

STEP

energy services

**COMPENSATED NEUTRON
PEL DENSITY LOG**

Company BEREXCO, LLC Well HINES UNIT #26X Field FAIRPORT County RUSSELL State KANSAS Country USA API No. 15-167-24097-00-00	File No : HAYS-70386 Company : BEREXCO, LLC Well : HINES UNIT #26X Field : FAIRPORT County : RUSSELL State : KANSAS Country : USA API No : 15-167-24097-00-00
--	--

Location :
 200' FNL & 440' FWL
 NE NW NW NW

LSD : **Sect** : 16 **Twp** : 11S **Rge** : 15W

Permanent Datum: GL Drilling Measured From: KB Log Measured From: KB Above Permanent Datum: 6.00 Ft	Elevations: KB 1942.00 Ft DF 1941.00 Ft GL 1936.00 Ft
--	---

Services: CNT LDT MST	CST PIT
---------------------------------------	------------

Date	11-20-2019	
Run Number	0	
Depth--Driller	3550.0	Ft
Depth--Logger	3550.0	Ft
First Reading	3510.0	Ft
Last Reading	2300.0	Ft
Casing--Driller	264.0	Ft
Casing--Logger	264.0	Ft
Bit Size	7.875	In
Casing Size	8.625	In
Hole Fluid Type	CHEMICAL	
Density	9.0	
Fluid Loss	8.0	
PH/Viscosity	9.5	64.0
Sample Source	MEASURED	
RM@Measured Temp.	1.500	@ 60 F
RMF@Measured Temp	1.280	@ 60 F
RMG@Measured Temp.	1.730	@ 60 F
Source RMF/RMG	CALCULATED/CALCULATED	
RM@BHT	0.930 @ 101 F	
Time Circulation Stopped	11-20-2019 14:34	
Max Recorded Temp.	101	F
Equipment/Base	TRK-137	HAYS
Recorded By	B.BAILEY	
Witnessed By	J.SMITH	

The customer is hereby warned that by providing the log data herein, STEP Energy Services does not agree to provide any interpretation of log data, conversion of log data to physical rock parameters or recommendations. STEP Energy Services does not guarantee or warrant either expressly or impliedly, the accuracy of any interpretation of log data, conversion of log data to physical rock parameters or recommendations which may be given by STEP Energy Services personnel. Any interpretation, conversion or recommendation is not part of the consideration for the agreement between the parties and is not part of any part of the charge by STEP Energy Services for its services. Any user of the log data is warned that said user is not entitled to rely on interpretations, conversions or recommendations as aforesaid.

Bitsize Intervals		Casing Strings			
Size (In)	Bottom (Ft)	Size (In)	Weight (Lbs)	Bottom (Ft)	Top (Ft)
7.875	3550.00	8.625	32.00	264.00	0.00

Run Number	0
Date	11-20-2019
Date/Time On Bottom	11-20-2019 15:34
Depth to Fluid	0.0 Ft
Salinity	0.000
RMF@BHT	0.790 @ 101 F
RMC@BHT	1.070 @ 101 F

Run Number 0

Comments

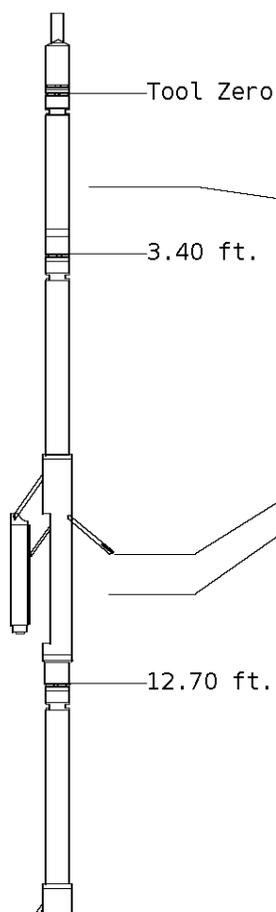
ALL PRESENTATIONS AS PER CUSTOMER REQUEST
 GRT, CNT, LDT, MLT, CST, AND PIT RUN IN COMBINATION
 CALIPERS ORIENTED ON X-Y AXIS
 2.71 G/CC USED TO CALCULATE POROSITY
 ANNULAR HOLE VOLUME CALCULATED USING 5.50" PRODUCTION CASING
 PHIN IS CALIPER CORRECTED

GRT: GRP.
 CNT: PHIN, CLCNIN.
 LDT: PORL, LCORN, PECLN, LDENN, CLLDIN.
 CST: PORS, ITT, CDTF, TT1, TT2, TT3, TT4.
 PIT : ILD,ILM,SPU,SFLAEC,CIRD,RXO/RT

OPERATORS:
 D.RAGSDALE
 J.VAUGH
 D.LEGLEITER

Tool String Schematic

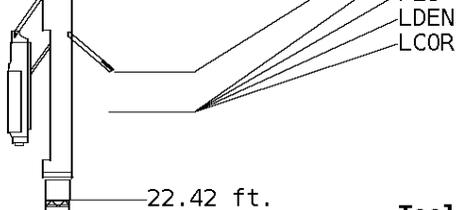
Total Tool Length - 67.37 ft.
Maximum Outside diameter - 6.00 in.
Net Weight in Air - 1171.00 lbs.



Tool: GRT-B Gamma Ray Controller	Length: 3.40 ft.	O.D.: 3.60 in.
Sonde ID :GRT-BC-038		
Measure Point	Tool Offset	Stack Offset
GRP	2.00	2.00
		Bottom Offset
		65.37

Tool: CNT-AA Compensated Neutron A Pad on NDT-A	Length: 9.30 ft.	O.D.: 4.36 in.
Sonde ID :NDT-AF-104		
Source ID :N-1104		
Pad ID :CNP-AE-41		
Measure Point	Tool Offset	Stack Offset
CLCN	6.00	9.40
PHIN	6.80	10.20
		Bottom Offset
		57.97
		57.17

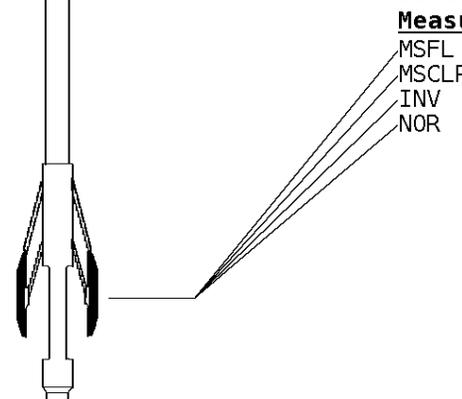
Tool: LDT-DF Litho Density D Pad on NDT-F	Length: 9.72 ft.	O.D.: 4.80 in.
Sonde ID :NDT-FA-404		
Source ID :1637GW		
Pad ID :LDP-DA-062		
Measure Point	Tool Offset	Stack Offset
CLLD	6.42	19.12
PEL	7.42	20.12
PES	7.82	20.52
		Bottom Offset
		48.25
		47.25
		46.85



7.62 20.32 47.05
 7.62 20.32 47.05

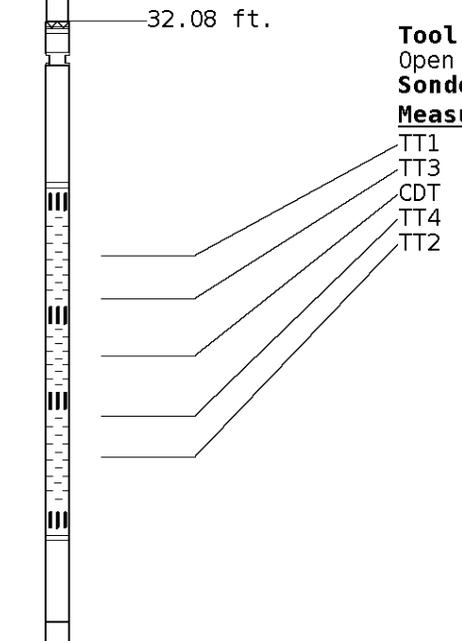
Tool: MST-DA **Length:** 9.66 ft. **O.D.** 6.00 in.
 Micro Spherically Focused (IC,D)
Sonde ID :MST-DA-13

Measure Point	Tool Offset	Stack Offset	Bottom Offset
MSFL	7.60	30.02	37.35
MSCLP	7.60	30.02	37.35
INV	7.60	30.02	37.35
NOR	7.60	30.02	37.35



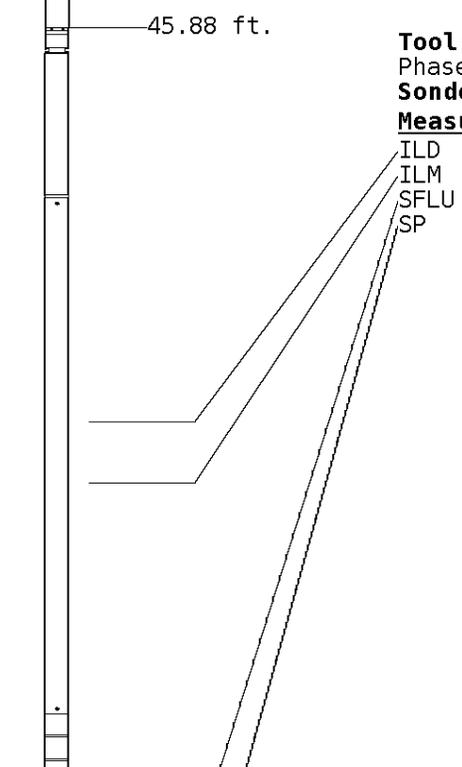
Tool: CST-AD **Length:** 13.80 ft. **O.D.** 3.60 in.
 Open Hole Sonic
Sonde ID :CST-AD-043

Measure Point	Tool Offset	Stack Offset	Bottom Offset
TT1	4.80	36.88	30.49
TT3	5.80	37.88	29.49
CDT	7.30	39.38	27.99
TT4	8.80	40.88	26.49
TT2	9.80	41.88	25.49



Tool: PIT-CA **Length:** 21.49 ft. **O.D.** 3.62 in.
 Phased Dual Induction w/ RM & D
Sonde ID :PIT-AC-043

Measure Point	Tool Offset	Stack Offset	Bottom Offset
ILD	8.92	54.80	12.56
ILM	10.10	55.98	11.39
SFLU	17.49	63.37	4.00
SP	20.60	66.48	0.88



LWT 67.37 ft.

Well File: BEREXCO-HINES-26X_NOV20-QST

Scale: 1:240

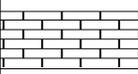
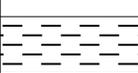
Format: NLD-240

Segment: V1.D2.S8 Reprocess MAIN

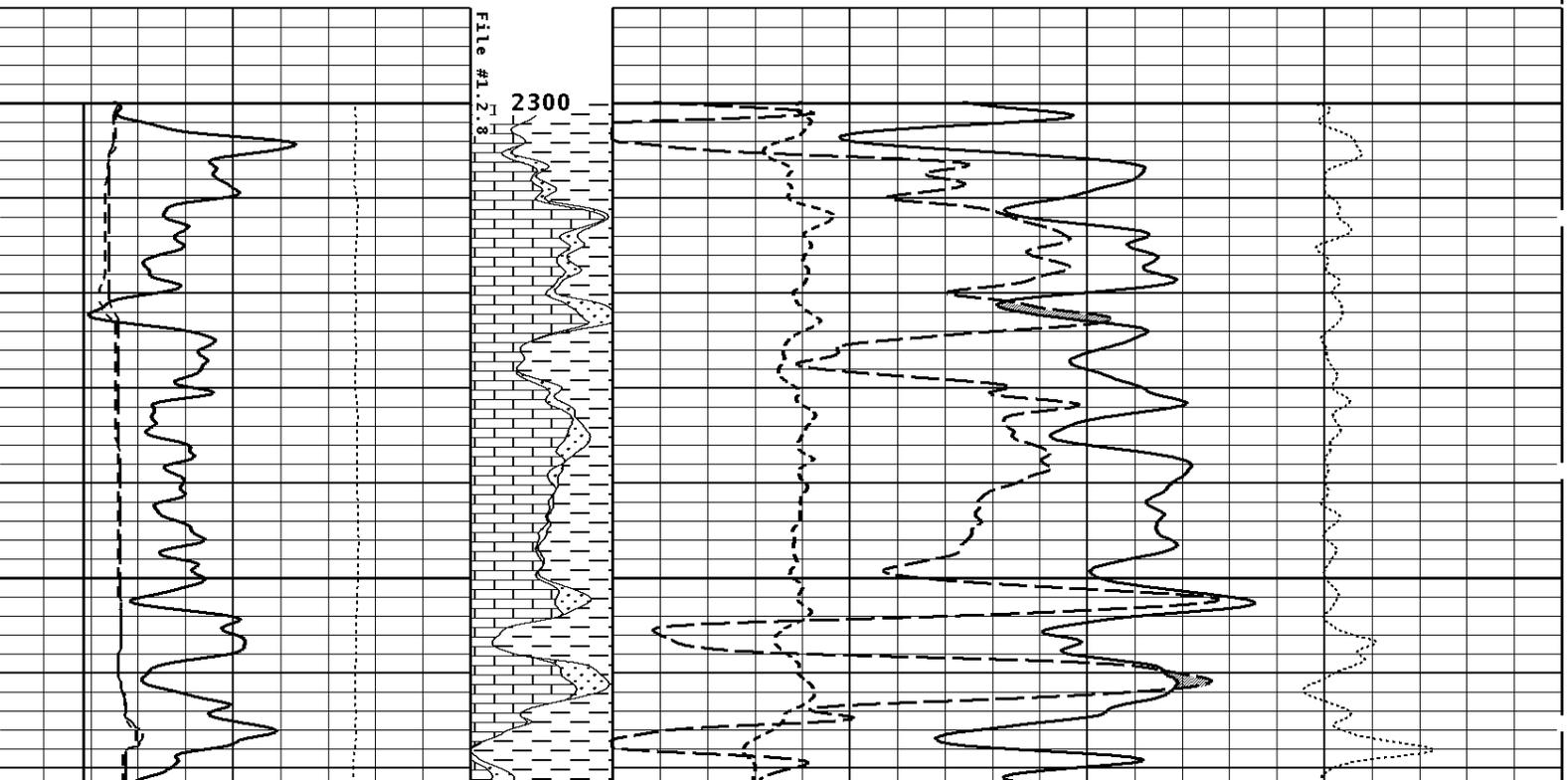
Acquired: 2019-11/20 16:48 3.4.1-13972

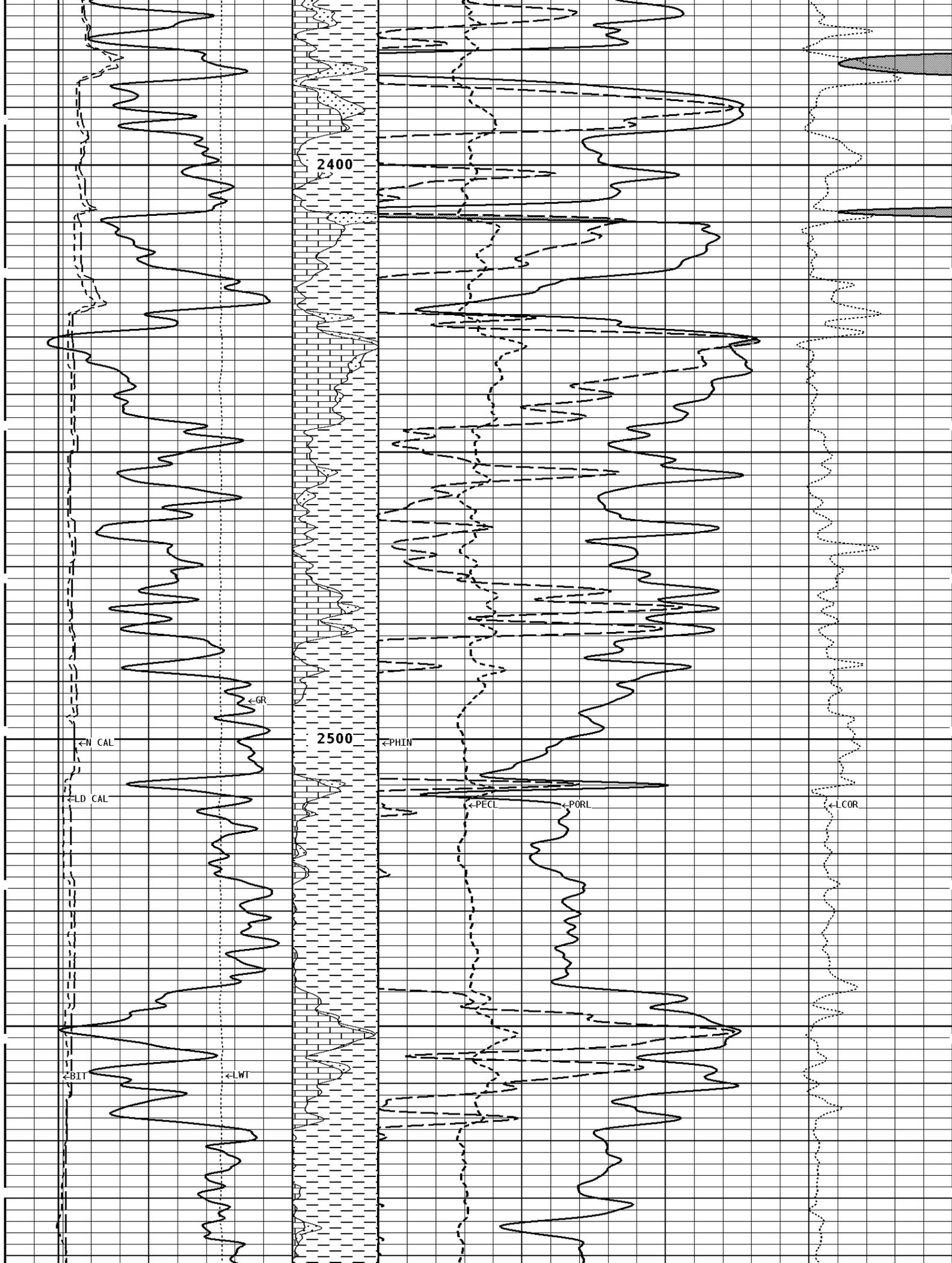
Reference: 0

Processed: 2019-11/20 18:43 3.4.1-13972

BIT SIZE INCHES (IN)							
6	16						
NEUTRON (Y) CALIPER INCHES (IN)							
16	26						
6	16						
DENSITY (X) CALIPER INCHES (IN)		Volume Quartz	PE CROSS-SECTION BARN/ELECTRON		DENSITY CORRECTION G/CC		
16	26		0	10	-0.25	0.25	
6	16						
TENSION LBS		Volume Calcite	DENSITY POROSITY (2.71g/cc) PERCENT				
10000	0		70	30			
			30	-10			
			-10	-50			
GAMMA RAY API UNITS		Volume Dolo/Shale	NEUTRON POROSITY (LIMESTONE) PERCENT				
150	300		30	-10			
0	150						

1:240 MAIN SECTION

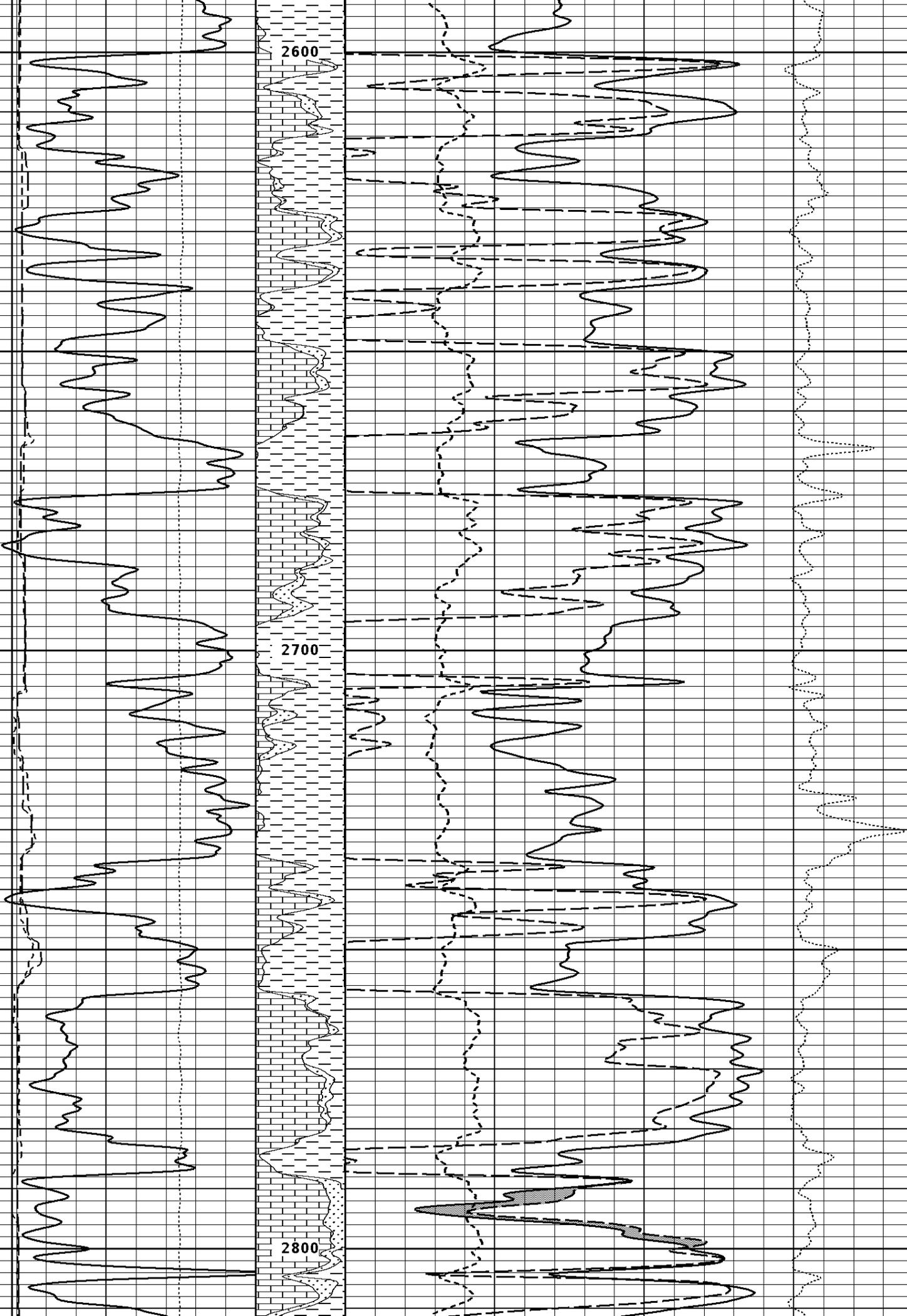


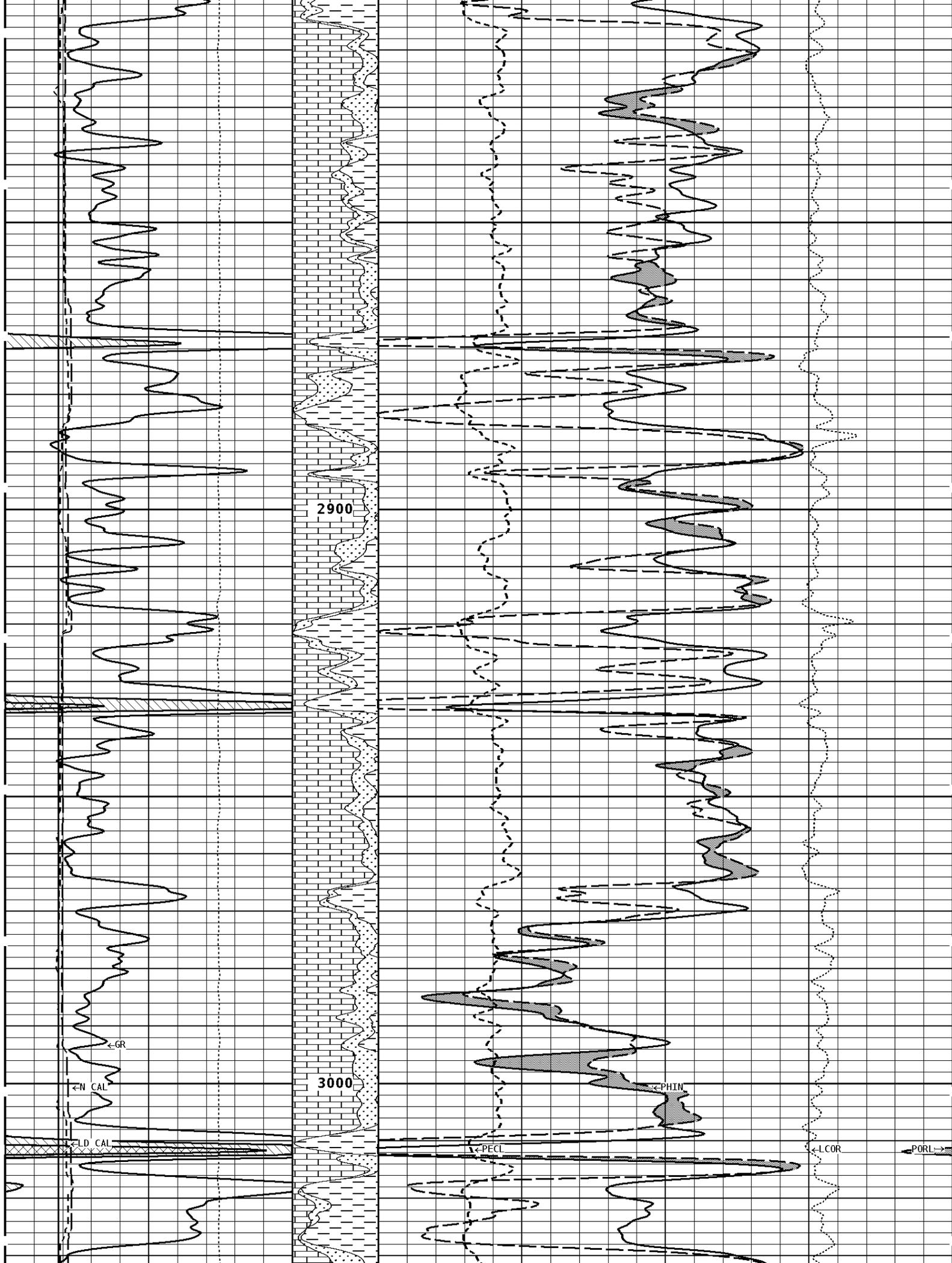


2600

2700

2800





2900

3000

← GR

← N CAL

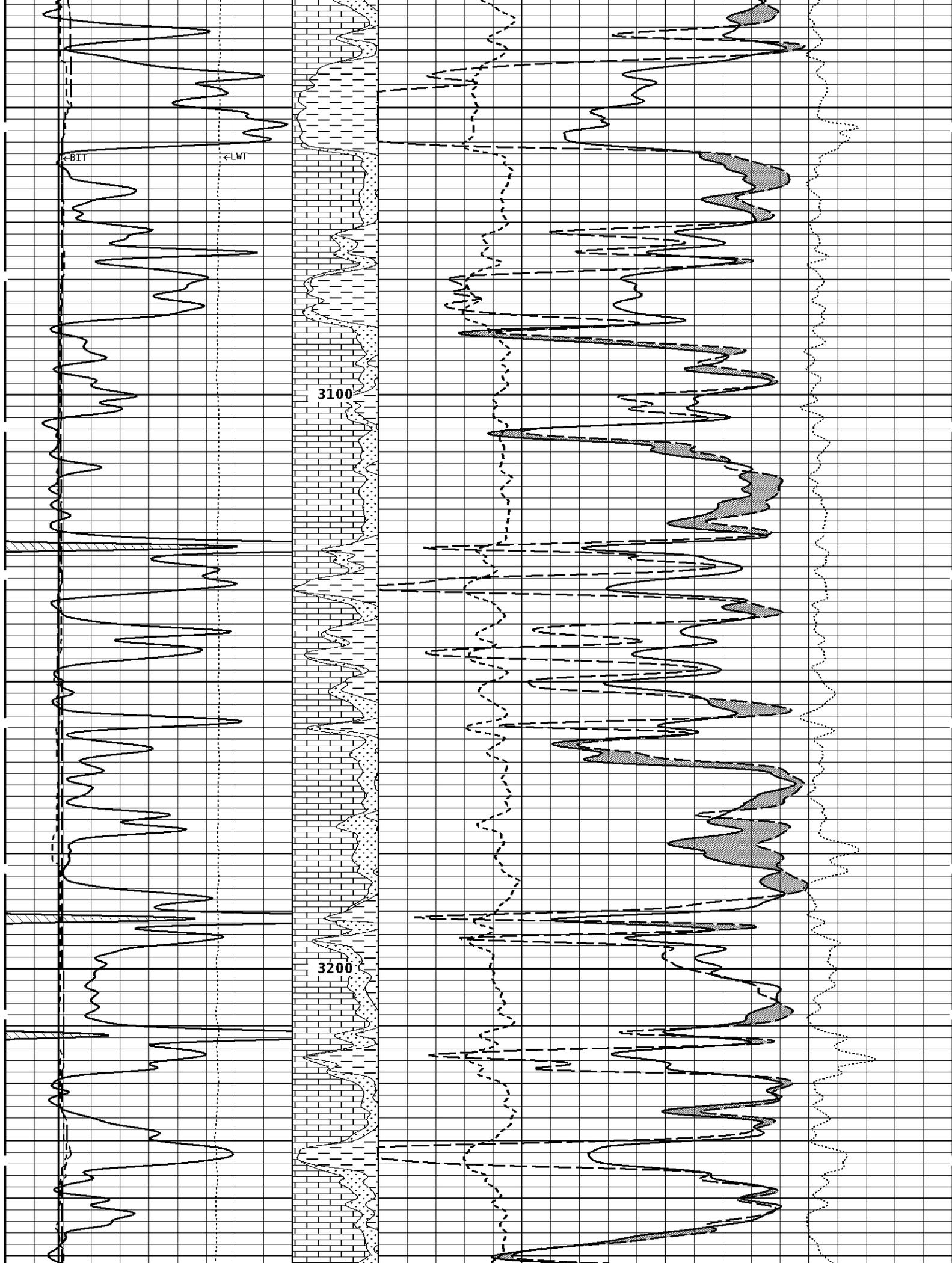
← LD CAL

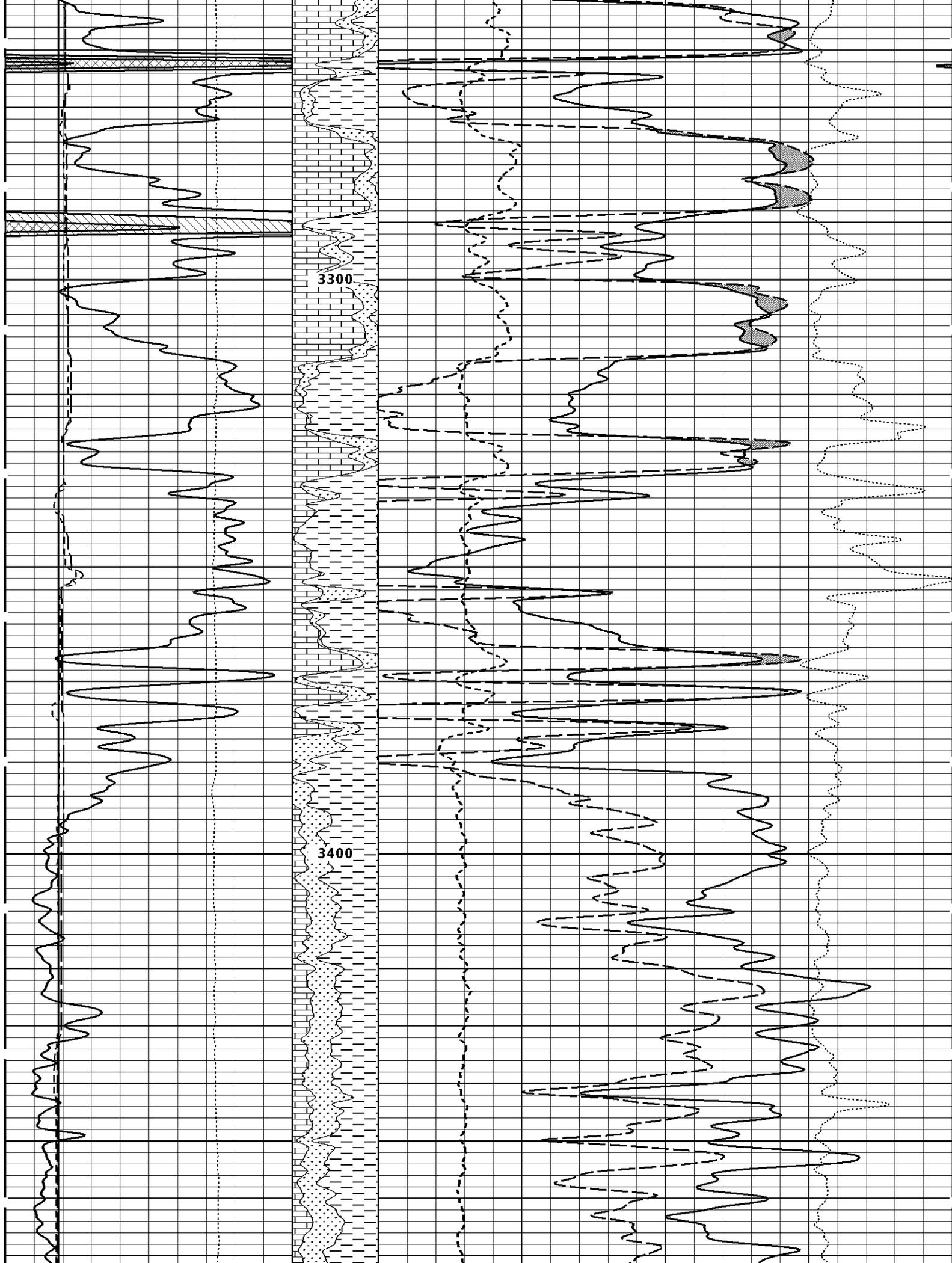
← PECL

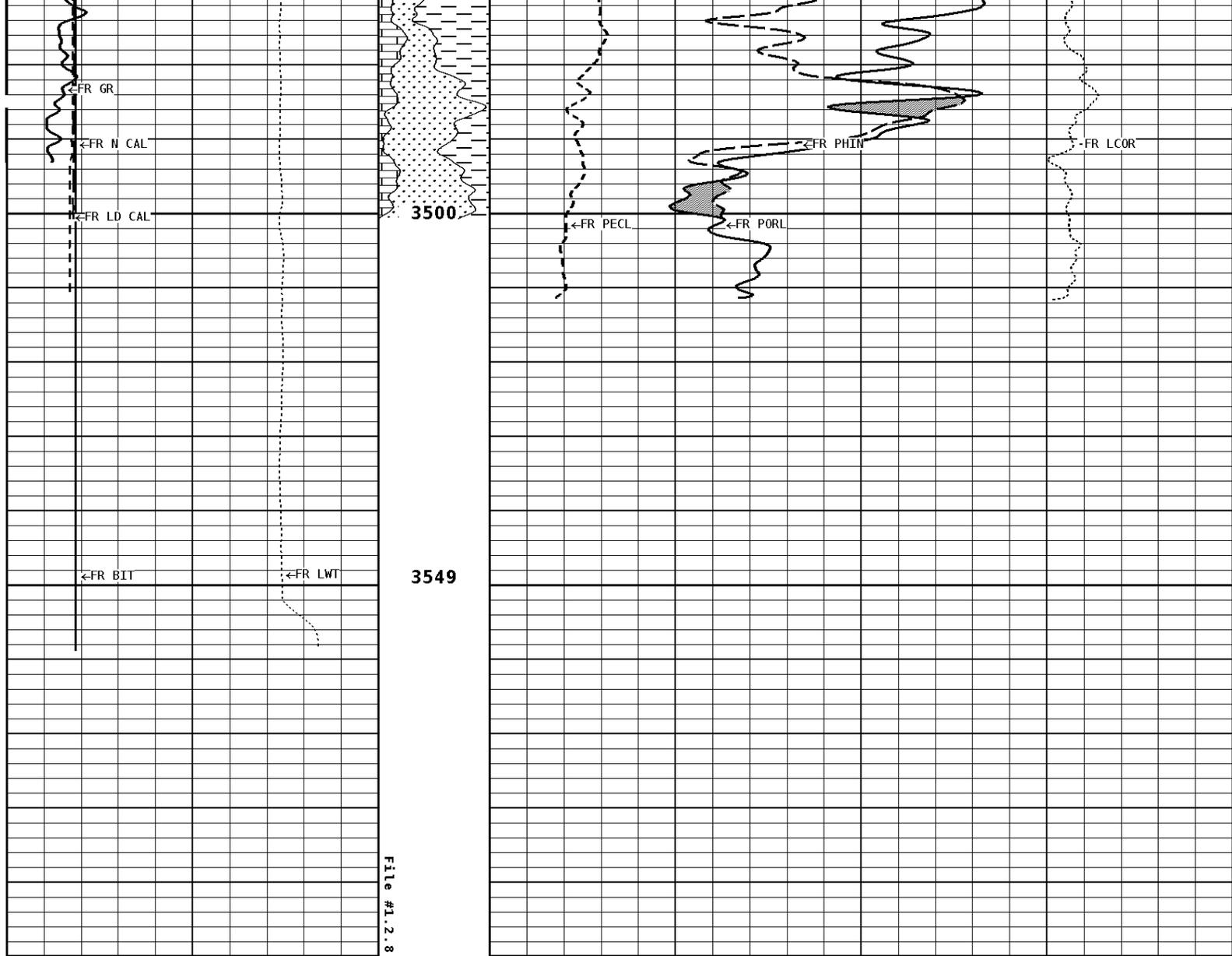
← PHIN

← L COR

← P ORL →







1:240 MAIN SECTION

GAMMA RAY API UNITS 150 0 300 150		Volume Dolo/Shale 30	NEUTRON POROSITY (LIMESTONE) PERCENT -10	
TENSION LBS 10000 0		Volume Calcite 70 30 -10	DENSITY POROSITY (2.71g/cc) PERCENT 30 -10 -50	
DENSITY (X) CALIPER INCHES (IN) 16 6 26 16		Volume Quartz 0	PE CROSS-SECTION BARNS/ELECTRON 10	DENSITY CORRECTION G/CC -0.25 0.25
NEUTRON (Y) CALIPER INCHES (IN) 16 6 26 16				
BIT SIZE INCHES (IN) 6 16				

* Borehole Zone Factors *

Zone 1 99999.0 to 0.0 Feet		
Matrix Density _____	2.71	g/cc
Fluid Density _____	1.00	g/cc
Formation Matrix _____	Limestone	
Drill Bit Size _____	7.875	in
Casing Diameter _____	5.500	in
Casing Thickness _____	0.250	in
Casing Correction (PHI N) _____	Disable	

Well File: BEREXCO-HINES-26X NOV20-QST

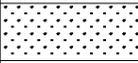
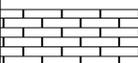
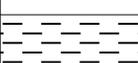
Scale: 1:240 Format: NLD-240

Segment: V1.D2.S6 Reprocess REPEAT

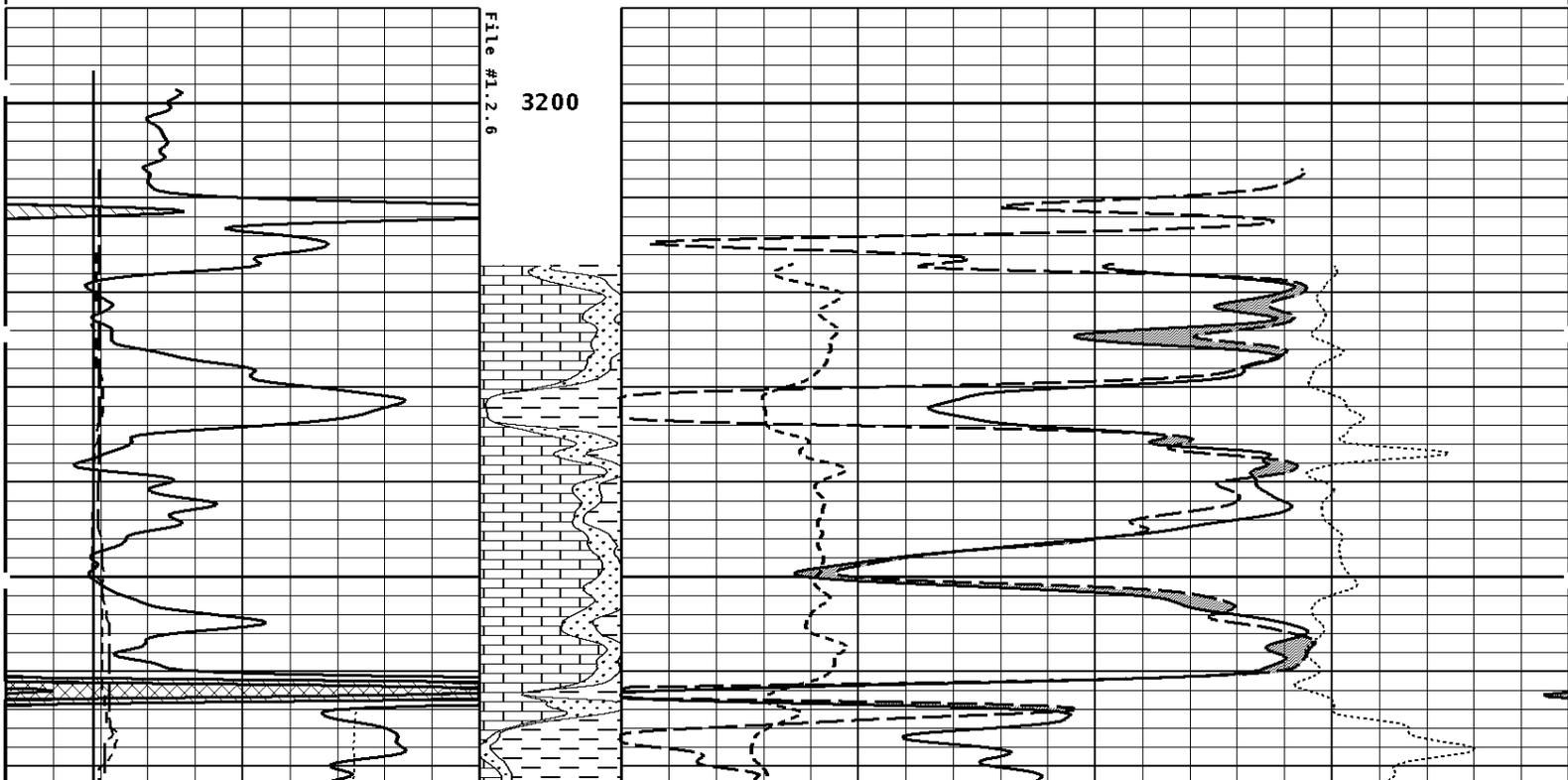
Acquired: 2019-11/20 16:30 3.4.1-13972

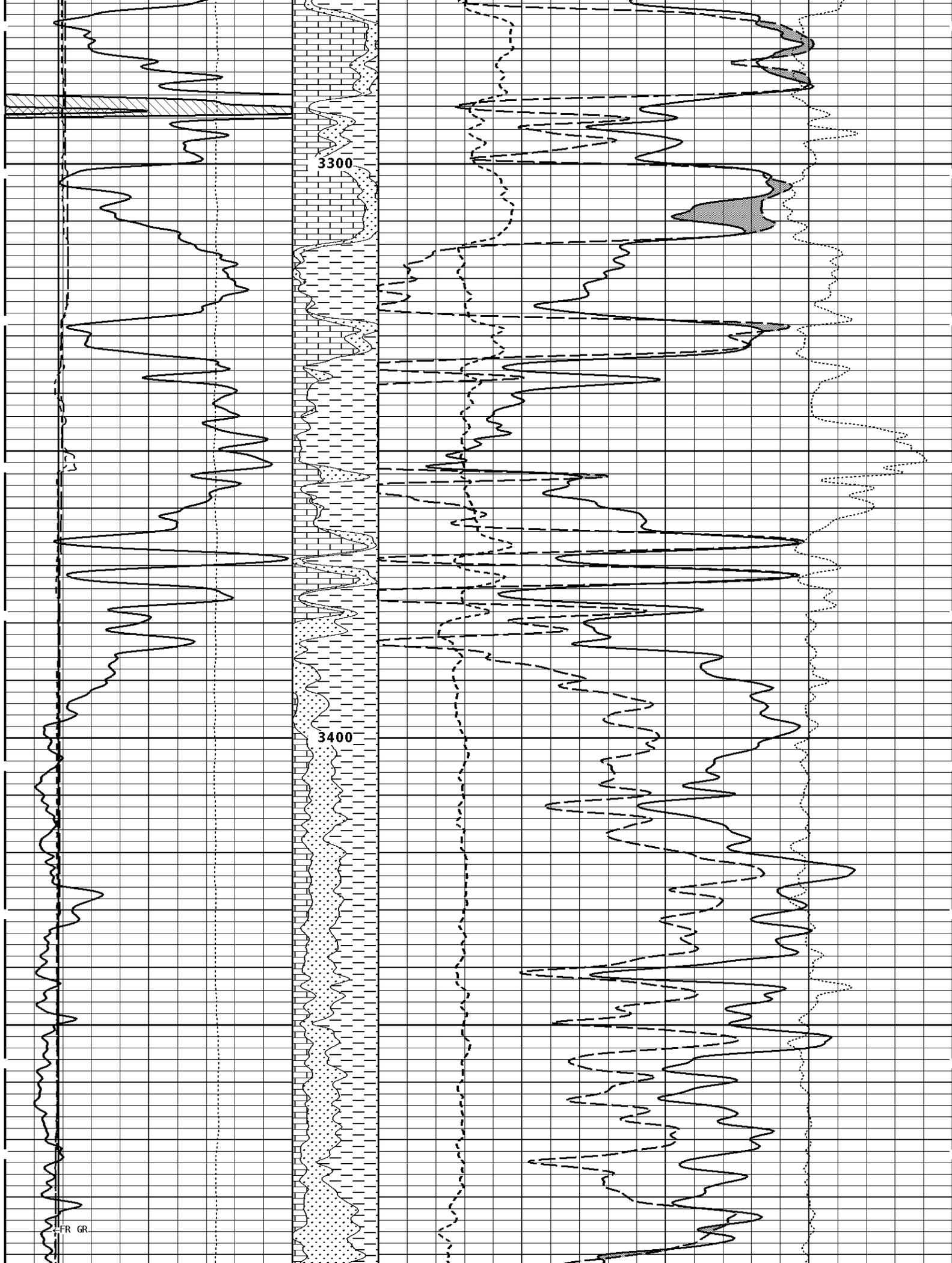
Reference: 0

Processed: 2019-11/20 18:40 3.4.1-13972

BIT SIZE INCHES (IN)	6	16			
NEUTRON (Y) CALIPER INCHES (IN)	16 6	26 16			
DENSITY (X) CALIPER INCHES (IN)	16 6	26 16	Volume Quartz 	PE CROSS-SECTION BARN/ ELECTRON	DENSITY CORRECTION G/CC
			0	10	-0.25
					0.25
TENSION LBS	10000	0	Volume Calcite 	DENSITY POROSITY (2.71g/cc) PERCENT	
			70 30 -10		30 -10 -50
GAMMA RAY API UNITS	150 0	300 150	Volume Dolo/Shale 	NEUTRON POROSITY (LIMESTONE) PERCENT	
			30		-10

1:240 REPEAT SECTION

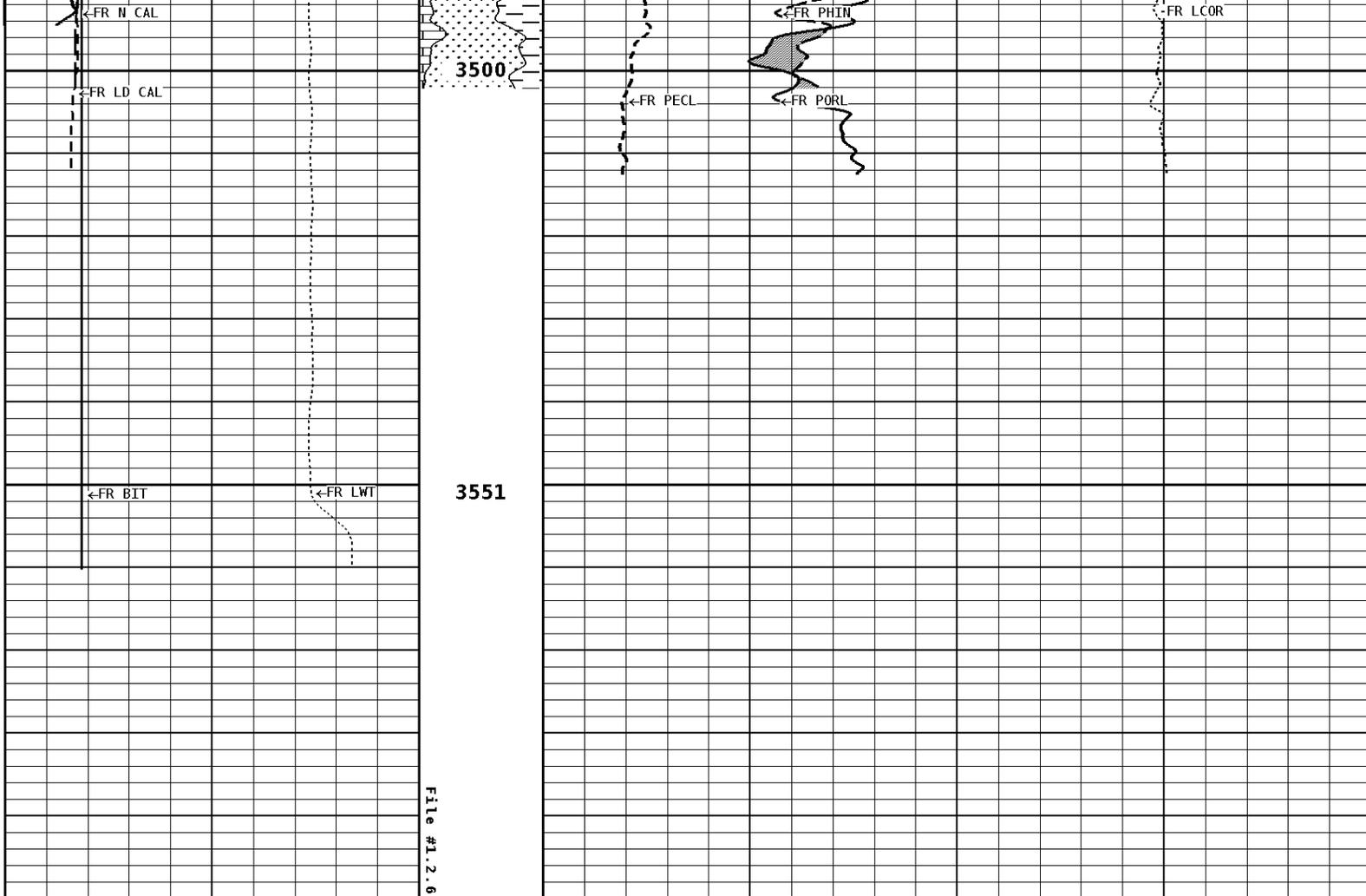




3300

3400

FR GR



File #1.2.6

1:240 REPEAT SECTION

GAMMA RAY API UNITS 150 300 0 150	Volume Dolo/Shale 	NEUTRON POROSITY (LIMESTONE) PERCENT ----- 30 -10	
TENSION LBS 10000 0	Volume Calcite 	DENSITY POROSITY (2.71g/cc) PERCENT 70 30 30 -10 -10 -50	
DENSITY (X) CALIPER INCHES (IN) 16 26 6 16	Volume Quartz 	PE CROSS-SECTION BARN/ELECTRON ----- 0 10	DENSITY CORRECTION G/CC ----- -0.25 0.25
NEUTRON (Y) CALIPER INCHES (IN) 16 26 6 16			
BIT SIZE INCHES (IN) 6 16			

* Borehole Zone Factors *

Zone 1 99999.0 to 0.0 Feet
Matrix Density _____ 2.71 g/cc Fluid Density _____ 1.00 g/cc Formation Matrix _____ Limestone

Formation Matrix	Limestone
Drill Bit Size	7.875 in
Casing Diameter	5.500 in
Casing Thickness	-0.650 in
Casing Correction (PHI N)	Disable

Well File: BEREXCO-HINES-26X_NOV20-QST	Scale: 1:240	Format: LDT-240
Segment: V1.D2.S8 Reprocess MAIN	Acquired: 2019-11/20 16:48 3.4.1-13972	
Reference: 0	Processed: 2019-11/20 18:43 3.4.1-13972	

BIT SIZE INCHES (IN)

6 16

NEUTRON (Y) CALIPER INCHES (IN)

16 26
6 16

DENSITY (X) CALIPER INCHES (IN)

16 26
6 16

TENSION LBS

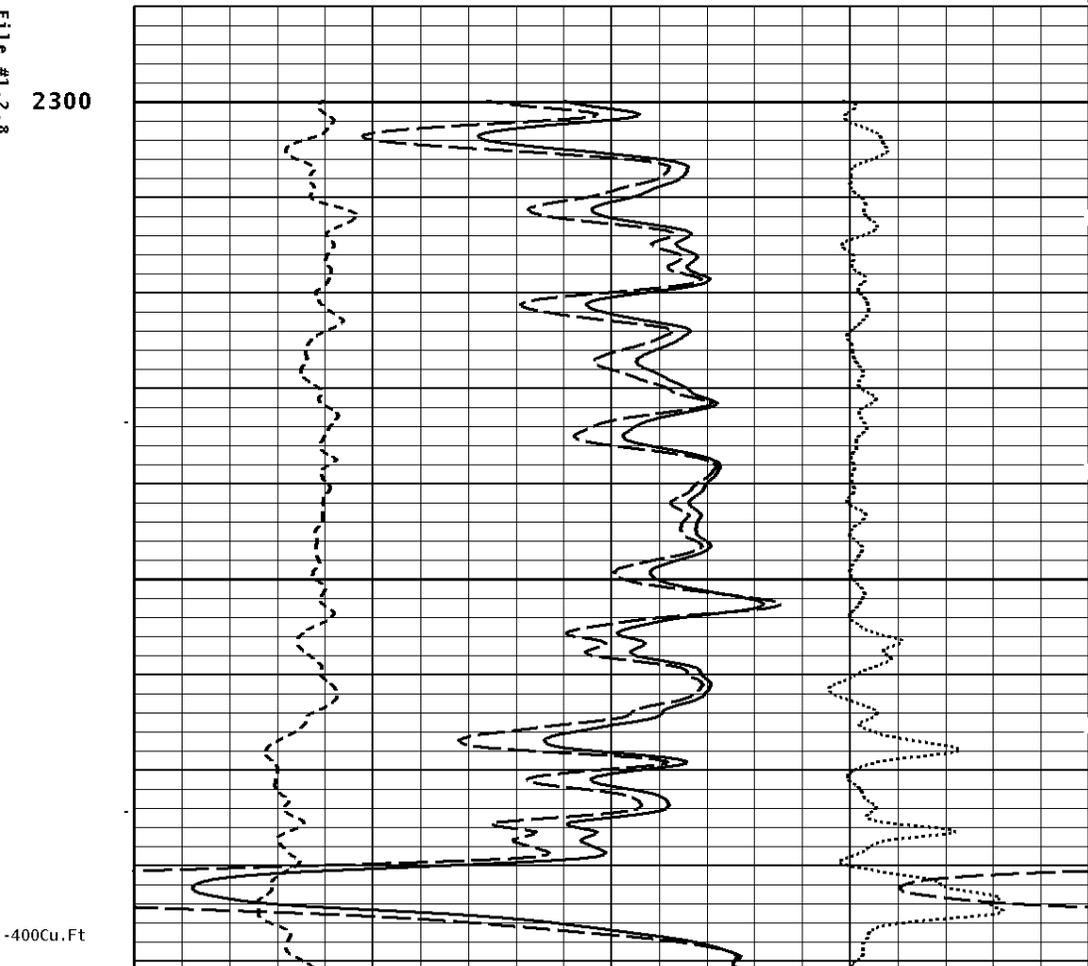
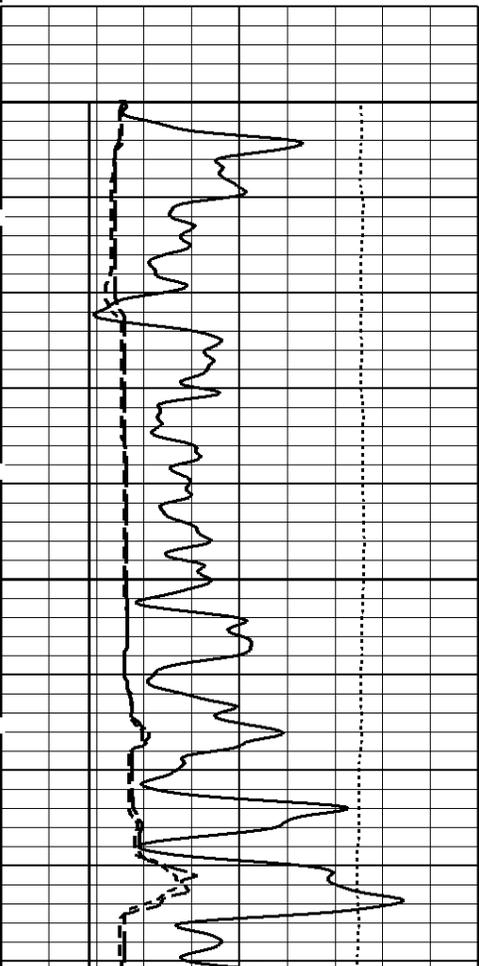
10000 0

GAMMA RAY API UNITS

150 300
0 150

PE CROSS-SECTION BARN/ ELECTRON	DENSITY CORRECTION G/CC
0 10	-0.25 0.25
COMPENSATED BULK DENSITY G/CC	
3.0 4.0 2.0 3.0 1.0 2.0	
DENSITY POROSITY (2.71g/cc) PERCENT	
70 30 30 -10 -10 -50	

1:240 MAIN SECTION BULK DENSITY

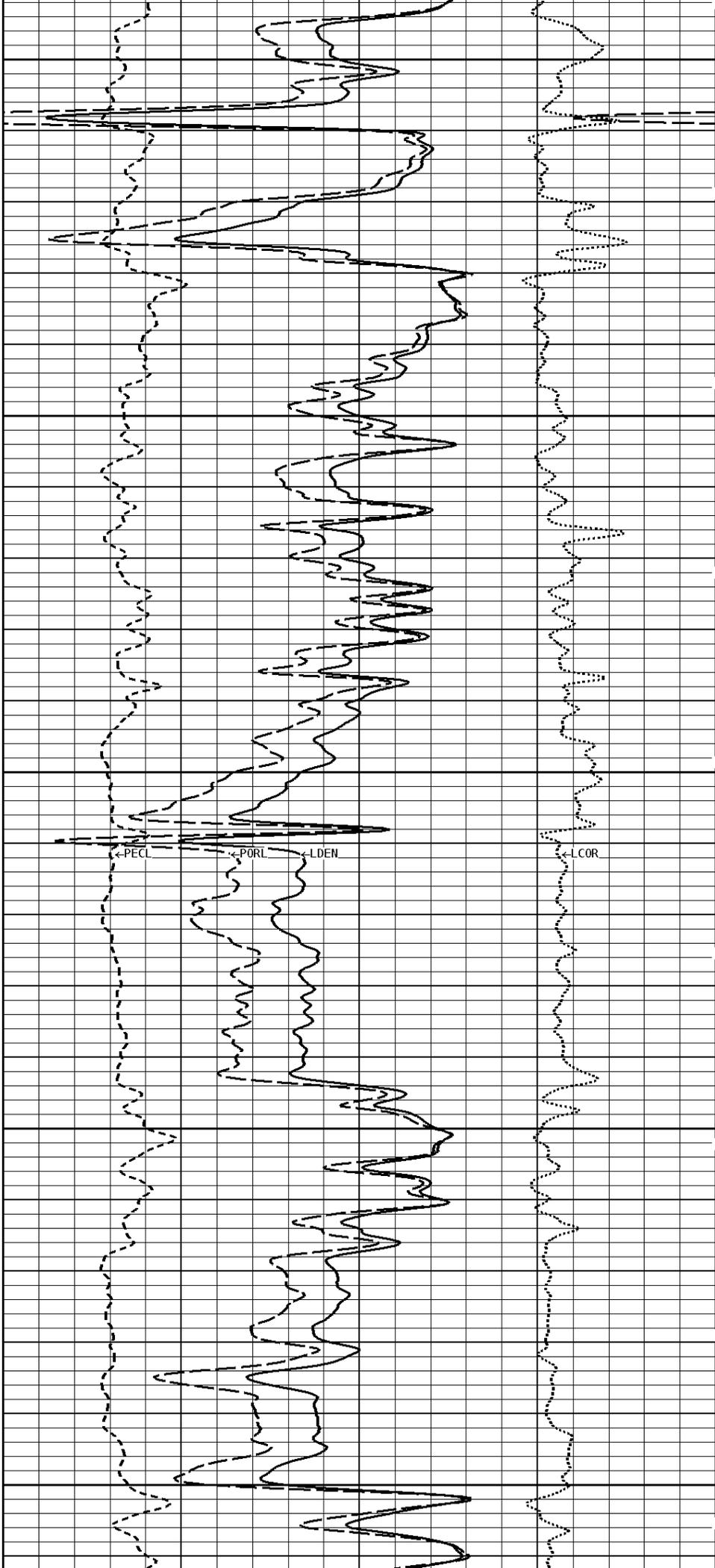
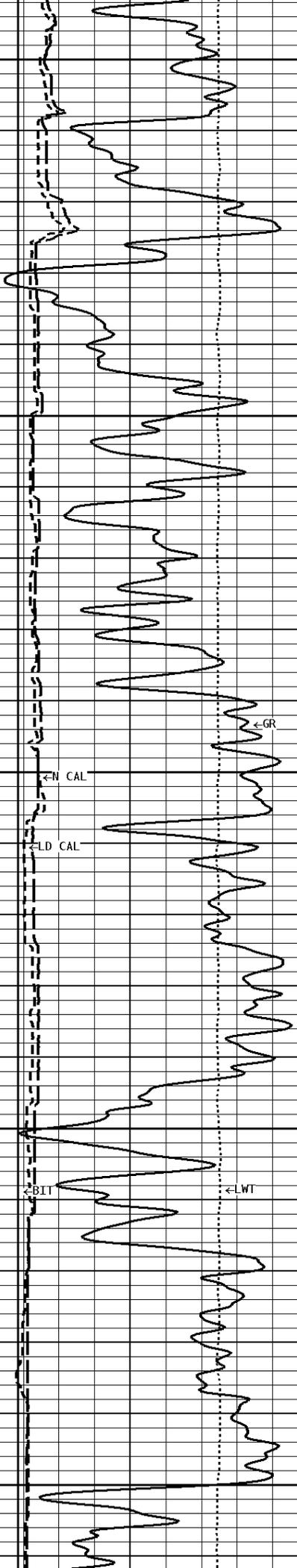


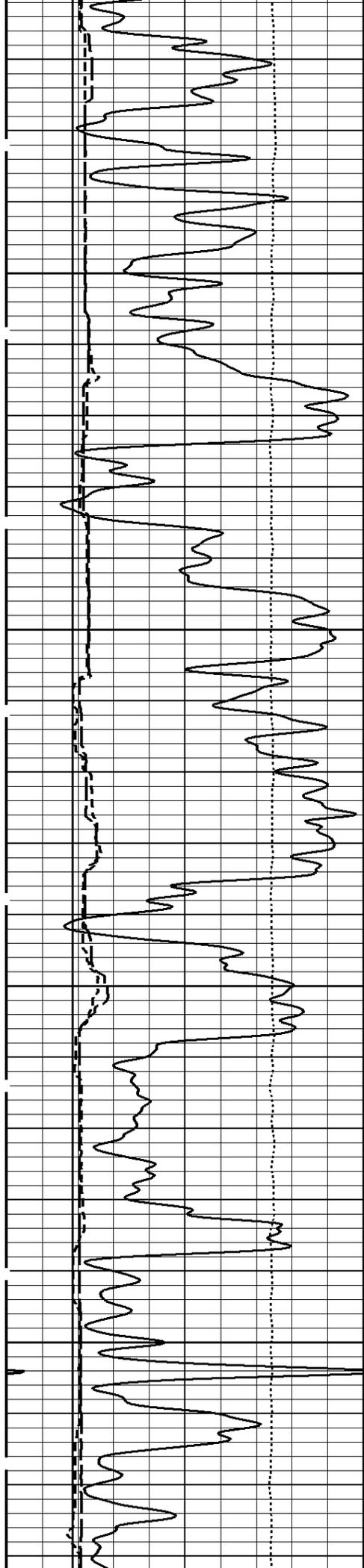
2400

200Cu.Ft--

2500

2600

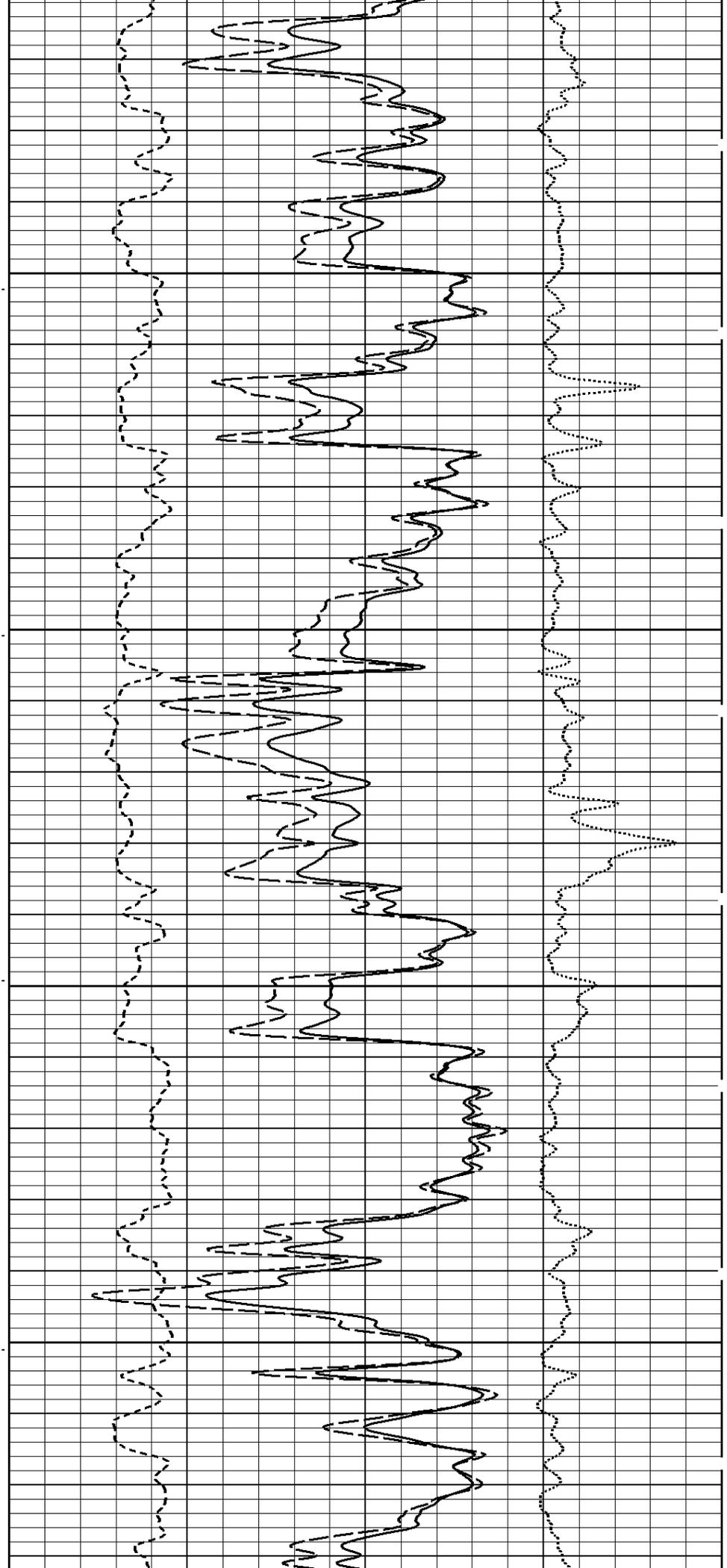


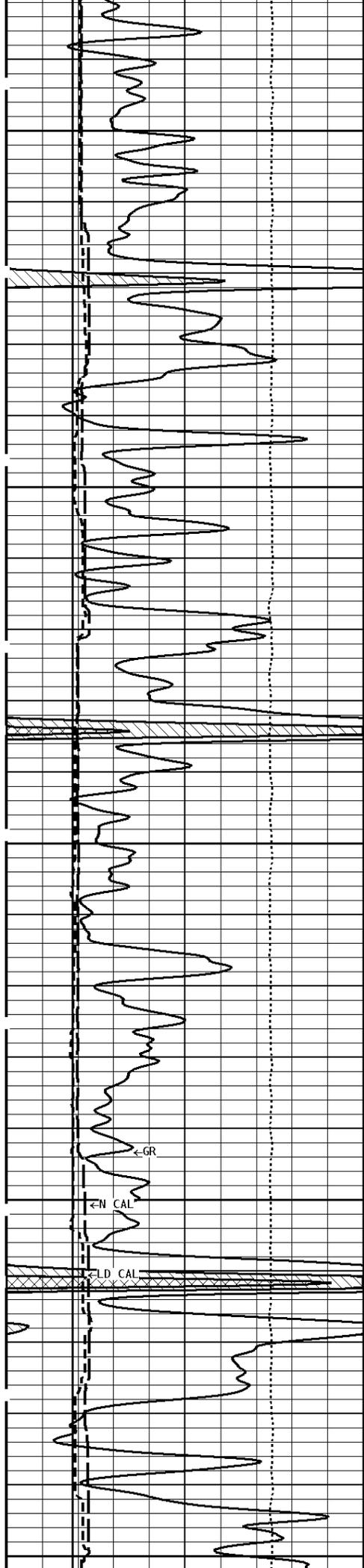


300Cu.Ft

2700

2800



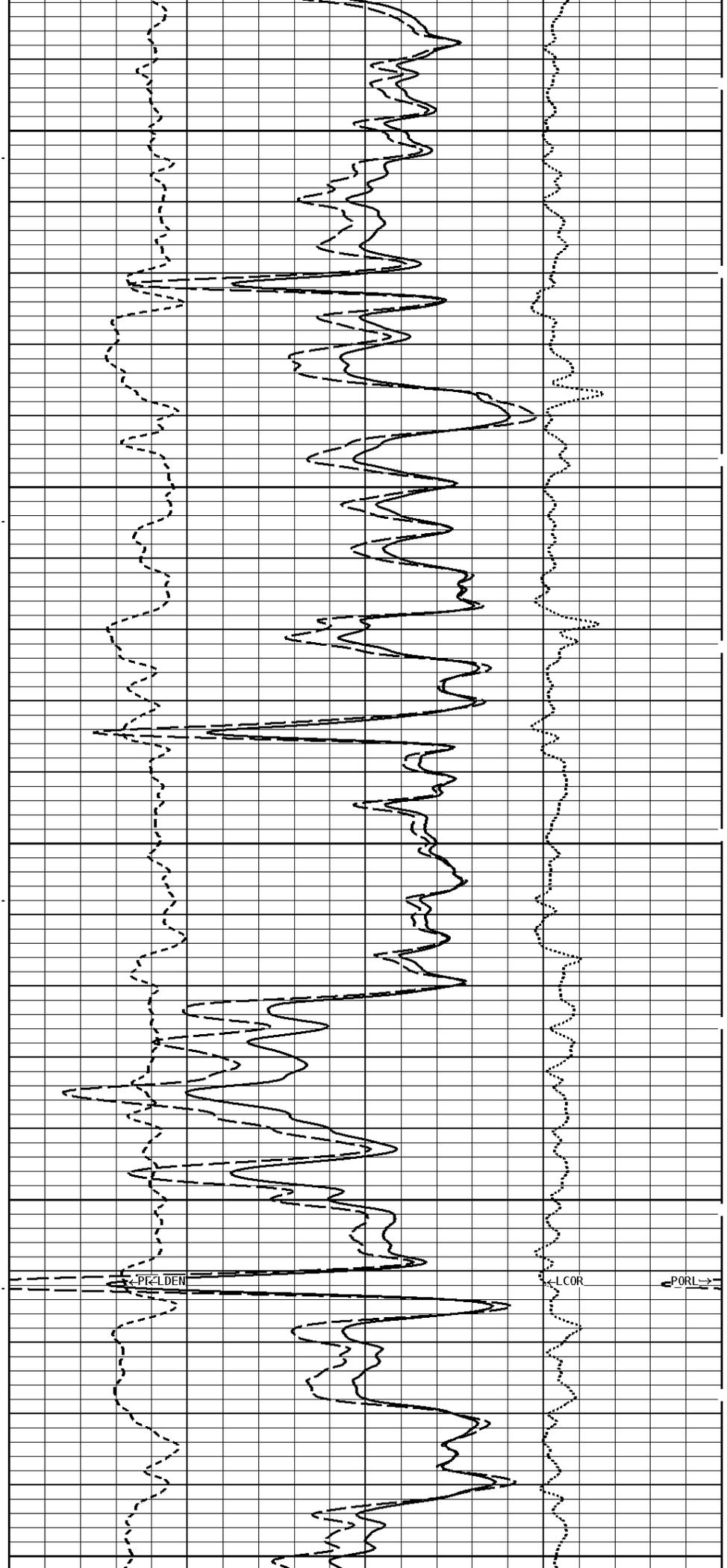


2900

--200Cu.Ft--

100Cu.Ft--

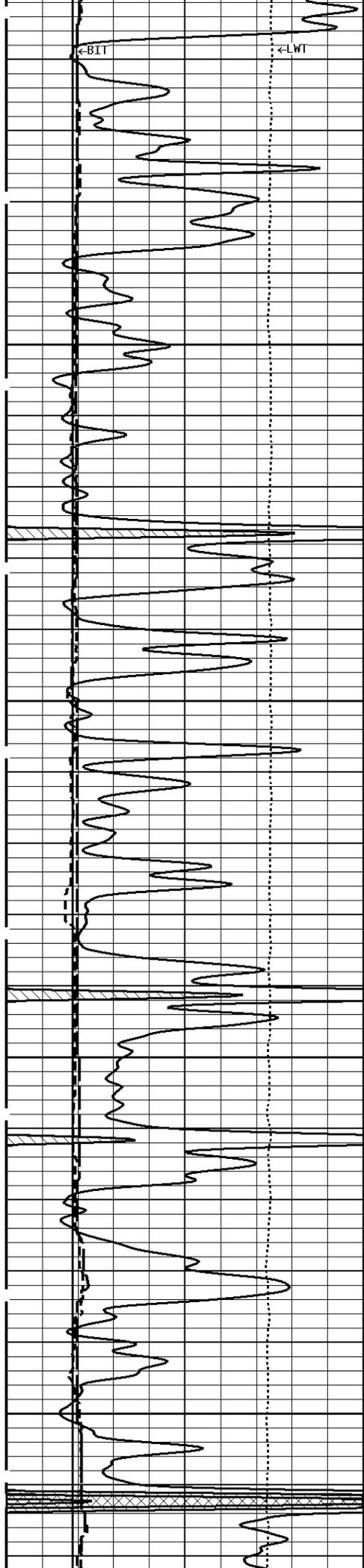
3000



PEZL DEN

L COR

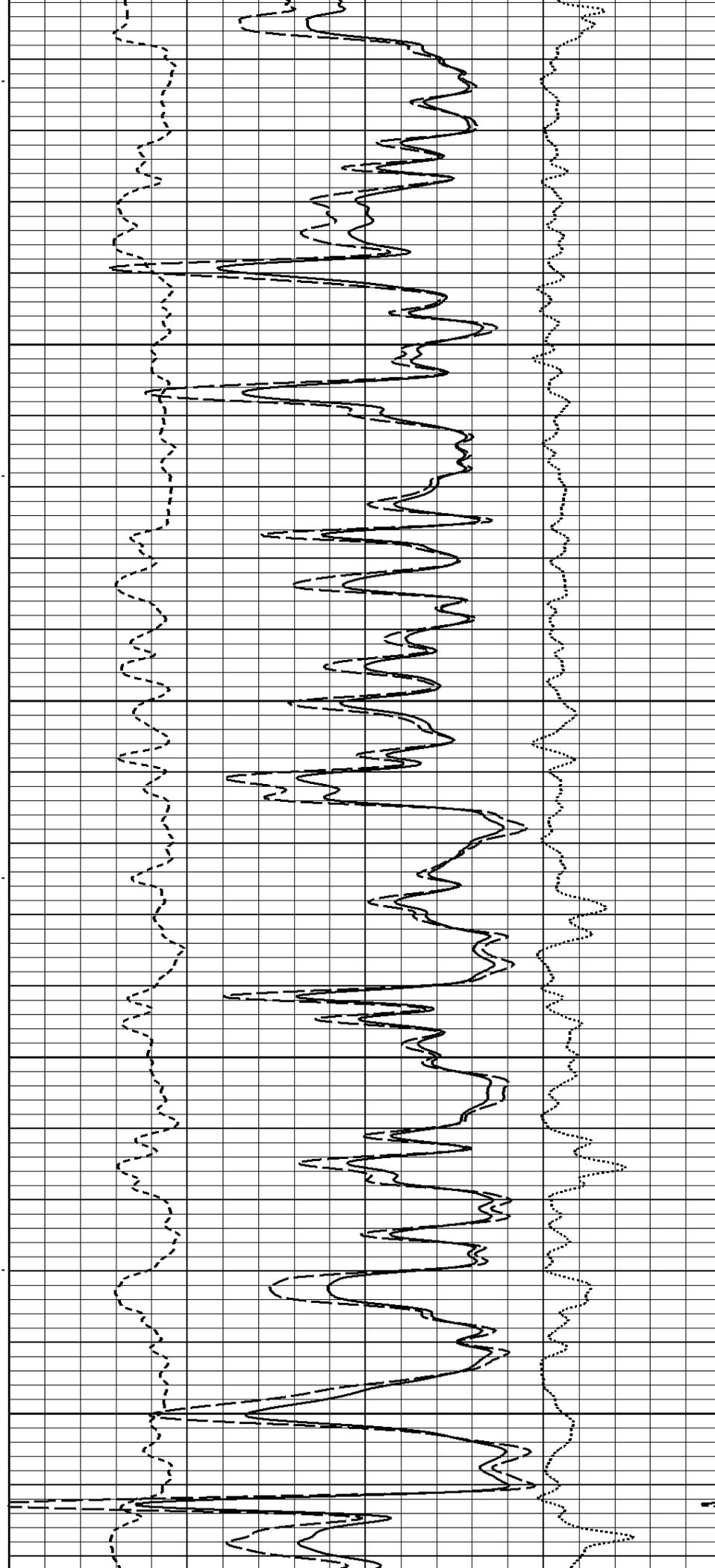
P ORL

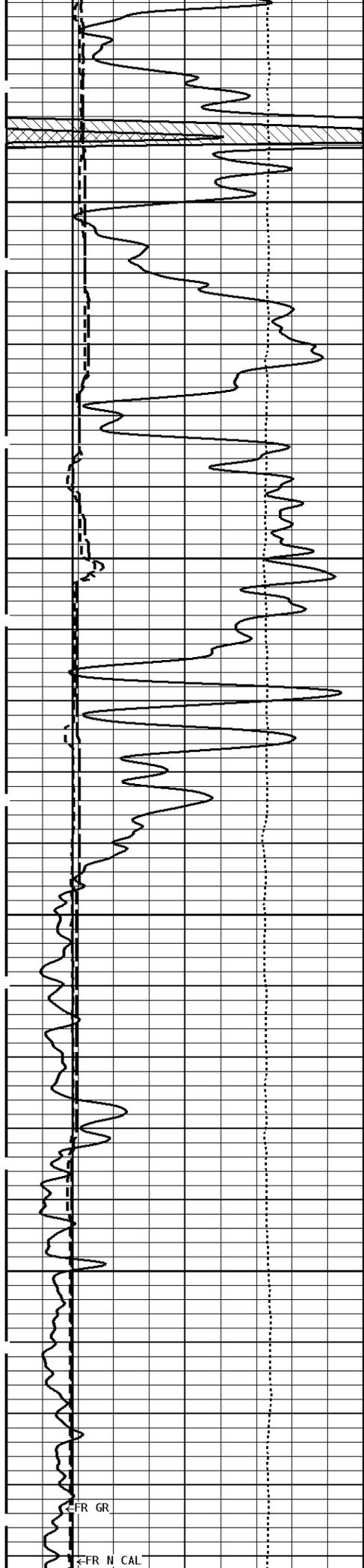


3100

3200

-100Cu.Ft



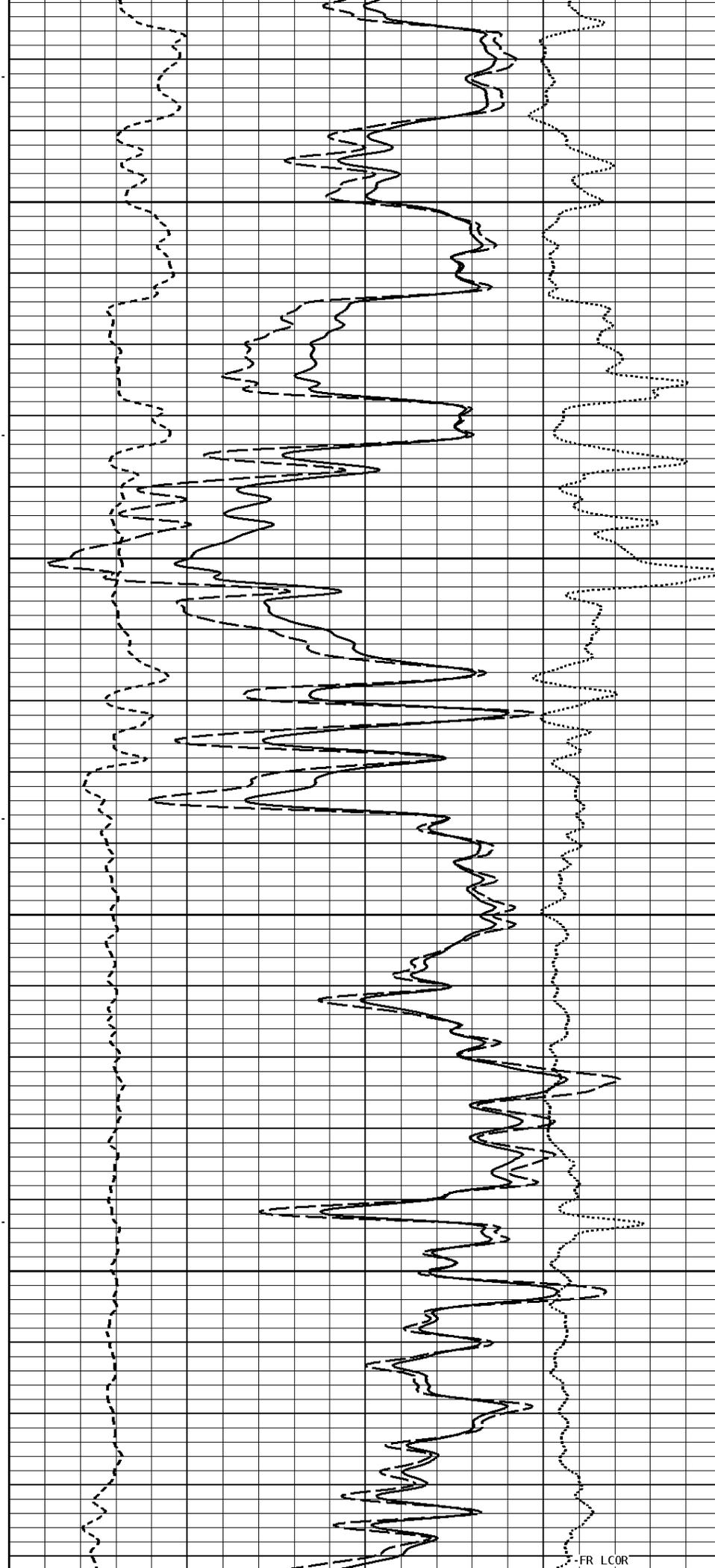


3300

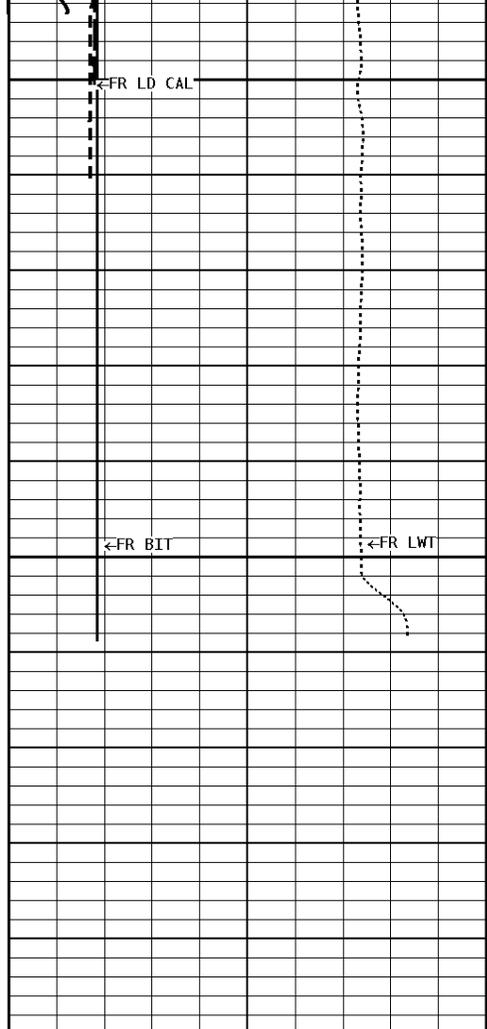
3400

FR GR

FR N CAL



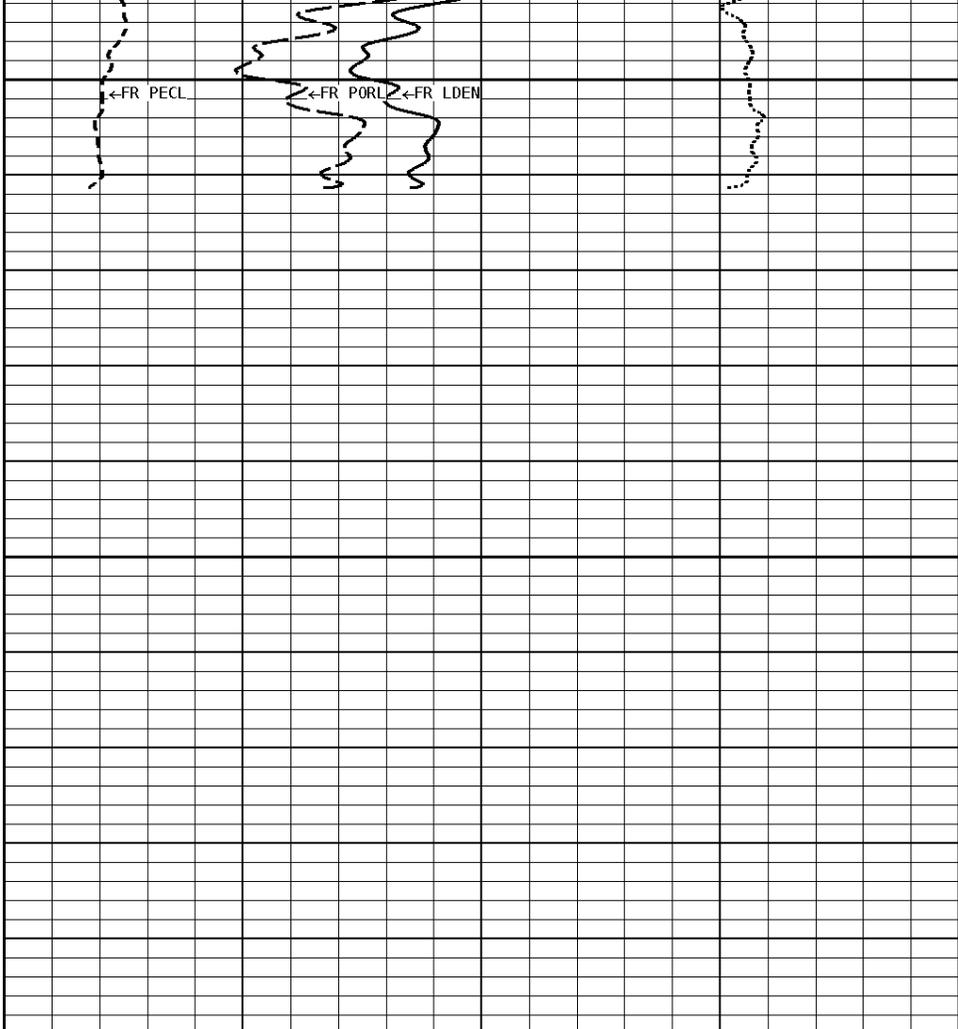
FR L COR



3500

3549

File #1.2.8



1:240 MAIN SECTION
BULK DENSITY

GAMMA RAY API UNITS 150 0 300 150	
TENSION LBS 10000 0	
DENSITY (X) CALIPER INCHES (IN) 16 26 6 16	26 16
NEUTRON (Y) CALIPER INCHES (IN) 16 26 6 16	
BIT SIZE INCHES (IN) 6 16	

-BHV ANV- CU.FT	DENSITY POROSITY (2.71g/cc) PERCENT 70 30 30 -10 -10		30 -10 -50
	COMPENSATED BULK DENSITY G/CC 3.0 4.0 2.0 3.0 1.0 2.0		
	PE CROSS-SECTION BARN/ELECTRON 0 10	DENSITY CORRECTION G/CC -0.25 0.25	

*** Borehole Zone Factors ***

Zone 1 99999.0 to 0.0 Feet			
Matrix Density	_____	2.71	g/cc
Fluid Density	_____	1.00	g/cc
Formation Matrix	_____	_____	_____

Formation Matrix	Limestone
Drill Bit Size	7.875 in
Casing Diameter	5.500 in
Casing Correction (PHI N)	Disable

*** Calibration Summary ***

Shop Calibration					
GRT-B					
Performed : 24-JUN-2019			Time : 12:20		
Sensor Suite : GR-GR5			ID : GRT-BC-038		
	Measured	Units	Calibrated	Units	
GR	Background	Jig	Jig		
	36	266	160	GRAPI	
Shop Calibration					
CNT-AA					
Performed : 03-Jun-2019			Time : 11:06		
Sensor Suite : CALI-BCN			ID : NDT-AF-104		
	Jig - Measured	Units	Jig - Calibrated	Units	
CL # 1	Ring#1 Ring#2		Ring#1 Ring#2		
	8.3 13.2		6.0 12.0	IN.	
Shop Calibration					
LDT-DF					
Performed : 18-SEP-2019			Time : 16:10		
Sensor Suite : BHC NEUT			ID : CNP-AE-41		
Source ID : N-1104					
	Measured	Calibrated	Verification	Units	
N/F	Tank	Jig	Jig		
Porosity	3.7537	3.6893	3.6964	%	
	21.5	20.5	20.6		
Shop Calibration					
LDT-DF					
Performed : 03-Jun-2019			Time : 14:53		
Sensor Suite : CALI-LTH			ID : NDT-FA-404		
	Jig - Measured	Units	Jig - Calibrated	Units	
CL # 1	Ring#1 Ring#2		Ring#1 Ring#2		
	8.3 13.2		6.0 12.0	IN.	
Shop Calibration					
LDP-DA-062					
Performed : 18-SEP-2019			Time : 12:05		
Sensor Suite : BHCPELNG			ID : LDP-DA-062		
Source ID : 1637GW					
	BKGD	Al	Mg	Al+Fe	Units
LSW1	65	1048	1693	671	CPS
LSW2	68	1209	1923	869	CPS
LSW3	248	2723	4386	2317	CPS
LSW4	304	2339	3355	2060	CPS
LSW5	27	46	51	43	CPS
LSW6	87	88	86	86	CPS
LSW7	51	56	57	57	CPS
LSW8	1	3	4	3	CPS
QS	0.261	0.222	0.203	0.205	
PES			2.778	5.967	
SSDN		2.600	1.680		G/CC
	BKGD	Al	Mg	Al+Fe	Units
LLW1	96	1171	4837	704	CPS
LLW2	106	2047	8062	1488	CPS
LLW3	404	3698	14047	3196	CPS
LLW4	517	1760	5509	1595	CPS
LLW5	59	67	114	66	CPS
LLW6	161	160	148	159	CPS
LLW7	108	104	99	106	CPS
LLW8	4	7	17	6	CPS
QL	0.195	0.215	0.198	0.198	
PEL			2.697	5.458	
LSDN		2.600	1.680		G/CC



Company: BEREXCO, LLC
 Well: HINES UNIT #26X
 Location: 200' FNL & 440' FWL
 Logged: 11-20-2019

energy services

K.B. Elev: 1942.0 Ft