



**WELL COMPLETION FORM**  
**WELL HISTORY - DESCRIPTION OF WELL & LEASE**

OPERATOR: License # \_\_\_\_\_

Name: \_\_\_\_\_

Address 1: \_\_\_\_\_

Address 2: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ + \_\_\_\_\_

Contact Person: \_\_\_\_\_

Phone: ( \_\_\_\_\_ ) \_\_\_\_\_

CONTRACTOR: License # \_\_\_\_\_

Name: \_\_\_\_\_

Wellsite Geologist: \_\_\_\_\_

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
- Conv. to GSW
- Plug Back: \_\_\_\_\_ Plug Back Total Depth \_\_\_\_\_
- Commingled      Permit #: \_\_\_\_\_
- Dual Completion      Permit #: \_\_\_\_\_
- SWD      Permit #: \_\_\_\_\_
- ENHR      Permit #: \_\_\_\_\_
- GSW      Permit #: \_\_\_\_\_

Spud Date or Recompletion Date      Date Reached TD      Completion Date or Recompletion Date

API No. 15 - \_\_\_\_\_

Spot Description: \_\_\_\_\_

\_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West

\_\_\_\_\_ Feet from  North /  South Line of Section

\_\_\_\_\_ Feet from  East /  West Line of Section

Footages Calculated from Nearest Outside Section Corner:

- NE       NW       SE       SW

County: \_\_\_\_\_

Lease Name: \_\_\_\_\_ Well #: \_\_\_\_\_

Field Name: \_\_\_\_\_

Producing Formation: \_\_\_\_\_

Elevation: Ground: \_\_\_\_\_ Kelly Bushing: \_\_\_\_\_

Total Depth: \_\_\_\_\_ Plug Back Total Depth: \_\_\_\_\_

Amount of Surface Pipe Set and Cemented at: \_\_\_\_\_ Feet

Multiple Stage Cementing Collar Used?  Yes  No

If yes, show depth set: \_\_\_\_\_ Feet

If Alternate II completion, cement circulated from: \_\_\_\_\_

feet depth to: \_\_\_\_\_ w/ \_\_\_\_\_ sx cmt.

**Drilling Fluid Management Plan**

(Data must be collected from the Reserve Pit)

Chloride content: \_\_\_\_\_ ppm Fluid volume: \_\_\_\_\_ bbls

Dewatering method used: \_\_\_\_\_

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**

- Letter of Confidentiality Received  
Date: \_\_\_\_\_
- Confidential Release Date: \_\_\_\_\_
- Wireline Log Received
- Geologist Report Received
- UIC Distribution
- ALT  I  II  III Approved by: \_\_\_\_\_ Date: \_\_\_\_\_



1049432

Operator Name: \_\_\_\_\_ Lease Name: \_\_\_\_\_ Well #: \_\_\_\_\_

Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West County: \_\_\_\_\_

**INSTRUCTIONS:** Show important tops and base 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. Attach complete copy of all Electric Wire-line Logs surveyed. Attach final geological well site report.

Drill Stem Tests Taken <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Attach Additional Sheets)</i>  Samples Sent to Geological Survey <input type="checkbox"/> Yes <input type="checkbox"/> No  Cores Taken <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Log Run <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Log Submitted Electronically <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(If no, Submit Copy)</i>  List All E. Logs Run: _____	<input type="checkbox"/> Log Formation (Top), Depth and Datum <input type="checkbox"/> Sample  Name Top Datum
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CASING RECORD <input type="checkbox"/> New <input type="checkbox"/> 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

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				

Shots Per Foot	PERFORATION RECORD - Bridge Plugs Set/Type Specify Footage of Each Interval Perforated	Acid, Fracture, Shot, Cement Squeeze Record <i>(Amount and Kind of Material Used)</i>	Depth

TUBING RECORD:      Size: \_\_\_\_\_ Set At: \_\_\_\_\_ Packer At: \_\_\_\_\_ Liner Run:  Yes  No

Date of First, Resumed Production, SWD or ENHR. \_\_\_\_\_ Producing Method:  
 Flowing  Pumping  Gas Lift  Other *(Explain)* \_\_\_\_\_

Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity
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DISPOSITION OF GAS: <input type="checkbox"/> Vented <input type="checkbox"/> Sold <input type="checkbox"/> Used on Lease <i>(If vented, Submit ACO-18.)</i>	METHOD OF COMPLETION: <input type="checkbox"/> Open Hole <input type="checkbox"/> Perf. <input type="checkbox"/> Dually Comp. <input type="checkbox"/> Commingled <i>(Submit ACO-5)</i> <input type="checkbox"/> Other <i>(Specify)</i> _____ <input type="checkbox"/> Other <i>(Specify)</i> _____	PRODUCTION INTERVAL: _____ _____
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Form	ACO1 - Well Completion
Operator	Larson Engineering, Inc. dba Larson Operating Company
Well Name	Hagans 2
Doc ID	1049432

Tops

Name	Top	Datum
Anhydrite	1996	+590
Base Anhydrite	2030	+556
Heebner	3860	-1274
Lansing	3902	-1316
Pawnee	4332	-1746
Fort Scott	4397	-1811
Cherokee Sh	4422	-1836
Mississippi	4496	-1910

# QUALITY OILWELL CEMENTING, INC.

Federal Tax I.D.# 20-2886107

Phone 785-483-2025  
Cell 785-324-1041

Home Office P.O. Box 32 Russell, KS 67665

No. 4243

Date	9-17-10	Sec.	14	Twp.	16	Range	26	County	Ness	State	KS	On Location		Finish	11:00 PM	
Lease	Hagans		Well No.	2-24		Location	Utica, KS - West side 1 1/2 W E/Into									
Contractor	H-D Drilling Rig #2							Owner	To Quality Oilwell Cementing, Inc. You are hereby requested to rent cementing equipment and furnish cementer and helper to assist owner or contractor to do work as listed.							
Type Job	Surface							Charge To	Larson engineering							
Hole Size	12 1/4"		T.D.	223'		Depth	223'		Street							
Csg.	8 5/8"		Depth			Tool			City	State						
Tbg. Size			Shoe Joint	15'		Cement Left in Csg.	15'		The above was done to satisfaction and supervision of owner agent or contractor.							
Meas Line			Displace	13 BBLs		Cement Amount Ordered	165 sx Common 3%CC 2%Gnd									

**EQUIPMENT**

Pumptrk	5	No.	Cementer	Paul	Common	165
			Helper			
Bulktrk	4	No.	Driver	Cisco	Poz. Mix	
			Driver			
Bulktrk	pin	No.	Driver	Rick	Gel.	3
			Driver			

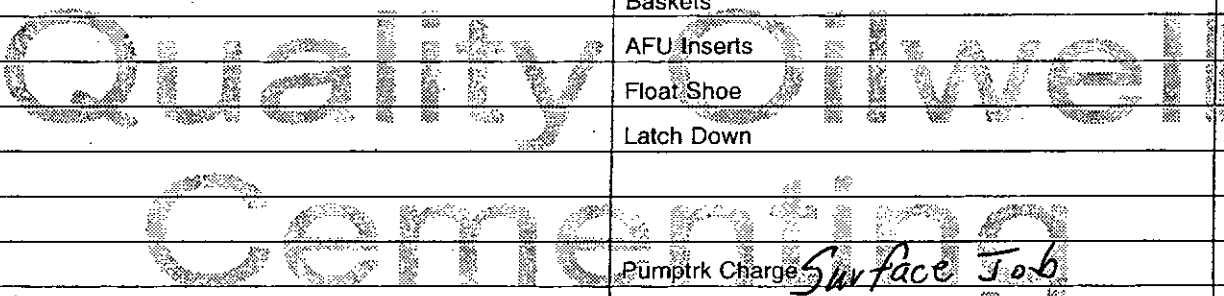
**JOB SERVICES & REMARKS**

Remarks:	Cement did Circulate.	Calcium	6
Rat Hole		Hulls	
Mouse Hole		Salt	
Centralizers		Flowseal	
Baskets		Kol-Seal	
D/V or Port Collar		Mud CLR 48	
		CFL-117 or CD110 CAF 38	
		Sand	
		Handling	174
		Mileage	

used 8 5/8" Swedge

**FLOAT EQUIPMENT**

Guide Shoe	
Centralizer	
Baskets	
AFU Inserts	
Float Shoe	
Latch Down	



Pumptrk Charge	Surface Job
Mileage	29

X Signature *Doug Roberts*

Tax	
Discount	
Total Charge	

# ALLIED CEMENTING CO., LLC. 035469

Federal Tax I.D.# 20-5975804

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

SERVICE POINT:

*Dakota, KS*

DATE <i>9/28/10</i>	SEC. <i>14</i>	TWP. <i>16</i>	RANGE <i>26</i>	CALLED OUT	ON LOCATION	JOB START <i>300 AM</i>	JOB FINISH <i>400 AM</i>
LEASE <i>Hogans</i>	WELL # <i>#2</i>	LOCATION <i>1/4 Sec 14 to Rd 0 1/2 W</i>			COUNTY <i>Neosho</i>	STATE <i>KS</i>	
OLD OR NEW (Circle one) <i>NEW</i>				<i>ENTER</i>			

CONTRACTOR *H-D PTA 2*

TYPE OF JOB \_\_\_\_\_

HOLE SIZE *7 7/8* T.D. \_\_\_\_\_

CASING SIZE *8 7/8* DEPTH \_\_\_\_\_

TUBING SIZE \_\_\_\_\_ DEPTH \_\_\_\_\_

DRILL PIPE *4 1/2* DEPTH \_\_\_\_\_

TOOL \_\_\_\_\_ DEPTH \_\_\_\_\_

PRES. MAX \_\_\_\_\_ MINIMUM \_\_\_\_\_

MEAS. LINE \_\_\_\_\_ SHOE JOINT \_\_\_\_\_

CEMENT LEFT IN CSG. \_\_\_\_\_

PERFS. \_\_\_\_\_

DISPLACEMENT \_\_\_\_\_

OWNER *Same*

CEMENT AMOUNT ORDERED *220 SKS 60/40 400*

*gel 1/4 16 Flo Seal*

COMMON	<i>162 SKS</i>	@	<i>13.65</i>	<i>2211.30</i>
POZMIX	<i>108 SKS</i>	@	<i>2.60</i>	<i>2808.00</i>
GEL	<i>9 SKS</i>	@	<i>20.40</i>	<i>183.60</i>
CHLORIDE		@		
ASC		@		
<i>Flo Seal</i>	<i>6816</i>	@	<i>2.45</i>	<i>166.60</i>
HANDLING	<i>282</i>	@	<i>2.10</i>	<i>592.20</i>
MILEAGE	<i>100 SK/mile</i>			<i>564.00</i>
TOTAL				<i>4,538.50</i>

**EQUIPMENT**

PUMP TRUCK CEMENTER *Alan*

# *422* HELPER *Wayne*

BULK TRUCK DRIVER *W. J.*

# *394* DRIVER \_\_\_\_\_

BULK TRUCK DRIVER \_\_\_\_\_

# \_\_\_\_\_ DRIVER \_\_\_\_\_

**REMARKS:**

*50 @ 2060'*

*80 @ 1300'*

*40 @ 650'*

*50 @ 260'*

*20 @ 80'*

*30 @ Rat Hole*

**SERVICE**

DEPTH OF JOB *2060'*

PUMP TRUCK CHARGE *1170.00*

EXTRA FOOTAGE \_\_\_\_\_ @ \_\_\_\_\_

MILEAGE *20* @ *7.00* *140.00*

MANIFOLD \_\_\_\_\_ @ \_\_\_\_\_

TOTAL *1310.00*

CHARGE TO: *Carson Engineering*

STREET \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

**PLUG & FLOAT EQUIPMENT**

\_\_\_\_\_ @ \_\_\_\_\_

\_\_\_\_\_ @ \_\_\_\_\_

\_\_\_\_\_ @ \_\_\_\_\_

\_\_\_\_\_ @ \_\_\_\_\_

TOTAL \_\_\_\_\_

To Allied Cementing Co., LLC.

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

PRINTED NAME *Gilbert Smith*

SIGNATURE *[Signature]*

SALES TAX (If Any) \_\_\_\_\_

TOTAL CHARGES \_\_\_\_\_

DISCOUNT \_\_\_\_\_ IF PAID IN 30 DAYS



## DRILL STEM TEST REPORT

Prepared For: **LARSON ENGINEERING**

562 WEST STATE RD 4 OLMITZ KS 67564 +  
8561

ATTN: STEVE DAVIS

**14-16S-26W NESS**

**HAGANS #2**

Start Date: 2010.09.25 @ 05:30:00

End Date: 2010.09.25 @ 14:02:00

Job Ticket #: 16061                      DST #: 1

Superior Testers Enterprises LLC  
PO Box 138 Great Bend KS 67530  
1-800-792-6902

Printed: 2010.09.27 @ 14:37:47

LARSON ENGINEERING

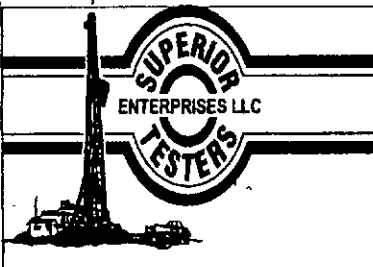
HAGANS #2

14-16S-26W NESS

DST # 1

MISSISSIPPI

2010.09.25



# DRILL STEM TEST REPORT

LARSON ENGINEERING

HAGANS #2

562 WEST STATE RD 4 OLMITZ KS 67564 + 8561

14-16S-26W NESS

ATTN: STEVE DAVIS

Job Ticket: 16061

DST#: 1

Test Start: 2010.09.25 @ 05:30:00

## GENERAL INFORMATION:

Formation: **MISSISSIPPI**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 08:58:30

Time Test Ended: 14:02:00

Test Type: Conventional Bottom Hole (Initial)

Tester: JARED SCHECK

Unit No: 3320-GB-190

Interval: 4415.00 ft (KB) To 4517.00 ft (KB) (TVD)

Reference Elevations: 2585.00 ft (KB)

Total Depth: 4517.00 ft (KB) (TVD)

2576.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Poor

KB to GR/CF: 9.00 ft

Serial #: 8405

Inside

Press@RunDepth: 100.41 psia @ 4513.00 ft (KB)

Capacity: 5000.00 psia

Start Date: 2010.09.25

End Date:

2010.09.25

Last Calib.: 2010.09.25

Start Time: 05:32:00

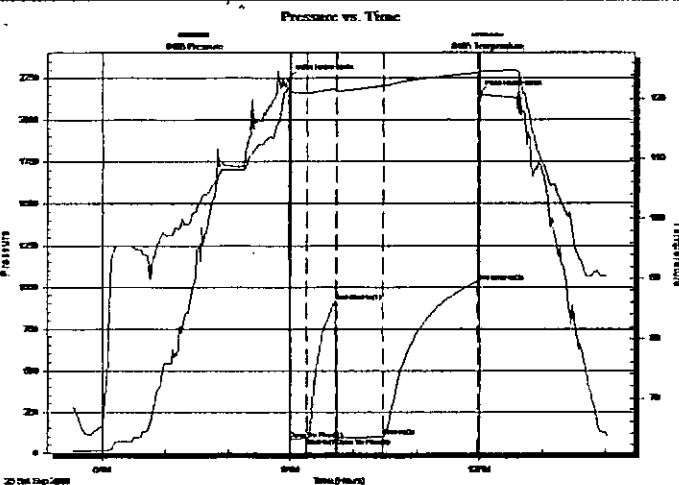
End Time:

14:02:00

Time On Btm: 2010.09.25 @ 08:57:30

Time Off Btm: 2010.09.25 @ 11:58:30

TEST COMMENT: 15/INITIAL OPEN:WEAK SURFACE BLOW BUILT 1 INCH INTO WATER IN 15 MINUTES  
 30/INITIAL SHUT IN:NO BLOW BACK  
 45/FINAL OPEN:VERY WEAK SURFACE BLOW DIED OFF  
 90/FINAL SHUT IN:NO BLOW BACK



## PRESSURE SUMMARY

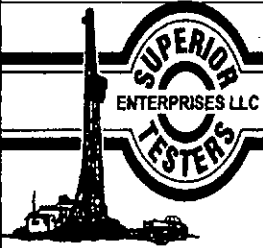
Time (Min.)	Pressure (psia)	Temp (deg F)	Annotation
0	2249.98	121.86	Initial Hydro-static
1	83.80	121.33	Open To Flow (1)
18	88.60	120.97	Shut-in(1)
46	913.57	121.64	End Shut-in(1)
47	91.36	121.32	Open To Flow (2)
91	100.41	122.18	Shut-in(2)
181	1031.26	124.30	End Shut-in(2)
181	2152.78	124.59	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
5.00	SLIGHTLEY OIL CUT MUD 4%OIL 96%M.O.2	

## Gas Rates

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



# DRILL STEM TEST REPORT

TOOL DIAGRAM

LARSON ENGINEERING

HAGANS #2

562 WEST STATE RD 4 OLMITZ KS 67564 + 8561

14-16S-26W NESS

Job Ticket: 16061

DST#: 1

ATTN: STEVE DAVIS

Test Start: 2010.09.25 @ 05:30:00

## Tool Information

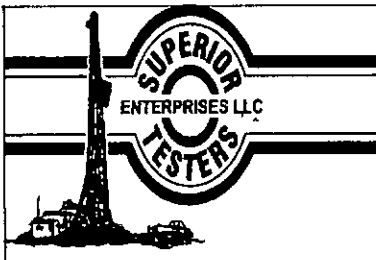
Drill Pipe:	Length: 4281.00 ft	Diameter: 3.80 inches	Volume: 60.05 bbl	Tool Weight: 1000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 120.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose: 90000.00 lb
			<u>Total Volume: 60.64 bbl</u>	Tool Chased 1.00 ft
Drill Pipe Above KB:	15.00 ft			String Weight: Initial 75000.00 lb
Depth to Top Packer:	4415.00 ft			Final 75000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	102.00 ft			
Tool Length:	131.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4387.00	
Shut-In Tool	5.00			4392.00	
Hydraulic Tool	5.00			4397.00	
Jars	6.00			4403.00	
Safety Joint	2.00			4405.00	
Packer	5.00			4410.00	29.00 Bottom Of Top Packer
Packer	5.00			4415.00	
Change Over Sub	0.75			4415.75	
Drill Pipe	60.50			4476.25	
Change Over Sub	0.75			4477.00	
Perforations	35.00			4512.00	
Recorder	1.00	8405	Inside	4513.00	
Recorder	1.00	8525	Outside	4514.00	
Bullnose	3.00			4517.00	102.00 Bottom Packers & Anchor

**Total Tool Length: 131.00**





# DRILL STEM TEST REPORT

FLUID SUMMARY

LARSON ENGINEERING

HAGANS #2

562 WEST STATE RD 4 OLMITZ KS 67564 + 8561

14-16S-26W NESS

Job Ticket: 16061

DST#: 1

ATTN: STEVE DAVIS

Test Start: 2010.09.25 @ 05:30:00

## Mud and Cushion Information

Mud Type: Gel Chem  
 Mud Weight: 9.00 lb/gal  
 Viscosity: 49.00 sec/qt  
 Water Loss: 7.19 in<sup>3</sup>  
 Resistivity: ohm.m  
 Salinity: 3300.00 ppm  
 Filter Cake: 2.00 inches

Cushion Type:  
 Cushion Length: ft  
 Cushion Volume: bbl  
 Gas Cushion Type:  
 Gas Cushion Pressure: psia

Oil API: deg API  
 Water Salinity: ppm

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
5.00	SLIGHTLEY OIL CUT MUD 4%OIL 96%MUD	0.025

Total Length: 5.00 ft      Total Volume: 0.025 bbl

Num Fluid Samples: 0

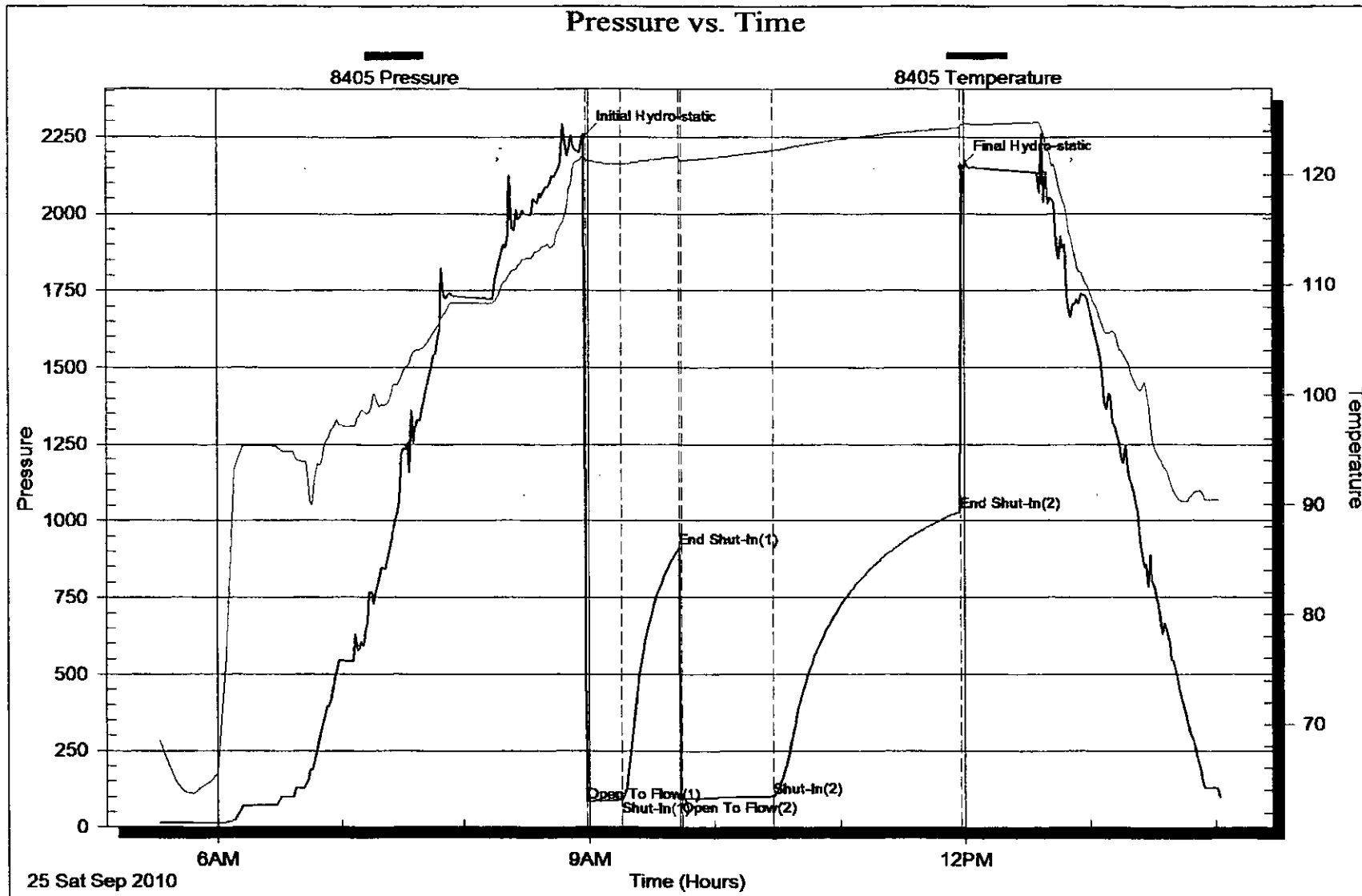
Num Gas Bombs: 0

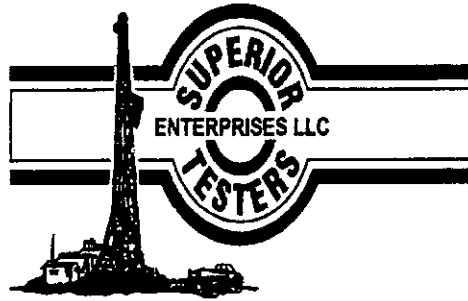
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:





## DRILL STEM TEST REPORT

Prepared For: **LARSON ENGINEERING**

562 WEST STATE RD 4 OLMITZ KS 67564 +  
8561

ATTN: STEVE DAVIS

**14-16S-26W NESS**

**HAGANS #2**

Start Date: 2010.09.25 @ 20:50:00

End Date: 2010.09.26 @ 03:09:30

Job Ticket #: 16062                      DST #: 2

Superior Testers Enterprises LLC  
PO Box 138 Great Bend KS 67530  
1-800-792-6902

Printed: 2010.09.27 @ 14:37:31

LARSON ENGINEERING

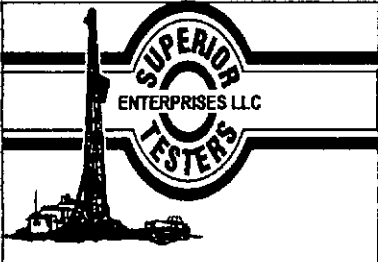
HAGANS #2

14-16S-26W NESS

DST # 2

MISSISSIPPI

2010.09.25



# DRILL STEM TEST REPORT

LARSON ENGINEERING

HAGANS #2

562 WEST STATE RD 4 OLMITZ KS 67564 + 8561

14-16S-26W NESS

ATTN: STEVE DAVIS

Job Ticket: 16062

DST#: 2

Test Start: 2010.09.25 @ 20:50:00

## GENERAL INFORMATION:

Formation: MISSISSIPPI

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 22:36:30

Time Test Ended: 03:09:30

Test Type: Conventional Bottom Hole (Initial)

Tester: JARED SCHECK

Unit No: 3320-GB-190

Interval: 4510.00 ft (KB) To 4524.00 ft (KB) (TVD)

Total Depth: 4524.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 2585.00 ft (KB)

2576.00 ft (CF)

KB to GR/CF: 9.00 ft

Serial #: 8405

Inside

Press@RunDepth: 41.19 psia @ 4520.00 ft (KB)

Capacity: 5000.00 psia

Start Date: 2010.09.25

End Date:

2010.09.26

Last Calib.:

2010.09.26

Start Time: 20:52:00

End Time:

03:09:30

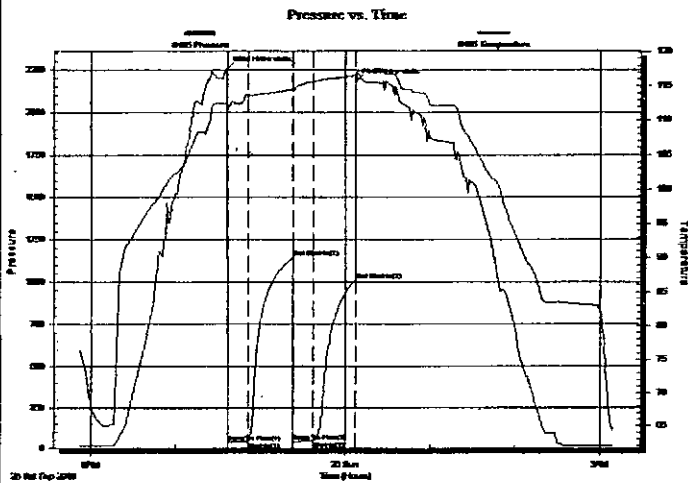
Time On Btm:

2010.09.25 @ 22:36:00

Time Off Btm:

2010.09.26 @ 00:07:30

TEST COMMENT: 15/INITIAL OPEN:VERY WEAK SURFACE BLOW STAYED STEADY THROUGHOUT OPEN  
 30/INITIAL SHUT IN:NO BLOW BACK  
 15/FINAL OPEN:VERY WEAK SURFACE BLOW STAYED STEADY THROUGH OUT OPEN  
 30/FINAL SHUT IN:NO BLOW BACK



## PRESSURE SUMMARY

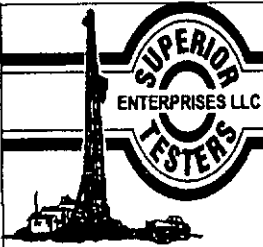
Time (Min.)	Pressure (psia)	Temp (deg F)	Annotation
0	2250.63	112.64	Initial Hydro-static
1	34.50	111.64	Open To Flow (1)
16	38.17	113.73	Shut-In(1)
47	1144.51	114.42	End Shut-In(1)
48	39.78	114.17	Open To Flow (2)
62	41.19	115.58	Shut-In(2)
91	1013.62	116.52	End Shut-In(2)
92	2175.92	116.85	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
5.00	SLIGHTLEY OIL CUT MUD 5%OIL 95%MUD.02	

## Gas Rates

Choke (inches)	Pressure (psia)	Gas Rate (Mc/d)



# DRILL STEM TEST REPORT

LARSON ENGINEERING

HAGANS #2

562 WEST STATE RD 4 OLMITZ KS 67564 + 8561

14-16S-26W NESS

ATTN: STEVE DAVIS

Job Ticket: 16062

DST#: 2

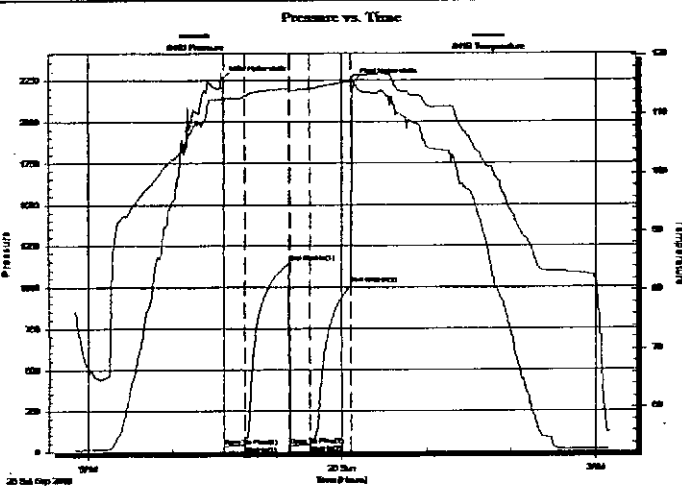
Test Start: 2010.09.25 @ 20:50:00

## GENERAL INFORMATION:

Formation: **MISSISSIPPI**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 22:36:30  
 Time Test Ended: 03:09:30  
 Interval: **4510.00 ft (KB) To 4524.00 ft (KB) (TVD)**  
 Total Depth: **4524.00 ft (KB) (TVD)**  
 Hole Diameter: 7.88 inches Hole Condition: Fair  
 Test Type: Conventional Bottom Hole (Initial)  
 Tester: JARED SCHECK  
 Unit No: 3320-GB-190  
 Reference Elevations: 2585.00 ft (KB)  
 2576.00 ft (CF)  
 KB to GR/CF: 9.00 ft

Serial #: **8419** Outside  
 Press@RunDepth: 1013.09 psia @ 4521.00 ft (KB) Capacity: 5000.00 psia  
 Start Date: 2010.09.25 End Date: 2010.09.26 Last Calib.: 2010.09.26  
 Start Time: 20:51:00 End Time: 03:09:30 Time On Btm: 2010.09.25 @ 22:36:00  
 Time Off Btm: 2010.09.26 @ 00:08:30

TEST COMMENT: 15/INITIAL OPEN:VERY WEAK SURFACE BLOW STAYED STEADY THROUGHOUT OPEN  
 30/INITIAL SHUT IN:NO BLOW BACK  
 15/FINAL OPEN:VERY WEAK SURFACE BLOW STAYED STEADY THROUGH OUT OPEN  
 30/FINAL SHUT IN:NO BLOW BACK



## PRESSURE SUMMARY

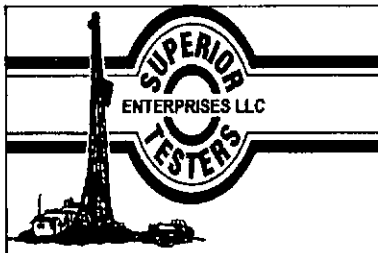
Time (Min.)	Pressure (psia)	Temp (deg F)	Annotation
0	2251.89	112.83	Initial Hydro-static
1	34.70	111.55	Open To Flow (1)
16	38.62	113.17	Shut-In(1)
47	1144.11	114.39	End Shut-In(1)
48	39.97	114.10	Open To Flow (2)
62	41.55	114.31	Shut-In(2)
91	1013.09	115.56	End Shut-In(2)
93	2235.06	116.74	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
5.00	SLIGHTLEY OIL CUT MUD 5%OIL 95%MUD.02	

## Gas Rates

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



# DRILL STEM TEST REPORT

TOOL DIAGRAM

LARSON ENGINEERING

HAGANS #2

562 WEST STATE RD 4 OLMITZ KS 67564 + 8561

14-16S-26W NESS

Job Ticket: 16062

DST#: 2

ATTN: STEVE DAVIS

Test Start: 2010.09.25 @ 20:50:00

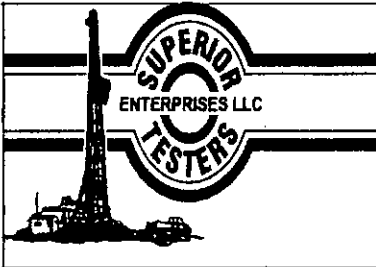
## Tool Information

Drill Pipe:	Length: 4376.00 ft	Diameter: 3.80 inches	Volume: 61.38 bbl	Tool Weight: 1000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 120.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose: 90000.00 lb
		Total Volume: 61.97 bbl		Tool Chased 0.00 ft
Drill Pipe Above KB:	15.00 ft			String Weight: Initial 75000.00 lb
Depth to Top Packer:	4510.00 ft			Final 75000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	14.00 ft			
Tool Length:	43.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4482.00	
Shut-In Tool	5.00			4487.00	
Hydraulic Tool	5.00			4492.00	
Jars	6.00			4498.00	
Safety Joint	2.00			4500.00	
Packer	5.00			4505.00	29.00 Bottom Of Top Packer
Packer	5.00			4510.00	
Perforations	9.00			4519.00	
Recorder	1.00	8405	Inside	4520.00	
Recorder	1.00	8419	Outside	4521.00	
Bullnose	3.00			4524.00	14.00 Bottom Packers & Anchor

**Total Tool Length: 43.00**



# DRILL STEM TEST REPORT

FLUID SUMMARY

LARSON ENGINEERING

HAGANS #2

562 WEST STATE RD 4 OLMITZ KS 67564 + 8561

14-16S-26W NESS

Job Ticket: 16062

DST#: 2

ATTN: STEVE DAVIS

Test Start: 2010.09.25 @ 20:50:00

## Mud and Cushion Information

Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity:	ppm
Viscosity: 59.00 sec/qt	Cushion Volume: bbl		
Water Loss: 6.79 in <sup>3</sup>	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psia		
Safinity: 3400.00 ppm			
Filter Cake: 2.00 inches			

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
5.00	SLIGHTLEY OIL CUT MUD 5%OIL 95%MUD	0.025

Total Length: 5.00 ft      Total Volume: 0.025 bbl

Num Fluid Samples: 0

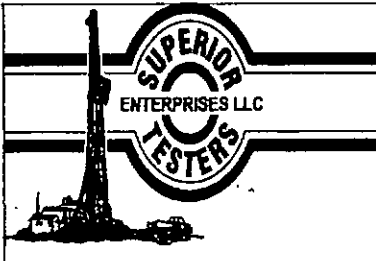
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



# DRILL STEM TEST REPORT

GAS RATES

LARSON ENGINEERING

HAGANS #2

562 WEST STATE RD 4 OLMITZ KS 67564 + 8561

14-16S-26W NESS

Job Ticket: 16062

DST#: 2

ATTN: STEVE DAVIS

Test Start: 2010.09.25 @ 20:50:00

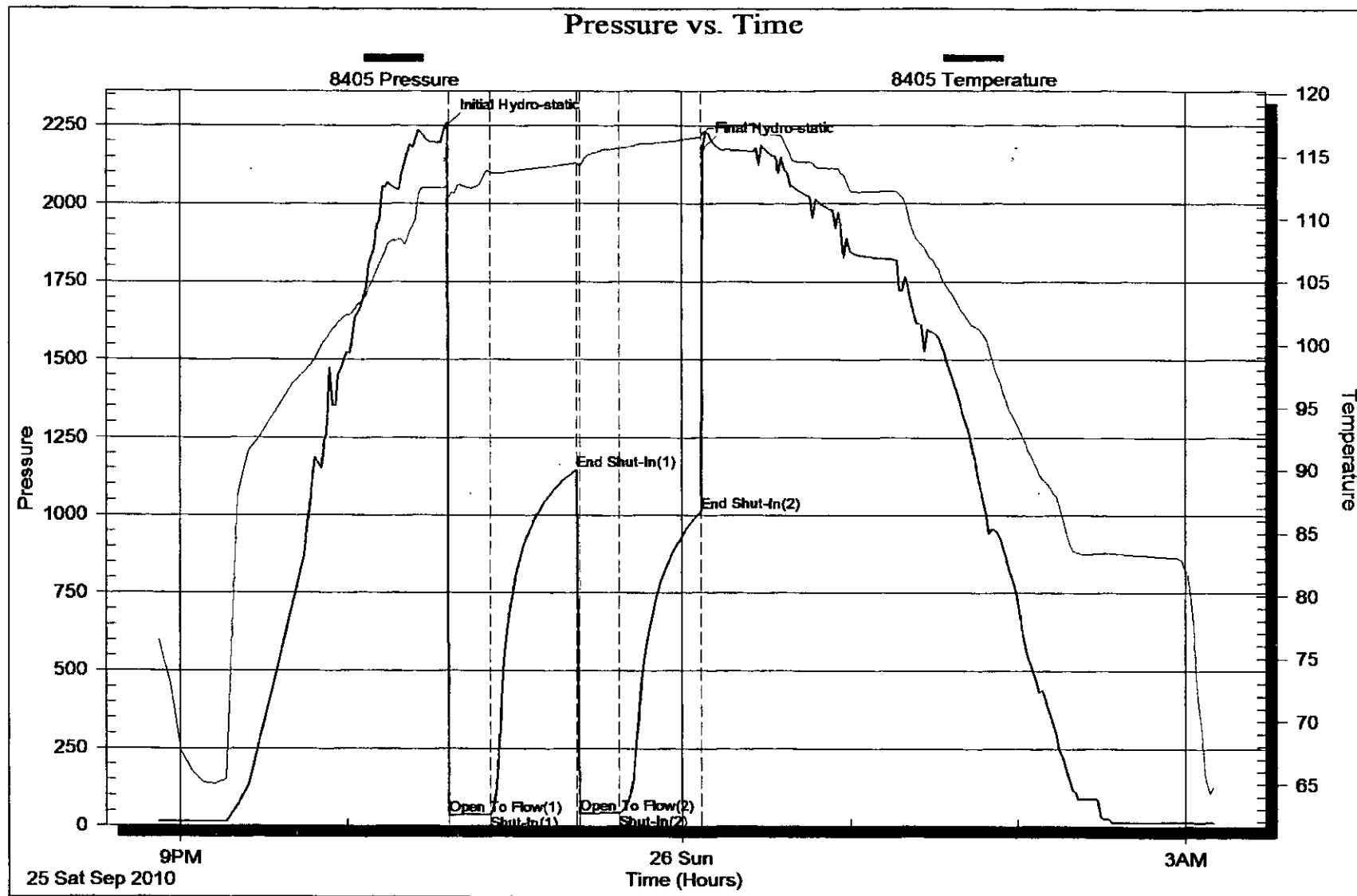
## Gas Rates Information

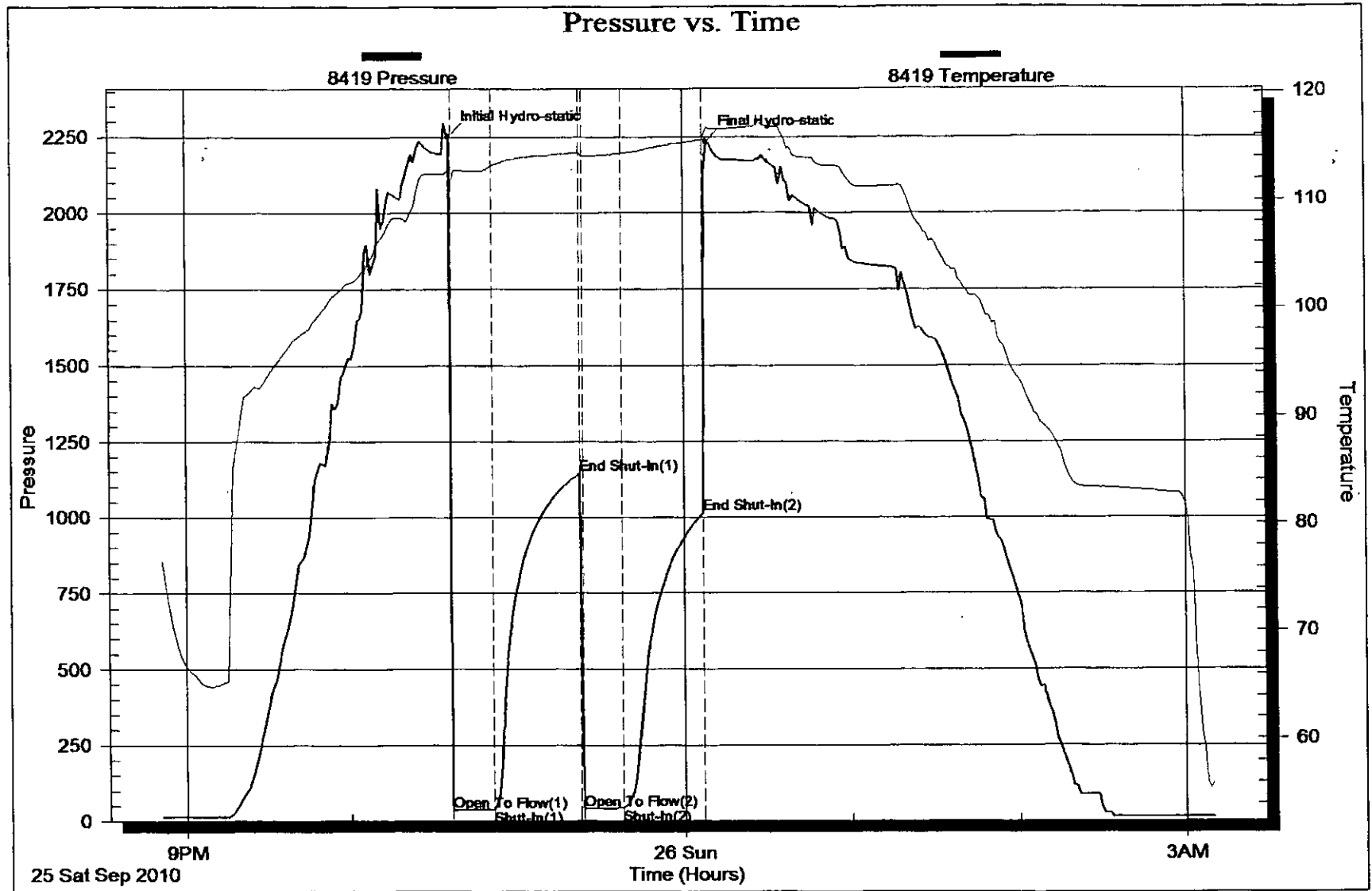
Temperature: 59 (deg F)  
Relative Density: 0.65  
Z Factor: 0.8

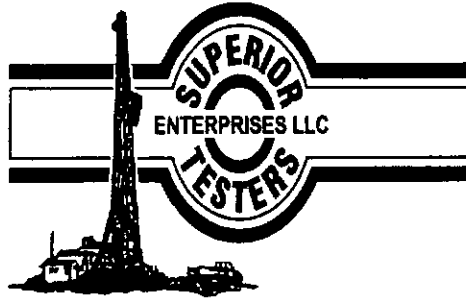
Gas Rates Table

Flow Period	Elapsed Time	Choke (inches)	Pressure (psia)	Gas Rate (Mcf/d)
		0.00	0.00	0.00









## DRILL STEM TEST REPORT

Prepared For: **LARSON ENGINEERING**

562 WEST STATE RD 4 OLMITZ KS 67564 +  
8561

ATTN: STEVE DAVIS

**14-16S-26W NESS**

**HAGANS #2**

Start Date: 2010.09.26 @ 11:00:00

End Date: 2010.09.26 @ 16:56:30

Job Ticket #: 16063                      DST #: 3

Superior Testers Enterprises LLC  
PO Box 138 Great Bend KS 67530  
1-800-792-6902

Printed: 2010.09.27 @ 14:37:14

LARSON ENGINEERING

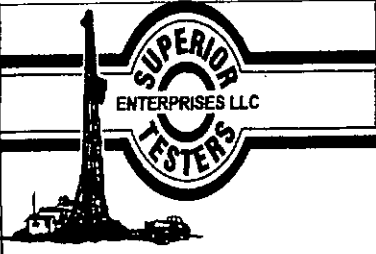
HAGANS #2

14-16S-26W NESS

DST # 3

MISSISSIPPI

2010.09.26



# DRILL STEM TEST REPORT

LARSON ENGINEERING  
 562 WEST STATE RD 4 OLMITZ KS 67564 + 8561  
 ATTN: STEVE DAVIS

**HAGANS #2**  
**14-16S-26W NESS**  
 Job Ticket: 16063      **DST#: 3**  
 Test Start: 2010.09.26 @ 11:00:00

## GENERAL INFORMATION:

Formation: **MISSISSIPPI**  
 Deviated: No Whipstock:                      ft (KB)  
 Time Tool Opened: 13:02:00  
 Time Test Ended: 16:56:30

Test Type: Conventional Bottom Hole (Initial)  
 Tester: JARED SCHECK  
 Unit No: 3320-GB-190

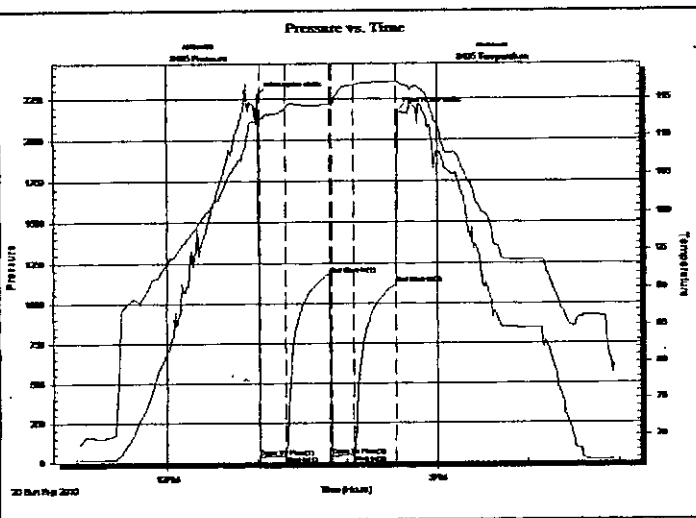
Interval: **4515.00 ft (KB) To 4529.00 ft (KB) (TVD)**  
 Total Depth: 4529.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 2585.00 ft (KB)  
 2576.00 ft (CF)  
 KB to GR/CF: 9.00 ft

## Serial #: 8405

**Inside**  
 Press@RunDepth: 43.47 psia @ 4525.00 ft (KB)  
 Capacity: 5000.00 psia  
 Start Date: 2010.09.26      End Date: 2010.09.26      Last Calib.: 2010.09.26  
 Start Time: 11:02:00      End Time: 16:56:30      Time On Btm: 2010.09.26 @ 13:01:00  
 Time Off Btm: 2010.09.26 @ 14:33:30

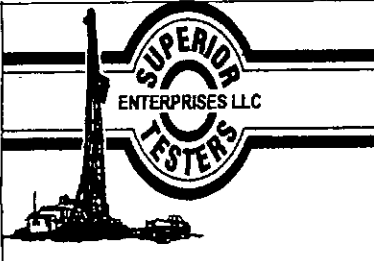
**TEST COMMENT:** 15/INITIAL OPEN:WEAK SURFACE BLOW STAYED STEADY THROUGHOUT OPEN  
 30/INITIAL SHUT IN:NO BLOW BACK  
 15/FINAL OPEN:WEAK SURFACE BLOW STAYED STEADY THROUGHOUT OPEN  
 30/FINAL SHUT IN:NO BLOW BACK



PRESSURE SUMMARY			
Time (Min.)	Pressure (psia)	Temp (deg F)	Annotation
0	2273.88	112.78	Initial Hydro-static
1	36.24	112.27	Open To Flow (1)
18	39.78	113.88	Shut-In(1)
48	1181.97	114.22	End Shut-In(1)
49	40.86	114.07	Open To Flow (2)
63	43.47	116.76	Shut-In(2)
92	1120.25	117.23	End Shut-In(2)
93	2175.61	117.22	Final Hydro-static

Recovery		
Length (ft)	Description	Volume (bbl)
5.00	SPOT OIL CUT MUD 1%OIL 99%MUD	0.02

Gas Rates			
	Choke (inches)	Pressure (psia)	Gas Rate (Mcfd)



# DRILL STEM TEST REPORT

LARSON ENGINEERING

**HAGANS #2**

562 WEST STATE RD 4 OLMITZ KS 67564 + 8561

**14-16S-26W NESS**

Job Ticket: 16063

DST#: 3

ATTN: STEVE DAVIS

Test Start: 2010.09.26 @ 11:00:00

## GENERAL INFORMATION:

Formation: **MISSISSIPPI**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 13:02:00

Time Test Ended: 16:56:30

Test Type: Conventional Bottom Hole (Initial)

Tester: JARED SCHECK

Unit No: 3320-GB-190

Interval: **4515.00 ft (KB) To 4529.00 ft (KB) (TVD)**

Reference Elevations: 2585.00 ft (KB)

Total Depth: 4529.00 ft (KB) (TVD)

2576.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 9.00 ft

Serial #: **8419**

Outside

Press@RunDepth: psia @ 4526.00 ft (KB)

Capacity: 5000.00 psia

Start Date: 2010.09.26

End Date: 2010.09.26

Last Calib.: 2010.09.26

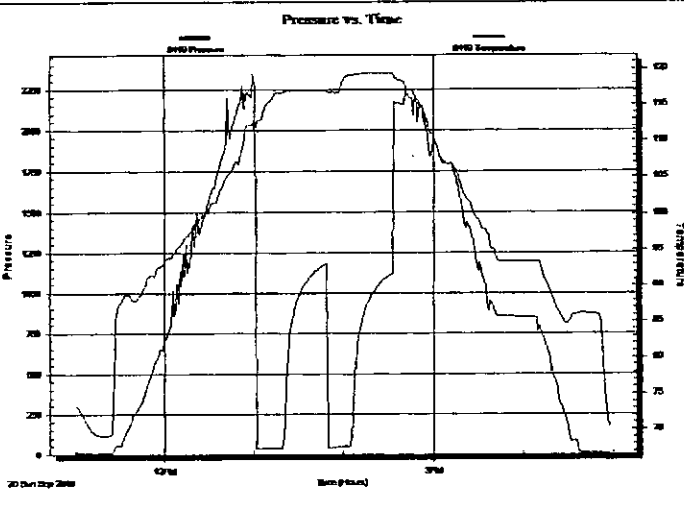
Start Time: 11:01:00

End Time: 16:57:30

Time On Btm:

Time Off Btm:

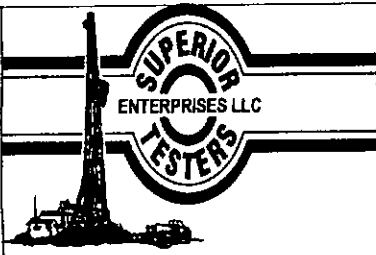
TEST COMMENT: 15/INITIAL OPEN:WEAK SURFACE BLOWSTAYED STEADY THROUGHOUT OPEN  
 30/INITIAL SHUT IN:NO BLOW BACK  
 15/FINAL OPEN:WEAK SURFACE BLOW STAYED STEADY THROUGHOUT OPEN  
 30/FINAL SHUT IN:NO BLOW BACK



PRESSURE SUMMARY			
Time (Min.)	Pressure (psia)	Temp (deg F)	Annotation

Recovery		
Length (ft)	Description	Volume (bbl)
5.00	SPOT OIL CUT MUD 1%OIL 99%MUD	0.02

Gas Rates			
	Choke (inches)	Pressure (psia)	Gas Rate (Mcf/d)



# DRILL STEM TEST REPORT TOOL DIAGRAM

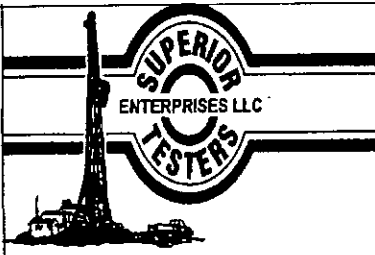
<b>LARSON ENGINEERING</b> 562 WEST STATE RD 4 OLMITZ KS 67564 + 8561 ATTN: STEVE DAVIS	<b>HAGANS #2</b> <b>14-16S-26W NESS</b> Job Ticket: 16063 <b>DST#: 3</b> Test Start: 2010.09.26 @ 11:00:00
--	---

### Tool Information

Drill Pipe: Length: 4374.00 ft	Diameter: 3.80 inches	Volume: 61.36' bbl	Tool Weight: 1000.00 lb
Heavy Wt. Pipe: Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar: Length: 120.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose: 90000.00 lb
	Total Volume: 61.95 bbl		Tool Chased: 0.00 ft
Drill Pipe Above KB: 8.00 ft			String Weight: Initial 75000.00 lb
Depth to Top Packer: 4515.00 ft			Final 75000.00 lb
Depth to Bottom Packer: ft			
Interval between Packers: 14.00 ft			
Tool Length: 43.00 ft			
Number of Packers: 2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4487.00	
Shut-In Tool	5.00			4492.00	
Hydraulic Tool	5.00			4497.00	
Jars	6.00			4503.00	
Safety Joint	2.00			4505.00	
Packer	5.00			4510.00	29.00      Bottom Of Top Packer
Packer	5.00			4515.00	
Perforations	9.00			4524.00	
Recorder	1.00	8405	Inside	4525.00	
Recorder	1.00	8419	Outside	4526.00	
Bullnose	3.00			4529.00	14.00      Bottom Packers & Anchor
<b>Total Tool Length:</b>		<b>43.00</b>			



# DRILL STEM TEST REPORT

FLUID SUMMARY

LARSON ENGINEERING

HAGANS #2

562 WEST STATE RD 4 OLMITZ KS 67564 + 8561

14-16S-26W NESS

Job Ticket: 16063

DST#: 3

ATTN: STEVE DAVIS

Test Start: 2010.09.26 @ 11:00:00

## Mud and Cushion Information

Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity:	ppm
Viscosity: 59.00 sec/qt	Cushion Volume: bbl		
Water Loss: 6.19 in <sup>3</sup>	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psia		
Salinity: 3400.00 ppm			
Filter Cake: 2.00 inches			

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
5.00	SPOT OIL CUT MUD 1%OIL 99%MUD	0.025

Total Length: 5.00 ft      Total Volume: 0.025 bbl

Num Fluid Samples: 0

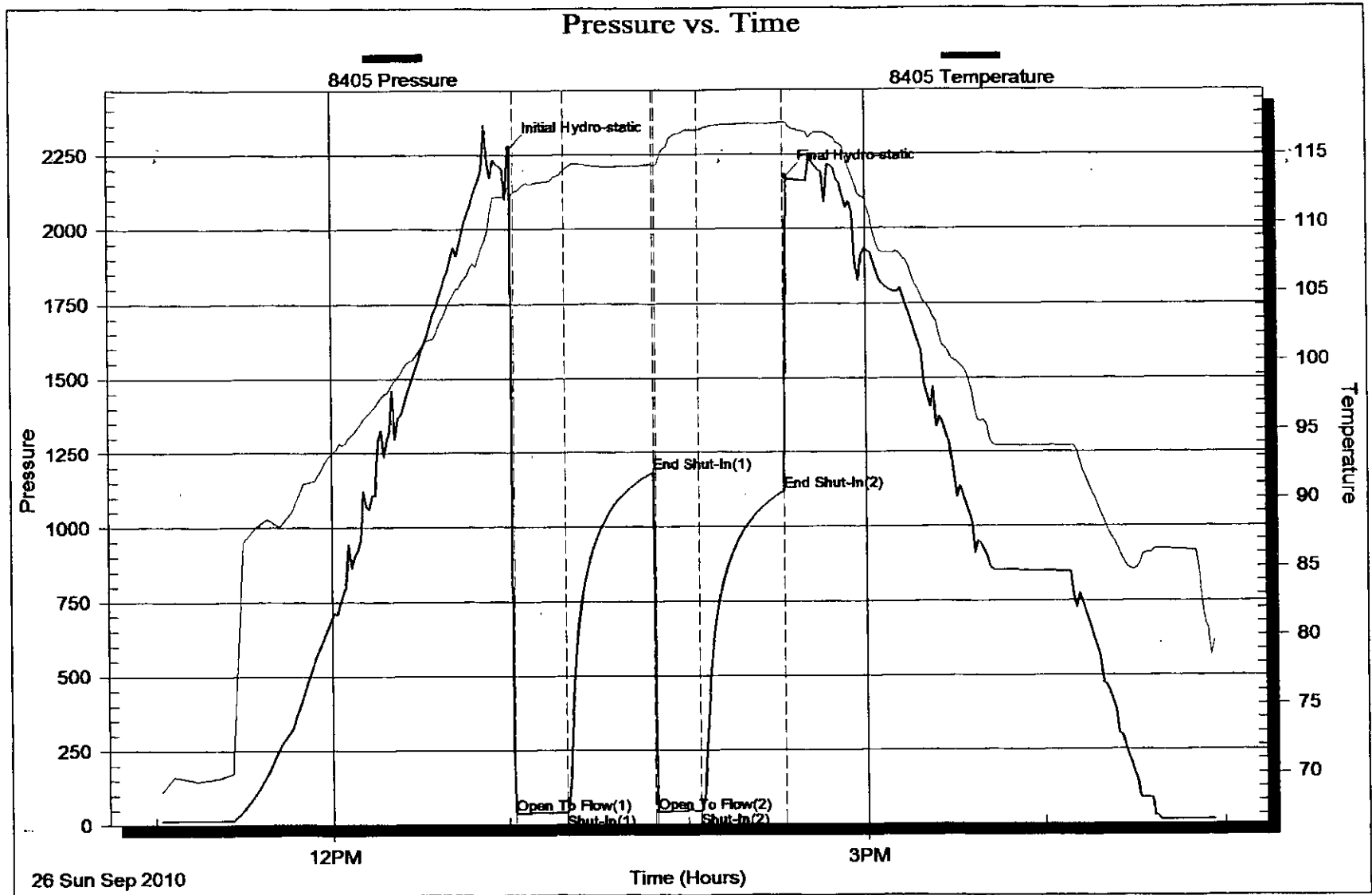
Num Gas Bombs: 0

Serial #:

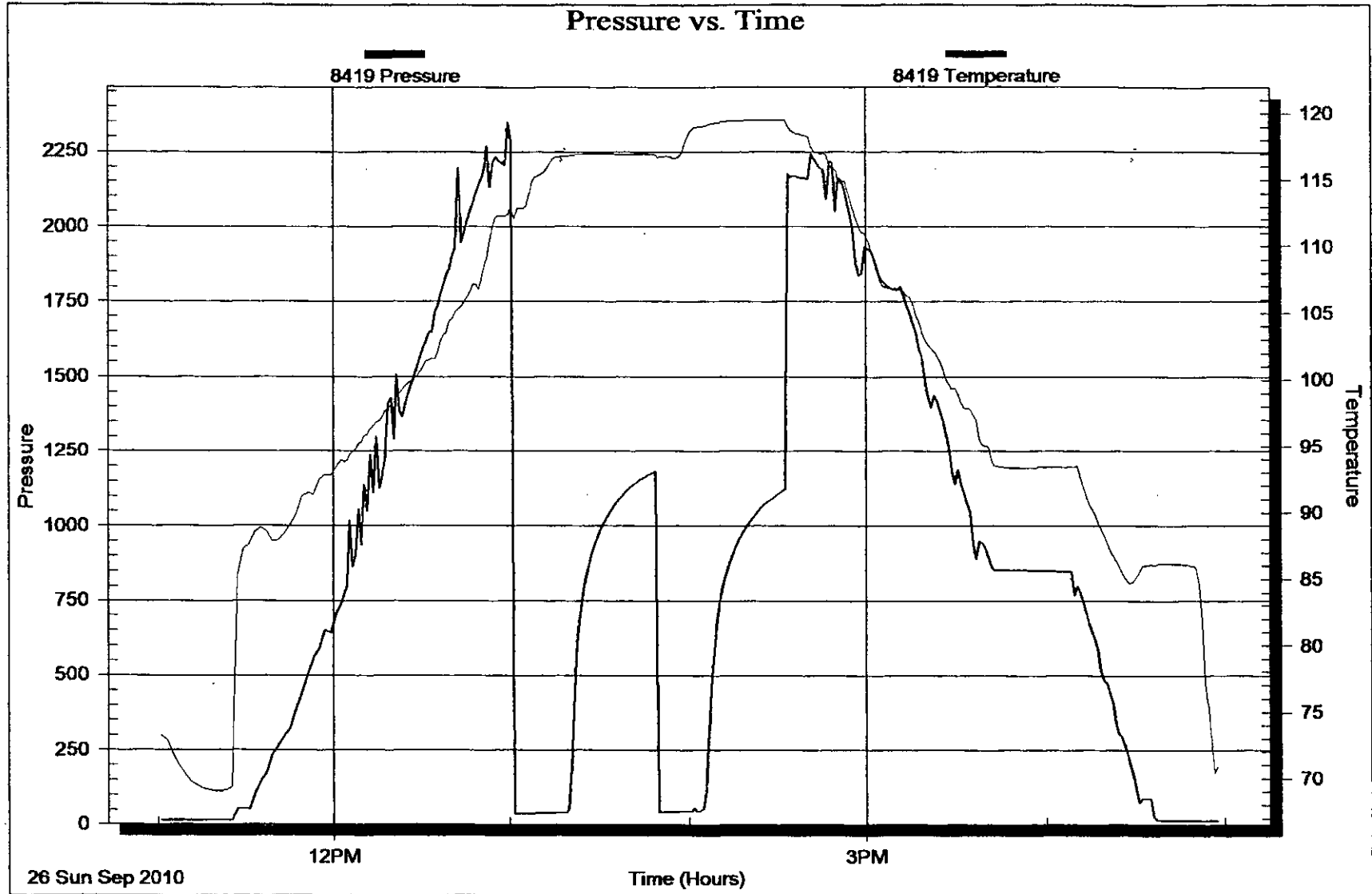
Laboratory Name:

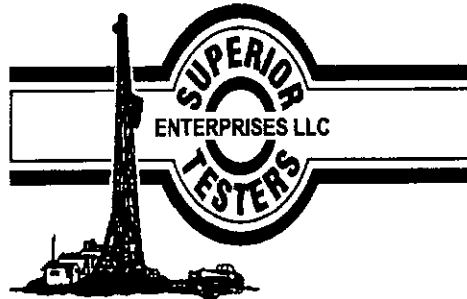
Laboratory Location:

Recovery Comments:









## DRILL STEM TEST REPORT

Prepared For: **LARSON ENGINEERING**

562 WEST STATE RD 4 OLMITZ KS 67564 +  
8561

ATTN: STEVE DAVIS

**14-16S-26W NESS**

**HAGANS #2**

Start Date: 2010.09.26 @ 23:40:00

End Date: 2010.09.27 @ 06:49:00

Job Ticket #: 16064                      DST #: 4

Superior Testers Enterprises LLC  
PO Box 138 Great Bend KS 67530  
1-800-792-6902

Printed: 2010.09.27 @ 14:36:58

LARSON ENGINEERING

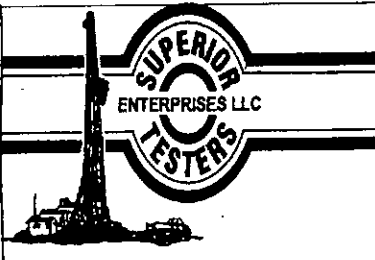
HAGANS #2

14-16S-26W NESS

DST # 4

MISSISSIPPI

2010.09.26



# DRILL STEM TEST REPORT

LARSON ENGINEERING

HAGANS #2

562 WEST STATE RD 4 OLMITZ KS 67564 + 8561

14-16S-26W NESS

ATTN: STEVE DAVIS

Job Ticket: 16064

DST#: 4

Test Start: 2010.09.26 @ 23:40:00

## GENERAL INFORMATION:

Formation: **MISSISSIPPI**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 01:42:30

Time Test Ended: 06:49:00

Test Type: Conventional Bottom Hole (Initial)

Tester: JARED SCHECK

Unit No: 320-GB-190

Interval: 4526.00 ft (KB) To 4538.00 ft (KB) (TVD)

Total Depth: 4538.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 2585.00 ft (KB)

2576.00 ft (CF)

KB to GR/CF: 9.00 ft

Serial #: 8405

Inside

Press@RunDepth: 61.45 psia @ 4534.00 ft (KB)

Capacity: 5000.00 psia

Start Date: 2010.09.26

End Date:

2010.09.27

Last Calib.: 2010.09.27

Start Time: 23:42:00

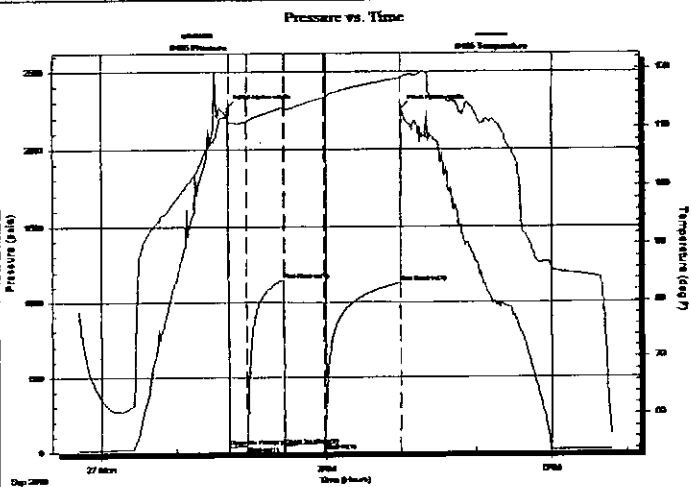
End Time:

06:49:00

Time On Btm: 2010.09.27 @ 01:41:30

Time Off Btm: 2010.09.27 @ 04:00:30

TEST COMMENT: 15/INITIAL OPEN:WEAK BLOW BUILT 1 INCH INTO WATER IN 15 MINUTES  
 30/INITIAL SHUT IN:NO BLOW BACK  
 30/FINAL OPEN:WEAK BUT BUILDING BLOW BUILT 1 INCH INTO WATER IN 30 MINUTES  
 60/FINAL SHUT IN:NO BLOW BACK



## PRESSURE SUMMARY

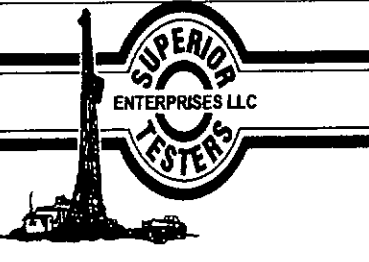
Time (Min.)	Pressure (psia)	Temp (deg F)	Annotation
0	2263.97	111.71	Initial Hydro-static
1	34.75	111.06	Open To Flow (1)
16	42.68	111.02	Shut-In(1)
45	1149.99	113.47	End Shut-In(1)
46	44.50	113.10	Open To Flow (2)
77	61.45	115.12	Shut-In(2)
138	1127.96	118.45	End Shut-In(2)
139	2261.55	118.59	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
65.00	MUDDY WATER 30%MUD 70%WATER	0.32
0.00	CHLORIDES 23,000	0.00
0.00	RESISTIVITY .2 @76 DEGREES	0.00

## Gas Rates

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



# DRILL STEM TEST REPORT

LARSON ENGINEERING

HAGANS #2

562 WEST STATE RD 4 OLMITZ KS 67564 + 8561

14-16S-26W NESS

Job Ticket: 16064

DST#: 4

ATTN: STEVE DAVIS

Test Start: 2010.09.26 @ 23:40:00

## GENERAL INFORMATION:

Formation: **MISSISSIPPI**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 01:42:30

Time Test Ended: 06:49:00

Test Type: Conventional Bottom Hole (Initial)

Tester: JARED SCHECK

Unit No: 320-GB-190

Interval: 4526.00 ft (KB) To 4538.00 ft (KB) (TVD)

Reference Elevations: 2585.00 ft (KB)

Total Depth: 4538.00 ft (KB) (TVD)

2576.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 9.00 ft

Serial #: 8419

Outside

Press@RunDepth: 1128.08 psia @ 4535.00 ft (KB)

Capacity: 5000.00 psia

Start Date: 2010.09.26

End Date:

2010.09.27

Last Calib.:

2010.09.27

Start Time: 23:41:00

End Time:

06:49:30

Time On Btm:

2010.09.27 @ 01:41:00

Time Off Btm:

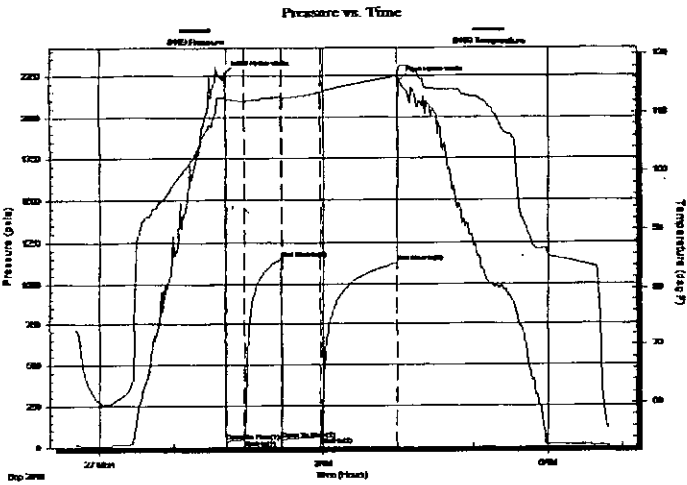
2010.09.27 @ 04:01:00

TEST COMMENT: 15/INITIAL OPEN:WEAK BLOW BUILT 1 INCH INTO WATER IN 15 MINUTES

30/INITIAL SHUT IN:NO BLOW BACK

30/FINAL OPEN:WEAK BUT BUILDING BLOW BUILT 1 INCH INTO WATER IN 30 MINUTES

60/FINAL SHUT IN:NO BLOW BACK



## PRESSURE SUMMARY

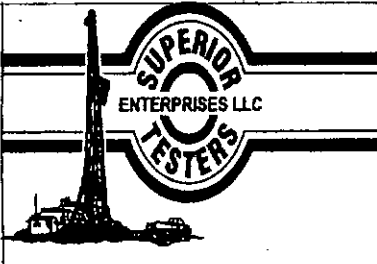
Time (Min.)	Pressure (psia)	Temp (deg F)	Annotation
0	2263.07	112.61	Initial Hydro-static
1	34.77	112.14	Open To Flow (1)
16	42.89	111.95	Shut-In(1)
45	1150.03	112.76	End Shut-In(1)
46	44.69	112.49	Open To Flow (2)
77	61.74	113.50	Shut-In(2)
138	1128.08	116.23	End Shut-In(2)
140	2222.87	117.95	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
65.00	MUDDY WATER 30%MUD 70%WATER	0.32
0.00	CHLORIDES 23,000	0.00
0.00	RESISTIVITY .2 @76 DEGREES	0.00

## Gas Rates

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



# DRILL STEM TEST REPORT

TOOL DIAGRAM

LARSON ENGINEERING

HAGANS #2

562 WEST STATE RD 4 OLMITZ KS 67564 + 8561

14-16S-26W NESS

Job Ticket: 16064

DST#: 4

ATTN: STEVE DAVIS

Test Start: 2010.09.26 @ 23:40:00

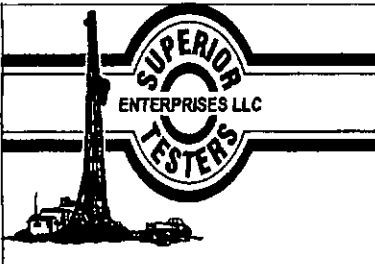
## Tool Information

Drill Pipe:	Length: 4407.00 ft	Diameter: 3.80 inches	Volume: 61.82 bbl	Tool Weight: 1000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 120.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 62.41 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	30.00 ft			String Weight: Initial 75000.00 lb
Depth to Top Packer:	4526.00 ft			Final 75000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	12.00 ft			
Tool Length:	41.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4498.00	
Shut-In Tool	5.00			4503.00	
Hydraulic Tool	5.00			4508.00	
Jars	6.00			4514.00	
Safety Joint	2.00			4516.00	
Packer	5.00			4521.00	29.00 Bottom Of Top Packer
Packer	5.00			4526.00	
Perforations	7.00			4533.00	
Recorder	1.00	8405	Inside	4534.00	
Recorder	1.00	8419	Outside	4535.00	
Bullnose	3.00			4538.00	12.00 Bottom Packers & Anchor

**Total Tool Length: 41.00**



# DRILL STEM TEST REPORT

FLUID SUMMARY

LARSON ENGINEERING

HAGANS #2

562 WEST STATE RD 4 OLMITZ KS 67564 + 8561

14-16S-26W NESS

Job Ticket: 16064

DST#: 4

ATTN: STEVE DAVIS

Test Start: 2010.09.26 @ 23:40:00

## Mud and Cushion Information

Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity:	ppm
Viscosity: 57.00 sec/qt	Cushion Volume: bbl		
Water Loss: 7.20 in <sup>3</sup>	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psia		
Salinity: 4400.00 ppm			
Filter Cake: 2.00 inches			

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
65.00	MUDDY WATER 30% MUD 70% WATER	0.320
0.00	CHLORIDES 23,000	0.000
0.00	RESISTIVITY .2 @76 DEGREES	0.000

Total Length: 65.00 ft      Total Volume: 0.320 bbl

Num Fluid Samples: 0

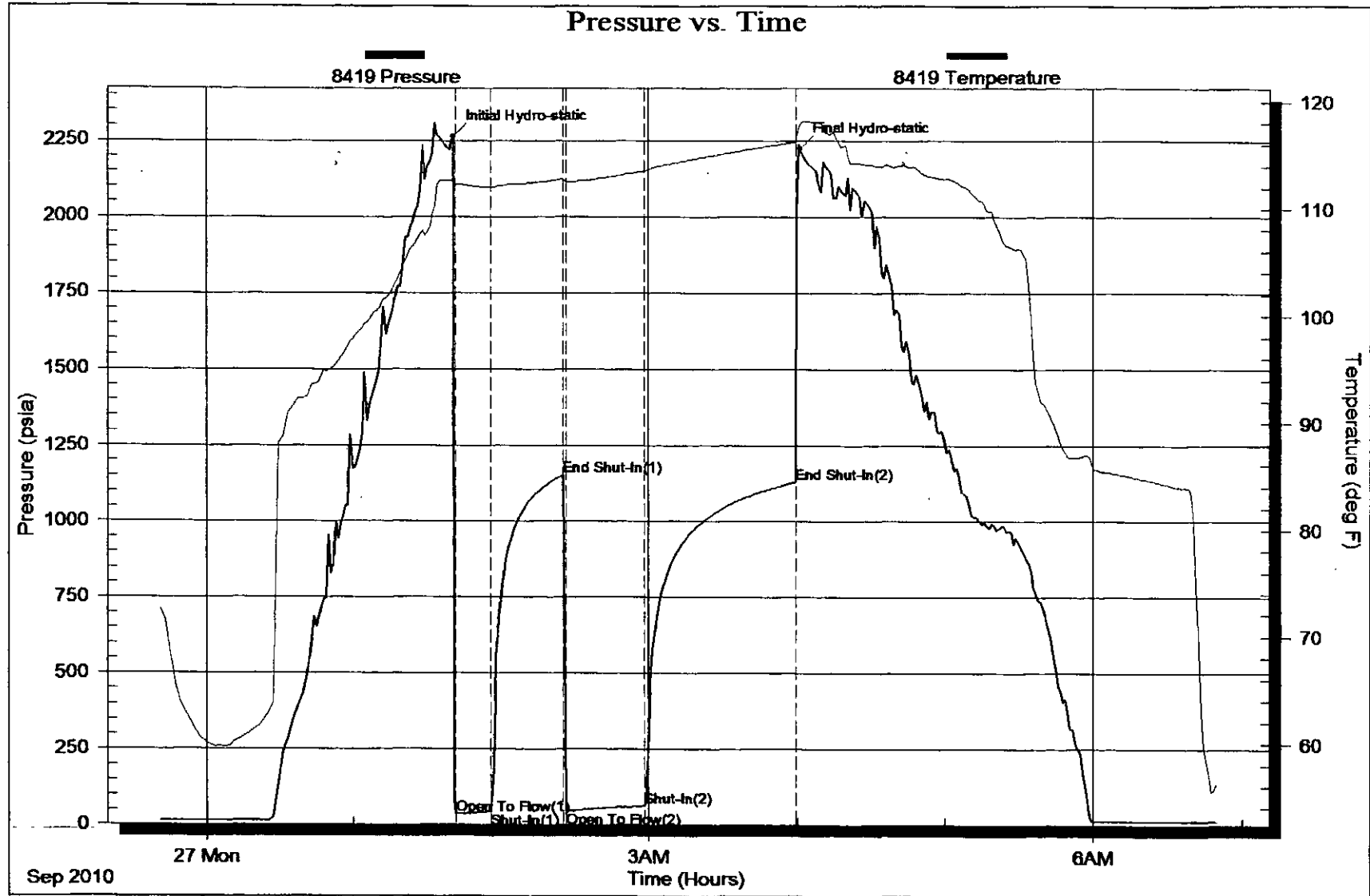
Num Gas Bombs: 0

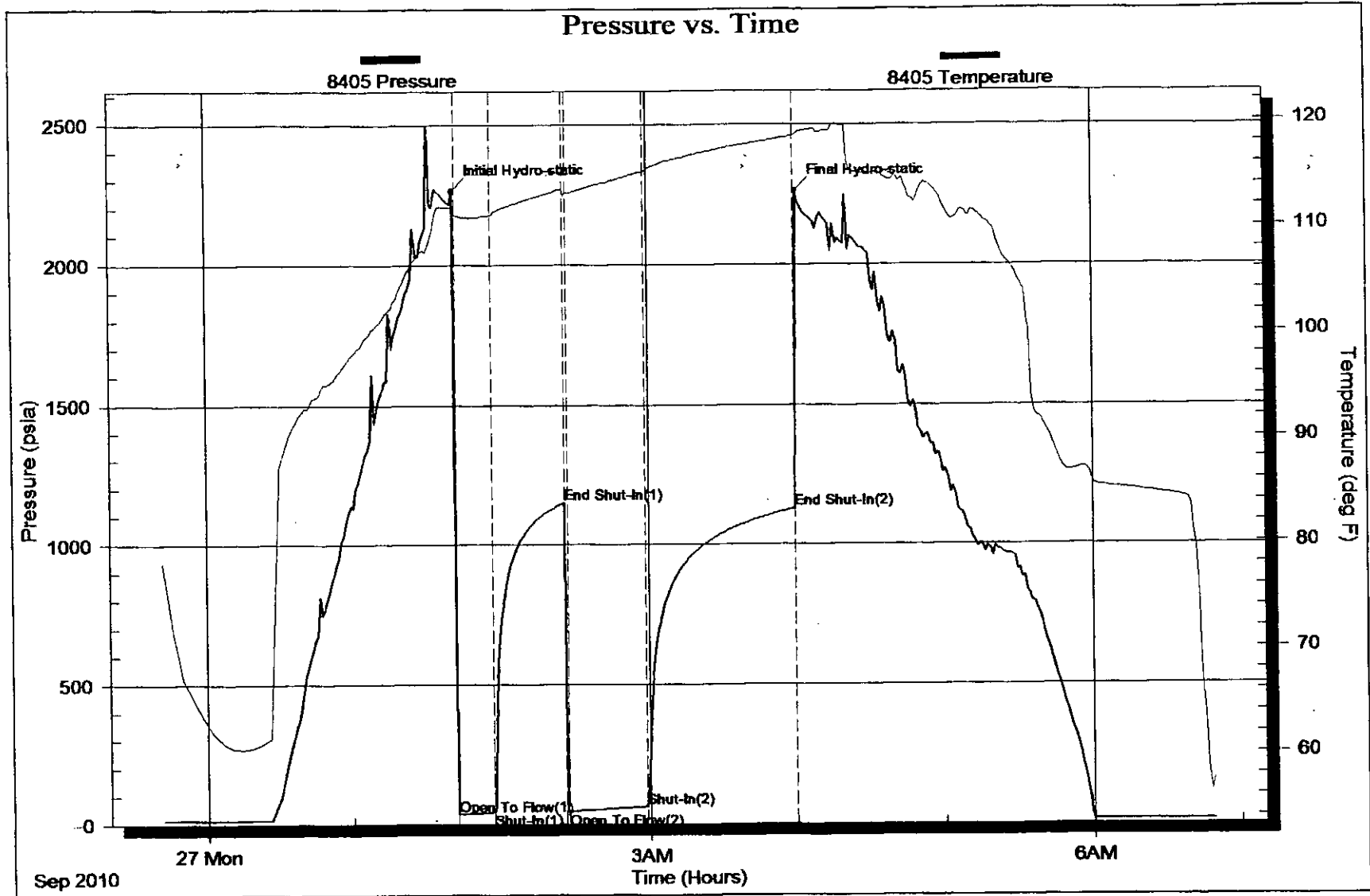
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RUINED BOTTOM PACKER







# RICHARD S. (Steve) DAVIS JR.

## Petroleum Geologist

212 N. Market

Wichita, Kansas 67202

Phone (316) 267-9115

### GEOLOGIST'S REPORT

#### DRILLING TIME AND SAMPLE LOG

COMPANY <u>CARSON ENGINEERING, INC.</u> LEASE <u>HAGANS # 2-14</u> FIELD <u>UNNAMED</u> LOCATION <u>1987 FSL @ 330' FWL</u> SEC <u>14</u> TWSP <u>18S</u> RGE <u>26W</u> COUNTY <u>NESS</u> STATE <u>KANSAS</u>	ELEVATIONS KB <u>2586</u> DF _____ GL <u>2576</u> Measurements Are All From <u>KB 2586</u>
CONTRACTOR <u>HO DRILLING RIG # 2</u> SPUD <u>9-17-2010</u> COMP <u>9-27-2010</u> RTD <u>4600 (2014)</u> LTD <u>4596 (2010)</u> MUD UP <u>3908</u> TYPE MUD <u>CHEMICAL</u>	CASING SURFACE <u>8 5/8" @ 223'</u> PRODUCTION <u>None</u> ELECTRICAL SURVEYS TUCKER: COL/CNL, O.I. & M.L.

SAMPLES SAVED FROM	<u>4300</u>	TO	<u>RTD</u>
DRILLING TIME KEPT FROM	<u>3800</u>	TO	<u>RTD</u>
SAMPLES EXAMINED FROM	<u>4300</u>	TO	<u>RTD</u>
GEOLOGICAL SUPERVISION FROM	<u>4100</u>	TO	<u>RTD</u>
GEOLOGIST ON WELL	<u>STEVE DAVIS</u>		

FORMATION TOPS	LOG	SAMPLES	
<u>ANNYORITE</u>	<u>1996 - 590</u>	<u>2003</u>	
<u>B/ANNYORITE</u>	<u>2030 - 556</u>	<u>2036</u>	
<u>HEEBNER</u>	<u>3860 - 1274</u>	<u>3865</u>	
<u>CANSING</u>	<u>3902 - 1316</u>	<u>3908</u>	
<u>STARK</u>	<u>4141 - 1555</u>	<u>4148</u>	
<u>PAWNEE</u>	<u>4332 - 1746</u>	<u>4333</u>	
<u>FORT SCOTT</u>	<u>4397 - 1811</u>	<u>4398</u>	
<u>CHEROKEE SH</u>	<u>4422 - 1836</u>	<u>4423</u>	
<u>MISSISSIPPI</u>	<u>4496 - 1910</u>	<u>4499</u>	

API: 15-135-25154

DAILY PENETRATION		BIT RECORD						
DATE	DEPTH	NO	SIZE	MAKE	TYPE	DEPTH OUT	FEET	HOURS
9-17-2010	Spud	1	12 1/4	112	RR	223	223	1 1/2
9-18	223	2	7 7/8	112	QX 20	4600	4377	136
9-19	1749							
9-20	2686							
9-21	3271							
9-22	3760							
9-23	4120							
9-24	4375							
9-25	4517							
9-26	4529							
9-27	4538-4600 R+D							

### LEGEND



Anhydrite    Salt    Sandstone    Shale    Carb sh    Limestone    Ool. Lime    Chert    Dolomite

SCALE                    " = 100'

In Minutes	DRILLING TIME	DEPTH	SAMPLE DESCRIPTION	REMARKS				
0	5	10	15	15				

DAVIS-6

ANHYDRITE  
2003 (+583)

2000

BIPHENYLENE  
2030 (+550)

50

3800

50

NEEBNER  
3865 (1279)

3900

KANSING  
3908 (1322)

Vis 73 wt 86 F: 6.8  
Ch. 1.200 PH 11.5 CCM 1#  
(9.22.10)

50



4100

STARK

4198 (7582)

50

4200

Vis 49 Wt 89 Fl 72  
PHI 3.300 PHIS CCM 14

(9.23.10)

50

LS tan-gray lenticular silty lss  
msd

LS sh w/ inc shale black, gray &  
green

4300

start 10' wet & dry @ 4300'

LS tan-gray lenticular silty lss  
chky IP msd

LS tan-gray lenticular chky IP  
msd

shale black sub carb. gray &

PRINCE  
4333(1907)

50

CS tan-gray siltstone silty base  
some chky nod

CS tan-crim white silty base  
dense nod

CS crim. off white silty base  
ool P. mable N.S. + abnt shale  
gray, green + rust low pc's  
cat white

Abnt shale AN + CS gray tan  
white silty base nod

FORT SCOTT  
4398(1912) 4400

Shale black carb

CS crim. gray, silty base ool  
P. spind. + P. sp. solid str + solid  
chit thin N.S. FO, V. blades

CS brown-gray silty base ool P  
dense nod

CHEROKEE ST  
4423(1937)

shale black carb

short trip @ 4440

CS tan-crim white silty base  
dense nod

l-eps

Vis. 49 Wt. 9.1 Fil. 7.2  
Chl 3.400 PH 11.5 CCM H.  
(9-24-10)

50

Abnt shale gray black + green +  
CS tan-crim white silty base dense  
nod chky IP



1

2

3

4

MISSISSIPPI

4449 (1913)

4500

cfs

cfs

cfs

cfs

50

CS gray tan furbula dense and shale AA

CS AA w/ inc shale black gray, green & rust

Shale AA + chl gray & pink low sils ss gray w/ gm rd well sort P.gd N.S

Most shale black, green gray & rust + ss clefts black furbula sub gaa med sort P.gd N.S.E.O black 2 1/2 sta N-odor

Dolo tan brown furbula low pass flag F.P. ind. P.gd G.S.E.O unlt sta c. fluor. G-odor

Dolo dk brown gray furbula P.gd & P.gd G.S.E.O unlt split dk sta dull fluor G-odor

Dolo tan brown furbula F.P. ind. F.P. v. d. G.S.E.O unlt fluor G-odor

cfs 4529 Dolo tan gray furbula P.F. ind. P.gd v. d. F.G.S.E.O unlt split sta dull unlt fluor G-odor

cfs 4538 Dolo tan gray furbula silty chl F.P. ind. P.gd v. d. G.S.E.O unlt split sta dull fluor F-odor (show dec)

Dolo tan off white furbula chl. P.P. ind. & P.gd v. d. G.S.E.O split 1/2 sta dull fluor but odor

CS gray tan furbula dense silty less - out and

Dolo tan white furbula silty chl P.gd & P.gd v. d. G.S.E.O split + chl gray

Pipe Strop @ 4517 survey 1° 1.17 Cong

DST #1 4415-4517 15:30-45:90 BLOW: I.F. 1

F.F. surface blow died RECOVERY: 5' S.O.C.M. (4% O 96% M)

I.H.P. 2249# I.F.P. 83-88# I.S.I.P. 913# F.F.P. 91-100# F.S.I.P. 1031# F.H.P. 2152# B.H.T. 124°F

Vis. 59 wt. 9.3 Fil 6.8 chl. 3.400 PH 10.5 (CM) # (9-25-10)

DST #2 4510-4524 15:30-15:30 BLOW:

I.F. weak surface F.F. weak surface RECOVERY:

5' S.O.C.M. (5% O 95% M) I.H.P. 2250# I.F.P. 34-38# I.S.I.P. 1144# F.F.P. 39-41# F.S.I.P. 1013# F.H.P. 2175# B.H.T. 116°F

DST #3 4515-4529

		<p>4600</p> <p>50</p>	<p>Top tan-white, light silty cal chty I.P. P. moldd xls + chf gray</p> <p>Top tan-gray Pyrite silty glauc. P. mold. xls + chf gray opp</p>	<p>15. 30 - 15 - 30 BLOW: I.F. weak surface F.F. weak surface RECOVERY: S.S.O.C.M. (1% O. 99% M) I.H.P. 2273# I.F.P. 36-39# I.S.I.P. 1181# F.F.P. 40-43# F.S.I.P. 1120# F.H.P. 2175# B.H.T. 117°F</p> <hr/> <p>DST #4 4526 - 4538 15. 30 - 30 - 60 BLOW: I.F. weak built 1" F.F. weak built 1" RECOVERY: 65 M.W. (30% M 70% W) chl. 23.000 I.H.P. 2265# I.F.P. 34-42# I.S.I.P. 1149# F.F.P. 44-61# F.S.I.P. 1127# F.H.P. 2261# B.H.T. 118°F</p> <hr/> <p>@4600 vis. S7 wt 9.1 Fil. 7.6 chl. 5.100 PH 10.3 CCM 1# (9-27-10)</p>
DRILLING TIME	DEPTH	SAMPLE DESCRIPTION	REMARKS	

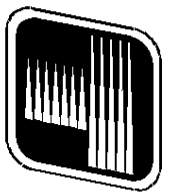
In Minutes

DRISSING TIME  
0 5 10 15 15

DEPTH

SAMPLE DESCRIPTION

REMARKS



**Tucker**  
WIRELINE SERVICES

DUAL INDUCTION  
RESISTIVITY LOG

File No. : TUL-56605  
Company : LARSON ENGINEERING, INC.  
Well : HAGANS #2-14  
Field :  
Country : NESS  
State : KANSAS  
Country : USA

Location : API # 15-135-25154  
1987' FSL & 330' FWL  
S/2 NW NW SW

Sect : 14 Twp : 16S Rge : 26W

Recorded By : R. FRANKLIN  
Witnessed By : S. DAVIS

Date : SEP 27 2010  
Run No. : 1

Permanent Datum : GL  
Drilling Measured From : KB  
Log Measured From : KB  
Above Permanent Datum : 10.000 FT

Depth--Driller : 4600.0 FT  
Depth--Logger : 4596.0 FT  
Bottom Log Interval : 4595.0 FT  
Top Log Interval : 220.0 FT

Casing Depth--Driller: 223.0 FT  
Casing Depth--Logger : 220.0 FT  
Casing Diameter : 8.625 IN

Bit Size : 7.875 IN  
Unit No. : 123  
Location : TULSA

Elevations :  
KB : 2586.00 FT  
DF : 2585.00 FT  
GL : 2576.00 FT

**Additional Services**

CNT  
LDT  
MLT

The customer is hereby warned that by providing the log data herein, T. W. S. does not agree to provide any interpretation of log data, conversion of log data to physical rock parameters or recommendations. T. W. S. 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 T. W. S. 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 T. W. S. 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.

**Run Number 1**

Depth To Fluid 0.0 FT  
Fluid Type In Hole : WBM  
Density : 0.000 SG  
Viscosity : 0.000 SEC  
pH : 0.000  
Fluid Loss : 0.000  
Salinity : 0.000 KPPM

RM Source : MEASURED  
RM : 0.220 OHMM at 85 F  
RM at BHT : 0.163 OHMM at 117 F

RMF Source : CALCULATED  
RMF : 0.187 OHMM at 85 F  
RMF at BHT : 0.138 OHMM at 117 F

RMC Source : CALCULATED  
RMC : 0.253 OHMM at 85 F

RMC : 0.253 OHMM at 85 F  
 RMC at BHT : 0.187 OHMM at 117 F  
 Max Recorded Temp. : 117 F  
 Time Circulation Stopped :  
 Operating Rig Time, Hrs. : 3.0

**- Source Serial Numbers -**

Gamma 2991GW  
 Neutron N-1046

**- Sonde Serial Numbers -**

GRTB GRT-BC-41  
 CNT CNP-AA-112  
 LDTNG LDP-DA-66  
 MSTNG MST-DA-029  
 PIT\_B PIT-BA-20

**Casing Strings**

Size (IN)	Weight (LB/FT)	Bottom (FT)
8.625	36.00	223.00

**- Comments -**

ALL PRESENTATIONS AS PER CUSTOMER REQUEST.

GRT, CNT, LDT, MLT, AND PIT RUN IN COMBINATION.  
 CALIPERS ORIENTED ON THE X-Y AXIS.  
 PHIN IS CALIPER CORRECTED.  
 2.71 G/CC USED TO CALCULATE POROSITY.  
 ANNULAR HOLE VOLUME CALCULATED USING 5.50" PRODUCTION CASING.  
 DETAIL PRESENTED FROM TD TO 3600' AS PER CLIENTS REQUEST.  
 DETAIL PRESENTED OVER ANHYDRITE FROM 2050' TO 1980'.

GRT: GRP.  
 CNT: PHIN, CLCDIN.  
 LDT: PORL, LCOR, PECLN, CLLDIN, LDENN, PORLLS, PECSN.  
 MLT: NOR\_R, INV\_R, MSCLPIN.  
 PIT: ILD, ILM, CIRD, SFLA, SPU.  
 MINERAL VOLUME: VM31, VM33.

OPERATORS:  
 S. DAVIS  
 M. GARNER

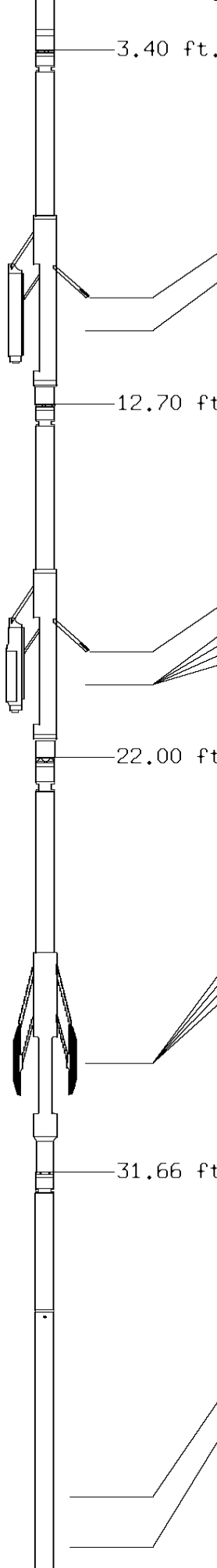
THANK YOU FOR USING TUCKER WIRELINE SERVICES!

**Tool String Schematic**

Total Tool Length - 53.15 ft.  
 Maximum Outside diameter - 6.00 in.  
 Net Weight in Air - 943.00 lbs.



<b>Tool:</b> GRTB	<b>Length:</b> 3.40 ft. O.D.: 3.60 in.
<b>Sonde ID</b>	: GRT-BC-41
<b>Measure Point</b>	<b>Stack Offset</b> <b>Tool Offset</b> <b>Bottom Offset</b>
GRTB	3.00 3.00 51.15



GRP 2.00 2.00 51.15

3.40 ft.

**Tool: CNT**      **Length: 9.30 ft. O.D.: 4.36 in.**  
**Sonde ID**      : CNP-AA-112  
**Source ID**     : N-1046  
**Pad ID**        : CNP-AA-112

<u>Measure Point</u>	<u>Stack Offset</u>	<u>Tool Offset</u>	<u>Bottom Offset</u>
CLCN	9.40	6.00	43.75
PHIN	10.24	6.84	42.91

12.70 ft.

**Tool: LDTNG**      **Length: 9.30 ft. O.D.: 4.80 in.**  
**Sonde ID**        : LDP-DA-66  
**Source ID**     : 2991GW  
**Pad ID**         : LDP-DA-66

<u>Measure Point</u>	<u>Stack Offset</u>	<u>Tool Offset</u>	<u>Bottom Offset</u>
CLLD	18.70	6.00	34.45
PEL	19.70	7.00	33.45
PES	20.10	7.40	33.05
LDEN	19.70	7.00	33.45
LCOR	19.70	7.00	33.45

22.00 ft.

**Tool: MST**        **Length: 9.66 ft. O.D.: 6.00 in.**  
**Sonde ID**        : MST\_DA\_029

<u>Measure Point</u>	<u>Stack Offset</u>	<u>Tool Offset</u>	<u>Bottom Offset</u>
MSFL	29.60	7.60	23.55
CLMR	29.60	7.60	23.55
MSFN	29.60	7.60	23.55
MSFI	29.60	7.60	23.55

31.66 ft.

**Tool: PIT**        **Length: 21.49 ft. O.D.: 3.62 in.**  
**Sonde ID**        : PIT-BA-20

<u>Measure Point</u>	<u>Stack Offset</u>	<u>Tool Offset</u>	<u>Bottom Offset</u>
ILD	40.58	8.92	12.56
ILM	41.76	10.10	11.39
SFLU	49.15	17.49	4.00
SP	52.26	20.60	0.88

LWT ——— 53.15 ft.

TENSION  
LBS

10000 ————— 0

SPONTANEOUS POTENTIAL  
mV

→ | | ← 20

GAMMA RAY  
API UNITS

150 0 300 150

SHALLOW FOCUSED RESISTIVITY  
OHMM

0.0 500.0  
0.0 50.0

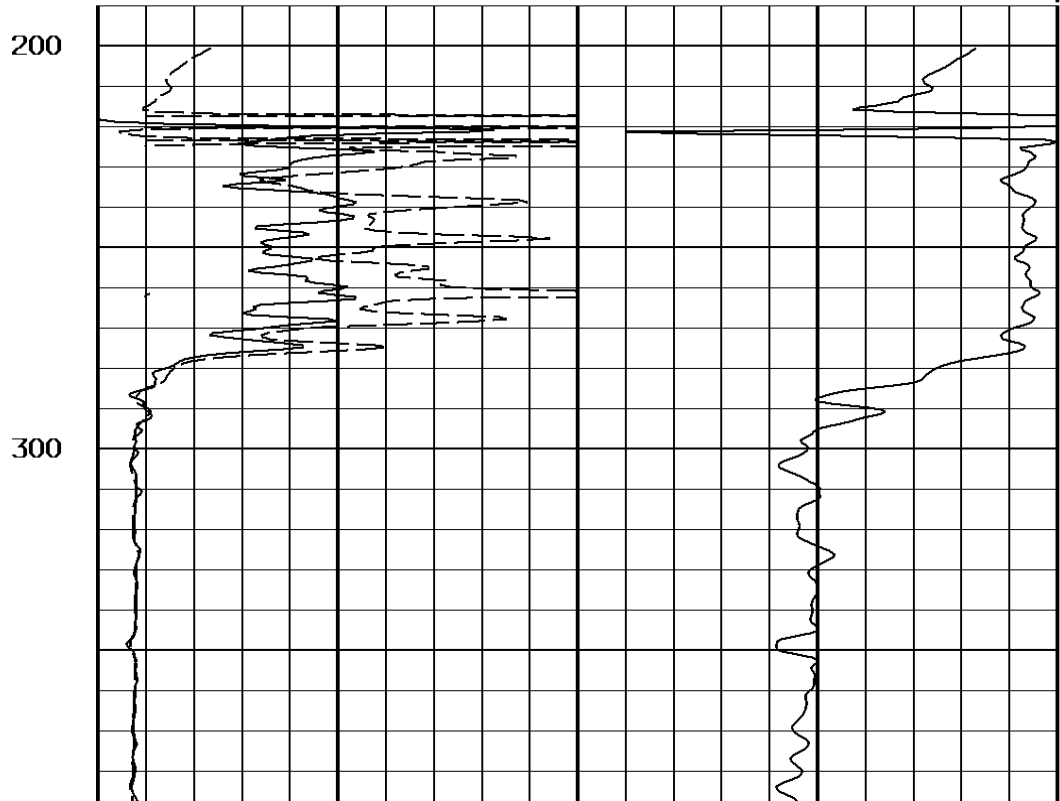
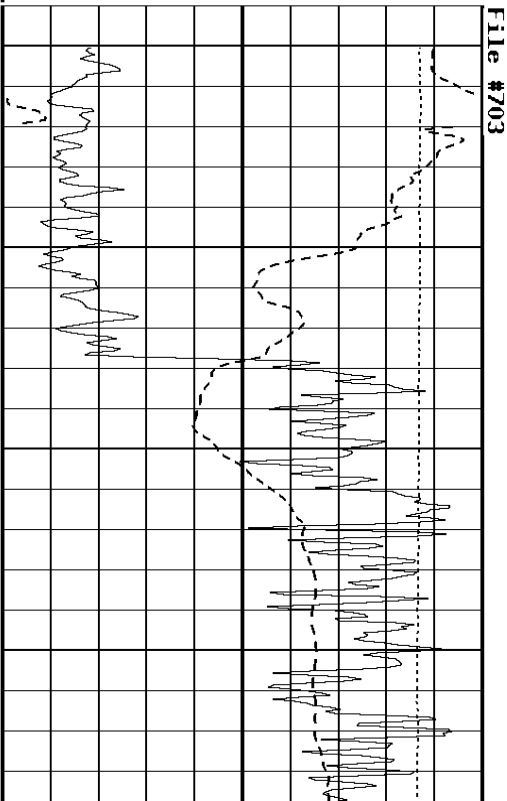
DEEP INDUCTION  
OHMM

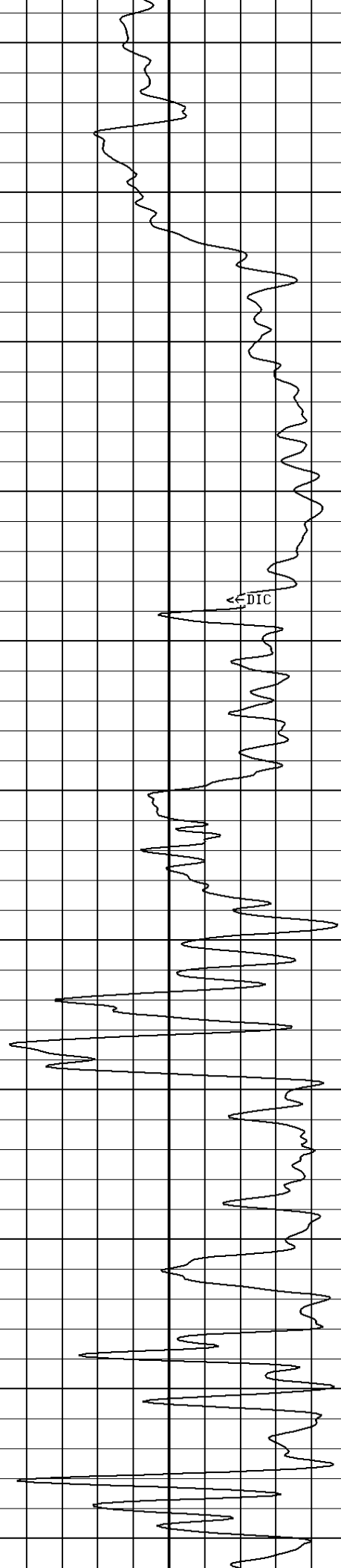
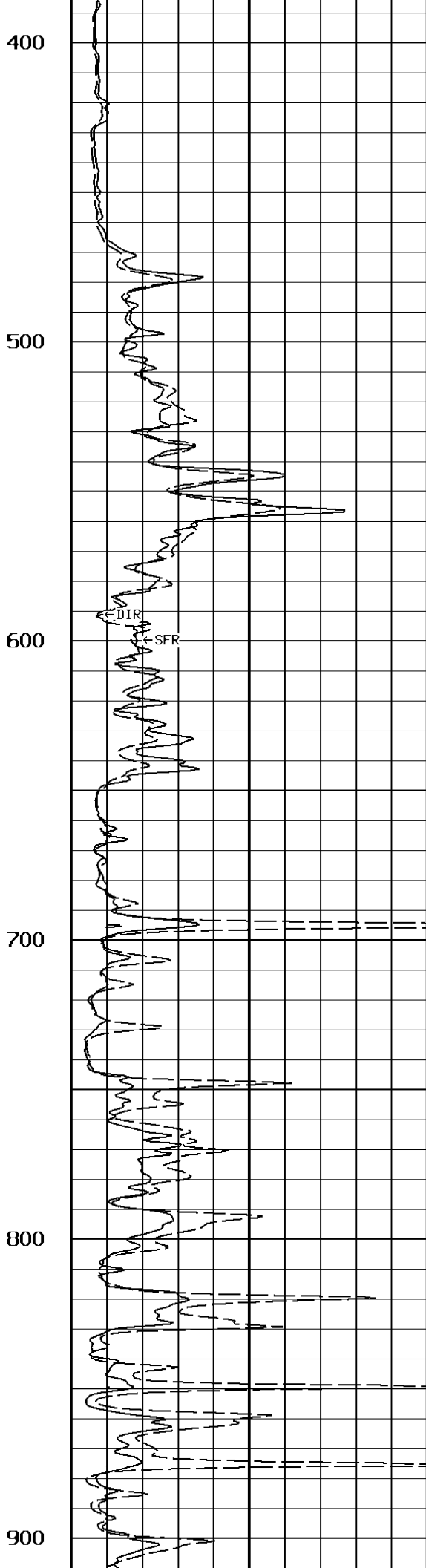
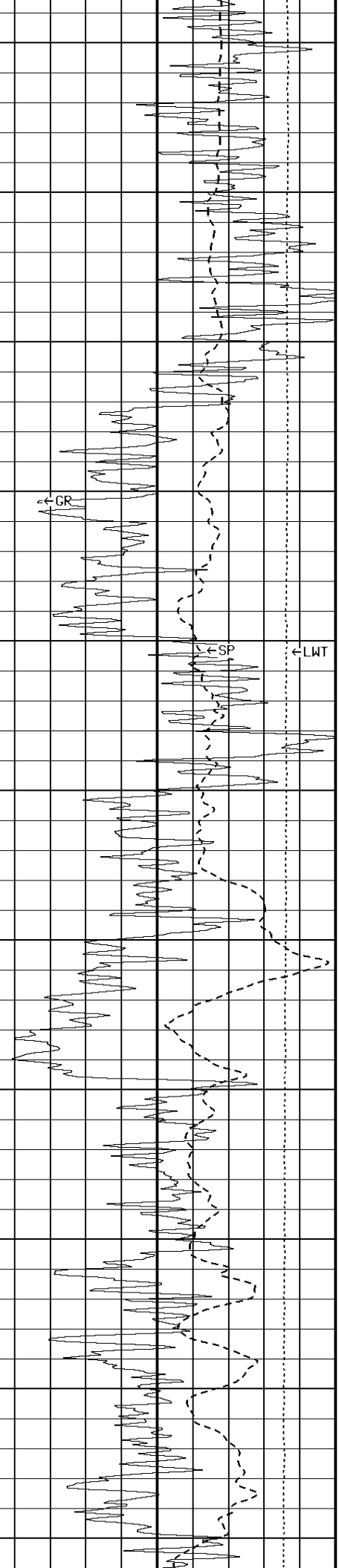
0.0 500.0  
0.0 50.0

DEEP CONDUCTIVITY  
MMHO

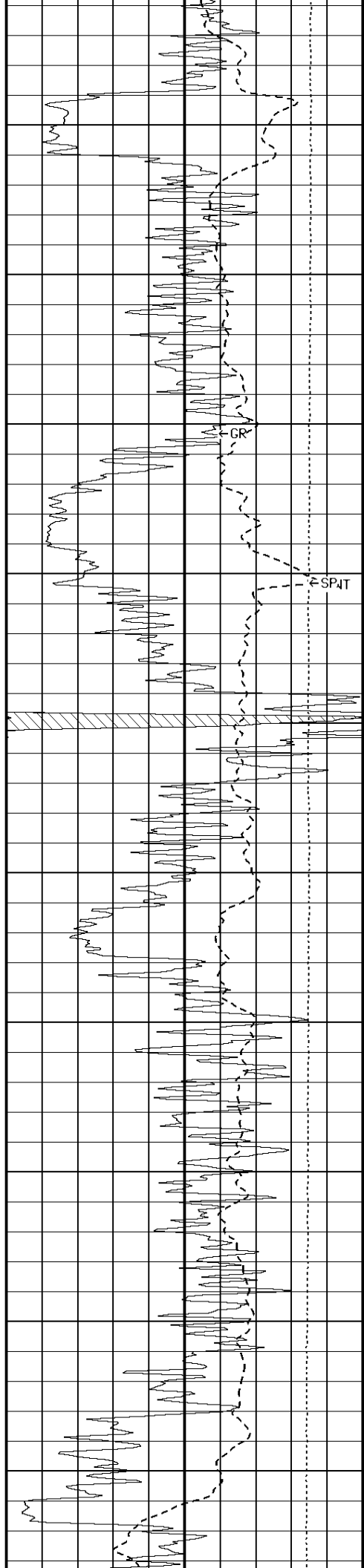
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1:600 SECTION









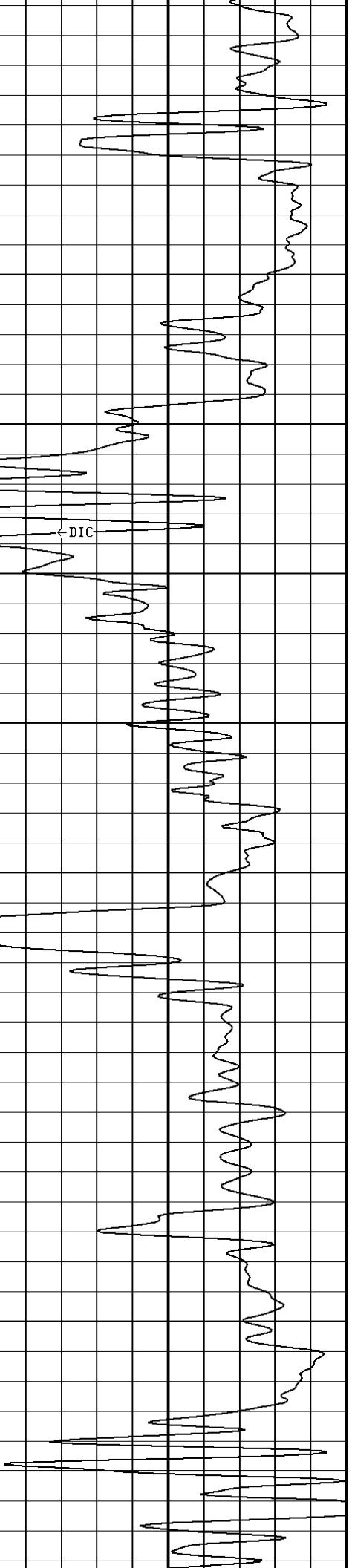
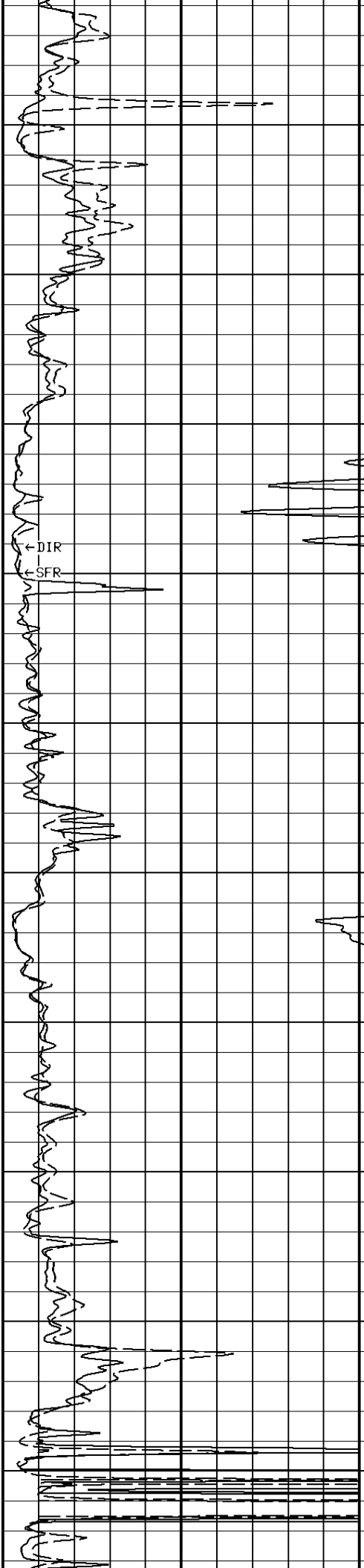
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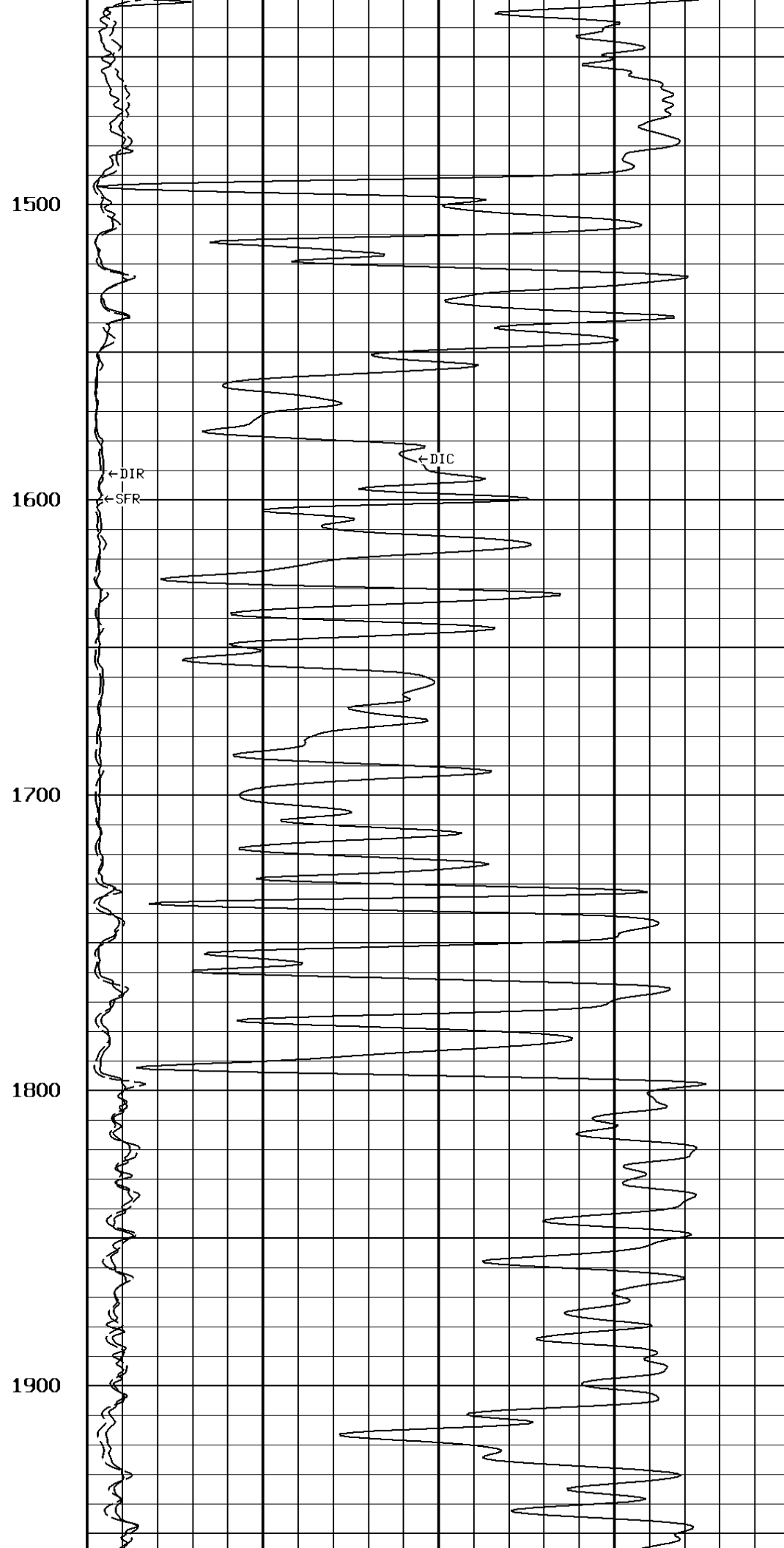
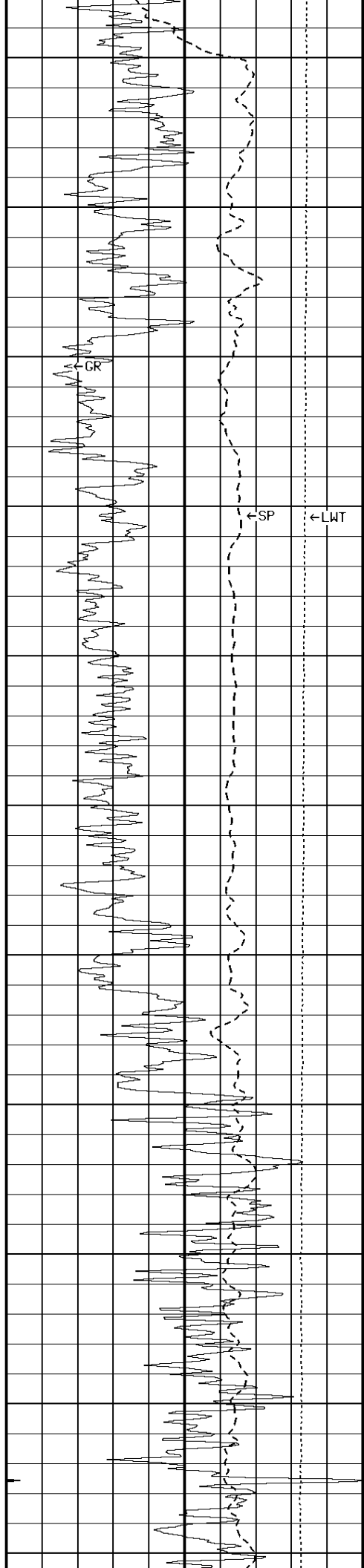
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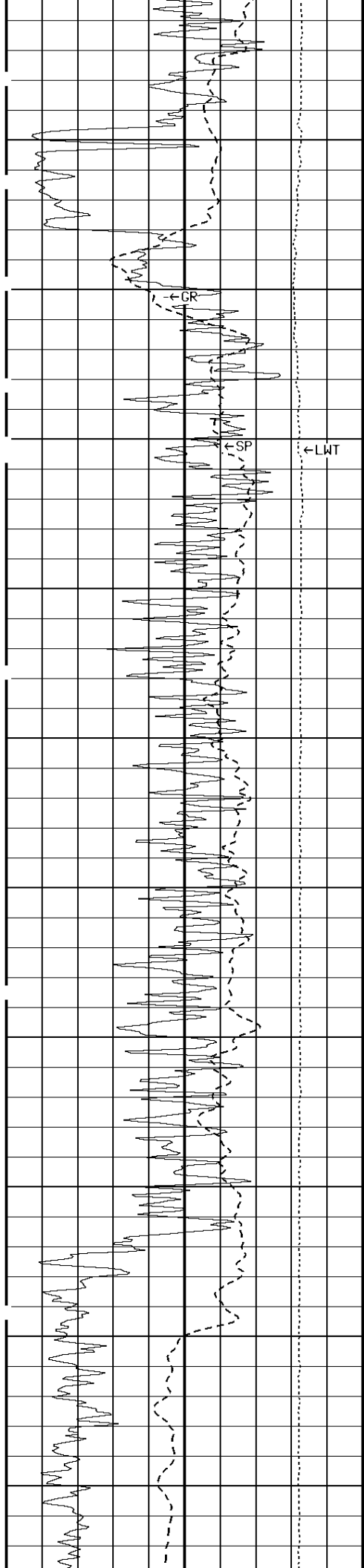
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1300

1400







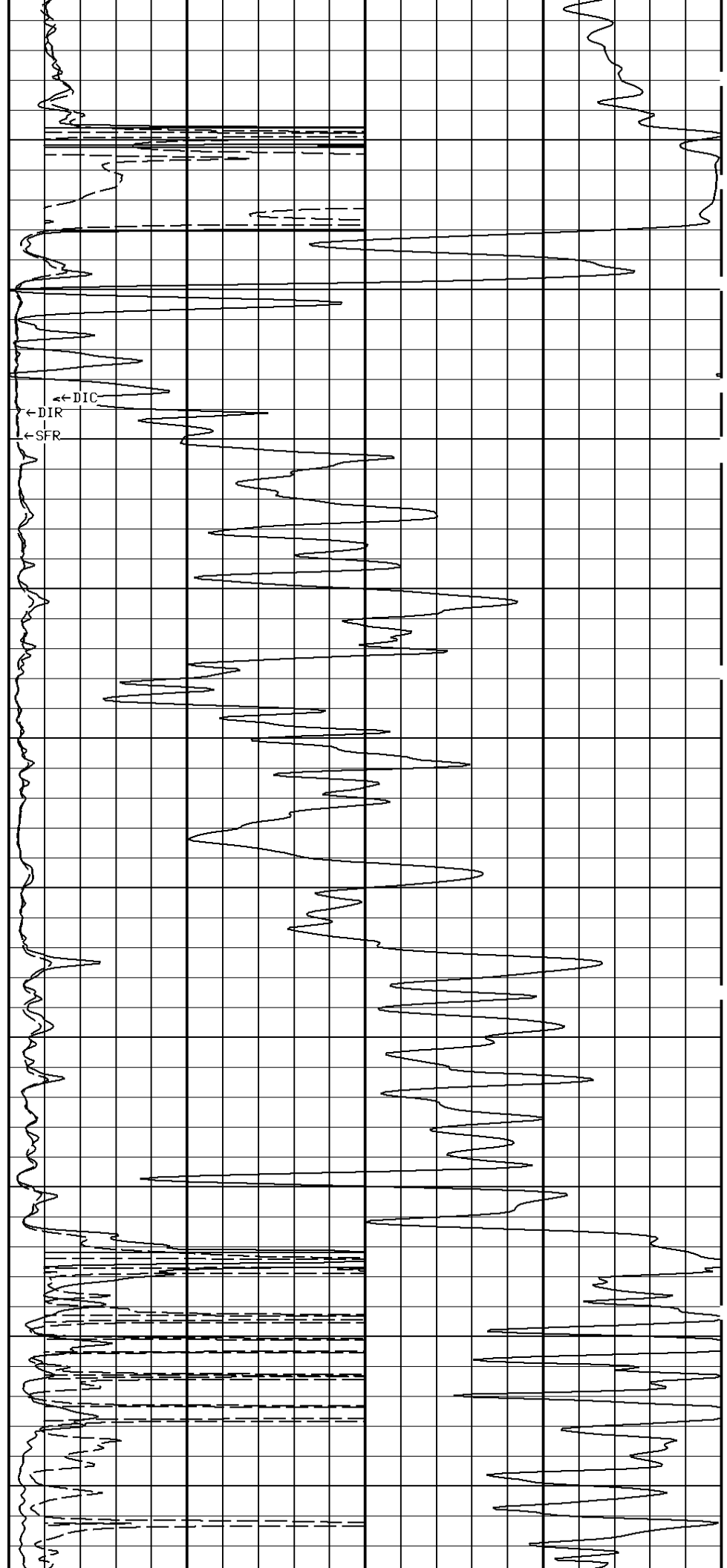
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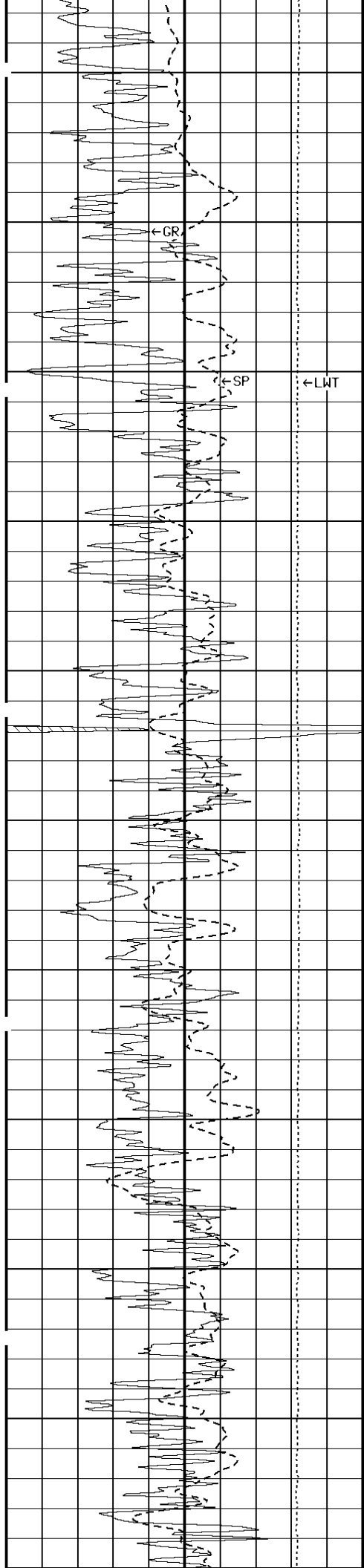
2100

2200

2300

2400





2500

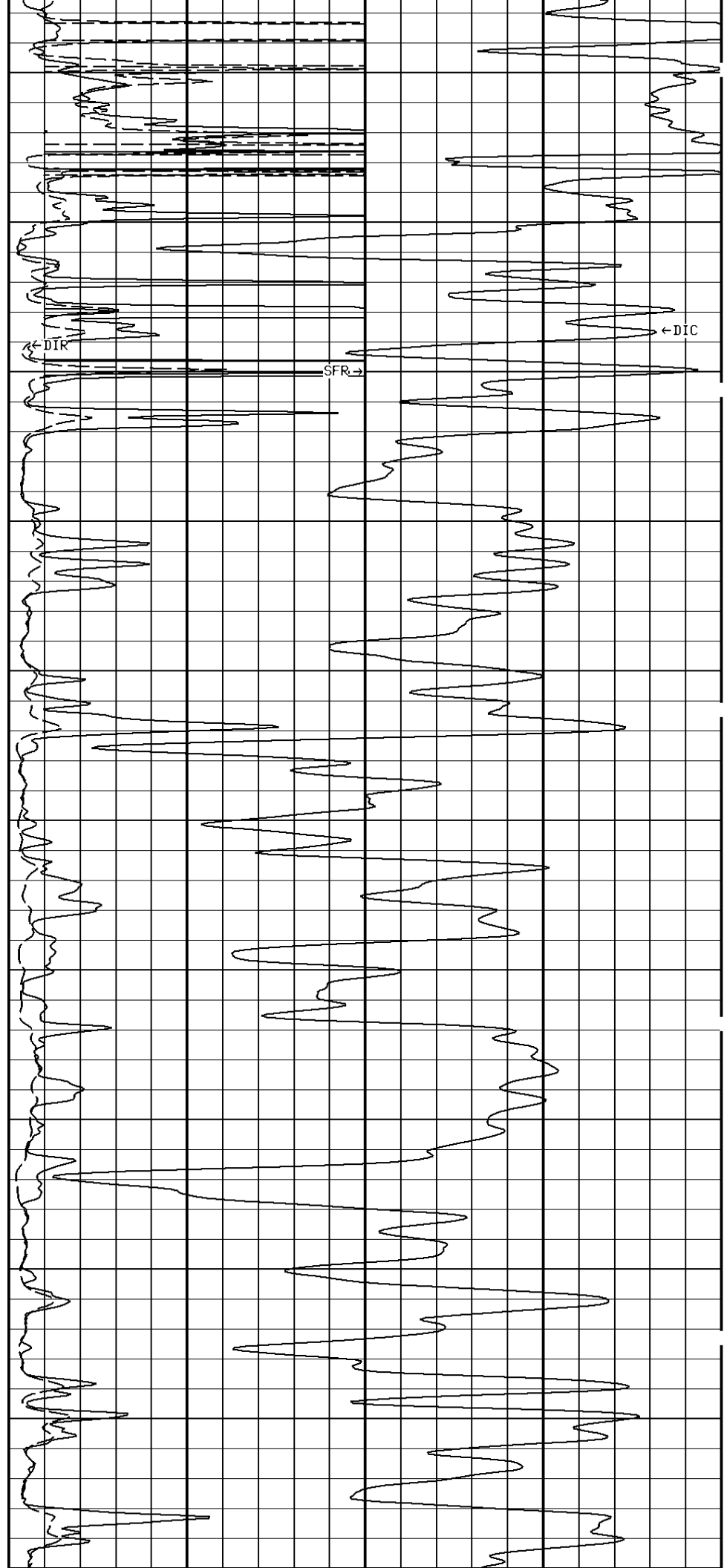
2600

2700

2800

2900

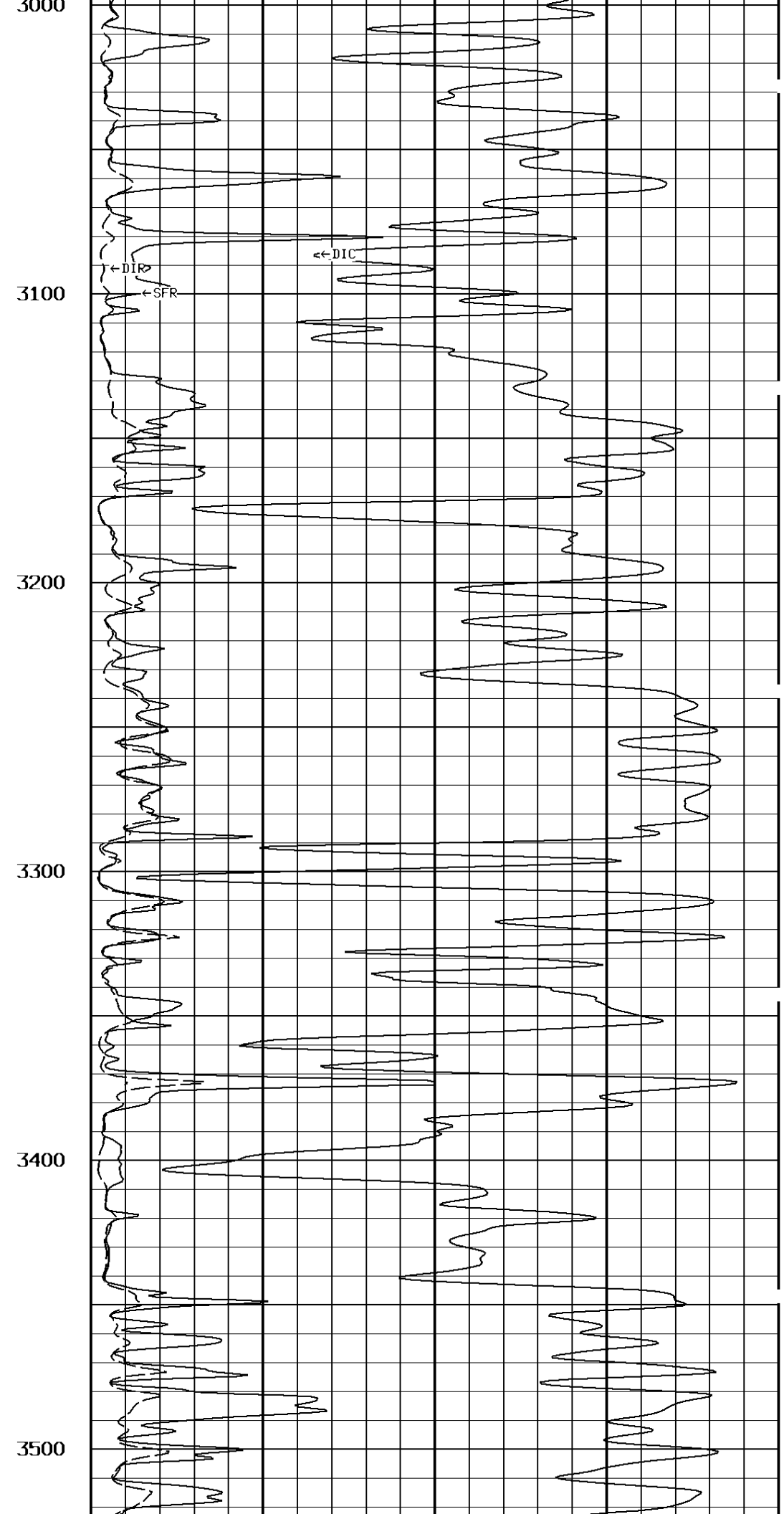
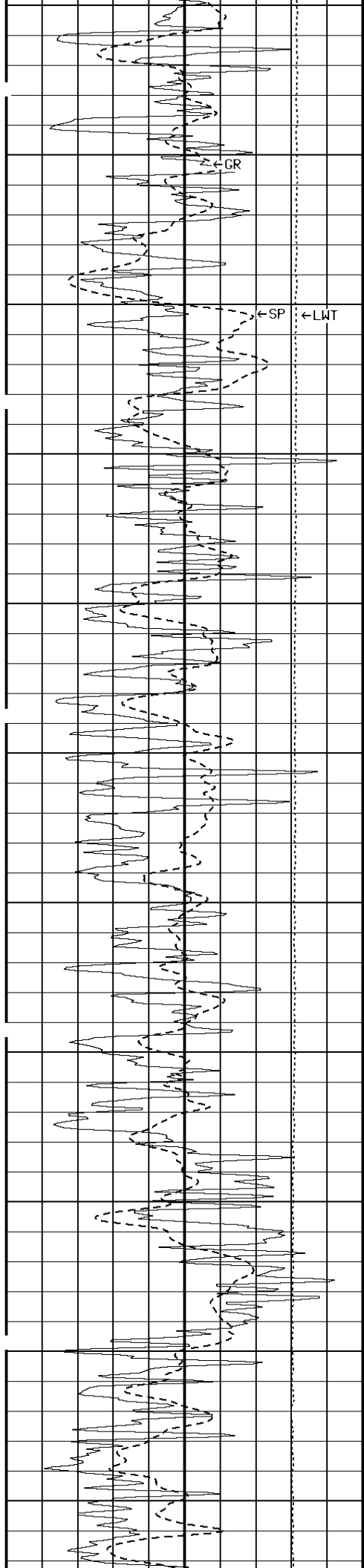
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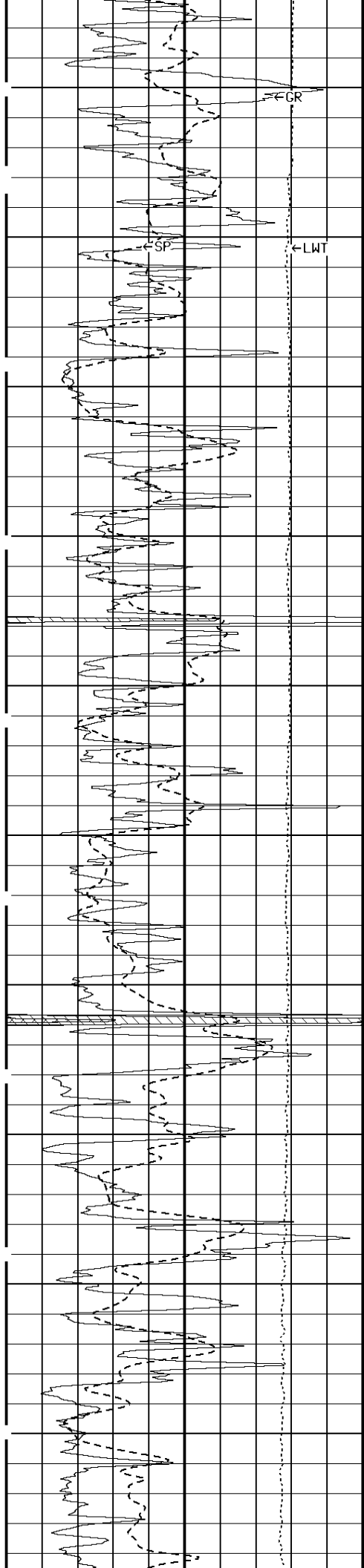


DIR

SFR

DIC





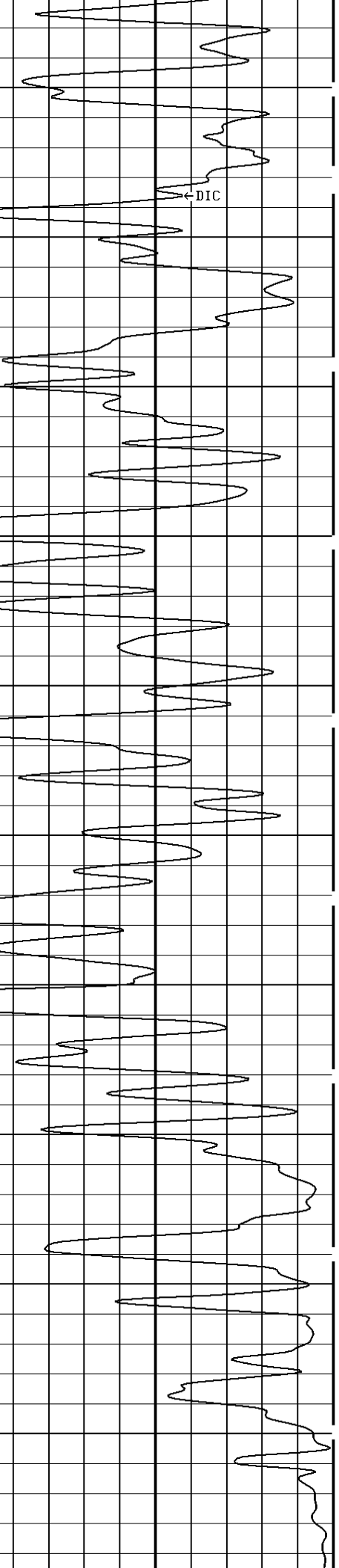
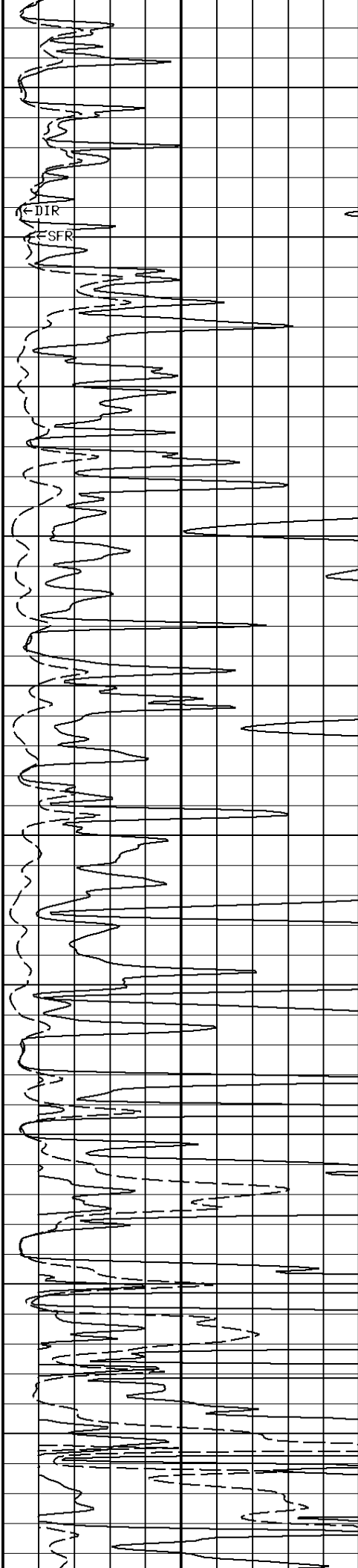
3600

3700

3800

3900

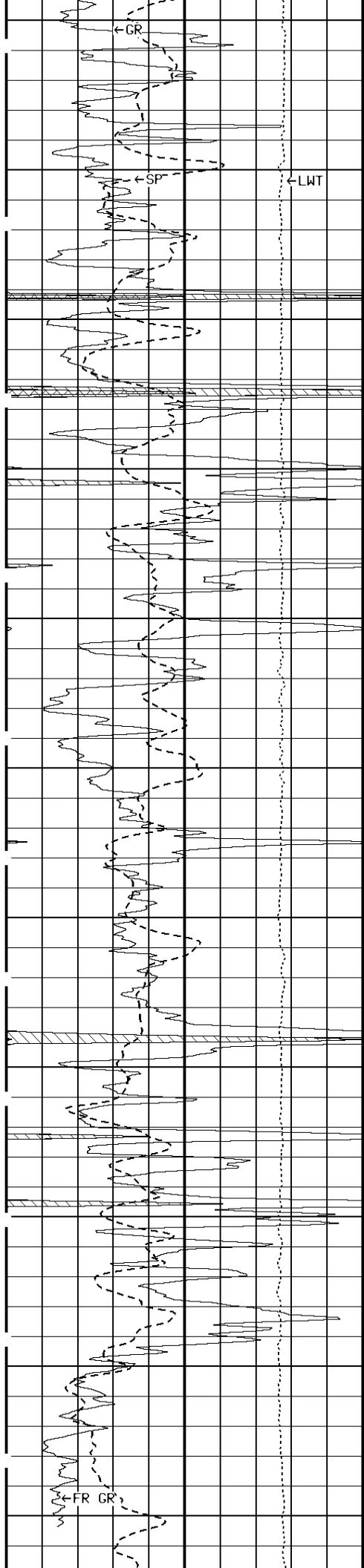
4000



DIC

DIR

SFR



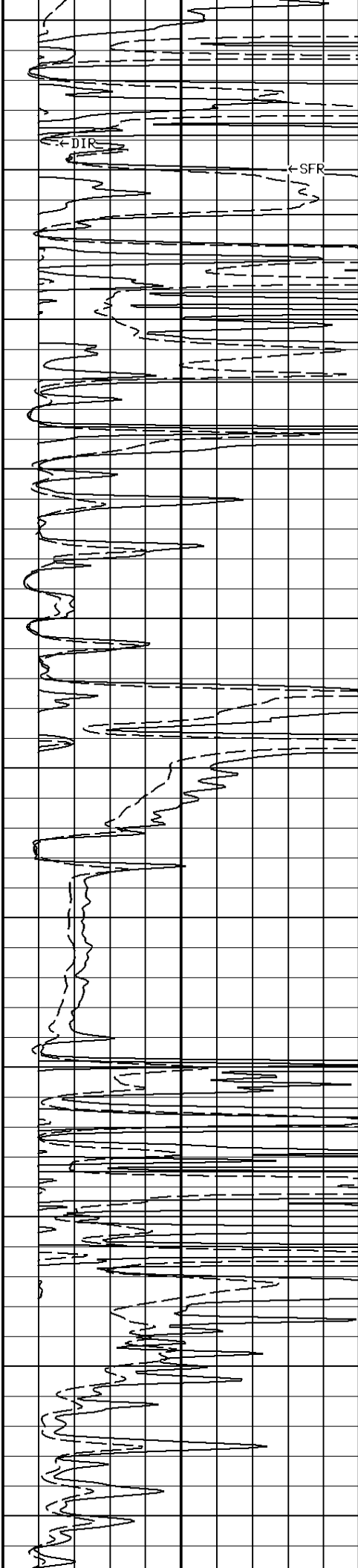
4100

4200

4300

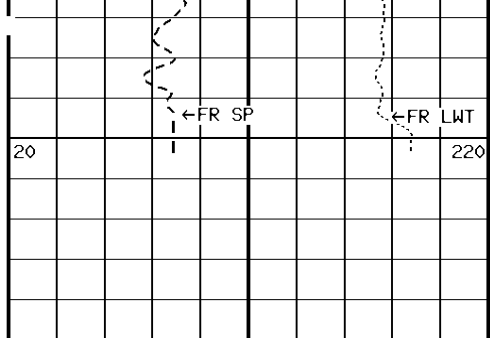
4400

4500



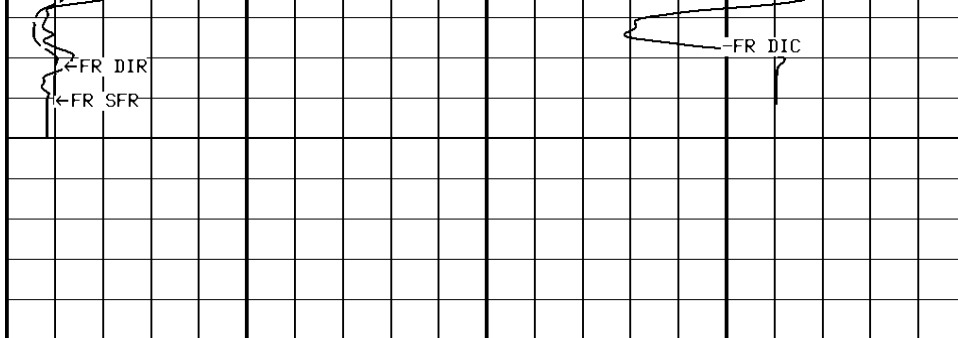
DIC

FR GR

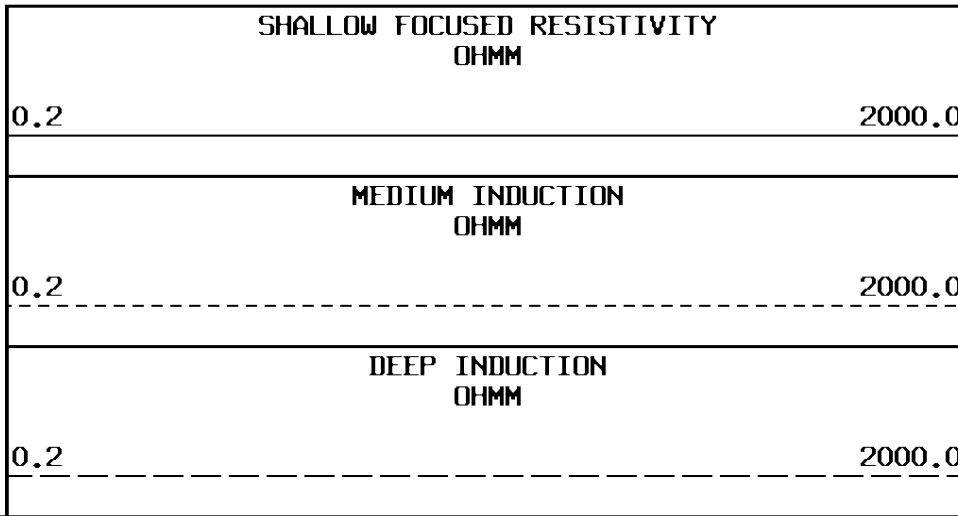
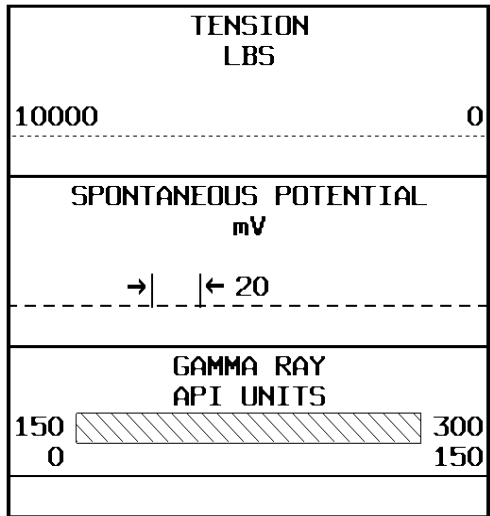
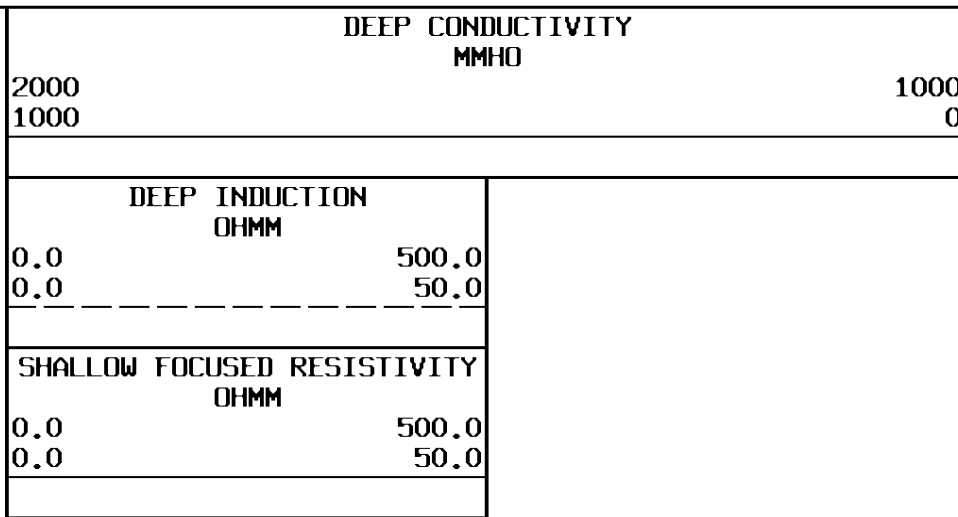
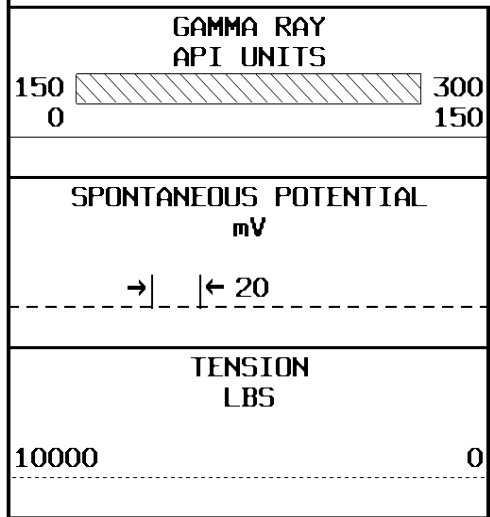


4596

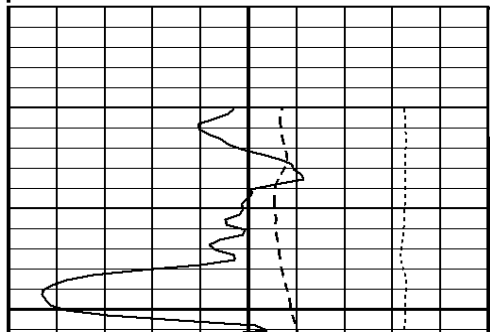
File #703



1:600 SECTION

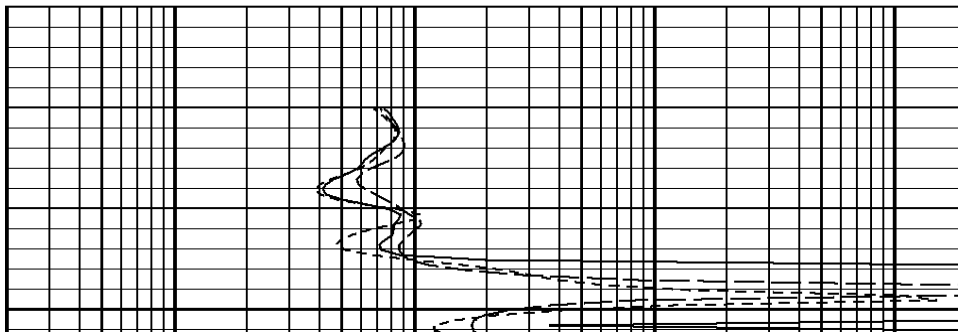


1:240 MAIN SECTION

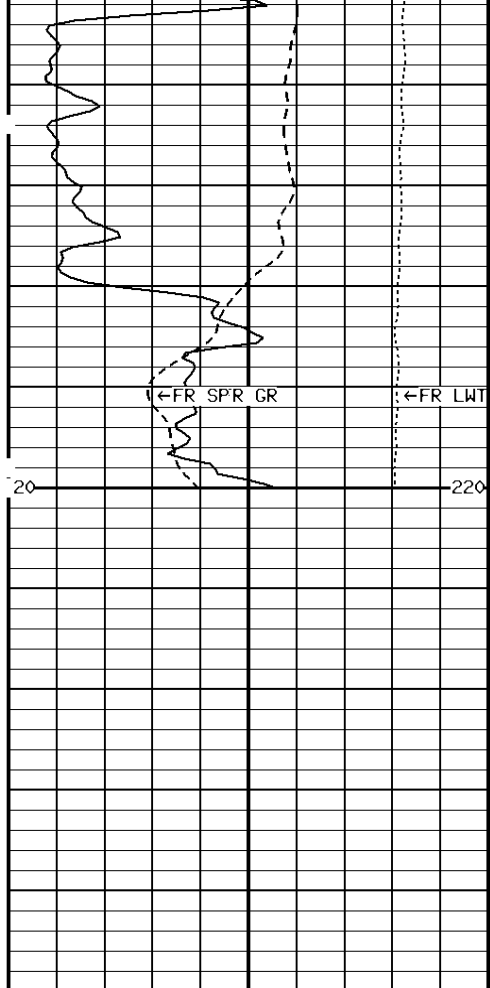


File #705

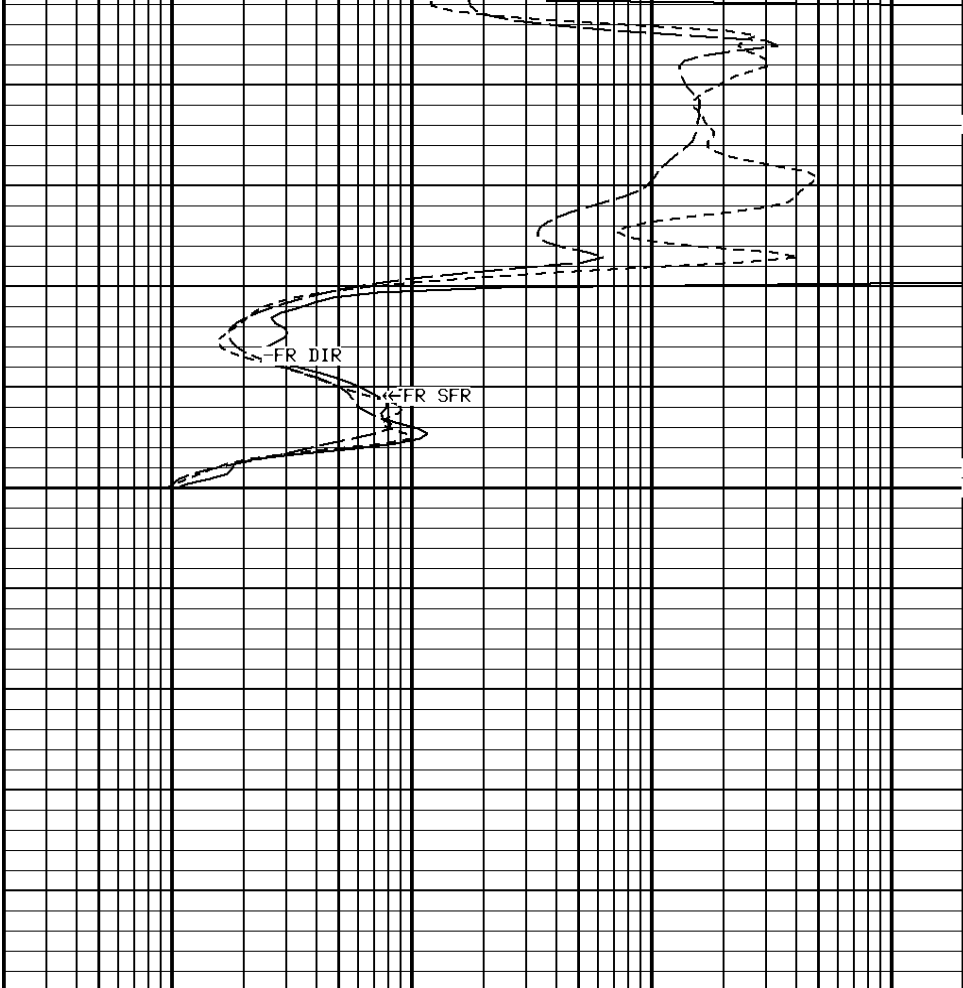
2000





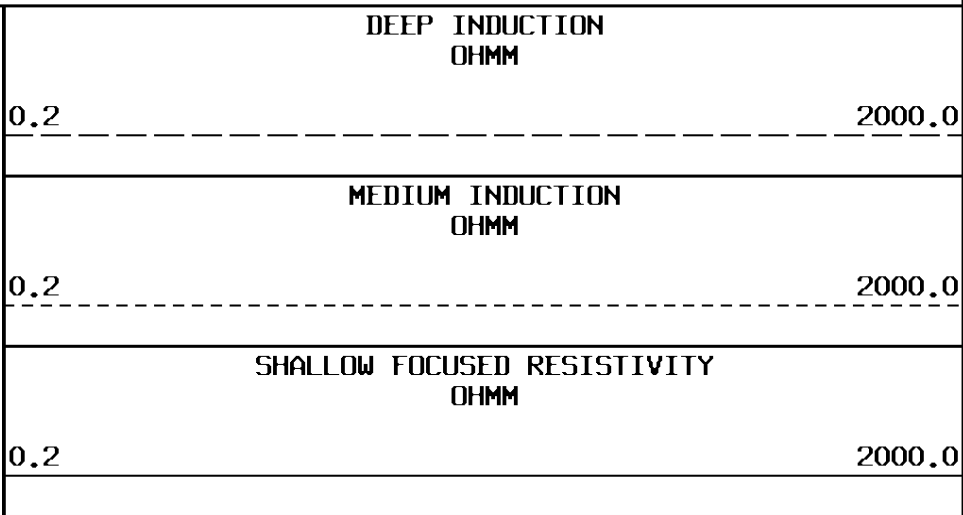
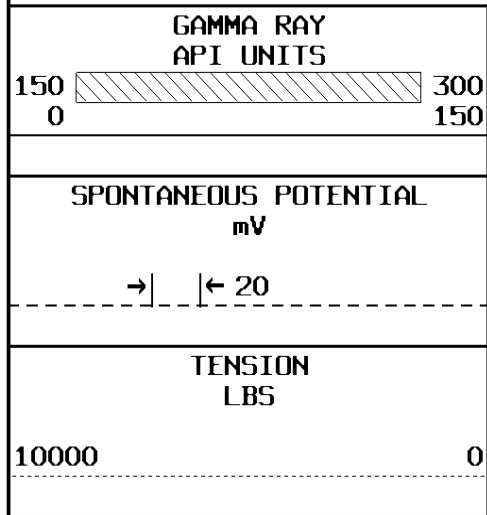


2041



File #705

1:240 MAIN SECTION



\* Borehole Zone Factors \*

Zone 1 99999.0 to 0.0 F		
Drill Bit Size_____	7.875	IN
BHT Depth_____	4596.000	F
Borehole Temperature_____	117.0	DEGF
Temperature Gradient_____	1.00	DFHF
Resistivity Of Mud_____	0.22	OHMM
Resistivity Of Mud Temperature_____	85.00	DEGF



TENSION  
LBS

10000 0

SHALLOW FOCUSED RESISTIVITY  
OHMM

0.2 2000.0

SPONTANEOUS POTENTIAL  
mV

→ | | ← 20

MEDIUM INDUCTION  
OHMM

0.2 2000.0

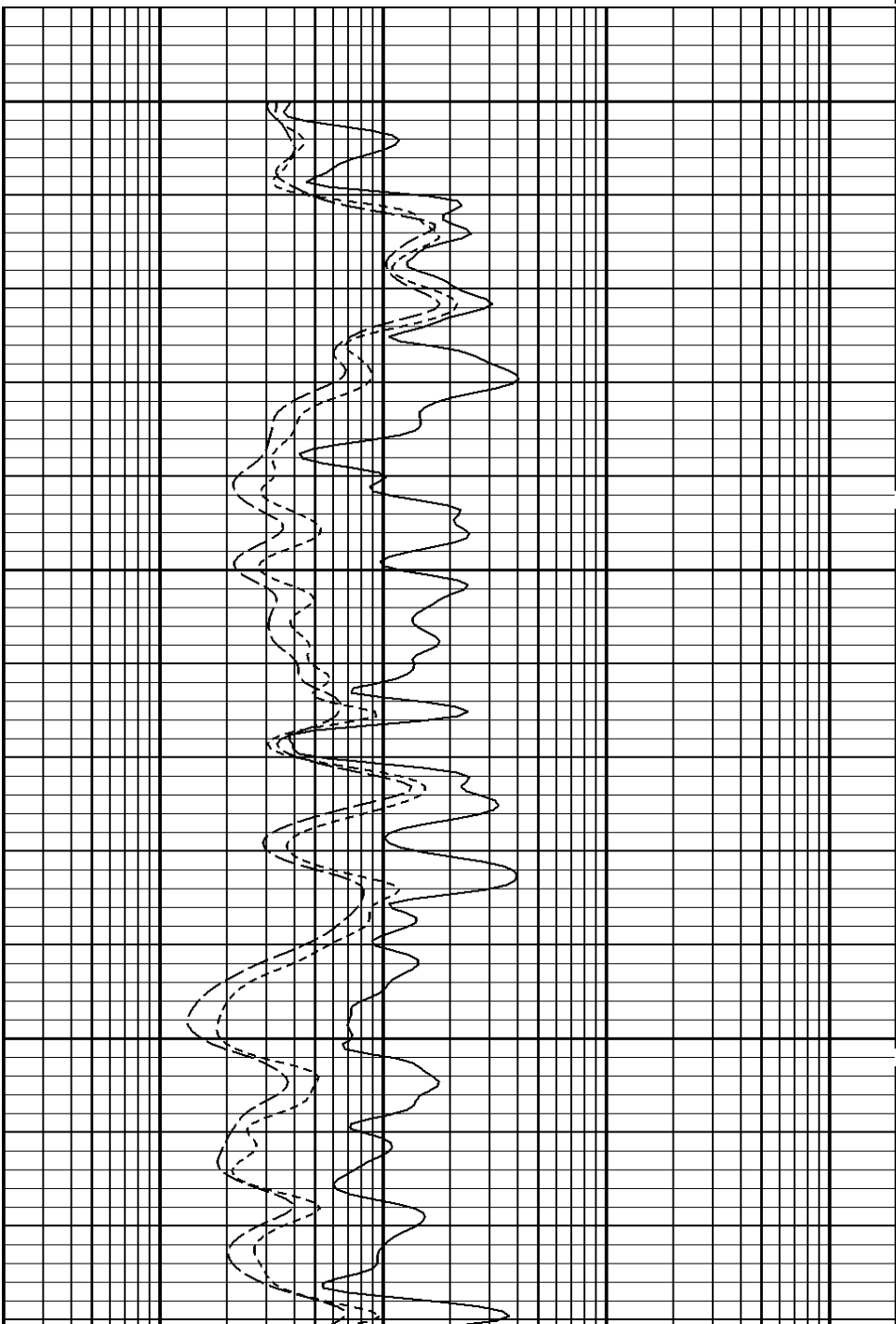
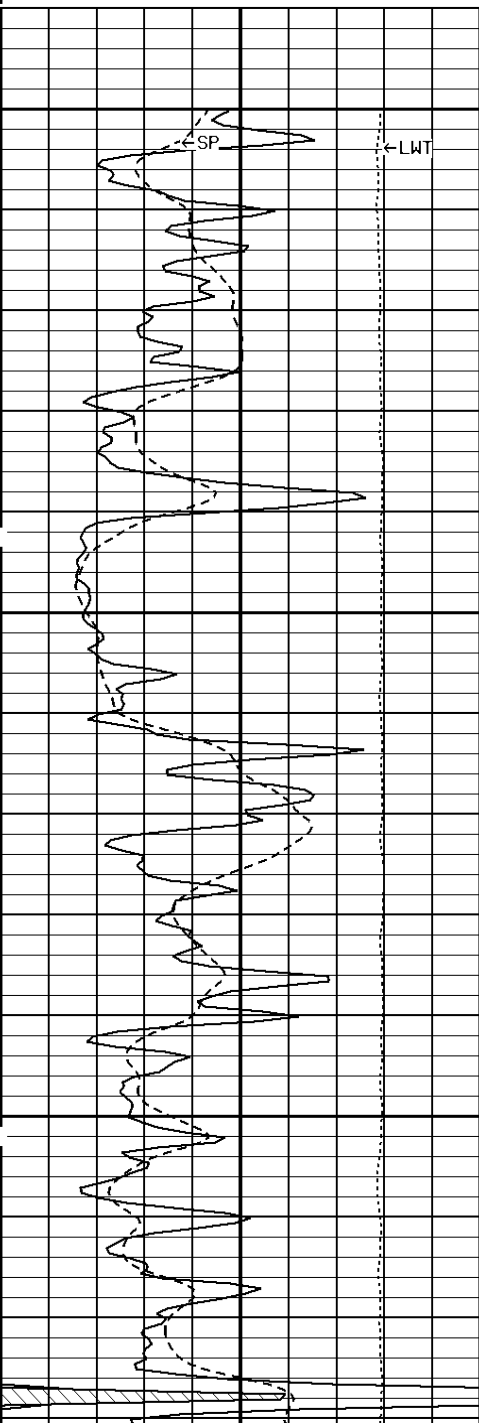
GAMMA RAY  
API UNITS

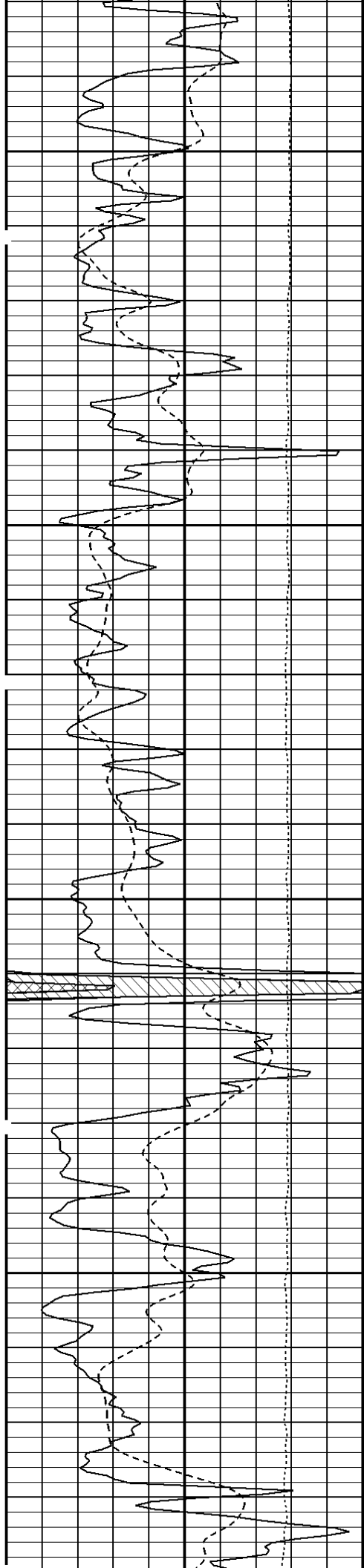
150 0 300 150

DEEP INDUCTION  
OHMM

0.2 2000.0

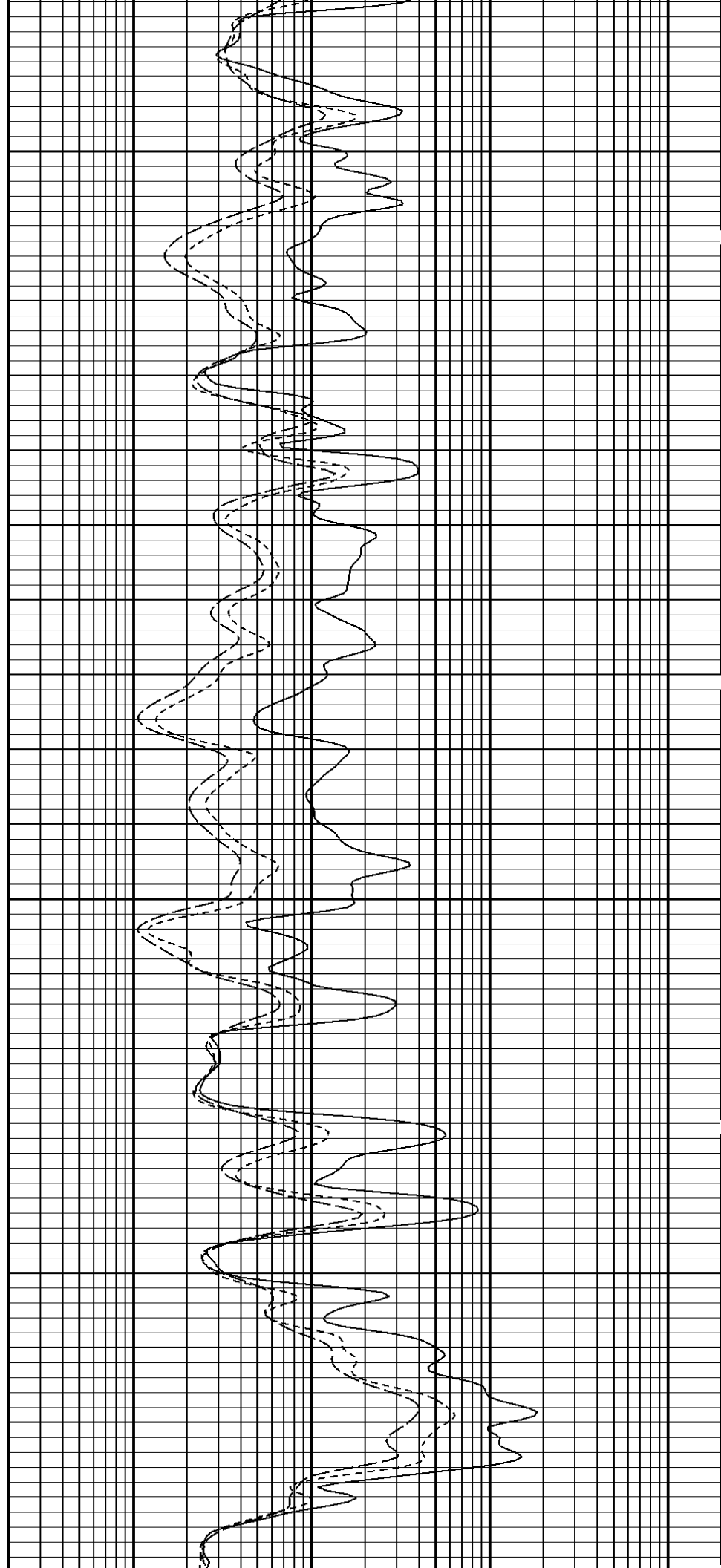
### 1:240 MAIN SECTION

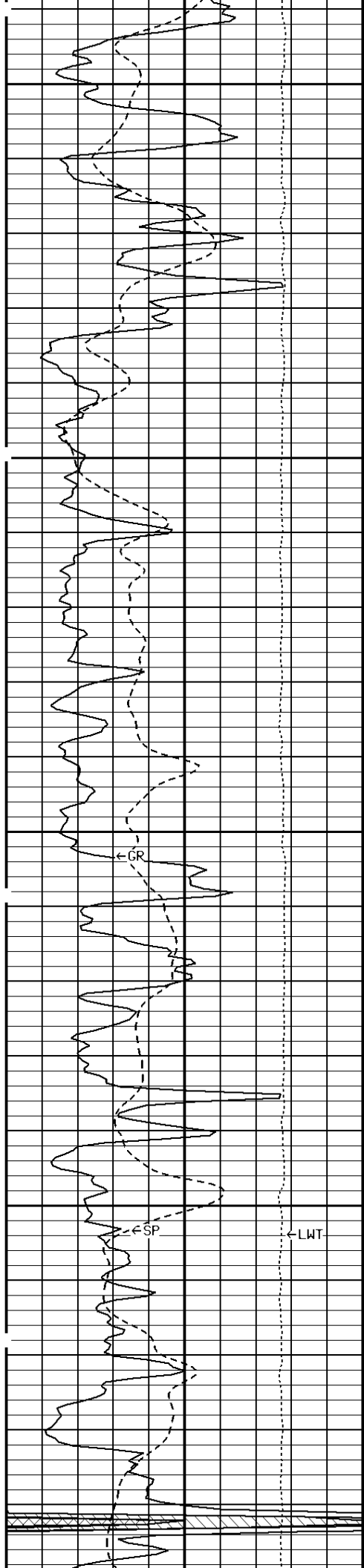




3800

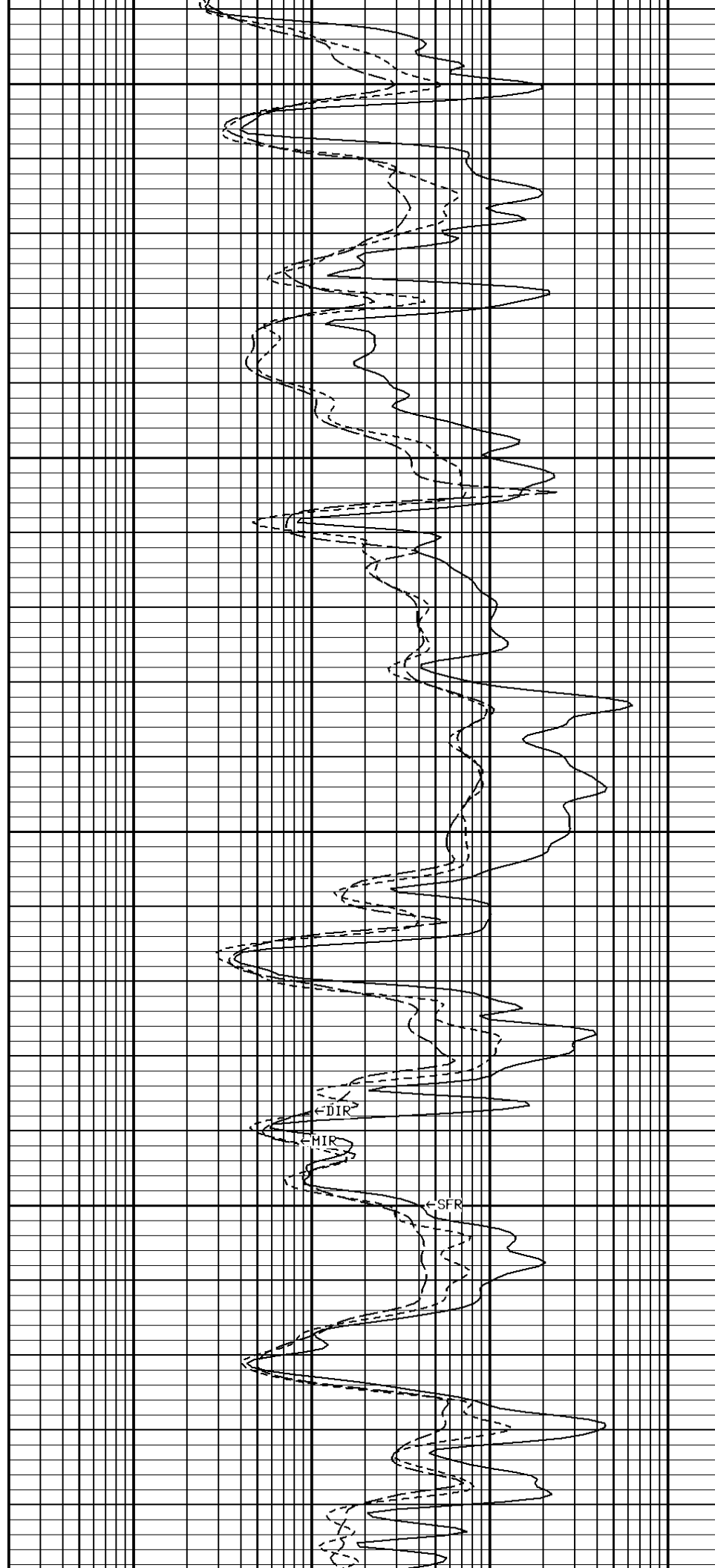
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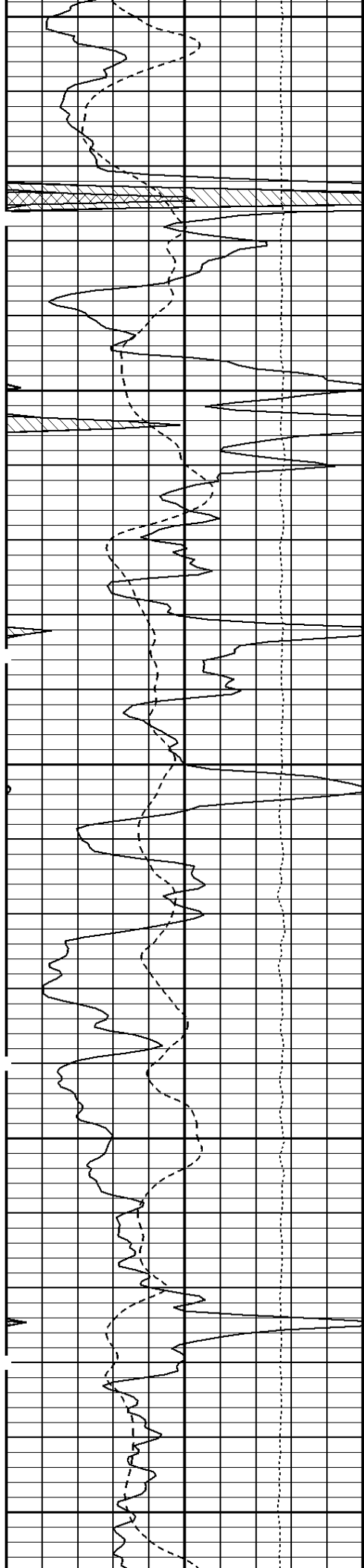




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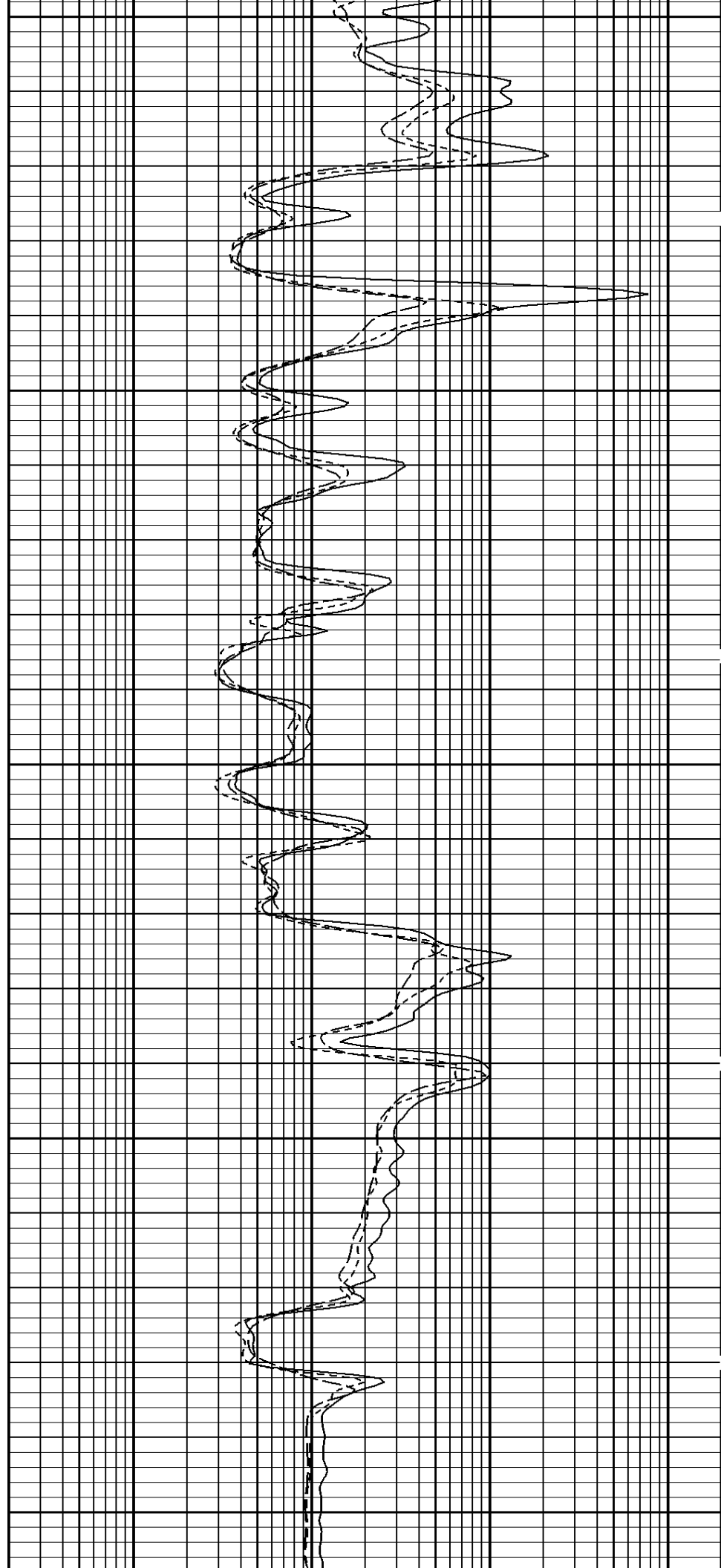
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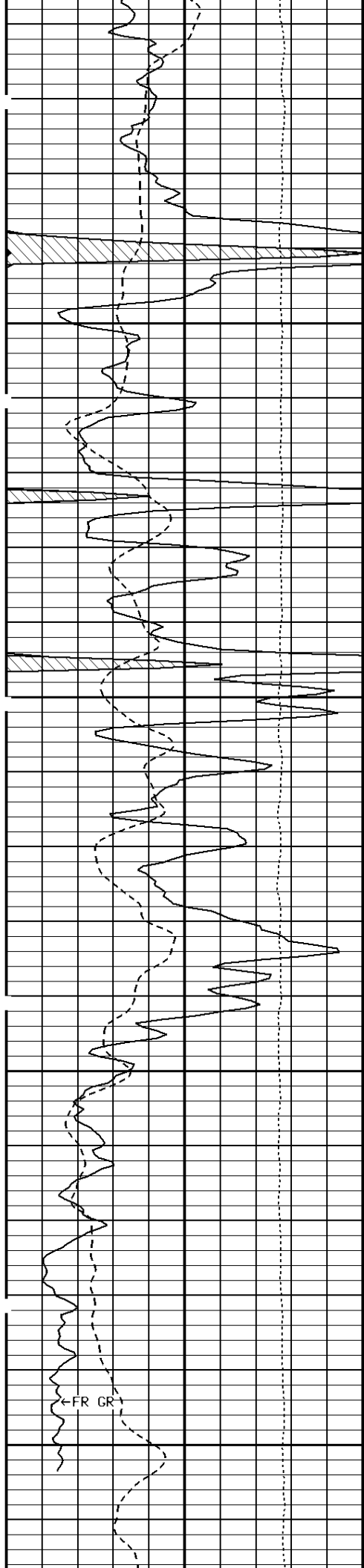




4200

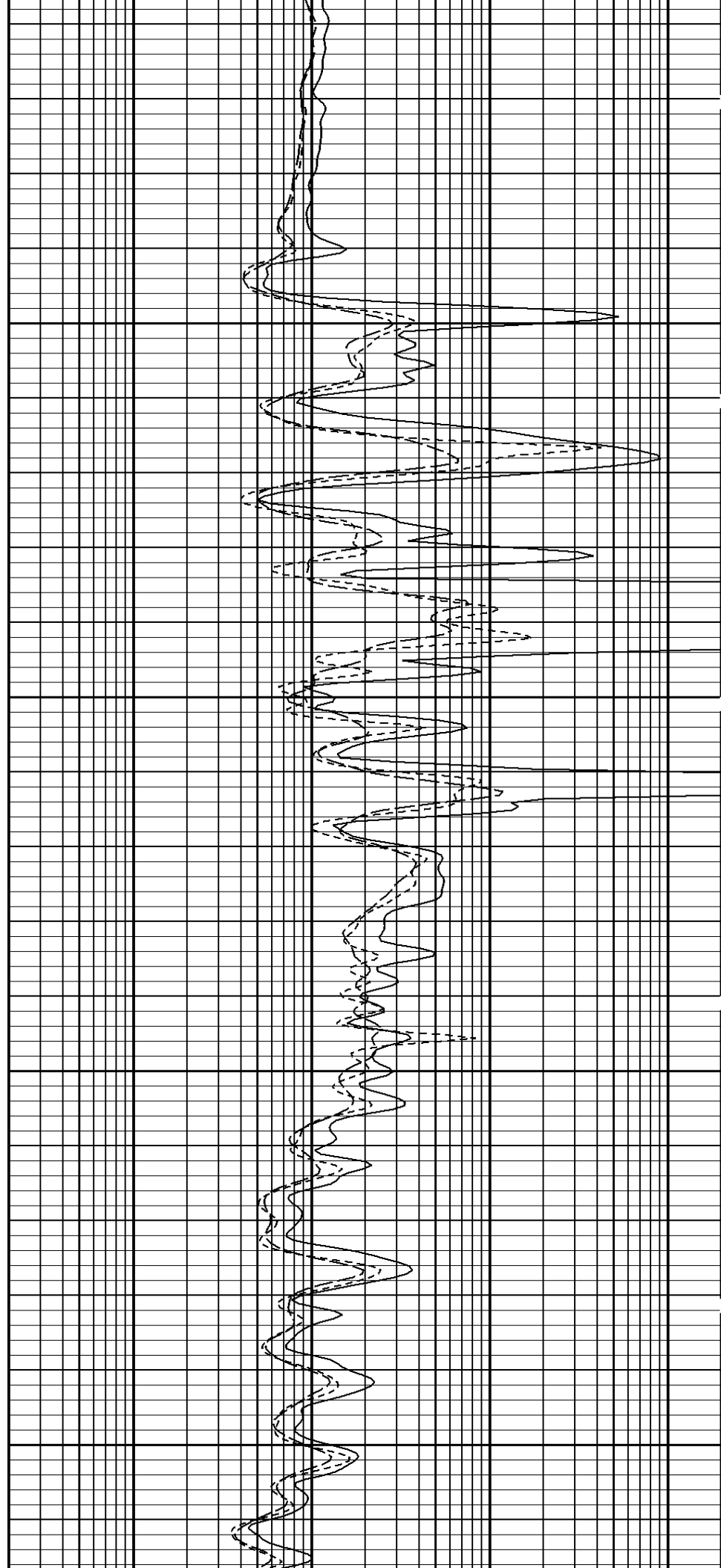
4300

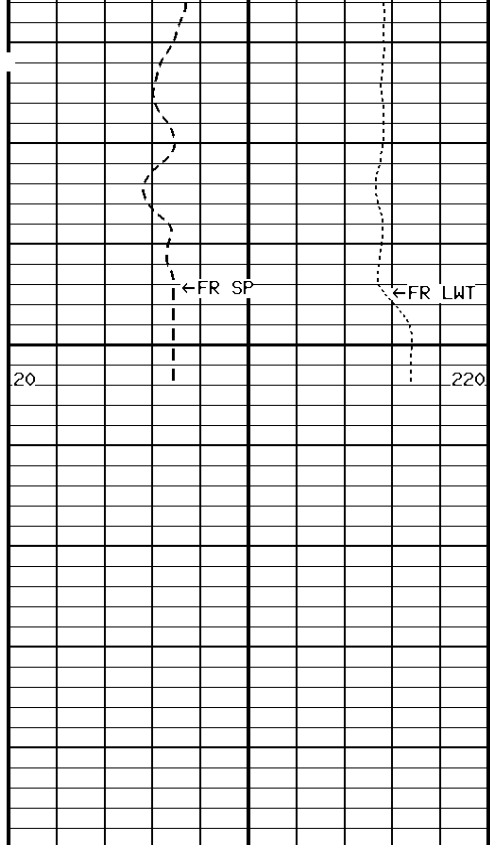




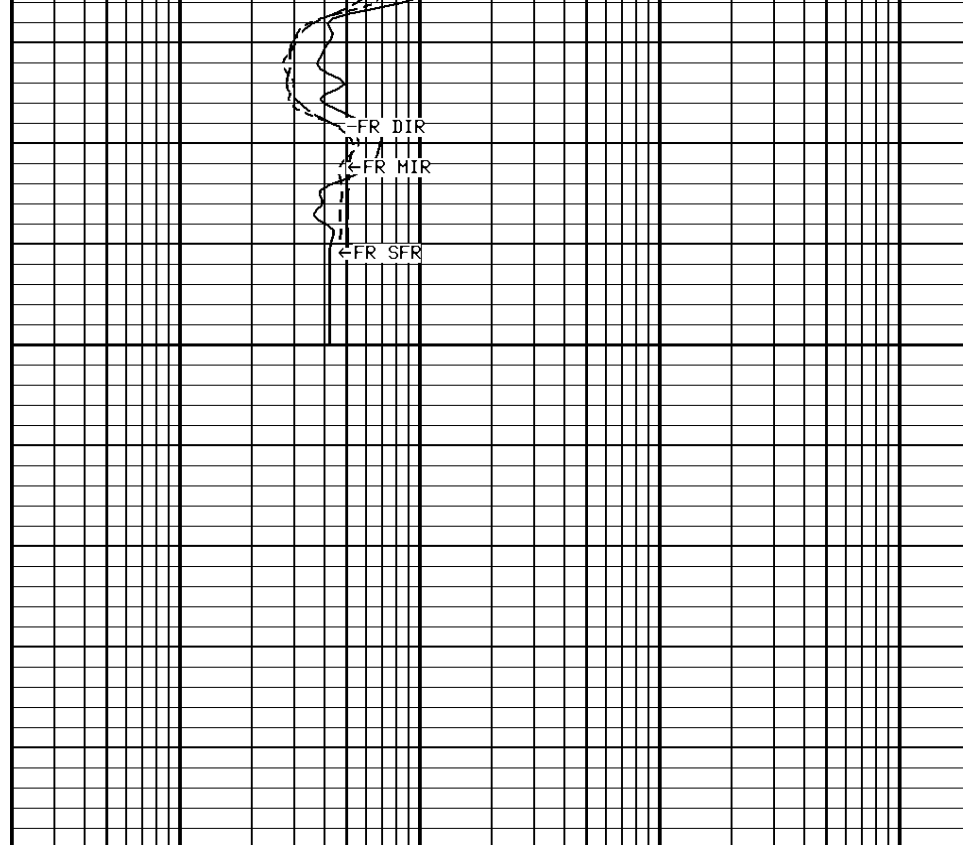
4400

4500



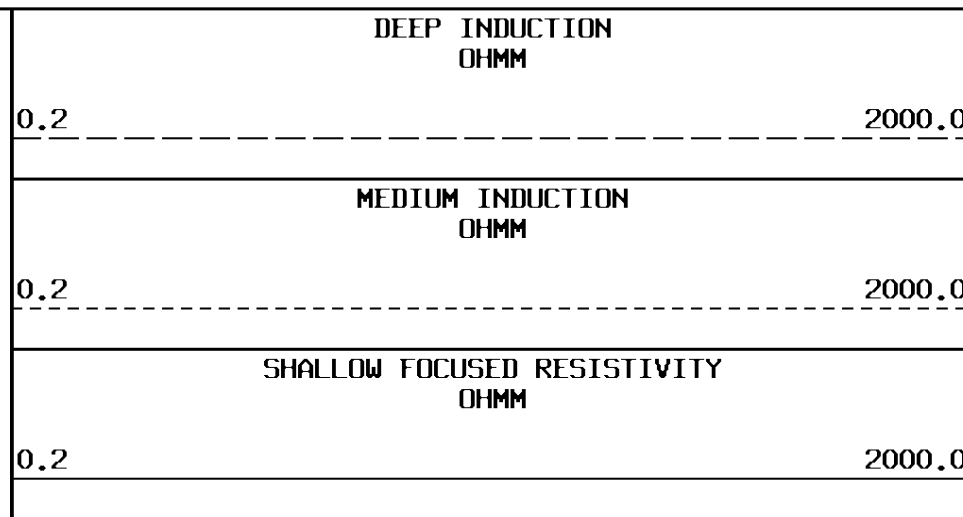
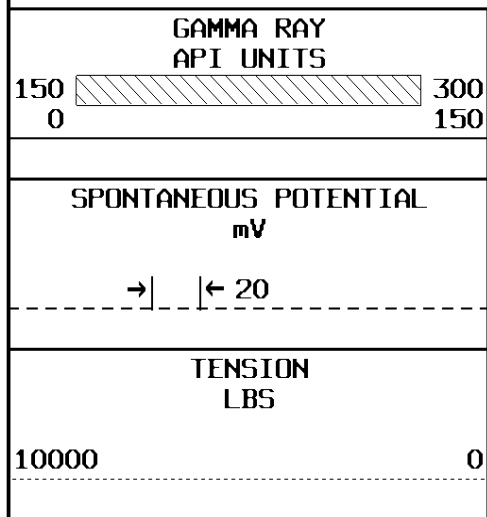


4596  
4600



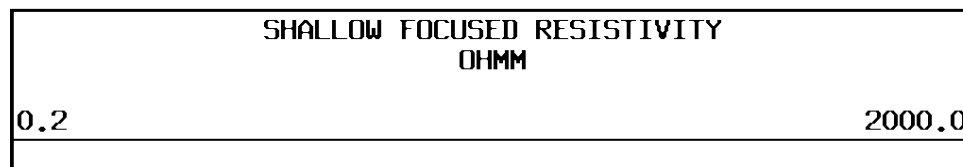
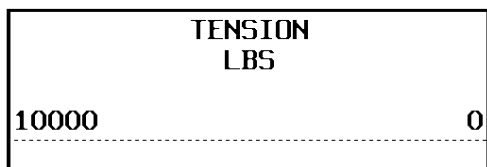
File #704

1:240 MAIN SECTION



\* Borehole Zone Factors \*

Zone 1 99999.0 to 0.0 F		
Drill Bit Size_____	7.875	IN
BHT Depth_____	4596.000	F
Borehole Temperature_____	117.0	DEGF
Temperature Gradient_____	1.00	DFHF
Resistivity Of Mud_____	0.22	OHMM
Resistivity Of Mud Temperature_____	85.00	DEGF



SPONTANEOUS POTENTIAL  
mV

→ | ← 20

GAMMA RAY  
API UNITS

150 0 300 150

MEDIUM INDUCTION  
OHMM

0.2

2000.0

DEEP INDUCTION  
OHMM

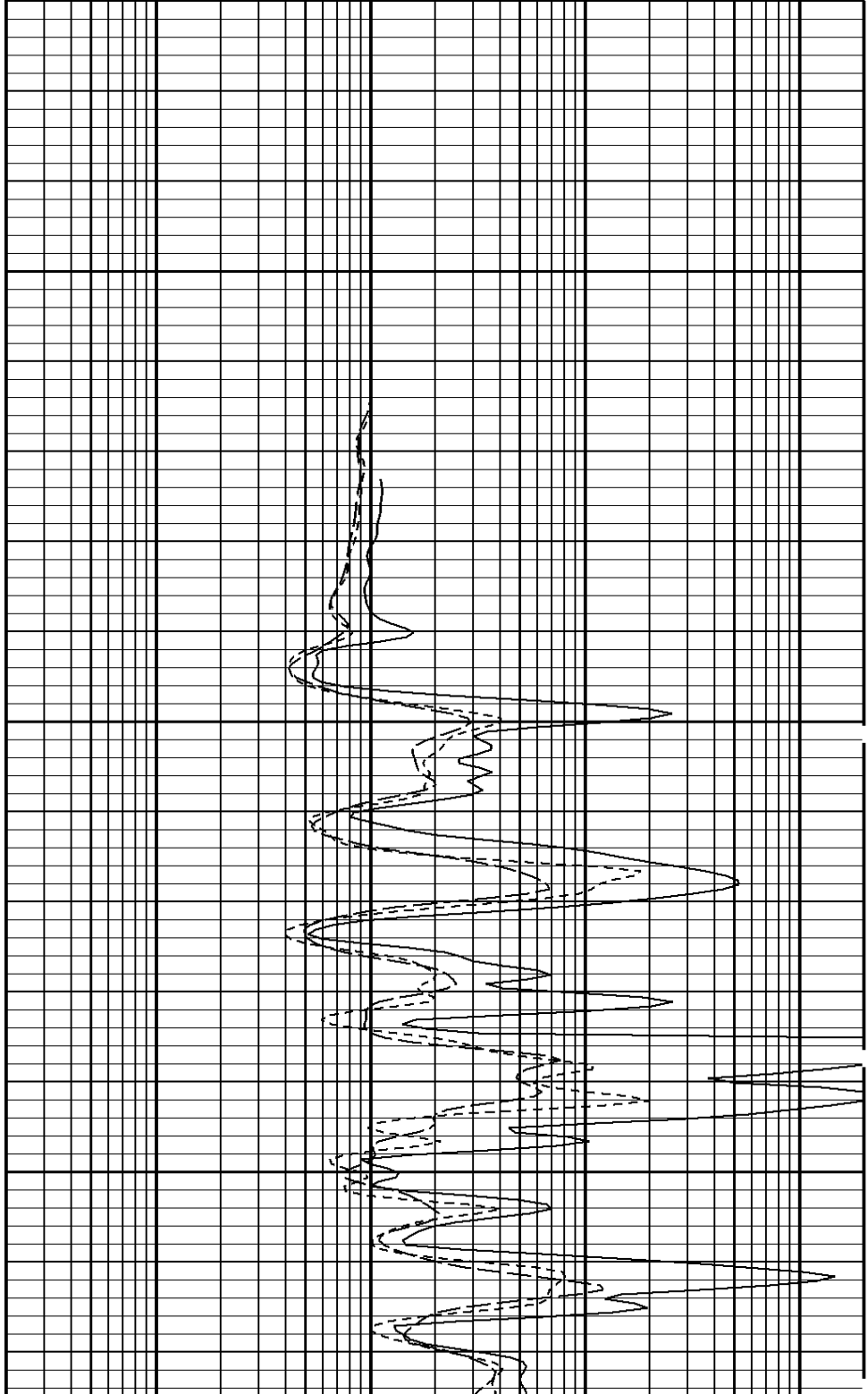
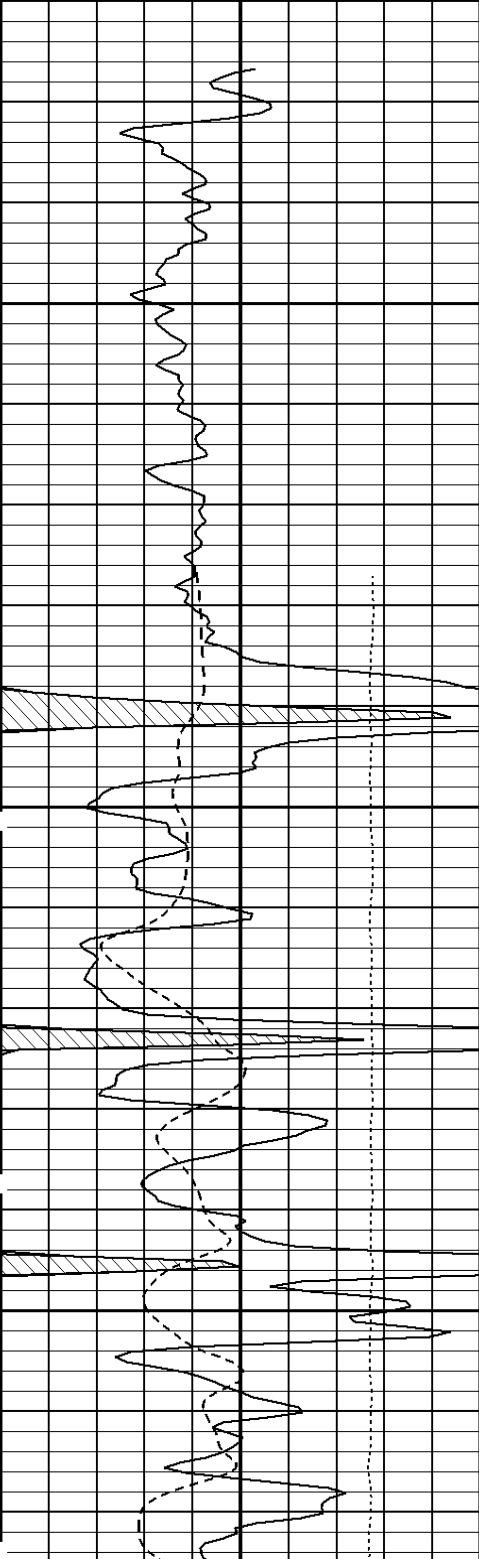
0.2

2000.0

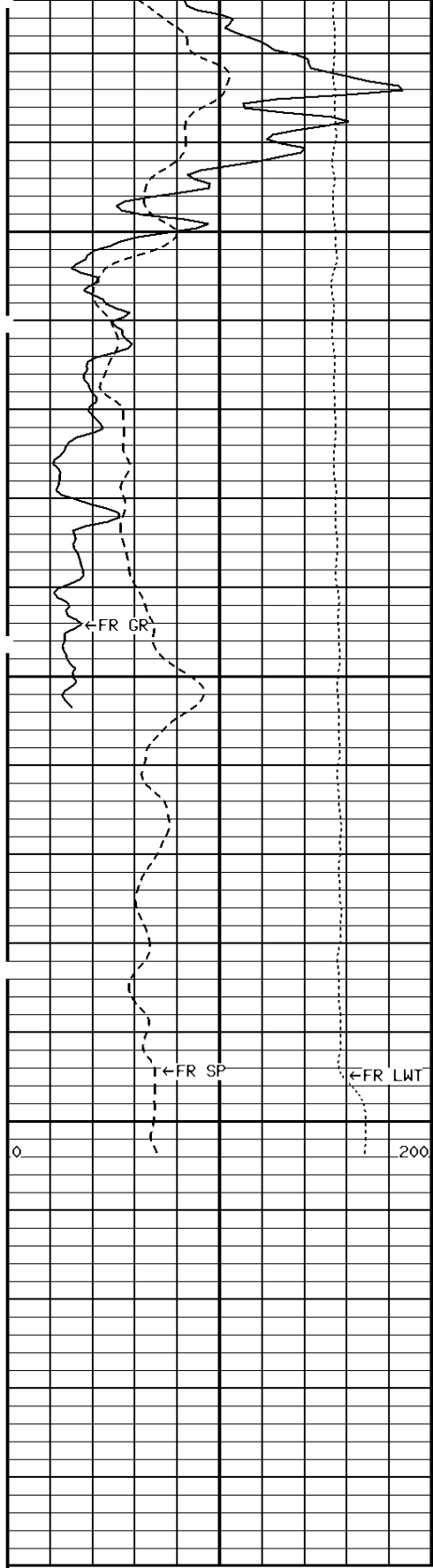
1:240 REPEAT SECTION

File #706

4400







4500

←FR GR

←FR SP

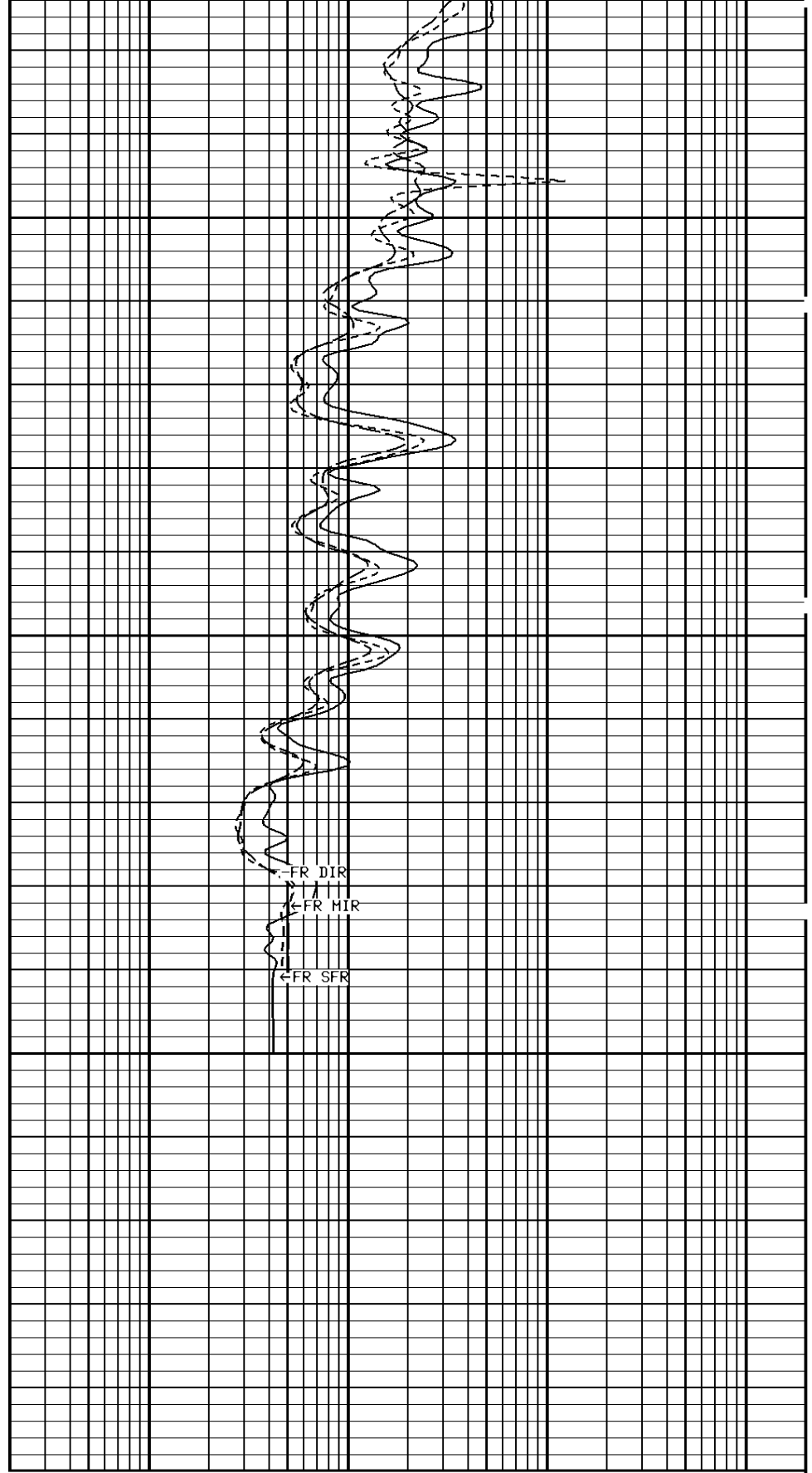
←FR LWT

4596

4600

0 200

File #706

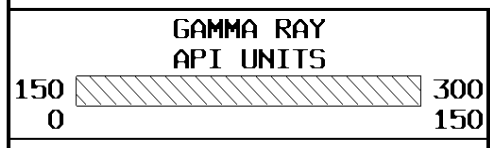


←FR DIR

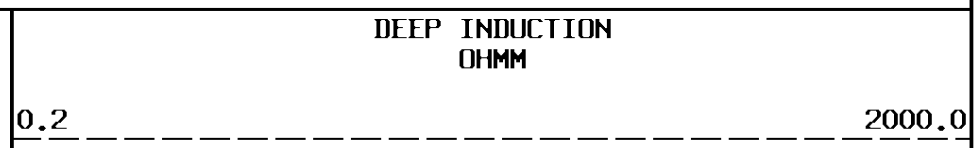
←FR MIR

←FR SFR

1:240 REPEAT SECTION



GAMMA RAY  
API UNITS



DEEP INDUCTION  
OHMM

SPONTANEOUS POTENTIAL mV	
→	← 20
TENSION LBS	
10000	0

MEDIUM INDUCTION OHMM	
0.2	2000.0
SHALLOW FOCUSED RESISTIVITY OHMM	
0.2	2000.0

**\* Borehole Zone Factors \***

Zone 1 99999.0 to 0.0 F		
Drill Bit Size_____	7.875	IN
BHT Depth_____	4596.000	F
Borehole Temperature_____	117.0	DEGF
Temperature Gradient_____	1.00	DFHF
Resistivity Of Mud_____	0.22	OHMM
Resistivity Of Mud Temperature_____	85.00	DEGF

**\* Calibration Summary \***

<b>Shop Calibration</b>					
<b>GRTB</b>					
Performed : 29-Apr-2010			Time : 11:02		
Sensor Suite : GR-GR5			ID : GRT-BC-41		
	Measured	Units	Calibrated	Units	
GR	Background	Jig	Jig	GRAPI	
	46	346	175		
<b>Shop Calibration</b>					
<b>PIT_B</b>					
Performed : 09-Mar-2010			Time : 11:08		
Sensor Suite : P-IND-T			ID : PIT-BA-20		
Medium					
	Measured		Calibrated		Units
	R	X	R	X	
Air	131850	129617	0.1	0.1	MMHOS
Zero	131066	131069	0.0	0.0	MMHOS
Reference	244028	243695	5000.0	5000.0	MMHOS
Loop	150861	170755	2667.8	984.9	MMHOS
Sonde Error			-0.1	1.7	MMHOS
Cond			5000.0	5000.0	MMHOS
Deep					
	Measured		Calibrated		Units
	R	X	R	X	
Air	129092	131615	0.1	-0.0	MMHOS
Zero	131075	131069	0.0	0.0	MMHOS
Reference	226896	227570	2000.0	2000.0	MMHOS
Loop	148067	173099	1255.9	463.7	MMHOS
Sonde Error			-1.7	-4.4	MMHOS
Cond			2000.0	2000.0	MMHOS
Temperature					
	Measured		Calibrated		Units
	Low	High	Low	High	
	16980.0	56920.0	70.0	350.0	DEGF
Performed : 09-Mar-2010			Time : 11:05		
Sensor Suite : SFL			ID : PIT-BA-20		

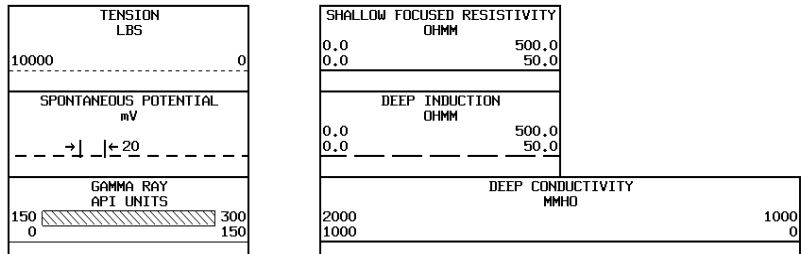
Internal					
	Measured		Calibrated		Units
	Zero	Reference	Zero	Reference	
Im	32745.0	48834.1	0.0	7028.0	uA
Ib	32761.4	48458.4	0.0	1750.0	mA
MOM1	32806.0	56045.2	0.0	175.0	mV
Equivalent SFL				43.97	OHMM

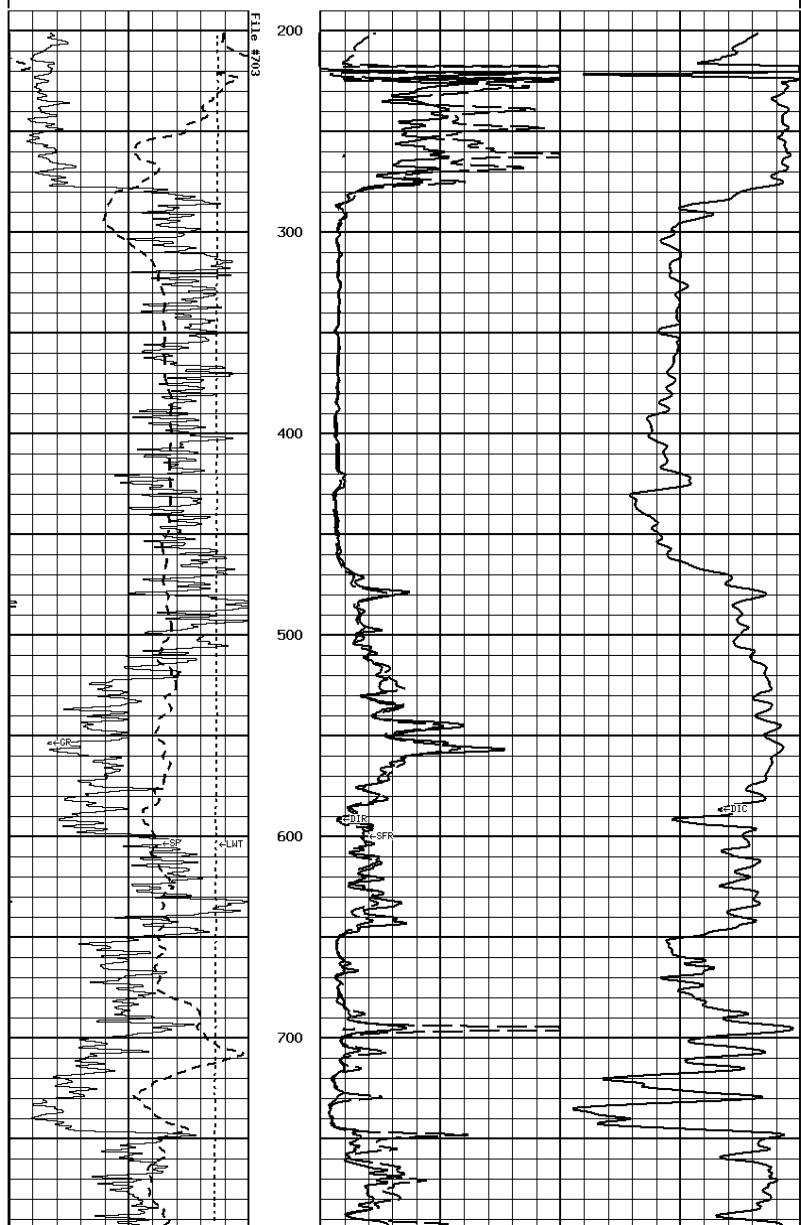
Performed : 09-Mar-2010	Time : 10:57
Sensor Suite : P-SP	ID : PIT-BA-20

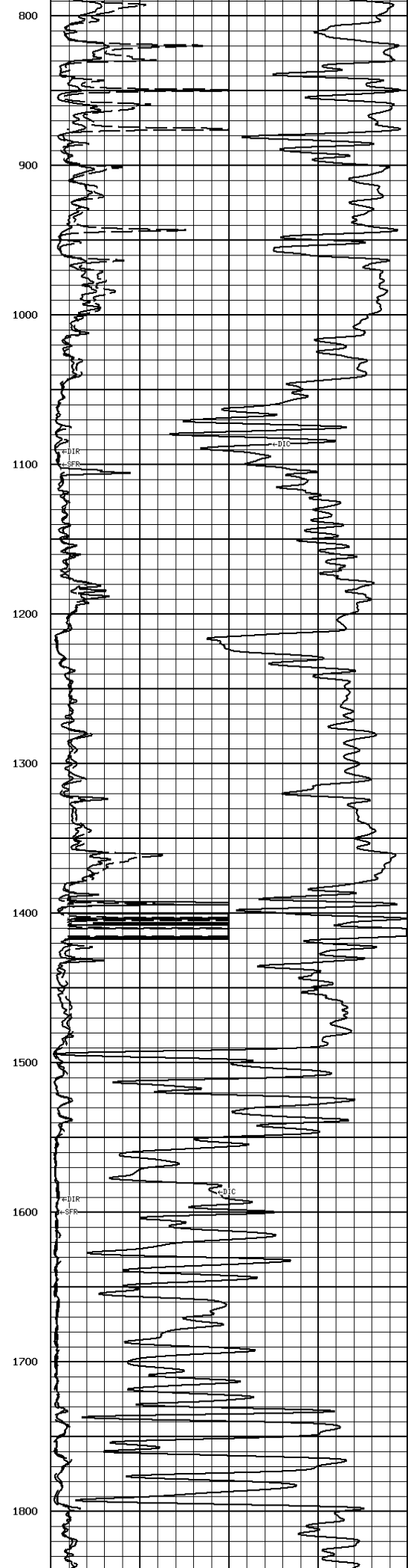
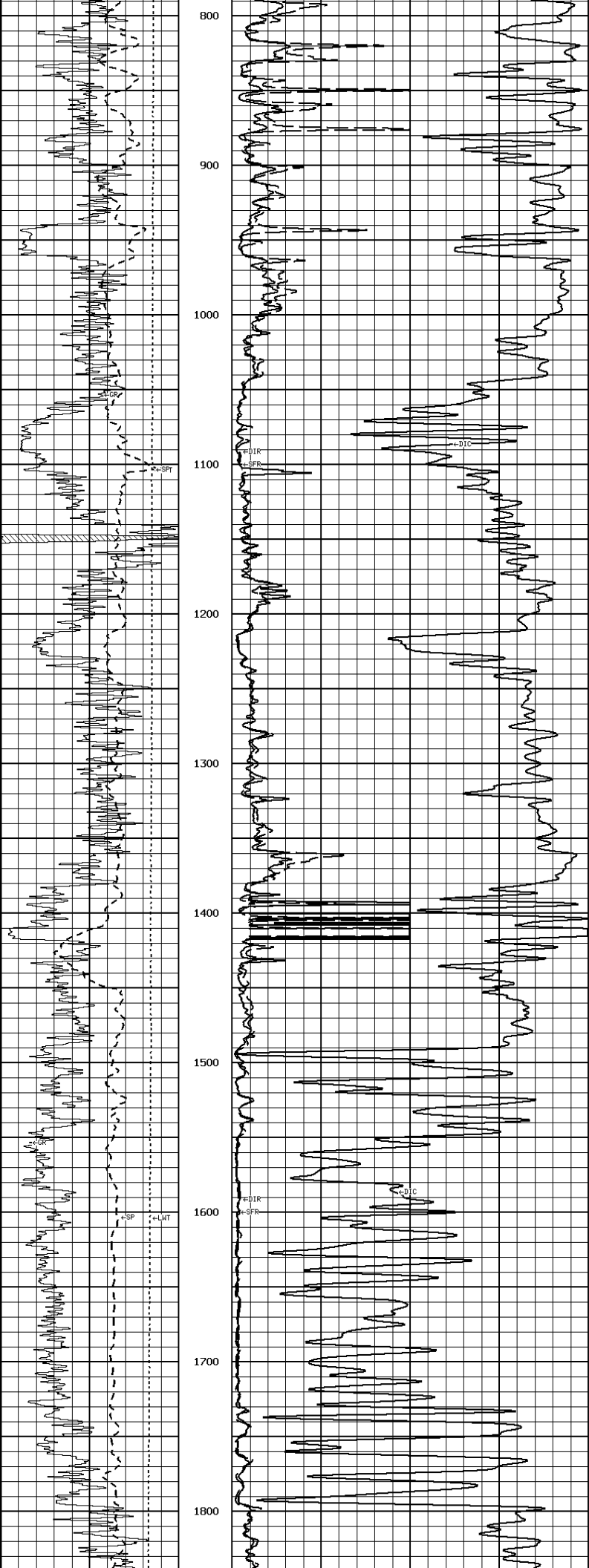
  

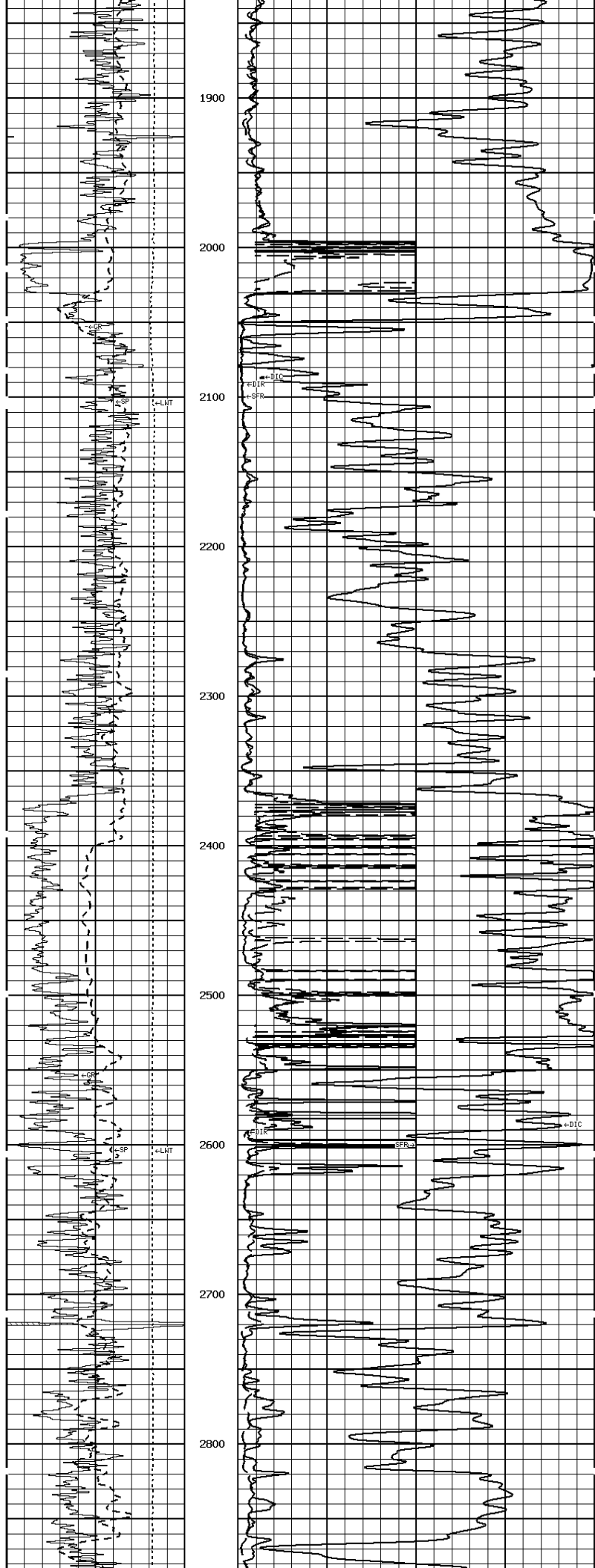
Internal					
	Measured		Calibrated		Units
	Zero	Reference	Zero	Reference	
	32794.7	58952.0	0.0	1000.0	mV

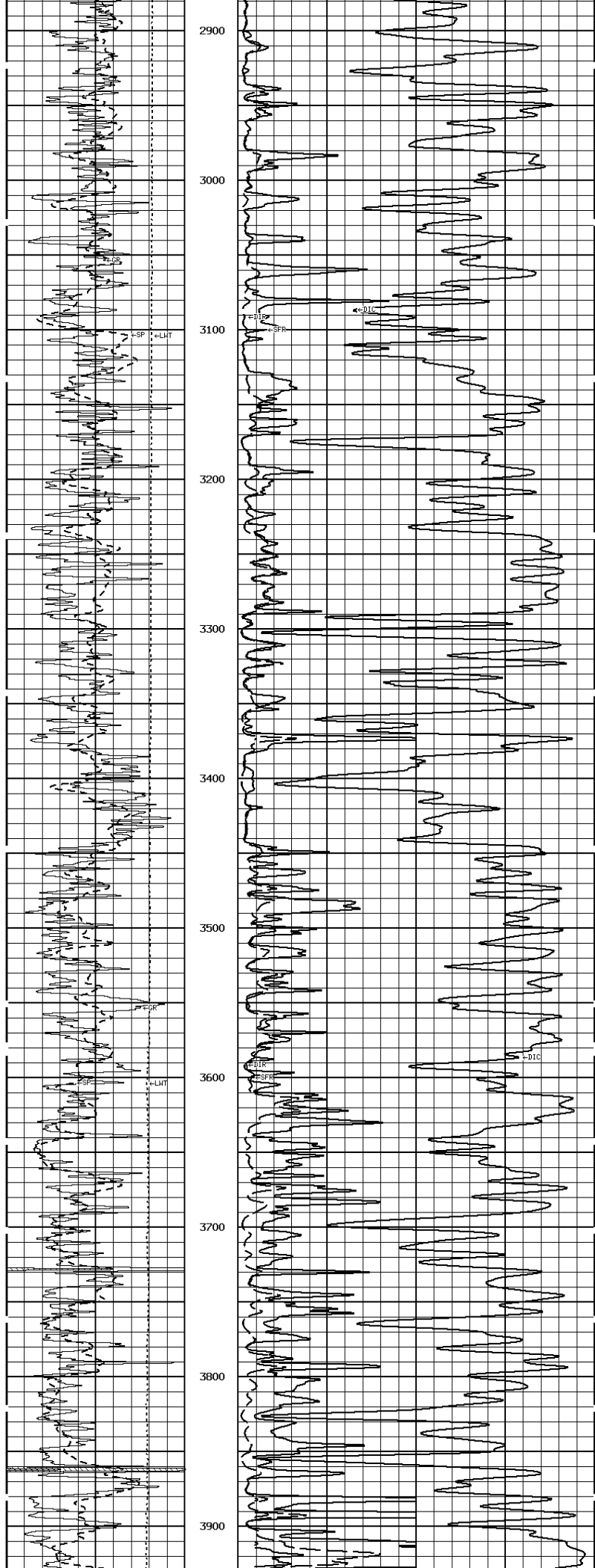


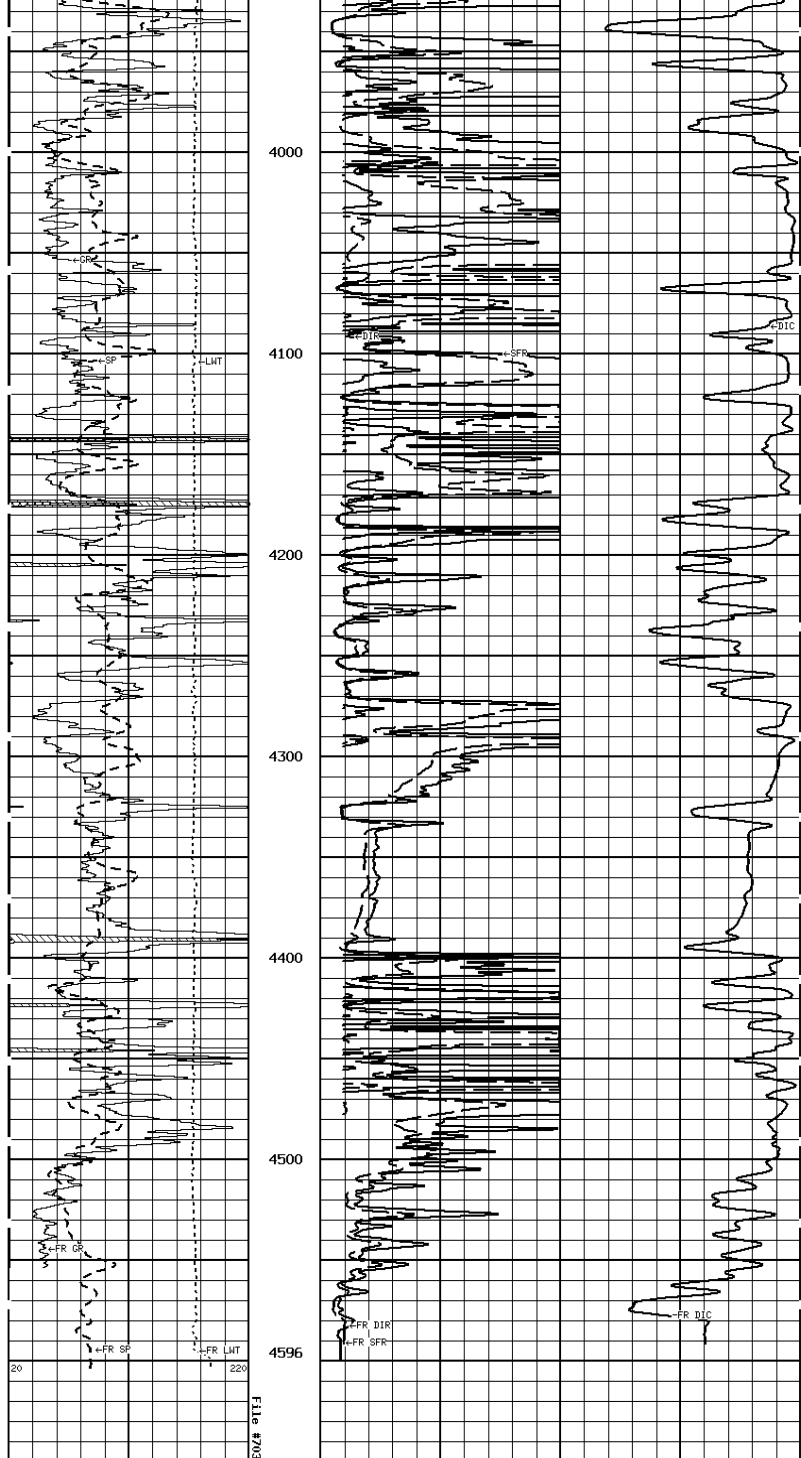
1:1200 SECTION



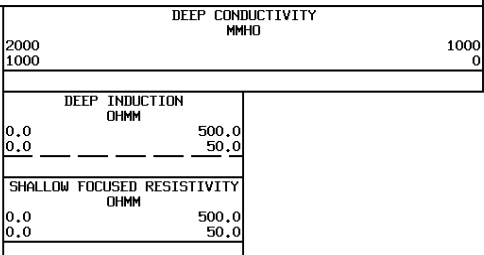
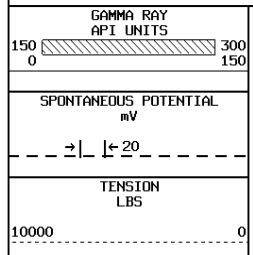


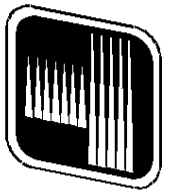






1:1200 SECTION





# Tucker

WIRELINE SERVICES

MICRO  
LOG

File No. : TUL-56605  
 Company : LARSON ENGINEERING, INC.  
 Well : HAGANS #2-14  
 Field :  
 Country : NESS  
 State : KANSAS  
 Country : USA

Location : API # 15-135-25154  
 1987' FSL & 330' FWL  
 S/2 NW NW SW

Sect : 14 Twp : 16S Rge : 26W

Recorded By : R. FRANKLIN  
 Witnessed By : S. DAVIS

Date : SEP 27 2010  
 Run No. : 1

Permanent Datum : GL  
 Drilling Measured From : KB  
 Log Measured From : KB  
 Above Permanent Datum : 10.000 FT  
 Depth--Driller : 4600.0 FT  
 Depth--Logger : 4596.0 FT  
 Bottom Log Interval : 4572.0 FT  
 Top Log Interval : 3600.0 FT  
 Casing Depth--Driller: 223.0 FT  
 Casing Depth--Logger : 220.0 FT  
 Casing Diameter : 8.625 IN  
 Bit Size : 7.875 IN  
 Unit No. : 123  
 Location : TULSA

Elevations :  
 KB : 2586.00 FT  
 DF : 2585.00 FT  
 GL : 2576.00 FT

### Additional Services

CNT  
 LDT  
 PIT

The customer is hereby warned that by providing the log data herein, T. W. S. does not agree to provide any interpretation of log data, conversion of log data to physical rock parameters or recommendations. T. W. S. 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 T. W. S. 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 T. W. S. 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.

### Run Number 1

Depth To Fluid 0.0 FT  
 Fluid Type In Hole : WBM  
 Density : 0.000 SG  
 Viscosity : 0.000 SEC  
 pH : 0.000  
 Fluid Loss : 0.000  
 Salinity : 0.000 KPPM

RM Source : MEASURED  
 RM : 0.220 OHMM at 85 F  
 RM at BHT : 0.163 OHMM at 117 F

RMF Source : CALCULATED  
 RMF : 0.187 OHMM at 85 F  
 RMF at BHT : 0.138 OHMM at 117 F

RMC Source : CALCULATED  
 RMC : 0.253 OHMM at 85 F



RMC : 0.253 OHMM at 85 F  
 RMC at BHT : 0.187 OHMM at 117 F  
 Max Recorded Temp. : 117 F  
 Time Circulation Stopped :  
 Operating Rig Time, Hrs. : 3.0

**- Source Serial Numbers -**

Gamma 2991GW  
 Neutron N-1046

**- Sonde Serial Numbers -**

GRTB GRT-BC-41  
 CNT CNP-AA-112  
 LDTNG LDP-DA-66  
 MSTNG MST-DA-029  
 PIT\_B PIT-BA-20

**Casing Strings**

Size (IN)	Weight (LB/FT)	Bottom (FT)
8.625	36.00	223.00

**- Comments -**

ALL PRESENTATIONS AS PER CUSTOMER REQUEST.

GRT, CNT, LDT, MLT, AND PIT RUN IN COMBINATION.  
 CALIPERS ORIENTED ON THE X-Y AXIS.  
 PHIN IS CALIPER CORRECTED.  
 2.71 G/CC USED TO CALCULATE POROSITY.  
 ANNULAR HOLE VOLUME CALCULATED USING 5.50" PRODUCTION CASING.  
 DETAIL PRESENTED FROM TD TO 3600' AS PER CLIENTS REQUEST.  
 DETAIL PRESENTED OVER ANHYDRITE FROM 2050' TO 1980'.

GRT: GRP.  
 CNT: PHIN, CLCDIN.  
 LDT: PORL, LCOR, PECLN, CLLDIN, LDENN, PORLLS, PECSN.  
 MLT: NOR\_R, INV\_R, MSCLPIN.  
 PIT: ILD, ILM, CIRD, SFLA, SPU.  
 MINERAL VOLUME: VM31, VM33.

OPERATORS:  
 S. DAVIS  
 M. GARNER

THANK YOU FOR USING TUCKER WIRELINE SERVICES!

**Tool String Schematic**

Total Tool Length - 53.15 ft.  
 Maximum Outside diameter - 6.00 in.  
 Net Weight in Air - 943.00 lbs.



<b>Tool:</b> GRTB	<b>Length:</b> 3.40 ft. O.D.: 3.60 in.
<b>Sonde ID</b>	: GRT-BC-41
<b>Measure Point</b>	<b>Stack Offset</b> <b>Tool Offset</b> <b>Bottom Offset</b>
GRTB	3.00 3.00 51.15



GRP 2.00 2.00 51.15

3.40 ft.

**Tool: CNT**      **Length: 9.30 ft. O.D.: 4.36 in.**  
**Sonde ID**      : CNP-AA-112  
**Source ID**      : N-1046  
**Pad ID**          : CNP-AA-112

<u>Measure Point</u>	<u>Stack Offset</u>	<u>Tool Offset</u>	<u>Bottom Offset</u>
CLCN	9.40	6.00	43.75
PHIN	10.24	6.84	42.91

12.70 ft.

**Tool: LDTNG**      **Length: 9.30 ft. O.D.: 4.80 in.**  
**Sonde ID**          : LDP-DA-66  
**Source ID**      : 2991GW  
**Pad ID**          : LDP-DA-66

<u>Measure Point</u>	<u>Stack Offset</u>	<u>Tool Offset</u>	<u>Bottom Offset</u>
CLLD	18.70	6.00	34.45
PEL	19.70	7.00	33.45
PES	20.10	7.40	33.05
LDEN	19.70	7.00	33.45
LCOR	19.70	7.00	33.45

22.00 ft.

**Tool: MST**          **Length: 9.66 ft. O.D.: 6.00 in.**  
**Sonde ID**          : MST\_DA\_029

<u>Measure Point</u>	<u>Stack Offset</u>	<u>Tool Offset</u>	<u>Bottom Offset</u>
MSFL	29.60	7.60	23.55
CLMR	29.60	7.60	23.55
MSFN	29.60	7.60	23.55
MSFI	29.60	7.60	23.55

31.66 ft.

**Tool: PIT**          **Length: 21.49 ft. O.D.: 3.62 in.**  
**Sonde ID**          : PIT-BA-20

<u>Measure Point</u>	<u>Stack Offset</u>	<u>Tool Offset</u>	<u>Bottom Offset</u>
ILD	40.58	8.92	12.56
ILM	41.76	10.10	11.39
SFLU	49.15	17.49	4.00
SP	52.26	20.60	0.88

LWT — 53.15 ft.

TENSION  
LBS

10000 0

BIT SIZE  
INCHES (IN)

6 16

GAMMA RAY  
API UNITS

150 300  
0 150

CALIPER MICRO  
INCHES (IN)

16 26  
6 16

MICRO-INVERSE  
OHMM

0 40

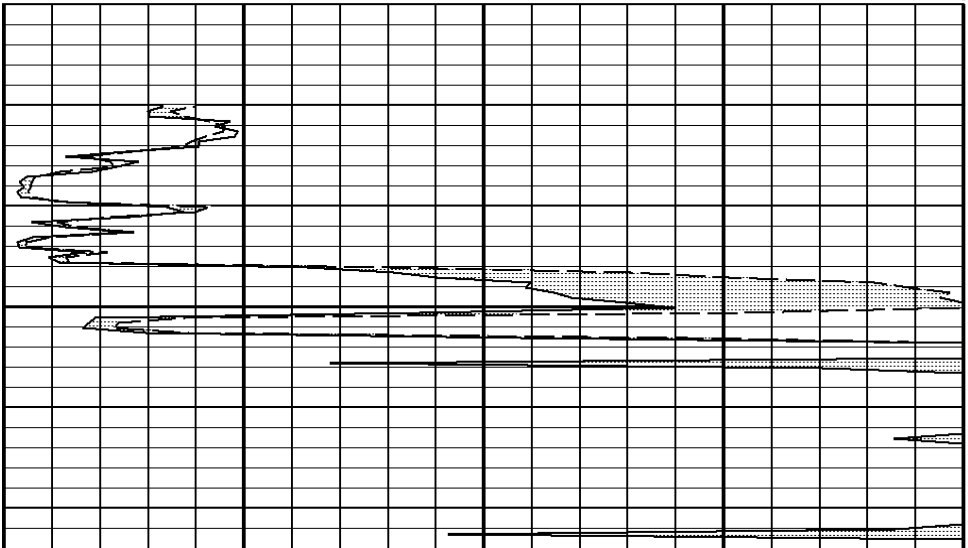
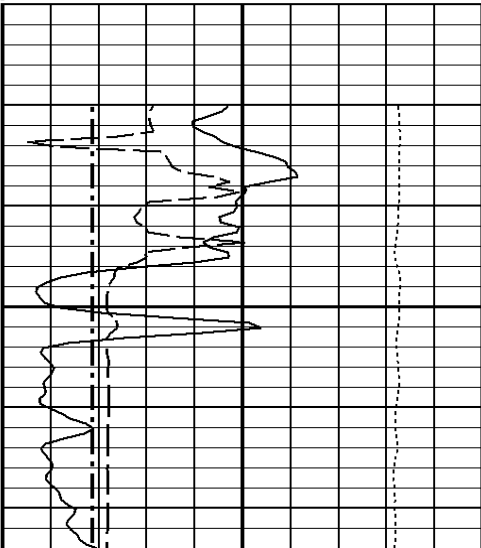
MICRO-NORMAL  
OHMM

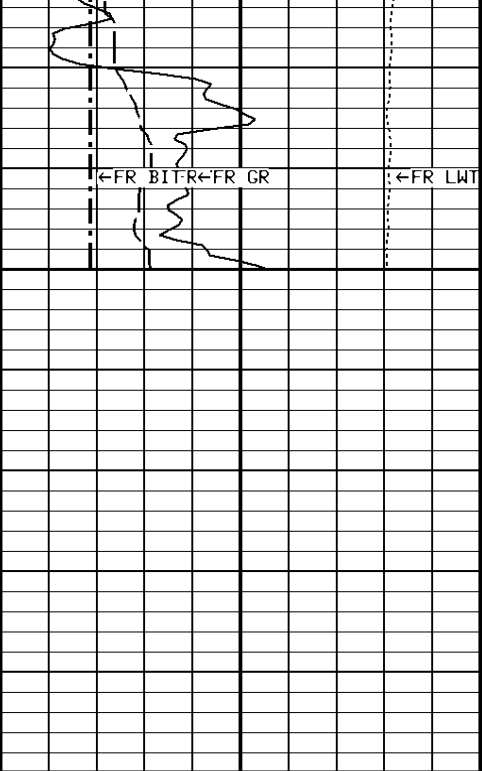
0 40

1:240 MAIN SECTION

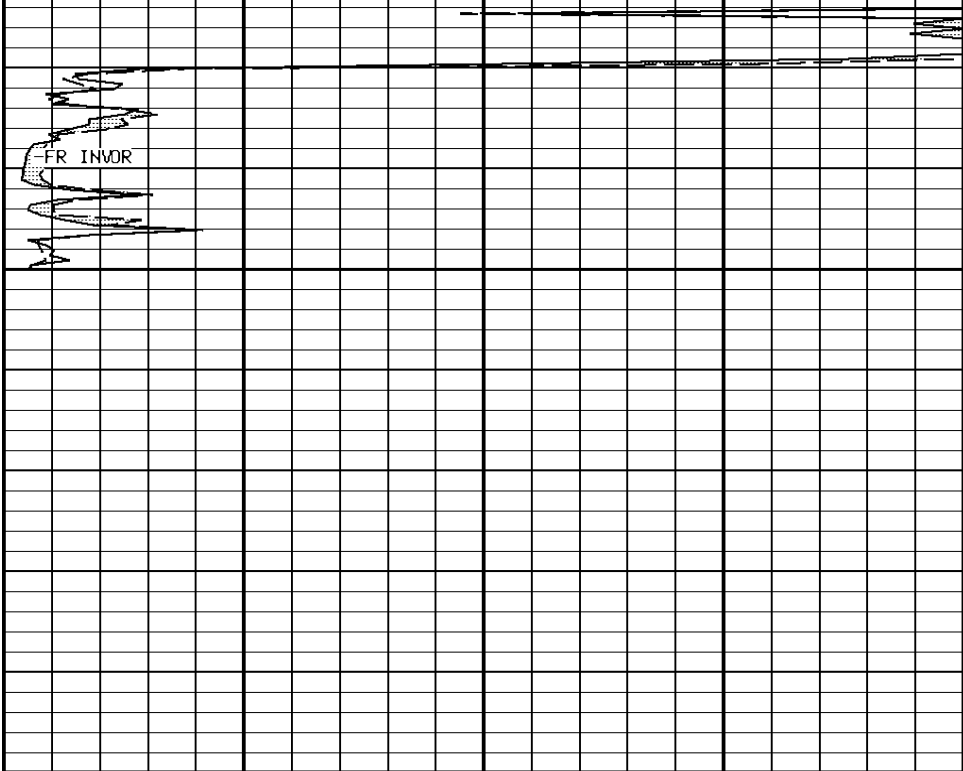
File #705

2000



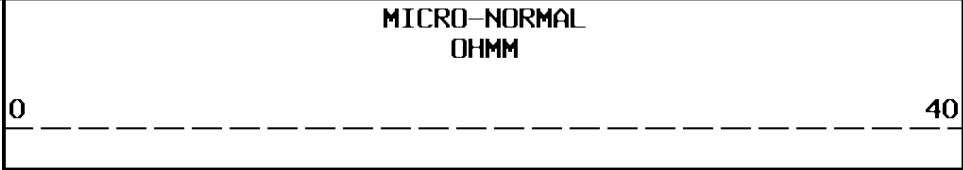
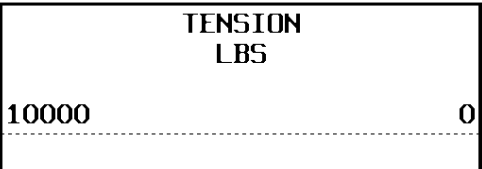
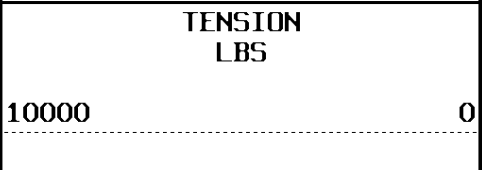
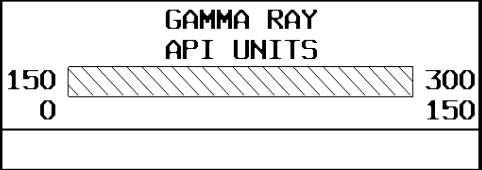


2041



File #705

1:240 MAIN SECTION



GAMMA RAY  
API UNITS



CALIPER MICRO  
INCHES (IN)



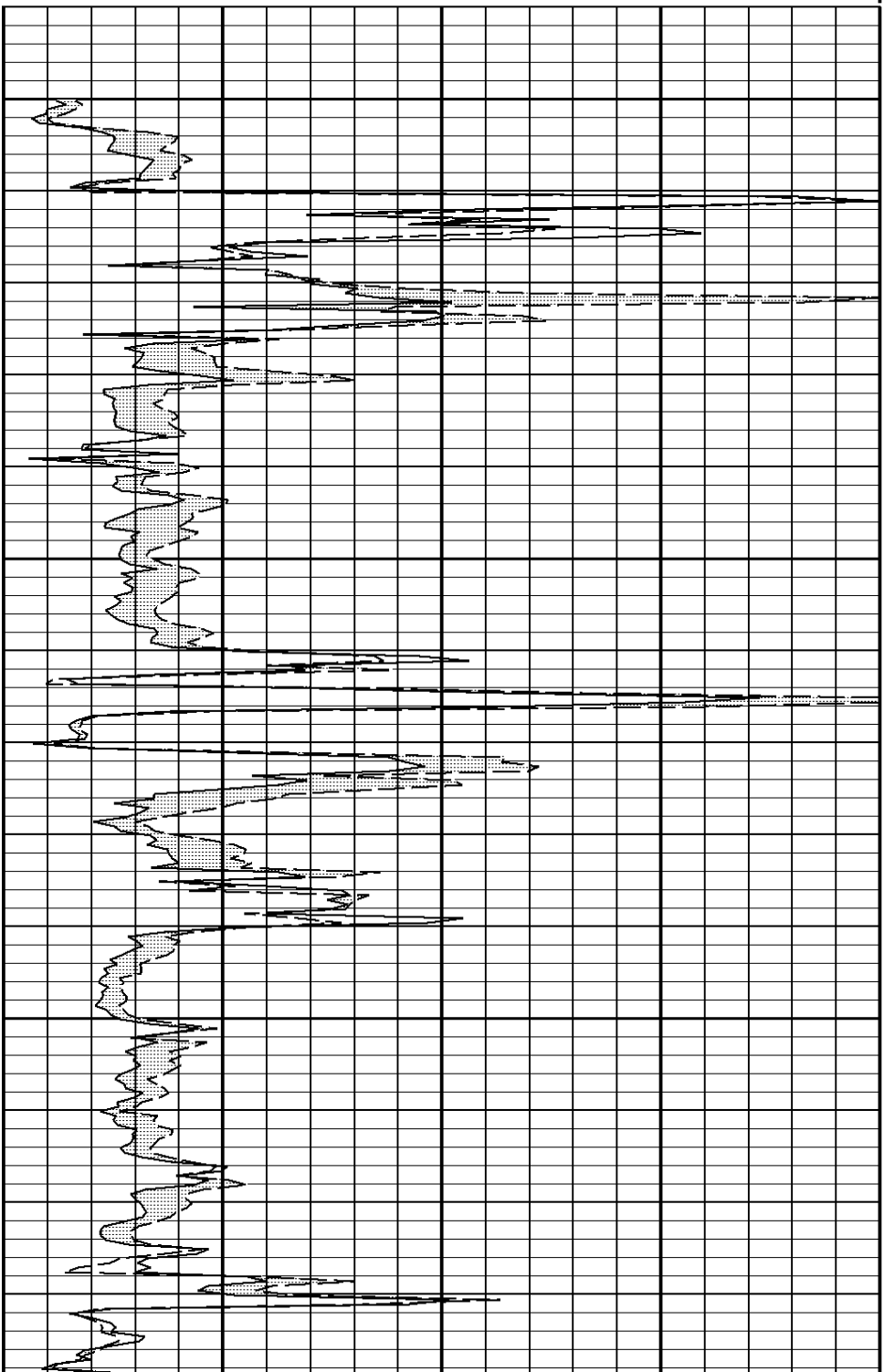
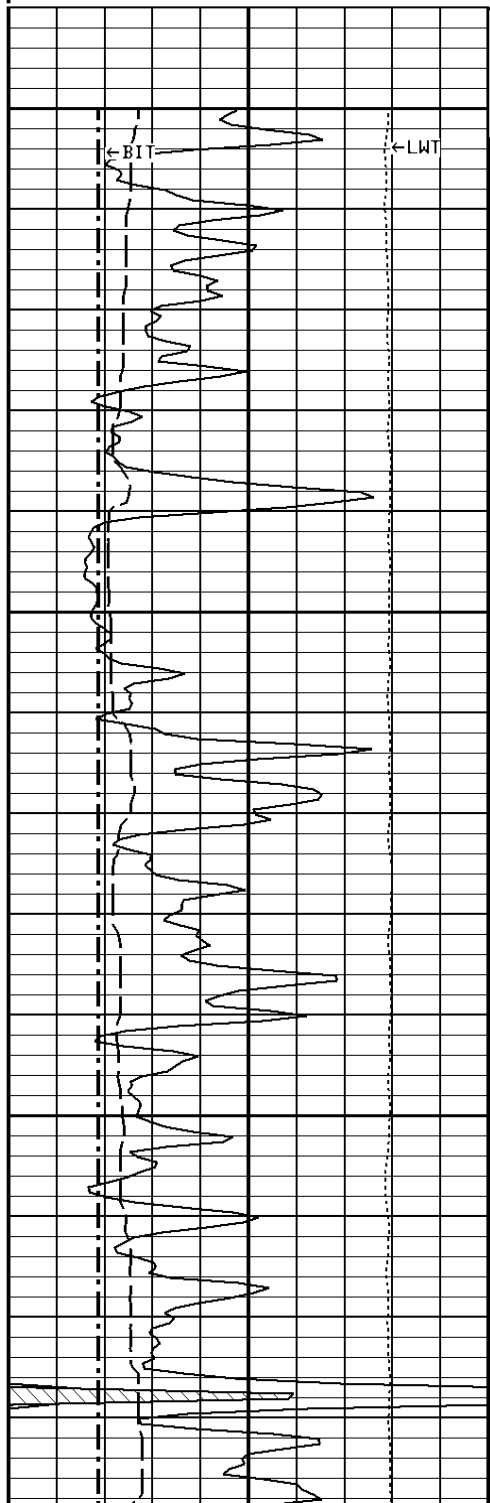
MICRO-INVERSE  
OHMM

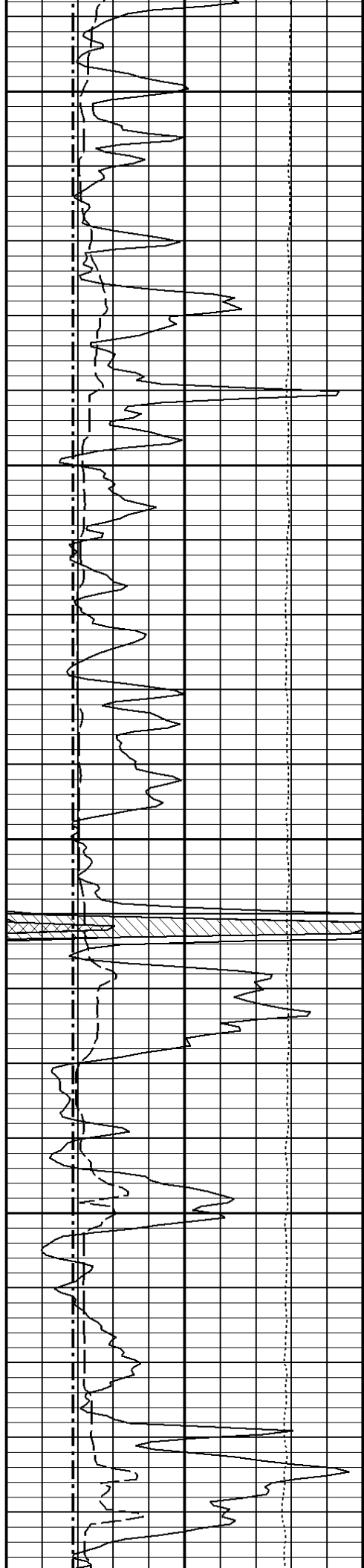


MICRO-NORMAL  
OHMM



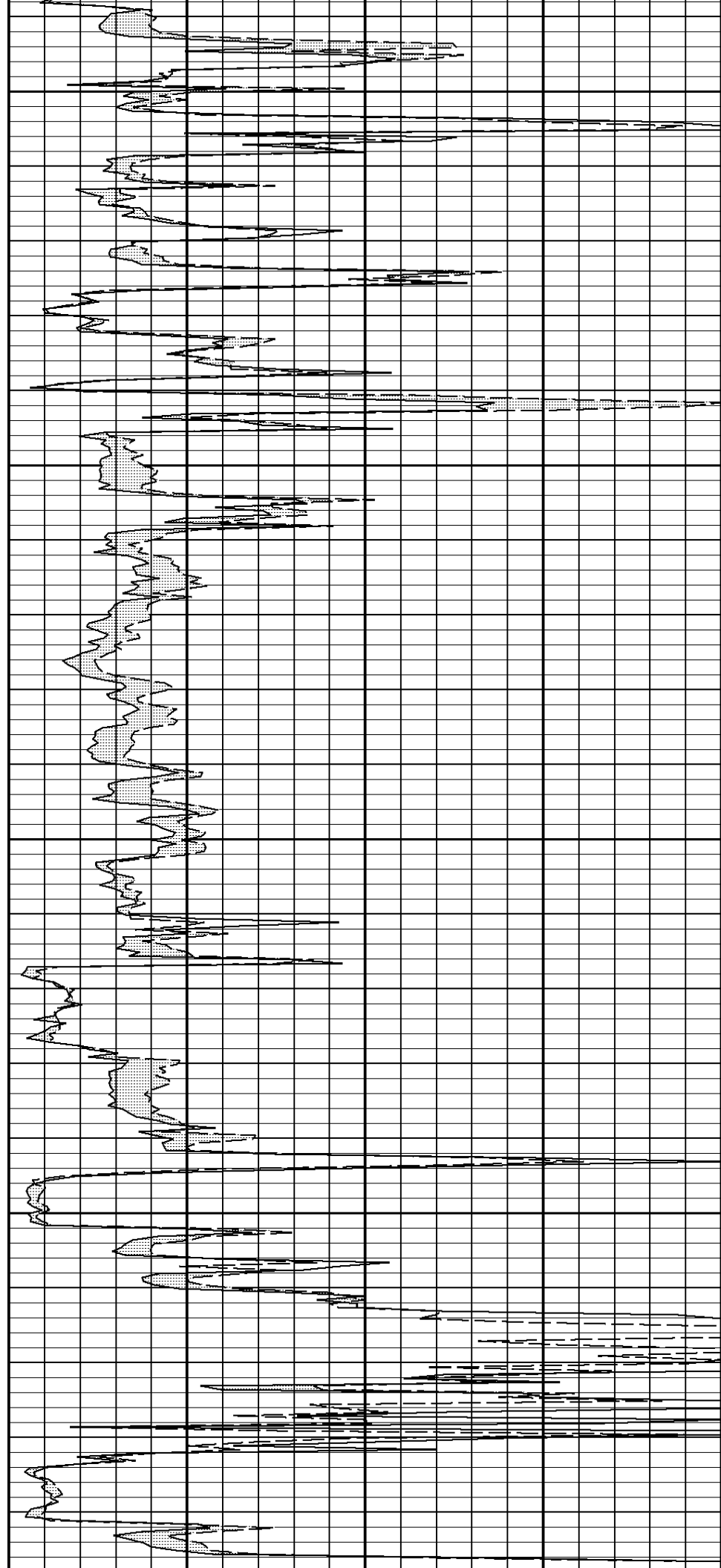
1:240 MAIN SECTION

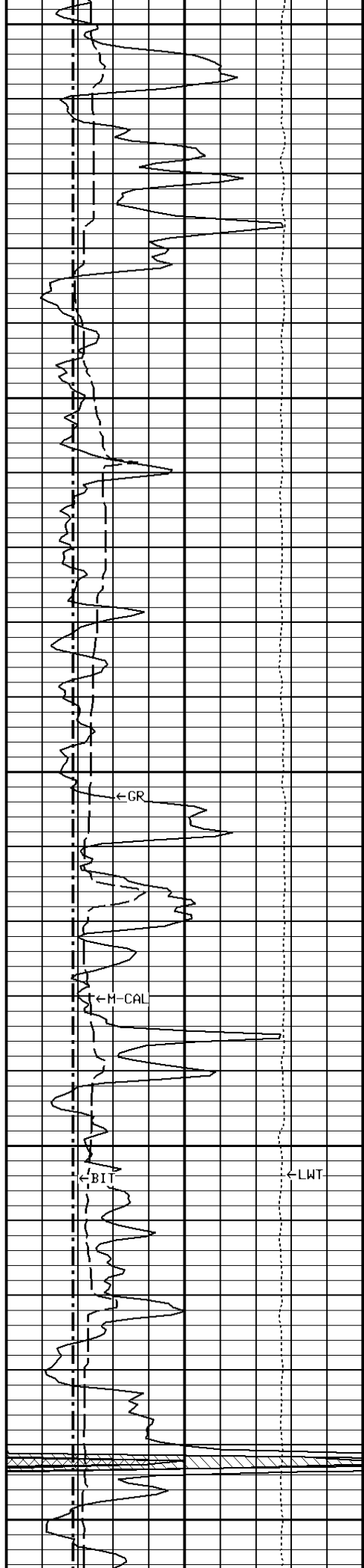




3800

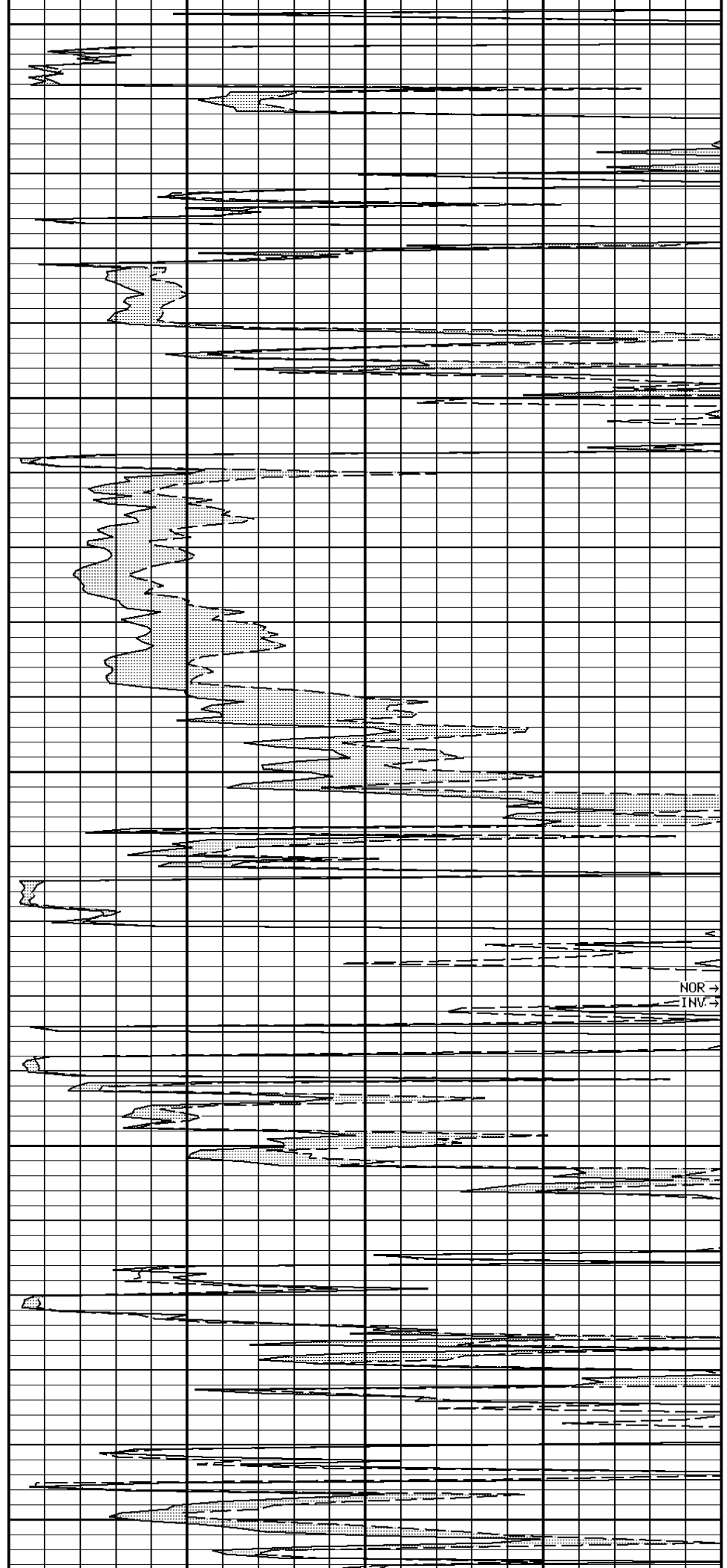
3900



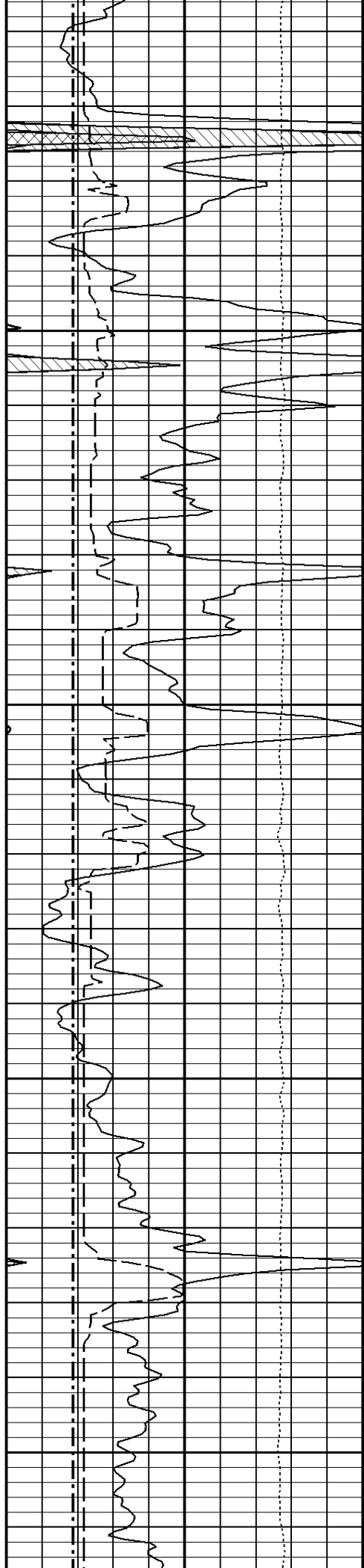


4000

4100

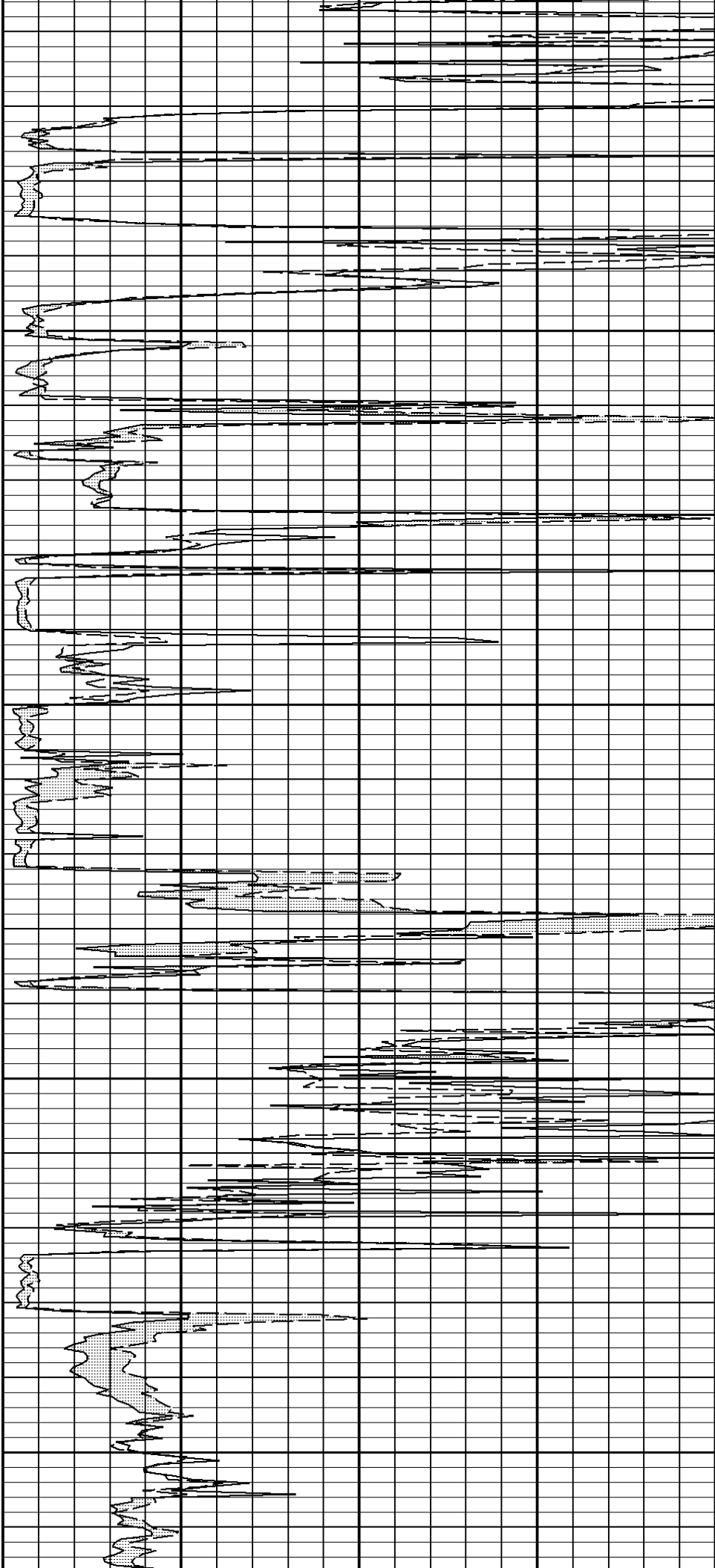


NOR →  
INV →

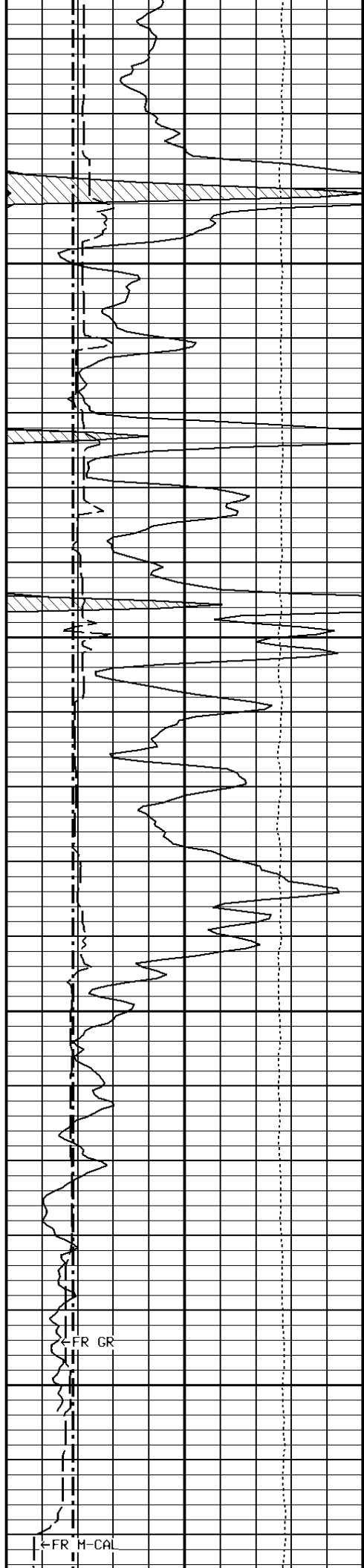


4200

4300

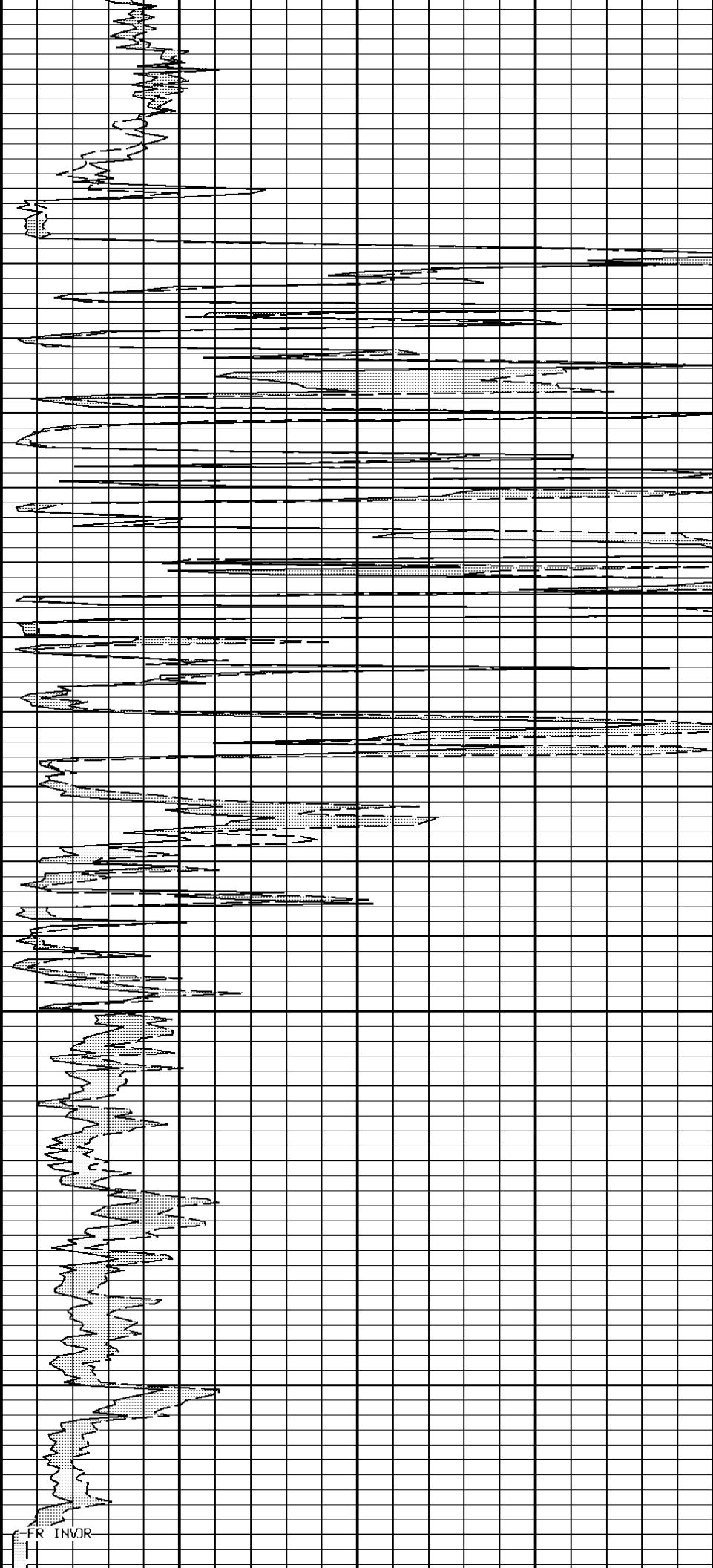


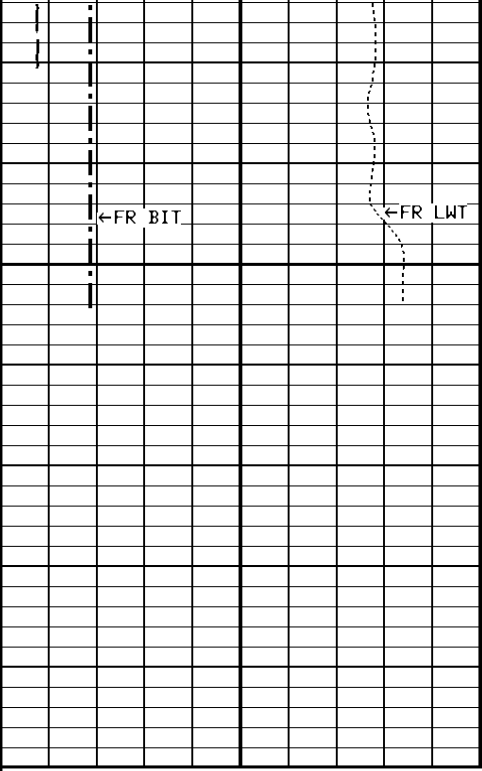




4400

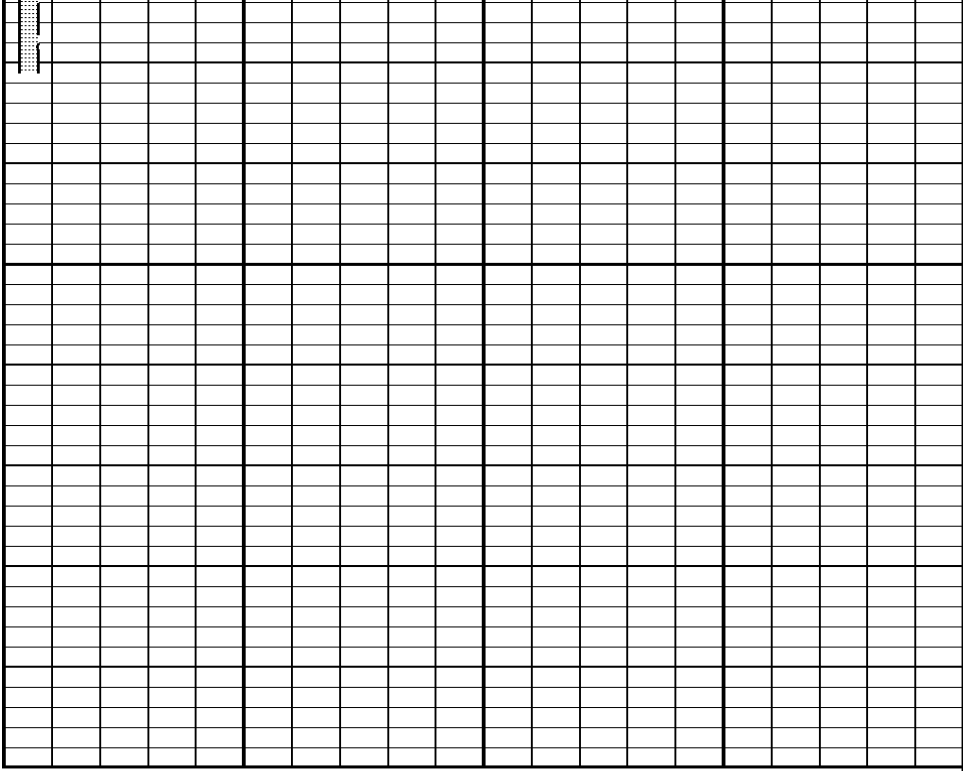
4500



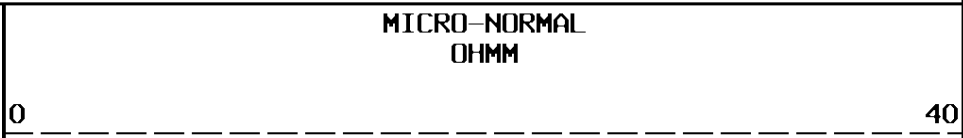
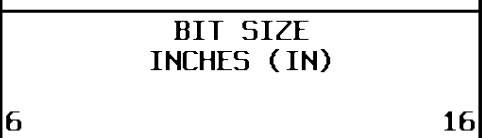
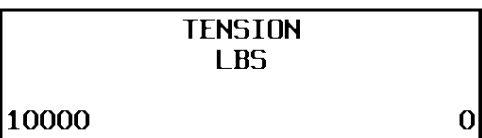
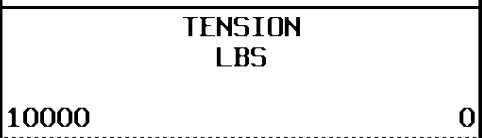
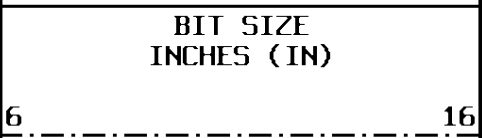
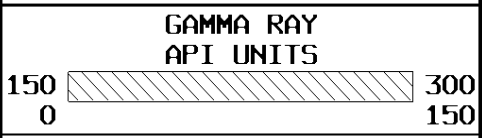
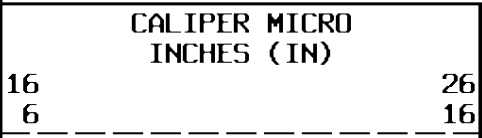


4596  
4600

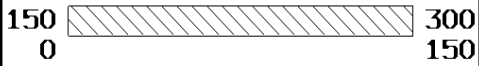
File #704



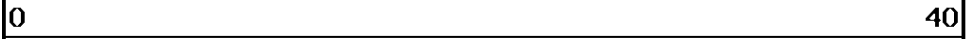
1:240 MAIN SECTION



GAMMA RAY  
API UNITS



MICRO-INVERSE  
OHMM



CALIPER MICRO  
INCHES (IN)

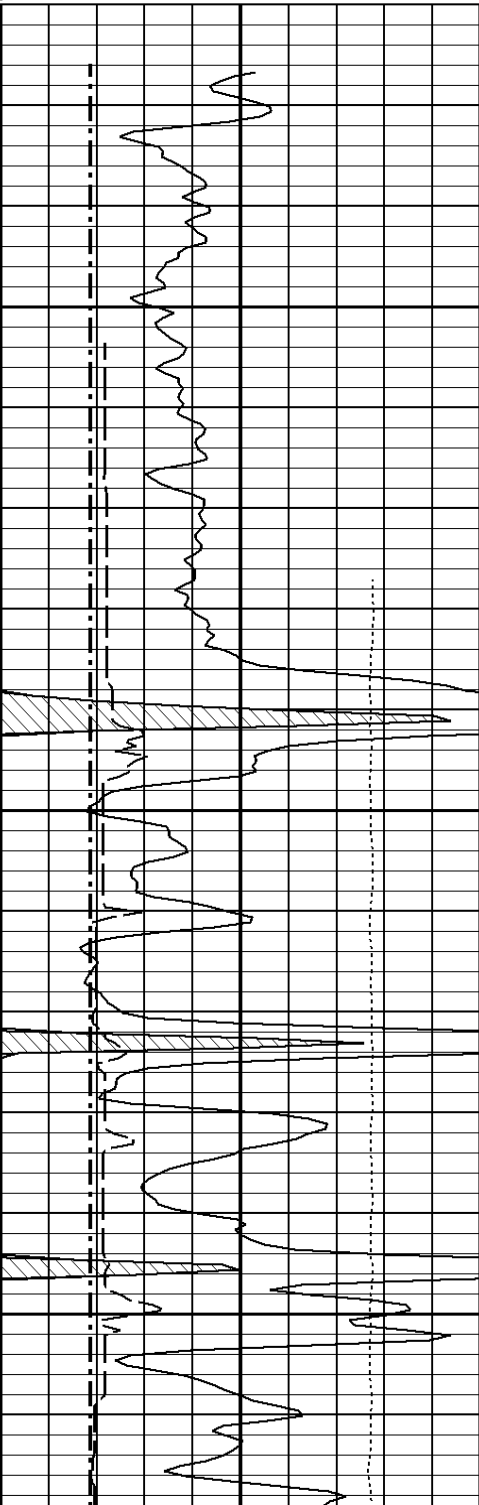


MICRO-NORMAL  
OHMM

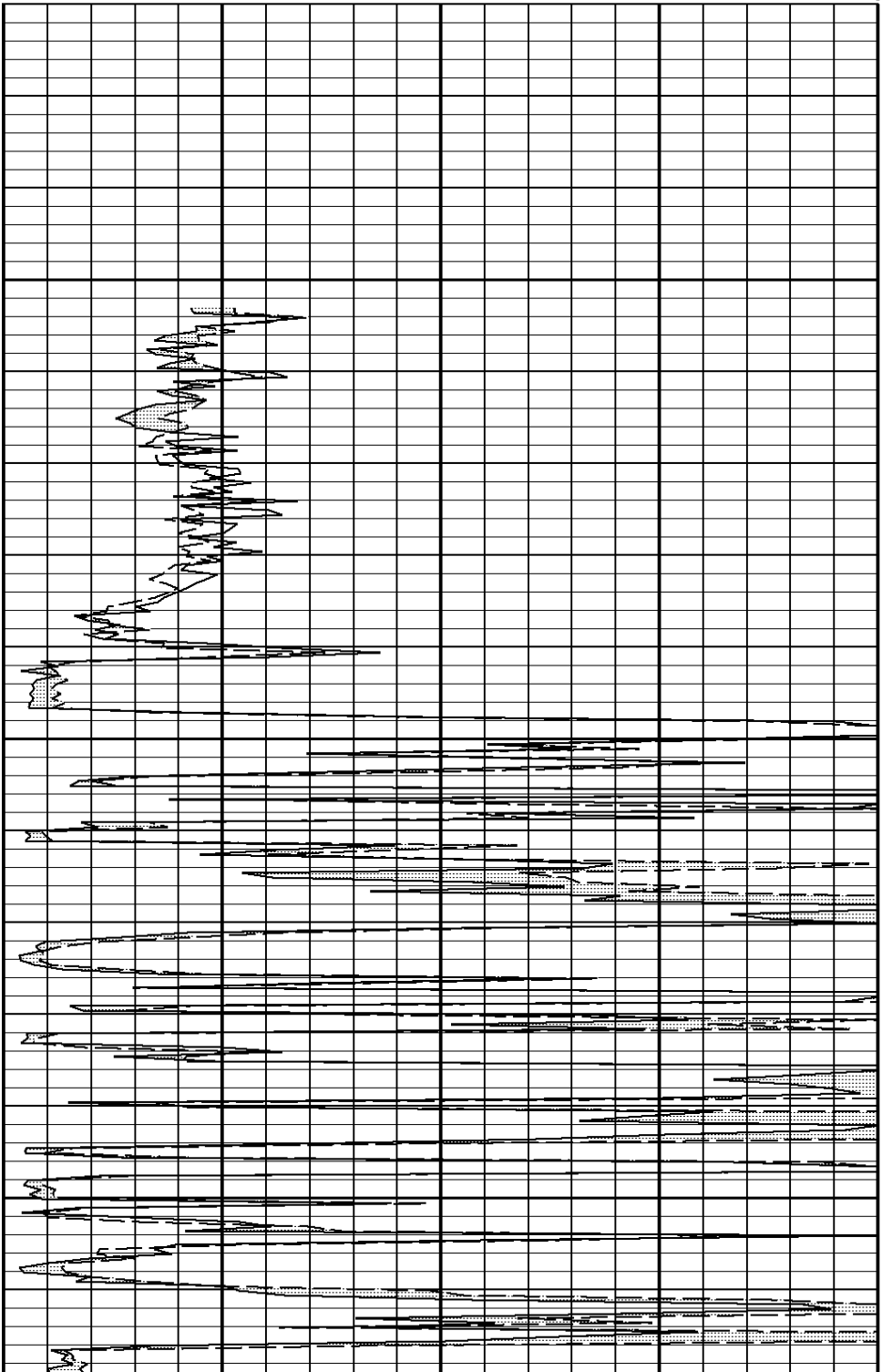


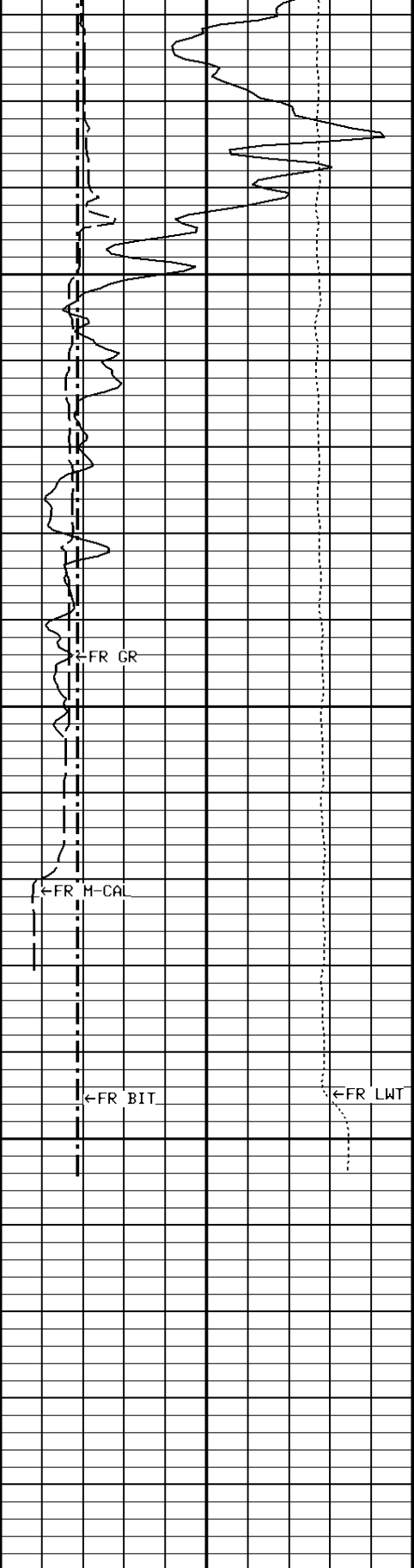
### 1:240 REPEAT SECTION

File #706



4400

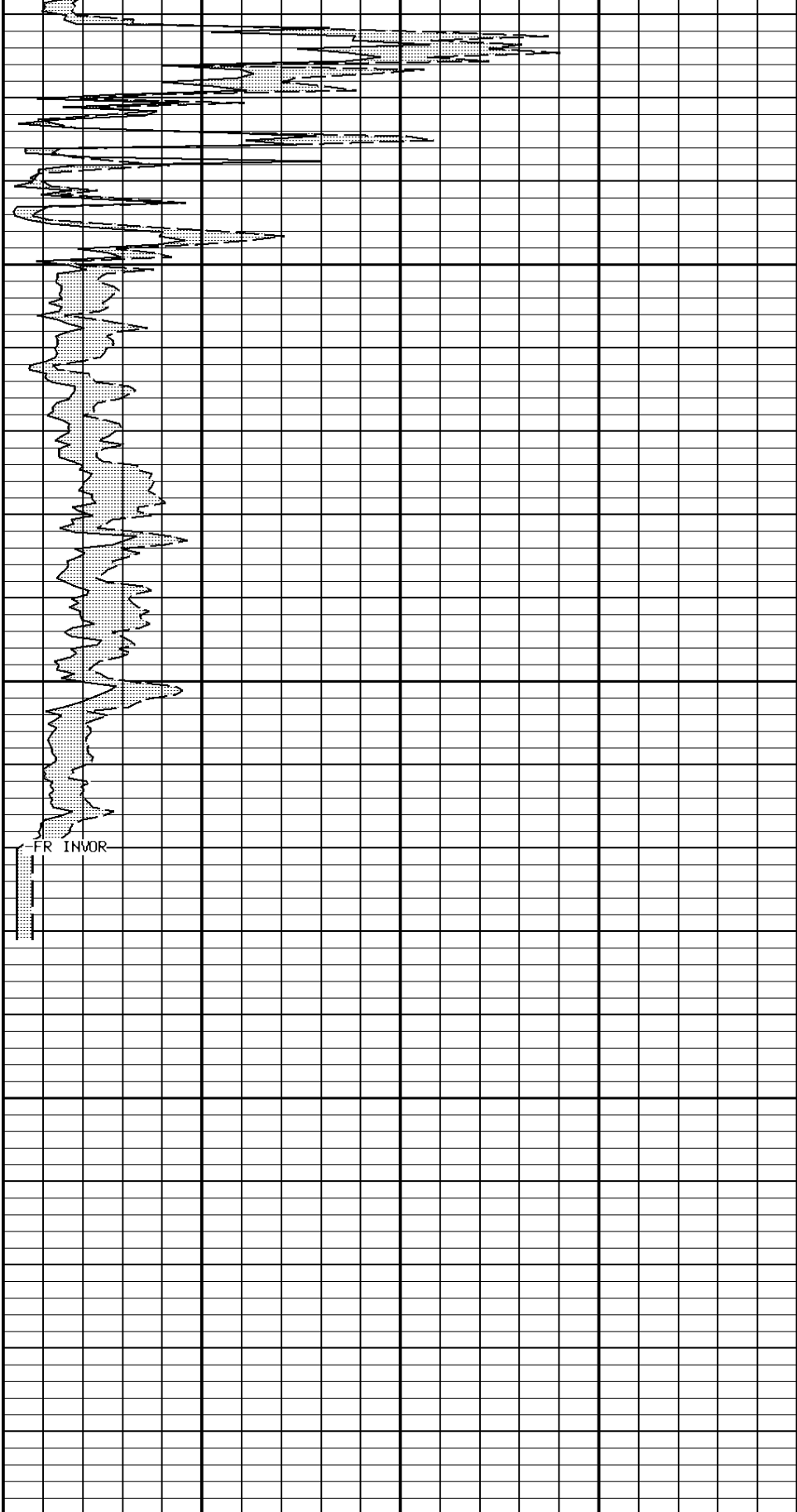




4500

4596  
4600

File #706



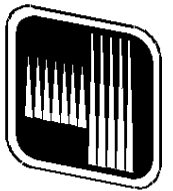
1:240 REPEAT SECTION

<b>CALIPER MICRO INCHES (IN)</b>	
16	26
6	16
<b>GAMMA RAY API UNITS</b>	
150	300
0	150
<b>BIT SIZE INCHES (IN)</b>	
6	16
<b>TENSION LBS</b>	
10000	0

<b>MICRO-NORMAL OHMM</b>	
0	40
<b>MICRO-INVERSE OHMM</b>	
0	40

**\* Calibration Summary \***

<b>Shop Calibration</b>						
<b>GRTB</b>						
Performed : 29-Apr-2010			Time : 11:02			
Sensor Suite : GR-GR5			ID : GRT-BC-41			
	Measured		Units	Calibrated		Units
GR	Background	Jig		Jig		GRAPI
	46	346	CPS	175		
<b>Shop Calibration</b>						
<b>MSTNG</b>						
Performed : 24-JUN-2010			Time : 10:21			
Sensor Suite : MSNG-NI			ID : MST_DA-_029			
	Measured			Calibrated		
	Zero	Reference	Units	Zero	Reference	Units
INV-V	85.0	29766.5		0.00	1546.00	MV
NOR-V	158.0	30932.1		0.00	1546.00	MV
IN-C	153.0	60292.6		0.00	15.46	UA
INV-R					32.34	OHMM
NOR-R					55.11	OHMM
Performed : 24-JUN-2010			Time : 11:38			
Sensor Suite : CALI-MSN			ID : MST_DA-_029			
	Jig - Measured			Jig - Calibrated		Units
	Ring#1	Ring#2		Ring#1	Ring#2	
CL # 1	7.1	13.1		6.0	12.0	IN.



# Tucker

WIRELINE SERVICES

COMPENSATED NEUTRON  
PEL DENSITY LOG

File No. : TUL-56605  
 Company : LARSON ENGINEERING, INC.  
 Well : HAGANS #2-14  
 Field :  
 Country : NESS  
 State : KANSAS  
 Country : USA

Location : API # 15-135-25154  
 1987' FSL & 330' FWL  
 S/2 NW NW SW

Sect : 14 Twp : 16S Rge : 26W

Recorded By : R. FRANKLIN  
 Witnessed By : S. DAVIS

Date : SEP 27 2010  
 Run No. : 1

Permanent Datum : GL  
 Drilling Measured From : KB  
 Log Measured From : KB  
 Above Permanent Datum : 10.000 FT  
 Depth--Driller : 4600.0 FT  
 Depth--Logger : 4596.0 FT  
 Bottom Log Interval : 4562.0 FT  
 Top Log Interval : 3600.0 FT  
 Casing Depth--Driller: 223.0 FT  
 Casing Depth--Logger : 220.0 FT  
 Casing Diameter : 8.625 IN  
 Bit Size : 7.875 IN  
 Unit No. : 123  
 Location : TULSA

Elevations :  
 KB : 2586.00 FT  
 DF : 2585.00 FT  
 GL : 2576.00 FT

**Additional Services**

MLT  
 PIT

The customer is hereby warned that by providing the log data herein, T. W. S. does not agree to provide any interpretation of log data, conversion of log data to physical rock parameters or recommendations. T. W. S. 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 T. W. S. 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 T. W. S. 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.

**Run Number 1**

Depth To Fluid 0.0 FT  
 Fluid Type In Hole : WBM  
 Density : 0.000 SG  
 Viscosity : 0.000 SEC  
 pH : 0.000  
 Fluid Loss : 0.000  
 Salinity : 0.000 KPPM

RM Source : MEASURED  
 RM : 0.220 OHMM at 85 F  
 RM at BHT : 0.163 OHMM at 117 F

RMF Source : CALCULATED  
 RMF : 0.187 OHMM at 85 F  
 RMF at BHT : 0.138 OHMM at 117 F

RMC Source : CALCULATED  
 RMC : 0.253 OHMM at 85 F

RMC : 0.253 OHMM at 85 F  
 RMC at BHT : 0.187 OHMM at 117 F  
 Max Recorded Temp. : 117 F  
 Time Circulation Stopped :  
 Operating Rig Time, Hrs. : 3.0

**- Source Serial Numbers -**

Gamma 2991GW  
 Neutron N-1046

**- Sonde Serial Numbers -**

GRTB GRT-BC-41  
 CNT CNP-AA-112  
 LDTNG LDP-DA-66  
 MSTNG MST-DA-029  
 PIT\_B PIT-BA-20

**Casing Strings**

Size (IN)	Weight (LB/FT)	Bottom (FT)
8.625	36.00	223.00

**- Comments -**

ALL PRESENTATIONS AS PER CUSTOMER REQUEST.

GRT, CNT, LDT, MLT, AND PIT RUN IN COMBINATION.

CALIPERS ORIENTED ON THE X-Y AXIS.

PHIN IS CALIPER CORRECTED.

2.71 G/CC USED TO CALCULATE POROSITY.

ANNULAR HOLE VOLUME CALCULATED USING 5.50" PRODUCTION CASING.

DETAIL PRESENTED FROM TD TO 3600' AS PER CLIENTS REQUEST.

DETAIL PRESENTED OVER ANHYDRITE FROM 2050' TO 1980'.

GRT: GRP.

CNT: PHIN, CLCDIN.

LDT: PORL, LCON, PECLN, CLLDIN, LDENN, PORLLS, PECSN.

MLT: NOR\_R, INV\_R, MSCLPIN.

PIT: ILD, ILM, CIRD, SFLA, SPU.

MINERAL VOLUME: VM31, VM33.

OPERATORS:

S. DAVIS

M. GARNER

THANK YOU FOR USING TUCKER WIRELINE SERVICES!

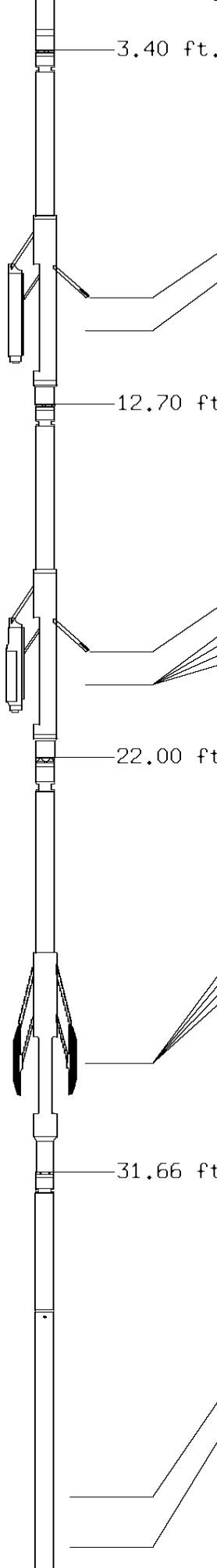
**Tool String Schematic**

Total Tool Length - 53.15 ft.  
 Maximum Outside diameter - 6.00 in.  
 Net Weight in Air - 943.00 lbs.



Tool: GRTB Length: 3.40 ft. O.D.: 3.60 in.  
 Sonde ID : GRT-BC-41

Measure Point	Stack Offset	Tool Offset	Bottom Offset
GRTB	3.00	3.00	51.15



GRP 2.00 2.00 51.15

3.40 ft.

**Tool: CNT**      **Length: 9.30 ft. O.D.: 4.36 in.**  
**Sonde ID**      : CNP-AA-112  
**Source ID**     : N-1046  
**Pad ID**        : CNP-AA-112

<u>Measure Point</u>	<u>Stack Offset</u>	<u>Tool Offset</u>	<u>Bottom Offset</u>
CLCN	9.40	6.00	43.75
PHIN	10.24	6.84	42.91

12.70 ft.

**Tool: LDTNG**      **Length: 9.30 ft. O.D.: 4.80 in.**  
**Sonde ID**        : LDP-DA-66  
**Source ID**     : 2991GW  
**Pad ID**         : LDP-DA-66

<u>Measure Point</u>	<u>Stack Offset</u>	<u>Tool Offset</u>	<u>Bottom Offset</u>
CLLD	18.70	6.00	34.45
PEL	19.70	7.00	33.45
PES	20.10	7.40	33.05
LDEN	19.70	7.00	33.45
LCOR	19.70	7.00	33.45

22.00 ft.

**Tool: MST**        **Length: 9.66 ft. O.D.: 6.00 in.**  
**Sonde ID**        : MST\_DA\_029

<u>Measure Point</u>	<u>Stack Offset</u>	<u>Tool Offset</u>	<u>Bottom Offset</u>
MSFL	29.60	7.60	23.55
CLMR	29.60	7.60	23.55
MSFN	29.60	7.60	23.55
MSFI	29.60	7.60	23.55

31.66 ft.

**Tool: PIT**        **Length: 21.49 ft. O.D.: 3.62 in.**  
**Sonde ID**        : PIT-BA-20

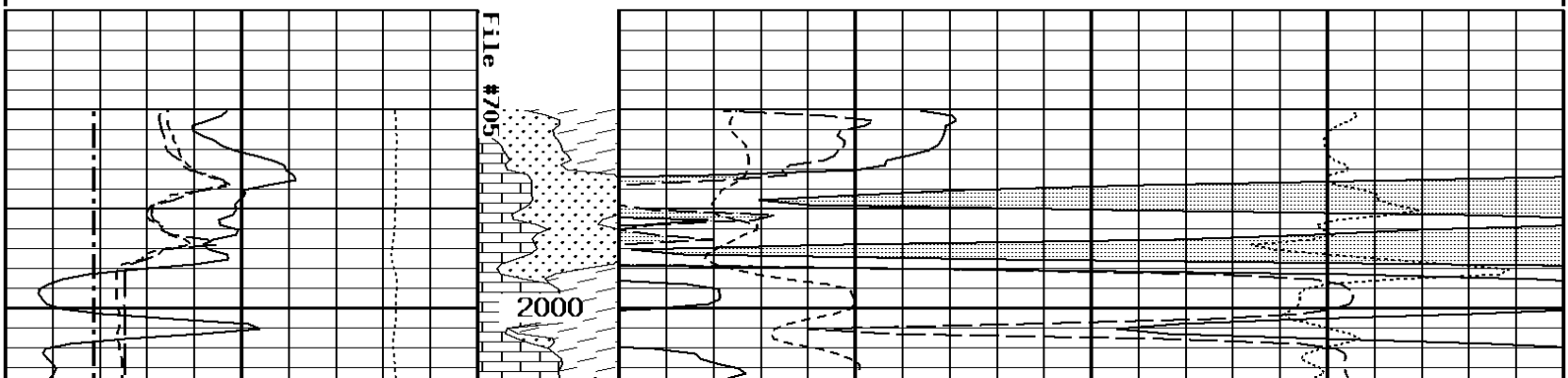
<u>Measure Point</u>	<u>Stack Offset</u>	<u>Tool Offset</u>	<u>Bottom Offset</u>
ILD	40.58	8.92	12.56
ILM	41.76	10.10	11.39
SFLU	49.15	17.49	4.00
SP	52.26	20.60	0.88

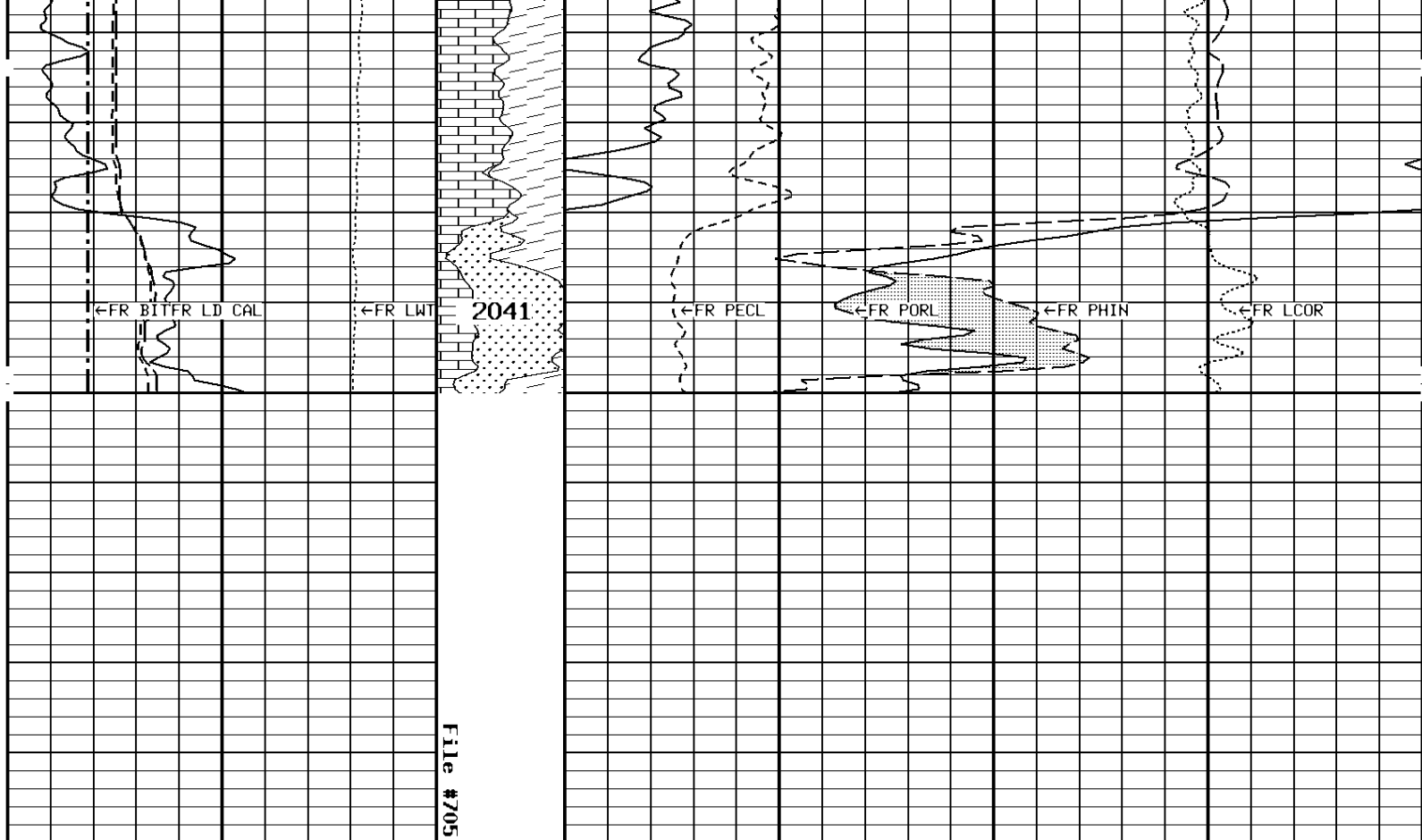


LWT ——— 53.15 ft.

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

1:240 MAIN SECTION



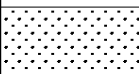
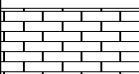



1:240 MAIN SECTION

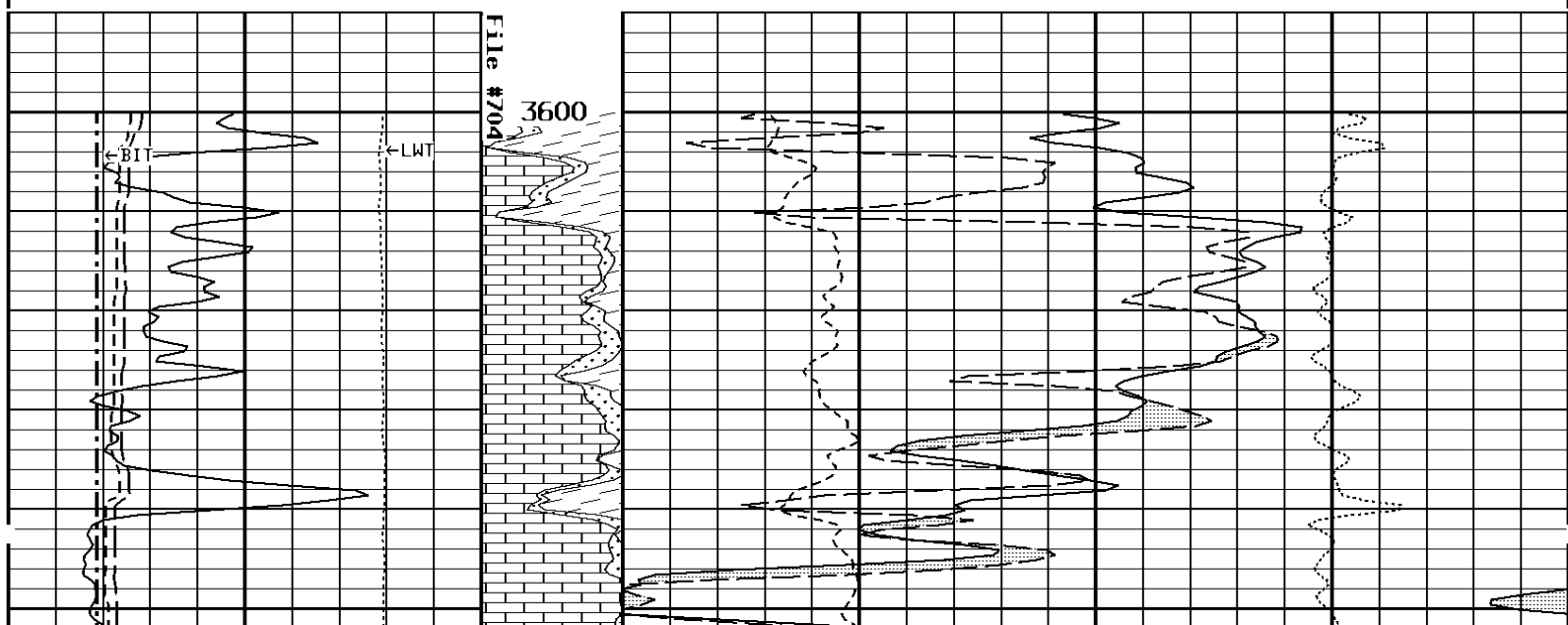
<b>GAMMA RAY</b> <b>API UNITS</b> 150 0 300 150		Volume Dolo/Shale 70 30 -10	<b>DENSITY POROSITY</b> <b>PERCENT (2.71 g/cc)</b> 30 -10 -50	
<b>NEUTRON (Y) CALIPER</b> <b>INCHES (IN)</b> 16 6 26 16		Volume Calcite 30	<b>NEUTRON POROSITY</b> <b>PERCENT (LIMESTONE MATRIX)</b> -10	
<b>DENSITY (X) CALIPER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

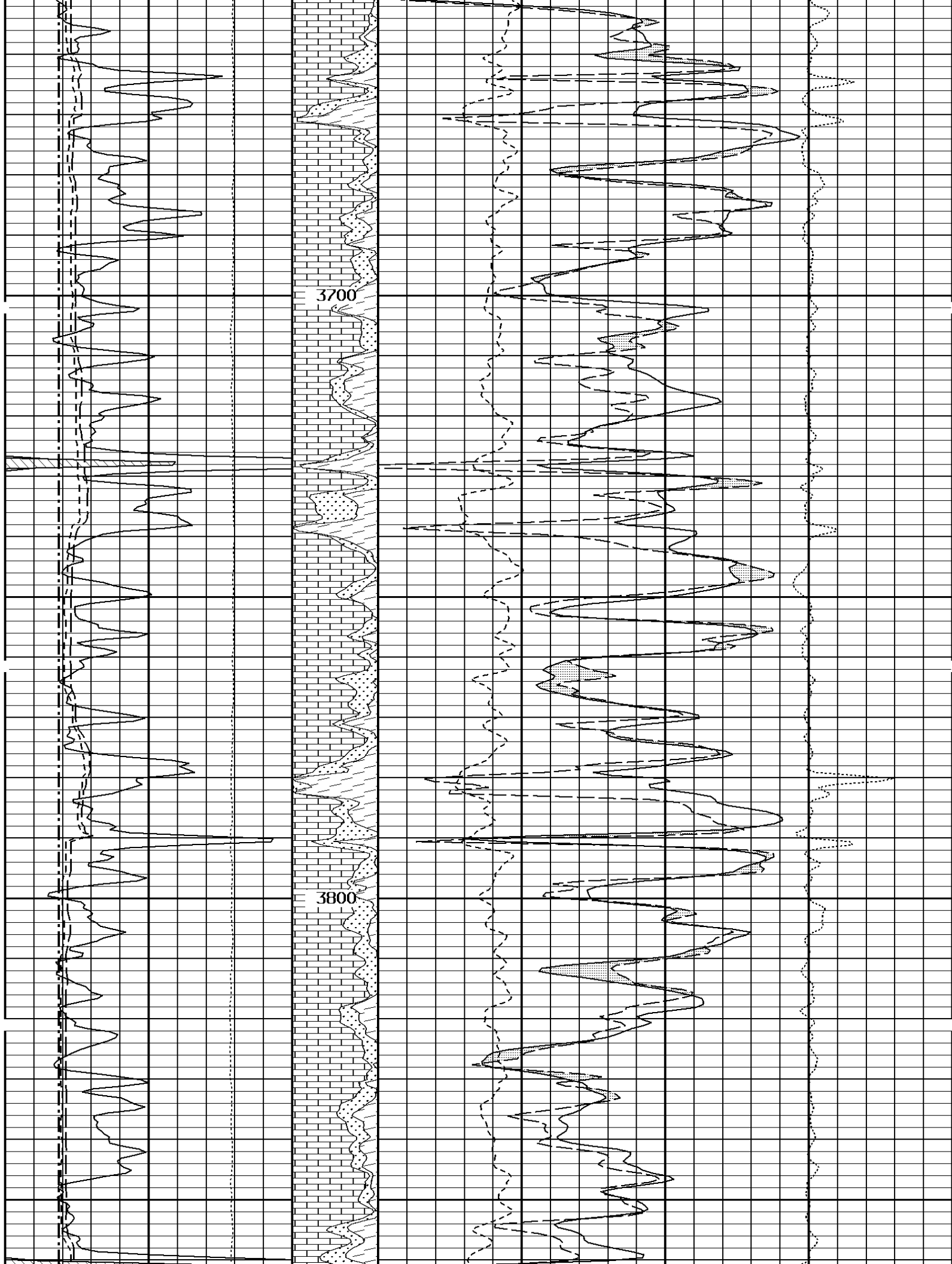
\* Borehole Zone Factors \*

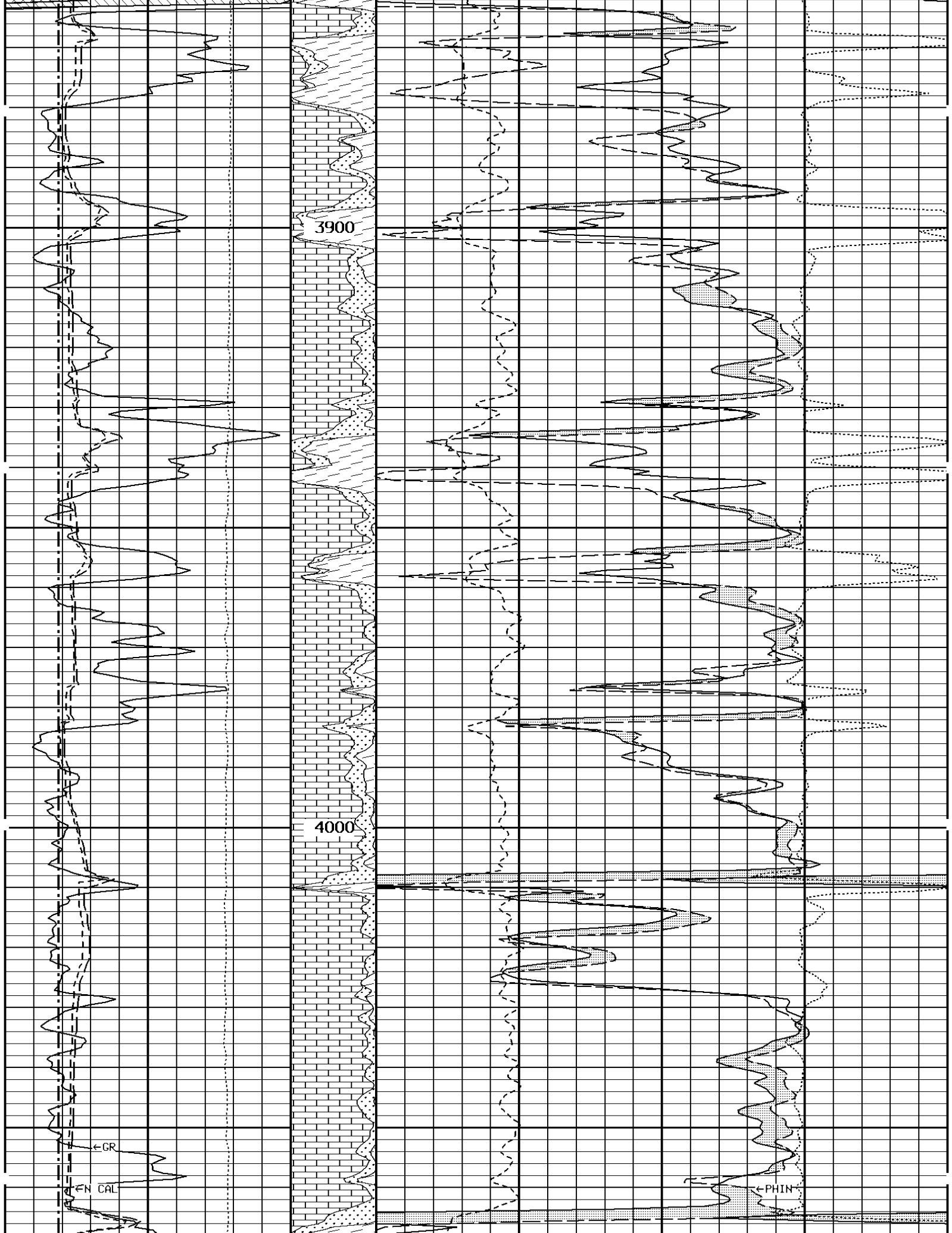
Zone 1 99999.0 to 0.0 F		
Matrix Density_____	2.71	G/C3
Fluid Density_____	1.00	G/C3
Formation Matrix_____	Limestone	
Drill Bit Size_____	7.875	IN
Production Casing Diameter_____	5.500	IN
Casing Correction (PHI N)_____	Disable	

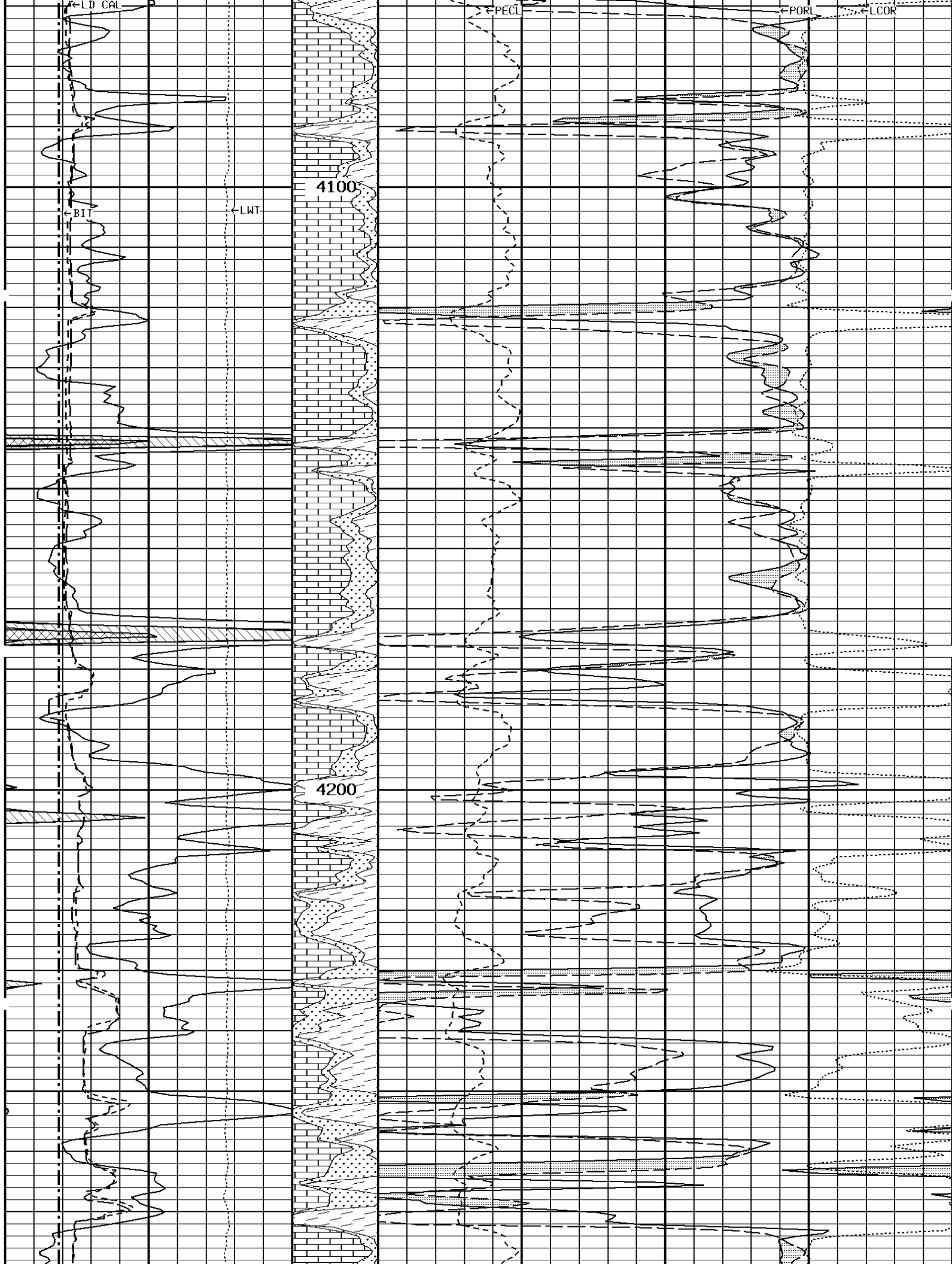
TENSION LBS					
10000	0				
BIT SIZE INCHES (IN)					
6	16				
DENSITY (X) CALIPER INCHES (IN)		Volume Quartz	PE CROSS-SECTION BARNS/ELECTRON	DENSITY CORRECTION G/CC	
16	26		0	10	-0.25
6	16				
NEUTRON (Y) CALIPER INCHES (IN)		Volume Calcite	NEUTRON POROSITY PERCENT (LIMESTONE MATRIX)		
16	26		30		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

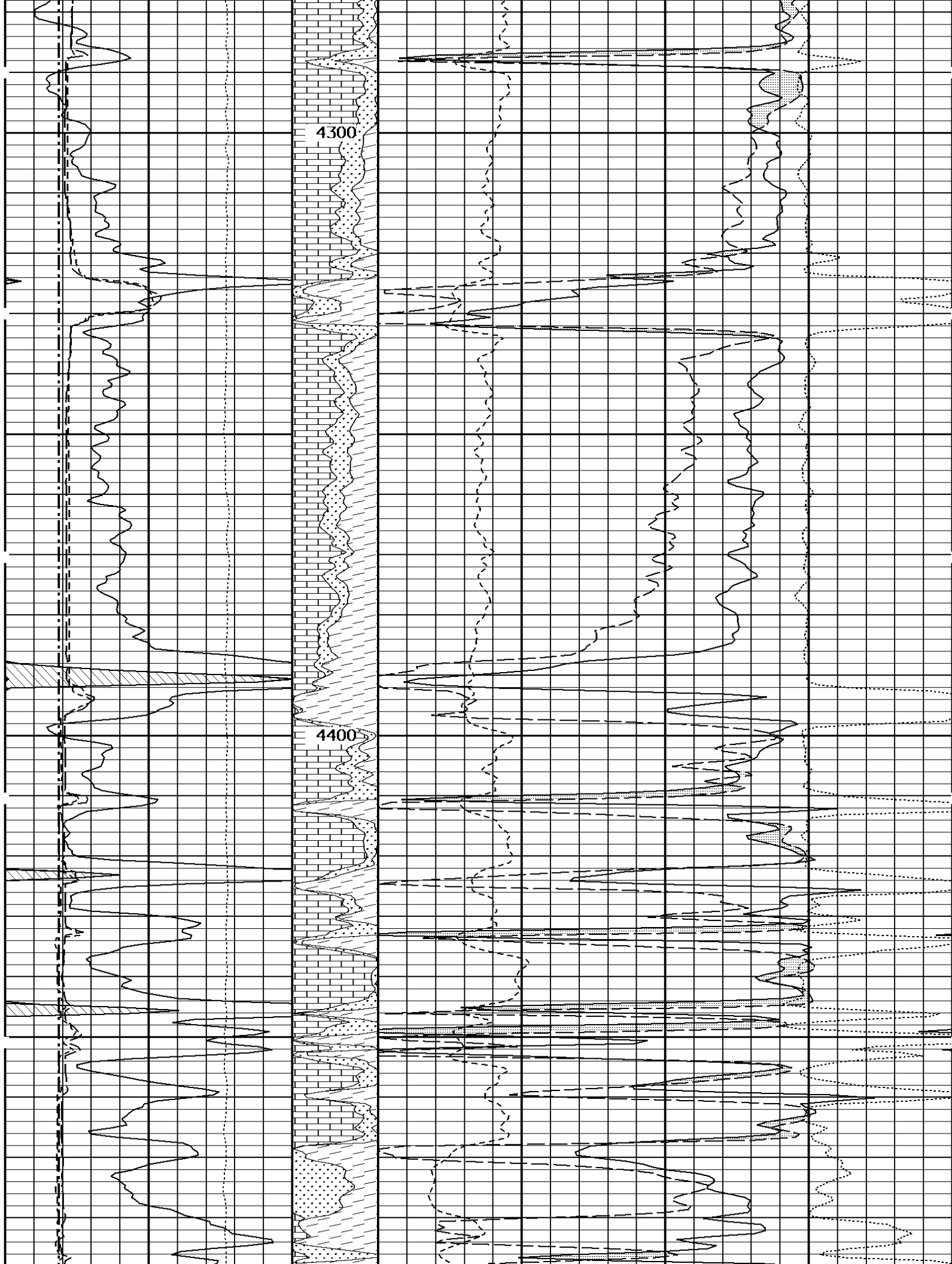
1:240 MAIN SECTION





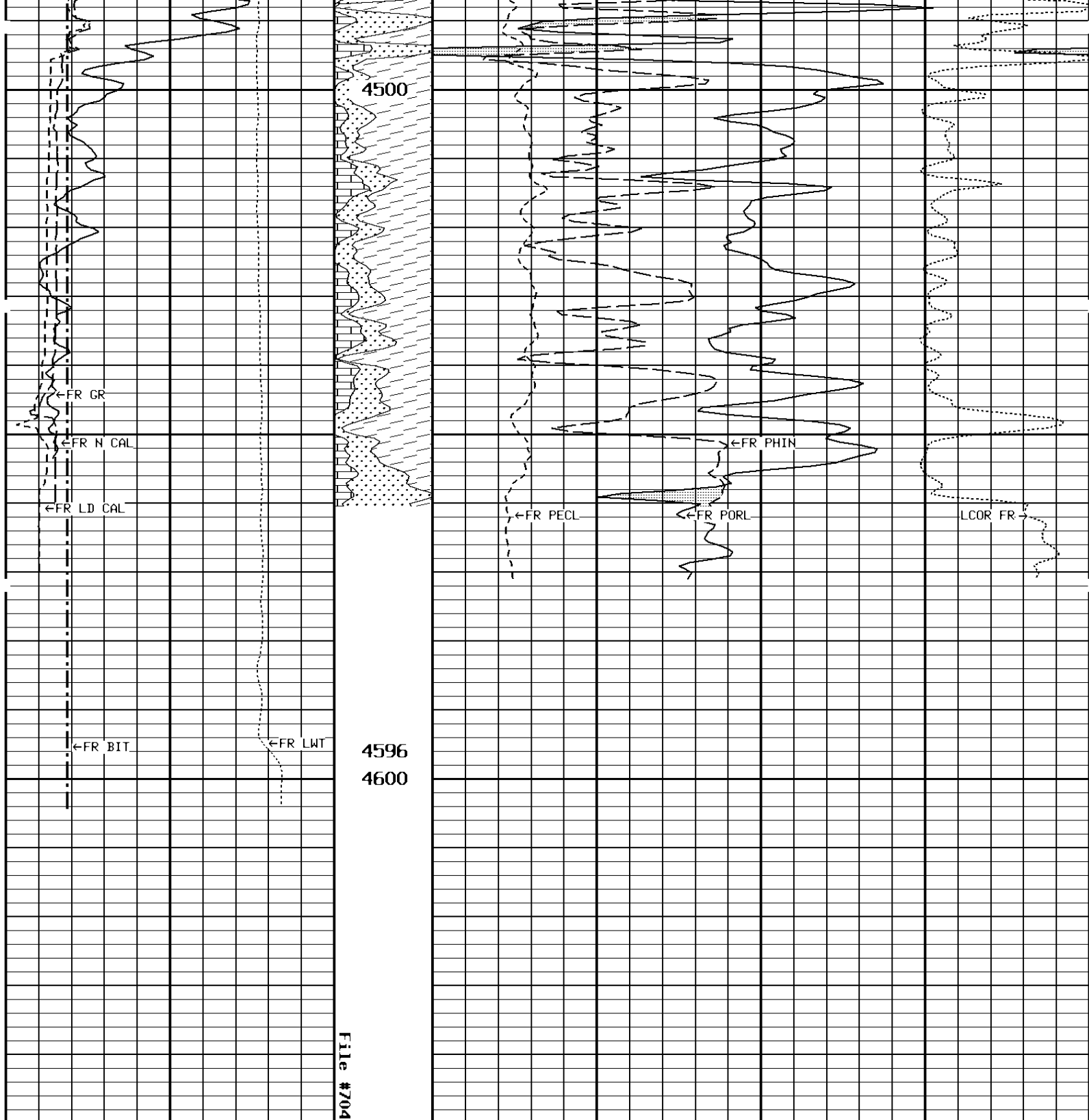






4300

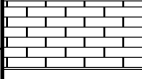
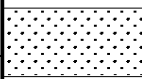
4400



1:240 MAIN SECTION

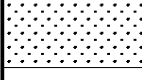
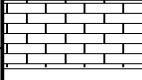
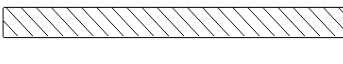
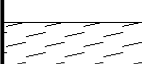

<p>GAMMA RAY API UNITS</p> <p>150 0 300 150</p>	<p>Volume Dolo/Shale</p>	<p>DENSITY POROSITY PERCENT (2.71 g/cc)</p>
	<p>70</p> <p>30</p> <p>-10</p>	<p>30</p> <p>-10</p> <p>-50</p>
<p>NEUTRON (γ) CALIPER</p>	<p>Volume</p>	<p>NEUTRON POROSITY</p>



NEUTRON (Y) CALIPER INCHES (IN)		Volume Calcite		NEUTRON POROSITY PERCENT (LIMESTONE MATRIX)	
16 6	26 16		30		-10
DENSITY (X) CALIPER INCHES (IN)		Volume Quartz		PE CROSS-SECTION BARNs/ELECTRON	DENSITY CORRECTION G/CC
16 6	26 16		0	10	-0.25      0.25
BIT SIZE INCHES (IN)					
6	16				
TENSION LBS					
10000	0				

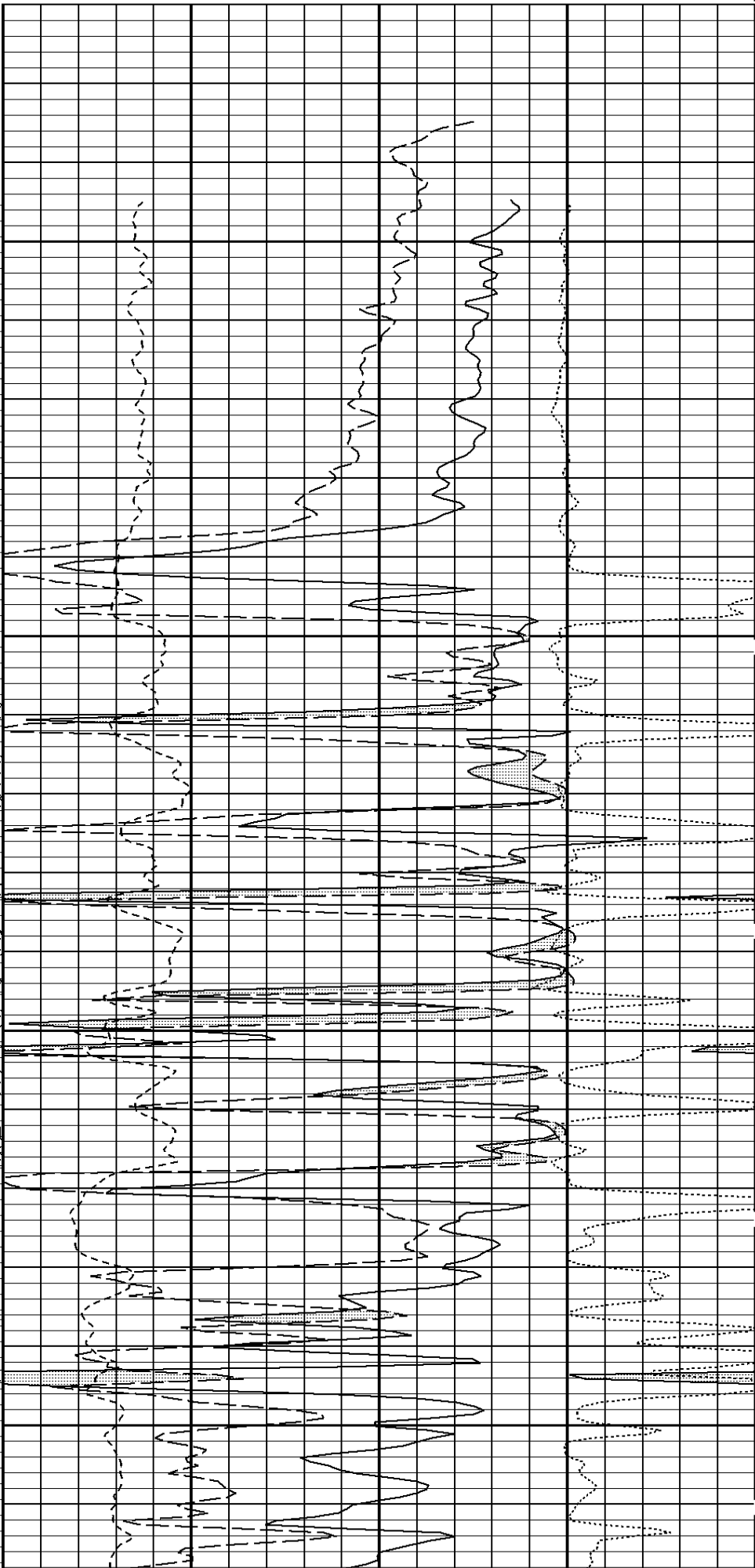
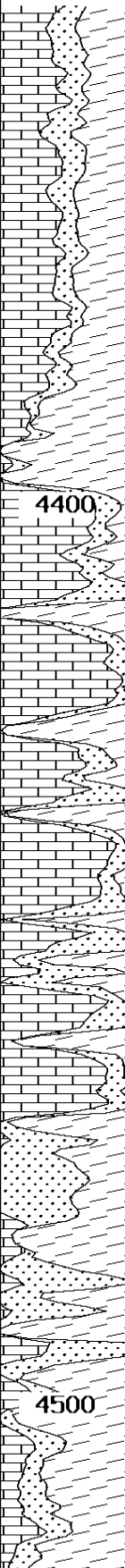
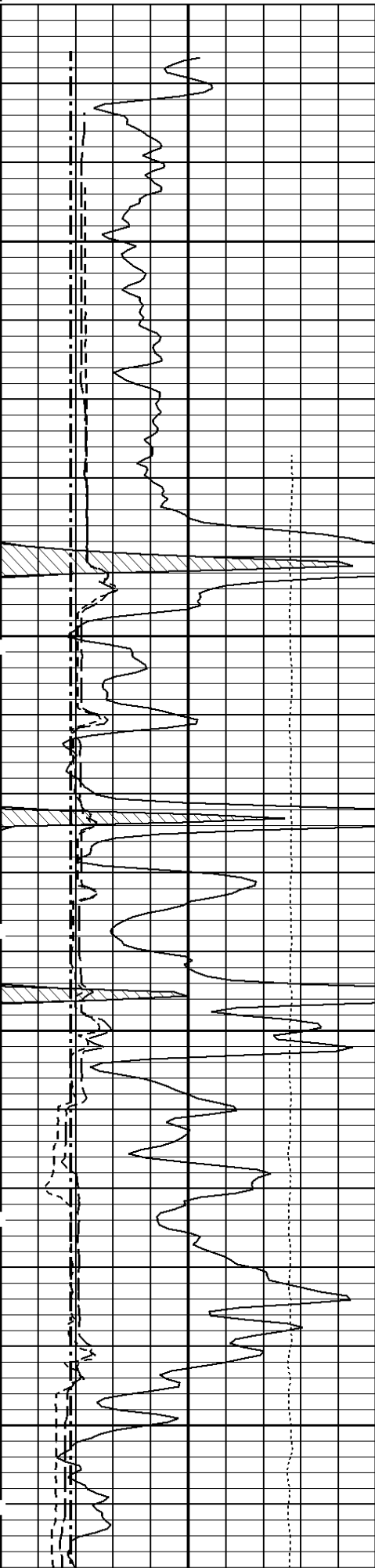
\* Borehole Zone Factors \*

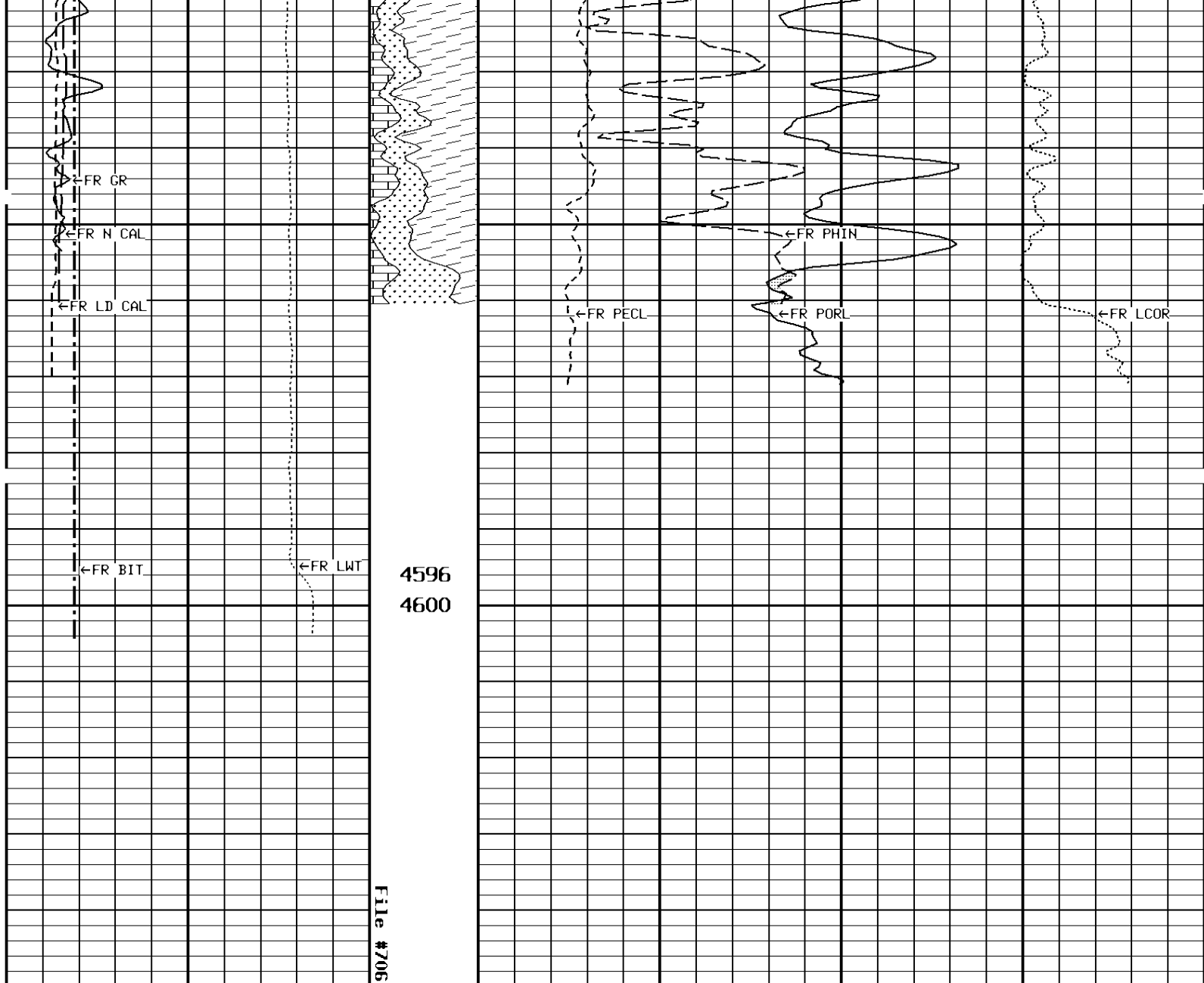
Zone 1    99999.0    to    0.0    F		
Matrix Density_____	2.71	G/C3
Fluid Density_____	1.00	G/C3
Formation Matrix_____	Limestone	
Drill Bit Size_____	7.875	IN
Production Casing Diameter_____	5.500	IN
Casing Correction (PHI N)_____	Disable	

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

1:240 REPEAT SECTION

File #706





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

BIT SIZE INCHES (IN)	
6	16
TENSION LBS	
10000	0

\* Borehole Zone Factors \*

Zone 1 99999.0 to 0.0 F		
Matrix Density_____	2.71	G/C3
Fluid Density_____	1.00	G/C3
Formation Matrix_____	Limestone	
Drill Bit Size_____	7.875	IN
Production Casing Diameter_____	5.500	IN
Casing Correction (PHI N)_____	Disable	

TENSION LBS	
10000	0

BIT SIZE INCHES (IN)	
6	16

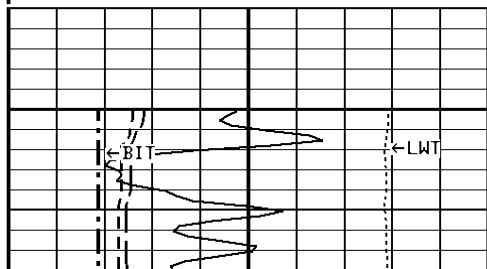
DENSITY (X) CALIPER INCHES (IN)	
16	26
6	16

NEUTRON (Y) CALIPER INCHES (IN)	
16	26
6	16

GAMMA RAY API UNITS	
150	300
0	150

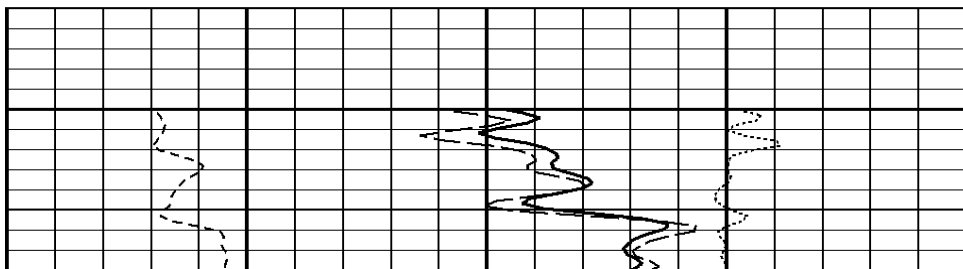
PE CROSS-SECTION BARNS/ELECTRON	DENSITY CORRECTION G/CC
0	10 -0.25
DENSITY POROSITY PERCENT (2.71 g/cc)	
70	30
30	-10
-10	-50
COMPENSATED BULK DENSITY G/CC	
3.0	4.0
2.0	3.0
1.0	2.0

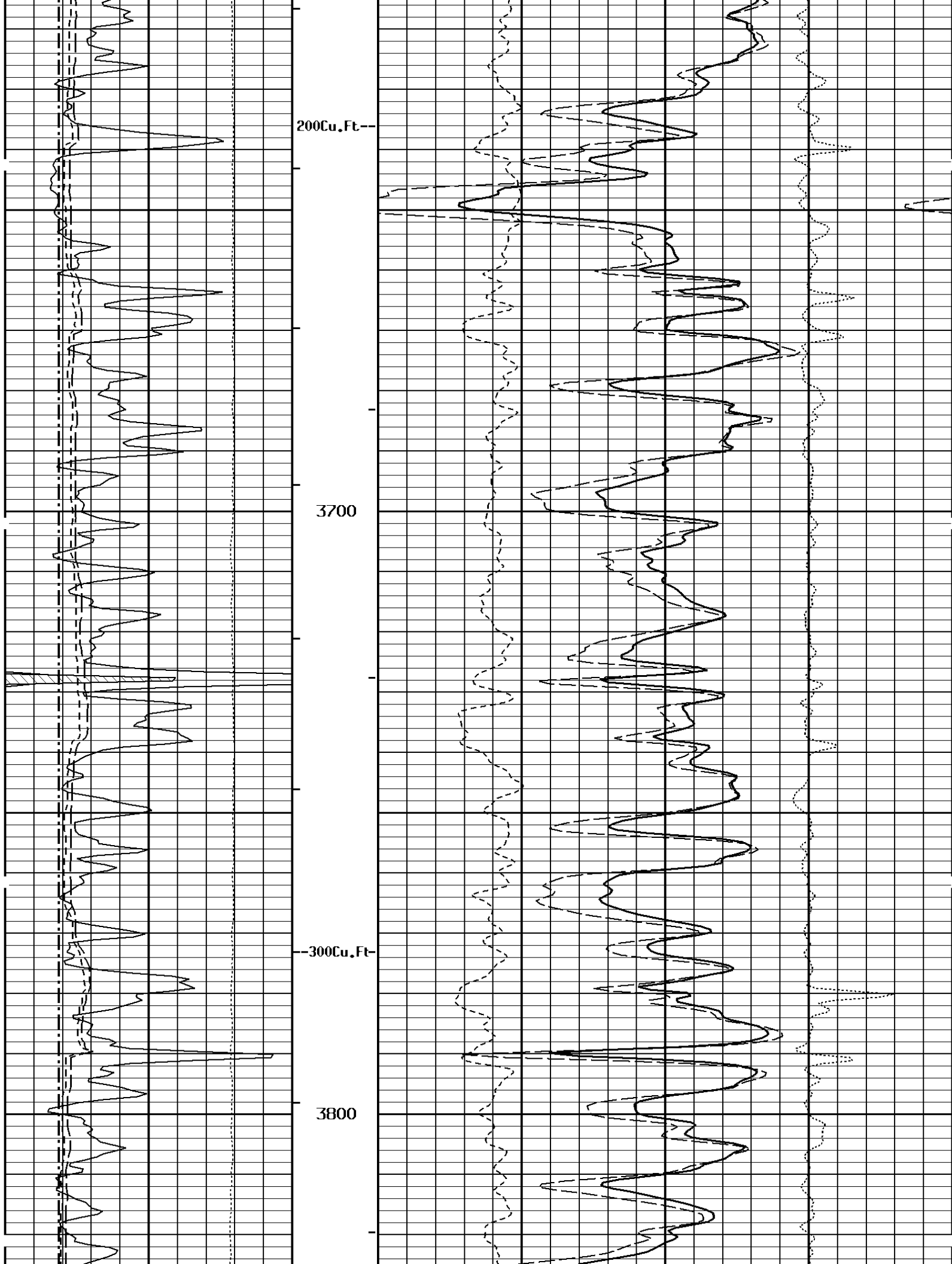
1:240 MAIN SECTION  
BULK DENSITY

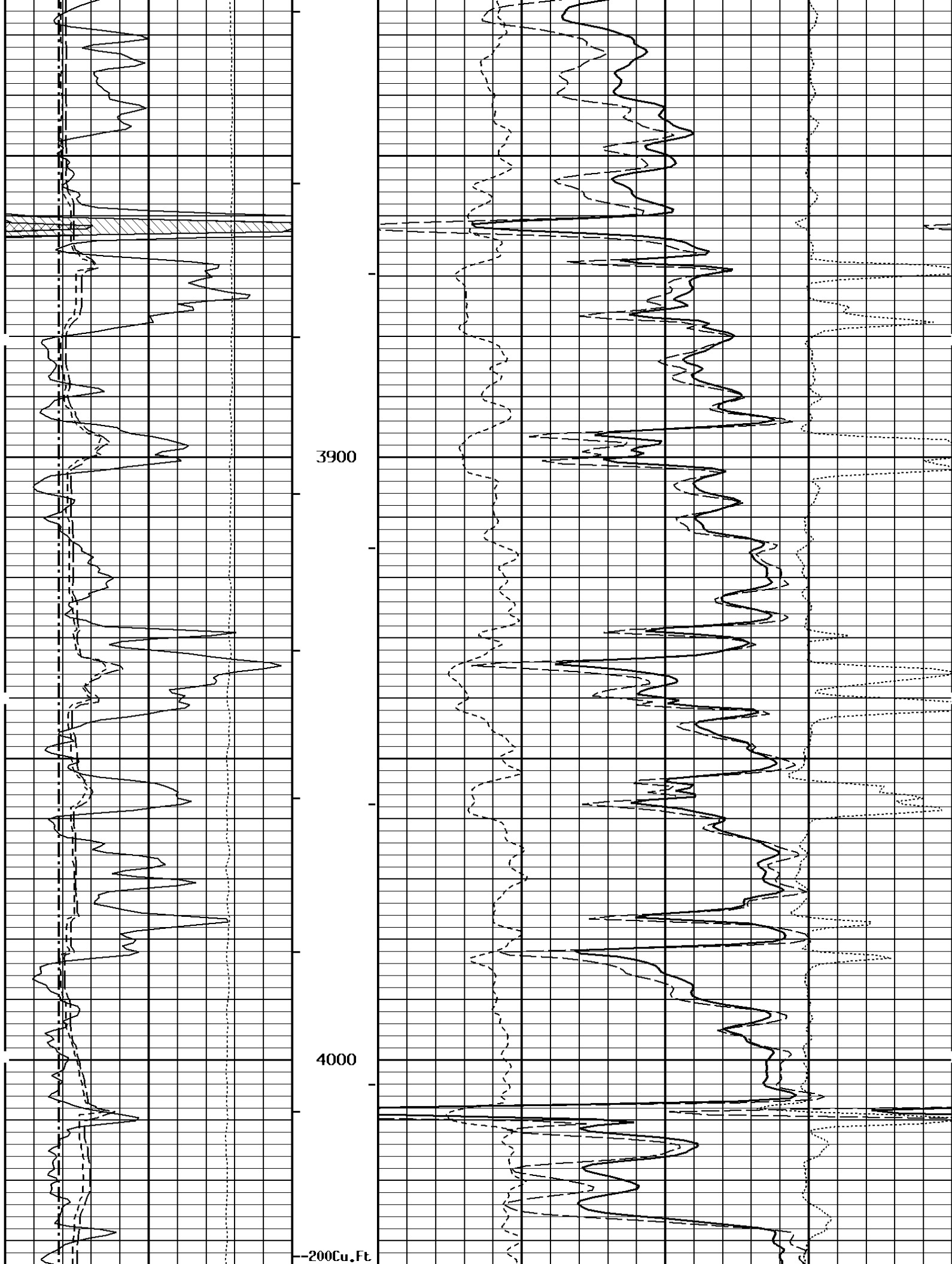


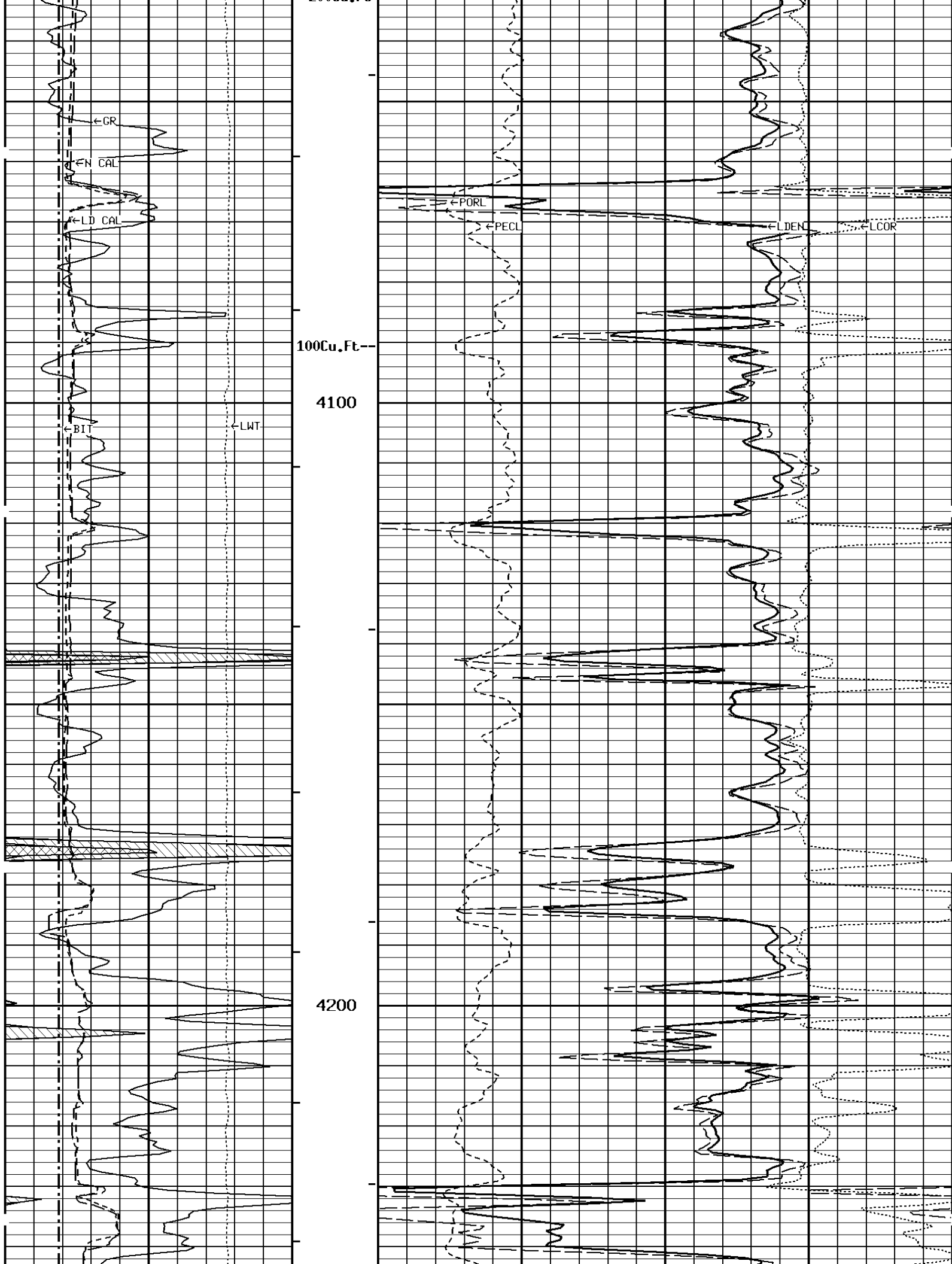
File #704

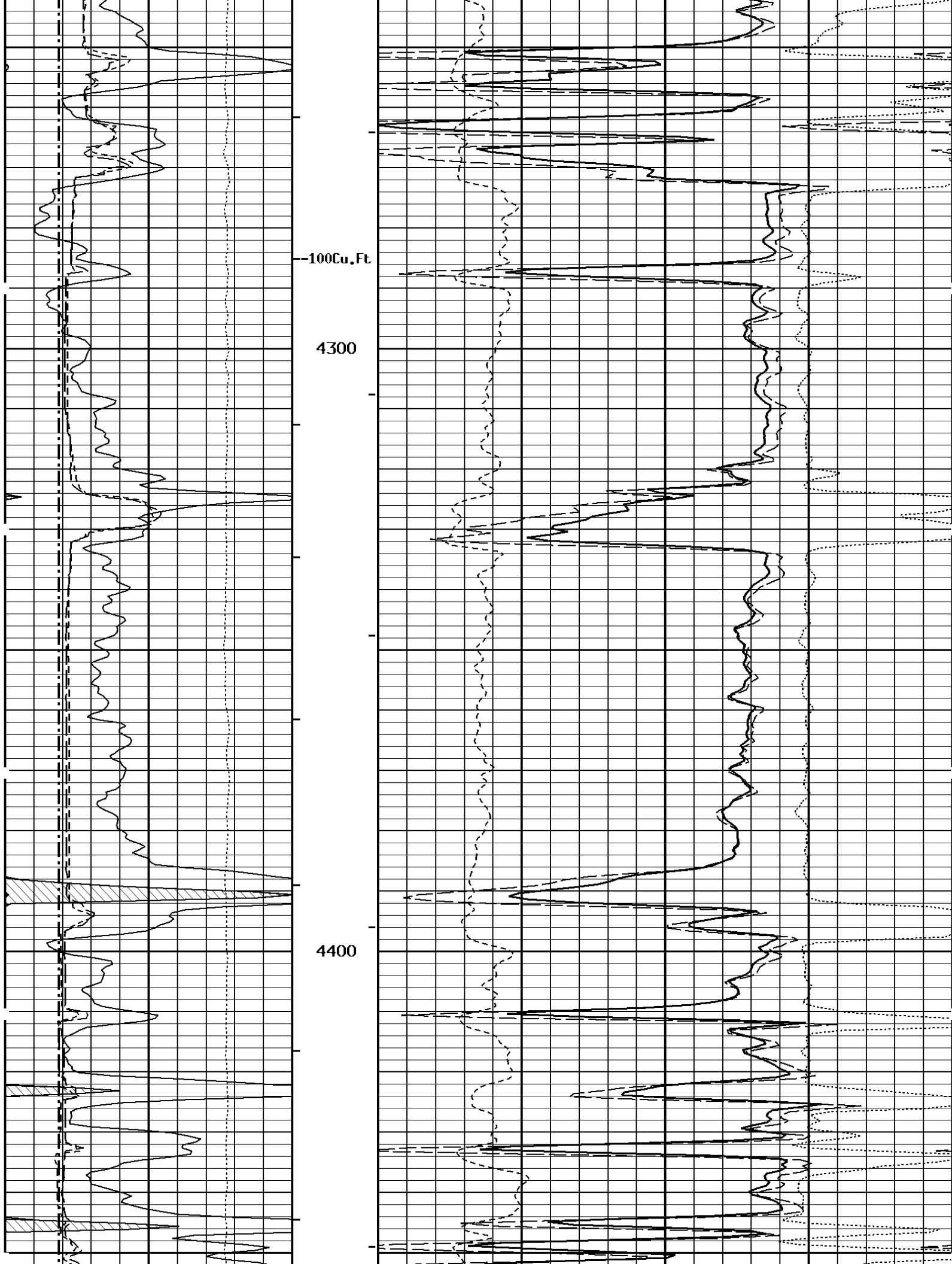
3600



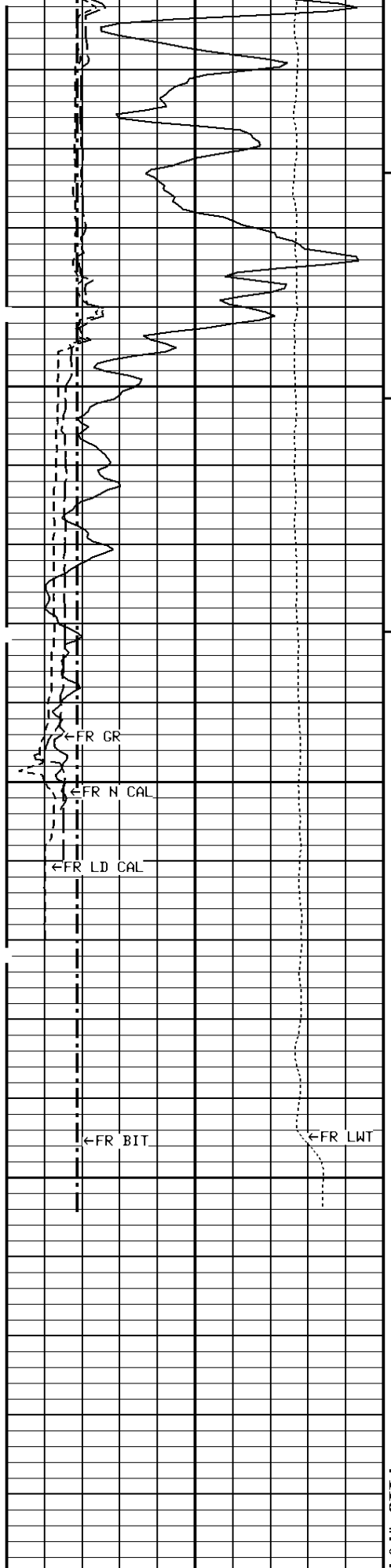






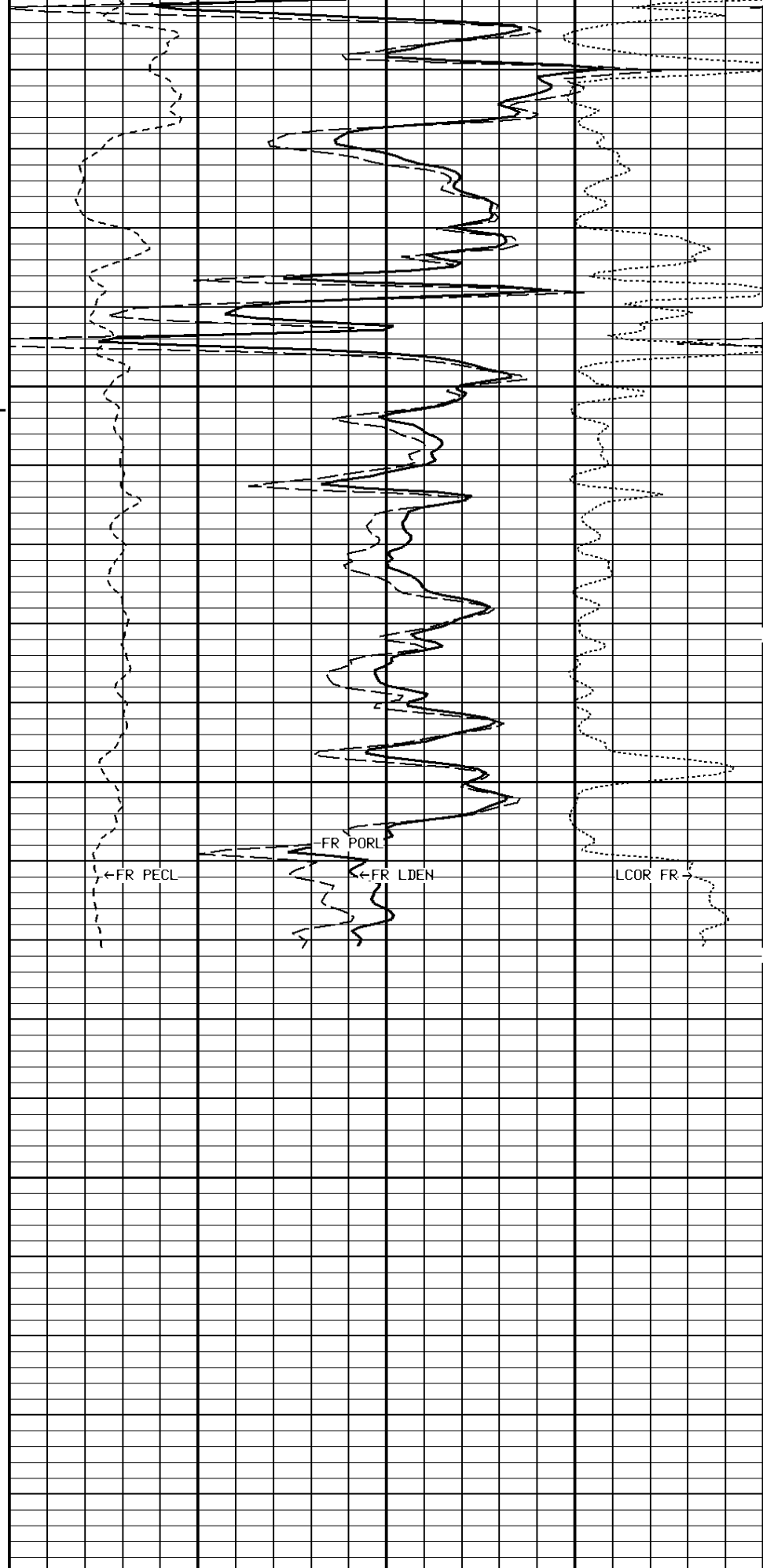







4500  
 4596  
 4600

File #704



1:240 MAIN SECTION  
BULK DENSITY

<b>GAMMA RAY API UNITS</b> 150  300 0 150		<b>-BHV AHV- CU.FT</b>	<b>COMPENSATED BULK DENSITY G/CC</b> 3.0 4.0 2.0 3.0 1.0 2.0	
<b>NEUTRON (Y) CALIPER INCHES (IN)</b> 16 26 6 16			<b>DENSITY POROSITY PERCENT (2.71 g/cc)</b> 70 30 30 -10 -10 -50	
<b>DENSITY (X) CALIPER INCHES (IN)</b> 16 26 6 16		<b>PE CROSS-SECTION BARNS/ELECTRON</b> 0 10		<b>DENSITY CORRECTION G/CC</b> -0.25 0.25
<b>BIT SIZE INCHES (IN)</b> 6 16				
<b>TENSION LBS</b> 10000 0				

**\* Borehole Zone Factors \***

<b>Zone 1 99999.0 to 0.0 F</b>			
Matrix Density_____	2.71	G/C3	
Fluid Density_____	1.00	G/C3	
Formation Matrix_____	Limestone		
Drill Bit Size_____	7.875	IN	
Production Casing Diameter_____	5.500	IN	
Casing Correction (PHI N)_____	Disable		

**\* Calibration Summary \***

<b>Shop Calibration GRTB</b>					
Performed : 29-Apr-2010			Time : 11:02		
Sensor Suite : GR-GR5			ID : GRT-BC-41		
	Measured	Units	Calibrated	Units	
GR	Background	Jig	Jig		
	46	346	175	GRAPI	

<b>Shop Calibration CNT</b>					
Performed : 03-Sep-2010			Time : 10:01		
Sensor Suite : BHC NEUT			ID : CNP-AA-112		
Source ID : N-1046					
	Tank	Verification	Units		
	Measured	Calibrated	Jig		
N/F	4.0559	3.6889	3.6970		
Porosity	26.5	20.5	20.6	%	

Performed : 03-SEP-2010  
Sensor Suite : CALI-BCN

Time : 11:36  
ID : CNP-AA-112

CL #	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
1	11.3	16.2	6.0	12.0	IN.

**Shop Calibration  
LDTNG**

Performed : 15-JUL-2010  
Sensor Suite : CALIPEL

Time : 17:11  
ID : LDP-DA-66

CL #	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
1	9.6	13.9	6.0	12.0	IN.

Performed : 20-Sep-2010  
Sensor Suite : BHCPELNG  
Source ID : 2991GW

Time : 10:11  
ID : LDP-DA-66

	Short Space				Units
	BKGD	Al	Mg	Al+Fe	
LSW1	69	1118	1801	735	CPS
LSW2	74	1357	2149	982	CPS
LSW3	276	3192	5125	2712	CPS
LSW4	340	2828	4078	2502	CPS
LSW5	32	60	66	57	CPS
LSW6	91	97	96	95	CPS
LSW7	59	63	63	64	CPS
LSW8	2	4	6	4	CPS
QS	0.213	0.212	0.208	0.195	
PES			2.778	5.967	
SSDN		2.600	1.680		G/CC

	Long Space				Units
	BKGD	Al	Mg	Al+Fe	
LLW1	107	1169	4728	713	CPS
LLW2	119	2210	8658	1597	CPS
LLW3	448	4251	16044	3668	CPS
LLW4	578	2049	6513	1860	CPS
LLW5	63	74	133	72	CPS
LLW6	187	179	169	180	CPS
LLW7	116	113	111	114	CPS
LLW8	3	7	19	6	CPS
QL	0.234	0.226	0.207	0.224	
PEL			2.697	5.458	
LSDN		2.600	1.680		G/CC