



NABORS

**COMPLETION
& PRODUCTION
SERVICES CO.**

COMPENSATED DENSITY/NEUTRON LOG

Company	RITCHIE EXPLORATION, INC.	Company	RITCHIE EXPLORATION, INC.
Well	#1 L. EICHMAN	Well	#1 L. EICHMAN
Field	THUNDER NORTH	Field	THUNDER NORTH
County	FORD	County	FORD
State	KANSAS	State	KANSAS
Location:	AP1 # : 15-057-20915-00-00 100' FNL & 100' FEL SE - NW - SE	Other Services	DIL
Permanent Datum	SEC 11 TWP 27S RGE 24W	Elevation	
Log Measured From	GROUND LEVEL	Elevation	2436
Drilling Measured From	KELLY BUSHING 10' A.G.L. KELLY BUSHING	K.B. 2448 D.F. 2444 G.L. 2436	
Date	11/18/13		
Run Number	ONE		
Depth Driller	5080		
Depth Logger	5084		
Bottom Logged Interval	5060		
Top Log Interval	3400		
Casing Driller	8 5/8" @ 415'		
Casing Logger	415		
Bit Size	7 7/8"		
Type Fluid in Hole	CHEMICAL MUD	CHLORIDES 4,100 PPM	
Density / Viscosity	9.4 / 70		
pH / Fluid Loss	11.0 / 8.0		
Source of Sample	FLOWLINE		
Rm @ Meas. Temp	0.75 @ 55F		
Rmt @ Meas. Temp	0.56 @ 55F		
Rmc @ Meas. Temp	0.90 @ 55F		
Source of Rmt / Rmc	MEASUREMENT		
Rm @ BHT	0.33 @ 126F		
Time Circulation Stopped	2 HOURS		
Time Logger on Bottom			
Maximum Recorded Temperature	126F		
Equipment Number	4010		
Location	HAYS, KANSAS		
Recorded By	IAN MABB		
Witnessed By	DAVID P. WILLIAMS		

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

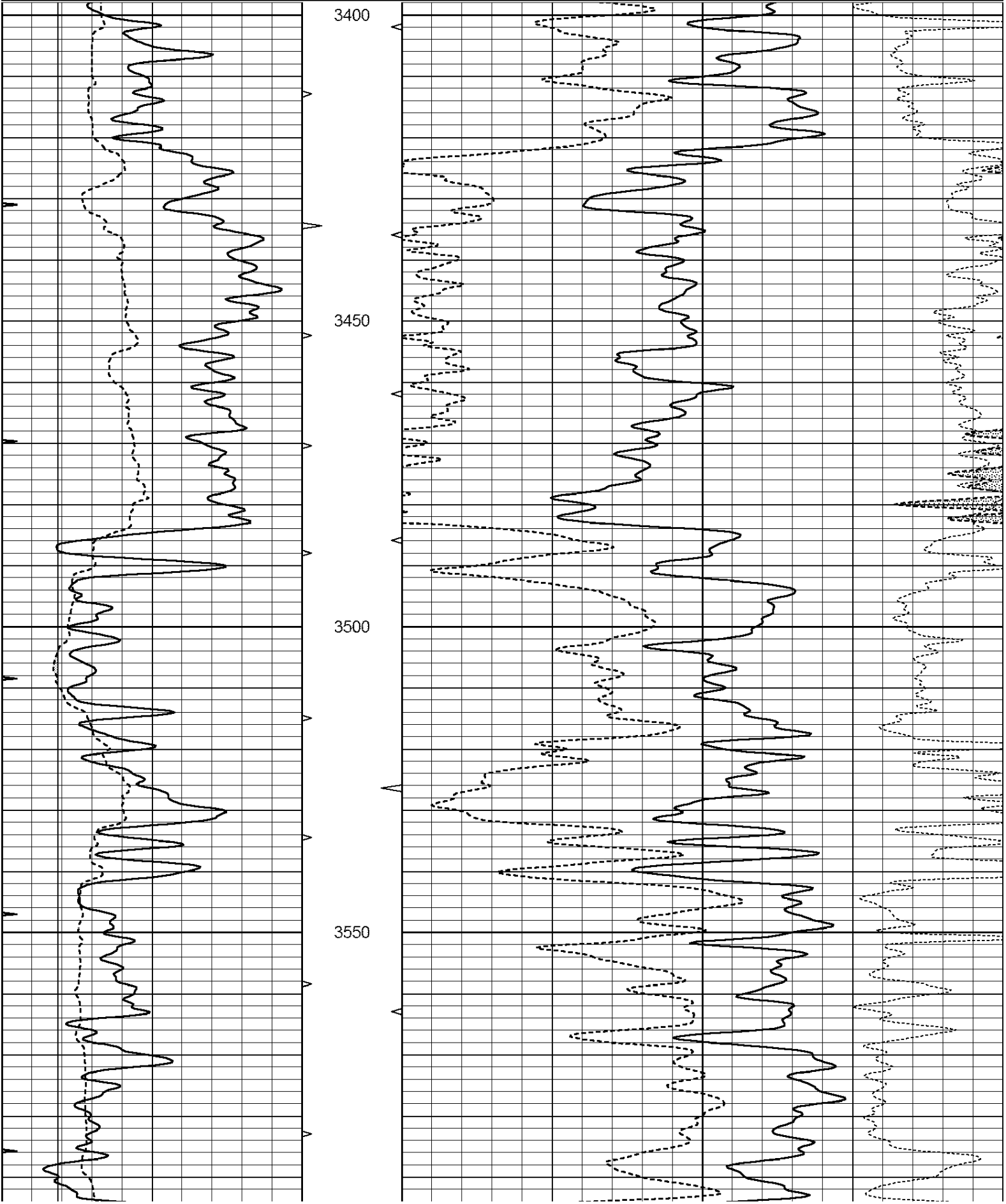
Comments

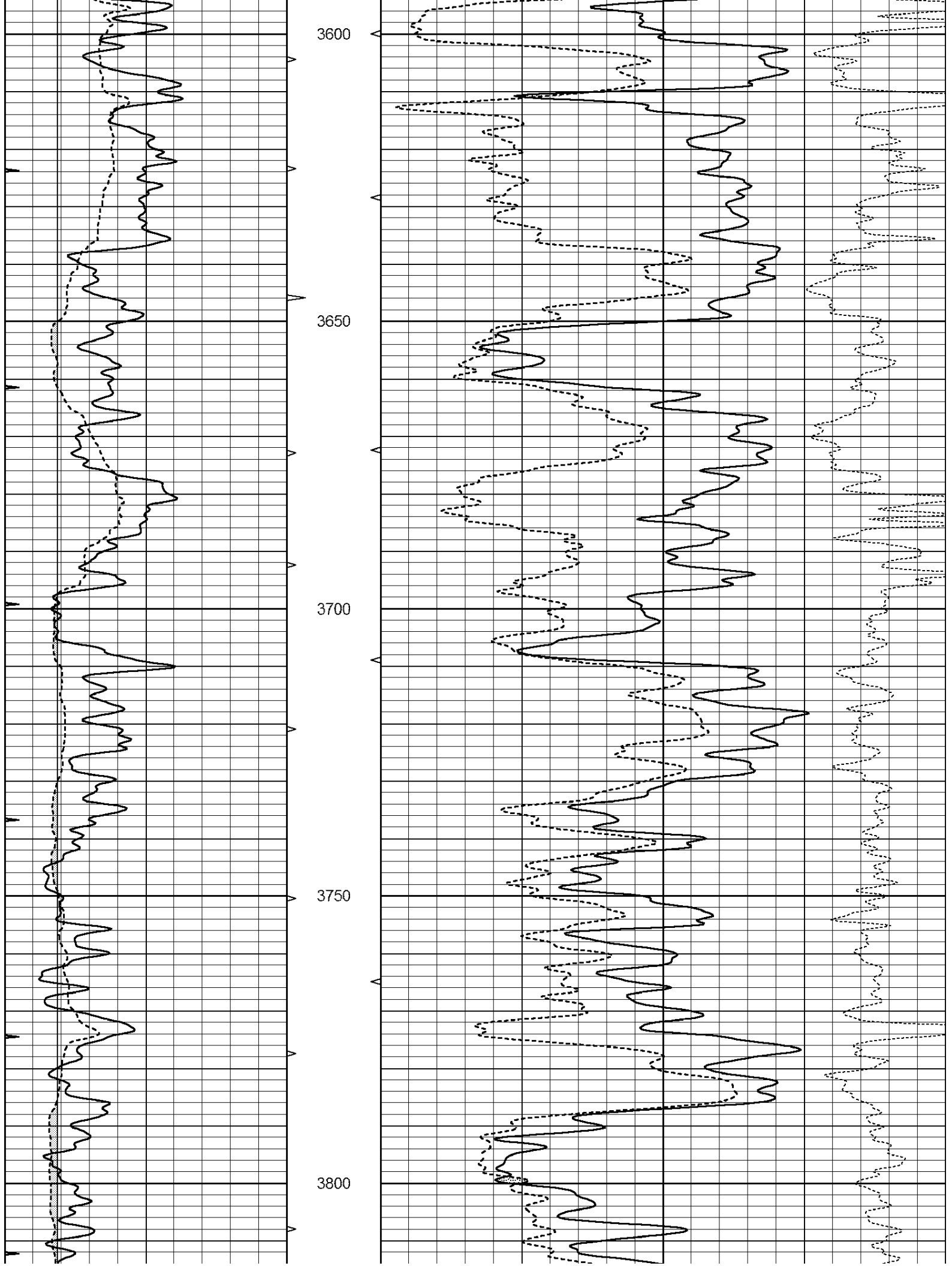
THANK YOU FOR USING NABORS, HAYS, KS. (785) 628-6395
DIRECTIONS:

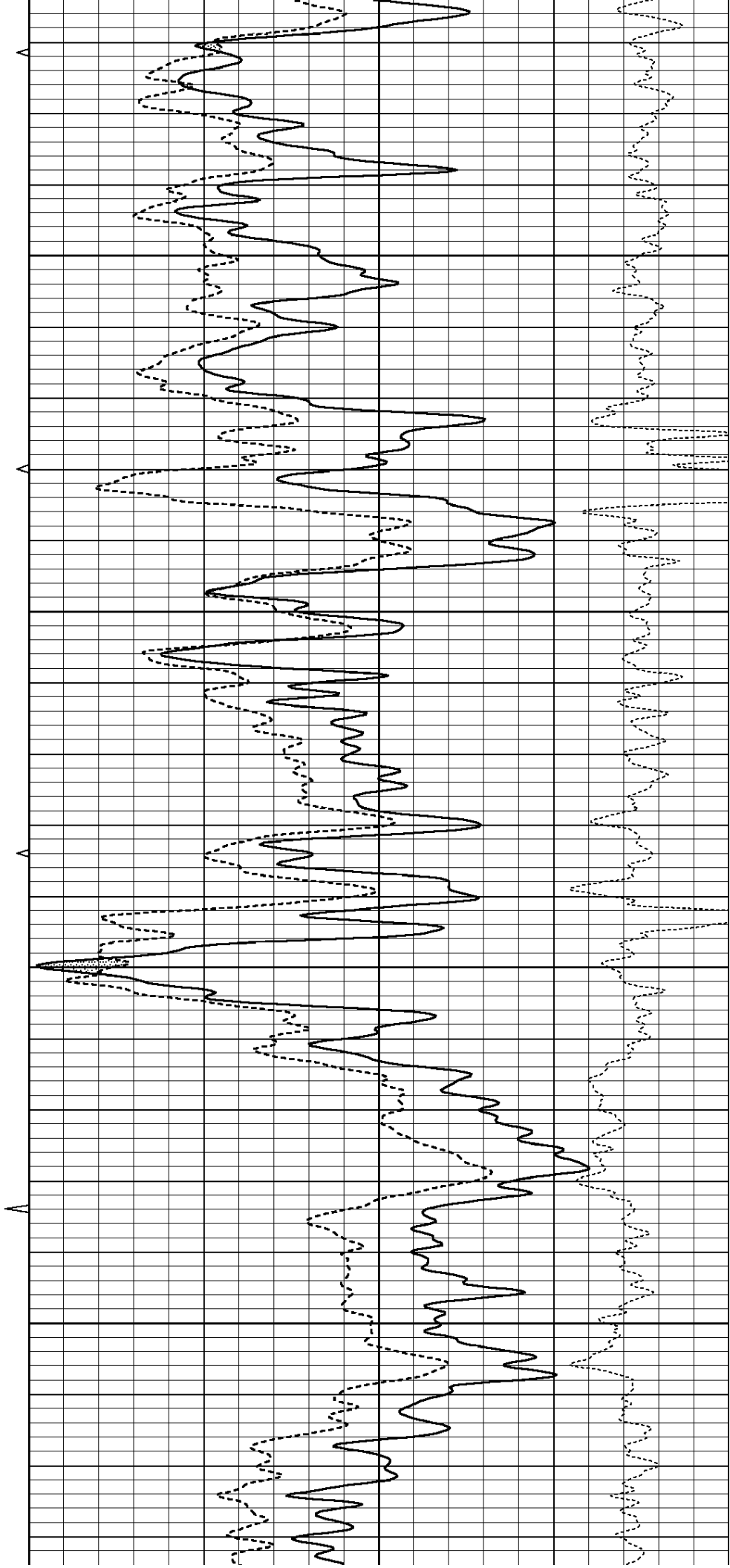
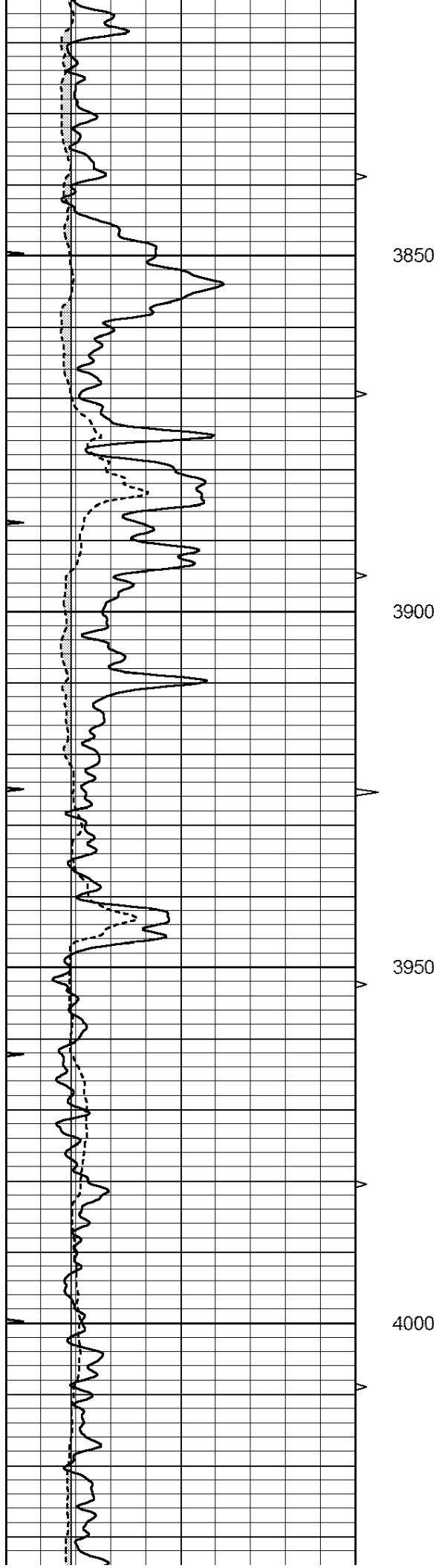
FORT DODGE, KS. - 1 1/2 MILES EAST - 1 SOUTH - NORTH WEST INTO JUST BEFORE THE RR TRACKS

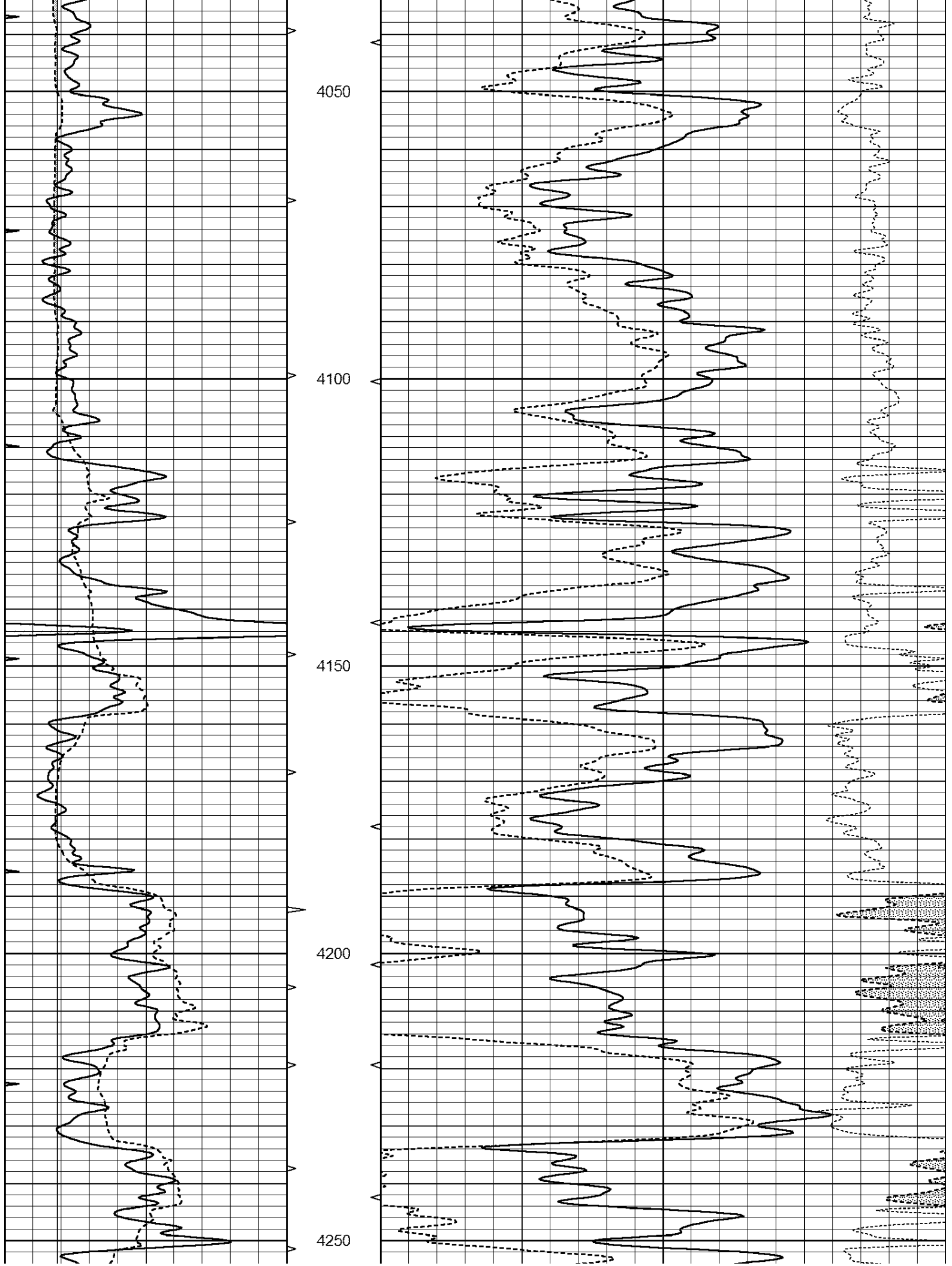
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Presentation Format: den_neu
Dataset Creation: Mon Nov 18 22:28:00 2013 by Calc Open-Cased 090629
Charted by: Depth in Feet scaled 1:240

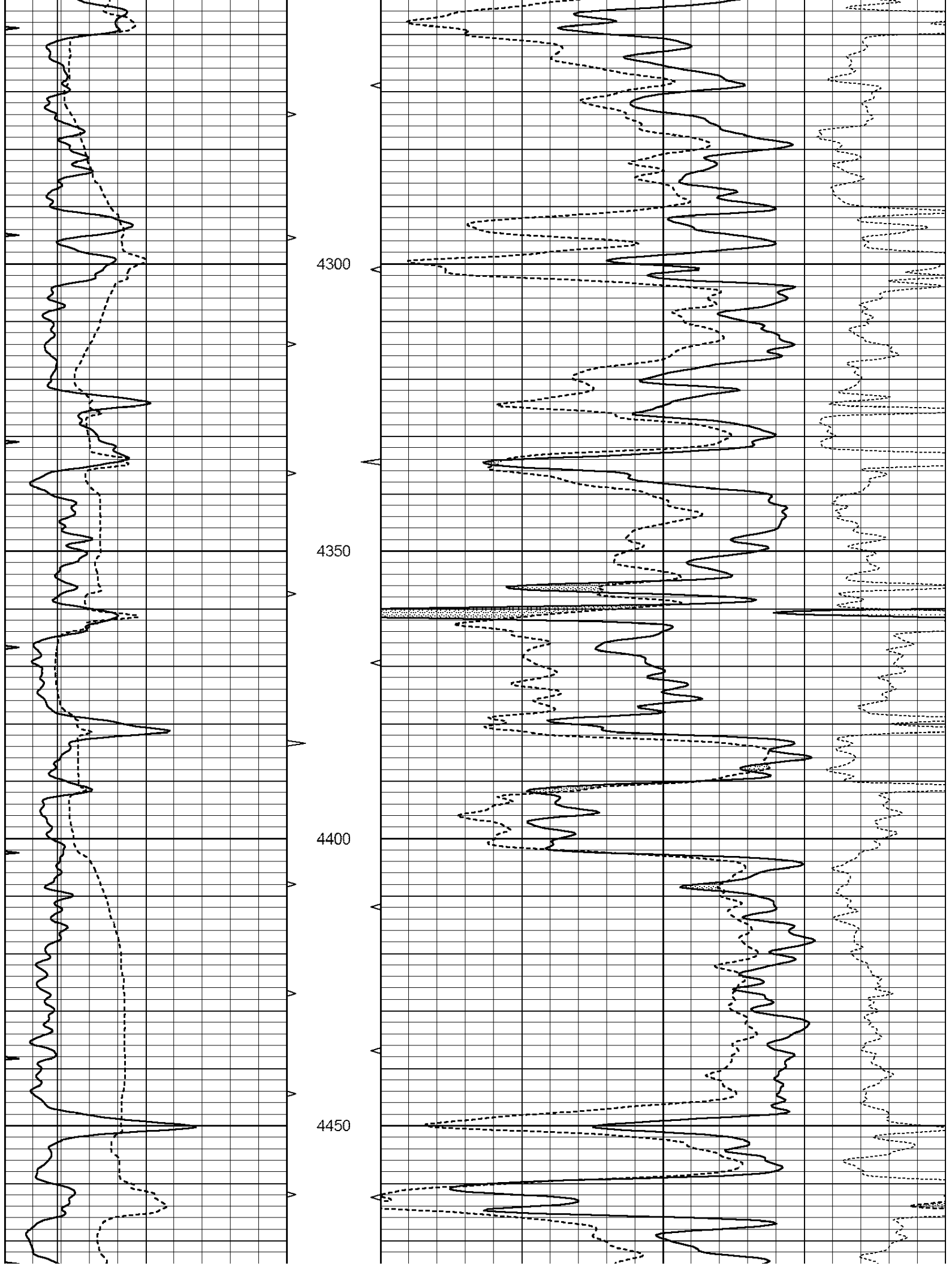
Charted by:		Depth in Feet scaled 1:2.10			
0	GAMMA RAY (GAPI)	150	ABHV	30	COMPENSATED DENSITY (pu) -10
6	CALIPER (in)	16	10 (ft3) 0	30	COMPENSATED NEUTRON (pu) -10
0	MINMK	20	TBHV		-0.25 CORRECTION (g/cc) 0.25
			0 (ft3) 10		

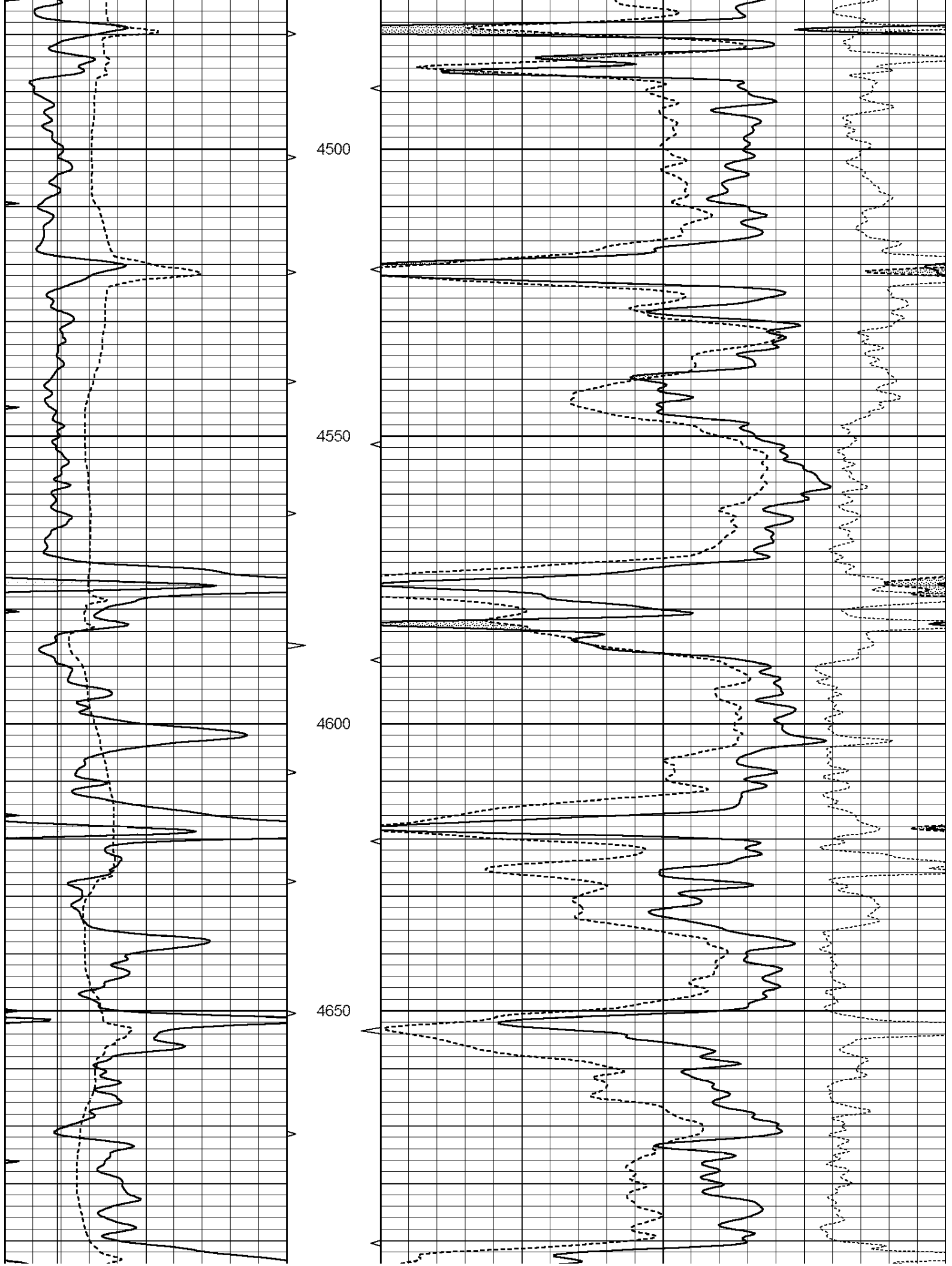


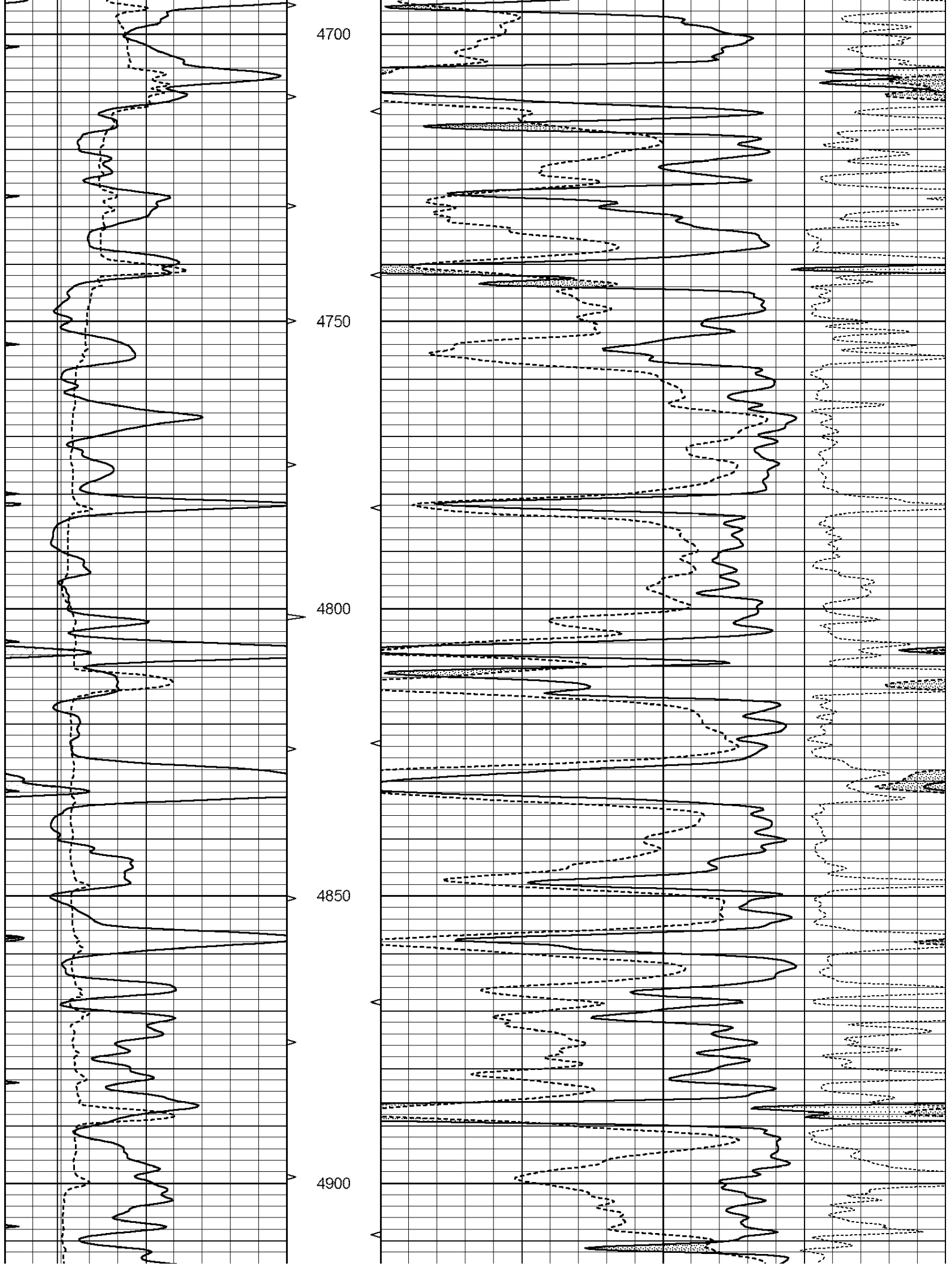






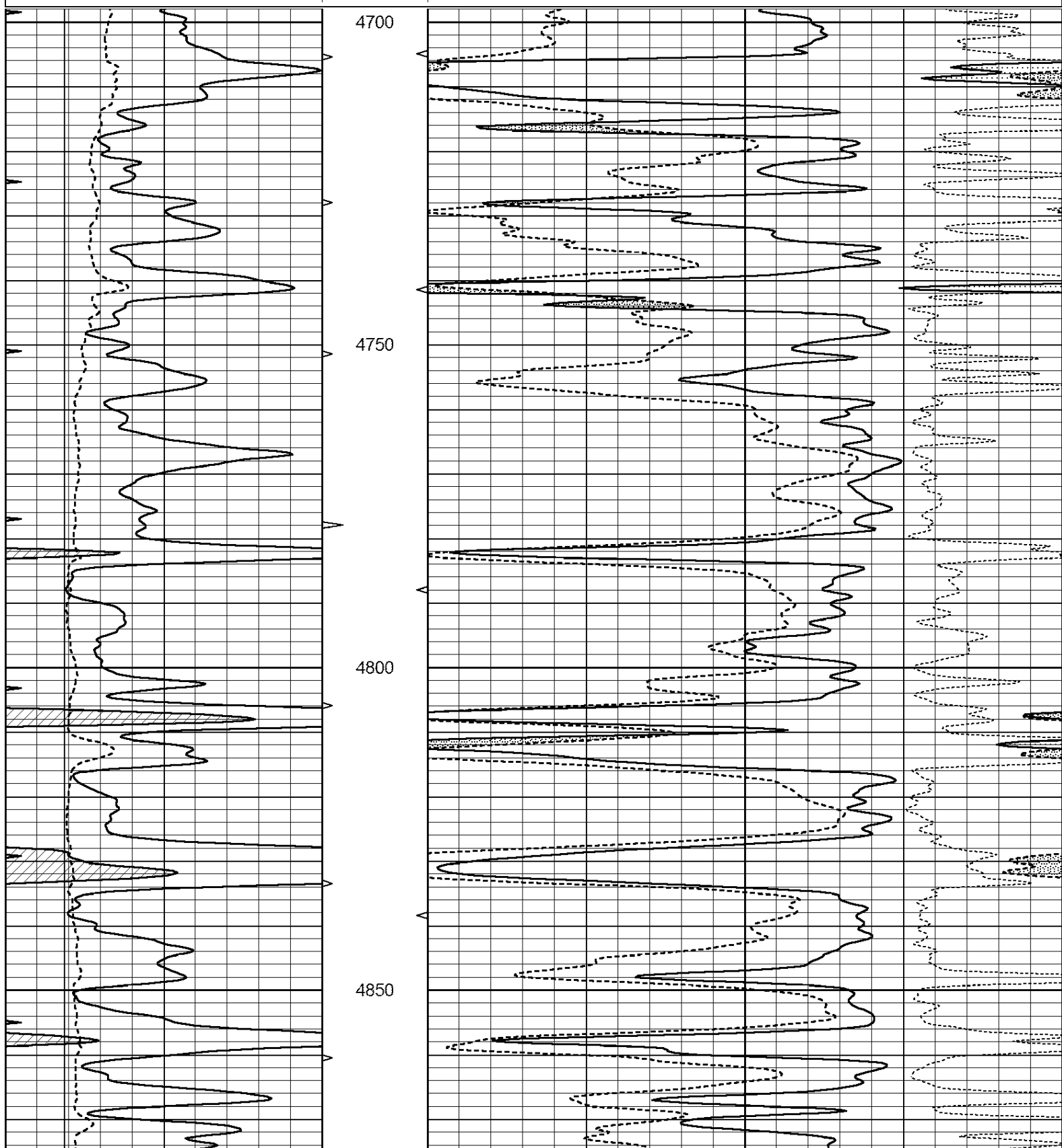


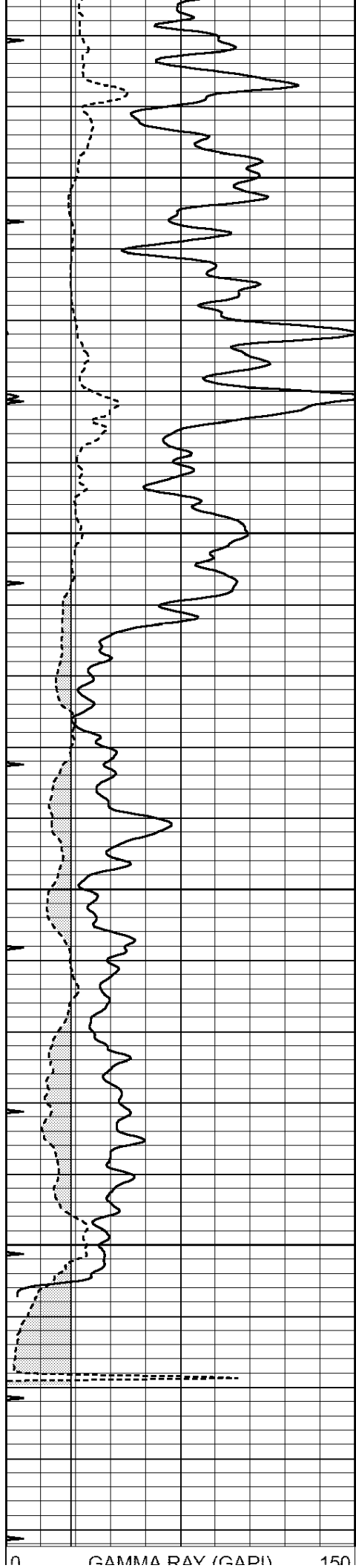




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 Presentation Format: den_neu
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 Charted by: Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150	ABHV	30	COMPENSATED DENSITY (pu)			-10	
6	CALIPER (in)	16	10 (ft3)	0	30	COMPENSATED NEUTRON (pu)			-10
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0	MINMK	20	TBHV		-0.25	CORRECTION (g/cc)		0.25	
			0 (ft3)	10	-----				





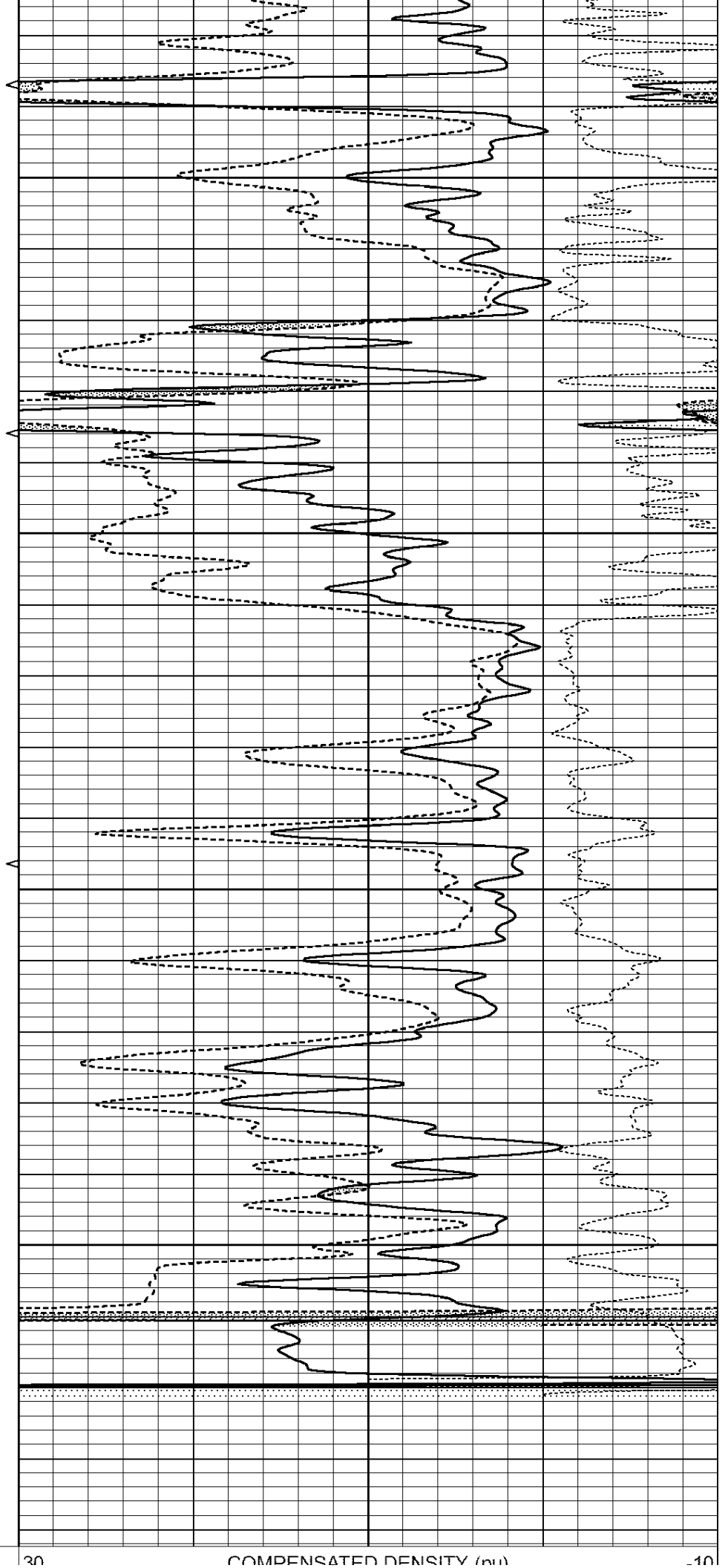
4900

4950

5000

5050

0 GAMMA RAY (GAPI) 150 ARHV



30 COMPENSATED DENSITY (ρ) 40

6	CALIPER (in)	16	10 (ft3)	0	30	COMPENSATED DENSITY (pu)	-10
0	MINMK	20	TBHV			-0.25 CORRECTION (g/cc)	0.25
			0 (ft3)	10			

Calibration Report	
Database File:	012094ddn.db
Dataset Pathname:	pass5.3.5
Dataset Creation:	Mon Nov 18 22:28:00 2013 by Calc Open-Cased 090629

Dual Induction Calibration Report

Serial-Model:	PROBE8-DILG
Surface Cal Performed:	Fri Aug 01 06:33:19 2008
Downhole Cal Performed:	Mon Jul 28 11:08:27 2008
After Survey Verification Performed:	Mon Jul 28 11:08:27 2008

Surface Calibration		Readings		References		Results	
Loop:	Air	Loop		Air	Loop	m	b
Deep	0.015	0.648	V	0.000	400.000	mmho/m	632.616
Medium	0.029	0.796	V	0.000	464.000	mmho/m	605.049
Internal:	Zero	Cal		Zero	Cal	m	b
Deep	0.017	0.657	V	0.000	400.000	mmho/m	625.153
Medium	0.016	0.757	V	0.000	464.000	mmho/m	625.992

Downhole Calibration		Readings		References		Results	
	Zero	Cal		Zero	Cal	m'	b'
Deep	0.000	0.000	mmho/m	2.011	405.777	mmho/m	1.000
Medium	0.000	0.000	mmho/m	7.590	503.393	mmho/m	1.000
LL3		7.500	V		1500.000	Ohm-m	
		0.000	V		20.000	Ohm-m	
		-7.200	V		3800.000	mmho-m	

After Survey Verification		Readings		Targets		Results	
	Zero	Cal		Zero	Cal	m'	b'
Deep	0.000	0.000	mmho/m	0.000	0.000	mmho/m	0.000
Medium	0.000	0.000	mmho/m	0.000	0.000	mmho/m	0.000
LL3		1.000	Ohm-m		1.000	Ohm-m	
		0.000	Ohm-m		0.000	Ohm-m	
		1.000	mmho-m		1.000	mmho-m	

Compensated Density Calibration Report
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Serial-Model:	GEAR4-GEARHART
Source / Verifier:	143 / 143
Master Calibration Performed:	Wed Sep 18 03:03:09 2013
Before Survey Verification Performed:	
After Survey Verification Performed:	

Master Calibration		Density		Far Detector		Near Detector	
Magnesium	1.710	g/cc		1075.98		532.39	cps
Aluminum	2.560	g/cc		286.51		422.88	cps

Spine Angle = 80.13			Density/Spine Ratio = 0.633		
	Size		Reading		
Small Ring	8.00	in	3.21	V	
Large Ring	14.00	in	5.46	V	
Before Survey Verification					
	Target		Measured		
		g/cc		g/cc	
		g/cc		g/cc	
		g/cc		g/cc	
After Survey Verification					
	Target		Measured		
		g/cc		g/cc	
		g/cc		g/cc	
		g/cc		g/cc	
Compensated Neutron Calibration Report					
Serial Number:			6I		
Tool Model:			G		
CALIBRATION					
	Detector	Readings		Target	
	Short Space	1.00	cps	1.00	cps
	Long Space	1.00	cps	1.00	cps
					Normalization
					1.0000
					1.0000
PRE-SURVEY VERIFICATION					
	Detector	Readings		Measured	
	Short Space		cps		
1)	Long Space		cps	pu	pu
	Short Space		cps		
2)	Long Space		cps	pu	
	Short Space		cps		
3)	Long Space		cps	pu	
POST-SURVEY VERIFICATION					
	Detector	Readings		Measured	
	Short Space		cps		
1)	Long Space		cps	pu	pu
	Short Space		cps		
2)	Long Space		cps	pu	pu
	Short Space		cps		
3)	Long Space		cps	pu	pu
Gamma Ray Calibration Report					
Serial Number:		#8			
Tool Model:		OPEN			
Performed:		Tue Jun 18 19:34:11 2013			
Calibrator Value:		150.0		GAPI	
Background Reading:		0.0		cps	

Background Reading:	0.0	cps
Calibrator Reading:	175.0	cps
Sensitivity:	1.2371	GAPI/cps