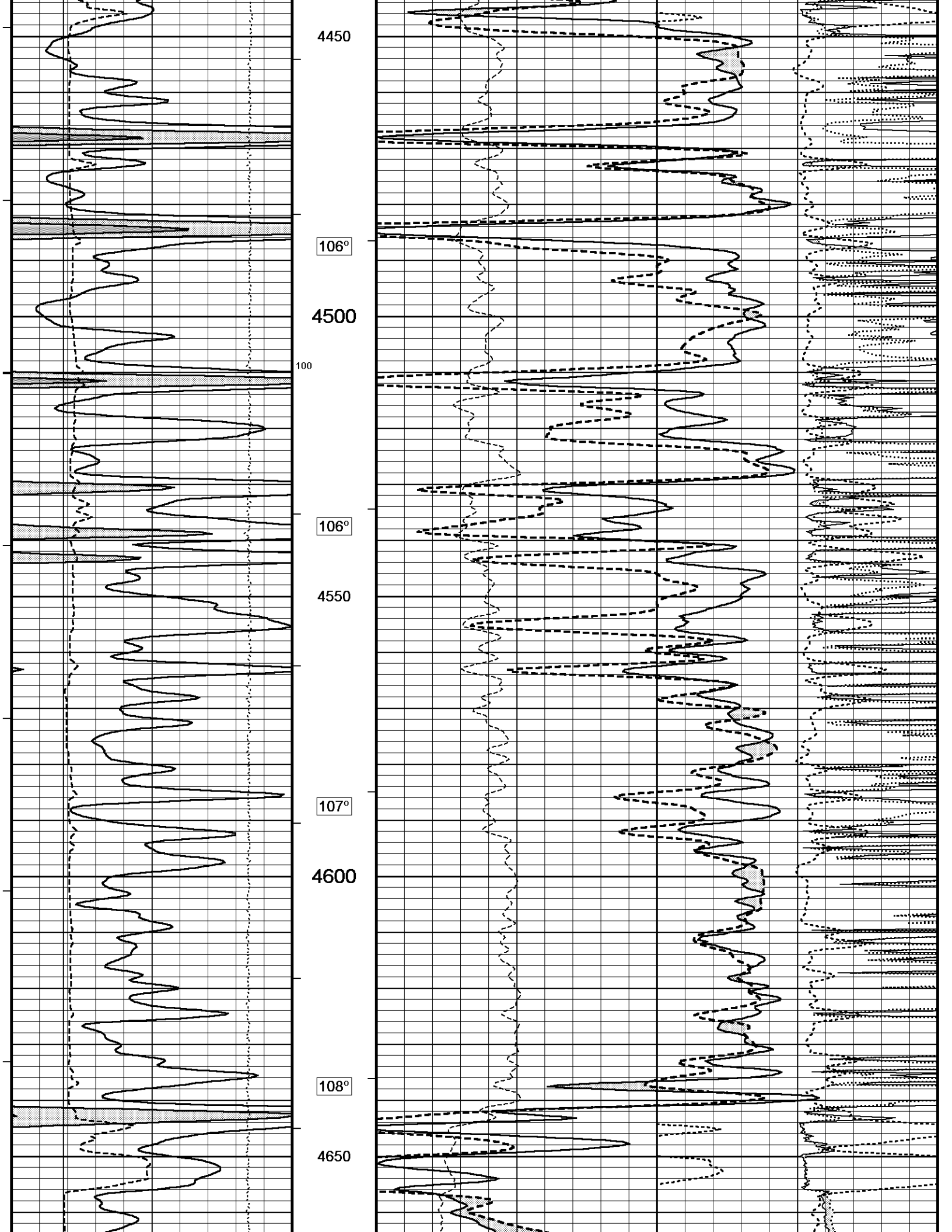


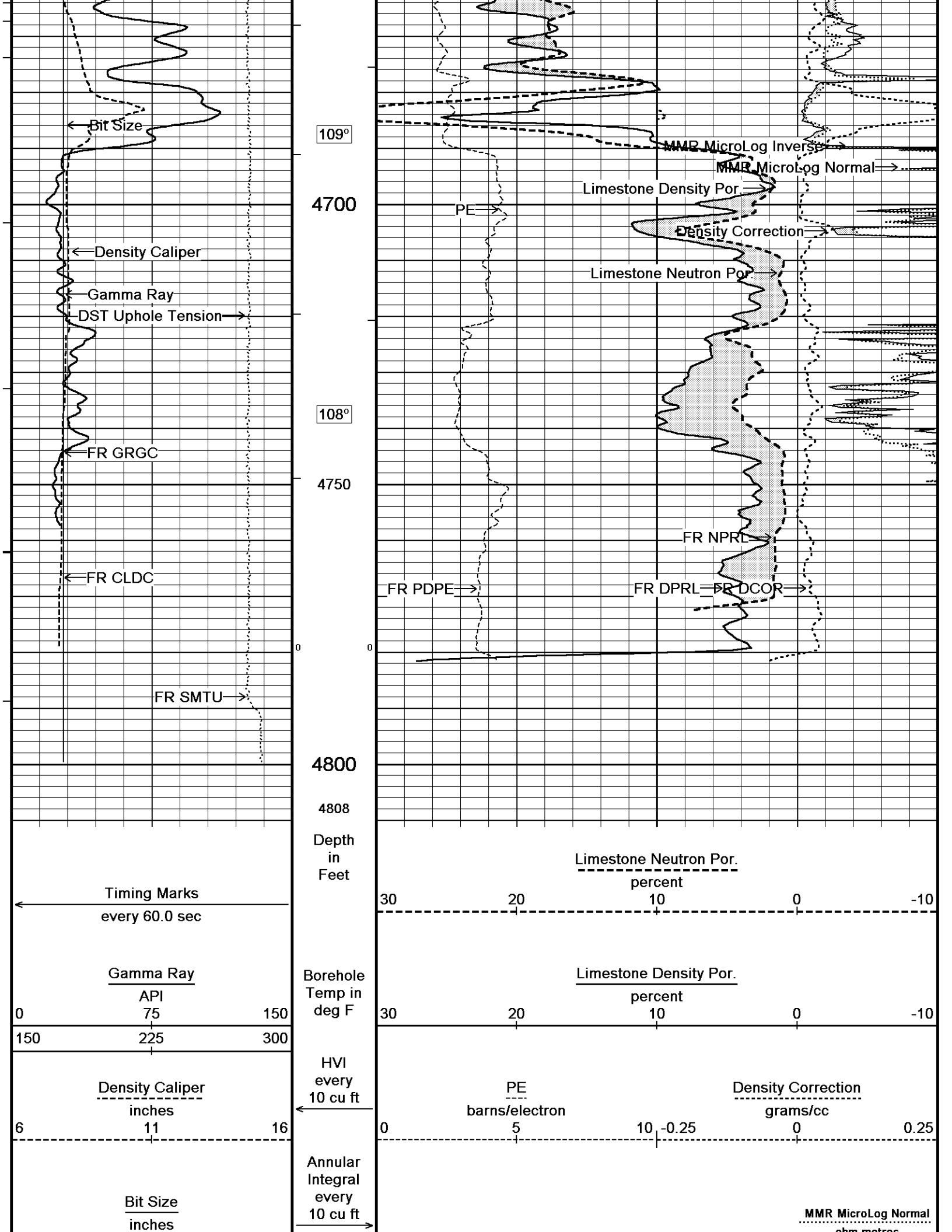

101°
3600
101°
3650
400
101°
3700
101°
3750
200


101°
3800
101°
3850
102°
3900
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
102°
300 3950
103°
4000
MMR MicroLog Normal
Limestone Density Por.
PE
Density Correction
Limestone Neutron Por.


103°
4050
104°
4100
104°
4150
104°
4200


200
105°
4250
105°
Bit Size
100
4300
MMR MicroLog Normal
Limestone Density Por.
PE
Density Correction
Density Caliper
Limestone Neutron Por.
Gamma Ray
DST Uphole Tension
105°
4350
105°
4400
106°


4450
106°
4500
100
106°
4550
107°
4600
108°
4650


Bit Size
109°
MMR MicroLog Inverse
MMR Micro-Log Normal
Limestone Density Por.
4700
PE
Density Caliper
Density Correction
Limestone Neutron Por.
Gamma Ray
DST Uphole Tension
108°
FR GRGC
4750
FR NPRL
FR CLDC
FR PDPE
FR DPRL
FR DCOR
FR SMTU
4800
4808
Depth in Feet
Limestone Neutron Por.
percent
30 20 10 0 -10
Timing Marks
every 60.0 sec
Gamma Ray
API
0 75 150
Borehole Temp in deg F
Limestone Density Por.
percent
30 20 10 0 -10
150 225 300
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
MMR MicroLog Normal
ohm metres

6 11 16

DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

MMR MicroLog Inverse
ohm metres
0 20

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Main.dta
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Plotted on 26-NOV-2012 17:05
Recorded on 25-NOV-2012 14:32

5 INCH MAIN

10 INCH HI-RES

Depth Based Data - Maximum Sampling Increment 2.5cm
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Hi-Res.dta
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Plotted on 26-NOV-2012 17:05
Recorded on 25-NOV-2012 13:44

Timing Marks
every 60.0 sec

Depth
in
Feet

Limestone Neutron Por.
percent
30 20 10 0 -10

Gamma Ray
API
0 75 150
150 225 300

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

MMR MicroLog Normal
ohm metres
0 20

Annular
Integral
every
10 cu ft

Bit Size
inches
6 11 16

MMR MicroLog Inverse
ohm metres
0 20

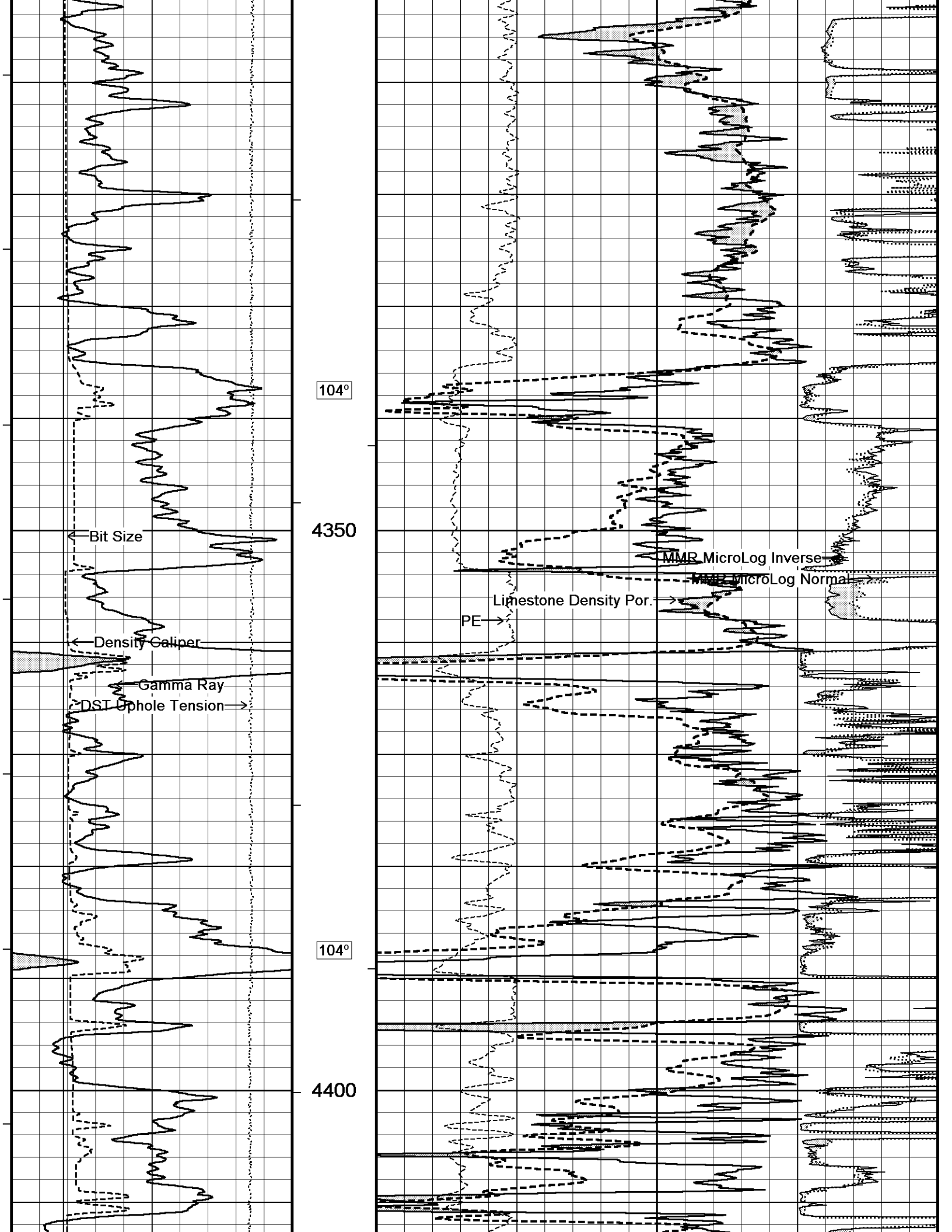
DST Uphole Tension
pounds
5000 0

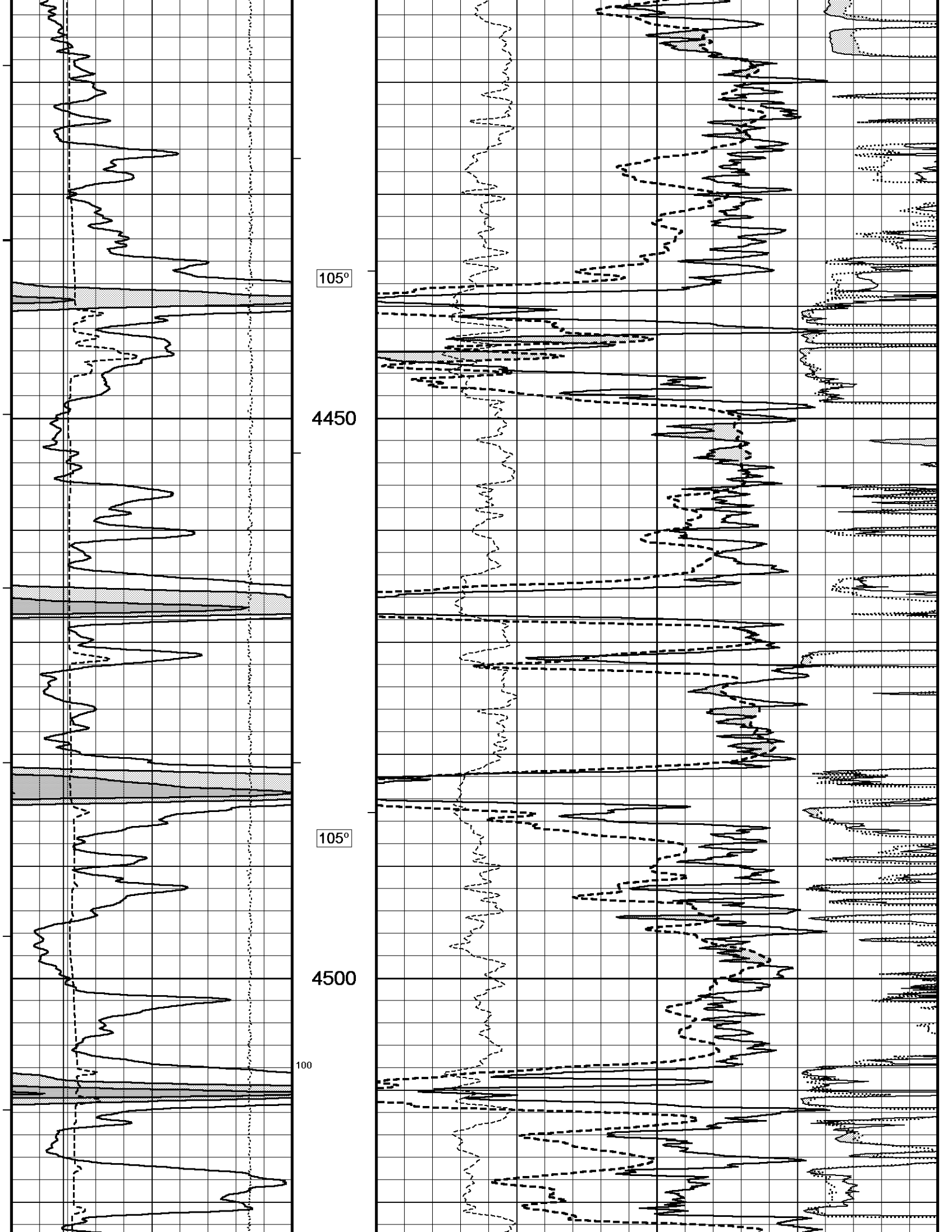
Replay
Scale
1:120

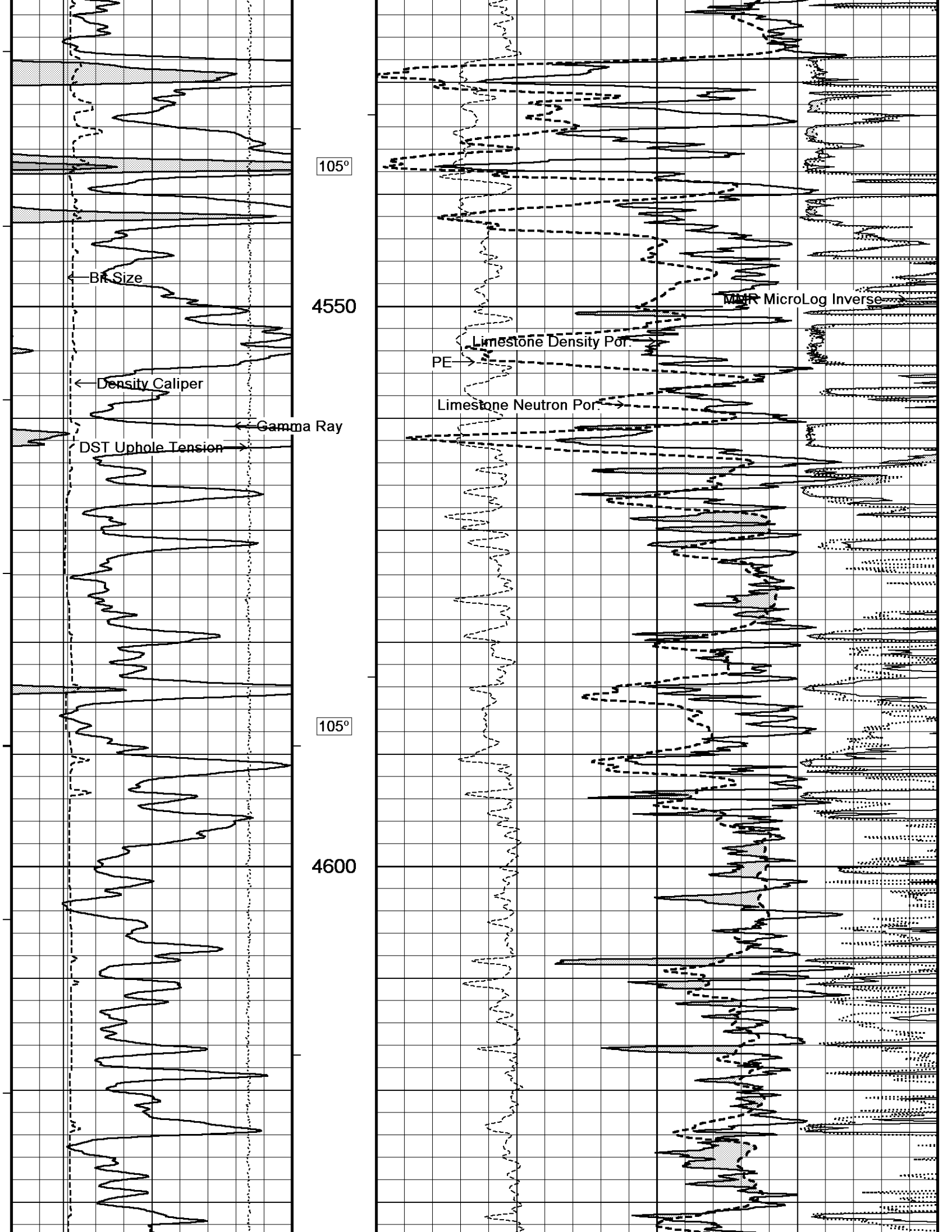
4280

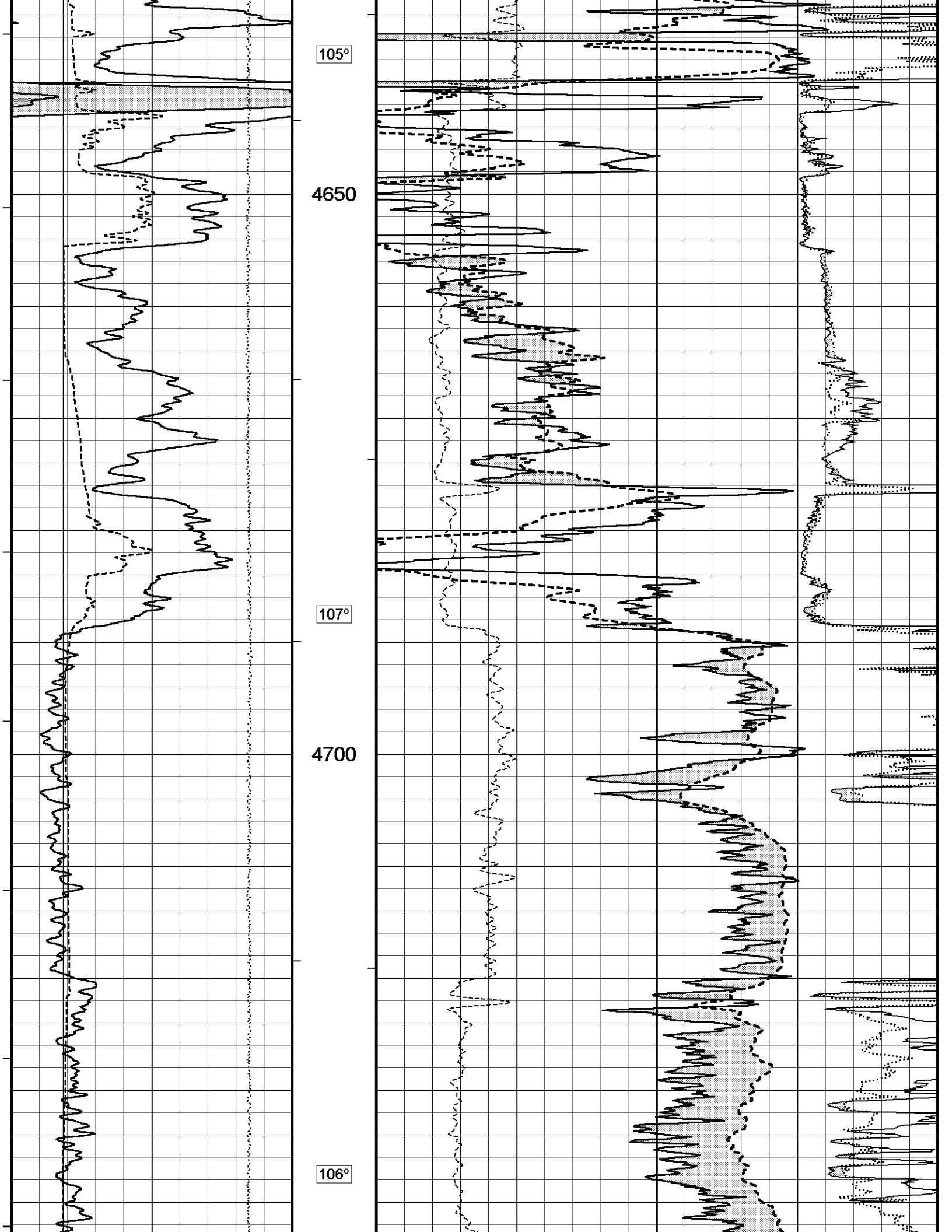
100

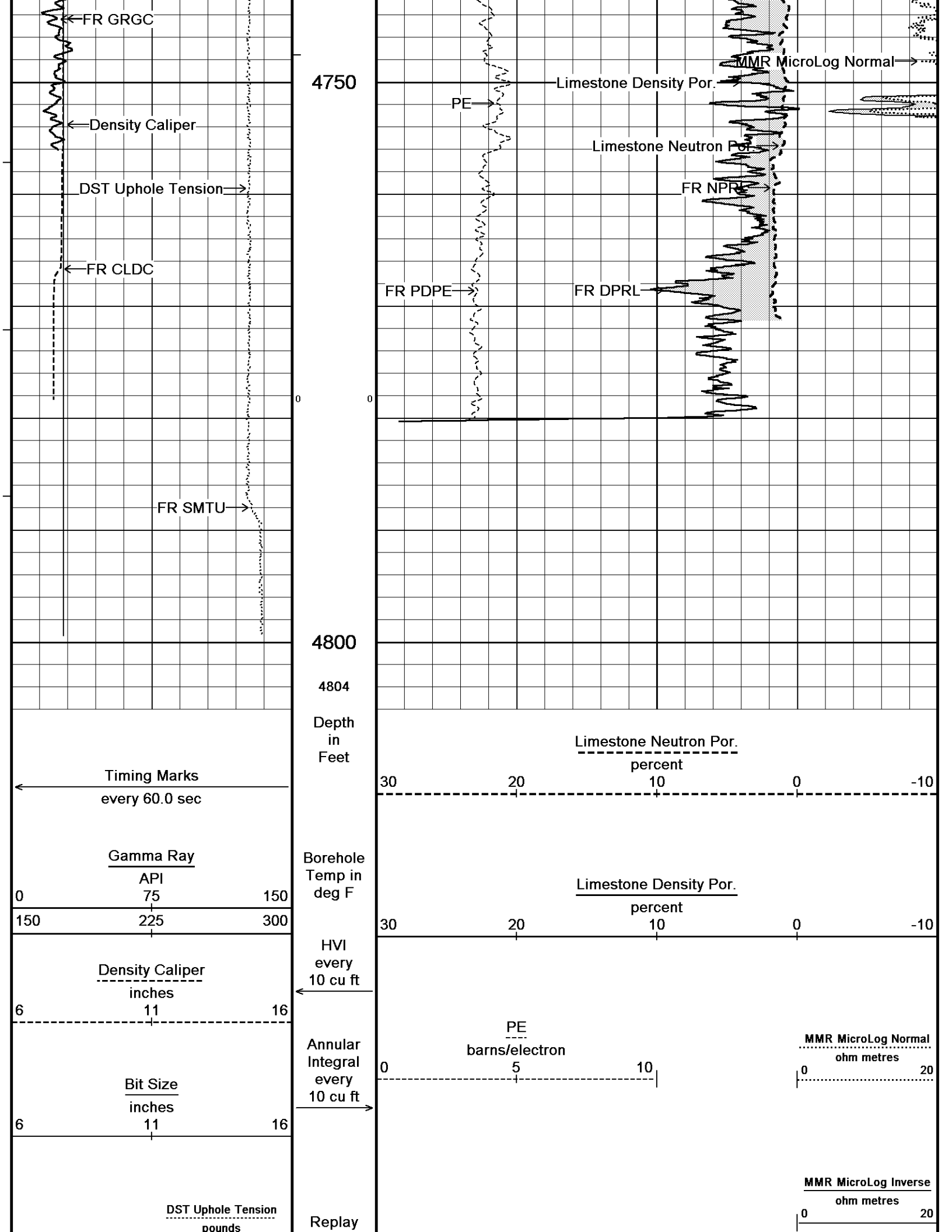
4300


104°
4350
Bit Size
MMR MicroLog Inverse
MMR MicroLog Normal
Limestone Density Por.
PE
Density Caliper
Gamma Ray
DST Uphole Tension
104°
4400


105°
4450
105°
4500
100


105°
Bit Size
4550
MaxR MicroLog Inverse
Limestone Density Por.
PE
Density Caliper
Limestone Neutron Por.
Gamma Ray
DST Uphole Tension
105°
4600


105°
4650
107°
4700
106°


FR GRGC
Density Caliper
DST Uphole Tension
FR CLDC
FR SMTU
4750
4800
4804
Depth in Feet
PE
FR PDPE
Limestone Density Por.
MMR MicroLog Normal
Limestone Neutron Por.
FR NPRL
FR DPRL
Limestone Neutron Por.
percent
30 20 10 0 -10
Timing Marks
every 60.0 sec
Gamma Ray
API
0 75 150
150 225 300
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
MMR MicroLog Normal
ohm metres
0 20
Annular Integral every 10 cu ft
Bit Size
inches
6 11 16
MMR MicroLog Inverse
ohm metres
0 20
DST Uphole Tension
pounds
Replay

5000 0

Scale 1:120

Depth Based Data - Maximum Sampling Increment 2.5cm
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Hi-Res.dta
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Plotted on 26-NOV-2012 17:05
Recorded on 25-NOV-2012 13:44

10 INCH HI-RES

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Rpt.dta
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Plotted on 26-NOV-2012 17:05
Recorded on 25-NOV-2012 13:44

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Density Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:240

Limestone Neutron Por.
percent
30 20 10 0 -10

Limestone Density Por.
percent
30 20 10 0 -10

PE
barns/electron
0 5 10

Density Correction
grams/cc
-0.25 0 0.25

MMR MicroLog Normal
ohm metres
0 20

MMR MicroLog Inverse
ohm metres
0 20

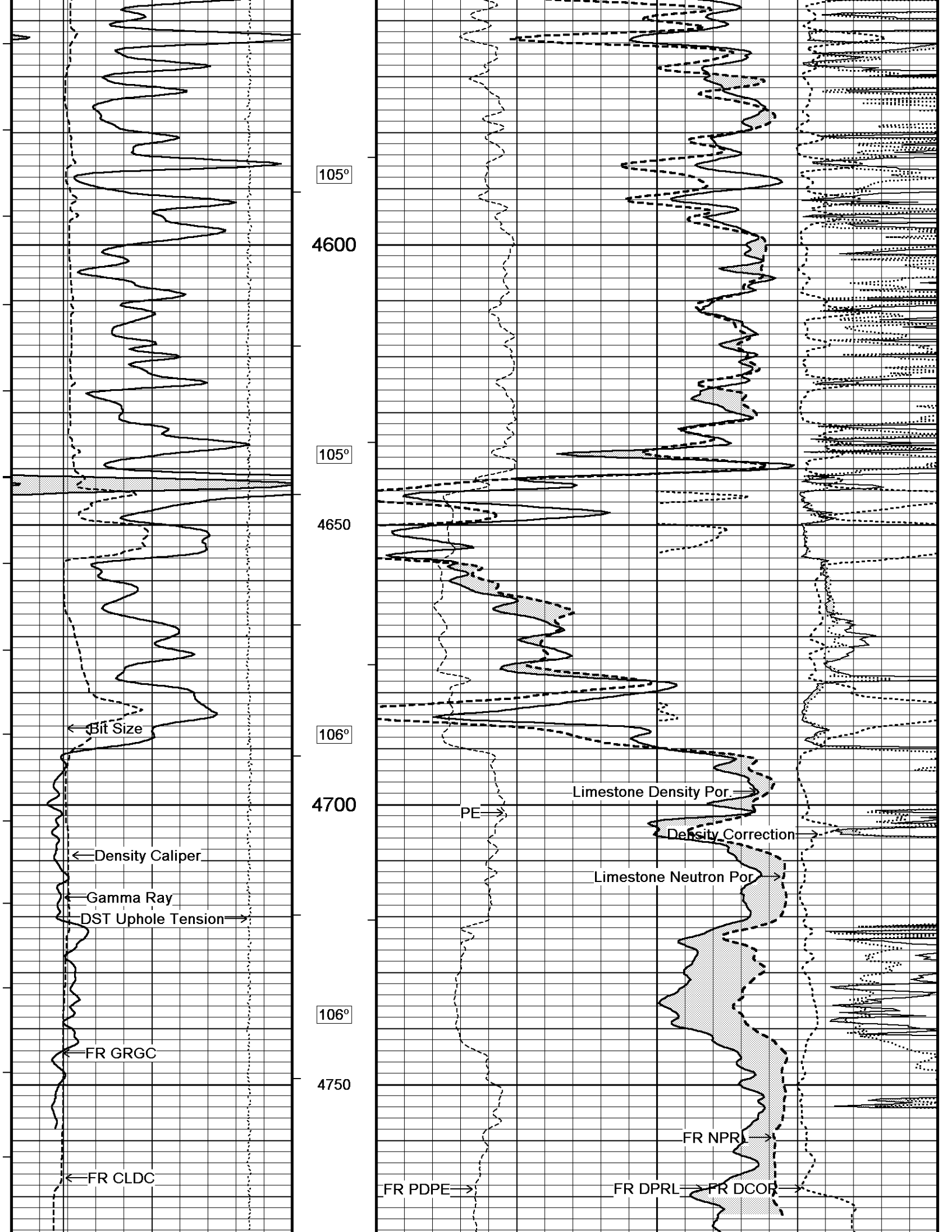
4488

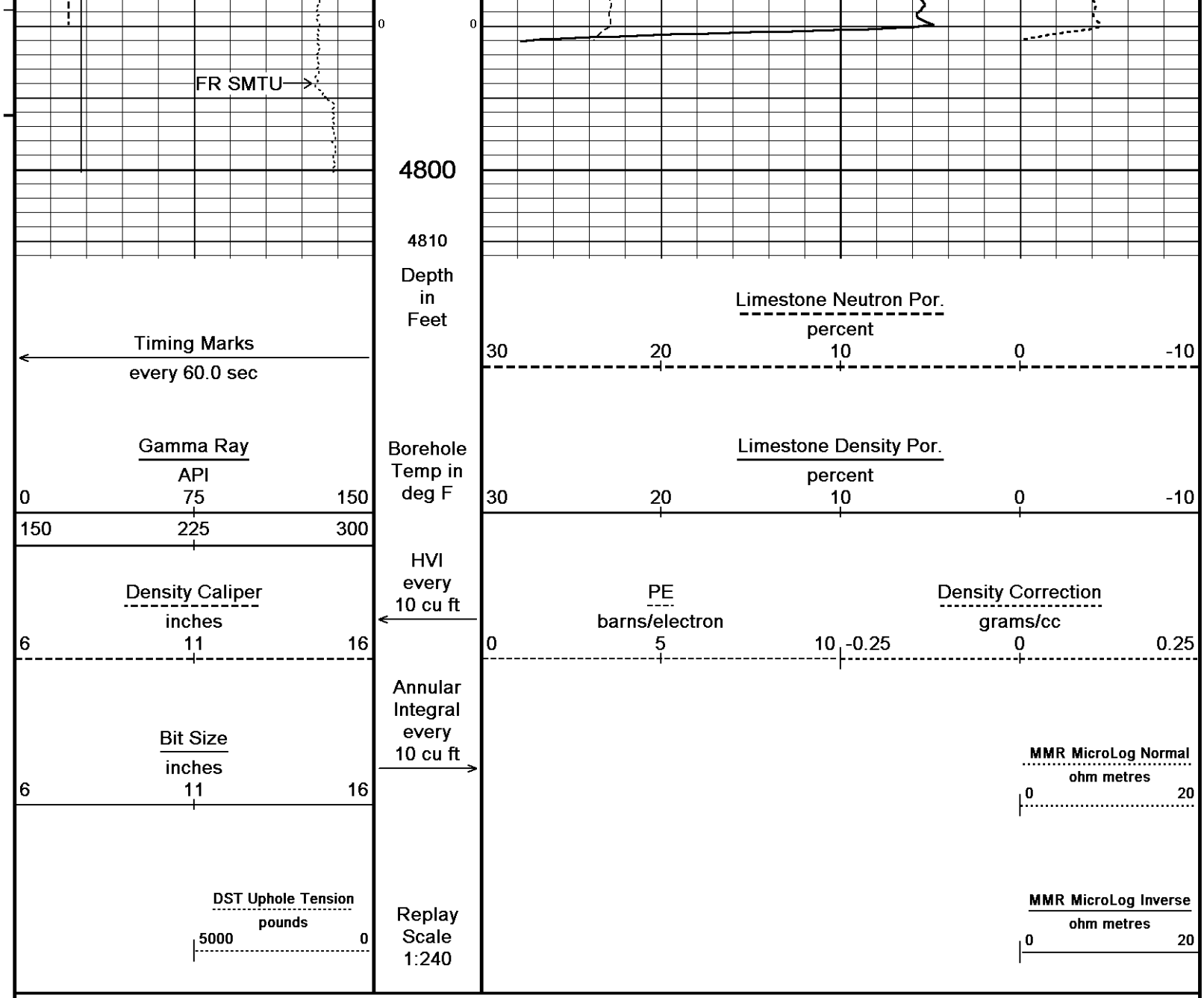
4500

100

105°

4550


105°
4600
105°
4650
106°
4700
106°
4750
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
FR GRGC
FR CLDC
PE
Limestone Density Por
Density Correction
Limestone Neutron Por
FR NPRL
FR PDPE
FR DPRL
FR DCOR

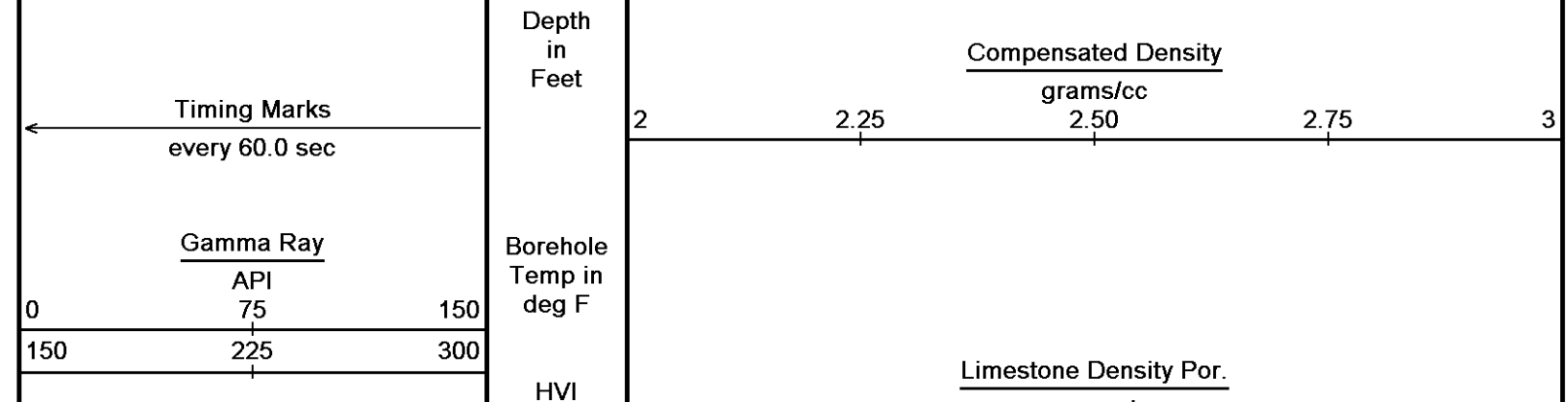


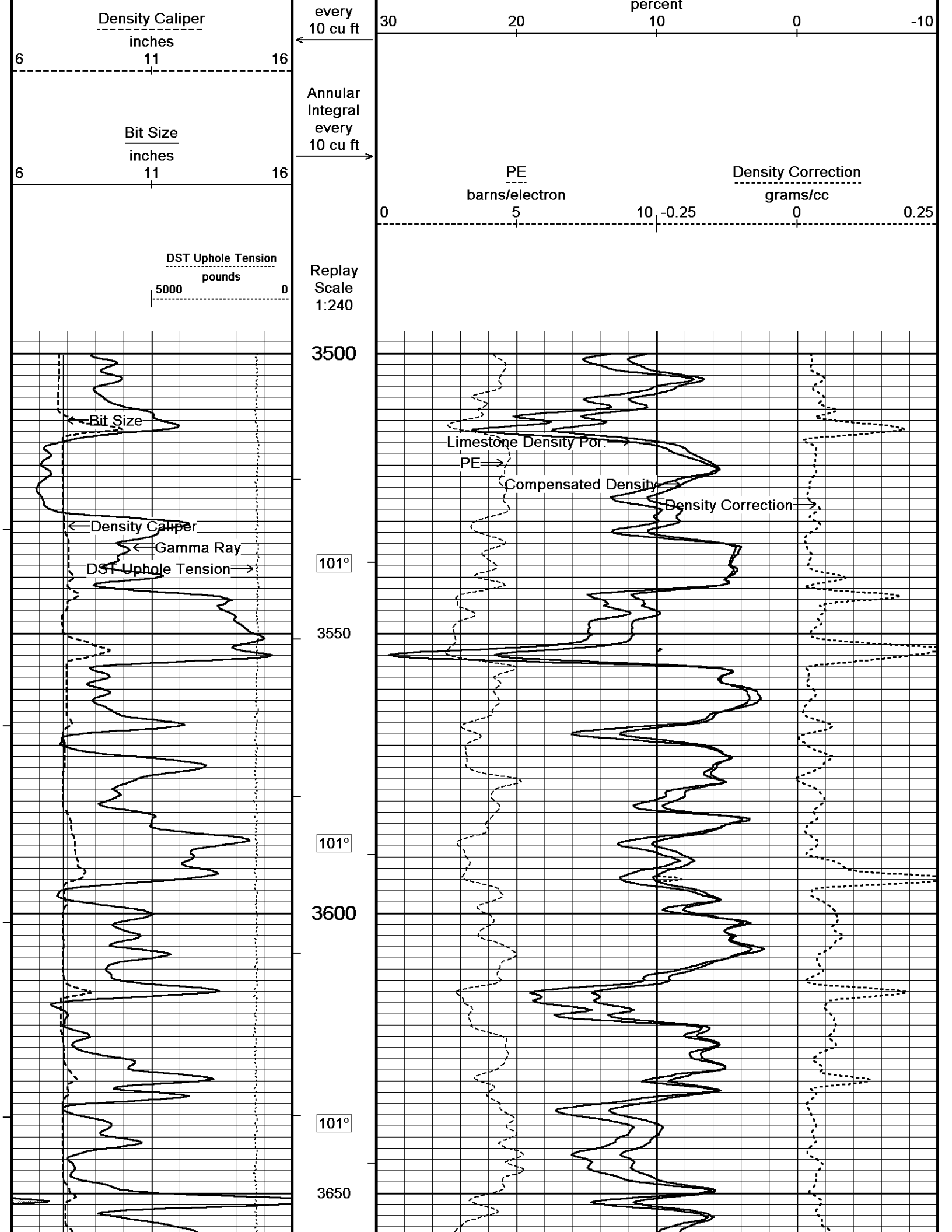
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 26-NOV-2012 17:05
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Rpt.dta
Recorded on 25-NOV-2012 13:44
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

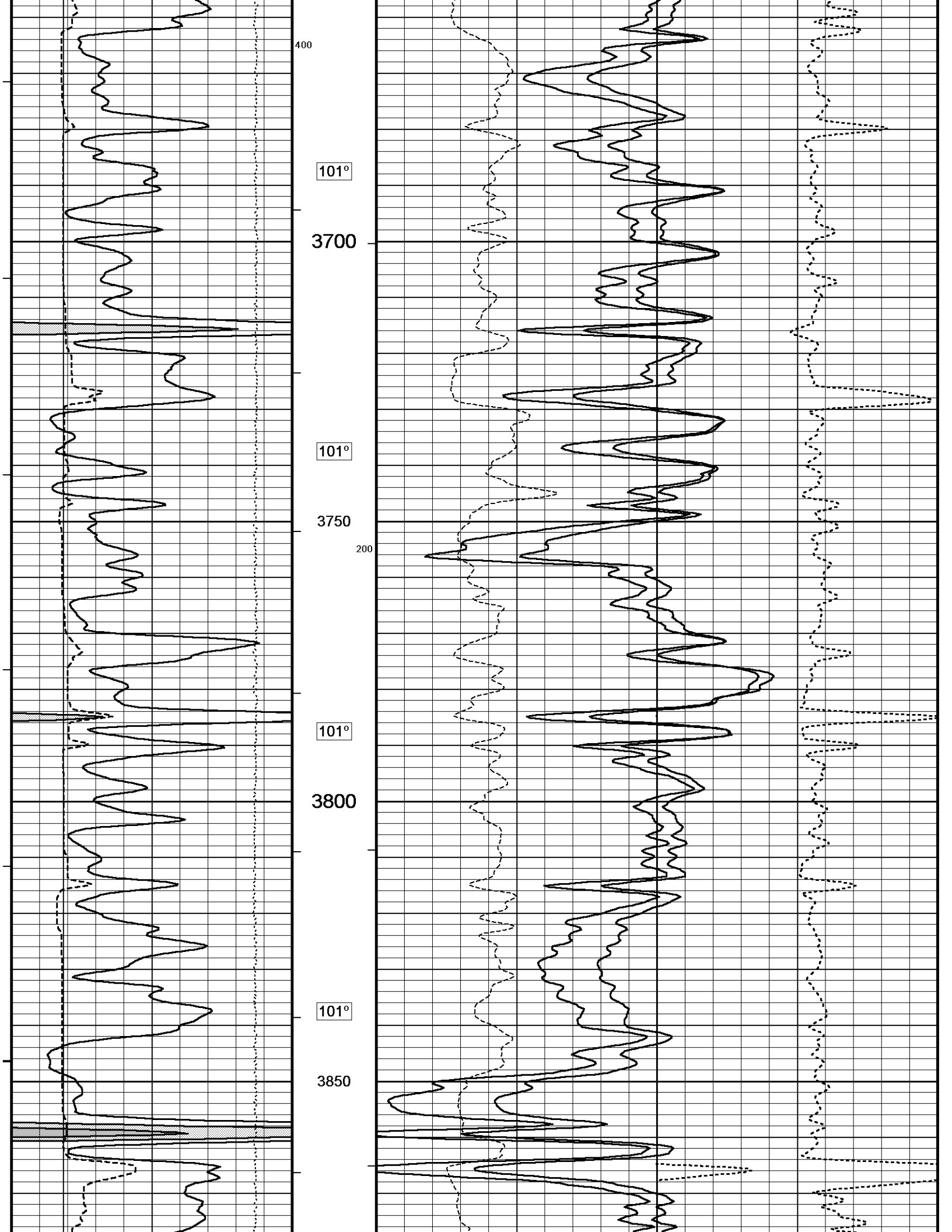
REPEAT SECTION

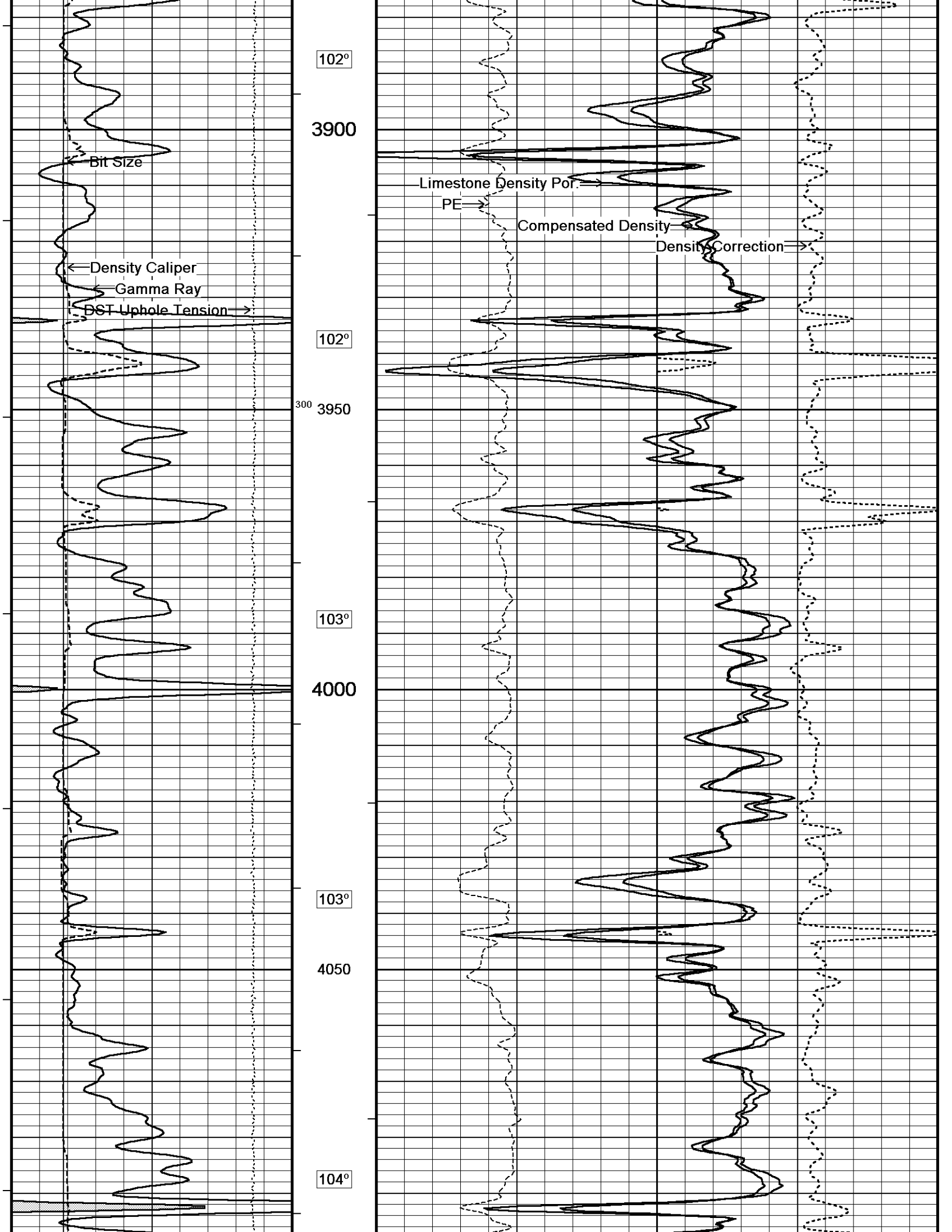
5 INCH MAIN

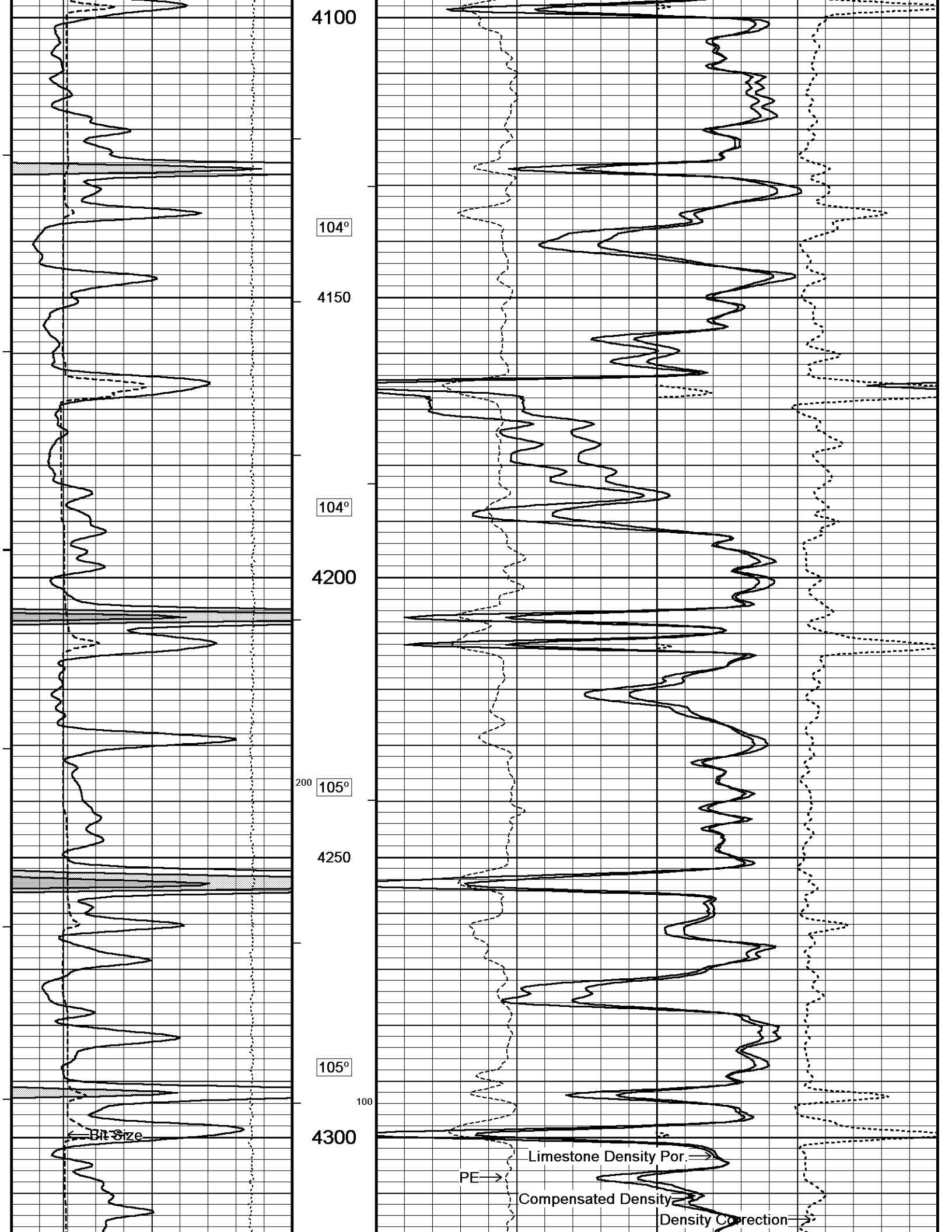
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 26-NOV-2012 17:05
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Main.dta
Recorded on 25-NOV-2012 14:32
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

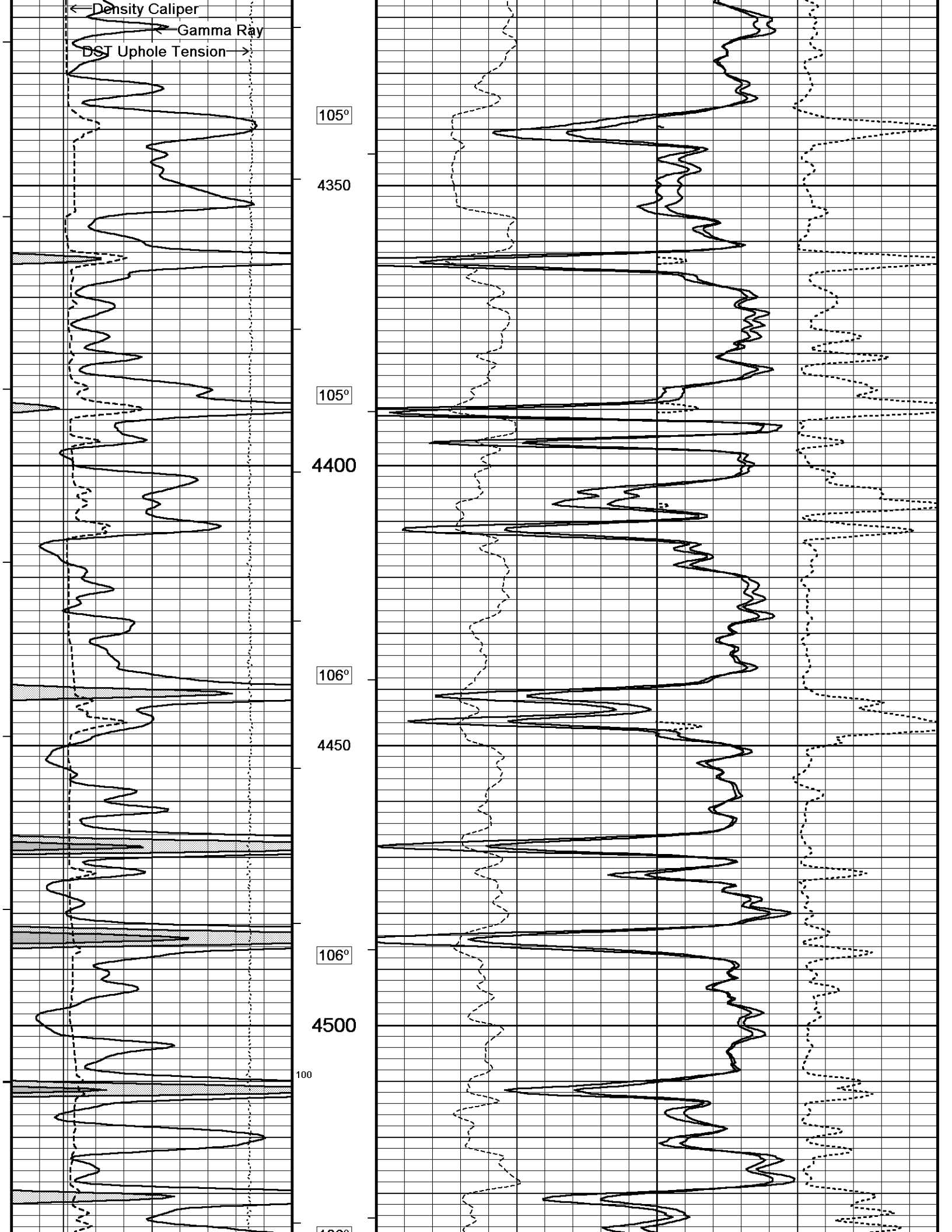


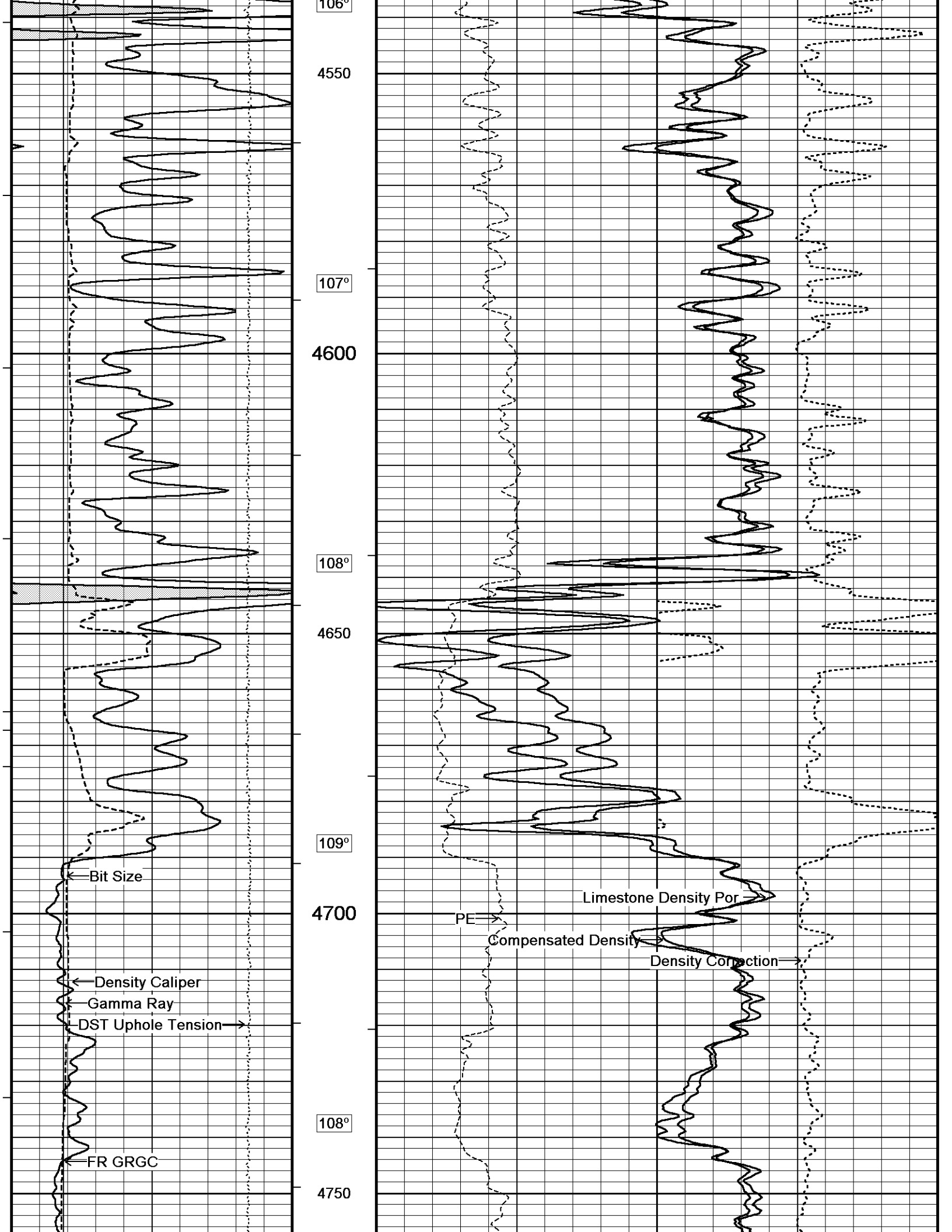

Density Caliper
inches
6
11
16
Bit Size
inches
6
11
16
DST Uphole Tension
pounds
5000
0
every
10 cu ft
Annular
Integral
every
10 cu ft
Replay
Scale
1:240
percent
30
20
10
0
-10
PE
barns/electron
0
5
10
Density Correction
grams/cc
-0.25
0
0.25
3500
3550
3600
3650
101°
101°
101°
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
Limestone Density Por.
PE
Compensated Density
Density Correction

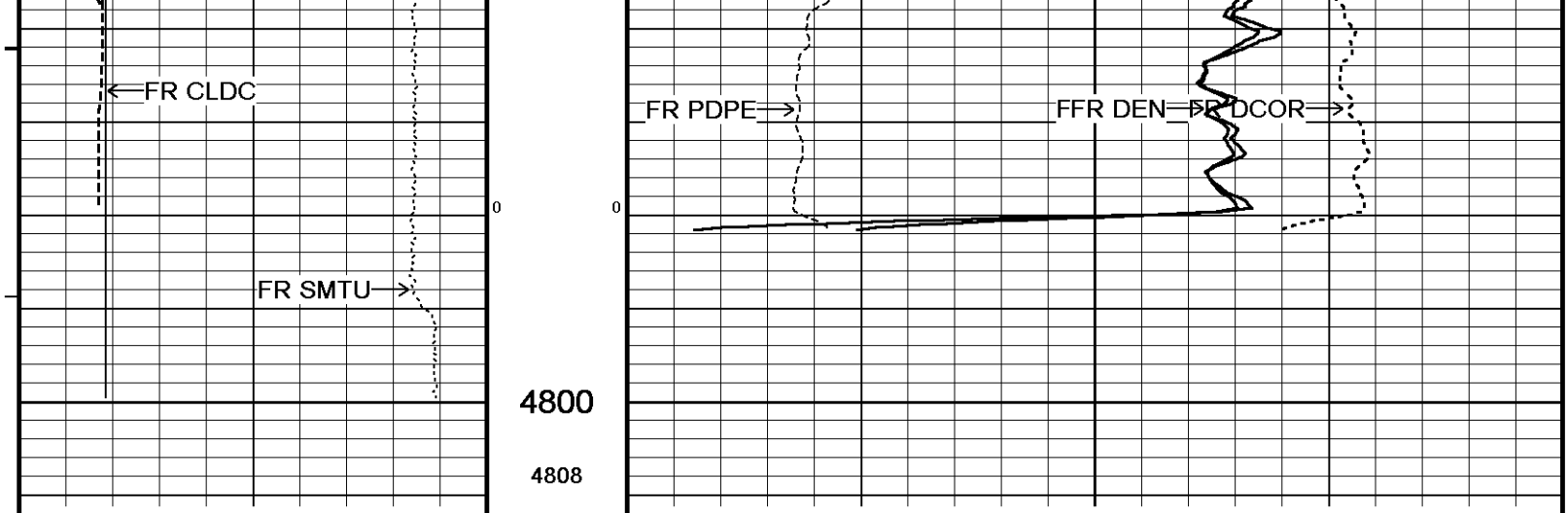

400
101°
3700
101°
3750
200
101°
3800
101°
3850


102°
3900
Bit Size
Limestone Density Por.
PE
Compensated Density
Density Correction
Density Caliper
Gamma Ray
DST Uphole Tension
102°
300
3950
103°
4000
103°
4050
104°


4100
104°
4150
104°
4200
200
105°
4250
105°
100
4300
Bit Size
Limestone Density Por.
PE
Compensated Density
Density Correction


Density Caliper
Gamma Ray
DST Uphole Tension
105°
4350
105°
4400
106°
4450
106°
4500
100


106°
4550
107°
4600
108°
4650
109°
4700
108°
4750
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
FR GRGC
PE
Limestone Density Por
Compensated Density
Density Correction



4800

4808

Depth in Feet

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Density Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:240

Compensated Density
grams/cc
2 2.25 2.50 2.75 3

Limestone Density Por.
percent
30 20 10 0 -10

PE
barns/electron
0 5 10

Density Correction
grams/cc
-0.25 0 0.25

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Main.dta
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492
Plotted on 26-NOV-2012 17:05
Recorded on 25-NOV-2012 14:32

5 INCH MAIN

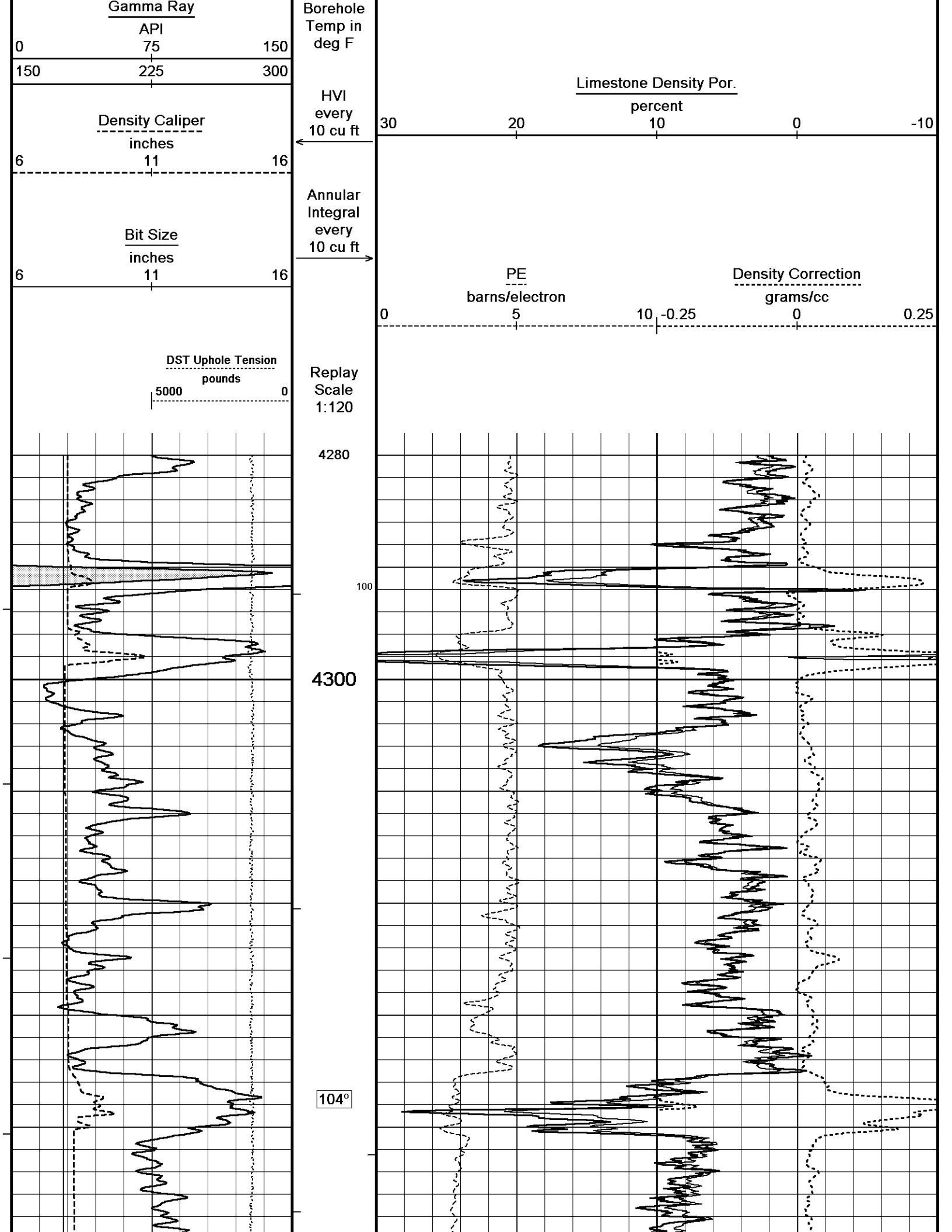
10 INCH HI-RES

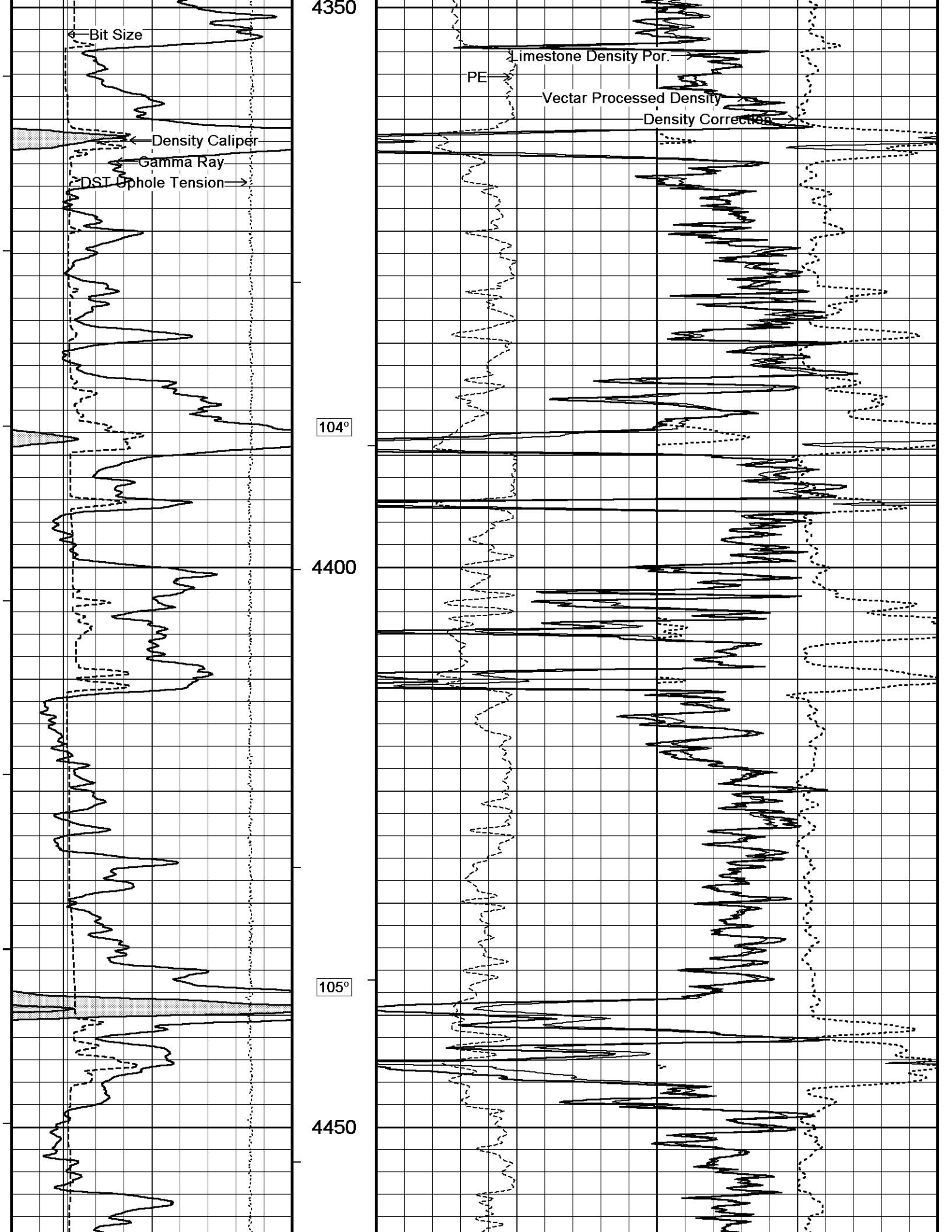
Depth Based Data - Maximum Sampling Increment 2.5cm
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Hi-Res.dta
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492
Plotted on 26-NOV-2012 17:05
Recorded on 25-NOV-2012 13:44

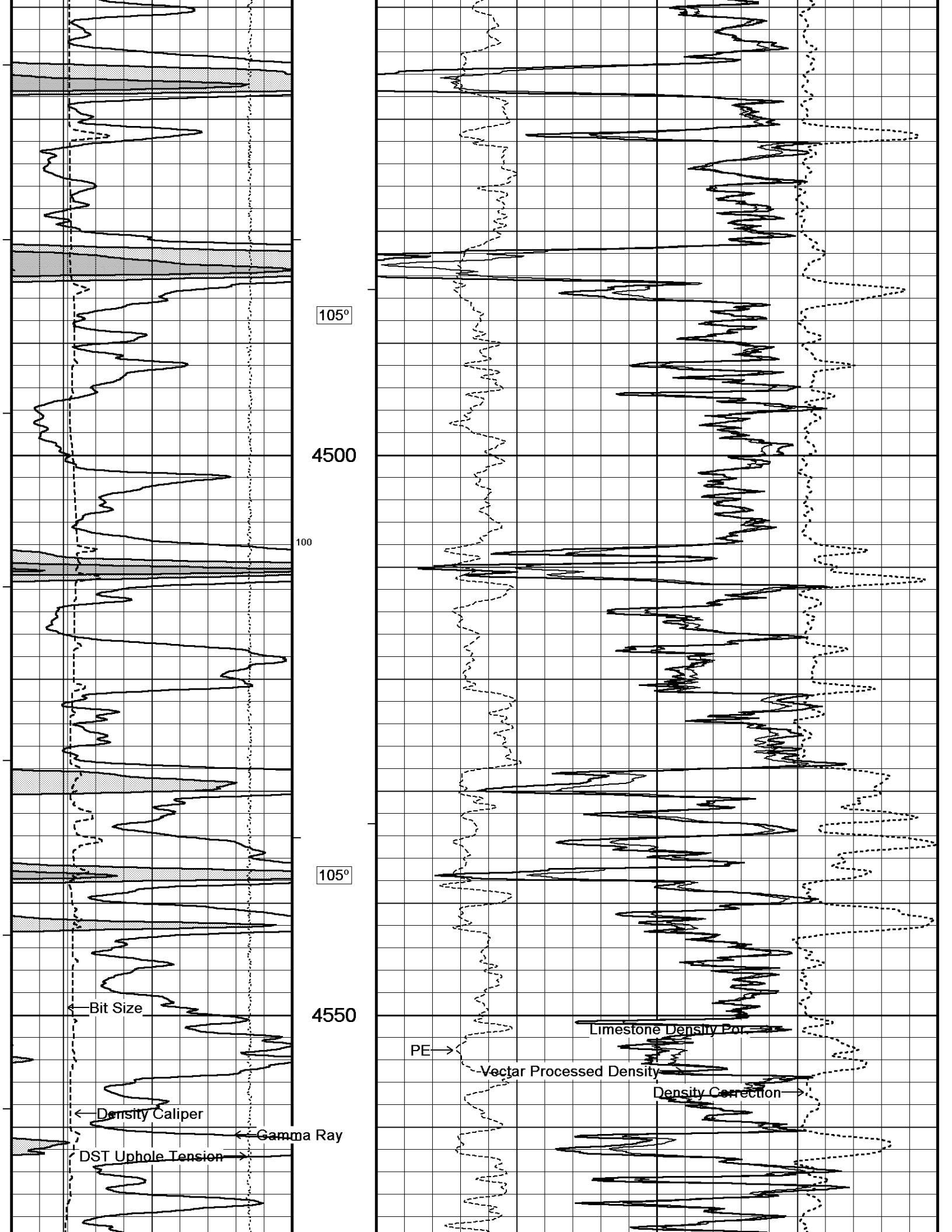
Depth in Feet

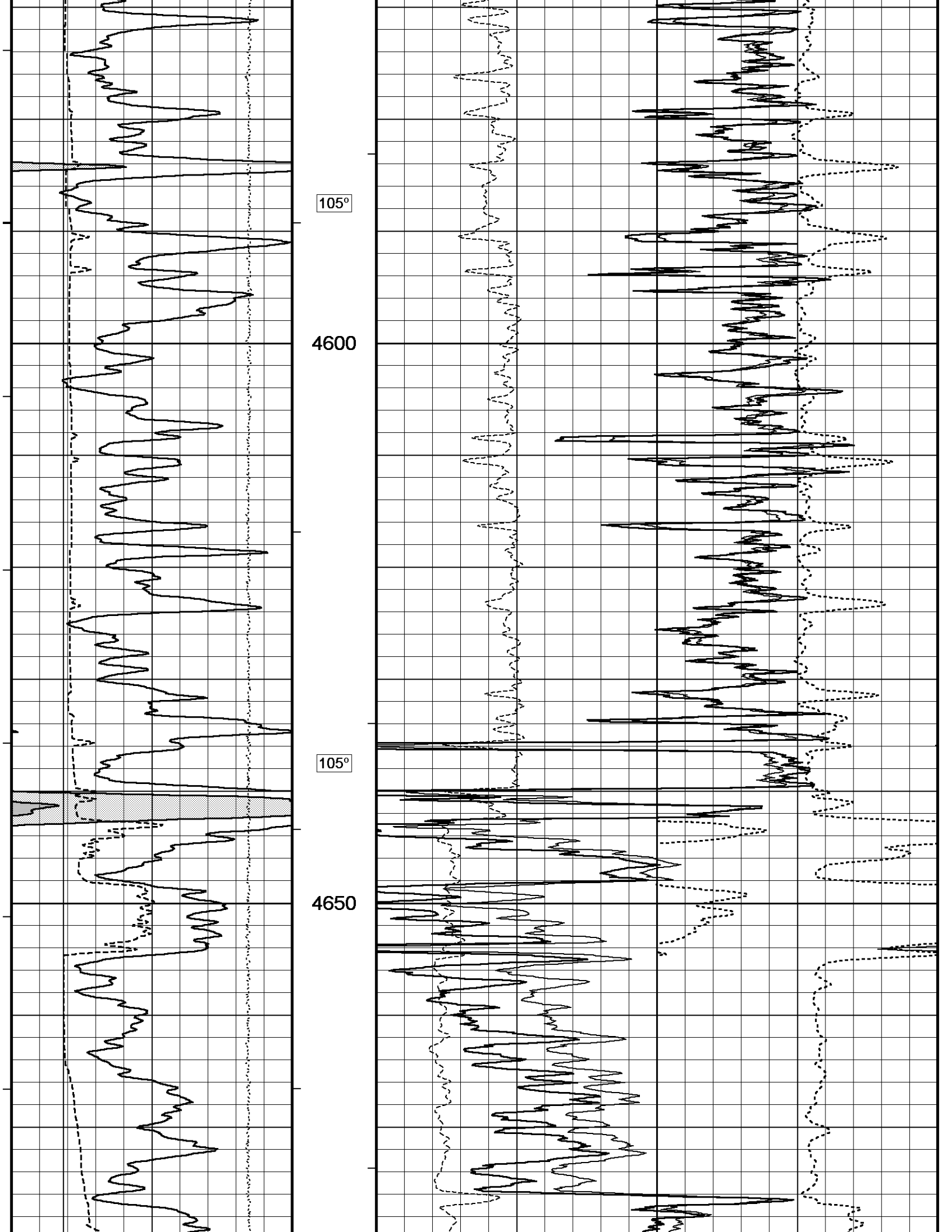
Timing Marks
every 60.0 sec

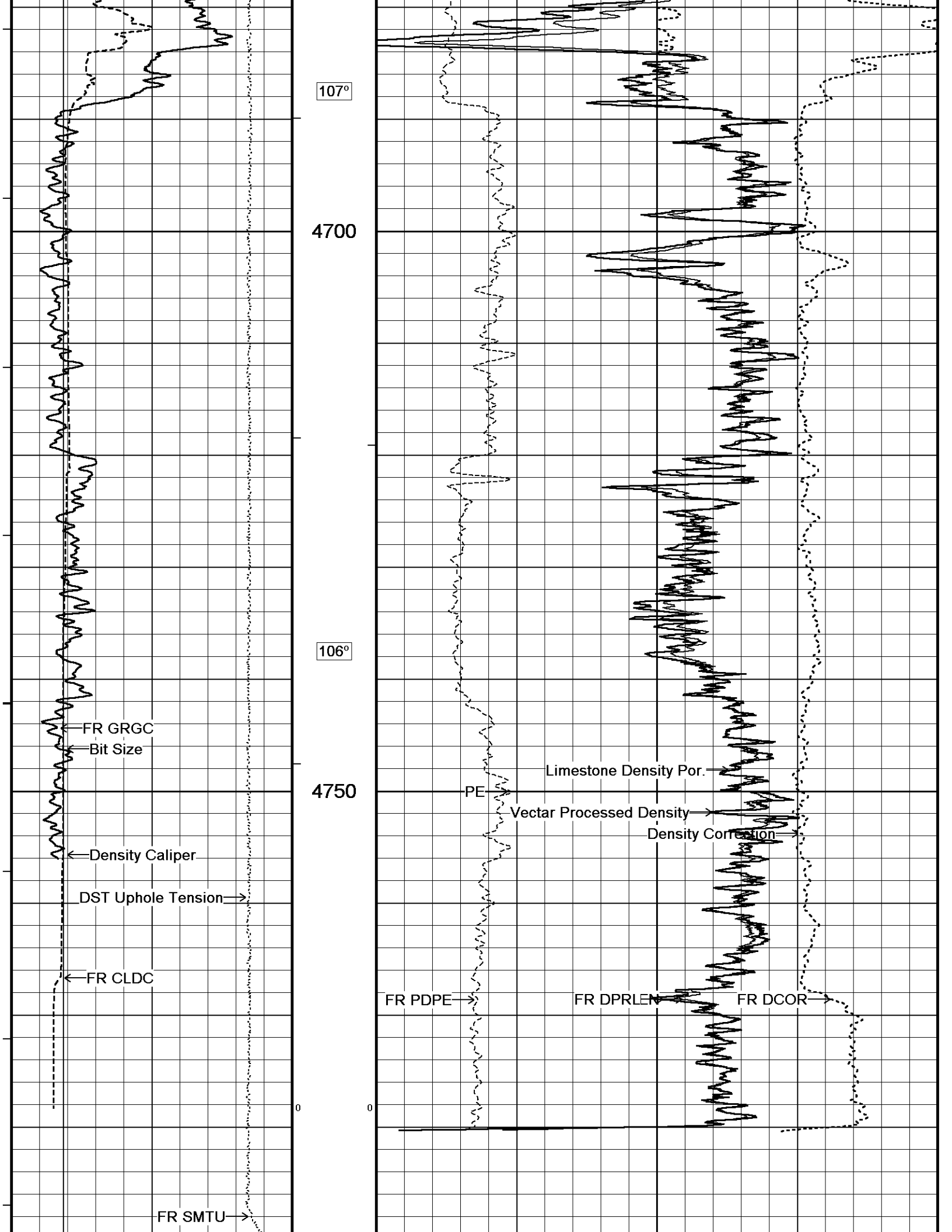
Vectar Processed Density
grams/cc
2 2.25 2.50 2.75 3

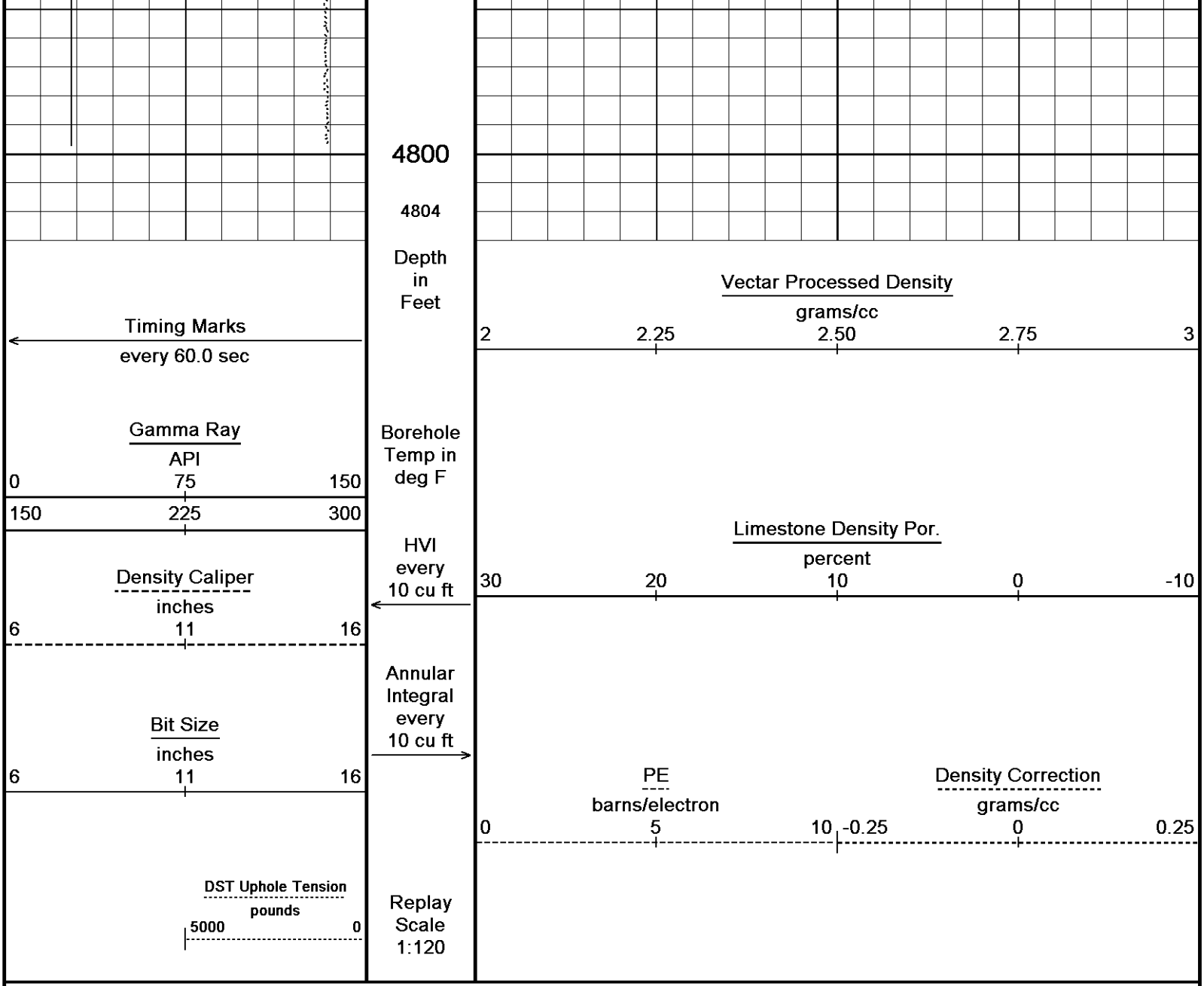

Gamma Ray
API
0
75
150
150
225
300
Density Caliper
inches
6
11
16
Bit Size
inches
6
11
16
DST Uphole Tension
pounds
5000
0
Borehole Temp in deg F
HVI every 10 cu ft
Annular Integral every 10 cu ft
Replay Scale 1:120
Limestone Density Por.
percent
30
20
10
0
-10
PE
barns/electron
0
5
10
Density Correction
grams/cc
-0.25
0
0.25
4280
100
4300
104°


Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
4350
104°
4400
105°
4450
Limestone Density Por.
PE
Vectar Processed Density
Density Correction


105°
4500
100
105°
4550
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
PE
Limestone Density Por.
Vectar Processed Density
Density Correction


105°
4600
105°
4650


107°
4700
106°
4750
FR GRGC
Bit Size
Density Caliper
DST Uphole Tension
FR CLDC
FR SMTU
Limestone Density Por.
PE
Vectar Processed Density
Density Correction
FR PDPE
FR DPRLEN
FR DCOR
0
0

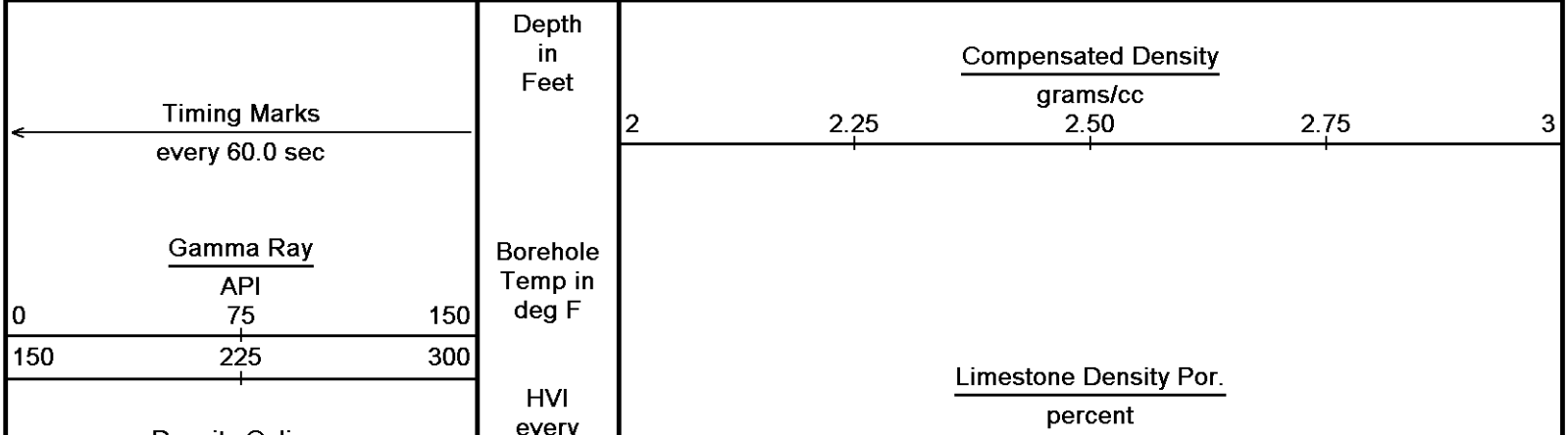


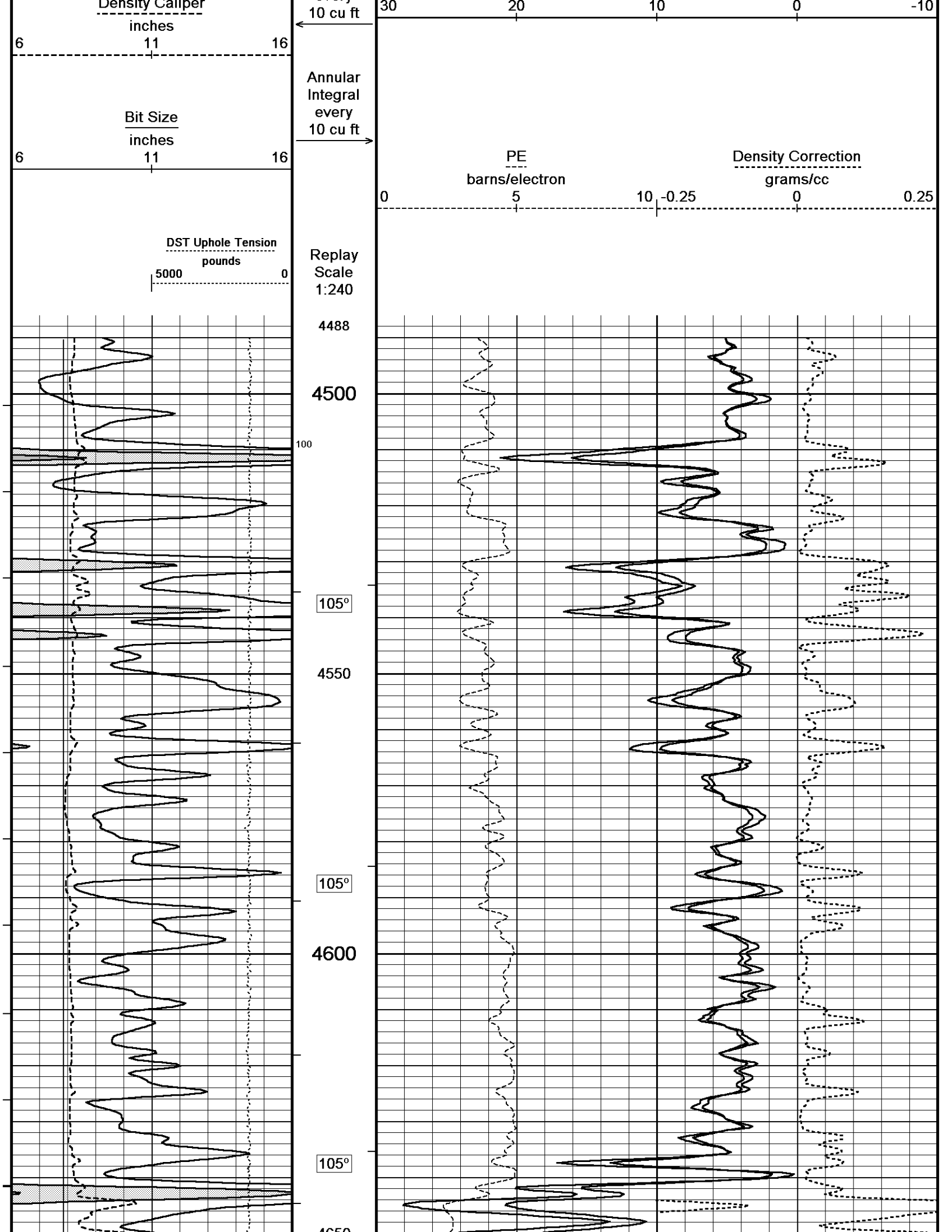
Depth Based Data - Maximum Sampling Increment 2.5cm
Plotted on 26-NOV-2012 17:05
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Hi-Res.dta
Recorded on 25-NOV-2012 13:44
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

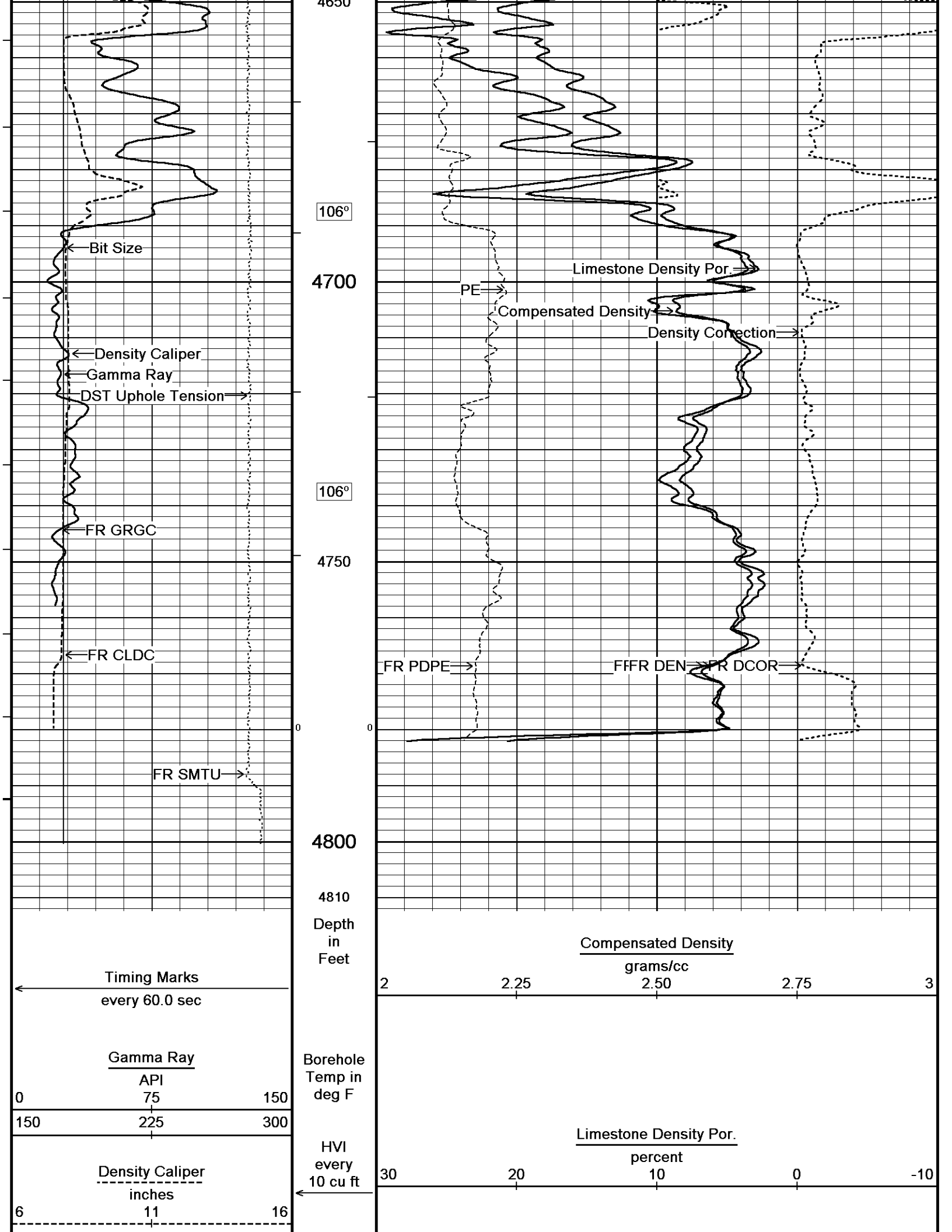
10 INCH HI-RES

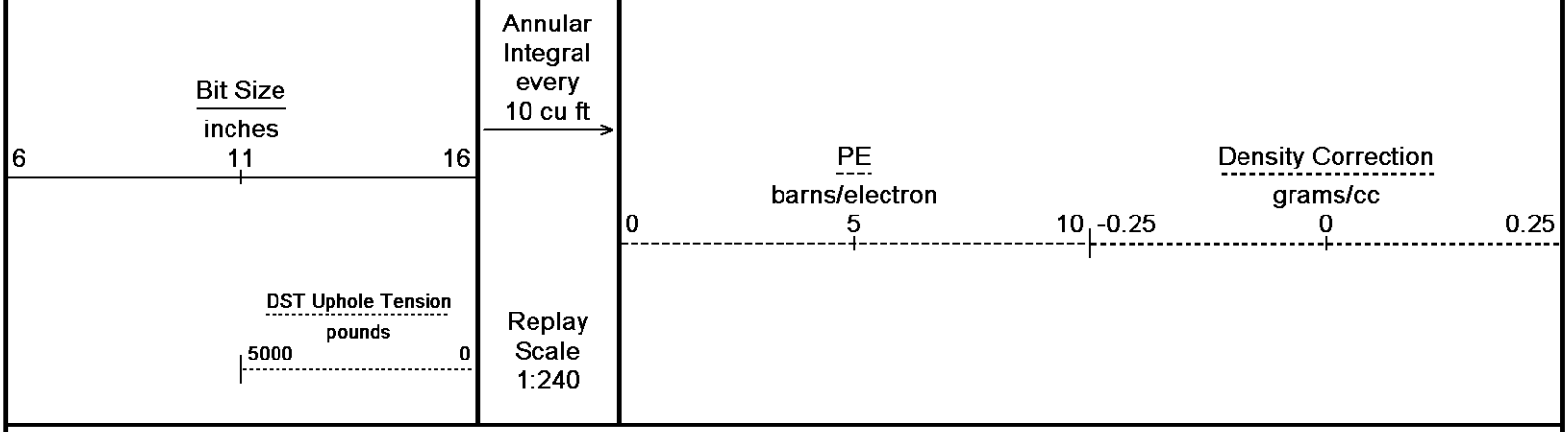
REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 26-NOV-2012 17:05
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Rpt.dta
Recorded on 25-NOV-2012 13:44
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492




Density Caliper
inches
6
11
16
Bit Size
inches
6
11
16
DST Uphole Tension
pounds
5000
0
Annular Integral every 10 cu ft
Replay Scale 1:240
30
20
10
0
-10
PE
barns/electron
0
5
10
Density Correction
grams/cc
-0.25
0
0.25
4488
4500
100
105°
4550
105°
4600
105°


4650
106°
Bit Size
4700
Limestone Density Por.
PE
Compensated Density
Density Correction
Density Caliper
Gamma Ray
DST Uphole Tension
106°
FR GRGC
4750
FR CLDC
FR PDPE
FFFR DEN
FR DCOR
0
0
FR SMTU
4800
4810
Depth
in
Feet
Compensated Density
grams/cc
2
2.25
2.50
2.75
3
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
Borehole
Temp in
deg F
150
225
300
HVI
every
10 cu ft
Limestone Density Por.
percent
30
20
10
0
-10
Density Caliper
inches
6
11
16



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 26-NOV-2012 17:05
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Rpt.dta — Recorded on 25-NOV-2012 13:44
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Main.dta

General Constants All 000

Last Edited on 25-NOV-2012,12:00

General Parameters		
Mud Resistivity	0.870	ohm-metres
Mud Resistivity Temperature	80.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	5.500	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. Four Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	

Down-hole Tension Calibration SMS 0

Field Calibration on 25-NOV-2012 13:06

Reading No	Measured	Calibrated (lbs)
1	14358.89	0.00
2	14383.58	396.00

Gamma Calibration MCG-C 208

Field Calibration on 19-NOV-2012 09:54

	Measured	Calibrated (API)
Background	73	51
Calibrator (Gross)	1099	776
Calibrator (Net)	1026	725

Gamma Constants MCG-C 208

Last Edited on 25-NOV-2012,12:00

Gamma Calibrator Number	GR38	
Mud Density	1.13	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

SP Calibration MCG-C 208

Field Calibration on 05-NOV-2012,14:25

	Measured	Calibrated (mV)
Reference 1	100.2	101.0
Reference 2	-101.3	-101.0

High Resolution Temperature Calibration MCG-C 208

Field Calibration on 05-NOV-2012,14:26

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

High Resolution Temperature Constants MCG-C 208

Last Edited on 05-NOV-2012,14:25

Pre-filter Length	11

Caliper Calibration MMR-A 11

Base Calibration on 19-NOV-2012 09:29
Field Calibration on 19-NOV-2012 09:30

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13673	5.98
2	16880	7.97
3	20107	9.86
4	24060	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

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

Micro Normal and Micro Inverse Calibration MMR-A 11

Base Calibration on 19-NOV-2012 09:34
Field Check on 19-NOV-2012 09:35

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.3	59.8	5.0	25.0
Micro Inverse	15.5	77.5	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	76.5	76.5
Micro Inverse	58.7	58.7

Micro Normal and Micro Inverse Constants MMR-A 11

Last Edited on 05-NOV-2012,13:54

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	1.0000	
Micro Inverse K Factor	1.0000	
Standoff Offset	0.0000	inches

Micro Laterolog Calibration MMR-A 11

Base Calibration on 31-DEC-1999 00:00
Field Check on 31-DEC-1999 00:00

Base Calibration

	Measured		Calibrated (ohm-m)	
	Ref 1	Ref 2	Ref 1	Ref 2
	0.0	0.0	0.0	0.0

Base Check (ohm-m)	Field Check (ohm-m)
0.0	0.0

Micro Laterolog Constants MMR-A 11

Last Edited on

Pad Type	6 in Solid Nylon B23059	
Micro Laterolog K Factor	0.0128	
Standoff Offset	0.0000	inches

Mudcake Thickness Correction Constants

Mud Cake Source	Constant Value	
Mud Cake Thickness	0.4000	inches
Mud Cake Thickness Caliper		
Mud Cake Resistivity	0.1500	ohm-m
Mud Cake Resistivity Temp.	20.00	Degrees C
Mud Cake Resistivity Source	Constant Value	
Temp. Source Rmc Correc.	MCG External Temperature	

Neutron Calibration MDN-A.B 65

Base Calibration on 05-NOV-2012 09:18
Field Check on 19-NOV-2012 09:59

Base Calibration

	Measured	Calibrated (cps)

	Near	Far	Near	Far
	3015	94	3714	110
Ratio	32.234		33.764	

Field Calibrator at Base	Calibrated (cps)	
	1713	2459
Ratio	0.697	

Field Check	Calibrated (cps)	
	1700	2446
Ratio	0.689	

Neutron Constants MDN-A.B 65

Last Edited on 19-NOV-2012,09:55

Neutron Source Id	PN-521	
Neutron Jig Number	5824NE	
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	Constant Value	
Formation Pressure	0.00	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-B.J 352

Base Calibration on 05-NOV-2012 14:17
Field Check on 19-NOV-2012 09:43

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	964.3	126.8
Base Check		281.3
Field Check		281.4

FE Constants MFE-B.J 352

Last Edited on 19-NOV-2012,09:42

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	0.5	inches

Induction Calibration MAI-A.A 45

Base Calibration on 05-NOV-2012,09:49
Field Check on 19-NOV-2012 09:41

Base Calibration

Test Loop Calibration	Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High
1	14.4	472.6	9.3	966.2
2	5.7	374.0	7.6	821.4
3	3.4	261.2	5.2	566.0
4	2.5	133.9	2.6	279.2

Array Temperature	78.4	Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	18.9	3852.1	18.8	3850.7
2	31.8	3630.1	31.8	3628.7
3	28.7	3050.1	28.7	3049.0
4	18.4	2079.5	18.3	2079.1

Deep	16.1	1911.5	16.1	1911.2	
Medium	42.6	4061.7	42.5	4059.8	
Shallow	49.8	5484.4	49.7	5481.7	
Array Temperature		67.0		66.0	Deg F

Induction Constants MAI-A.A 45

Last Edited on 19-NOV-2012,09:39

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	

High Resolution Temperature Calibration MAI-A.A 45

Field Calibration on 05-NOV-2012,14:25

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

High Resolution Temperature Constants MAI-A.A 45

Last Edited on 05-NOV-2012,14:25

Pre-filter Length	11

Caliper Calibration MPD-B 31

Base Calibration on 21-NOV-2012 17:11
Field Calibration on 21-NOV-2012 17:12

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	15176	3.99
2	23904	5.98
3	32704	7.97
4	40976	9.86
5	50319	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.96	5.98

Photo Density Calibration MPD-B 31

Base Calibration on 21-NOV-2012 18:05

Density Calibration

Base Calibration	Measured Near	Measured Far	Calibrated (sdu) Near	Calibrated (sdu) Far
Reference 1	46435	23587	59556	30836
Reference 2	19247	1949	24941	2541
Field Check at Base	680.7	845.1		
Field Check	680.1	844.7		

PE Calibration

Base Calibration	WS	Measured WH	Measured Ratio	Calibrated Ratio
Background	126	602		
Reference 1	19225	46315	0.418	0.371
Reference 2	5685	19160	0.300	0.272
Field Check at Base	126.0	602.5		
Field Check	126.8	600.7		

Density Constants MPD-B 31

Last Edited on 25-NOV-2012,11:59

Density Source Id	254	
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	1.13	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 (m)
2.71	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

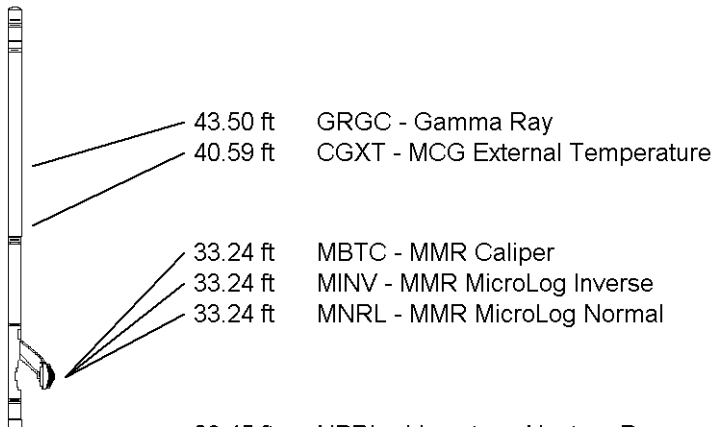
DOWNHOLE EQUIPMENT

C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Main.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

Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-Resistivity
MMR-A 11 LG: 8.59 ft WT: 81.6 lb OD: 4.88 in



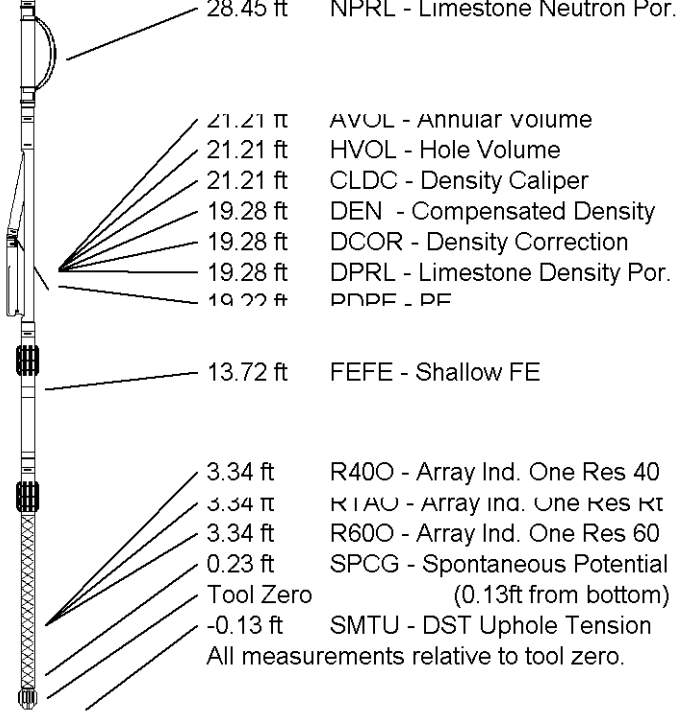
Compact Neutron
MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 50.36 ft Weight: 399.0 lb



28.45 ft NPRL - Limestone Neutron Por.
21.21 ft AVOL - Annular Volume
21.21 ft HVOL - Hole Volume
21.21 ft CLDC - Density Caliper
19.28 ft DEN - Compensated Density
19.28 ft DCOR - Density Correction
19.28 ft DPRL - Limestone Density Por.
19.22 ft PDPE - PE
13.72 ft FEFE - Shallow FE
3.34 ft R40O - Array Ind. One Res 40
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	CHOLLA PRODUCTION LLC.
WELL	BONTRAGER RT #1-32
FIELD	GRUBEN EAST
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2991.00	feet	First Reading	4769.00	feet
Elevation Drill Floor	2990.00	feet	Depth Driller	4790.00	feet
Elevation Ground Level	2986.00	feet	Depth Logger	4788.00	feet

Weatherford®

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG

Weatherford®

ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

COMPANY	CHOLLA PRODUCTION LLC.
WELL	BONTRAGER RT #1-32
FIELD	GRUBEN EAST
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	400' FNL & 2549' FEL

SEC	TWP	RGE	Other Services
32	19S	33W	MPD/MDN
API Number 15-171-20916			MML
Permit Number			

Permanent Datum G.L., Elevation 2986 feet
Log Measured From KB
Drilling Measured From K.B. @ 5 FEET

Elevations:	feet
KB	2991.00
DF	2990.00
GL	2986.00

Date	25-NOV-2012			
Run Number	ONE			
Service Order	3538952			
Depth Driller	4790.00	feet		
Depth Logger	4788.00	feet		
First Reading	4785.00	feet		
Last Reading	260.00	feet		
Casing Driller	259.00	feet		
Casing Logger	260.00	inches		
Bit Size	7.875			
Hole Fluid Type	CHEMICAL	lb/USg		
Density / Viscosity	9.40 lb/USg	50.00 CP		
PH / Fluid Loss	9.00	9.00		
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.87 @ 80.0	ohm-m		
Rmf @ Measured Temp	0.70 @ 80.0	ohm-m		
Rmc @ Measured Temp	1.04 @ 80.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.64 @108.0	ohm-m		
Time Since Circulation	3 HOURS			
Max Recorded Temp	108.00	deg F		
Equipment / Base	13057	LIB		
Recorded By	R. HOFFMAN			
Witnessed By	BILL GOFF			
S.O.# / JOB#	LB12-308			

BOREHOLE RECORD

Last Edited: 26-NOV-2012 15:43

Bit Size inches	Depth From feet	Depth To feet
7.875	260.00	4788.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	260.00	24.00

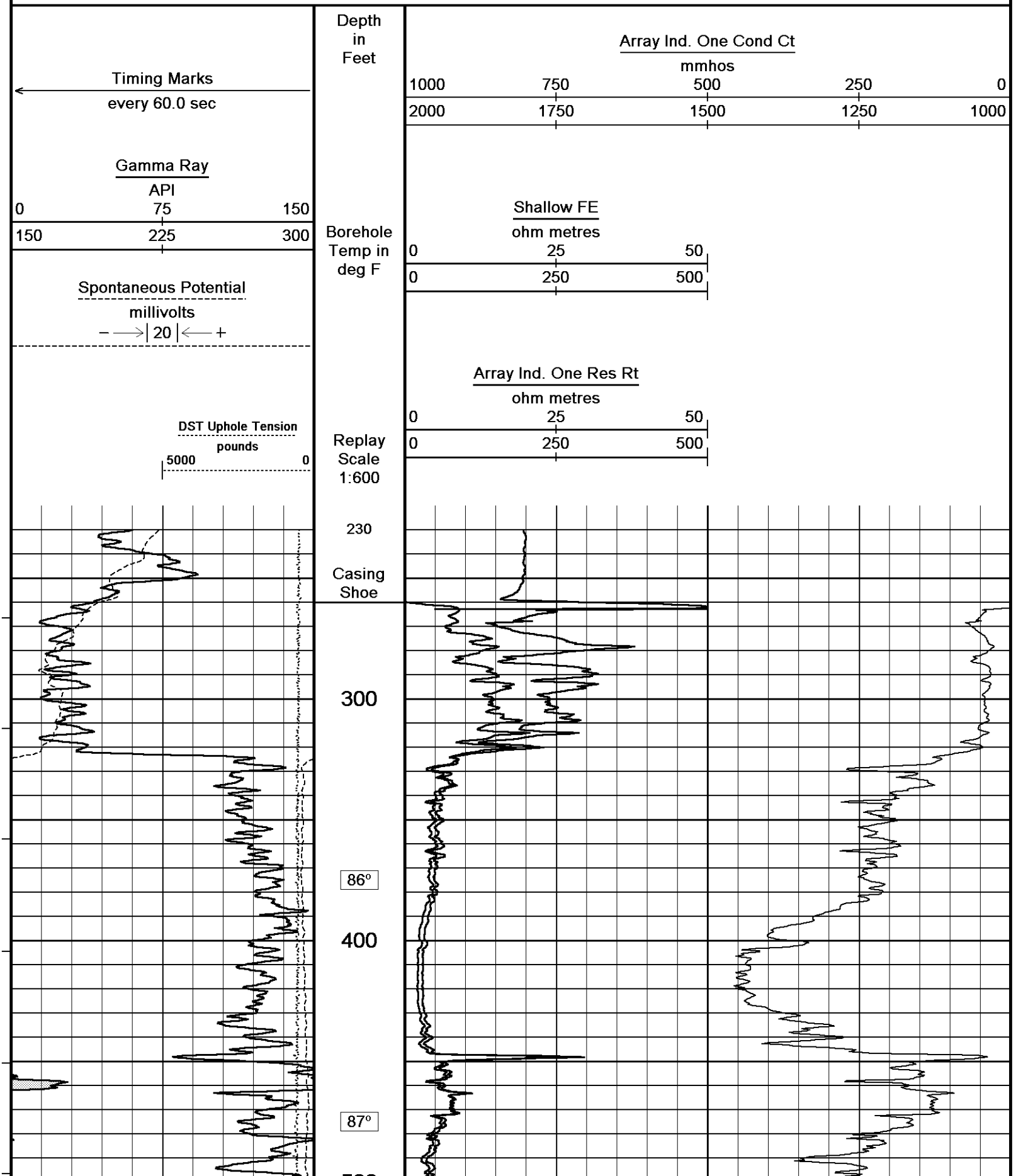
REMARKS

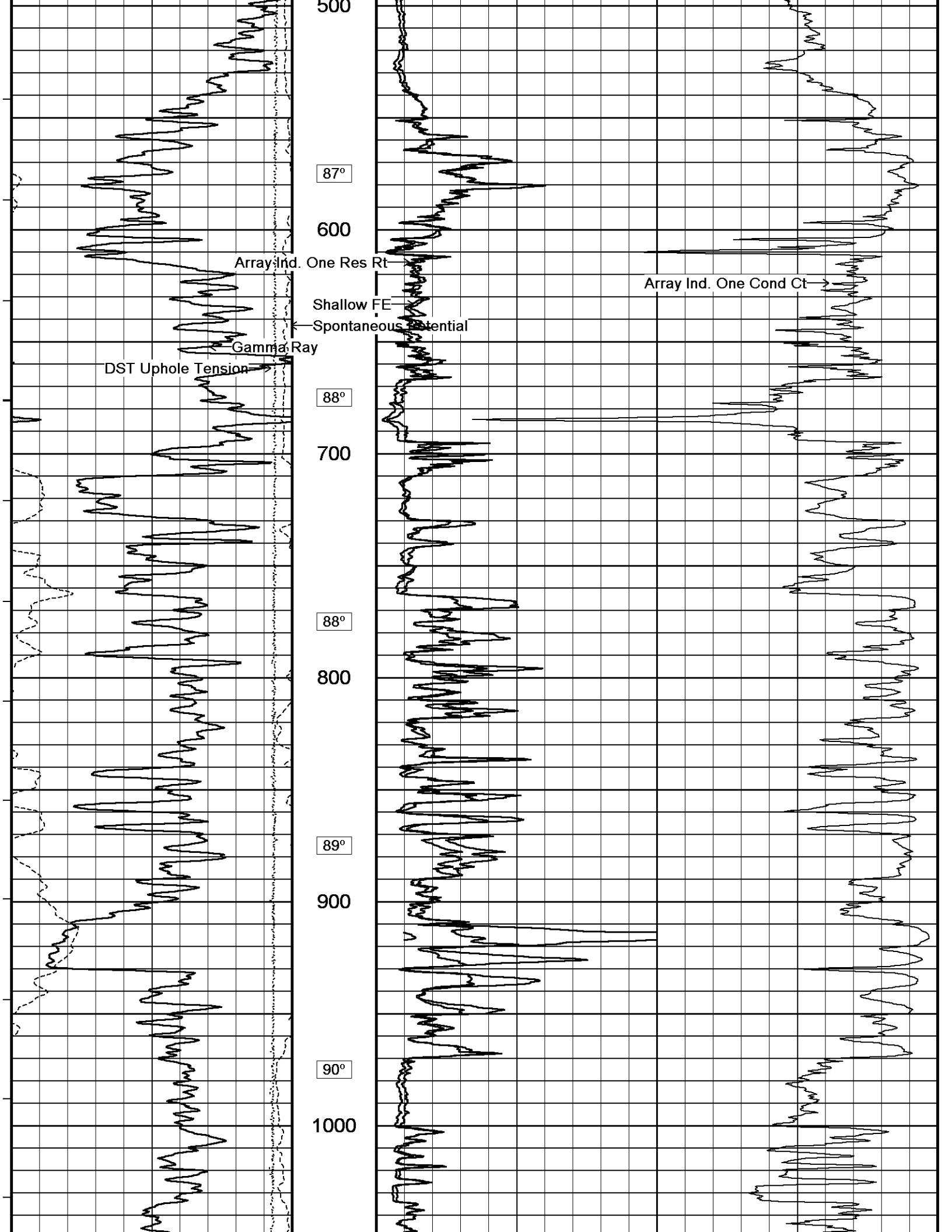
Tools Used: MCG, MML, MDN, MPD, MFE, MAI ran in combination.
Hardware: MPD: 8 inch profile plate used. MAI and MFE: 0.5 Inch standoffs used. MDN: Dual Bowspring used.
2.71 G/CC Limestone density matrix used to calculate porosity.
Borehole rugosity, tight pulls, and washouts will affect data quality.
All intervals logged and scaled per customer's request.
Total hole volume from TD to Surface casing= 2061 cubic feet
Annular volume with 5.5 inch production casing from TD to 3500ft.= 248 cubic feet
Service order #3538952
Rig: WW #2
Engineer: R. Hoffman
Operator(s): B. Johnson

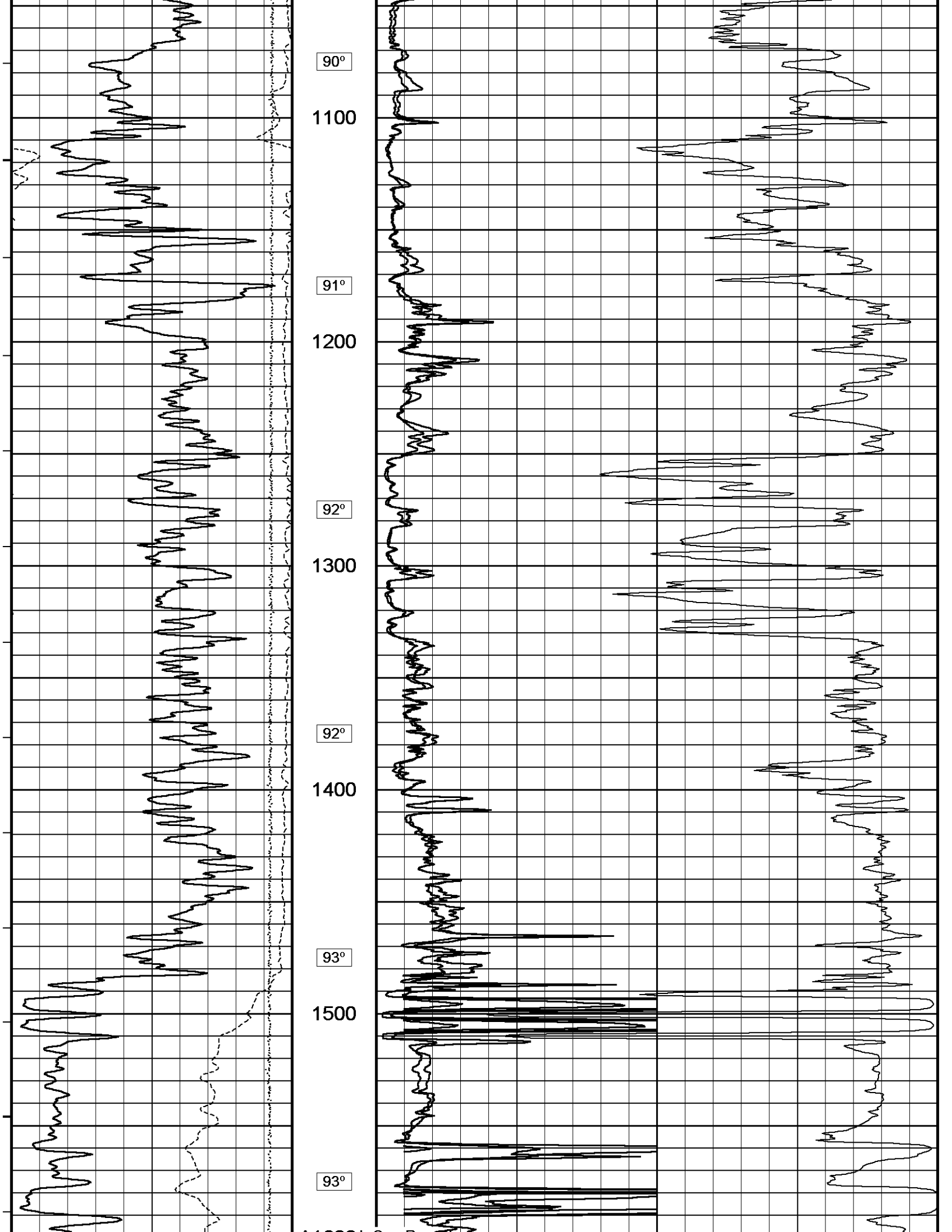
employees. These interpretations are also subject to our general terms and conditions in our price schedule.

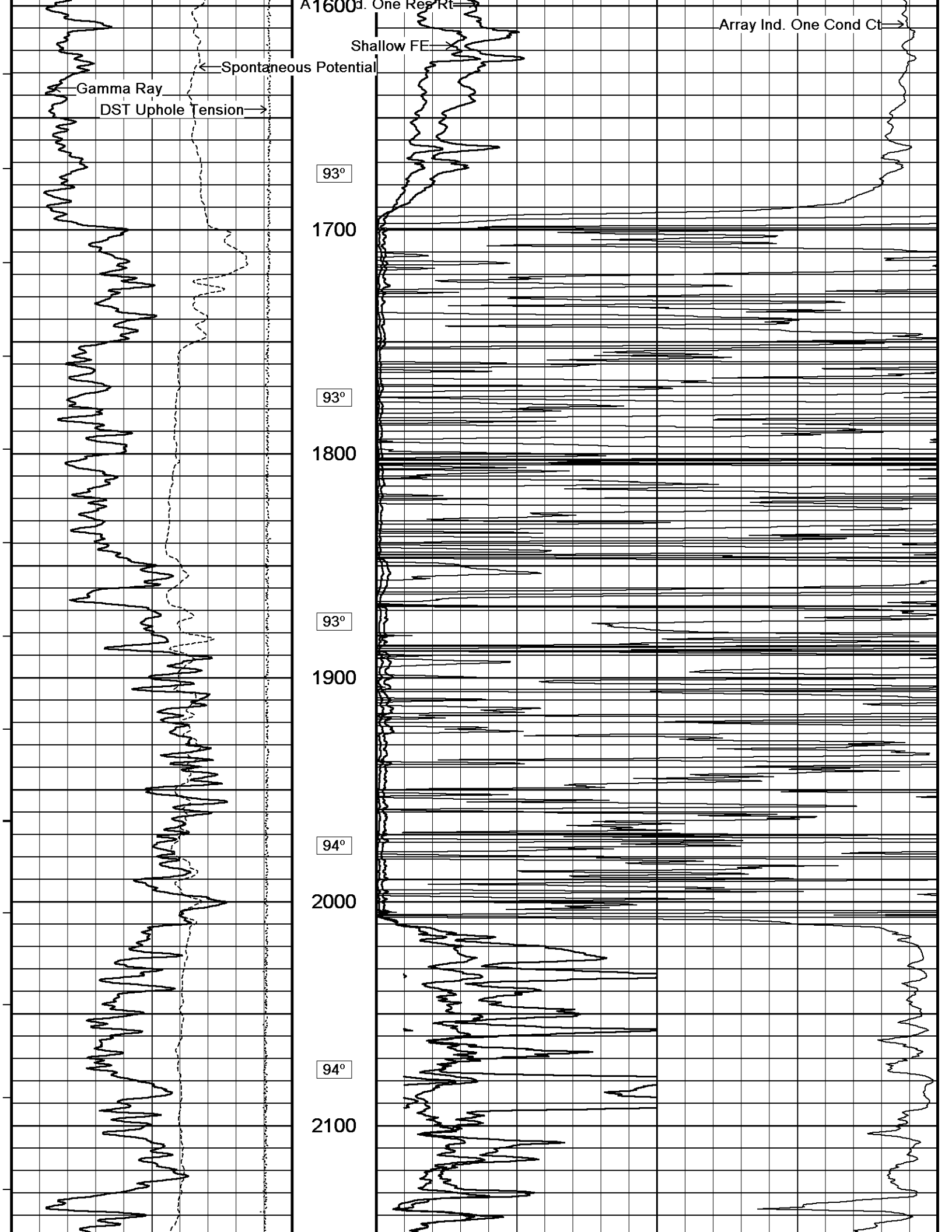
2 INCH MAIN

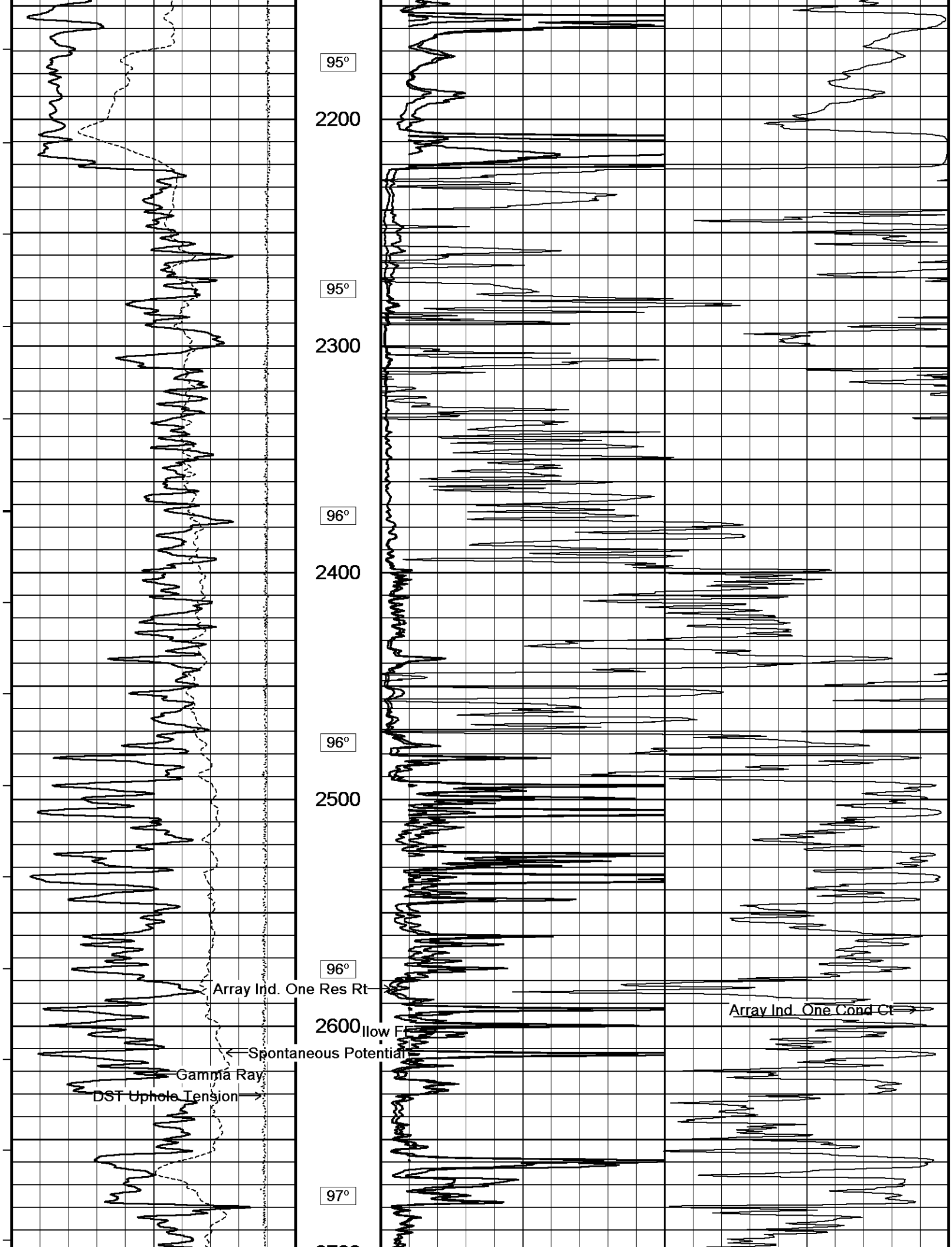
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 26-NOV-2012 16:17
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Main.dta
Recorded on 25-NOV-2012 14:32
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

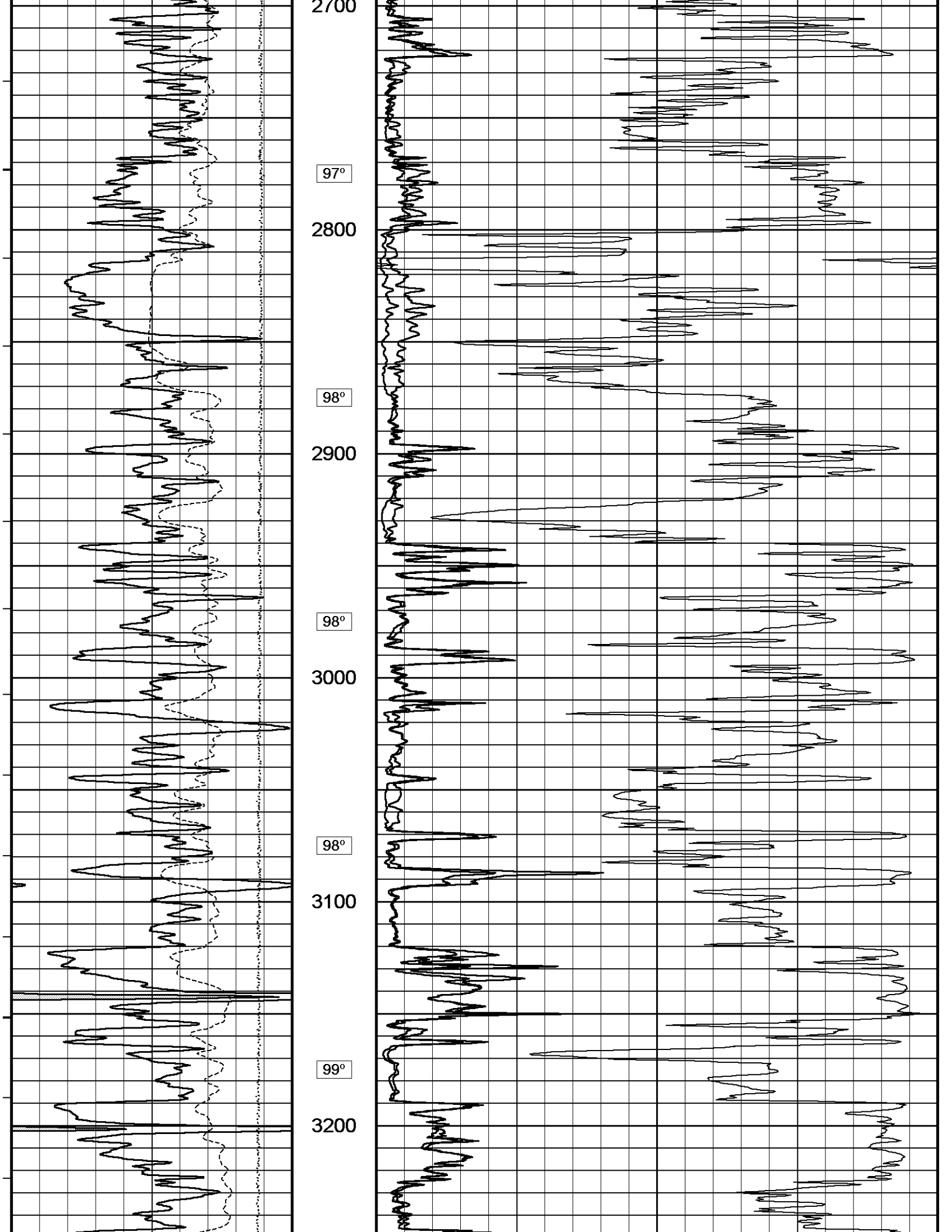


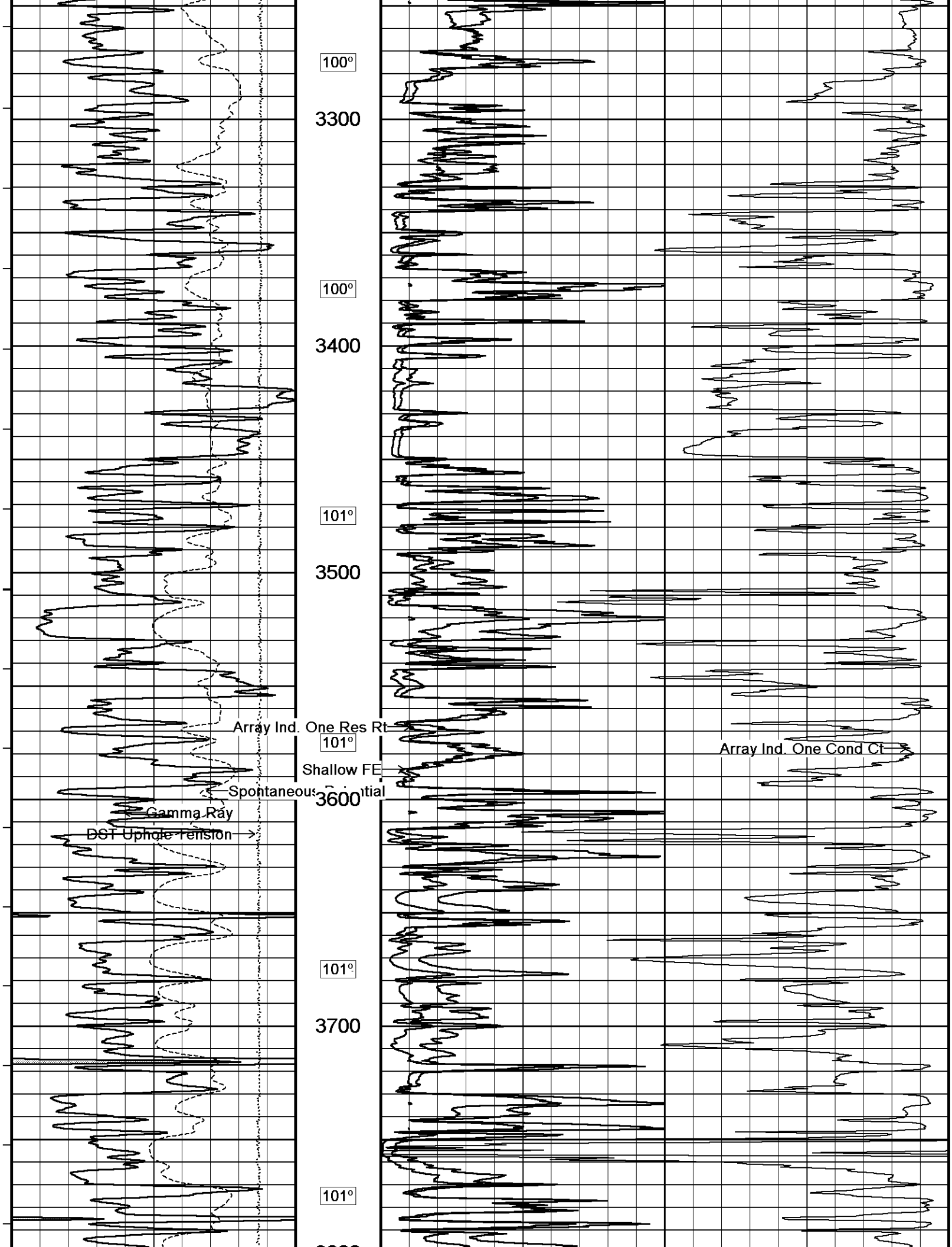

500
87°
600
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
88°
700
88°
800
89°
900
90°
1000

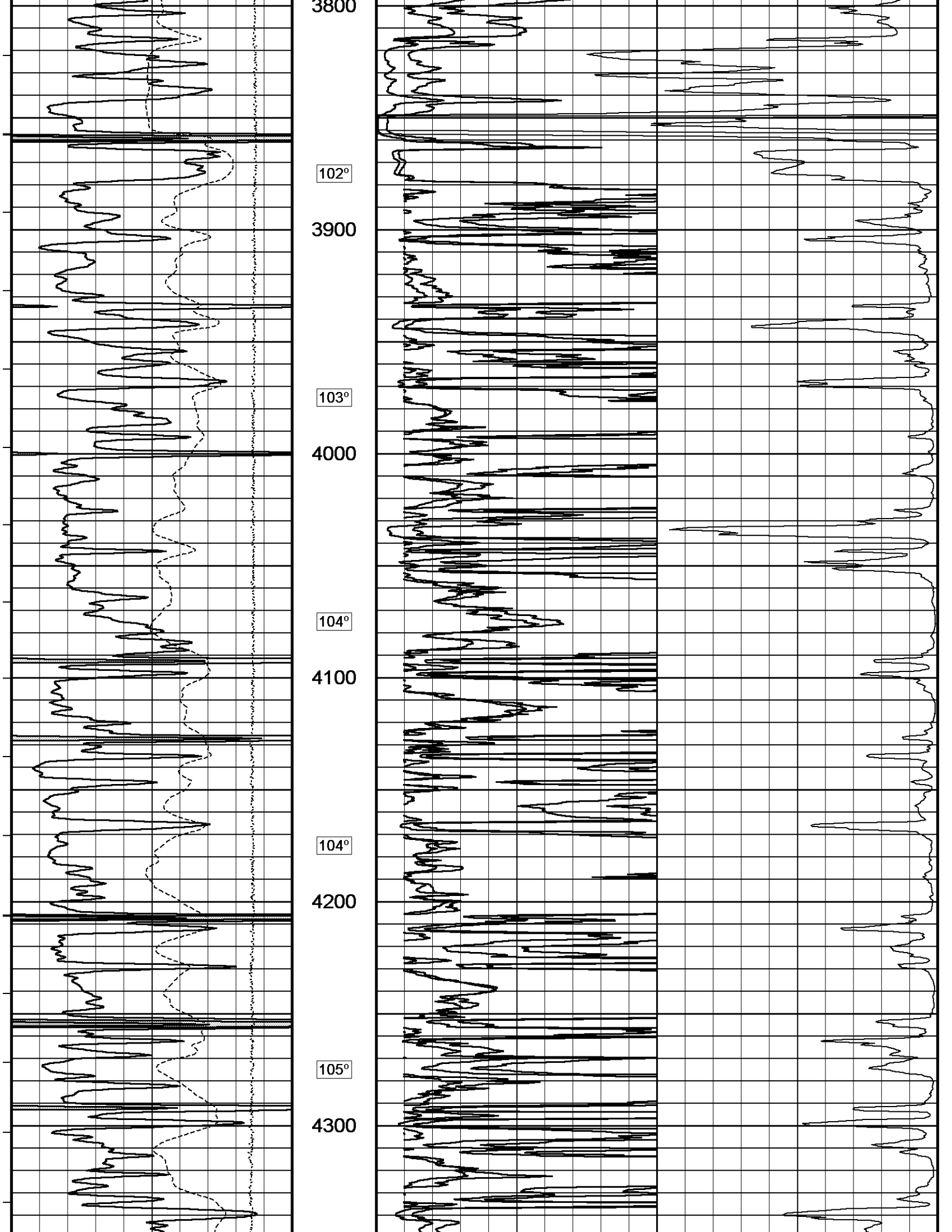

90°
1100
91°
1200
92°
1300
92°
1400
93°
1500
93°

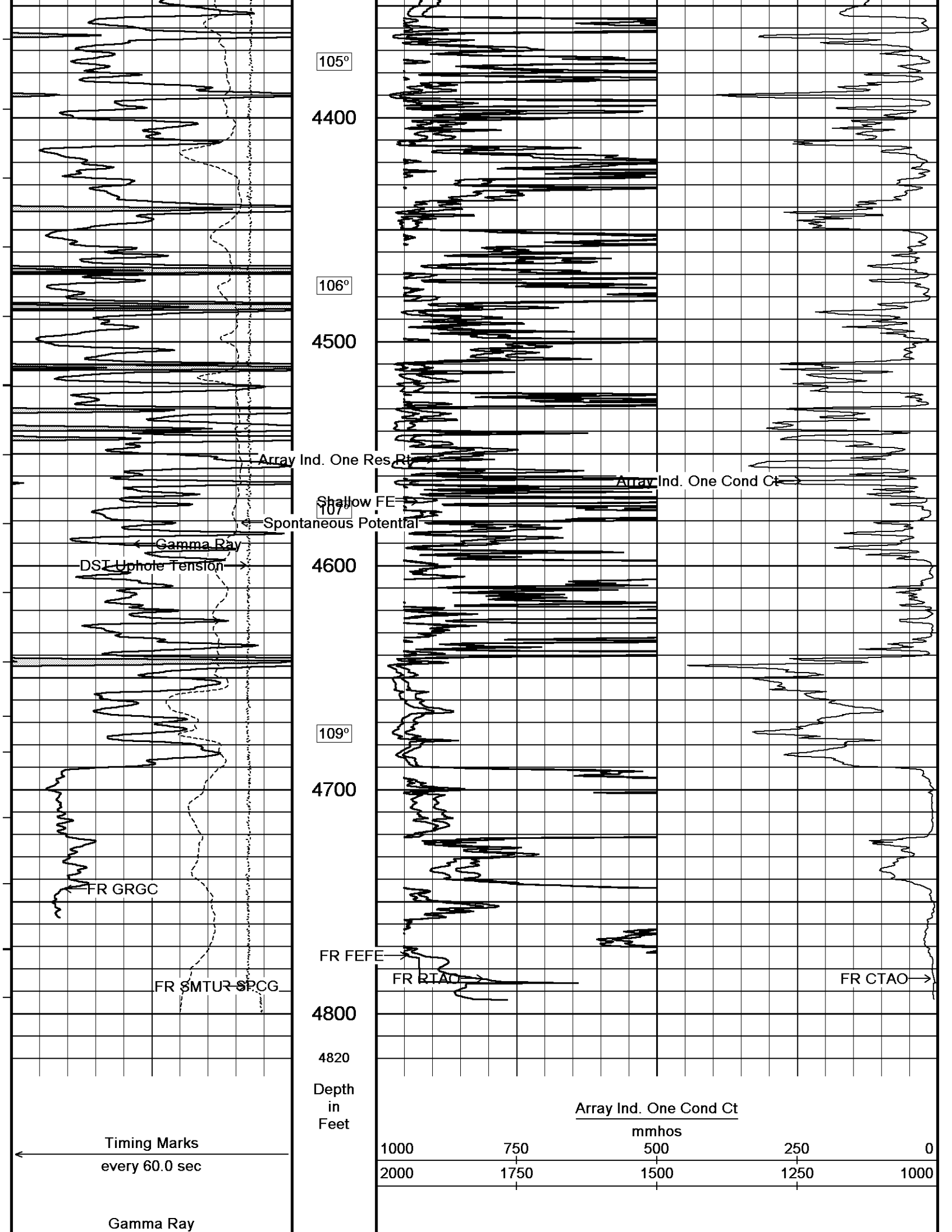

Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
1600
93°
1700
93°
1800
93°
1900
94°
2000
94°
2100


95°
2200
95°
2300
96°
2400
96°
2500
96°
Array Ind. One Res Rt
2600
llow Ft
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct
97°


2700
97°
2800
98°
2900
98°
3000
98°
3100
99°
3200


100°
3300
100°
3400
101°
3500
Array Ind. One Res Rt
101°
Shallow FE
Spontaneous Potential
3600
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct
101°
3700
101°


3800
102°
3900
103°
4000
104°
4100
104°
4200
105°
4300


105°
4400
106°
4500
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
107°
Spontaneous Potential
Gamma Ray
DSI Uphole Tension
4600
109°
4700
FR GRGC
FR FEFE
FR RTAO
FR CTAO
FR SMTU SPCG
4800
4820
Depth
in
Feet
Timing Marks
every 60.0 sec
Gamma Ray
Array Ind. One Cond Ct
mmhos
1000
750
500
250
0
2000
1750
1500
1250
1000

API
0 75 150
150 225 300

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
Plotted on 26-NOV-2012 16:17
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Main.dta
Recorded on 25-NOV-2012 14:32
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

2 INCH MAIN

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 26-NOV-2012 16:17
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Main.dta
Recorded on 25-NOV-2012 14:32
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
− → | 20 | ← +

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:240

2100

100

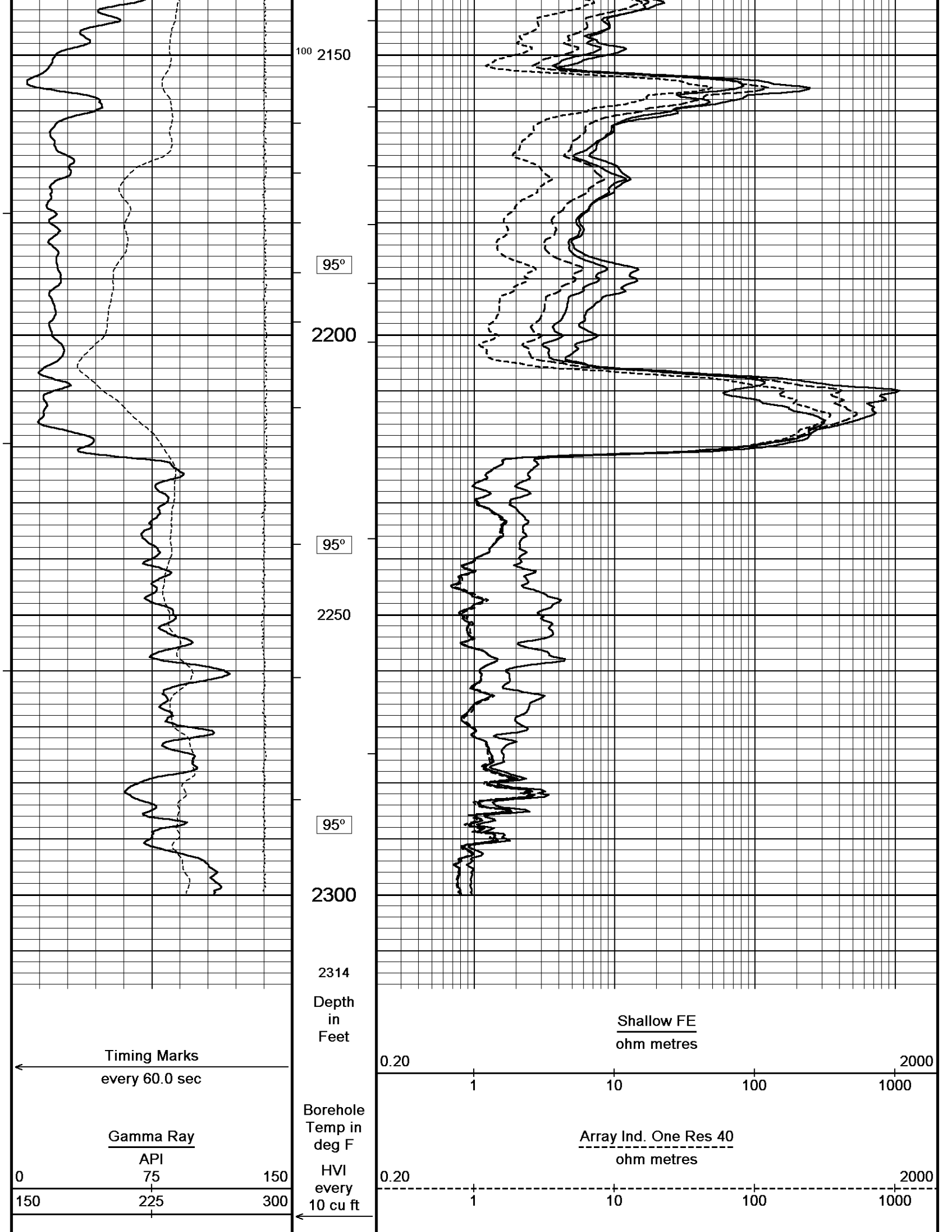
95°

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


100
2150
95°
2200
95°
2250
95°
2300
2314
Depth in Feet
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
150
225
300
Borehole Temp in deg F
HVI
every 10 cu ft
Shallow FE
ohm metres
0.20
1
10
100
1000
2000
Array Ind. One Res 40
ohm metres
0.20
1
10
100
1000
2000

Spontaneous Potential
millivolts
− → | 20 | ← +

Annular Integral every 10 cu ft

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

DST Uphole Tension
pounds
5000 0

Replay Scale 1:240

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

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 26-NOV-2012 16:17
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Main.dta
Recorded on 25-NOV-2012 14:32
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

5 INCH MAIN

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 26-NOV-2012 16:17
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Main.dta
Recorded on 25-NOV-2012 14:32
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Depth in Feet

Timing Marks
every 60.0 sec

Shallow FE
ohm metres
0.20 1 10 100 2000

Borehole Temp in deg F

Gamma Ray
API
0 75 150
150 225 300

HVI every 10 cu ft

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

Spontaneous Potential
millivolts
− → | 20 | ← +

Annular Integral every 10 cu ft

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

DST Uphole Tension
pounds
5000 0

Replay Scale 1:240

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

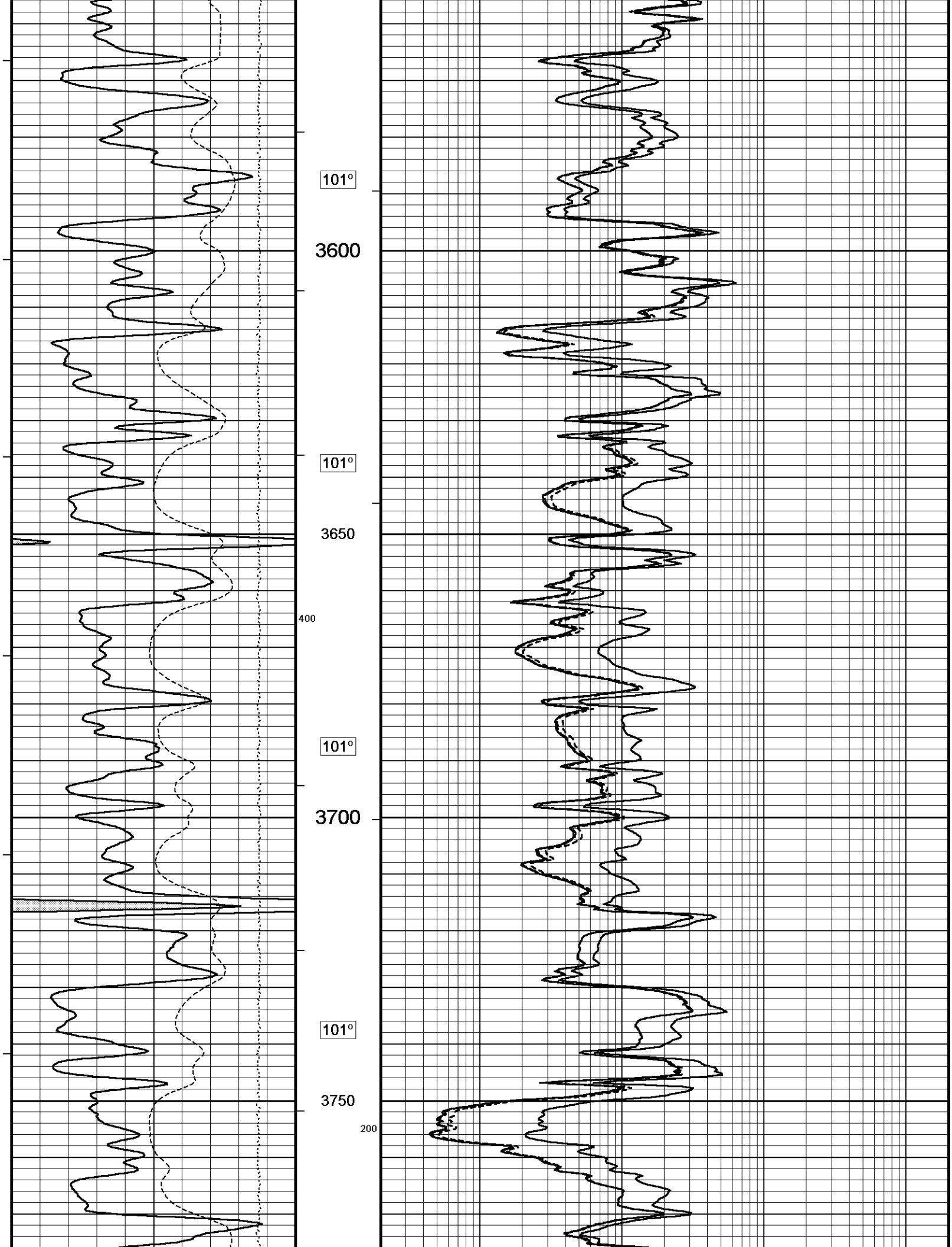
3500

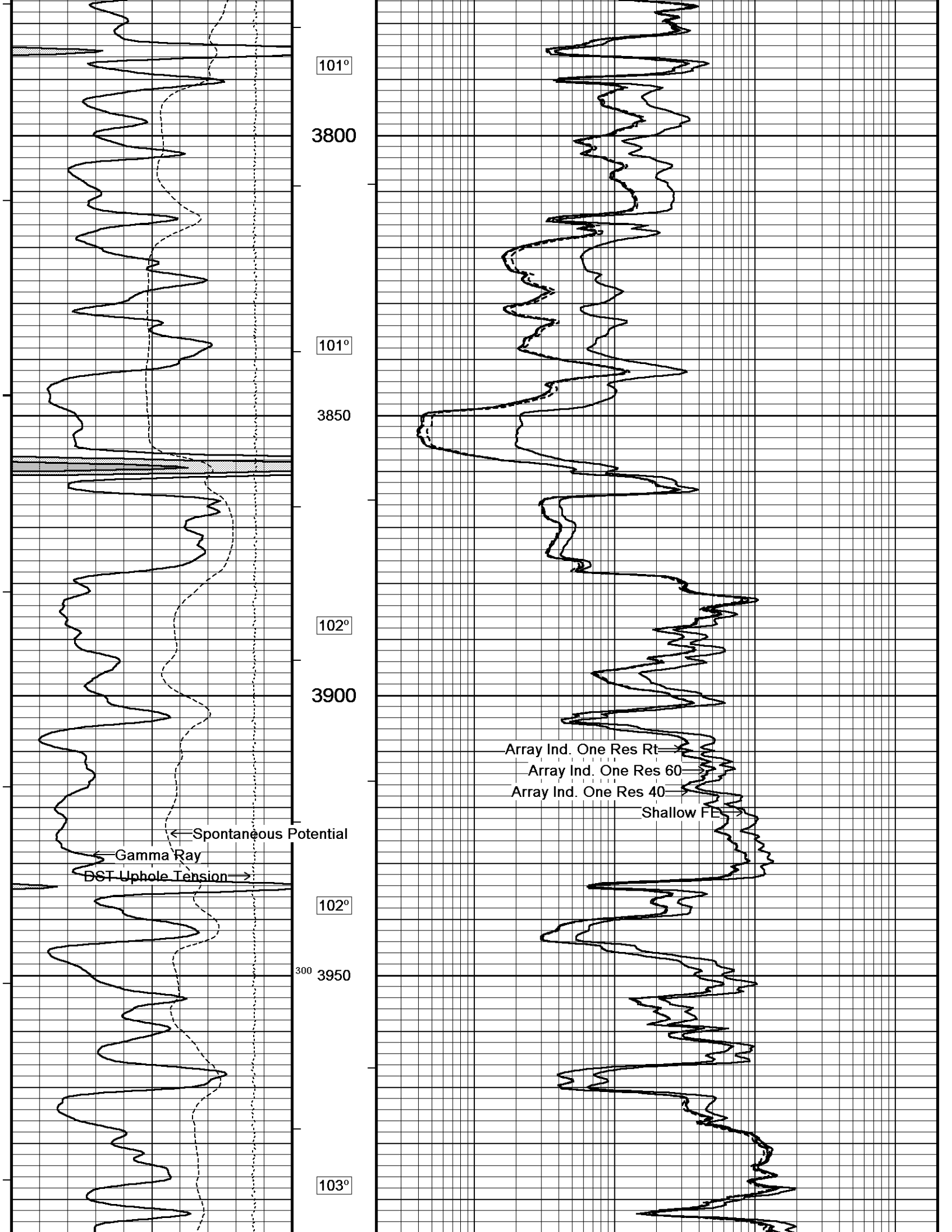
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE

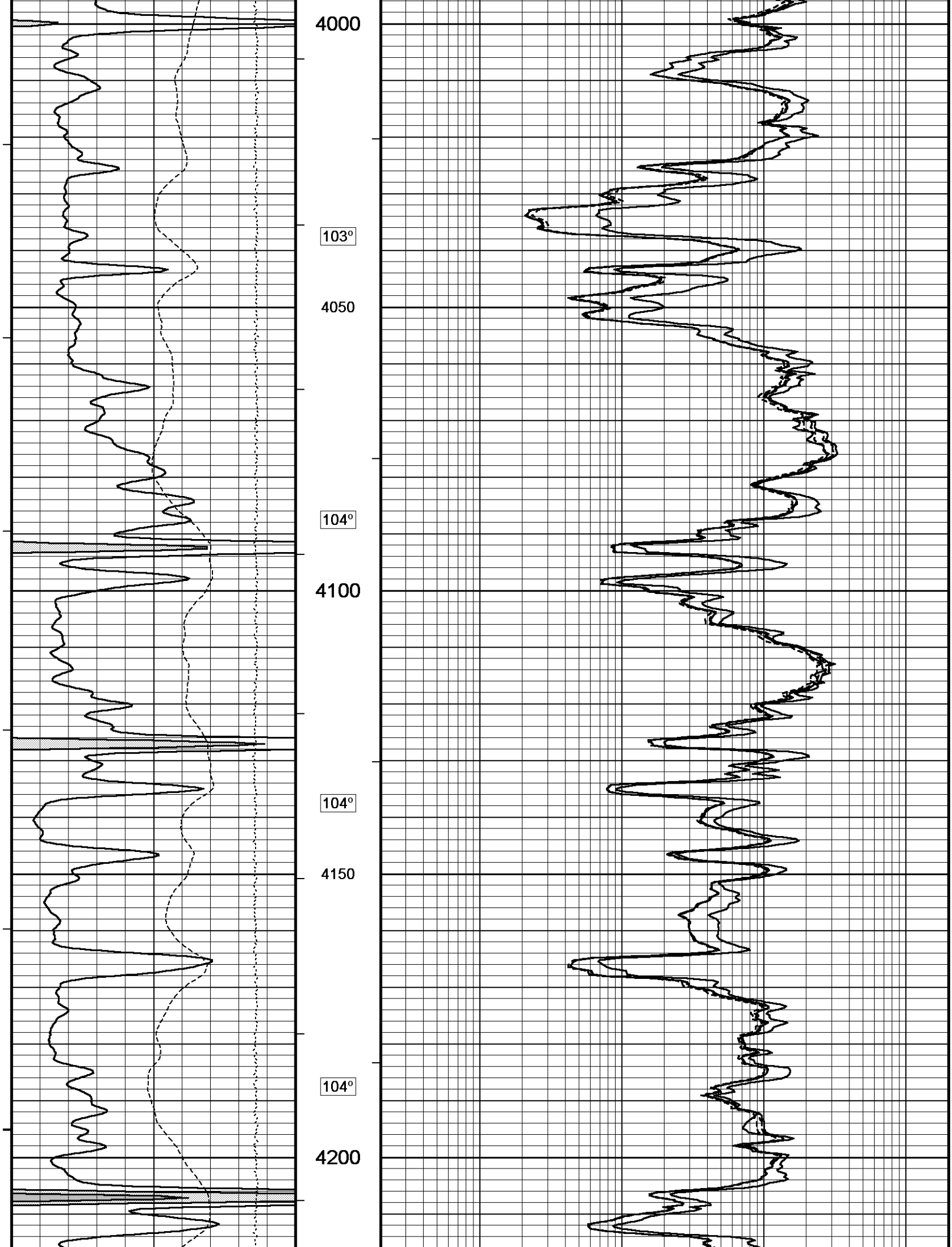
Spontaneous Potential
Gamma Ray
DST Uphole Tension

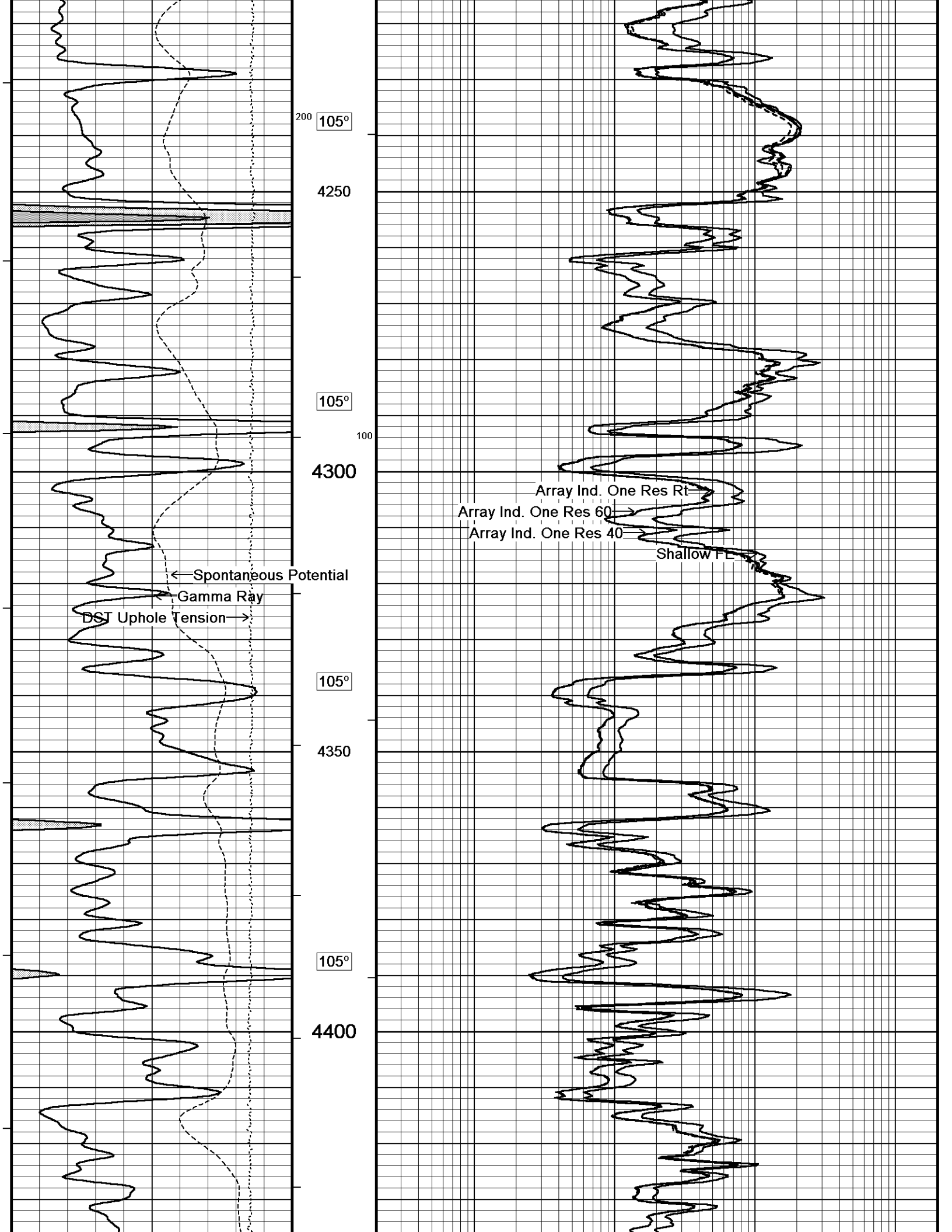
101°

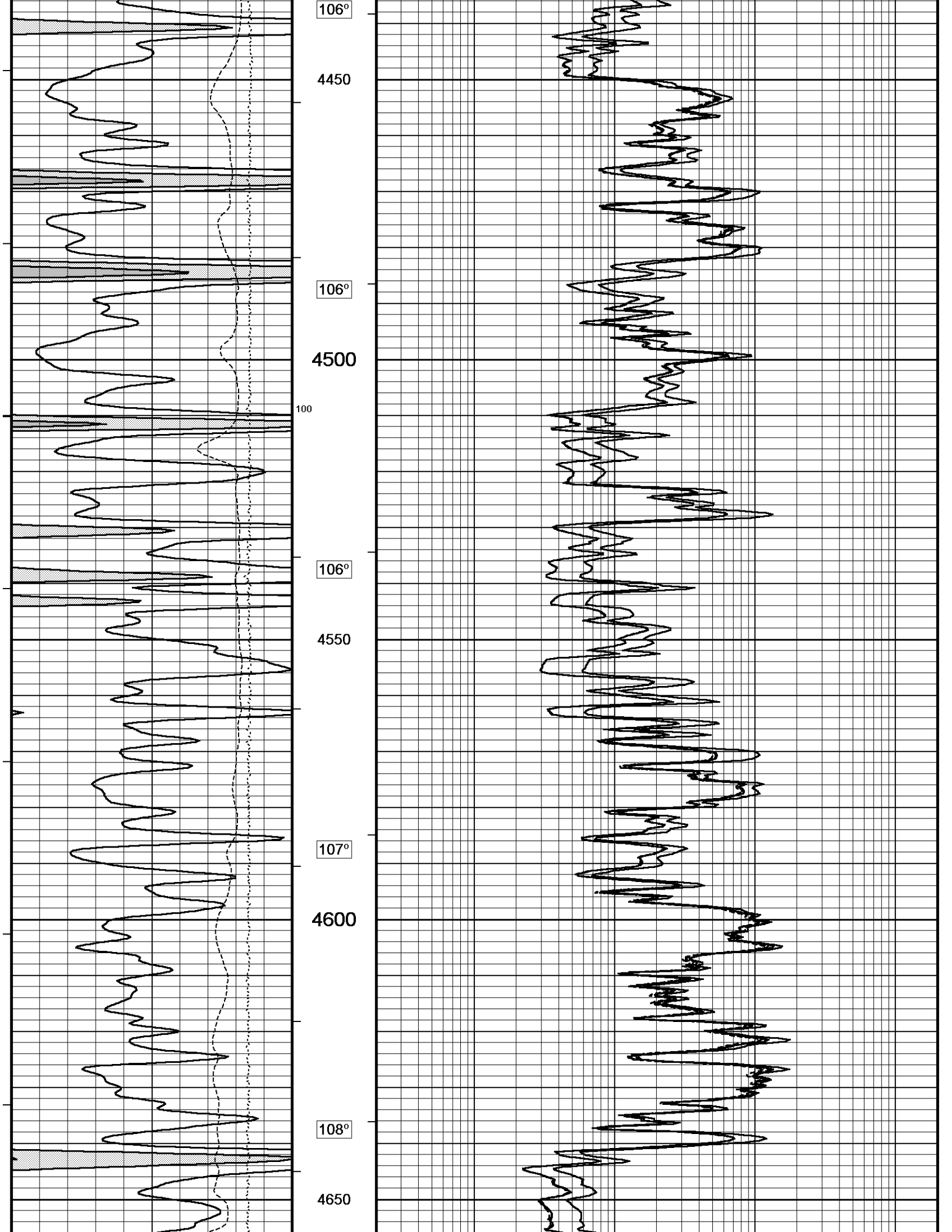
3550

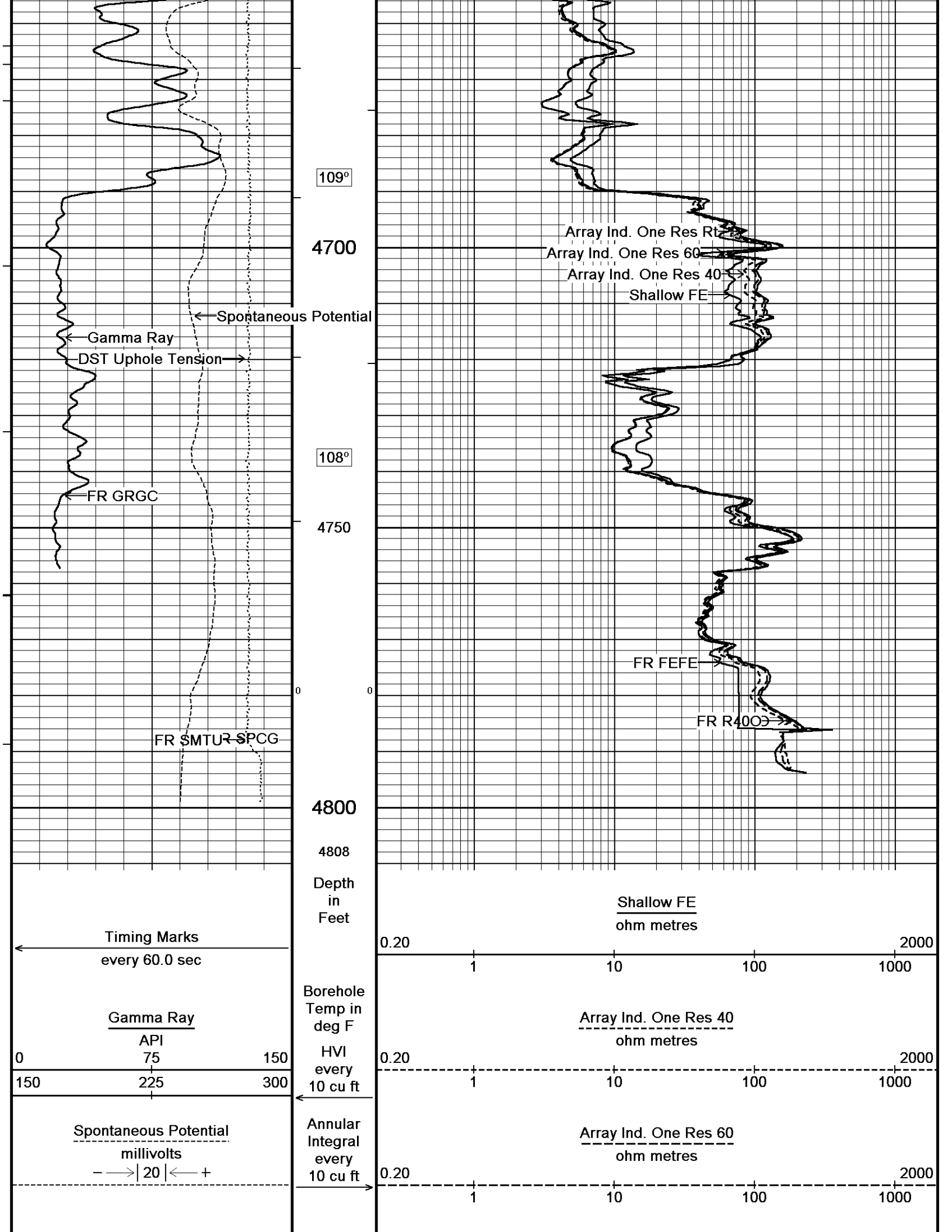

101°
3600
101°
3650
400
101°
3700
101°
3750
200


101°
3800
101°
3850
102°
3900
102°
300 3950
103°
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE


4000
103°
4050
104°
4100
104°
4150
104°
4200


200
105°
4250
105°
100
4300
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
105°
4350
105°
4400


106°
4450
106°
4500
100
106°
4550
107°
4600
108°
4650


109°
4700
Spontaneous Potential
Gamma Ray
DST Uphole Tension
108°
FR GRGC
4750
0
0
FR SMTU
SPCG
4800
4808
Depth in Feet
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
FR FEFE
FR R40O
Timing Marks
every 60.0 sec
Gamma Ray
API
0 75 150
150 225 300
Spontaneous Potential
millivolts
− 20 +
Borehole Temp in deg F
HVI every 10 cu ft
Annular Integral every 10 cu ft
Shallow FE
ohm metres
0.20 1 10 100 1000 2000
Array Ind. One Res 40
ohm metres
0.20 1 10 100 1000 2000
Array Ind. One Res 60
ohm metres
0.20 1 10 100 1000 2000

DST Uphole Tension
pounds
5000 0

Replay Scale 1:240

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

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 26-NOV-2012 16:17
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Main.dta
Recorded on 25-NOV-2012 14:32
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

5 INCH MAIN

10 INCH HI-RES

Depth Based Data - Maximum Sampling Increment 2.5cm
Plotted on 26-NOV-2012 16:17
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Hi-Res.dta
Recorded on 25-NOV-2012 13:44
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Timing Marks
every 60.0 sec

Depth in Feet

Shallow FE
ohm metres
0.20 2000
1 10 100 1000

Gamma Ray
API
0 75 150
150 225 300

Borehole Temp in deg F

HVI every 10 cu ft

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

Spontaneous Potential
millivolts
− → | 20 | ← +

Annular Integral every 10 cu ft

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

DST Uphole Tension
pounds
5000 0

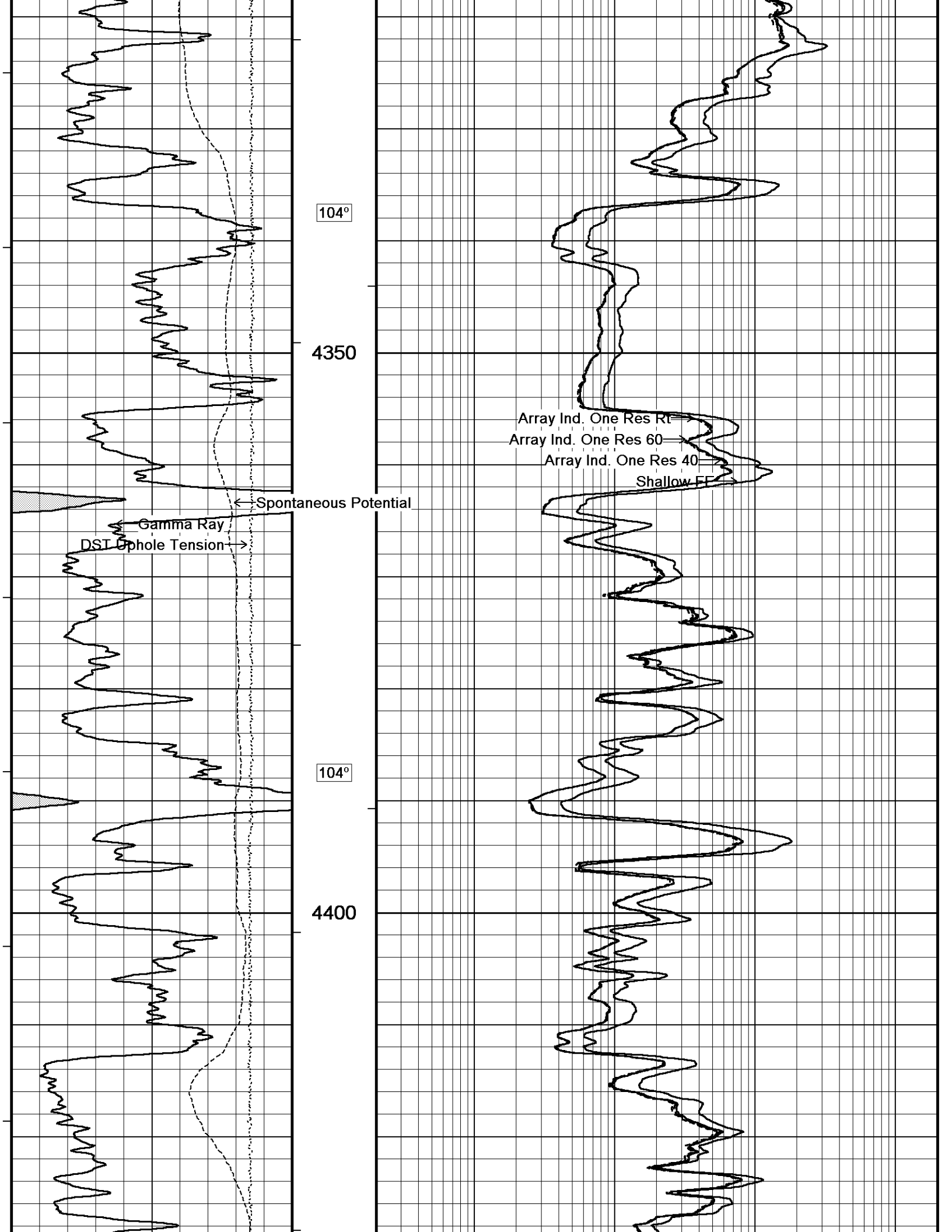
Replay Scale 1:120

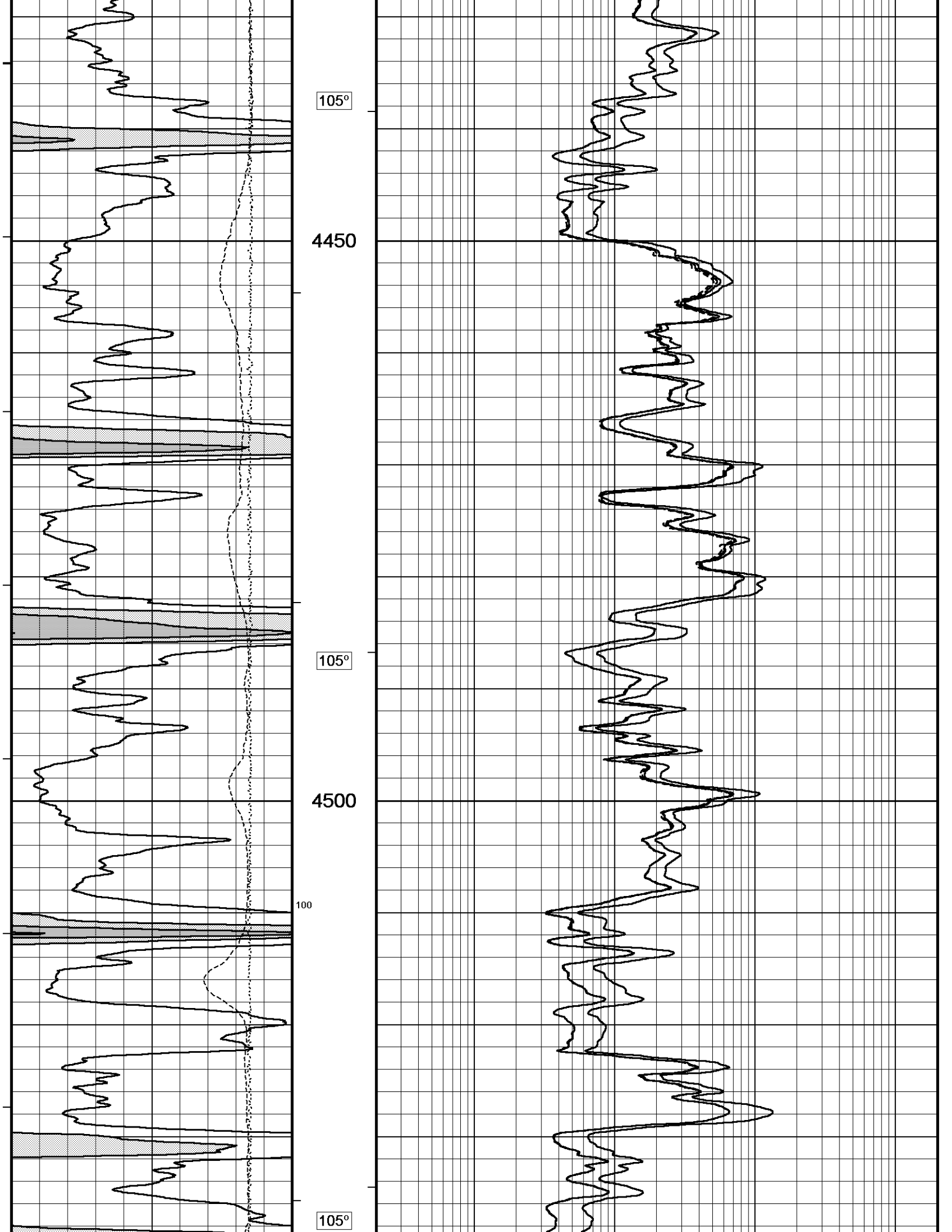
Array Ind. One Res Rt
ohm metres
0.20 2000
1 10 100 1000

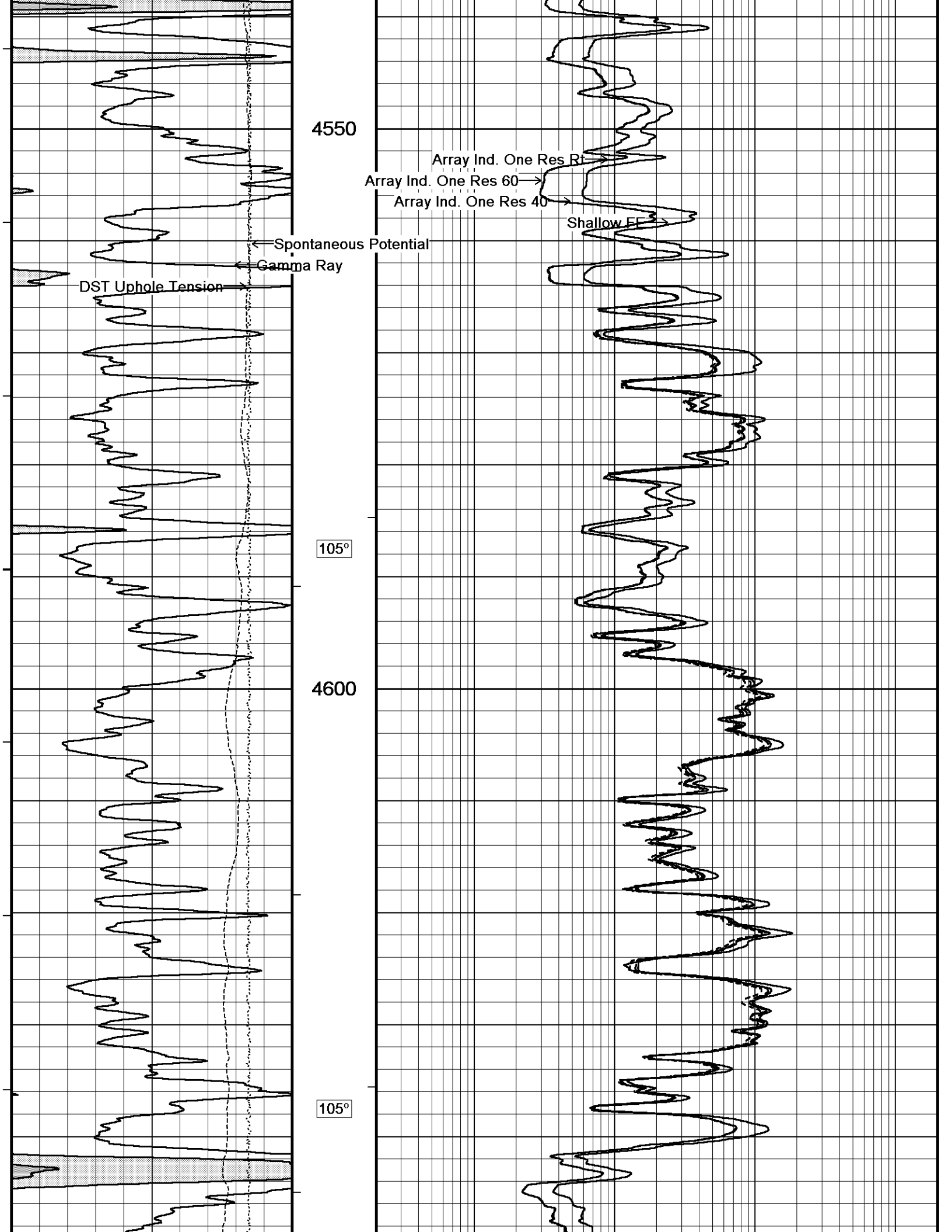
4280

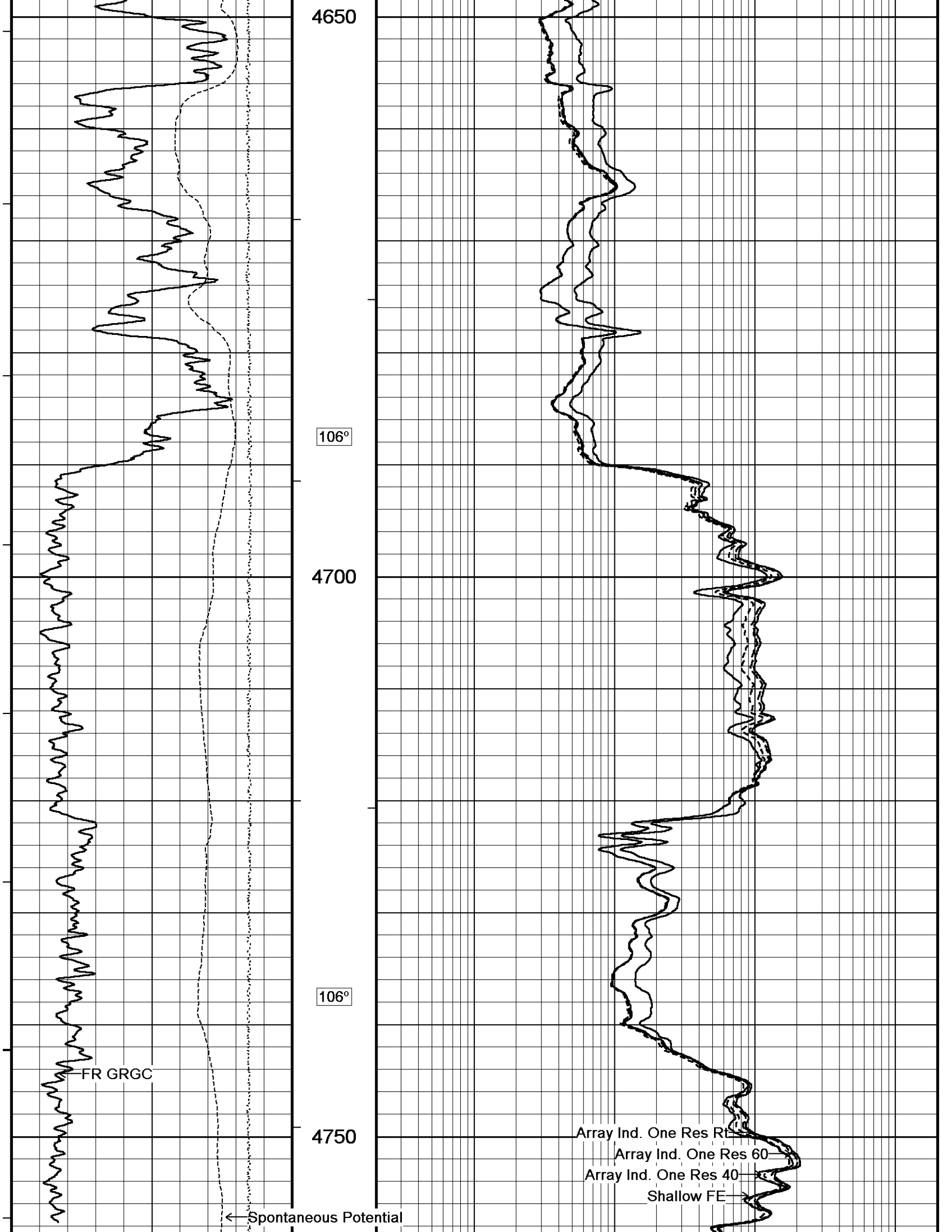
100

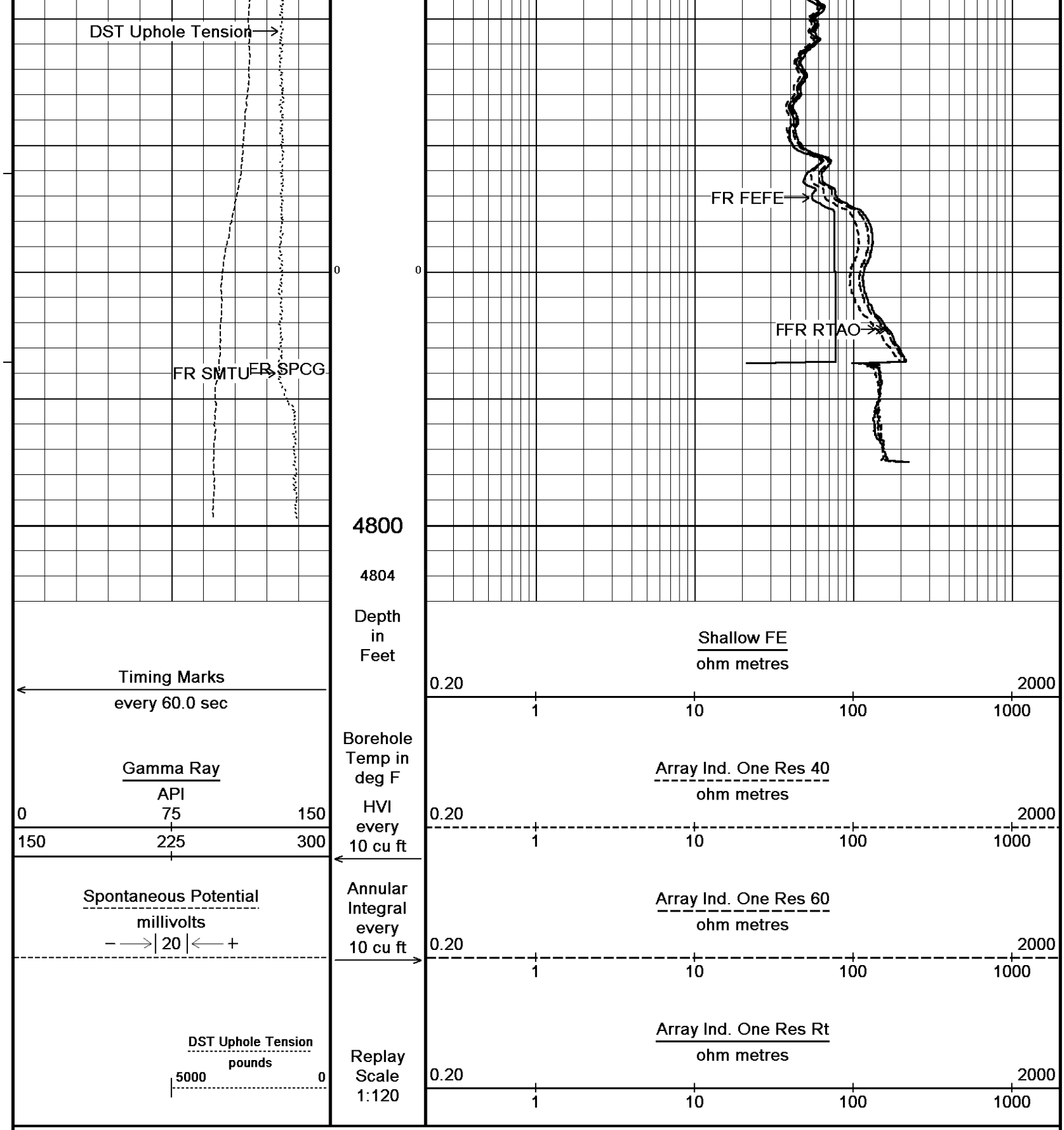
4300


104°
4350
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FF
Spontaneous Potential
Gamma Ray
DST Uphole Tension
104°
4400


105°
4450
105°
4500
100
105°


4550
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FF
Spontaneous Potential
Gamma Ray
DST Uphole Tension
105°
4600
105°


4650
106°
4700
106°
4750
FR GRGC
Spontaneous Potential
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE



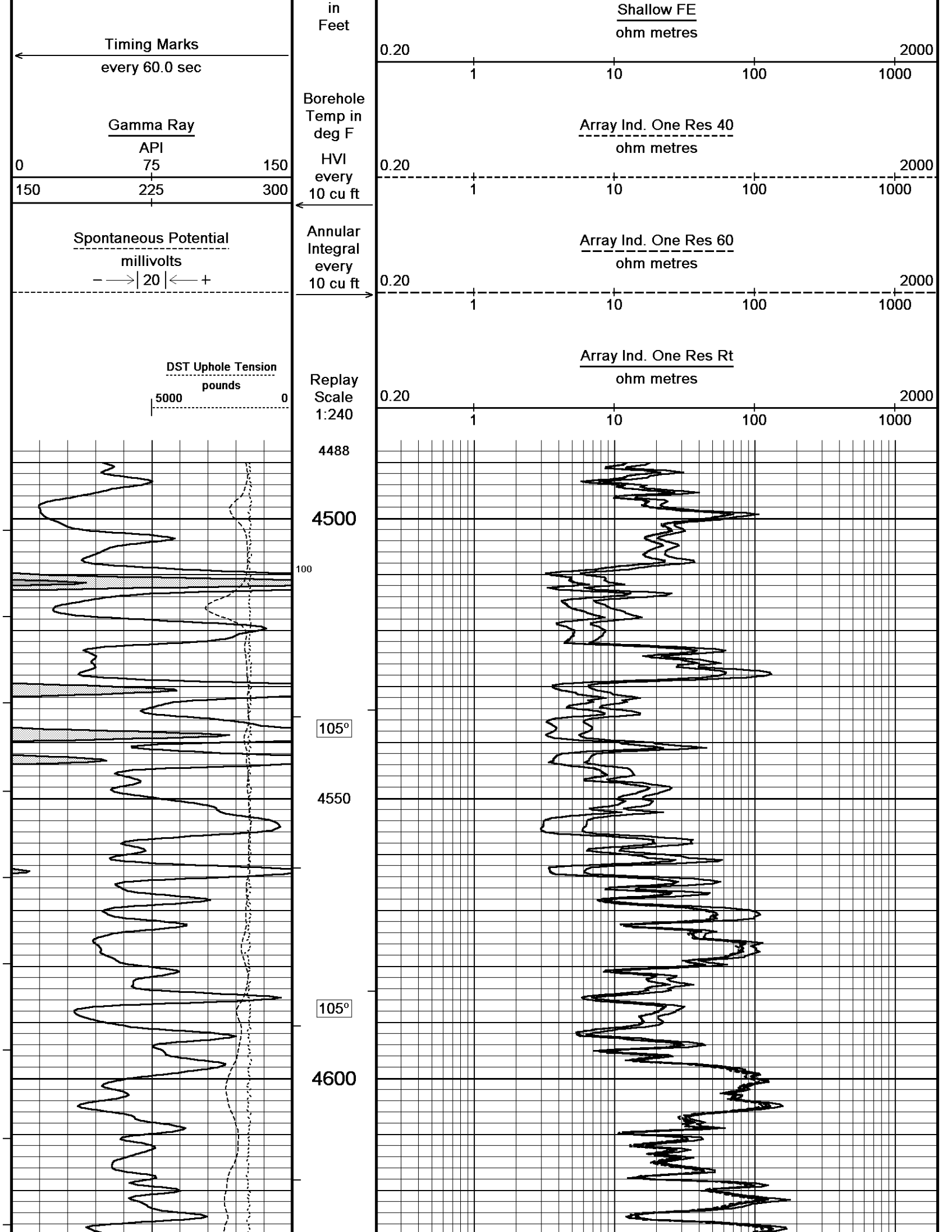
Depth Based Data - Maximum Sampling Increment 2.5cm
Plotted on 26-NOV-2012 16:17
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Hi-Res.dta
Recorded on 25-NOV-2012 13:44
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

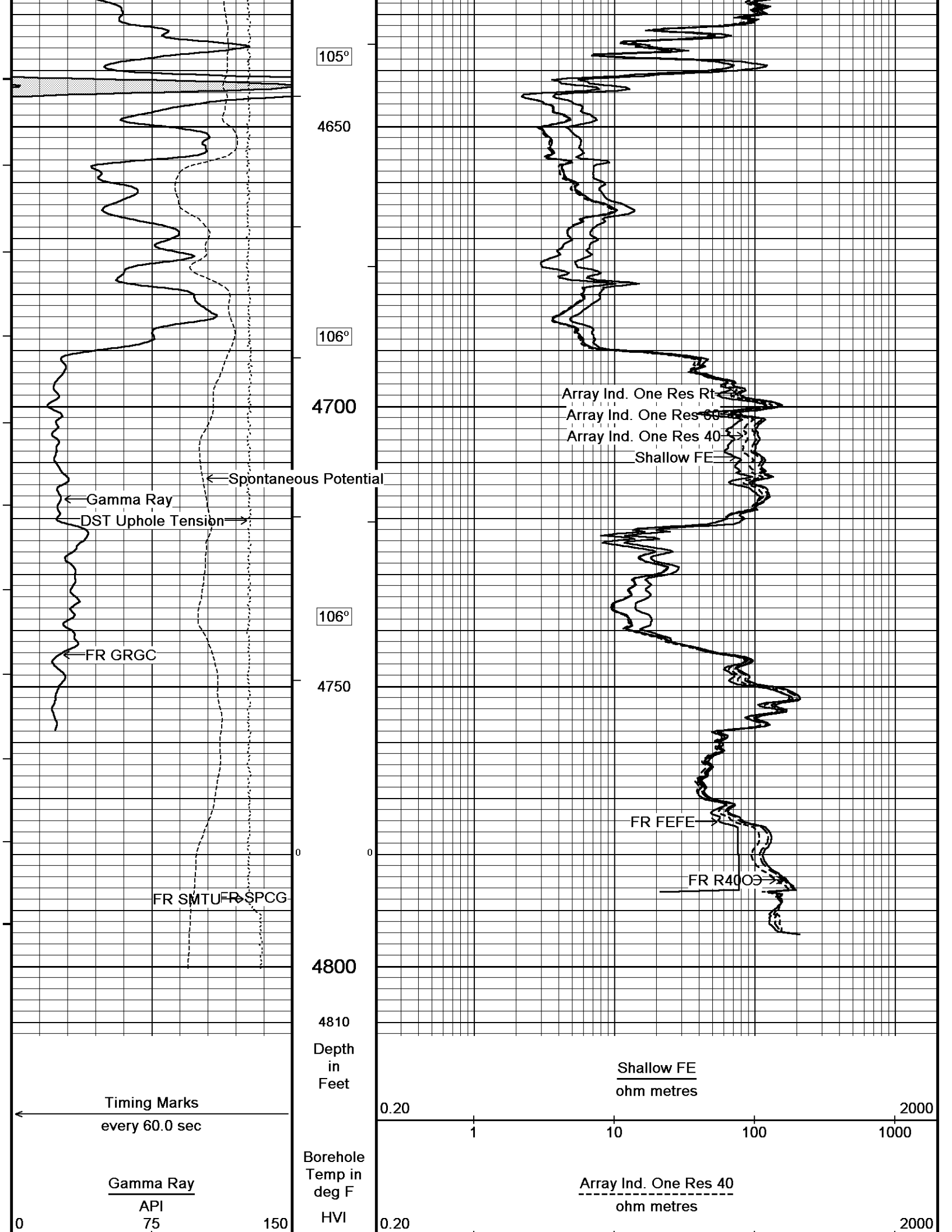
10 INCH HI-RES

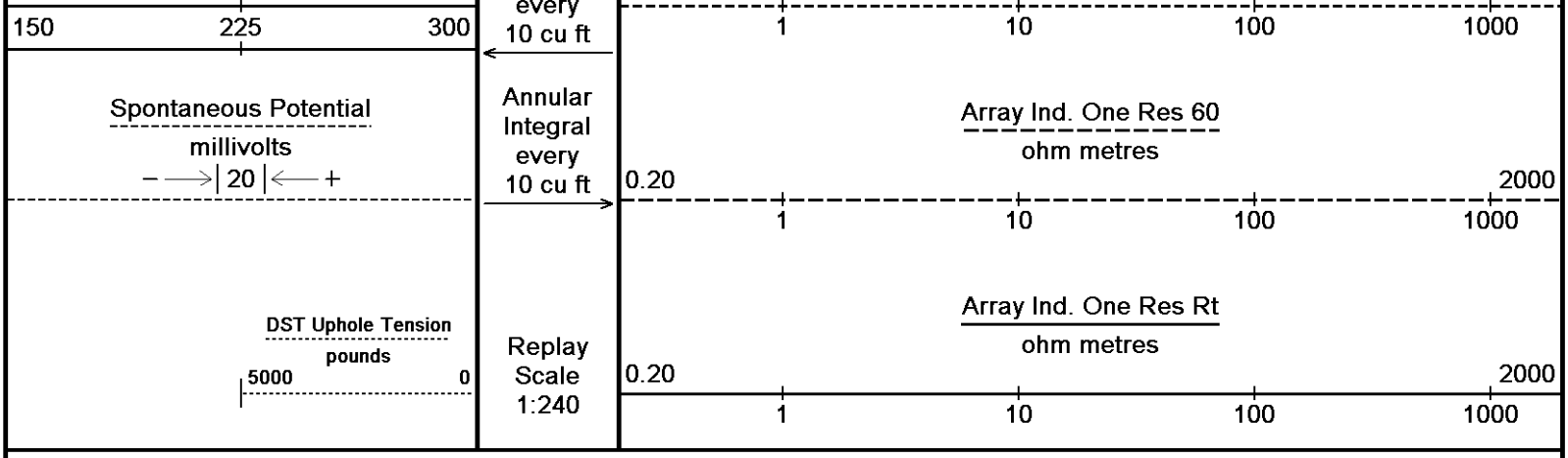
REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 26-NOV-2012 16:17
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Repeat.dta
Recorded on 25-NOV-2012 13:44
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Depth


Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
150
225
300
Spontaneous Potential
millivolts
– 20 +
DST Uphole Tension
pounds
5000
0
in
Feet
Borehole
Temp in
deg F
HVI
every
10 cu ft
Annular
Integral
every
10 cu ft
Replay
Scale
1:240
4488
4500
100
105°
4550
105°
4600
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


105°
4650
106°
4700
106°
4750
4800
4810
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
FR GRGC
FR FEFE
FR R40O
FR SMTU
FR SPCG
0
0
Depth
in
Feet
Timing Marks
every 60.0 sec
Shallow FE
ohm metres
0.20
1
10
100
1000
2000
Borehole
Temp in
deg F
HVI
Gamma Ray
API
0
75
150
Array Ind. One Res 40
ohm metres
0.20
2000



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 26-NOV-2012 16:17

Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Repeat.dta — Recorded on 25-NOV-2012 13:44

System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Main.dta

General Constants All 000

Last Edited on 26-NOV-2012,13:35

General Parameters		
Mud Resistivity	0.870	ohm-metres
Mud Resistivity Temperature	80.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	5.500	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. Four Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	

Down-hole Tension Calibration SMS 0

Field Calibration on 25-NOV-2012 13:06

Reading No	Measured	Calibrated (lbs)
1	14358.89	0.00
2	14383.58	396.00

Gamma Calibration MCG-C 208

Field Calibration on 19-NOV-2012 09:54

	Measured	Calibrated (API)
Background	73	51
Calibrator (Gross)	1099	776
Calibrator (Net)	1026	725

Gamma Constants MCG-C 208

Last Edited on 26-NOV-2012,13:35

Gamma Calibrator Number	GR38	
Mud Density	1.13	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

SP Calibration MCG-C 208

Field Calibration on 05-NOV-2012,14:25

	Measured	Calibrated (mV)
Reference 1	100.2	101.0

Reference 2	-101.3	-101.0

High Resolution Temperature Calibration MCG-C 208

Field Calibration on 05-NOV-2012,14:26

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

High Resolution Temperature Constants MCG-C 208

Last Edited on 05-NOV-2012,14:25

Pre-filter Length	11

Caliper Calibration MMR-A 11

Base Calibration on 19-NOV-2012 09:29
Field Calibration on 19-NOV-2012 09:30

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13673	5.98
2	16880	7.97
3	20107	9.86
4	24060	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

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

Micro Normal and Micro Inverse Calibration MMR-A 11

Base Calibration on 19-NOV-2012 09:34
Field Check on 19-NOV-2012 09:35

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.3	59.8	5.0	25.0
Micro Inverse	15.5	77.5	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	76.5	76.5
Micro Inverse	58.7	58.7

Micro Normal and Micro Inverse Constants MMR-A 11

Last Edited on 05-NOV-2012,13:54

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	1.0000	
Micro Inverse K Factor	1.0000	
Standoff Offset	0.0000	inches

Micro Laterolog Calibration MMR-A 11

Base Calibration on 31-DEC-1999 00:00
Field Check on 31-DEC-1999 00:00

Base Calibration

	Measured		Calibrated (ohm-m)	
	Ref 1	Ref 2	Ref 1	Ref 2
	0.0	0.0	0.0	0.0

Base Check (ohm-m)	Field Check (ohm-m)
0.0	0.0

Micro Laterolog Constants MMR-A 11

Last Edited on

Pad Type	6 in Solid Nylon B23059	
Micro Laterolog K Factor	0.0128	
Standoff Offset	0.0000	inches

Mudcake Thickness Correction Constants

Mud Cake Source	Constant Value	
Mud Cake Thickness	0.4000	inches
Mud Cake Thickness Caliper		
Mud Cake Resistivity	0.1500	ohm-m
Mud Cake Resistivity Temp.	20.00	Degrees C
Mud Cake Resistivity Source	Constant Value	
Temp. Source Rmc Correc.	MCG External Temperature	

Neutron Calibration MDN-A.B 65

Base Calibration on 05-NOV-2012 09:18
Field Check on 19-NOV-2012 09:59

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3015	94	3714	110
Ratio	32.234		33.764	

Field Calibrator at Base	Calibrated (cps)	
	1713	2459
Ratio	0.697	

Field Check	Calibrated (cps)	
	1700	2446
Ratio	0.689	

Neutron Constants MDN-A.B 65

Last Edited on 19-NOV-2012,09:55

Neutron Source Id	PN-521	
Neutron Jig Number	5824NE	
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	Constant Value	
Formation Pressure	0.00	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-B.J 352

Base Calibration on 05-NOV-2012 14:17
Field Check on 19-NOV-2012 09:43

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	964.3	126.8
Base Check		281.3
Field Check		281.4

FE Constants MFE-B.J 352

Last Edited on 19-NOV-2012,09:42

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	0.5	inches

Induction Calibration MAI-A.A 45

Base Calibration on 05-NOV-2012,09:49
Field Check on 19-NOV-2012 09:41

Base Calibration

Test Loop Calibration

Channel	Measured Low	Measured High	Calibrated (mmho/m) Low	Calibrated (mmho/m) High
1	14.4	472.6	9.3	966.2
2	5.7	374.0	7.6	821.4
3	3.4	261.2	5.2	566.0
4	2.5	133.9	2.6	279.2

Array Temperature	78.4	Deg F

Channel	Base Check (mmho/m) Low	Base Check (mmho/m) High	Field Check (mmho/m) Low	Field Check (mmho/m) High
1	18.9	3852.1	18.8	3850.7
2	31.8	3630.1	31.8	3628.7
3	28.7	3050.1	28.7	3049.0

4	18.4	2079.5	18.3	2079.1	
Deep	16.1	1911.5	16.1	1911.2	
Medium	42.6	4061.7	42.5	4059.8	
Shallow	49.8	5484.4	49.7	5481.7	
Array Temperature		67.0		66.0	Deg F

Induction Constants MAI-A.A 45

Last Edited on 19-NOV-2012,09:39

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	

High Resolution Temperature Calibration MAI-A.A 45

Field Calibration on 05-NOV-2012,14:25

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

High Resolution Temperature Constants MAI-A.A 45

Last Edited on 05-NOV-2012,14:25

Pre-filter Length	11

Caliper Calibration MPD-B 31

Base Calibration on 21-NOV-2012 17:11
Field Calibration on 26-NOV-2012 08:56

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	15176	3.99
2	23904	5.98
3	32704	7.97
4	40976	9.86
5	50319	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.97	5.98

Photo Density Calibration MPD-B 31

Base Calibration on 26-NOV-2012 10:46

Photo Density Calibration MPD-B 31

Base Calibration on 26-NOV-2012 10:46
Field Check on 26-NOV-2012 10:55

Density Calibration

Base Calibration	Measured Near	Measured Far	Calibrated (sdu) Near	Calibrated (sdu) Far
Reference 1	45785	23214	59556	30836
Reference 2	18987	1938	24941	2541
Field Check at Base	681.6	841.8		
Field Check	682.6	842.1		

PE Calibration

Base Calibration	WS	Measured WH	Measured Ratio	Calibrated Ratio
Background	126	606		
Reference 1	19572	45677	0.431	0.371
Reference 2	5722	18905	0.306	0.272
Field Check at Base	125.9	606.3		
Field Check	127.7	606.4		

Density Constants MPD-B 31

Last Edited on 26-NOV-2012,13:34

Density Source Id	254	
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	1.13	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Hybrid	

Matrix Density (gm/cc)	Depth (ft)
2.71	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

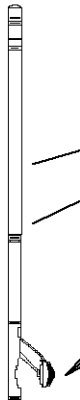
DOWNHOLE EQUIPMENT

C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Main.dta

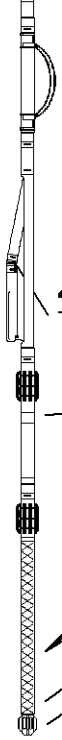
3/8" Triple Cone Cable Head (MCB C A)
MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-Resistivity
MMR-A 11 LG: 8.59 ft WT: 81.6 lb OD: 4.88 in



43.50 ft	GRGC - Gamma Ray
40.59 ft	CGXT - MCG External Temperature
33.24 ft	MBTC - MMR Caliper
33.24 ft	MINV - MMR MicroLog Inverse
33.24 ft	MNRL - MMR MicroLog Normal

Compact Neutron MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in		28.45 ft	NPRL - Limestone Neutron Por.
Compact Density/Caliper MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in		21.21 ft	AVOL - Annular Volume
		21.21 ft	HVOL - Hole Volume
		21.21 ft	CLDC - Density Caliper
		19.28 ft	DEN - Compensated Density
		19.28 ft	DCOR - Density Correction
		19.28 ft	DPRL - Limestone Density Por.
		19.22 ft	PDPE - PE
Compact Focussed Electric MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in		13.72 ft	FEFE - Shallow FE
Compact Induction MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in		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
Total Length: 50.36 ft Weight: 399.0 lb		Tool Zero	(0.13ft from bottom)
		-0.13 ft	SMTU - DST Uphole Tension
			All measurements relative to tool zero.

COMPANY	CHOLLA PRODUCTION LLC.
WELL	BONTRAGER RT #1-32
FIELD	GRUBEN EAST
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2991.00	feet	First Reading	4785.00	feet
Elevation Drill Floor	2990.00	feet	Depth Driller	4790.00	feet
Elevation Ground Level	2986.00	feet	Depth Logger	4788.00	feet

Weatherford®

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

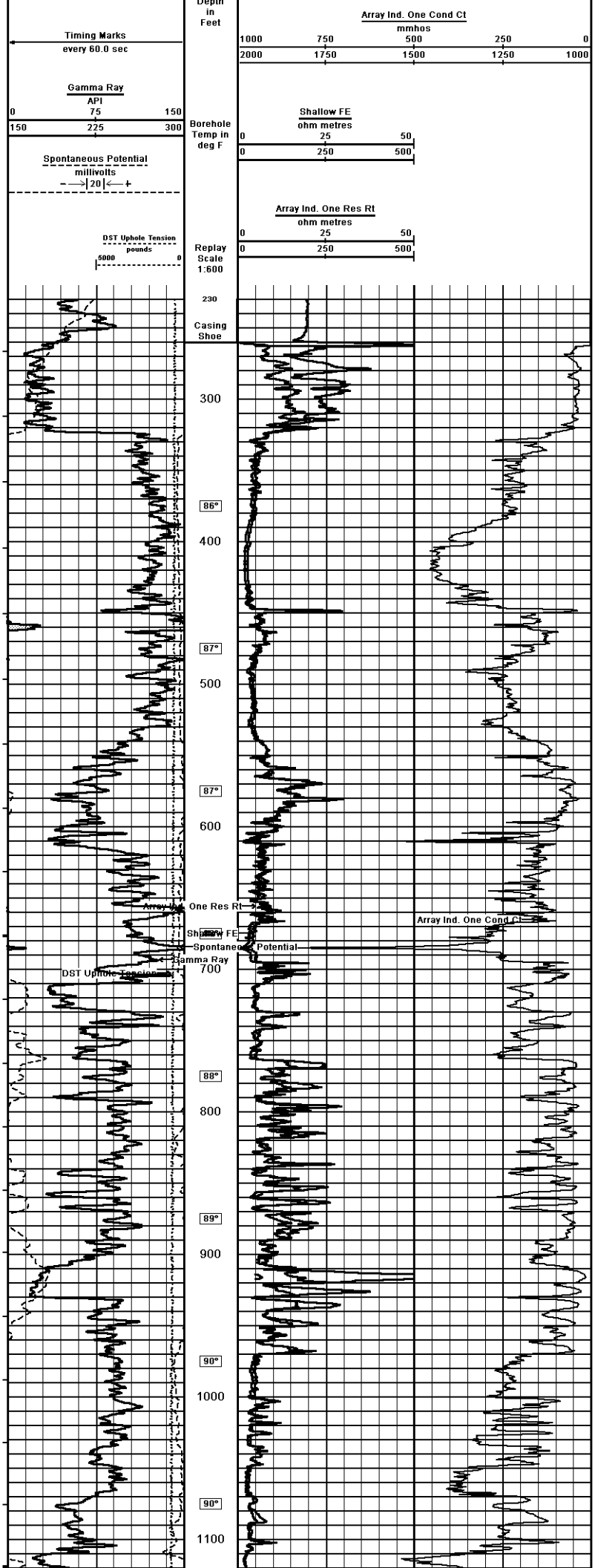
Weatherford

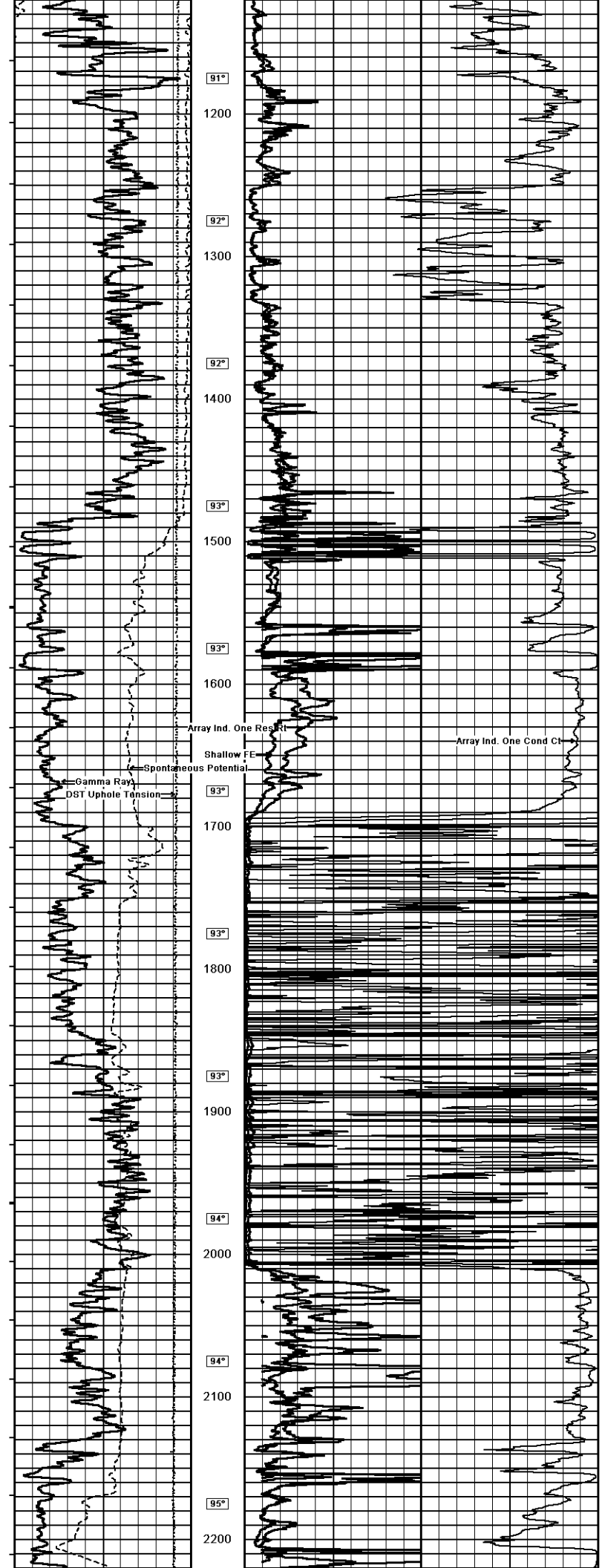
ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

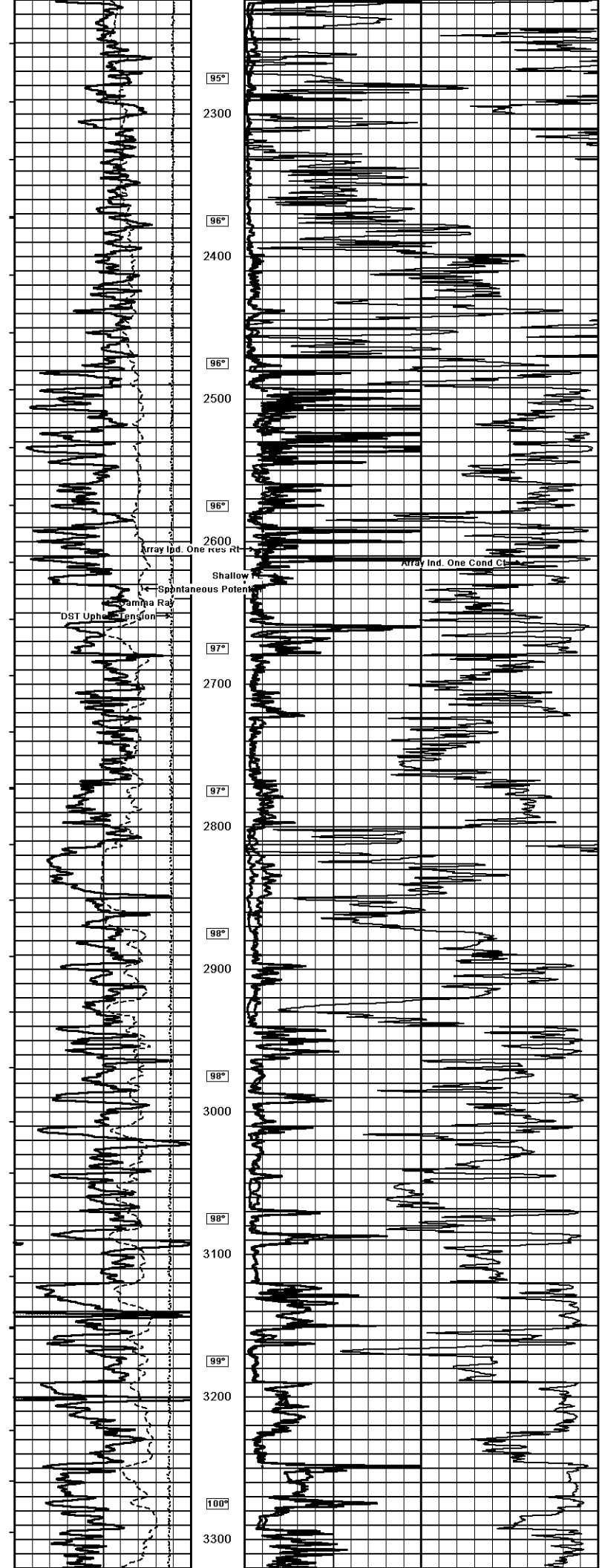
COMPANY	CHOLLA PRODUCTION LLC.
WELL	BONTRAGER RT #1-32
FIELD	GRUBEN EAST
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	400' FNL & 2549' FEL
SEC 32 TWP 19S RGE 33W	Other Services MPD/MDN MML
API Number 15-171-20916	
Permit Number	
Permanent Datum G.L., Elevation 2986 feet	Elevations: feet KB 2991.00 DF 2990.00 GL 2986.00
Log Measured From KB	
Drilling Measured From K.B. @ 5 FEET	

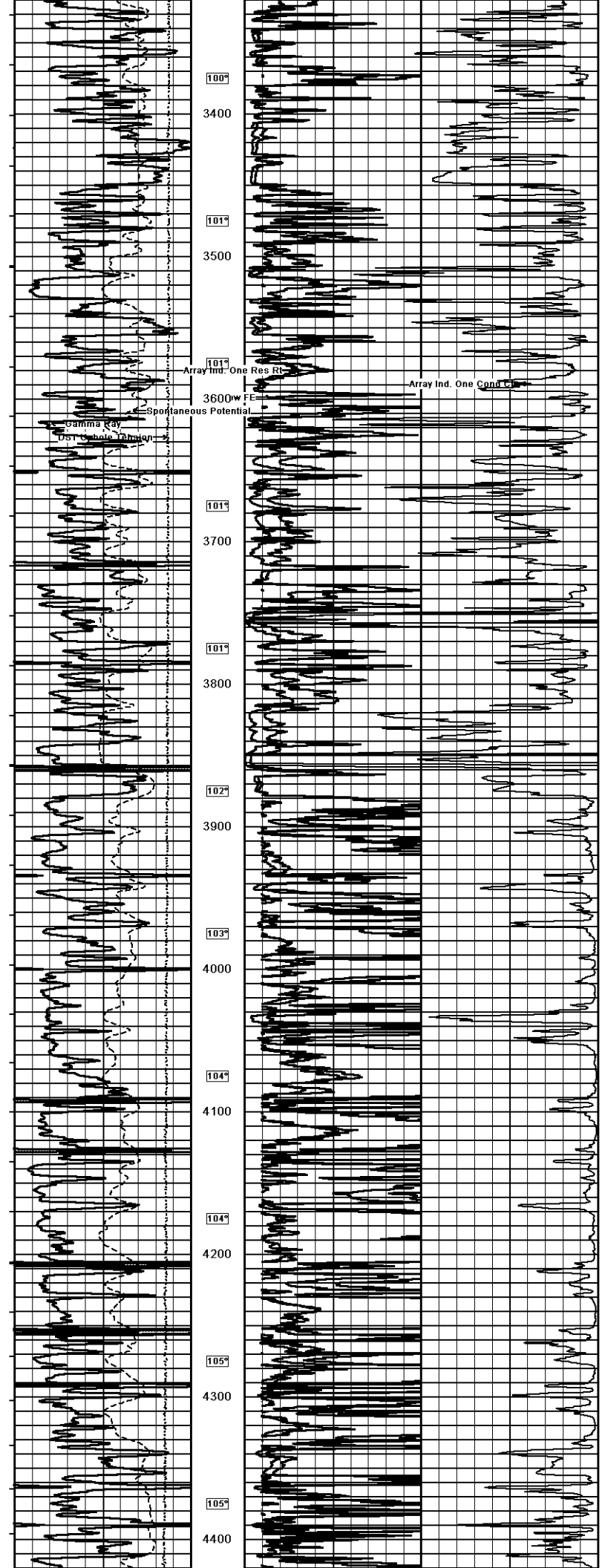
Date	25-NOV-2012		
Run Number	ONE		
Service Order	3538952		
Depth Driller	4790.00	feet	
Depth Logger	4788.00	feet	
First Reading	4785.00	feet	
Last Reading	260.00	feet	
Casing Driller	259.00	feet	
Casing Logger	260.00	inches	
Bit Size	7.875		
Hole Fluid Type	CHEMICAL	lb/USg	
Density / Viscosity	9.40 lb/USg	50.00 CP	
PH / Fluid Loss	9.00	9.00	
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.87 @ 80.0	ohm-m	
Rmf @ Measured Temp	0.70 @ 80.0	ohm-m	
Rmc @ Measured Temp	1.04 @ 80.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.64 @108.0	ohm-m	
Time Since Circulation	3 HOURS		
Max Recorded Temp	108.00	deg F	
Equipment / Base	13057	LIB	
Recorded By	R. HOFFMAN		
Witnessed By	BILL GOFF		
S.O.# / JOB#	LB12-308		

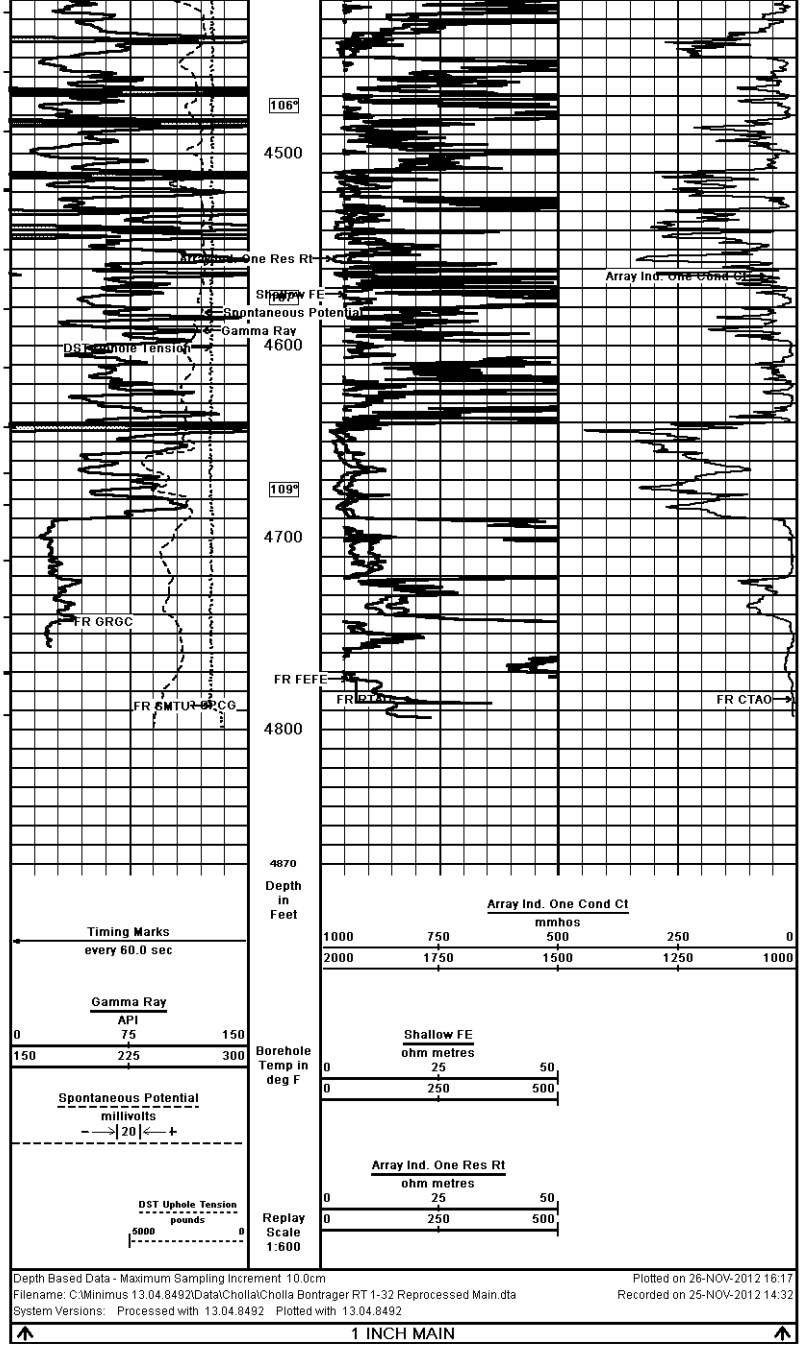
1 INCH MAIN	
Depth Based Data - Maximum Sampling Increment 10.0cm	Plotted on 26-NOV-2012 16:17
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Main.dta	Recorded on 25-NOV-2012 14:32
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492	


Depth in Feet
Timing Marks every 60.0 sec
Gamma Ray API 0 75 150 150 225 300
Spontaneous Potential millivolts -→|20|←+
DST Uphole Tension pounds 5000 0
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
230
Casing Shoe
300
86°
400
87°
500
87°
600
Array Ind. One Res Rt
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
700
88°
800
89°
900
90°
1000
90°
1100
Array Ind. One Cond Ct


91°
1200
92°
1300
92°
1400
93°
1500
93°
1600
Array Ind. One Res Rt
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct
93°
1700
93°
1800
93°
1900
94°
2000
94°
2100
95°
2200


95°
2300
96°
2400
96°
2500
96°
2600
Array Ind. One Res Rt
Array Ind. One Cond Cond
Shallow
Spontaneous Potenti
Gamma Ray
DST Uphole Tension
97°
2700
97°
2800
98°
2900
98°
3000
98°
3100
99°
3200
100°
3300


100°
3400
101°
3500
101°
Array Ind. One Res Rt
Array Ind. One Cond Cnd
3600
w FE
Spontaneous Potential
Gamma Ray
Dst Cable Tension
101°
3700
101°
3800
102°
3900
103°
4000
104°
4100
104°
4200
105°
4300
105°
4400



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 26-NOV-2012 16:17

Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Main.dta — Recorded on 25-NOV-2012 14:32

System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

1 INCH MAIN

COMPANY	CHOLLA PRODUCTION LLC.
WELL	BONTRAGER RT #1-32
FIELD	GRUBEN EAST
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2991.00	feet	First Reading	4785.00	feet
Elevation Drill Floor	2990.00	feet	Depth Driller	4790.00	feet
Elevation Ground Level	2986.00	feet	Depth Logger	4788.00	feet

Weatherford

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

MICRORESISTIVITY LOG

COMPANY	CHOLLA PRODUCTION LLC.
WELL	BONTRAGER RT #1-32
FIELD	GRUBEN EAST
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	400' FNL & 2549' FEL

SEC	TWP	RGE	Other Services
32	19S	33W	MPD/MDN
API Number	15-171-20916		MAI/MFE
Permit Number			

Permanent Datum G.L., Elevation 2986 feet
Log Measured From KB
Drilling Measured From K.B. @ 5 FEET

Elevations:	feet
KB	2991.00
DF	2990.00
GL	2986.00

Date	25-NOV-2012			
Run Number	ONE			
Service Order	3538952			
Depth Driller	4790.00	feet		
Depth Logger	4788.00	feet		
First Reading	4755.00	feet		
Last Reading	3500.00	feet		
Casing Driller	259.00	feet		
Casing Logger	260.00	inches		
Bit Size	7.875			
Hole Fluid Type	CHEMICAL	lb/USg		
Density / Viscosity	9.40 lb/USg	50.00 CP		
PH / Fluid Loss	9.00	9.00		
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.87 @ 80.0	ohm-m		
Rmf @ Measured Temp	0.70 @ 80.0	ohm-m		
Rmc @ Measured Temp	1.04 @ 80.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.64 @108.0	ohm-m		
Time Since Circulation	3 HOURS			
Max Recorded Temp	108.00	deg F		
Equipment / Base	13057	LIB		
Recorded By	R. HOFFMAN			
Witnessed By	BILL GOFF			
S.O.# / JOB#	LB12-308			

BOREHOLE RECORD

Last Edited: 26-NOV-2012 15:43

Bit Size inches	Depth From feet	Depth To feet
7.875	260.00	4788.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	260.00	24.00

REMARKS

Tools Used: MCG, MML, MDN, MPD, MFE, MAI ran in combination.
Hardware: MPD: 8 inch profile plate used. MAI 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.
Total hole volume from TD to Surface casing= 2061 cubic feet
Annular volume with 5.5 inch production casing from TD to 3500ft.= 248 cubic feet
Service order #3538952
Rig: WW #2
Engineer: R. Hoffman
Operator(s): B. Johnson

employees. These interpretations are also subject to our general terms and conditions in our price schedule.

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 26-NOV-2012 17:07
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Main.dta
Recorded on 25-NOV-2012 14:32
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
− → | 20 | ← +

MMR Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Depth in Feet

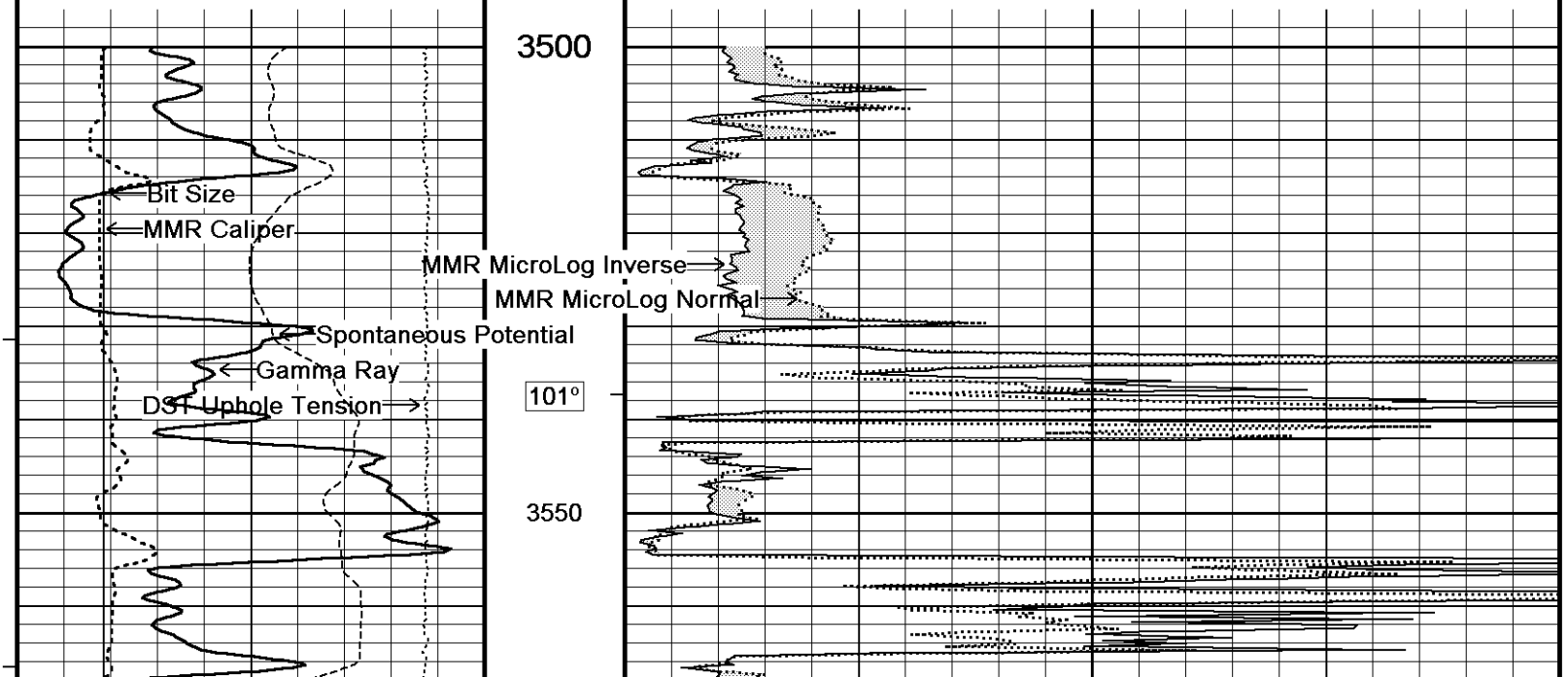
Borehole Temp in deg F

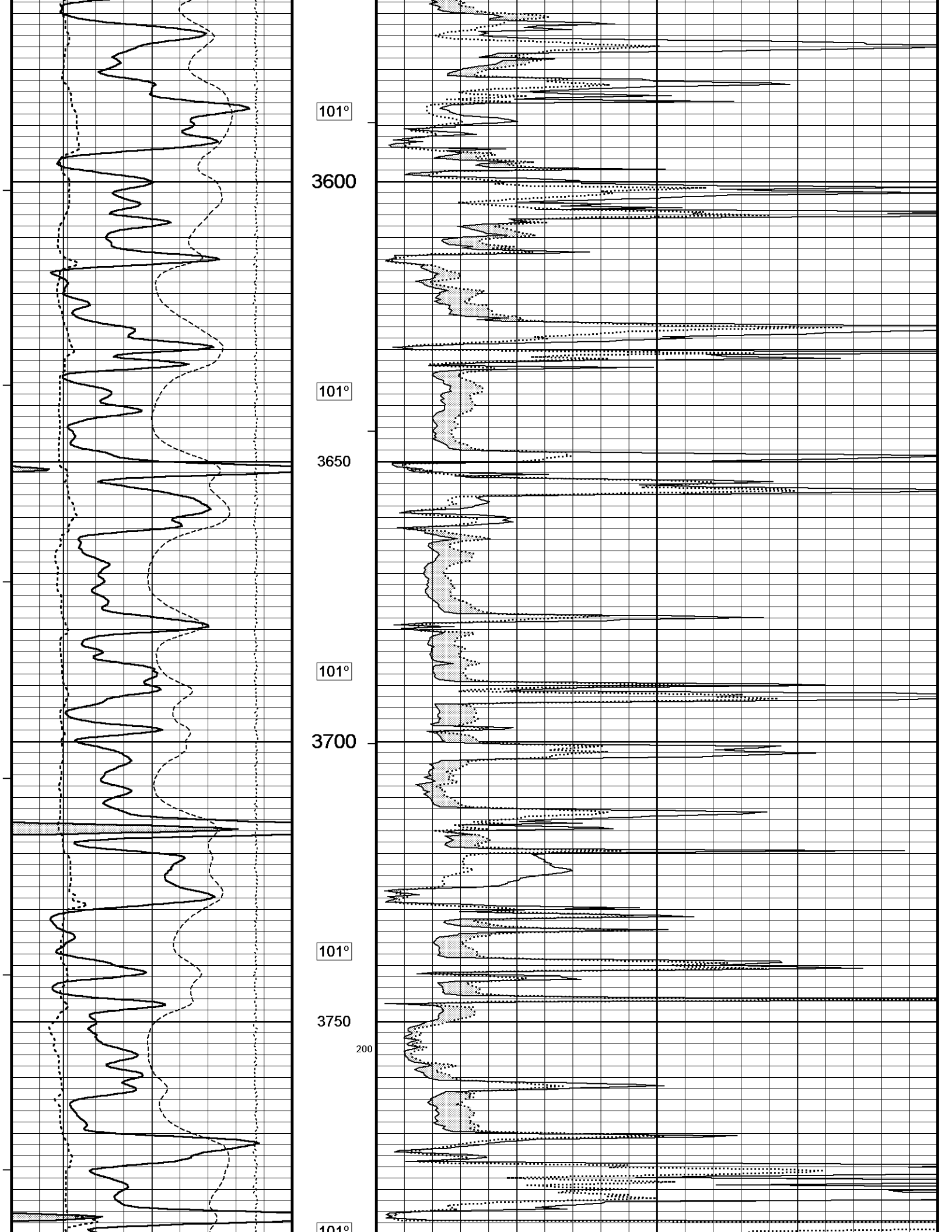
Annular Integral every 10 cu ft

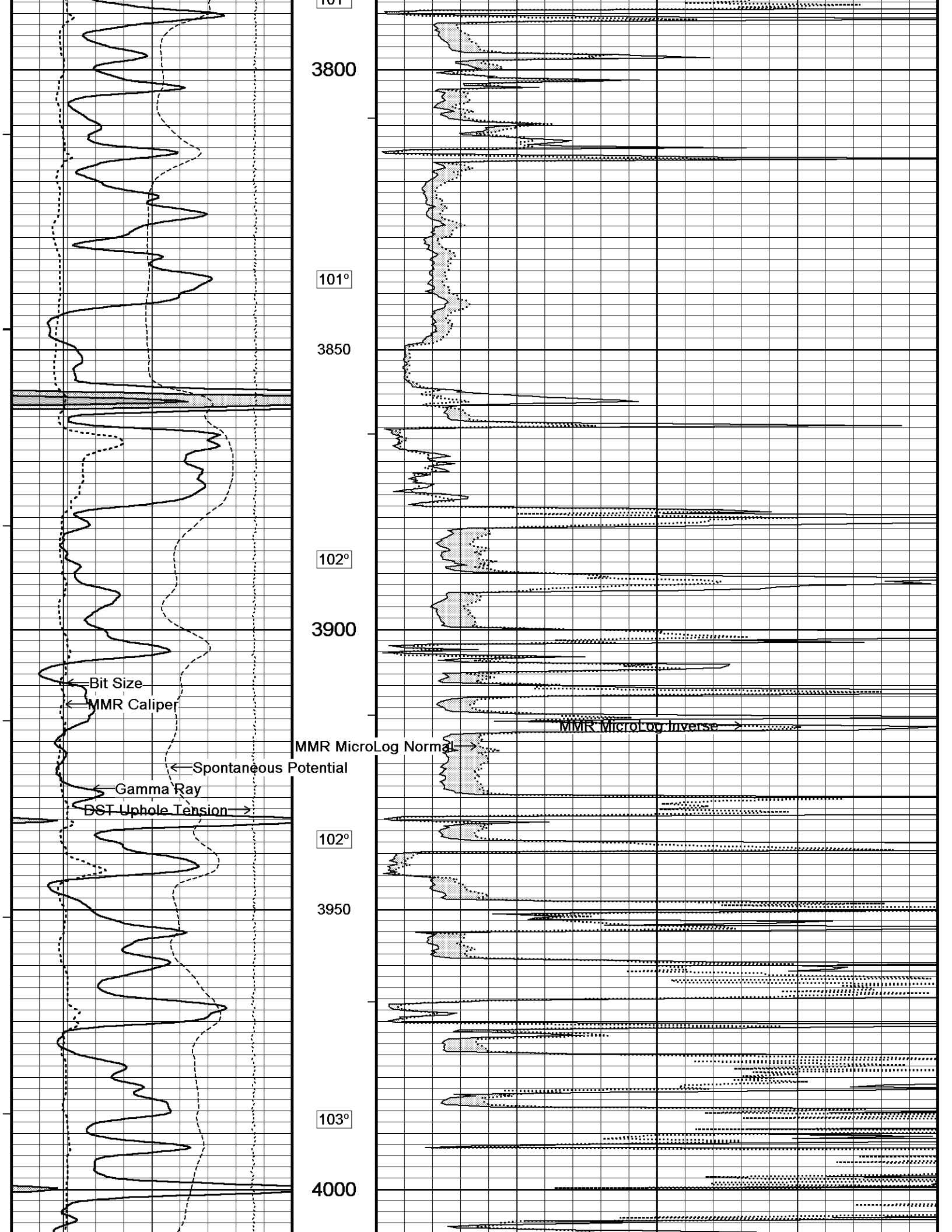
MMR MicroLog Normal
ohm metres
0 10 20 30 40

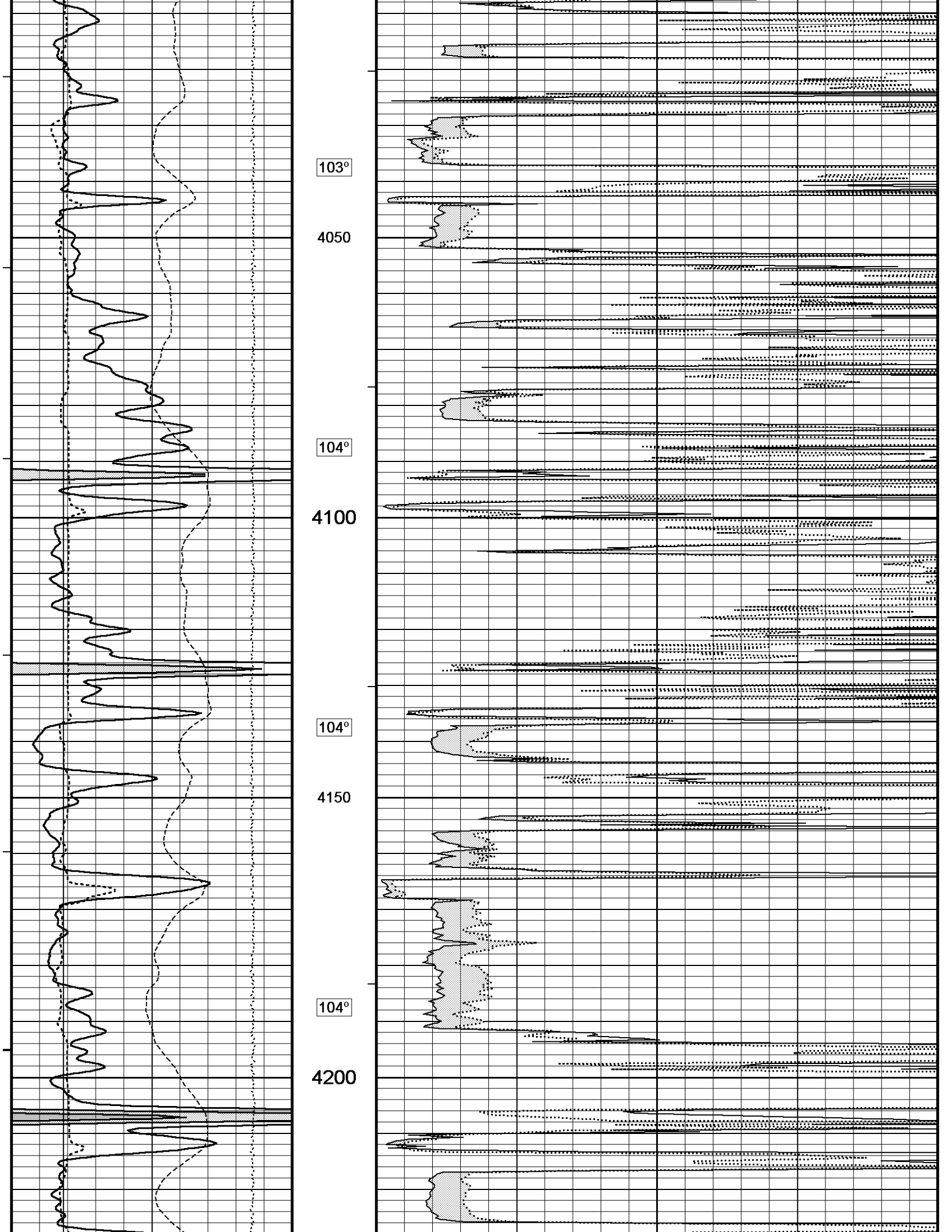
MMR MicroLog Inverse
ohm metres
0 10 20 30 40

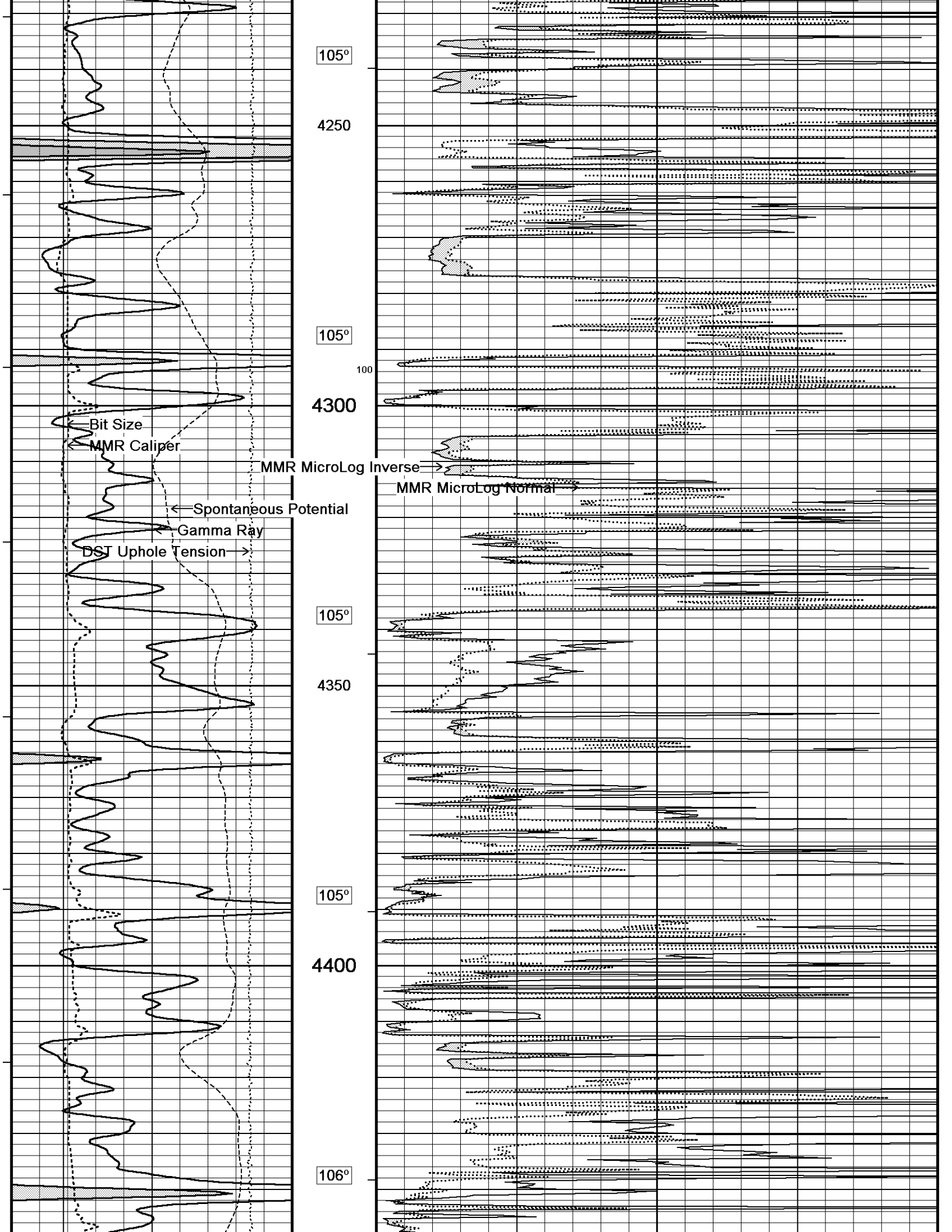
Replay Scale 1:240

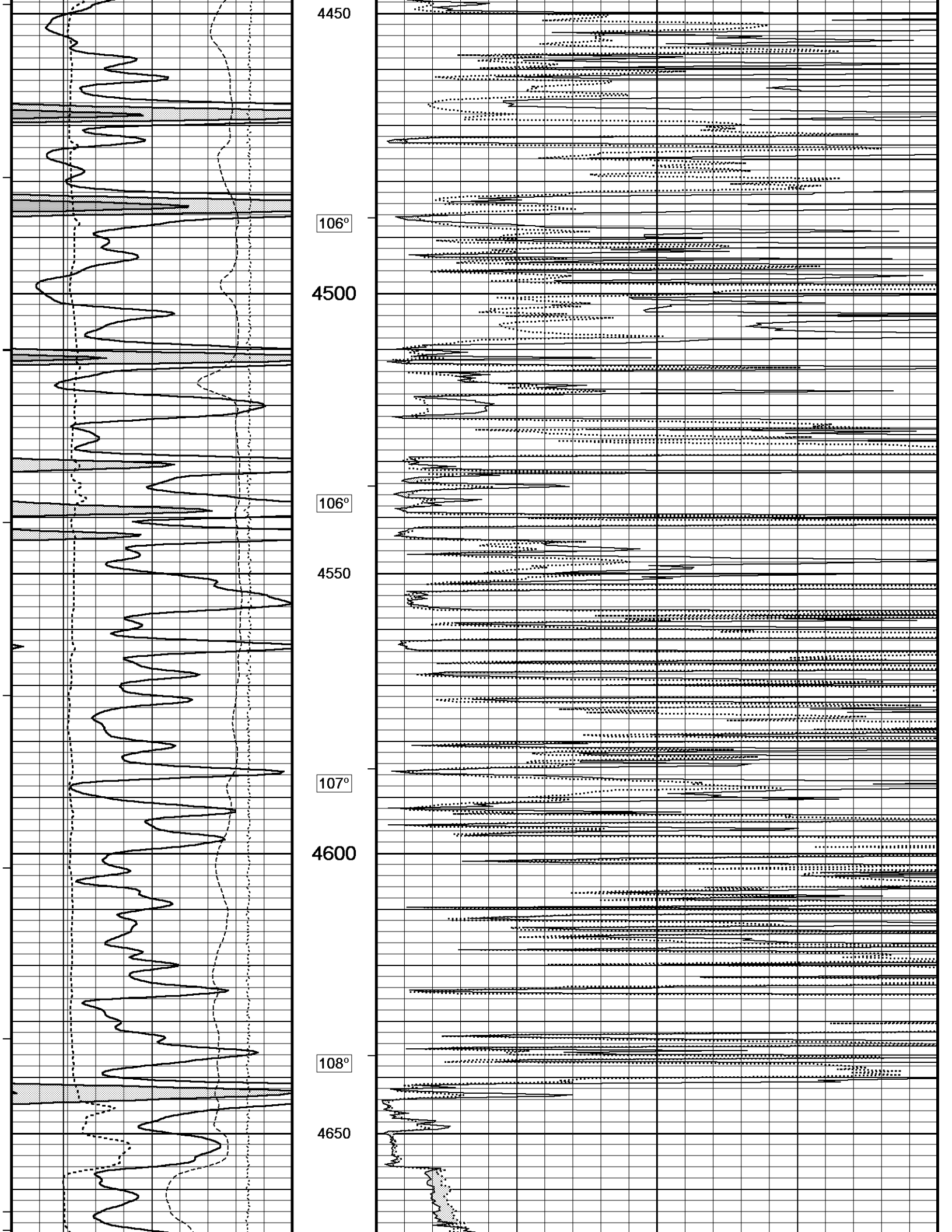


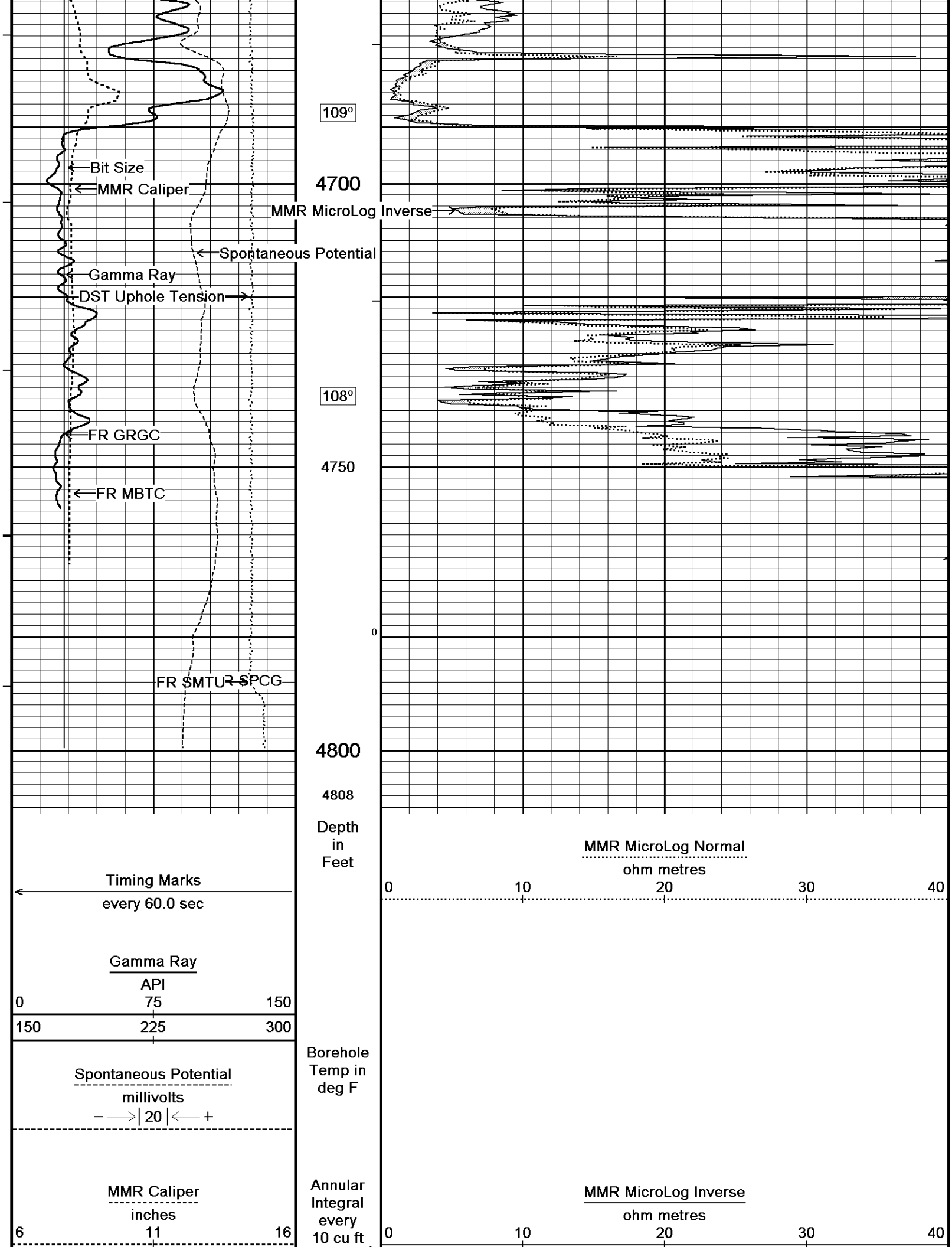

101°
3600
101°
3650
101°
3700
101°
3750
200
101°


101°
3800
101°
3850
102°
3900
Bit Size
MMR Caliper
MMR MicroLog Inverse
MMR MicroLog Normal
Spontaneous Potential
Gamma Ray
DST Uphole Tension
102°
3950
103°
4000


103°
4050
104°
4100
104°
4150
104°
4200


105°
4250
105°
100
4300
Bit Size
MMR Caliper
MMR MicroLog Inverse
MMR MicroLog Normal
Spontaneous Potential
Gamma Ray
DST Uphole Tension
105°
4350
105°
4400
106°


4450
106°
4500
106°
4550
107°
4600
108°
4650


109°
Bit Size
MMR Caliper
4700
MMR MicroLog Inverse
Spontaneous Potential
Gamma Ray
DST Uphole Tension
108°
FR GRGC
4750
FR MBTC
0
FR SMTU
SPCG
4800
4808
Depth in Feet
MMR MicroLog Normal
ohm metres
0
10
20
30
40
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
150
225
300
Borehole Temp in deg F
Spontaneous Potential
millivolts
20
MMR Caliper
inches
6
11
16
Annular Integral every 10 cu ft
MMR MicroLog Inverse
ohm metres
0
10
20
30
40

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 26-NOV-2012 17:07
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Main.dta
Recorded on 25-NOV-2012 14:32
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

5 INCH MAIN

10 INCH HI-RES

Depth Based Data - Maximum Sampling Increment 2.5cm
Plotted on 26-NOV-2012 17:07
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Hi-Res.dta
Recorded on 25-NOV-2012 13:44
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
– 20 +

MMR Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Depth
in
Feet

Borehole
Temp in
deg F

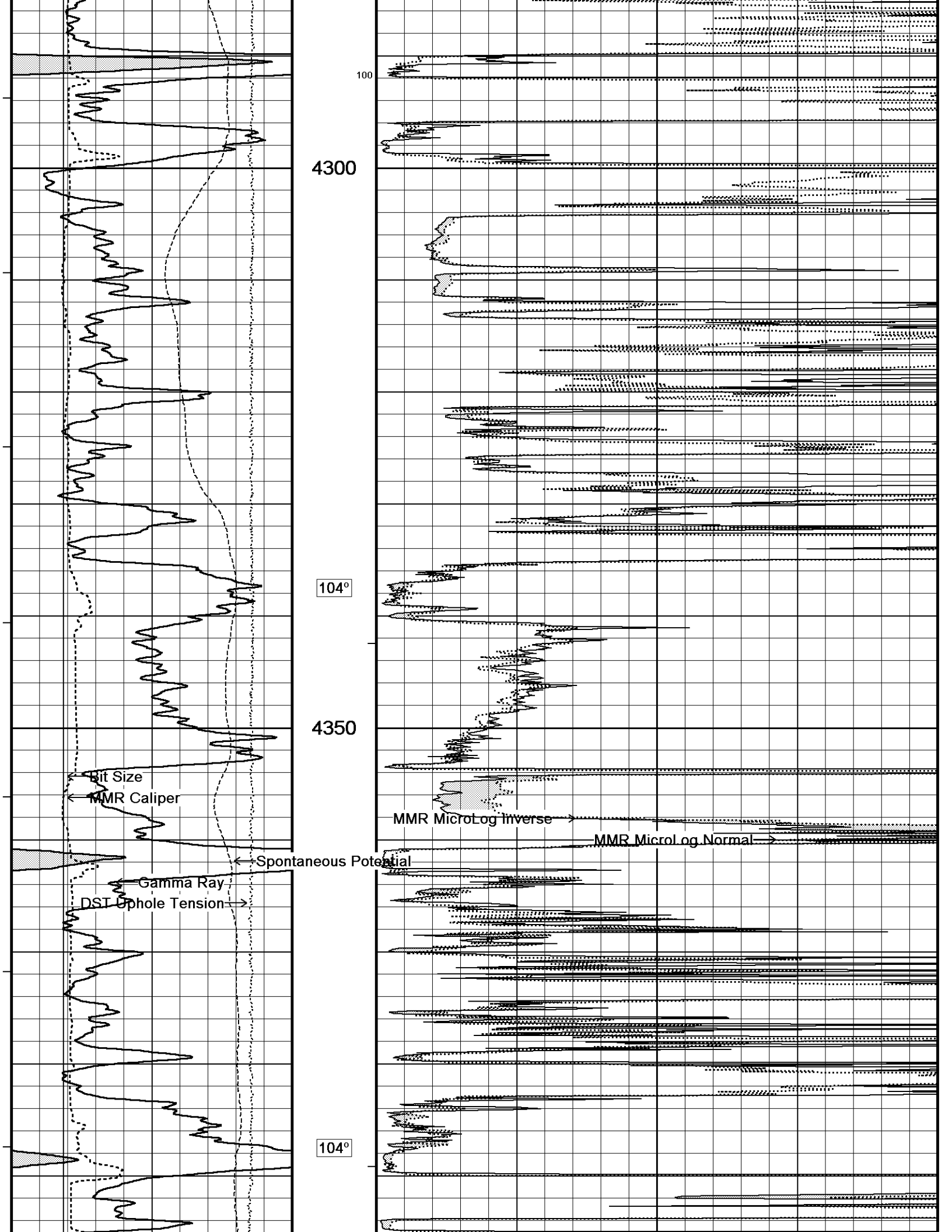
Annular
Integral
every
10 cu ft

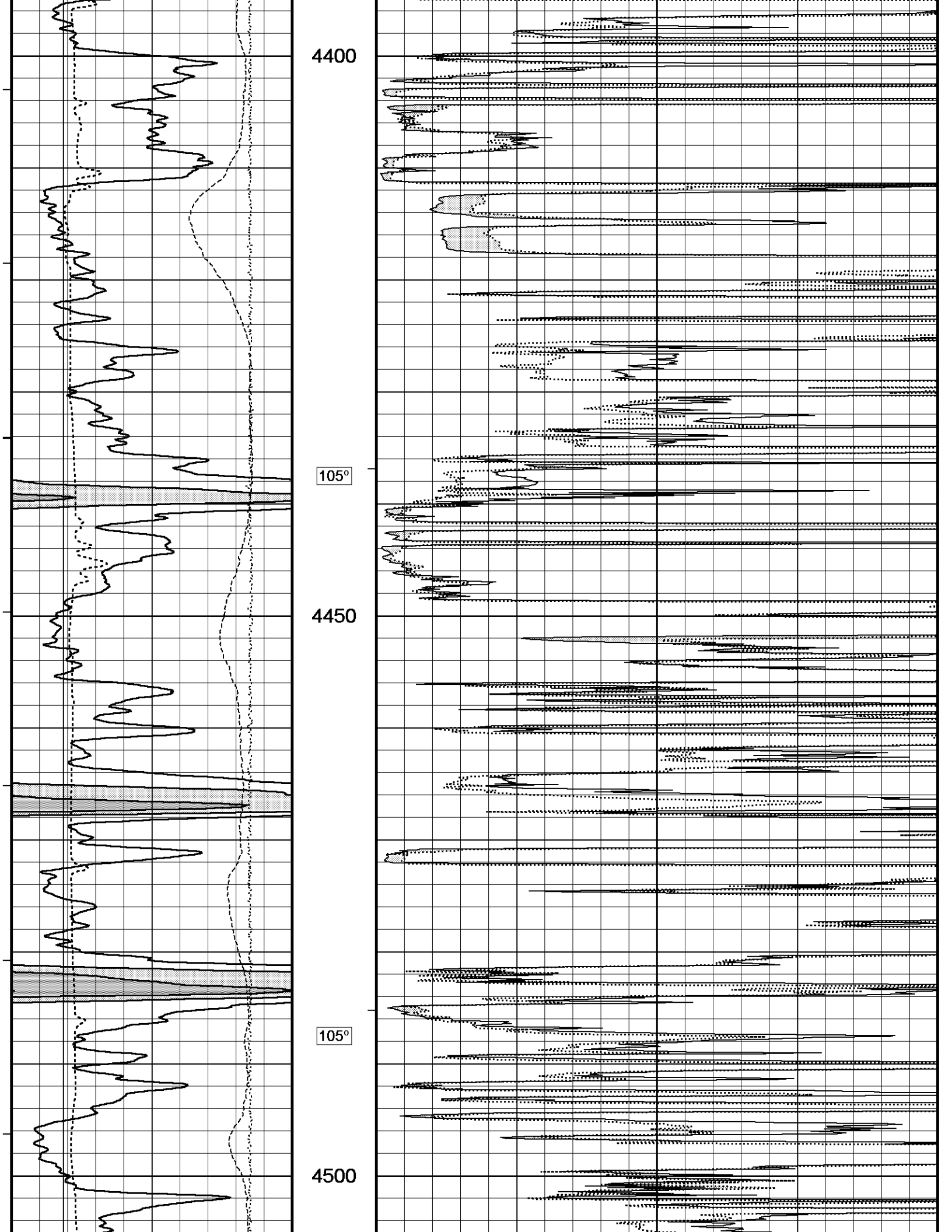
Replay
Scale
1:120

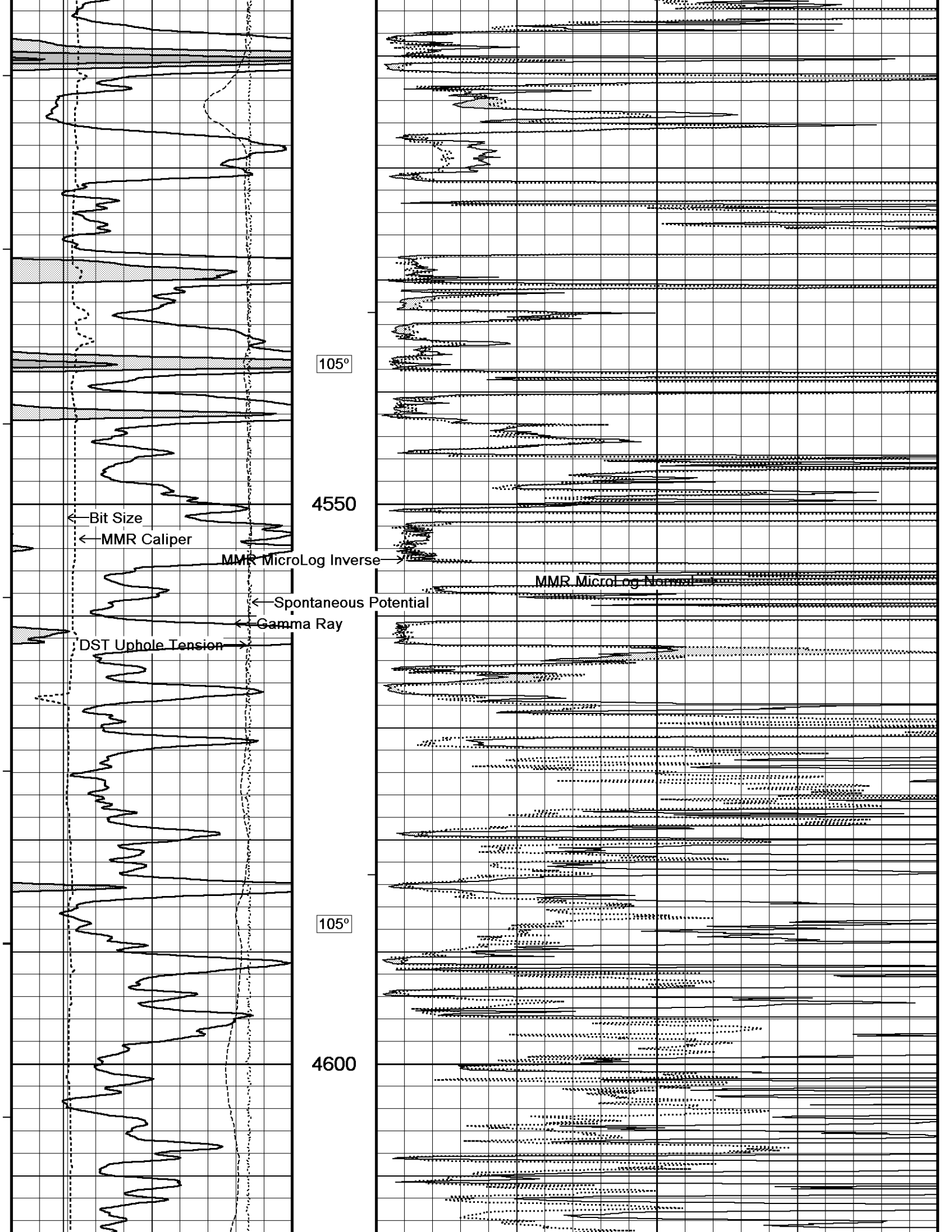
4280

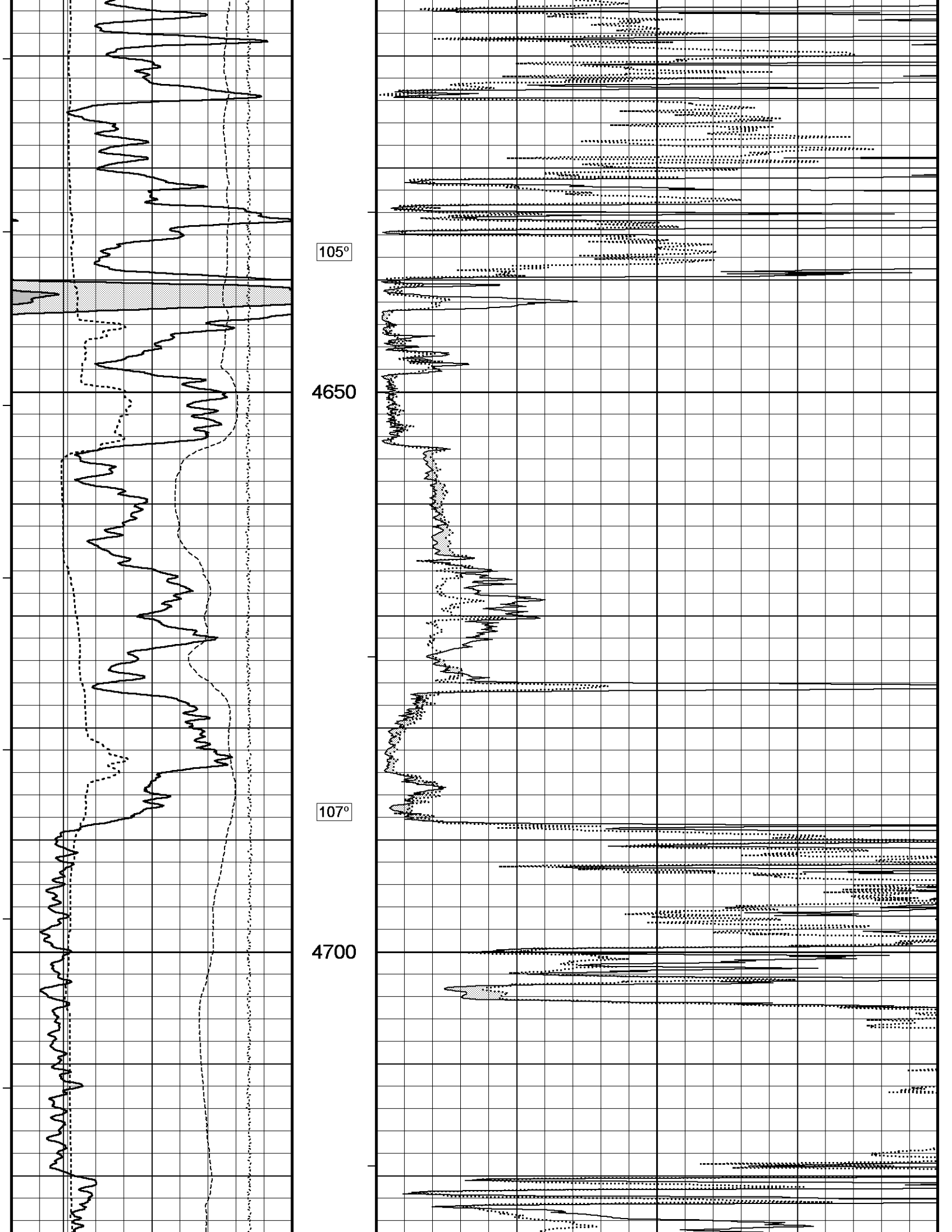
MMR MicroLog Normal
ohm metres
0 10 20 30 40

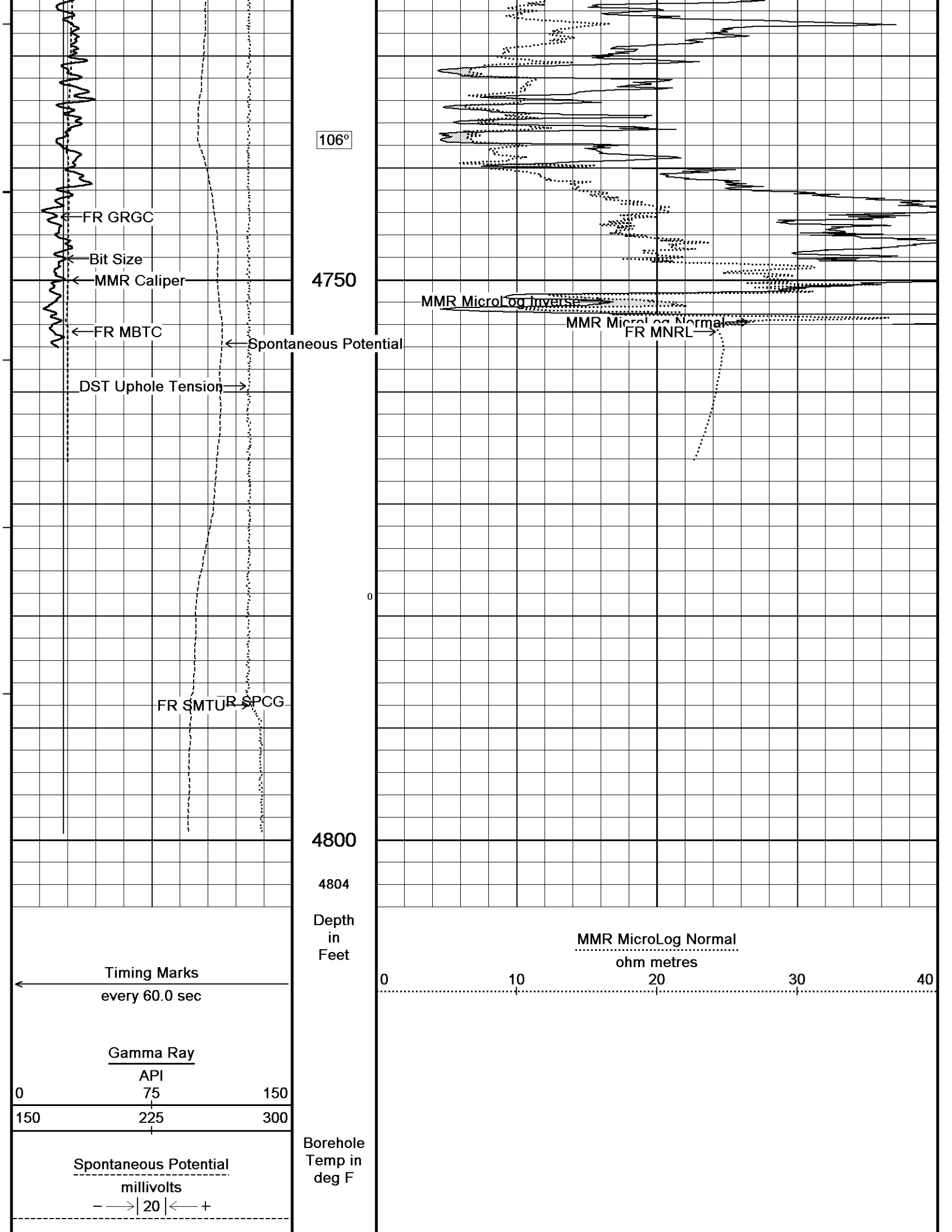
MMR MicroLog Inverse
ohm metres
0 10 20 30 40


100
4300
104°
4350
Bit Size
MMR Caliper
MMR MicroLog Inverse
MMR MicroLog Normal
Spontaneous Potential
Gamma Ray
DST Uphole Tension
104°


4400
105°
4450
105°
4500


105°
4550
Bit Size
MMR Caliper
MMR MicroLog Inverse
MMR MicroLog Normal
Spontaneous Potential
Gamma Ray
DST Uphole Tension
105°
4600


105°
4650
107°
4700


106°
FR GRGC
Bit Size
MMR Caliper
FR MBTC
Spontaneous Potential
DST Uphole Tension
FR SMTU
R SPCG
MMR MicroLog Inverse
MMR MicroLog Normal
FR MNRL
4750
0
4800
4804
Depth
in
Feet
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
150
225
300
Spontaneous Potential
millivolts
− | 20 | +
Borehole
Temp in
deg F
MMR MicroLog Normal
ohm metres
0
10
20
30
40

MMR Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Annular Integral every 10 cu ft

Replay Scale 1:120

MMR MicroLog Inverse
ohm metres
0 10 20 30 40

Depth Based Data - Maximum Sampling Increment 2.5cm
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Hi-Res.dta
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492
Plotted on 26-NOV-2012 17:07
Recorded on 25-NOV-2012 13:44

10 INCH HI-RES

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Rpt.dta
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492
Plotted on 26-NOV-2012 17:07
Recorded on 25-NOV-2012 13:44

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
– → | 20 | ← +

Depth in Feet

Borehole Temp in deg F

MMR MicroLog Normal
ohm metres
0 10 20 30 40

MMR Caliper
inches
6 11 16

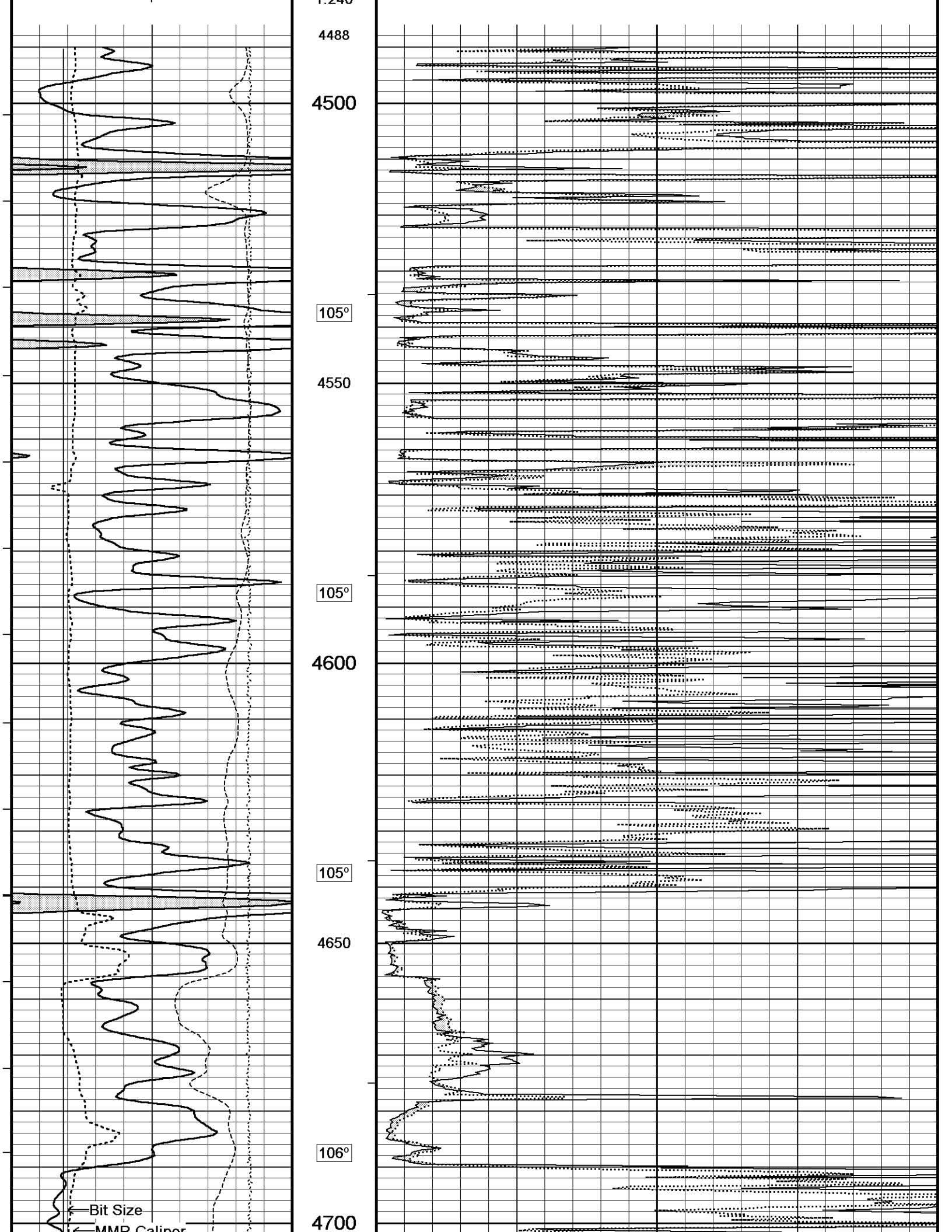
Annular Integral every 10 cu ft

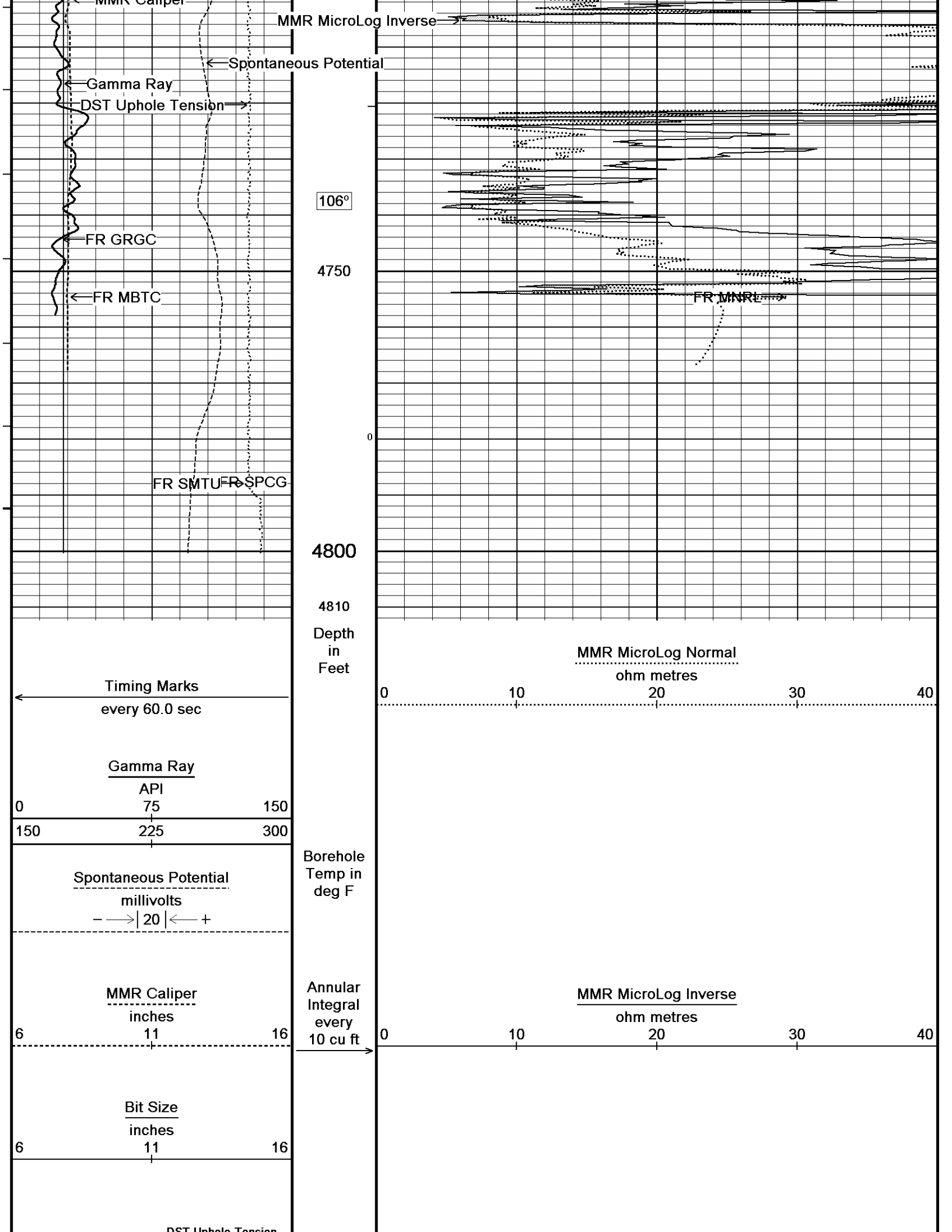
MMR MicroLog Inverse
ohm metres
0 10 20 30 40

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Replay Scale 1:240


4488
4500
105°
4550
105°
4600
105°
4650
106°
4700
Bit Size
MMR Caliper


MMR Caliper
MMR MicroLog Inverse
Spontaneous Potential
Gamma Ray
DST Uphole Tension
106°
FR GRGC
4750
FR MBTC
FR MNRL
FR SMTU
FR SPCG
0
4800
4810
Depth in Feet
MMR MicroLog Normal
ohm metres
0
10
20
30
40
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
150
225
300
Borehole Temp in deg F
Spontaneous Potential
millivolts
− 20 +
MMR Caliper
inches
6
11
16
Annular Integral every 10 cu ft
MMR MicroLog Inverse
ohm metres
0
10
20
30
40
Bit Size
inches
6
11
16
DST Uphole Tension

DST Uphole Tension
pounds
5000 0

Replay Scale 1:240

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 26-NOV-2012 17:07
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Rpt.dta — Recorded on 25-NOV-2012 13:44
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Main.dta

General Constants All 000

Last Edited on 26-NOV-2012,13:35

General Parameters		
Mud Resistivity	0.870	ohm-metres
Mud Resistivity Temperature	80.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	5.500	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. Four Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	

Down-hole Tension Calibration SMS 0

Field Calibration on 25-NOV-2012 13:06

Reading No	Measured	Calibrated (lbs)
1	14358.89	0.00
2	14383.58	396.00

Gamma Calibration MCG-C 208

Field Calibration on 19-NOV-2012 09:54

	Measured	Calibrated (API)
Background	73	51
Calibrator (Gross)	1099	776
Calibrator (Net)	1026	725

Gamma Constants MCG-C 208

Last Edited on 26-NOV-2012,13:35

Gamma Calibrator Number	GR38	
Mud Density	1.13	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

SP Calibration MCG-C 208

Field Calibration on 05-NOV-2012,14:25

	Measured	Calibrated (mV)
Reference 1	100.2	101.0
Reference 2	-101.3	-101.0

High Resolution Temperature Calibration MCG-C 208

Field Calibration on 05-NOV-2012,14:26

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

High Resolution Temperature Constants MCG-C 208

Last Edited on 05-NOV-2012,14:25

Pre-filter Length	11

Caliper Calibration MMR-A 11

Base Calibration on 19-NOV-2012 09:29

Caliper Calibration MMR-A 11

Field Calibration on 19-NOV-2012 09:30

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13673	5.98
2	16880	7.97
3	20107	9.86
4	24060	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

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

Micro Normal and Micro Inverse Calibration MMR-A 11

Base Calibration on 19-NOV-2012 09:34
Field Check on 19-NOV-2012 09:35

Base Calibration

Channel	Measured Resistor 1	Measured Resistor 2	Calibrated (ohm-m) Resistor 1	Calibrated (ohm-m) Resistor 2
Micro Normal	12.3	59.8	5.0	25.0
Micro Inverse	15.5	77.5	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	76.5	76.5
Micro Inverse	58.7	58.7

Micro Normal and Micro Inverse Constants MMR-A 11

Last Edited on 05-NOV-2012,13:54

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	1.0000	
Micro Inverse K Factor	1.0000	
Standoff Offset	0.0000	inches

Micro Laterolog Calibration MMR-A 11

Base Calibration on 31-DEC-1999 00:00
Field Check on 31-DEC-1999 00:00

Base Calibration

Measured Ref 1	Measured Ref 2	Calibrated (ohm-m) Ref 1	Calibrated (ohm-m) Ref 2
0.0	0.0	0.0	0.0

Base Check (ohm-m)	Field Check (ohm-m)
0.0	0.0

Micro Laterolog Constants MMR-A 11

Last Edited on

Pad Type	6 in Solid Nylon B23059	
Micro Laterolog K Factor	0.0128	
Standoff Offset	0.0000	inches

Mudcake Thickness Correction Constants

Mud Cake Source	Constant Value	
Mud Cake Thickness	0.4000	inches
Mud Cake Thickness Caliper		
Mud Cake Resistivity	0.1500	ohm-m
Mud Cake Resistivity Temp.	20.00	Degrees C
Mud Cake Resistivity Source	Constant Value	
Temp. Source Rmc Correc.	MCG External Temperature	

Neutron Calibration MDN-A.B 65

Base Calibration on 05-NOV-2012 09:18
Field Check on 19-NOV-2012 09:59

Base Calibration

	Measured Near	Measured Far	Calibrated (cps) Near	Calibrated (cps) Far
	3015	94	3714	110
Ratio	32.234		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	1713	2459
Ratio	0.697	

Field Check

	Calibrated (cps)	
	1700	2446

Ratio	0.689

Neutron Constants MDN-A.B 65

Last Edited on 19-NOV-2012,09:55

Neutron Source Id	PN-521	
Neutron Jig Number	5824NE	
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	Constant Value	
Formation Pressure	0.00	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-B.J 352

Base Calibration on 05-NOV-2012 14:17
Field Check on 19-NOV-2012 09:43

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	964.3	126.8
Base Check		281.3
Field Check		281.4

FE Constants MFE-B.J 352

Last Edited on 19-NOV-2012,09:42

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	0.5	inches

Induction Calibration MAI-A.A 45

Base Calibration on 05-NOV-2012,09:49
Field Check on 19-NOV-2012 09:41

Base Calibration

Test Loop Calibration

Channel	Measured Low	Measured High	Calibrated (mmho/m) Low	Calibrated (mmho/m) High
1	14.4	472.6	9.3	966.2
2	5.7	374.0	7.6	821.4
3	3.4	261.2	5.2	566.0
4	2.5	133.9	2.6	279.2

Array Temperature 78.4 Deg F

Channel	Base Check (mmho/m) Low	Base Check (mmho/m) High	Field Check (mmho/m) Low	Field Check (mmho/m) High
1	18.9	3852.1	18.8	3850.7
2	31.8	3630.1	31.8	3628.7
3	28.7	3050.1	28.7	3049.0
4	18.4	2079.5	18.3	2079.1
Deep	16.1	1911.5	16.1	1911.2
Medium	42.6	4061.7	42.5	4059.8
Shallow	49.8	5484.4	49.7	5481.7
Array Temperature		67.0		66.0 Deg F

Induction Constants MAI-A.A 45

Last Edited on 19-NOV-2012,09:39

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	

High Resolution Temperature Calibration MAI-A.A 45

Field Calibration on 05-NOV-2012,14:25

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

High Resolution Temperature Constants MAI-A.A 45

Last Edited on 05-NOV-2012,14:25

Pre-filter Length	11

Caliper Calibration MPD-B 31

Base Calibration on 21-NOV-2012 17:11
Field Calibration on 26-NOV-2012 08:56

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	15176	3.99
2	23904	5.98
3	32704	7.97
4	40976	9.86
5	50319	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.97	5.98

Photo Density Calibration MPD-B 31

Base Calibration on 26-NOV-2012 10:46
Field Check on 26-NOV-2012 10:55

Density Calibration

Base Calibration

	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	45785	23214	59556	30836
Reference 2	18987	1938	24941	2541

Field Check at Base

681.6	841.8

Field Check

Field Check	682.6	842.1

PE Calibration

Base Calibration	Measured WS	Measured WH	Measured Ratio	Calibrated Ratio
Background	126	606		
Reference 1	19572	45677	0.431	0.371
Reference 2	5722	18905	0.306	0.272

Field Check at Base		
	125.9	606.3

Field Check		
	127.7	606.4

Density Constants MPD-B 31

Last Edited on 26-NOV-2012,13:34

Density Source Id	254	
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	1.13	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Hybrid	

Matrix Density (gm/cc)	Depth (ft)
2.71	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

DOWNHOLE EQUIPMENT

C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Reprocessed Main.dta

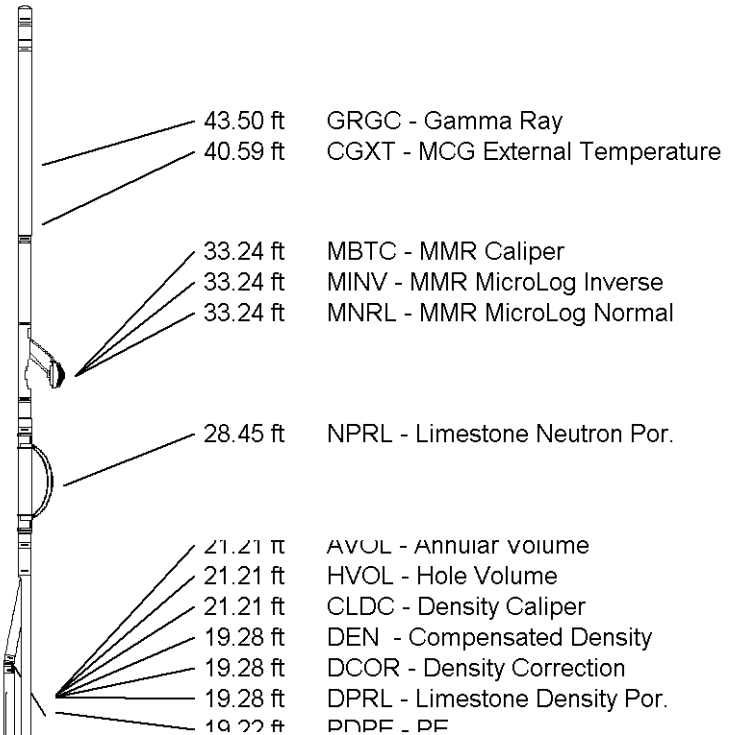
3/8" Triple Cone Cable Head (MCB C A)
MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-Resistivity
MMR-A 11 LG: 8.59 ft WT: 81.6 lb OD: 4.88 in

Compact Neutron
MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

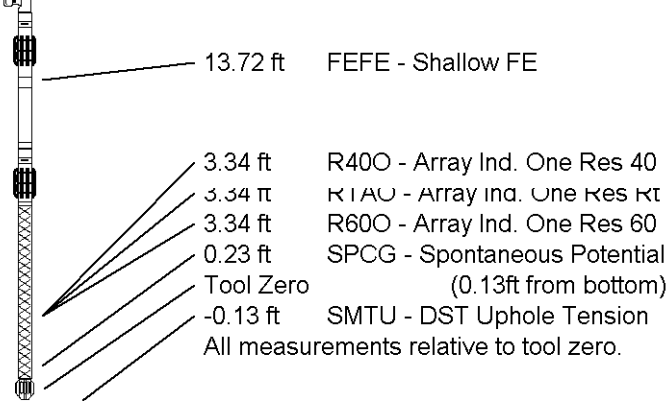
Compact Density/Caliper
MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in



Compact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 50.36 ft Weight: 399.0 lb



COMPANY	CHOLLA PRODUCTION LLC.
WELL	BONTRAGER RT #1-32
FIELD	GRUBEN EAST
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2991.00	feet	First Reading	4755.00	feet
Elevation Drill Floor	2990.00	feet	Depth Driller	4790.00	feet
Elevation Ground Level	2986.00	feet	Depth Logger	4788.00	feet

Weatherford®

MICRORESISTIVITY LOG

Weatherford®

REPEAT SECTION
HIGH RESOLUTION SECTION

COMPANY	CHOLLA PRODUCTION LLC.
WELL	BONTRAGER RT #1-32
FIELD	GRUBEN EAST
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	400' FNL & 2549' FEL

SEC	TWP	RGE	Other Services
32	19S	33W	

API Number 15-171-20916
Permit Number

Permanent Datum G.L., Elevation 2986 feet
Log Measured From KB
Drilling Measured From K.B. @ 5 FEET

Elevations:	feet
KB	2991.00
DF	2990.00
GL	2986.00

Date	25-NOV-2012			
Run Number	ONE			
Service Order	3538952			
Depth Driller	4790.00	feet		
Depth Logger	4788.00	feet		
First Reading	4788.00	feet		
Last Reading	4490.00	feet		
Casing Driller	259.00	feet		
Casing Logger	260.00	inches		
Bit Size	7.875			
Hole Fluid Type	CHEMICAL	lb/USg		
Density / Viscosity	9.40 lb/USg	50.00 CP		
PH / Fluid Loss	9.00	9.00		
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.87 @ 80.0	ohm-m		
Rmf @ Measured Temp	0.70 @ 80.0	ohm-m		
Rmc @ Measured Temp	1.04 @ 80.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.64 @108.0	ohm-m		
Time Since Circulation	3 HOURS			
Max Recorded Temp	108.00	deg F		
Equipment / Base	13057	LIB		
Recorded By	R. HOFFMAN			
Witnessed By	BILL GOFF			
S.O.# / JOB#	LB12-308			

Depth Based Data - Maximum Sampling Increment 10.0cm
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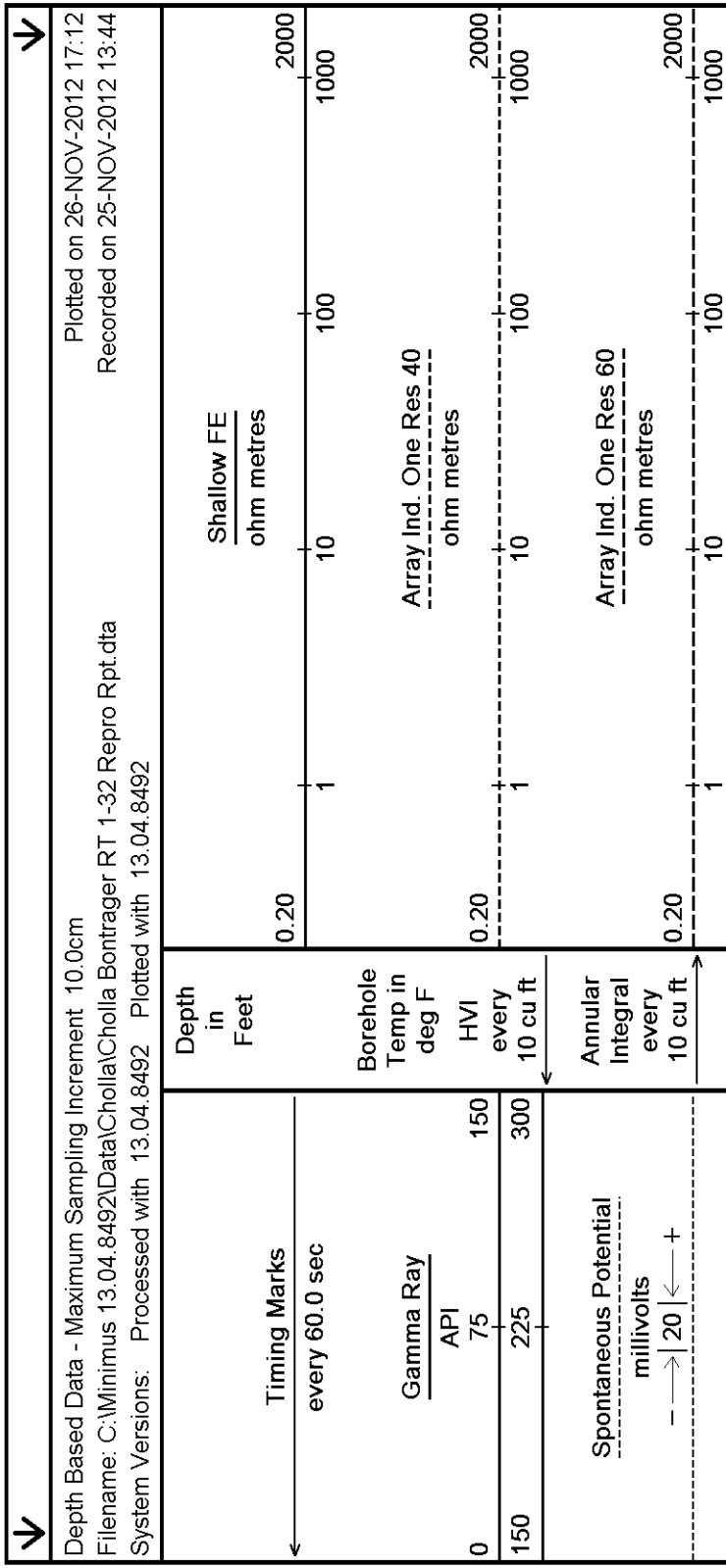
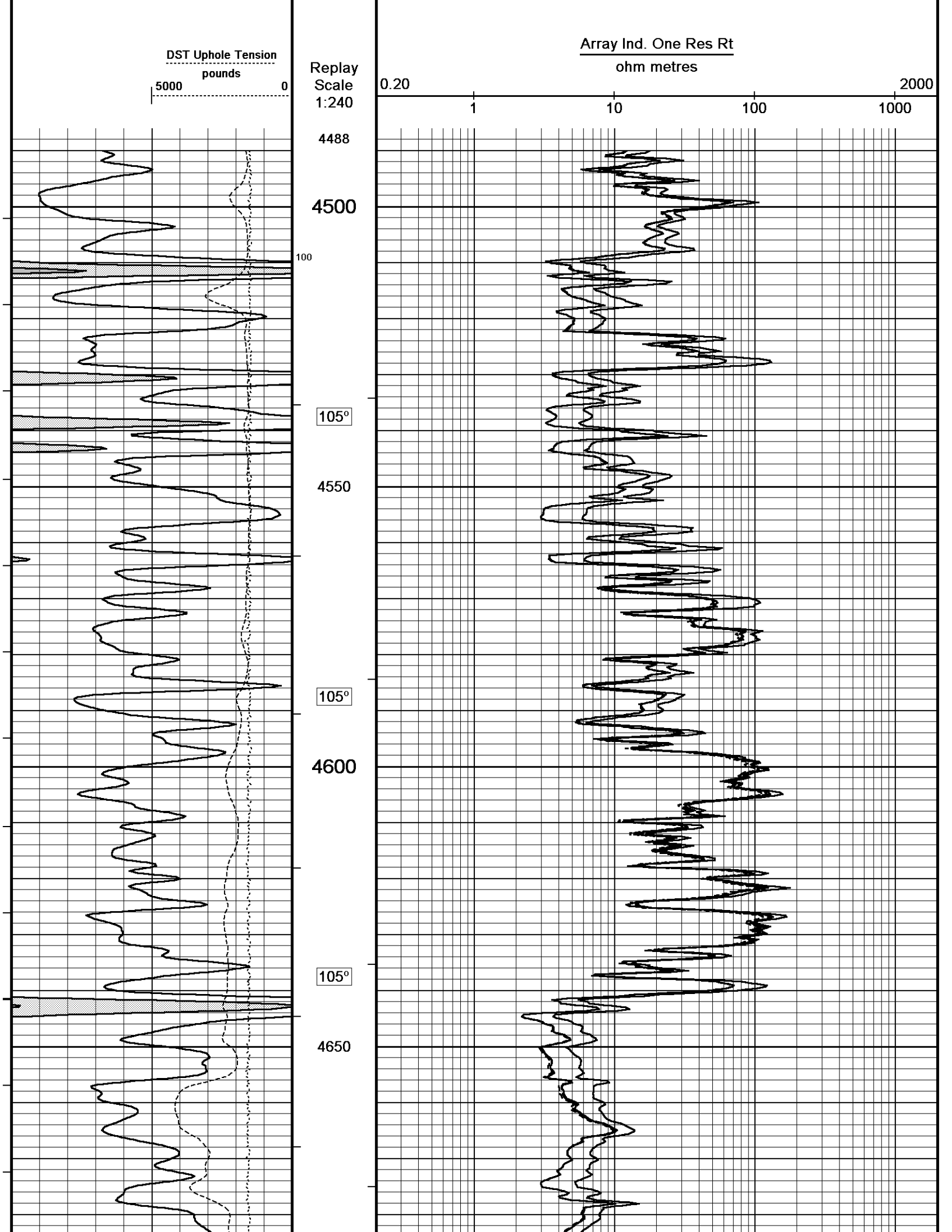
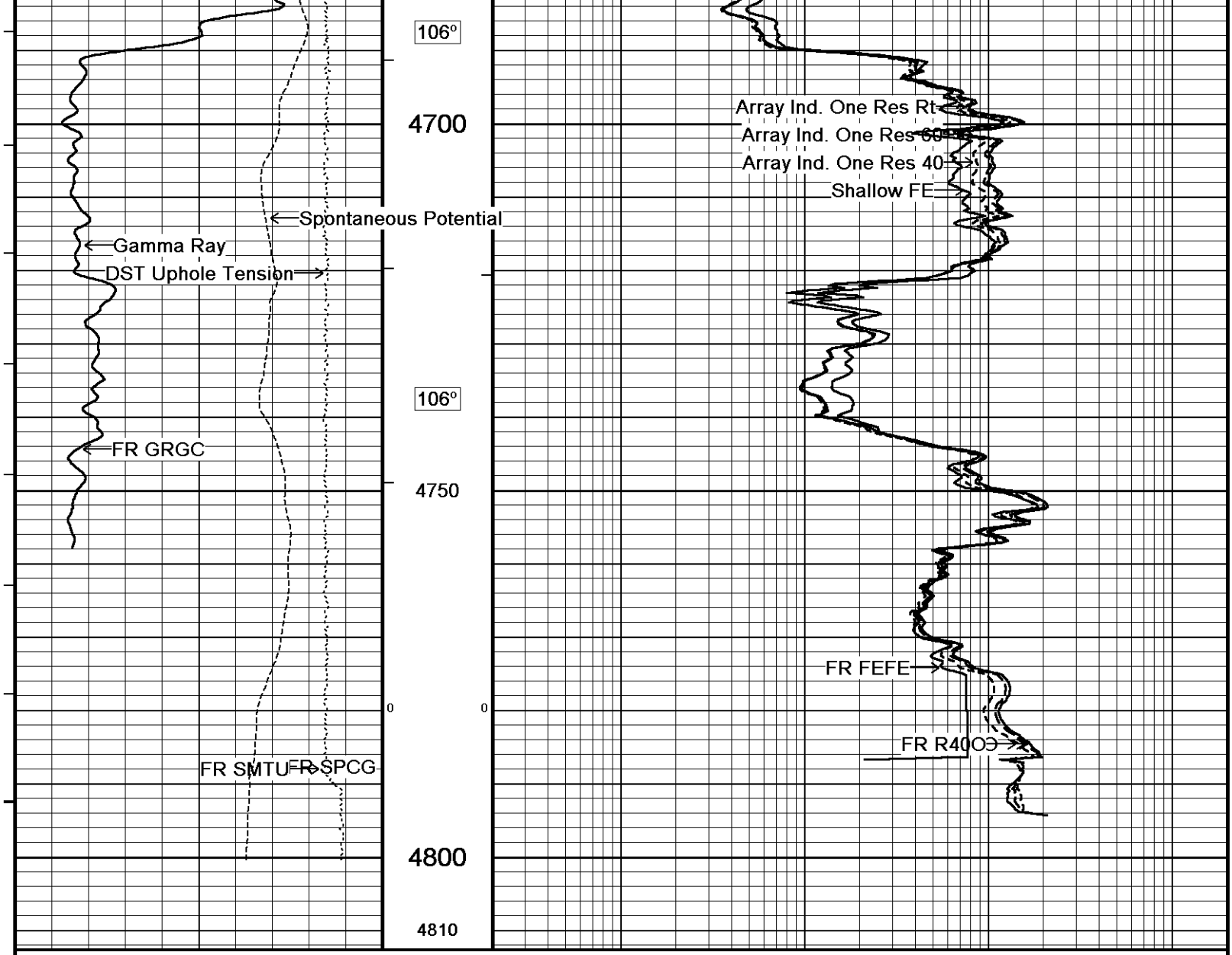
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Plotted on 26-NOV-2012 17:12
Recorded on 25-NOV-2012 13:44




DST Uphole Tension
pounds
5000
0
Replay
Scale
1:240
Array Ind. One Res Rt
ohm metres
0.20
2000
1
10
100
1000
4488
4500
100
105°
4550
105°
4600
105°
4650



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 26-NOV-2012 17:12
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System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Timing Marks
every 60.0 sec

Depth in Feet

Limestone Neutron Por.
percent
30 20 10 0 -10

Gamma Ray
API
0 75 150
150 225 300

Borehole Temp in deg F

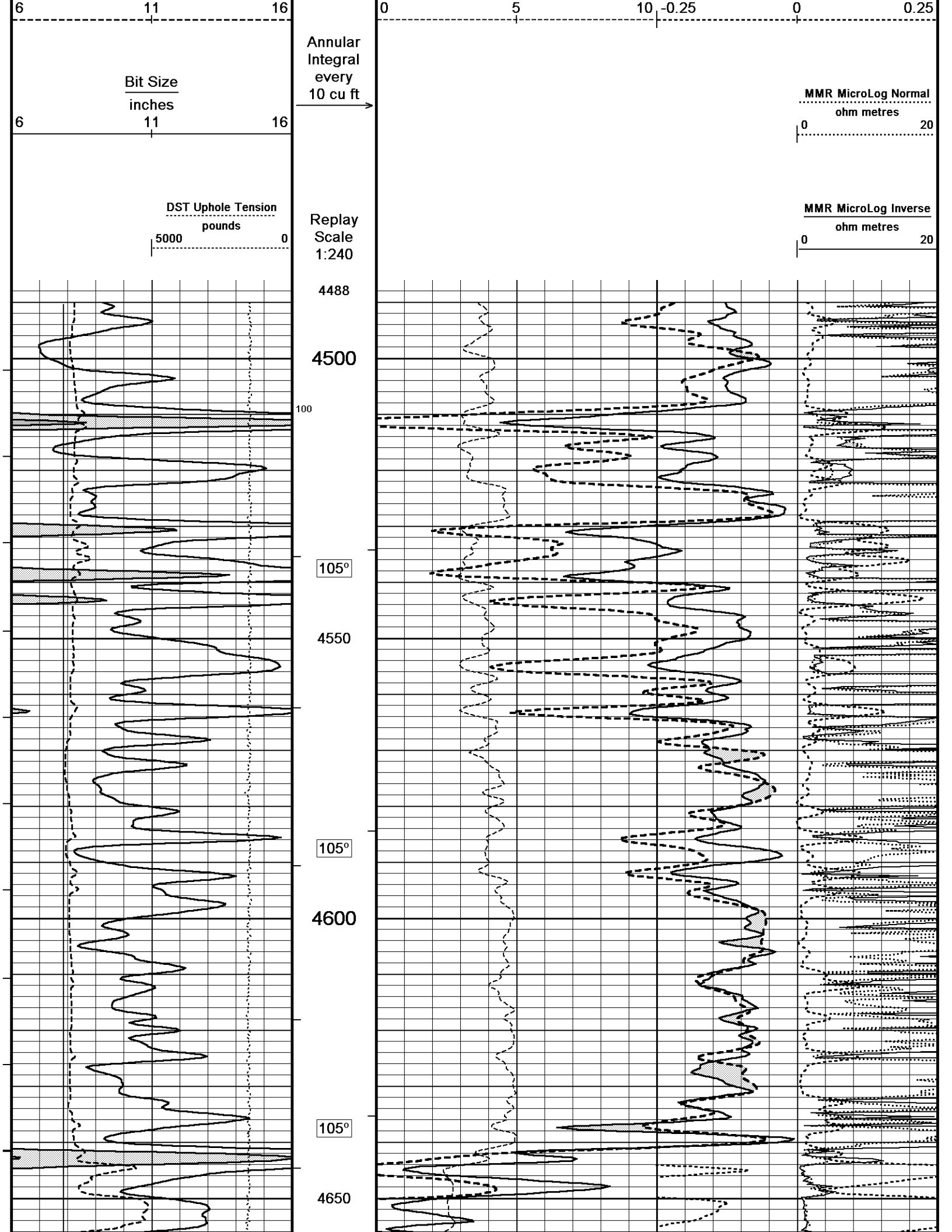
Limestone Density Por.
percent
30 20 10 0 -10

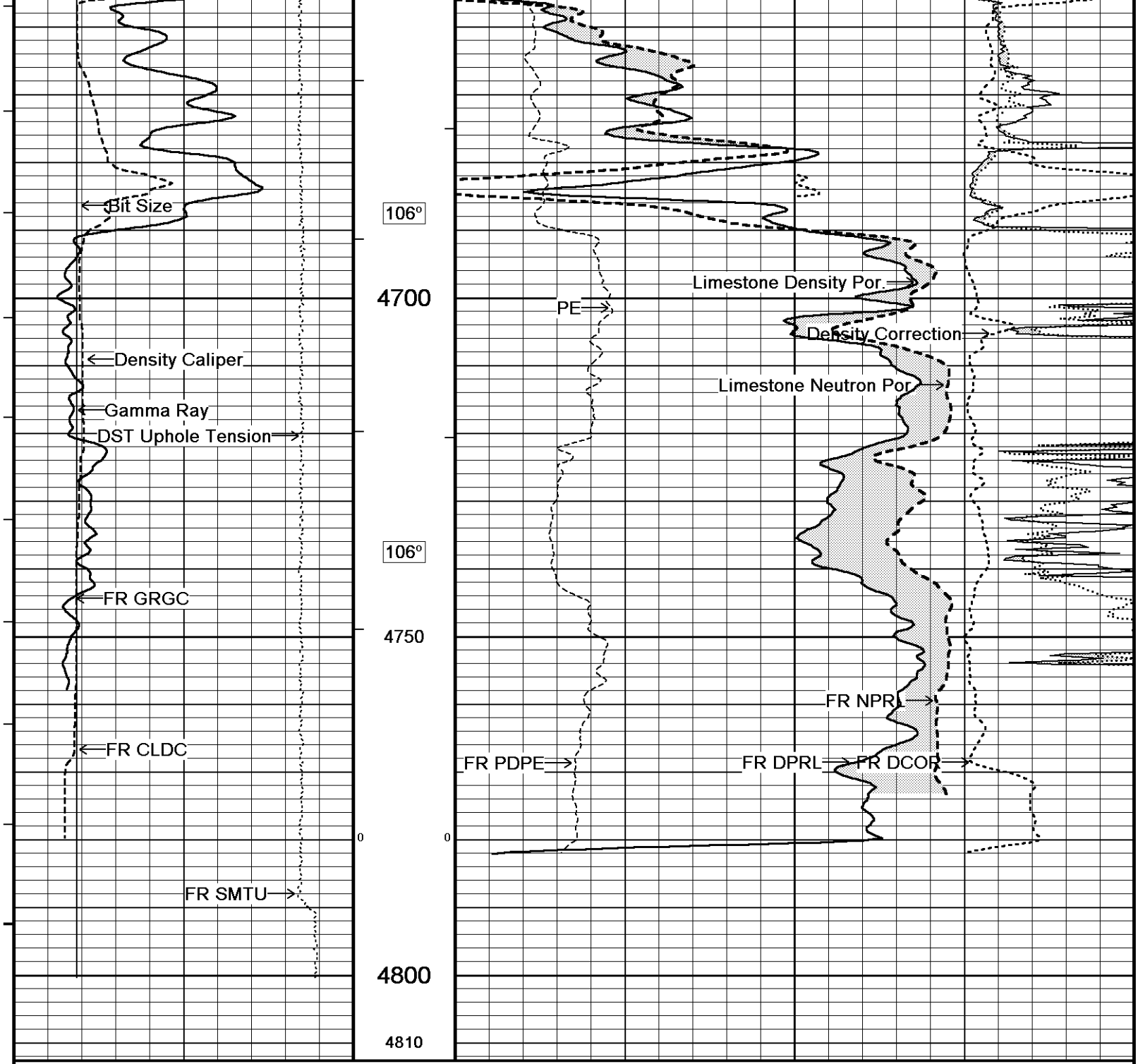
Density Caliper
inches

HVI
every
10 cu ft

PE
barns/electron

Density Correction
grams/cc


6
11
16
Bit Size
inches
6
11
16
Annular
Integral
every
10 cu ft
0
5
10
-0.25
0
0.25
MMR MicroLog Normal
ohm metres
0
20
MMR MicroLog Inverse
ohm metres
0
20
DST Uphole Tension
pounds
5000
0
Replay
Scale
1:240
4488
4500
100
105°
4550
105°
4600
105°
4650



Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 26-NOV-2012 17:12
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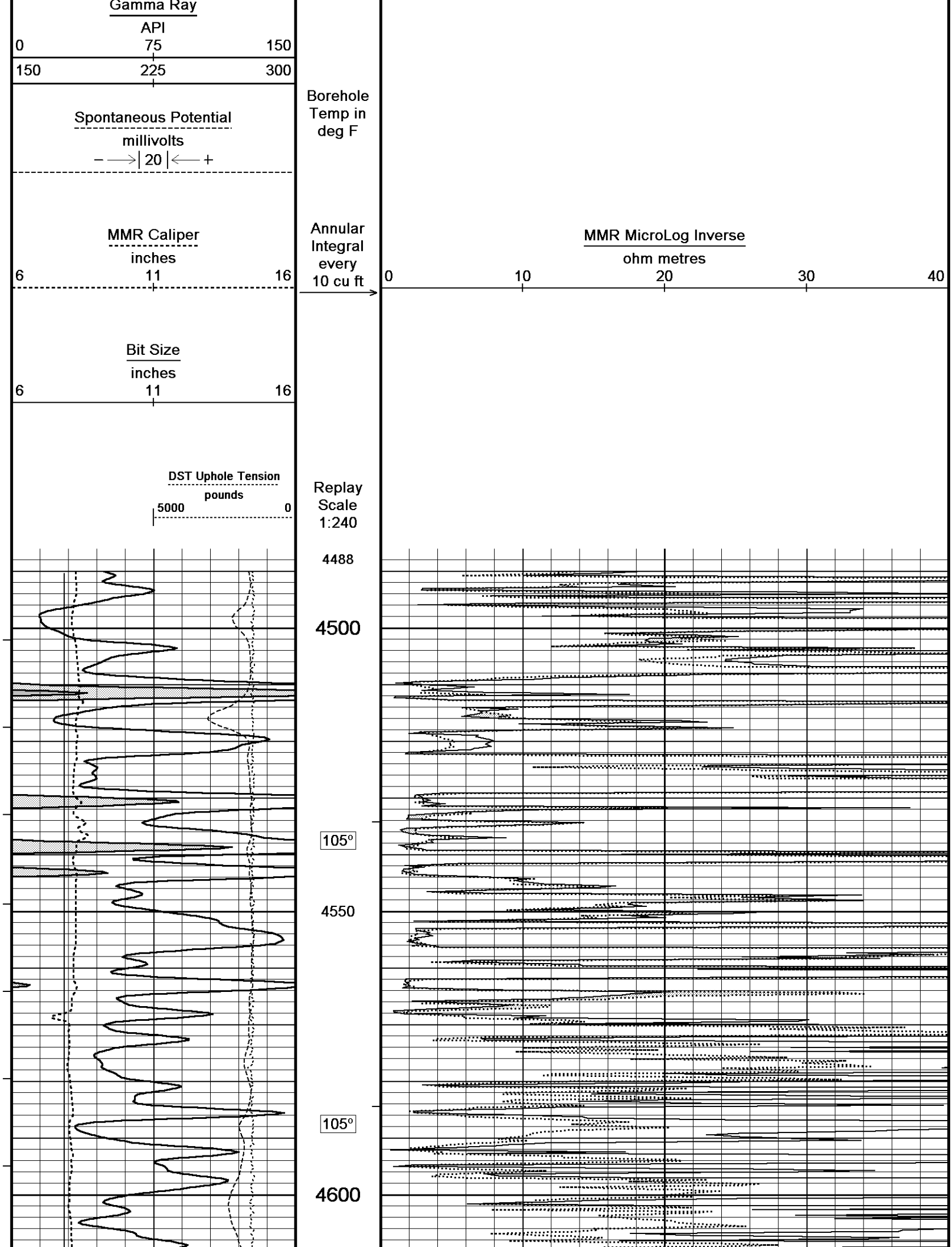
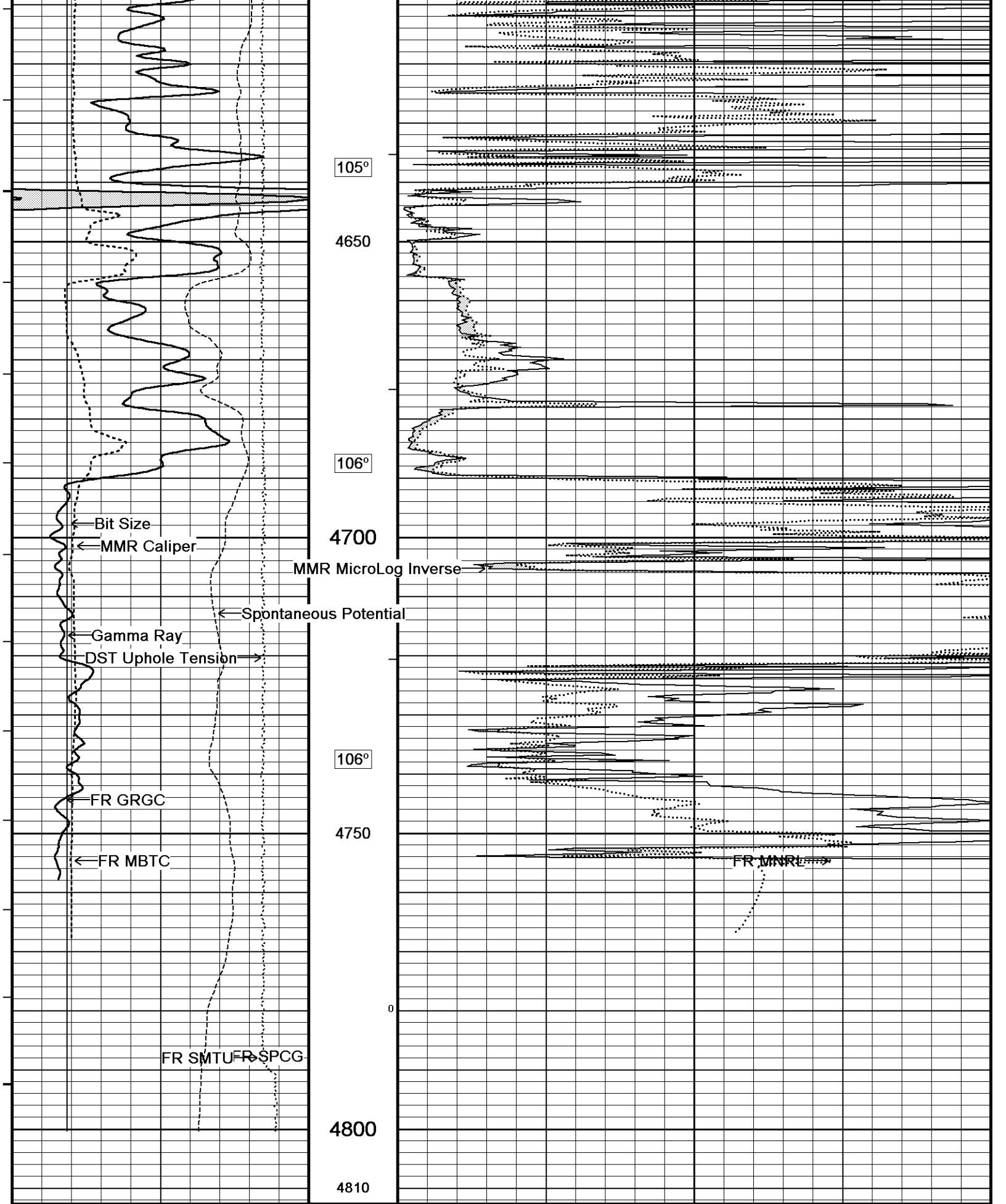
Recorded on 25-NOV-2012 13:44
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Timing Marks
every 60.0 sec

Depth
in
Feet

MMR MicroLog Normal
ohm metres
0 10 20 30 40


Gamma Ray
API
0
75
150
150
225
300
Spontaneous Potential
millivolts
− 20 +
MMR Caliper
inches
6
11
16
Bit Size
inches
6
11
16
DST Uphole Tension
pounds
5000
0
Borehole Temp in deg F
Annular Integral every 10 cu ft
Replay Scale 1:240
MMR MicroLog Inverse
ohm metres
0
10
20
30
40
4488
4500
105°
4550
105°
4600



Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 26-NOV-2012 17:12
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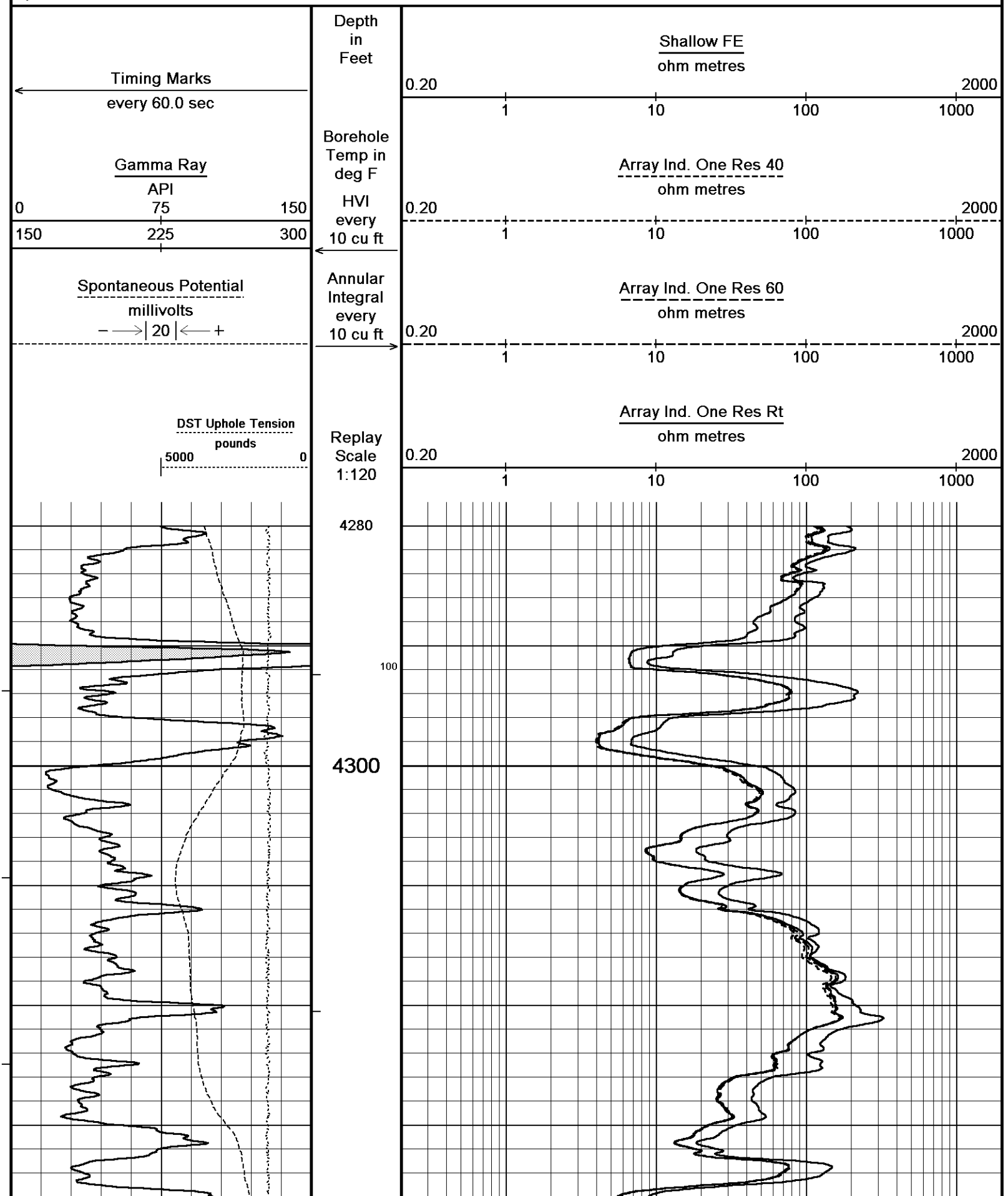
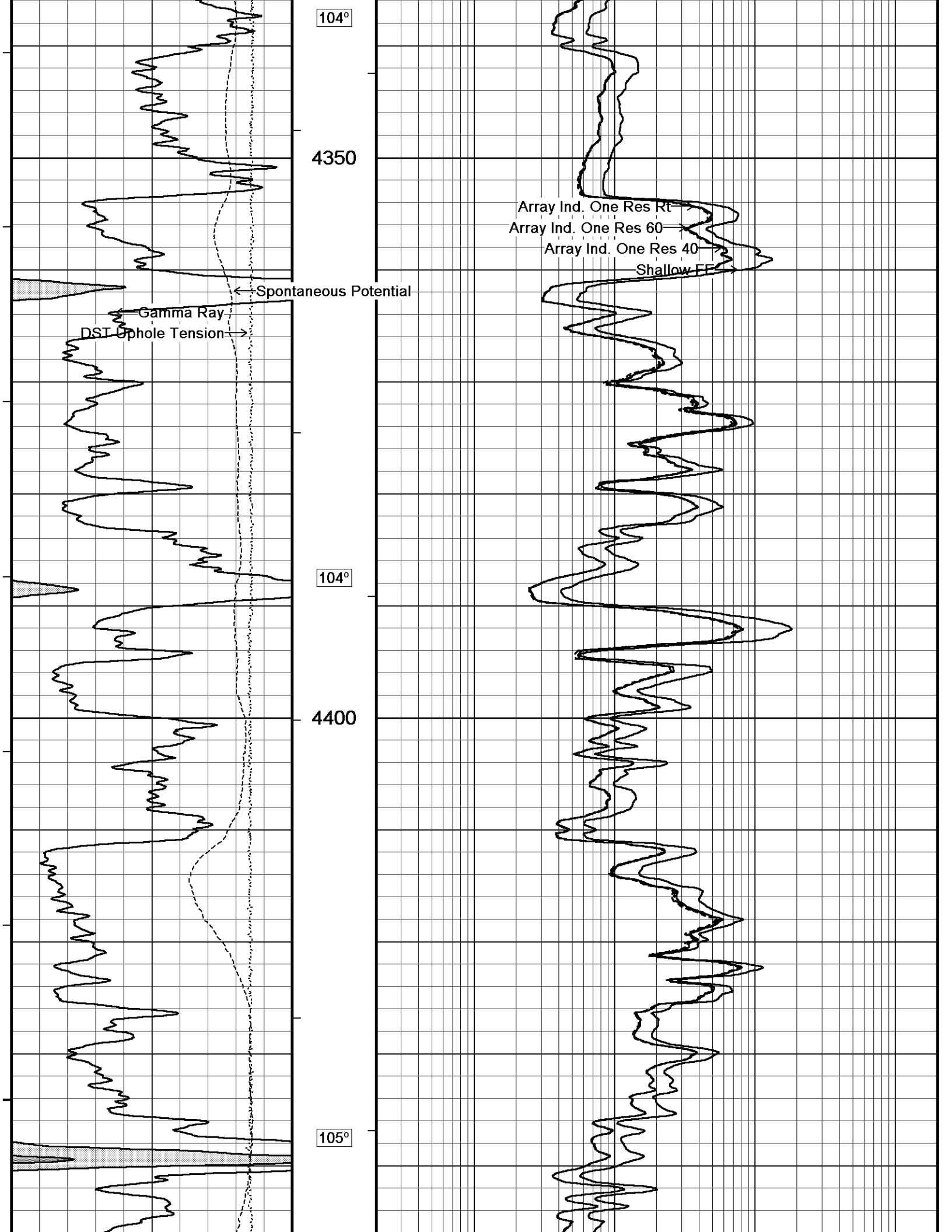
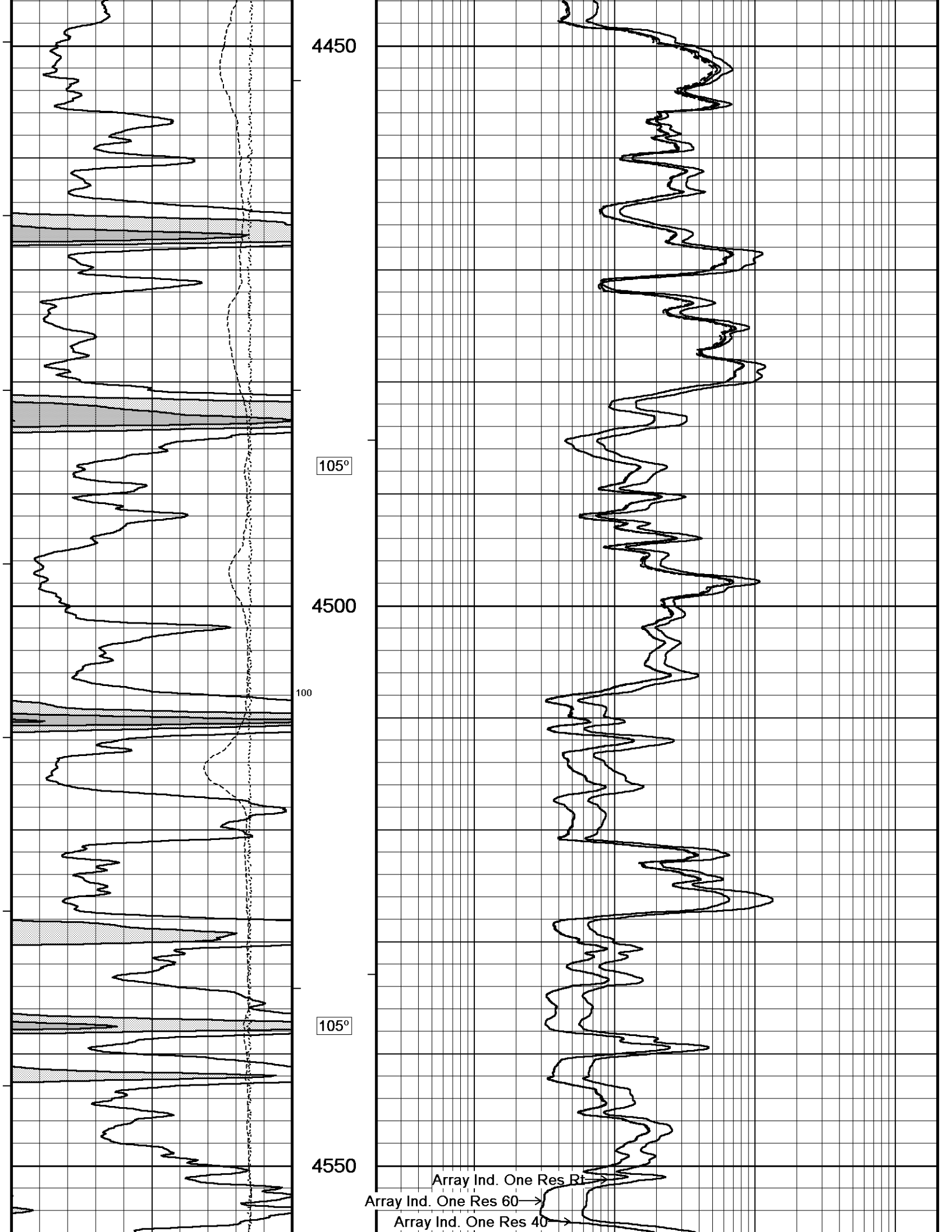
Recorded on 25-NOV-2012 13:44
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

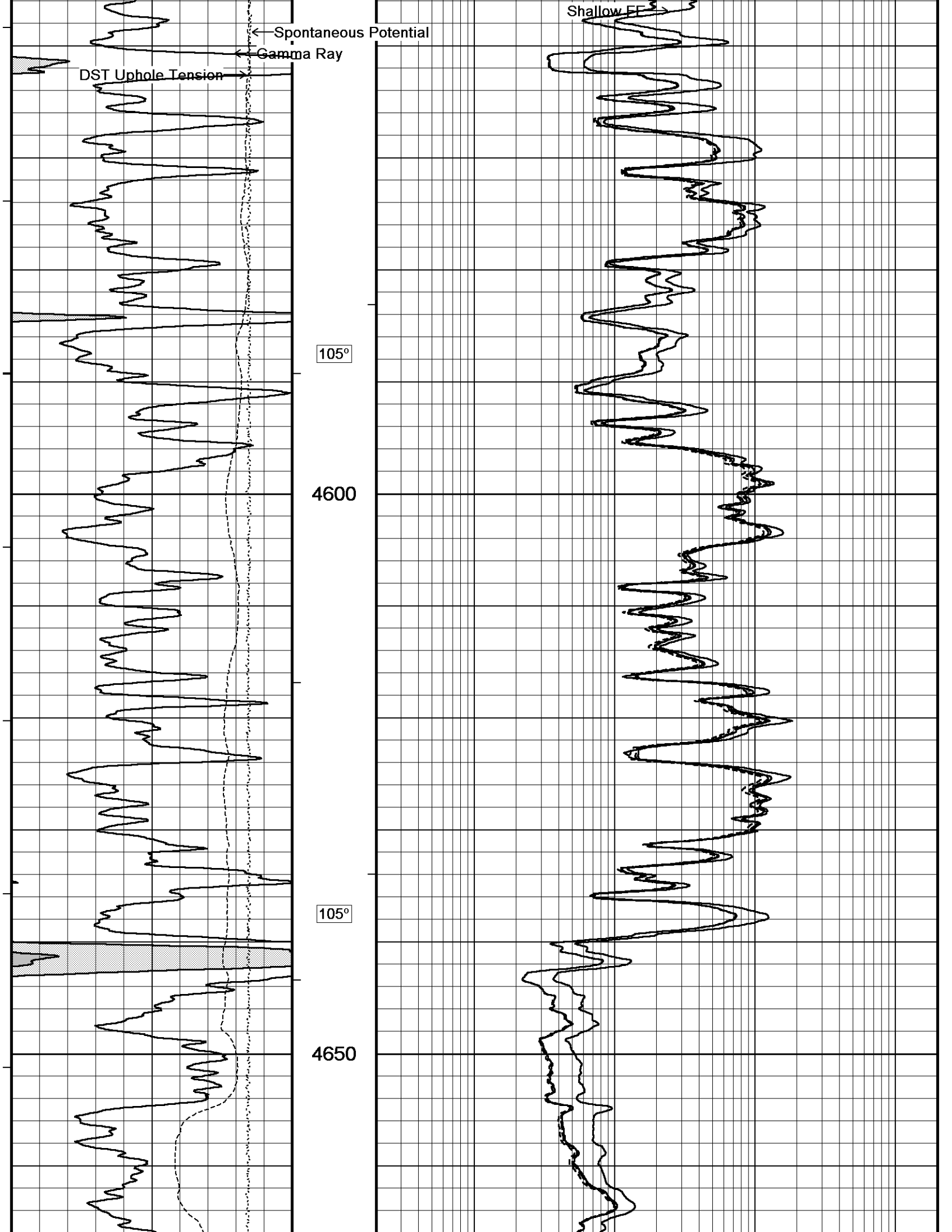
Depth Based Data - Maximum Sampling Increment 2.5cm
Filename: C:\Minimus 13.04.8492\Data\Cholla\Cholla Bontrager RT 1-32 Repro Hi-Res.dta
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

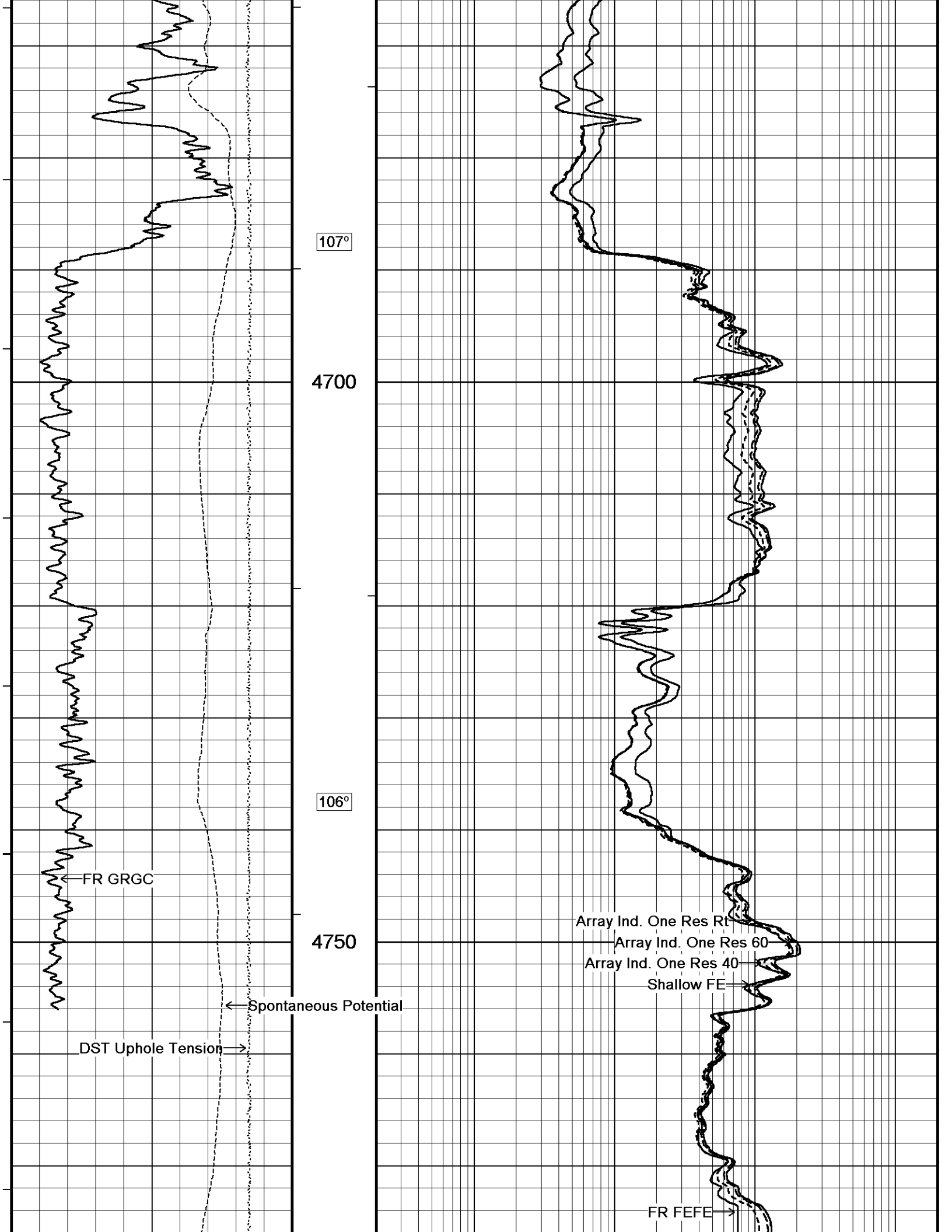
Plotted on 26-NOV-2012 17:12
Recorded on 25-NOV-2012 13:44

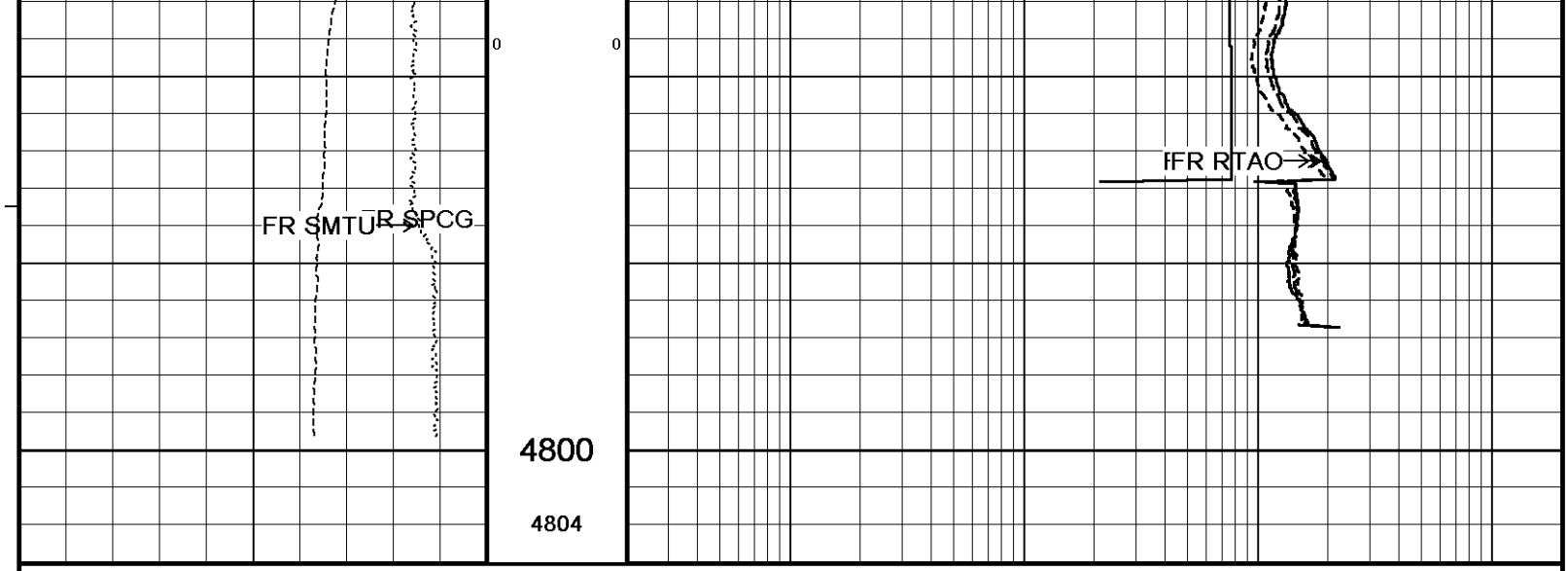



104°
4350
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FF
Spontaneous Potential
Gamma Ray
DST Uphole Tension
104°
4400
105°


4450
105°
4500
100
105°
4550
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40


Spontaneous Potential
Gamma Ray
DST Uphole Tension
Shallow FE
105°
4600
105°
4650


107°
4700
106°
4750
FR GRGC
Spontaneous Potential
DST Uphole Tension
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
FR FEFE



Depth Based Data - Maximum Sampling Increment 2.5cm
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System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

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Recorded on 25-NOV-2012 13:44

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Plotted on 26-NOV-2012 17:12
Recorded on 25-NOV-2012 13:44

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Density Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:120

4280

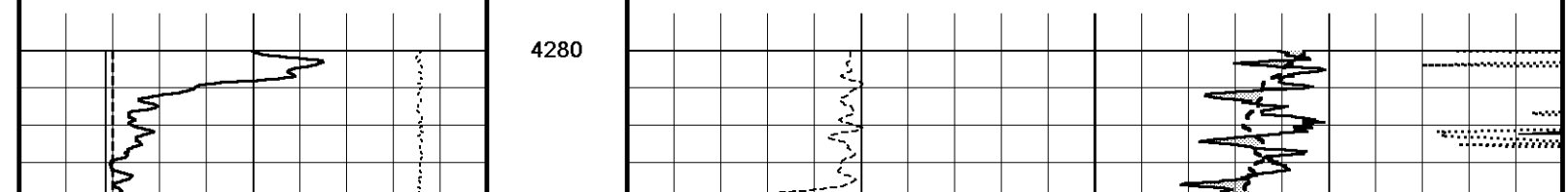
Limestone Neutron Por.
percent
30 20 10 0 -10

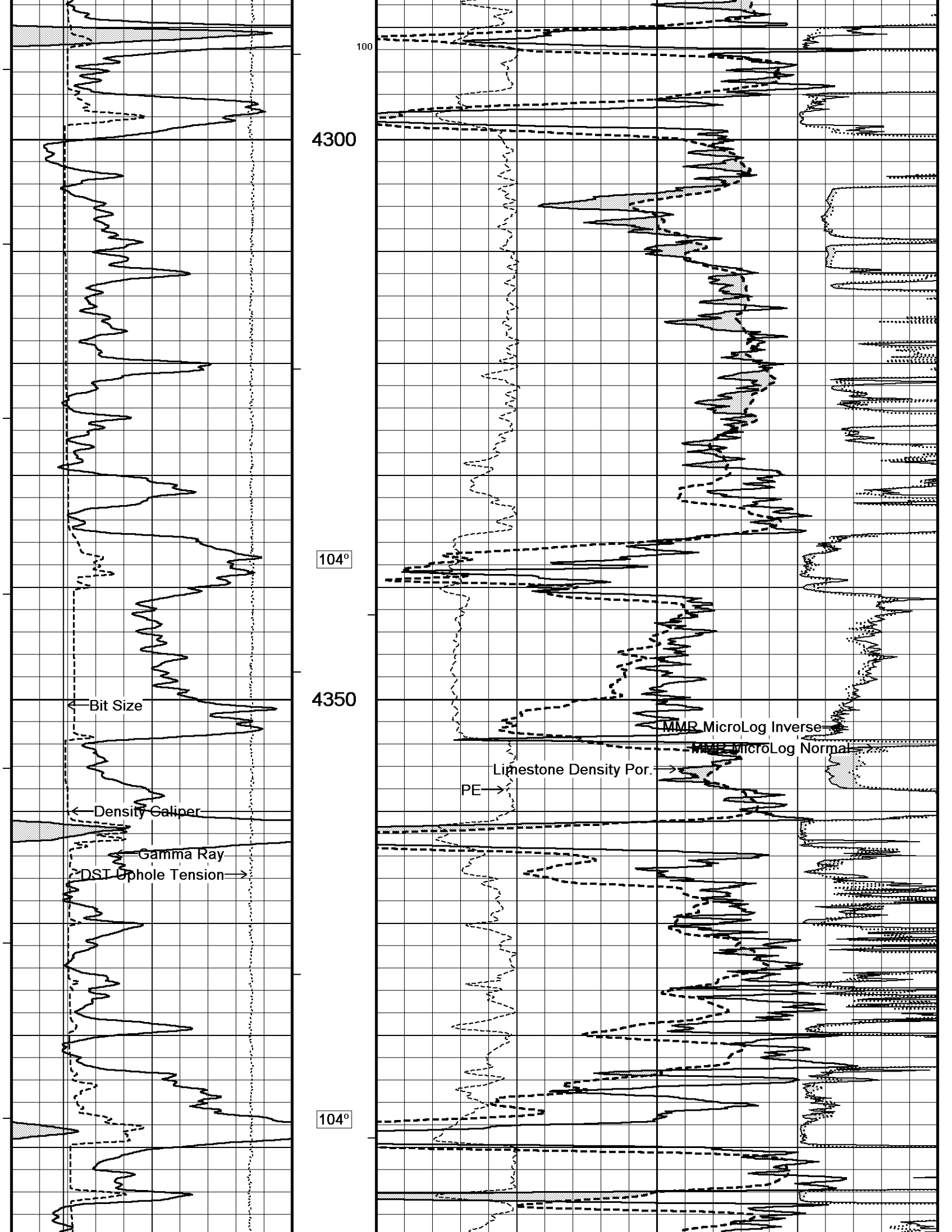
Limestone Density Por.
percent
30 20 10 0 -10

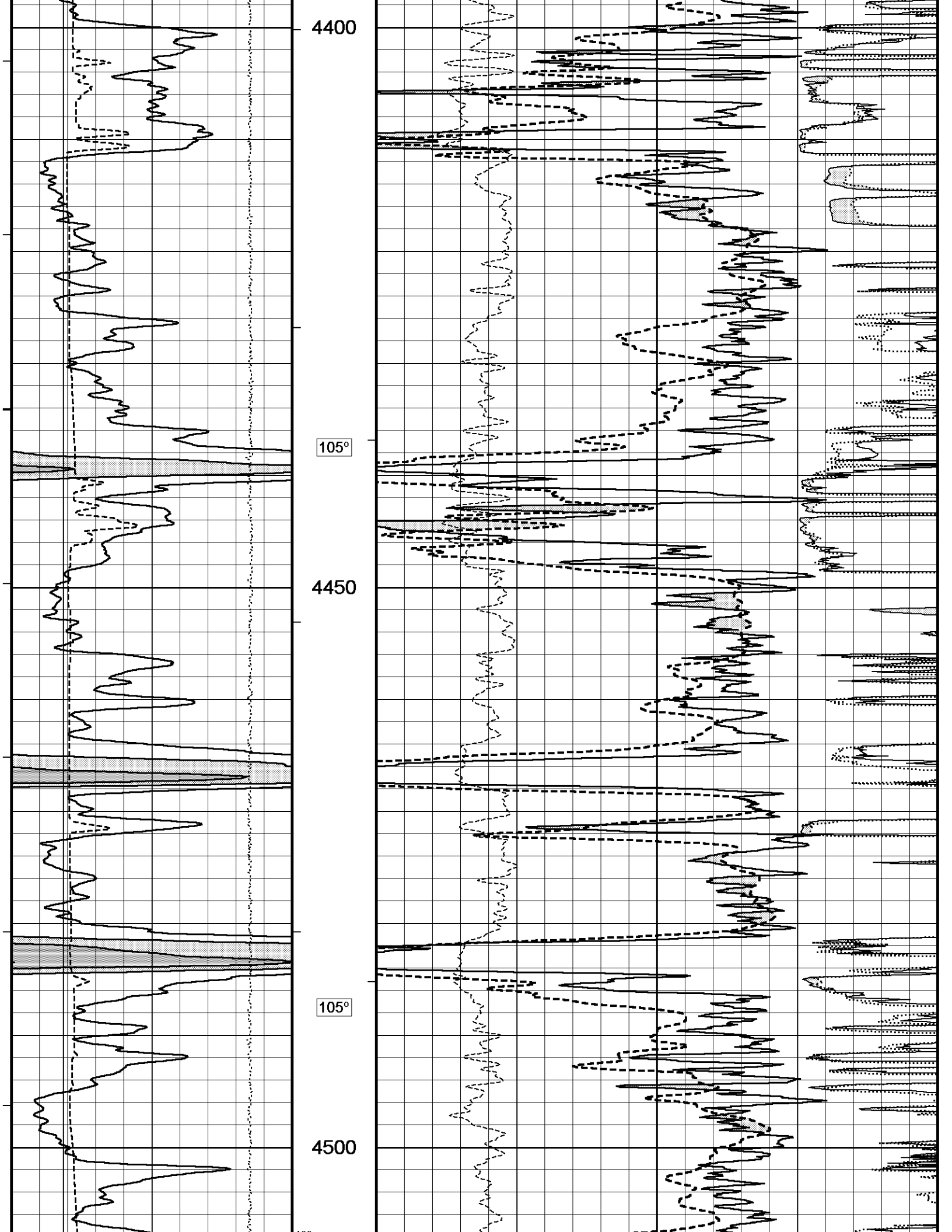
PE
barns/electron
0 5 10

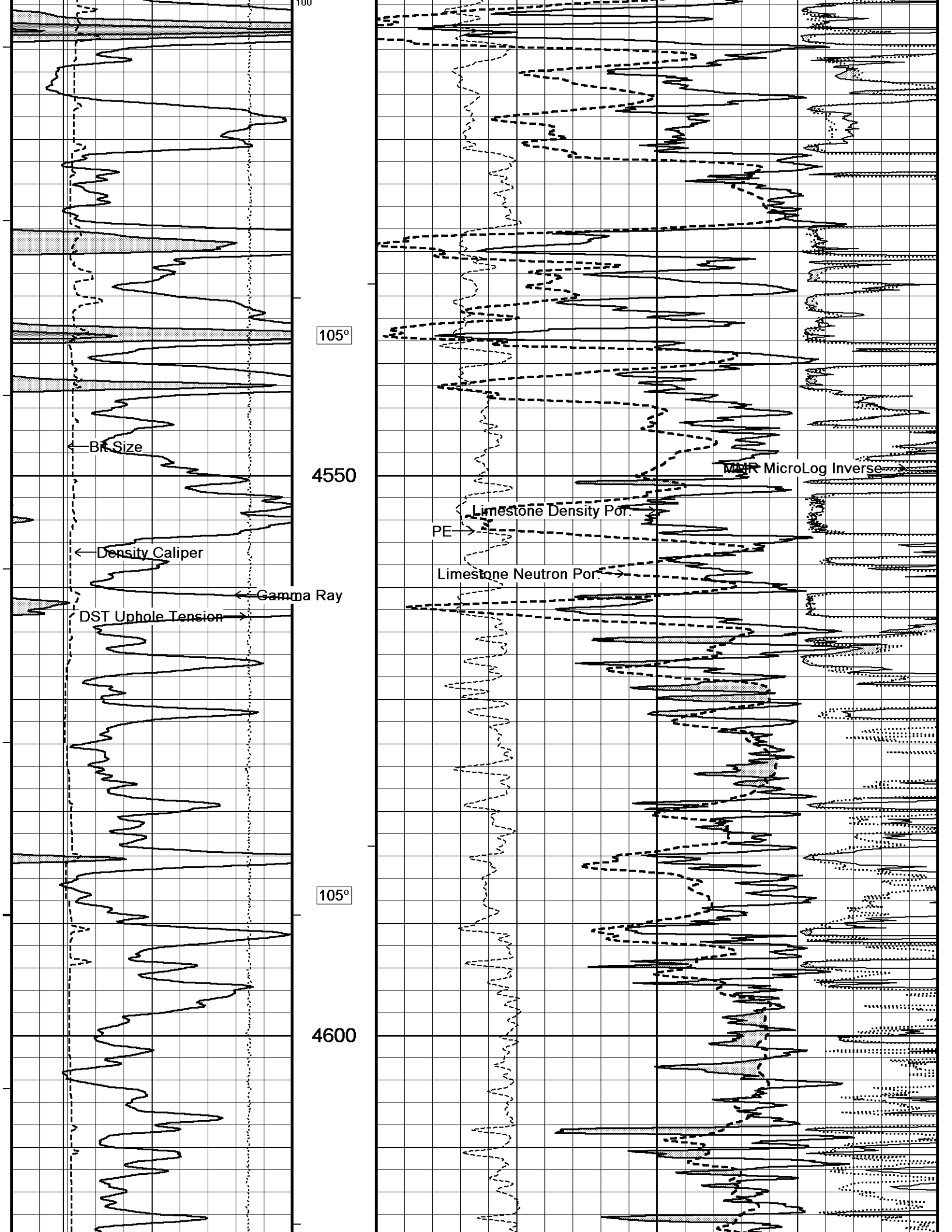
MMR MicroLog Normal
ohm metres
0 20

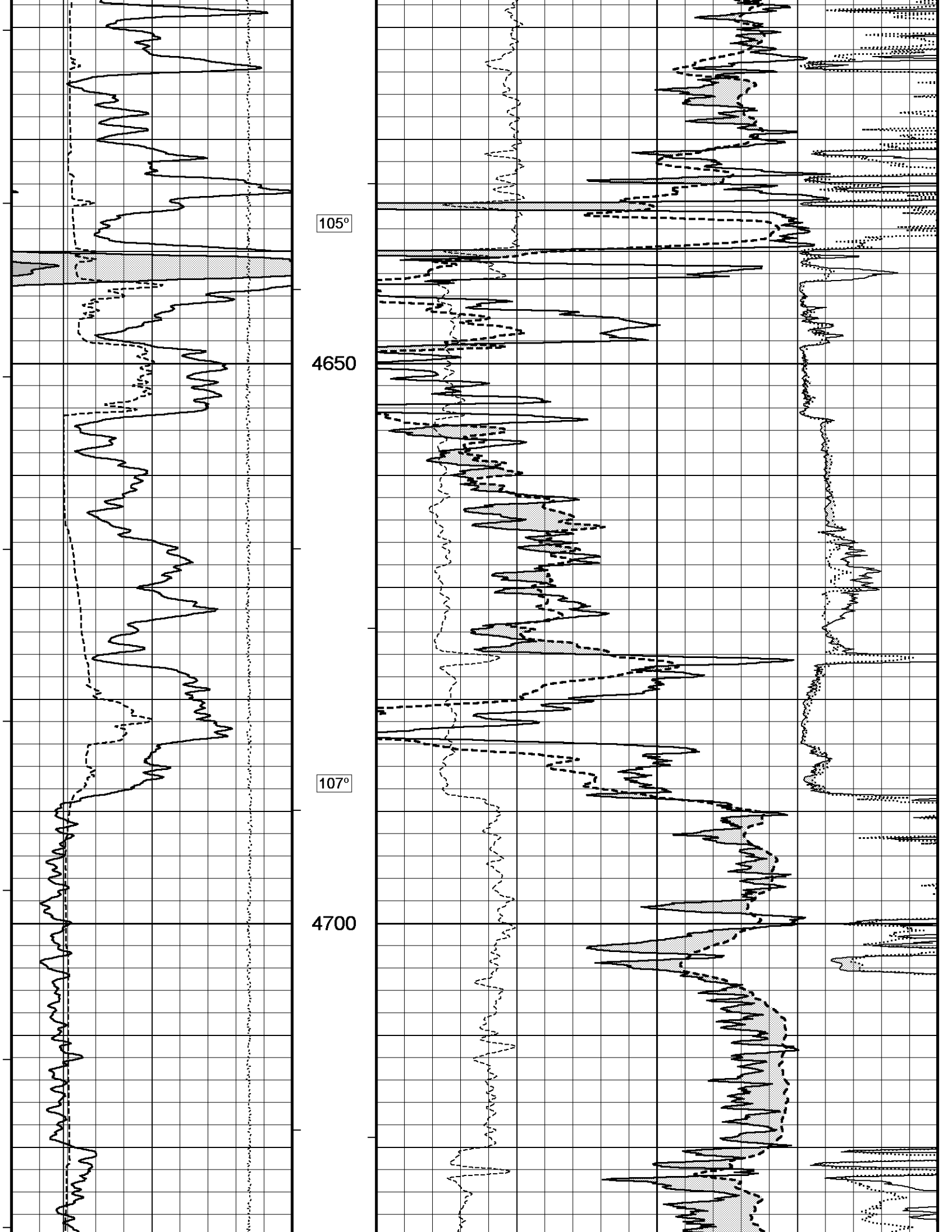
MMR MicroLog Inverse
ohm metres
0 20

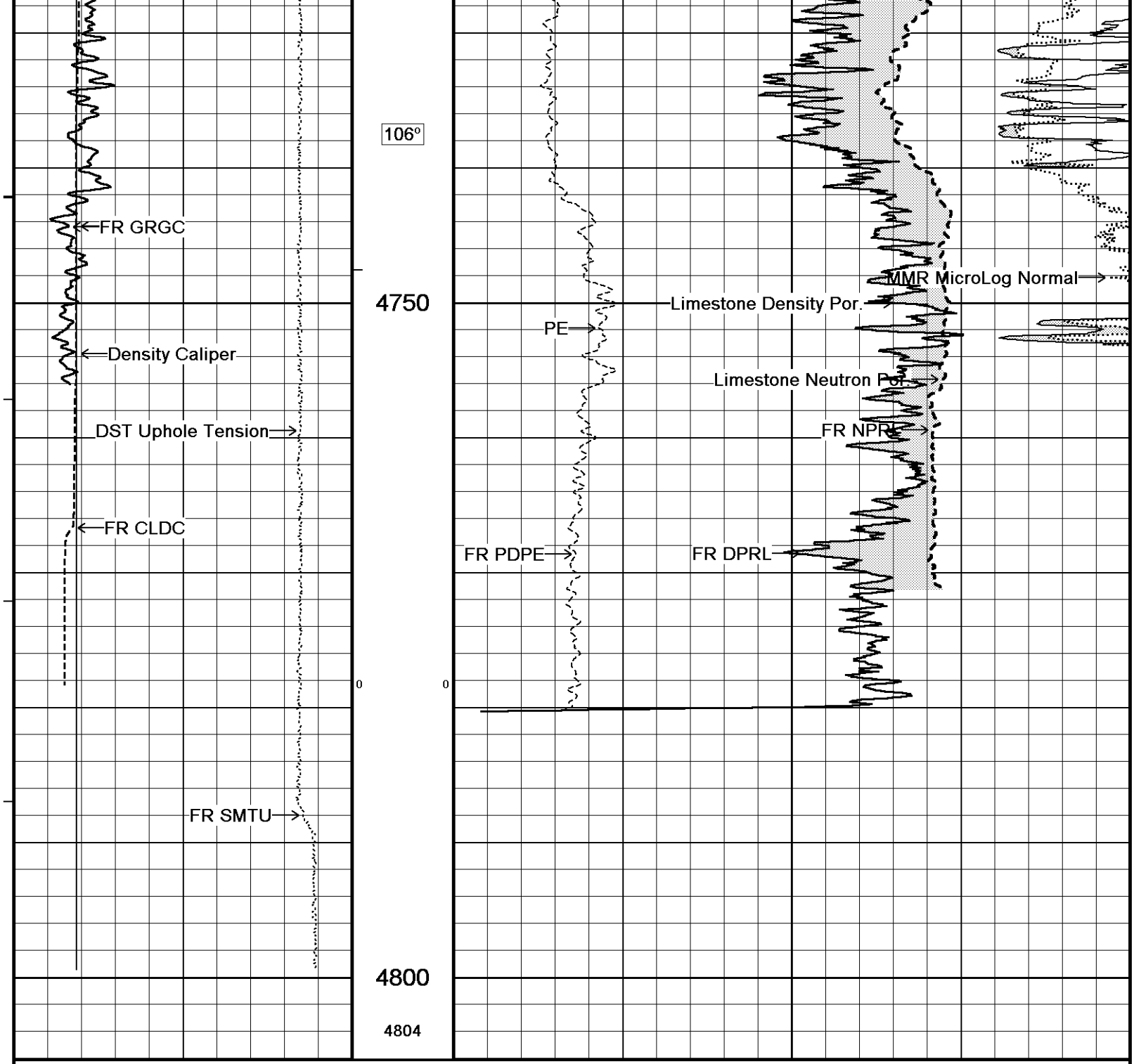



100
4300
104°
4350
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
MMR MicroLog Inverse
MMR MicroLog Normal
Limestone Density Por.
PE
104°


4400
105°
4450
105°
4500


100
105°
Bit Size
4550
MMR MicroLog Inverse
Limestone Density Por.
PE
Density Caliper
Limestone Neutron Por.
Gamma Ray
DST Uphole Tension
105°
4600


105°
4650
107°
4700



Depth Based Data - Maximum Sampling Increment 2.5cm
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Depth Based Data - Maximum Sampling Increment 2.5cm
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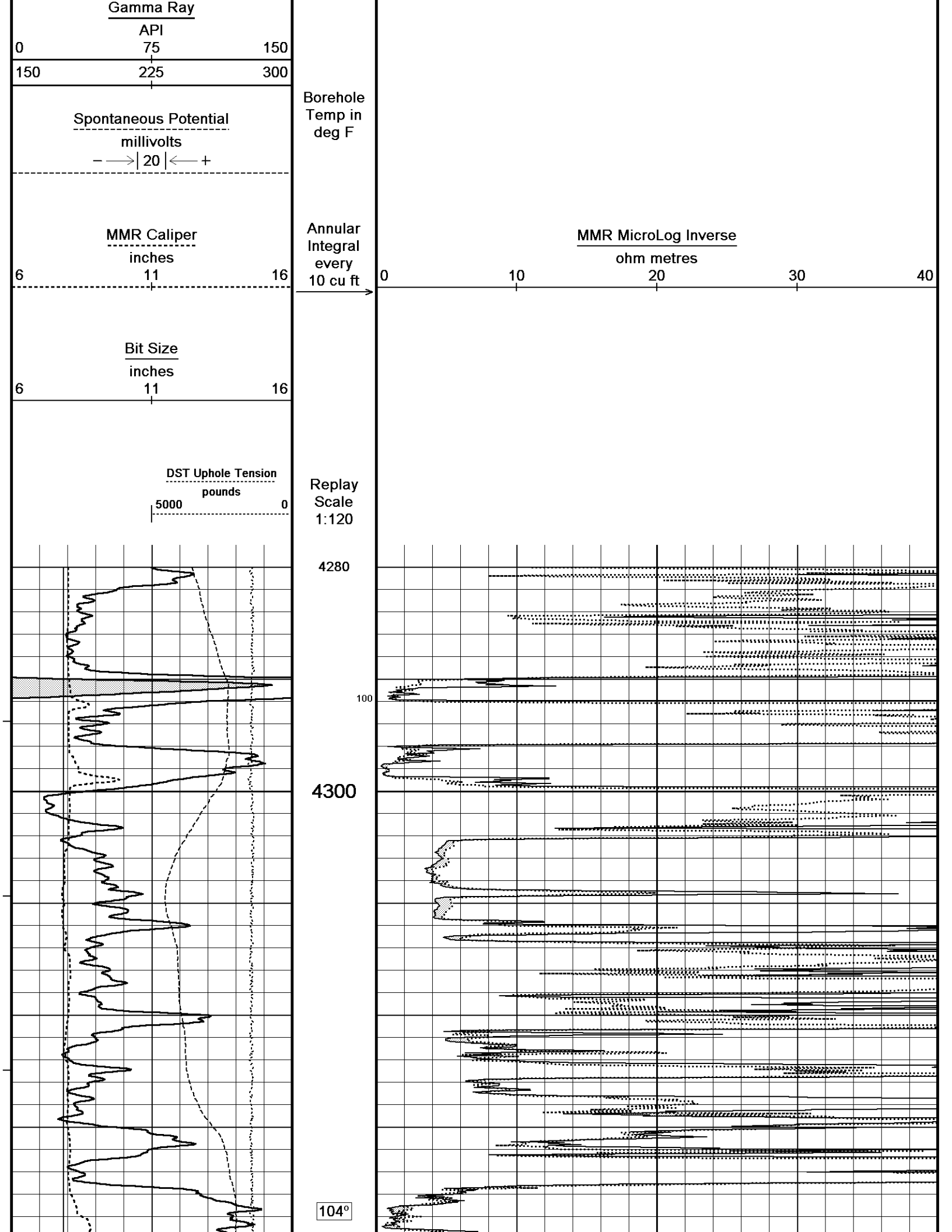
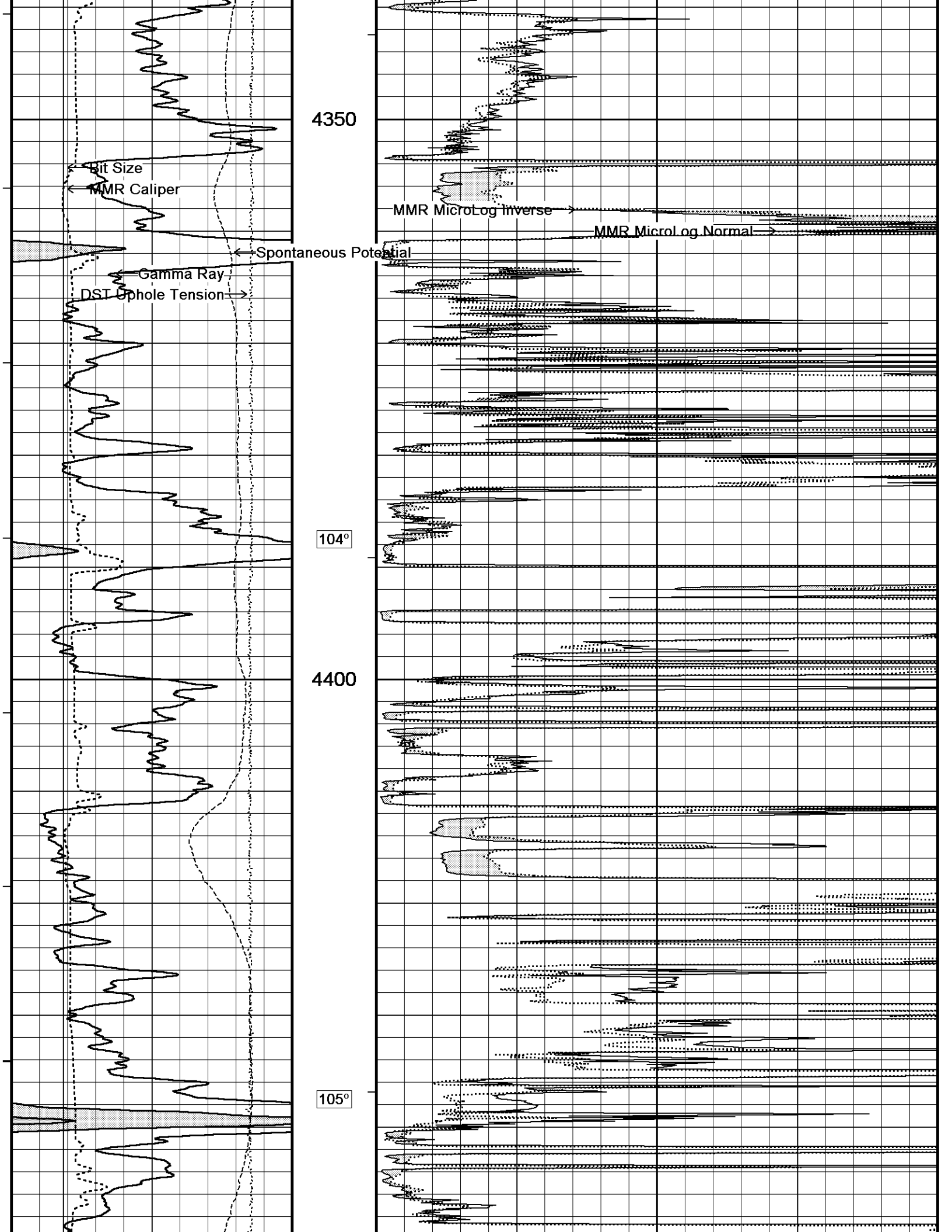
Plotted on 26-NOV-2012 17:12
Recorded on 25-NOV-2012 13:44

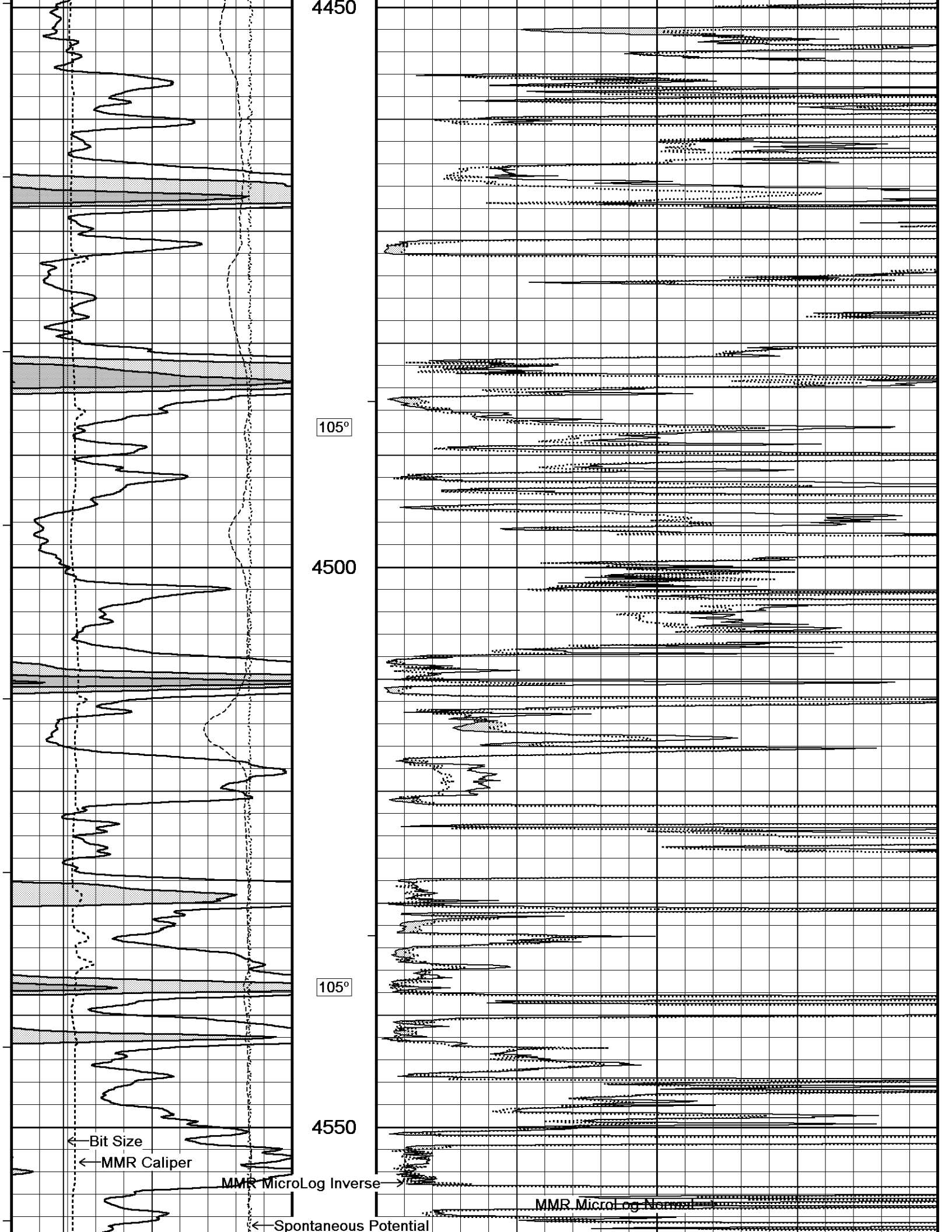
Timing Marks
every 60.0 sec

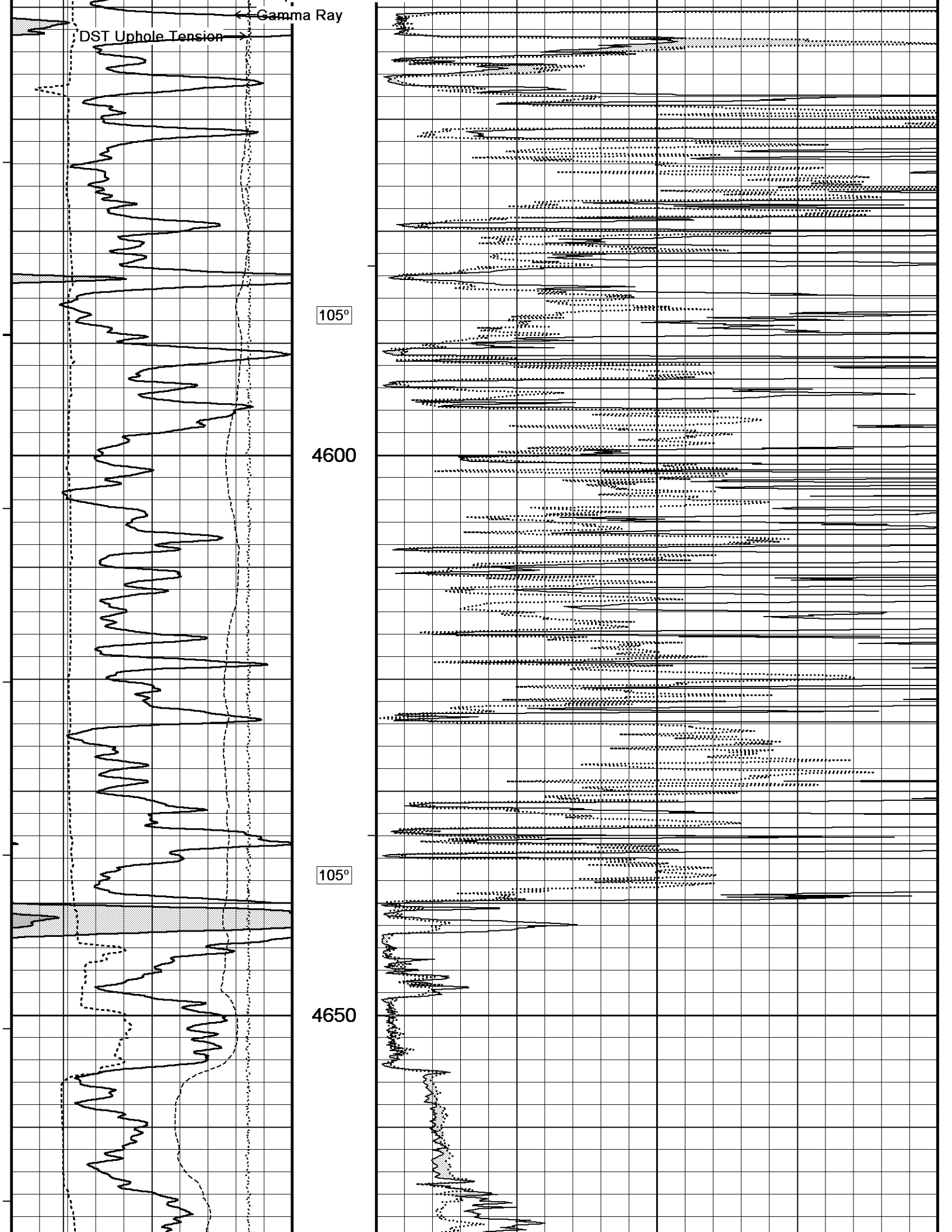
Depth
in
Feet

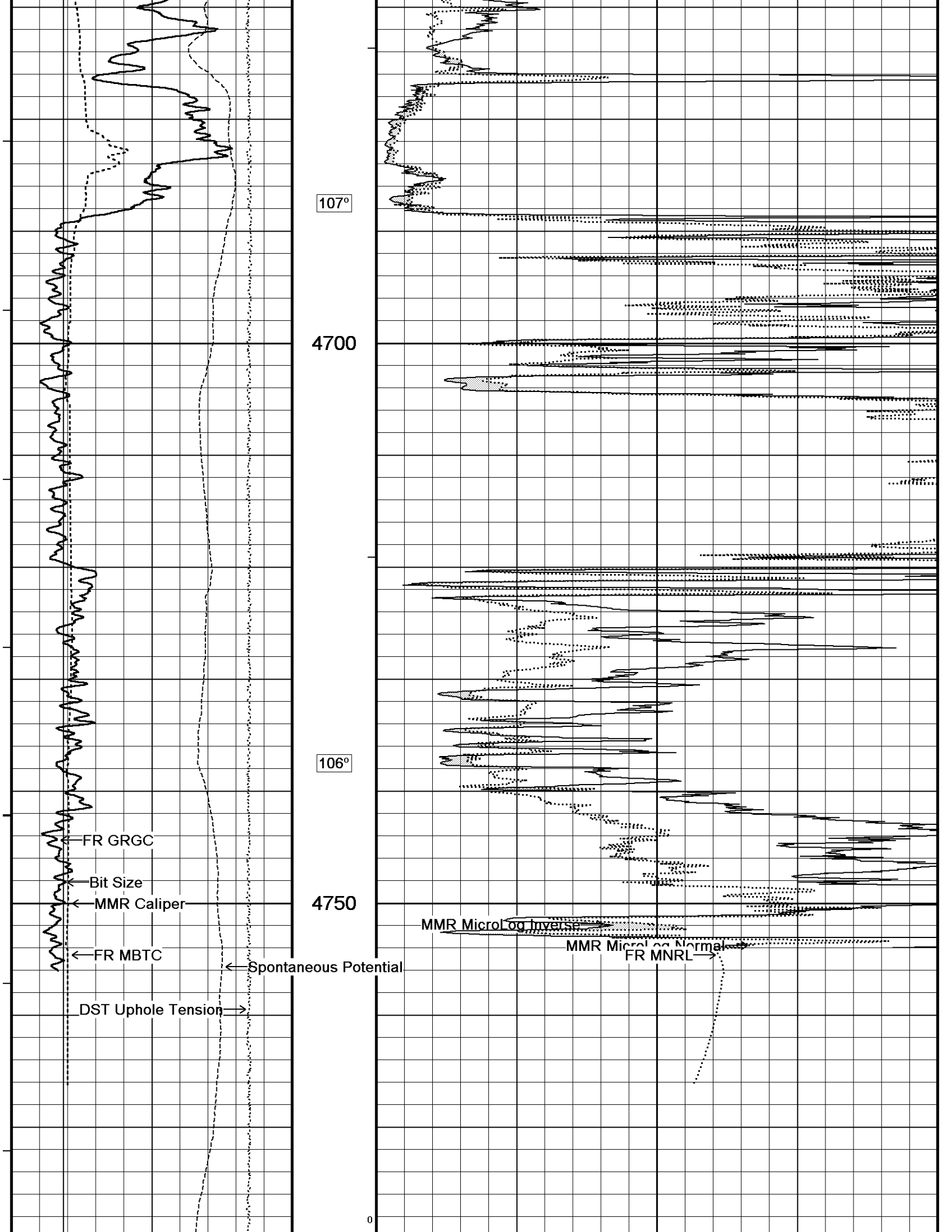
MMR MicroLog Normal
ohm metres
0 10 20 30 40

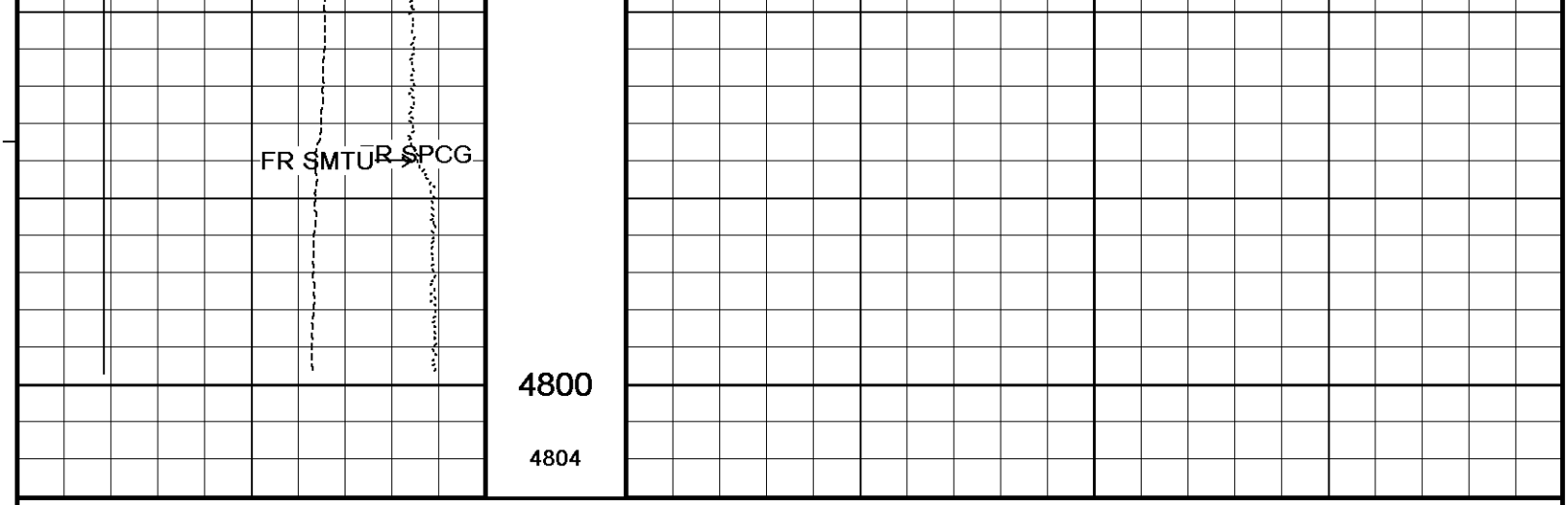

Gamma Ray
API
0
75
150
150
225
300
Spontaneous Potential
millivolts
− 20 +
MMR Caliper
inches
6
11
16
Bit Size
inches
6
11
16
DST Uphole Tension
pounds
5000
0
Borehole Temp in deg F
Annular Integral every 10 cu ft
Replay Scale 1:120
MMR MicroLog Inverse
ohm metres
0
10
20
30
40
4280
100
4300
104°


4350
Bit Size
MMR Caliper
MMR MicroLog Inverse
MMR MicroLog Normal
Spontaneous Potential
Gamma Ray
DST Uphole Tension
104°
4400
105°


4450
105°
4500
105°
4550
Bit Size
MMR Caliper
MMR MicroLog Inverse
MMR MicroLog Normal
Spontaneous Potential


Gamma Ray
DST Uphole Tension
105°
4600
105°
4650


107°
4700
106°
4750
FR GRGC
Bit Size
MMR Caliper
FR MBTC
Spontaneous Potential
DST Uphole Tension
MMR MicroLog Inverse
MMR MicroLog Normal
FR MNRL
0



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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/

March 14, 2013

Emily Hundley-Goff
Cholla Production, LLC
7851 S ELATI ST STE 201
LITTLETON, CO 80120-8081

Re: ACO1
API 15-171-20916-00-00
Bontrager RT 1-32
NE/4 Sec.32-19S-33W
Scott 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,
Emily Hundley-Goff