



# Tucker

ENERGY SERVICES

PHASED INDUCTION

SHALLOW FOCUS SP LOG

|                                                                                                                                                                                                      |                       |                                                                                                                                                                                                                                                 |                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <b>Company</b> CHIEFTAIN OIL CO., INC.<br><b>Well</b> AHS CATTLE CO. #10<br><b>Field</b> NA<br><b>County</b> BARBER<br><b>State</b> KANSAS<br><b>Country</b> USA<br><b>API No.</b> 15-007-24255-0000 |                       | <b>File No</b> : TUL-60377<br><b>Company</b> : CHIEFTAIN OIL CO., INC.<br><b>Well</b> : AHS CATTLE CO. #10<br><b>Field</b> : NA<br><b>County</b> : BARBER<br><b>State</b> : KANSAS<br><b>Country</b> : USA<br><b>API No</b> : 15-007-24255-0000 |                  |
| <b>Location</b> :<br>2490' FSL & 660' FEL<br>N/2 N/2 NE SE                                                                                                                                           |                       | <b>LSD</b> : <b>Sect</b> : 12 <b>Twp</b> : 35S <b>Rge</b> : 12W                                                                                                                                                                                 |                  |
| <b>Permanent Datum:</b>                                                                                                                                                                              | GL                    | <b>Elevations:</b>                                                                                                                                                                                                                              | <b>Services:</b> |
| <b>Drilling Measured From:</b>                                                                                                                                                                       | KB                    | KB 1392.00                                                                                                                                                                                                                                      | CNT              |
| <b>Log Measured From:</b>                                                                                                                                                                            | KB                    | DF 1391.00                                                                                                                                                                                                                                      | PIT              |
| <b>Above Permanent Datum:</b>                                                                                                                                                                        | 10.00 Ft              | GL 1382.00                                                                                                                                                                                                                                      | MLT              |
| <b>Date</b>                                                                                                                                                                                          | 01-04-2015            |                                                                                                                                                                                                                                                 |                  |
| <b>Run Number</b>                                                                                                                                                                                    | 1                     |                                                                                                                                                                                                                                                 |                  |
| <b>Depth--Driller</b>                                                                                                                                                                                | 5467.0                | Ft                                                                                                                                                                                                                                              |                  |
| <b>Depth--Logger</b>                                                                                                                                                                                 | 5476.0                | Ft                                                                                                                                                                                                                                              |                  |
| <b>First Reading</b>                                                                                                                                                                                 | 5476.0                | Ft                                                                                                                                                                                                                                              |                  |
| <b>Last Reading</b>                                                                                                                                                                                  | 936.0                 | Ft                                                                                                                                                                                                                                              |                  |
| <b>Casing--Driller</b>                                                                                                                                                                               | 936.0                 | Ft                                                                                                                                                                                                                                              |                  |
| <b>Casing--Logger</b>                                                                                                                                                                                | 936.0                 | Ft                                                                                                                                                                                                                                              |                  |
| <b>Bit Size</b>                                                                                                                                                                                      | 7.875                 | In                                                                                                                                                                                                                                              |                  |
| <b>Casing Size</b>                                                                                                                                                                                   | 8.625                 | In                                                                                                                                                                                                                                              |                  |
| <b>Hole Fluid Type</b>                                                                                                                                                                               | CHEM-GEL              |                                                                                                                                                                                                                                                 |                  |
| <b>Density</b>                                                                                                                                                                                       | 9.4                   |                                                                                                                                                                                                                                                 |                  |
| <b>Fluid Loss</b>                                                                                                                                                                                    | 9.6                   |                                                                                                                                                                                                                                                 |                  |
| <b>PH/Viscosity</b>                                                                                                                                                                                  | 9.5                   | 53.0                                                                                                                                                                                                                                            |                  |
| <b>Sample Source</b>                                                                                                                                                                                 | MEASURED              |                                                                                                                                                                                                                                                 |                  |
| <b>RM@Measured Temp.</b>                                                                                                                                                                             | 2.000                 | @ 50 F                                                                                                                                                                                                                                          |                  |
| <b>RMF@Measured Temp</b>                                                                                                                                                                             | 1.600                 | @ 50 F                                                                                                                                                                                                                                          |                  |
| <b>RM@Measured Temp.</b>                                                                                                                                                                             | 2.400                 | @ 50 F                                                                                                                                                                                                                                          |                  |
| <b>Source RMF/RMC</b>                                                                                                                                                                                | CALCULATED/CALCULATED |                                                                                                                                                                                                                                                 |                  |
| <b>RM@BHT</b>                                                                                                                                                                                        | 0.820                 | @ 132 F                                                                                                                                                                                                                                         |                  |
| <b>Time Circulation Stopped</b>                                                                                                                                                                      | 01-04-2015 10:00 pm   |                                                                                                                                                                                                                                                 |                  |
| <b>Max Recorded Temp.</b>                                                                                                                                                                            | 132                   | F                                                                                                                                                                                                                                               |                  |
| <b>Equipment/Base</b>                                                                                                                                                                                | 127                   | TULSA                                                                                                                                                                                                                                           |                  |
| <b>Recorded By</b>                                                                                                                                                                                   | SHELDON TYELR         |                                                                                                                                                                                                                                                 |                  |
| <b>Witnessed By</b>                                                                                                                                                                                  | DAVID BARKER          |                                                                                                                                                                                                                                                 |                  |

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

| Bitsize Intervals |             | Casing Strings |              |             |          |
|-------------------|-------------|----------------|--------------|-------------|----------|
| Size (In)         | Bottom (Ft) | Size (In)      | Weight (Lbs) | Bottom (Ft) | Top (Ft) |
| 7.875             | 5467.00     | 8.625          | 32.00        | 936.00      | 0.00     |
|                   |             |                |              |             |          |
|                   |             |                |              |             |          |
|                   |             |                |              |             |          |
|                   |             |                |              |             |          |

|                     |                    |  |
|---------------------|--------------------|--|
| Run Number          | 1                  |  |
| Date                | 01-04-2015         |  |
| Date/Time On Bottom | 01-05-2015 1:00 am |  |
| Depth to Fluid      | 0.0 Ft             |  |
| Salinity            | 3400.000           |  |
| RMF@BHT             | 0.660 @ 132 F      |  |
| RMC@BHT             | 0.980 @ 132 F      |  |

Run Number 1

Comments

ALL PRESENTATIONS AS PER CUSTOMER REQUEST  
 GRT, CNT, LDT, MLT AND PIT RUN IN COMBINATION  
 CALIPERS ORIENTED ON X-Y AXIS  
 2.71 G/CC USED TO CALCULATE POROSITY  
 ANNULAR HOLE VOLUME CALCULATED USING 5.5" PRODUCTION CASING  
 PHIN IS CALIPER CORRECTED

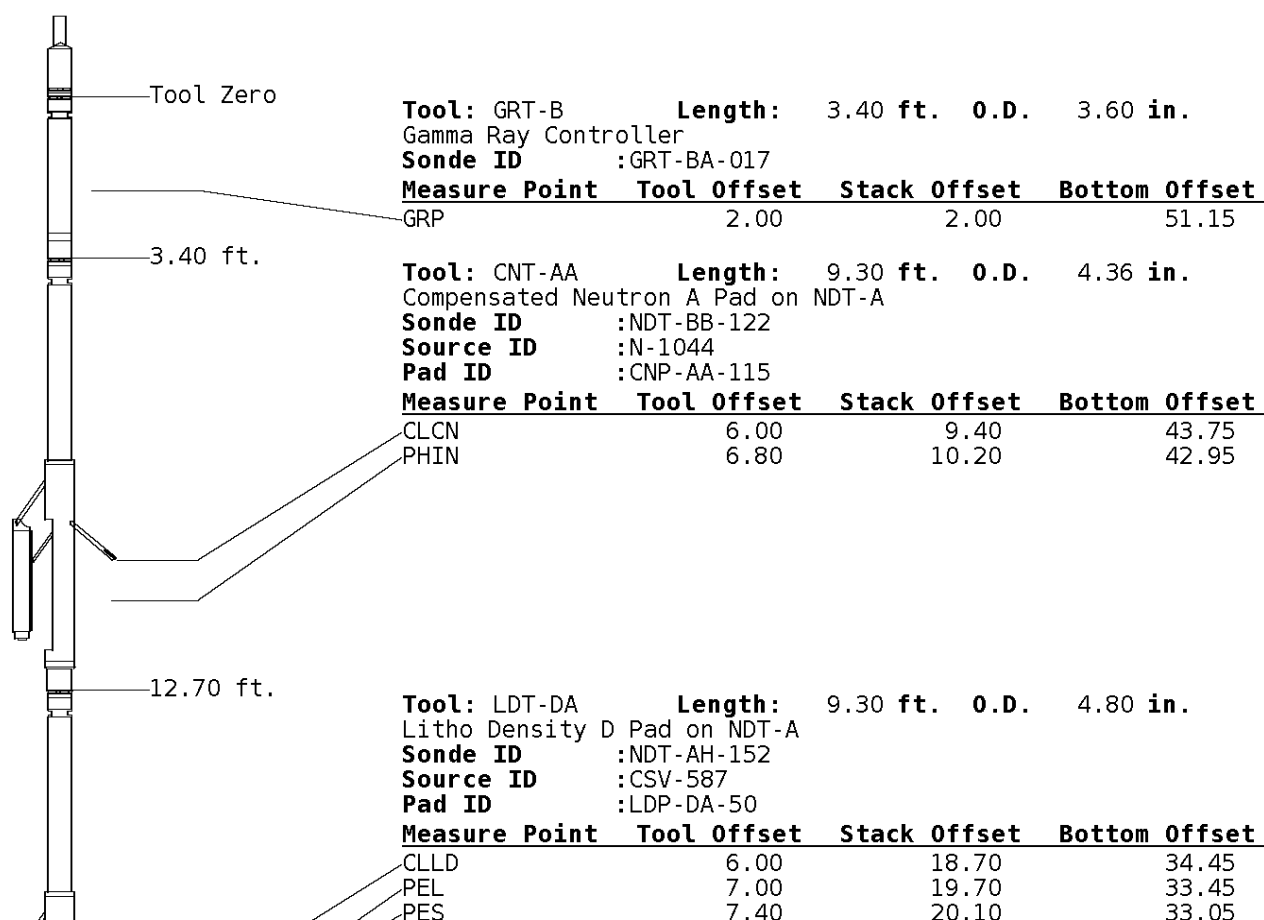
CUSTOMER REQUESTED DETAIL PULLED TO 3700'  
 PULLED TIGHT AT 5270' CLOSED CALIPERS REOPENED AT 5200'

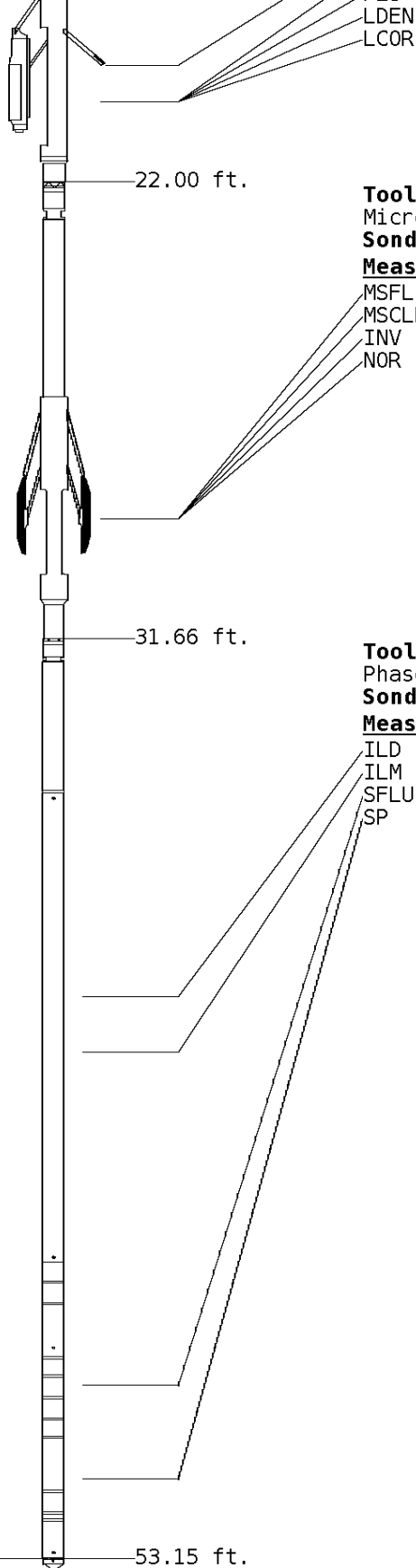
NO REPEAT DUE TO BAD HOLE CONDITIONS  
 DRAGGING MUD BALL FROM 5200' TO 5050'  
 GRT: GRP, GRX  
 CNT: PHIN, CLCNIN, PHXN  
 LDT: PORL, LCORN, PECLN, LDENN, PORLLS, CLLDIN, PRXL, PECLX, LDENNX, LCORX  
 MLT: NOR\_RF, INV\_RF, MSCLPIN  
 PIT: ILD, ILM, SPU, SFLAEC, CIRD

OPERATORS:+4  
 J.JOHNSON  
 C.GONZALES

## Tool String Schematic

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





Well File: CHIEFTAIN AHS CATTLE CO 10 JAN4 MSTK

Scale: 1:600

Format: DIL-600

Segment: V1.D1.S3 AS FINAL MAIN

Acquired: 2015-01/05 01:09 3.4.0-13284

Reference: 0

Processed: 2015-01/05 03:01 3.4.0-13284

TENSION  
LBS

10000

0

DEEP INDUCTION  
OHMM

0.0

500.0

0.0

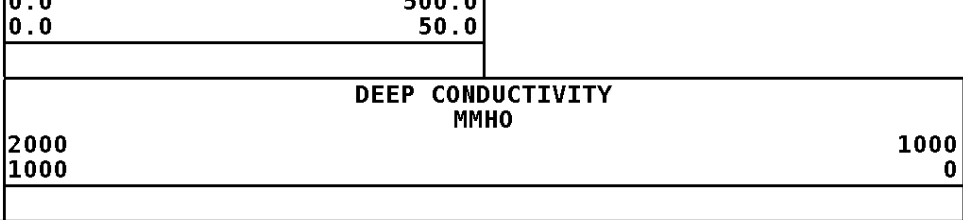
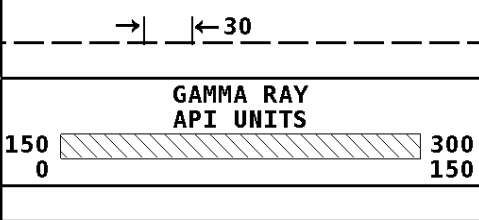
50.0

SPONTANEOUS POTENTIAL  
mV

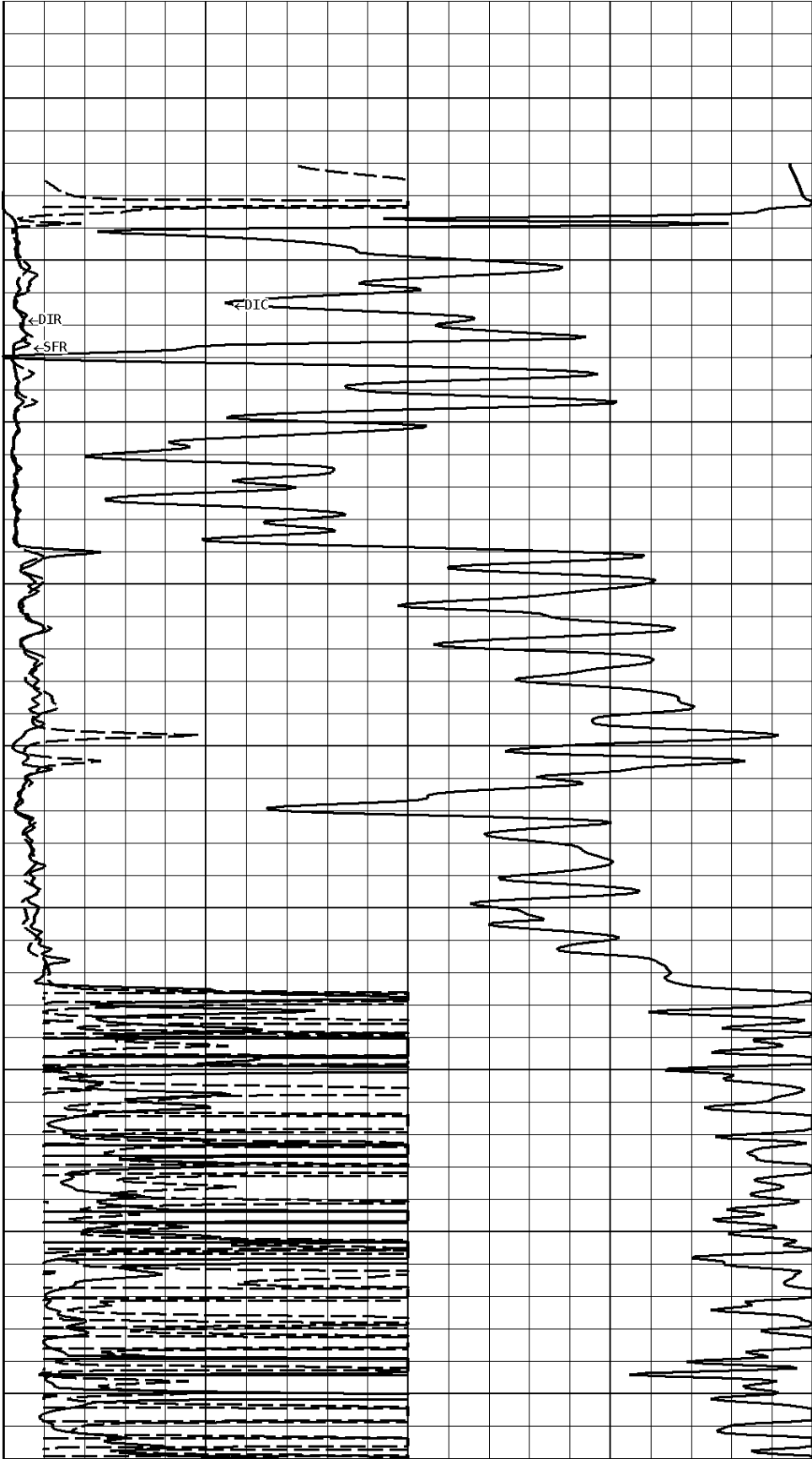
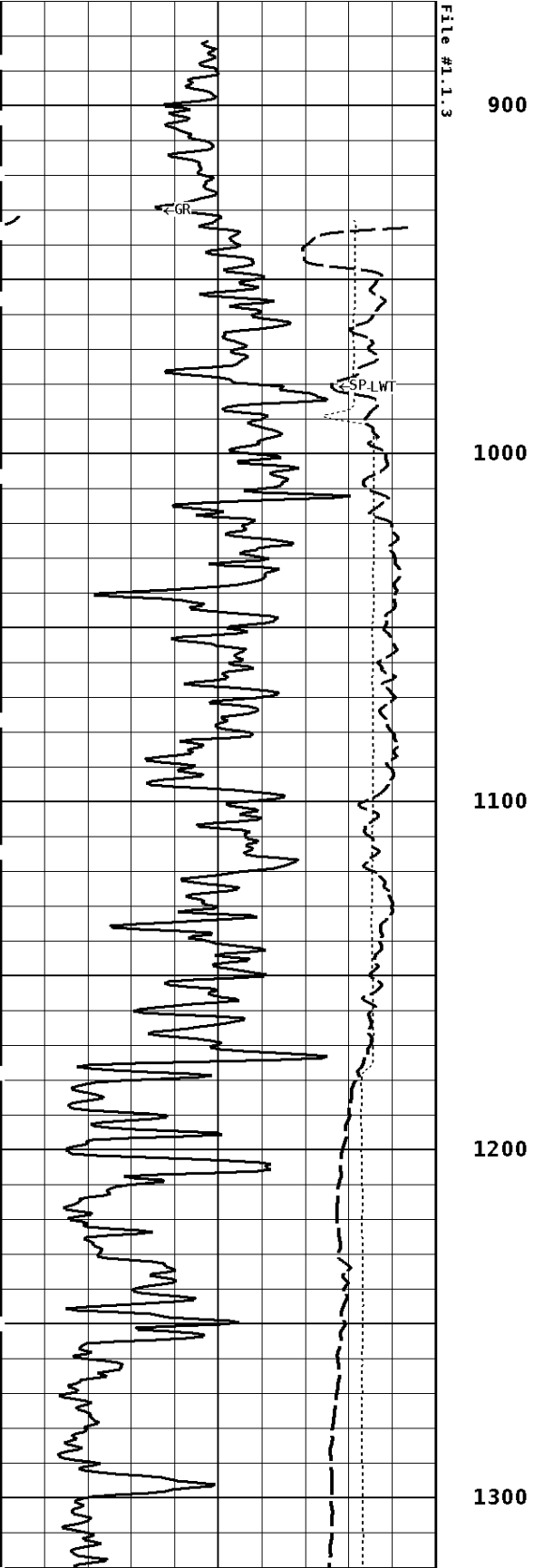
SHALLOW FOCUSED RESISTIVITY  
OHMM

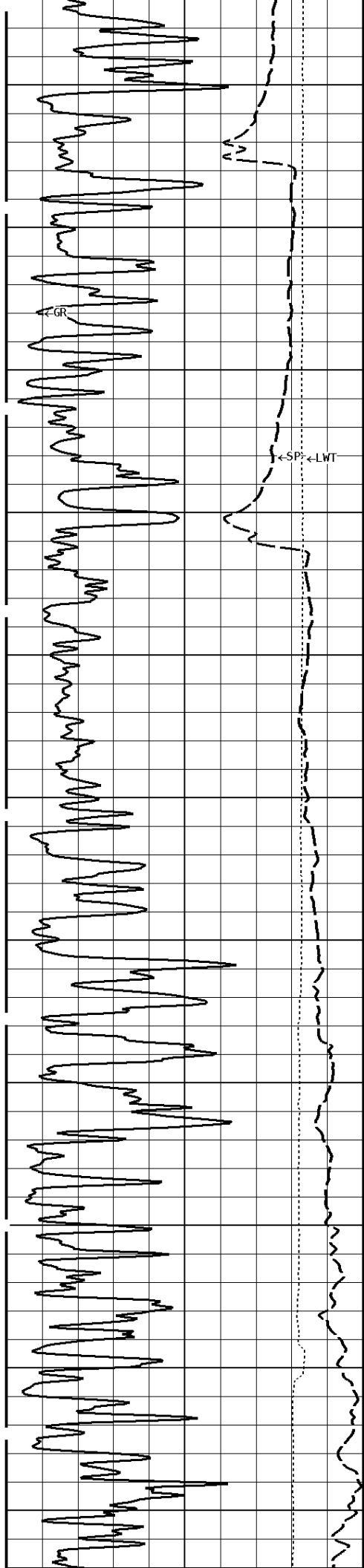
0.0

500.0



1:600 MAIN SECTION





1400

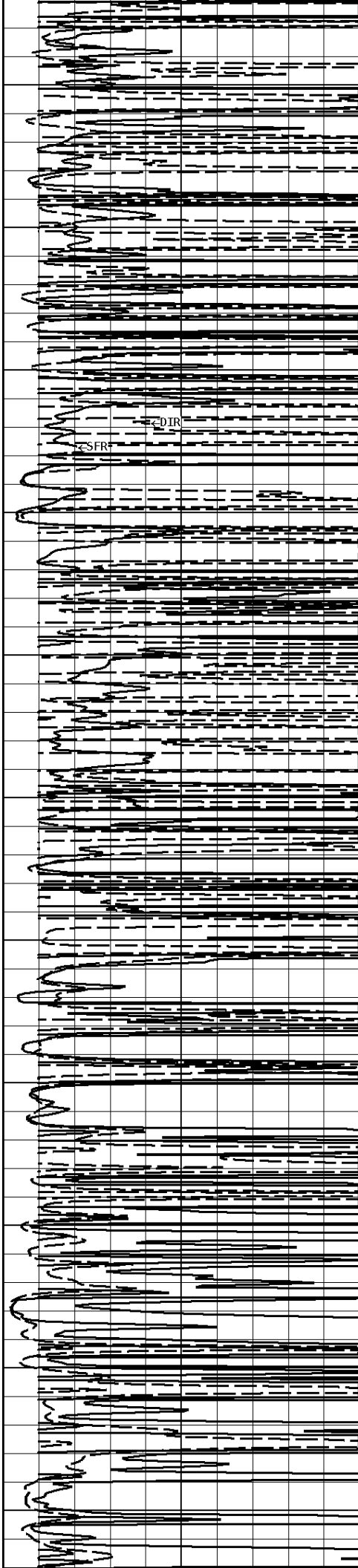
1500

1600

1700

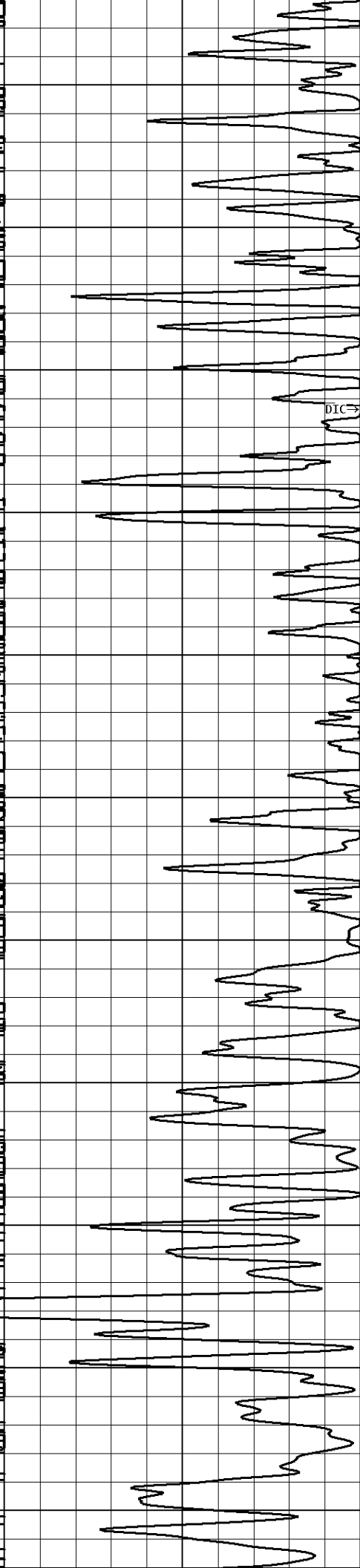
1800

←SP←LWT

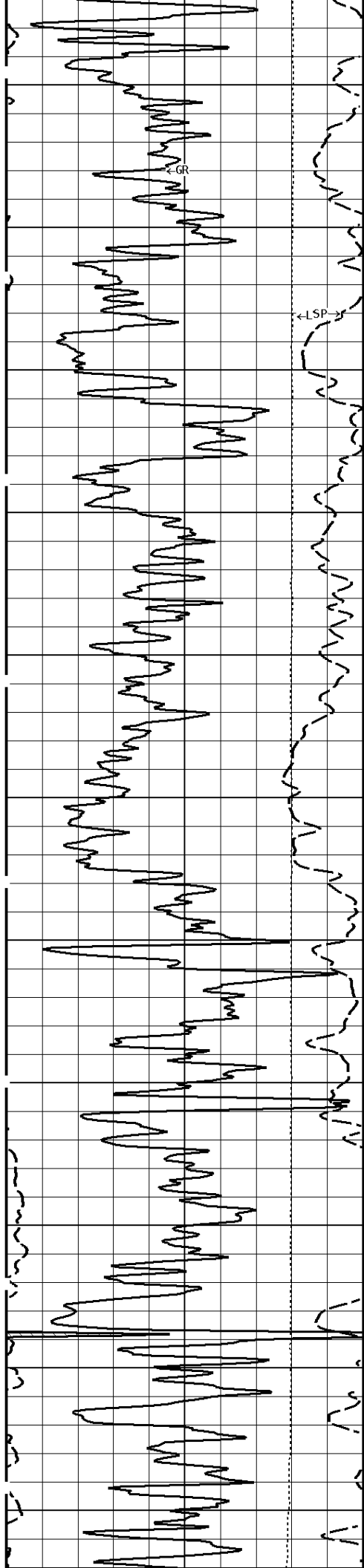


CSFR

COIR



DIC



1900

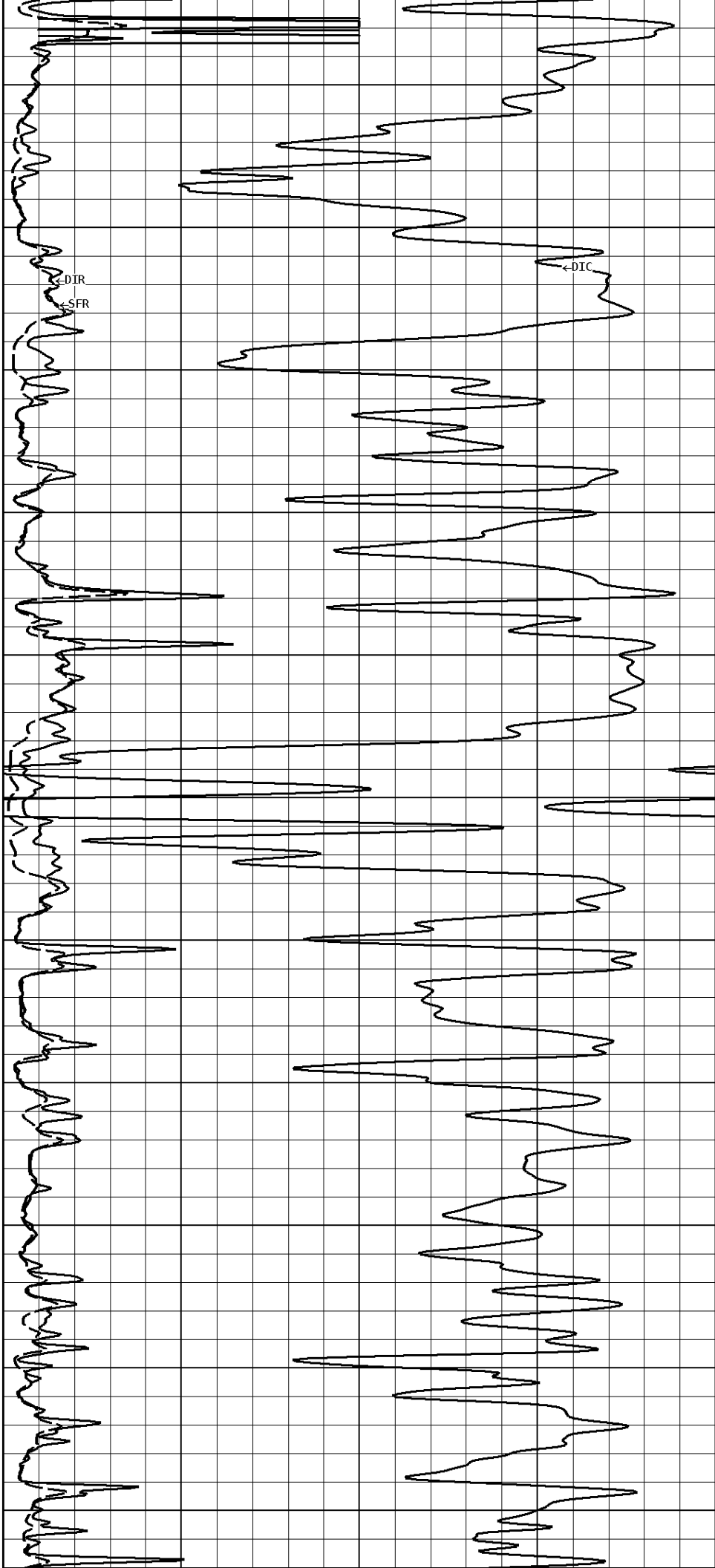
2000

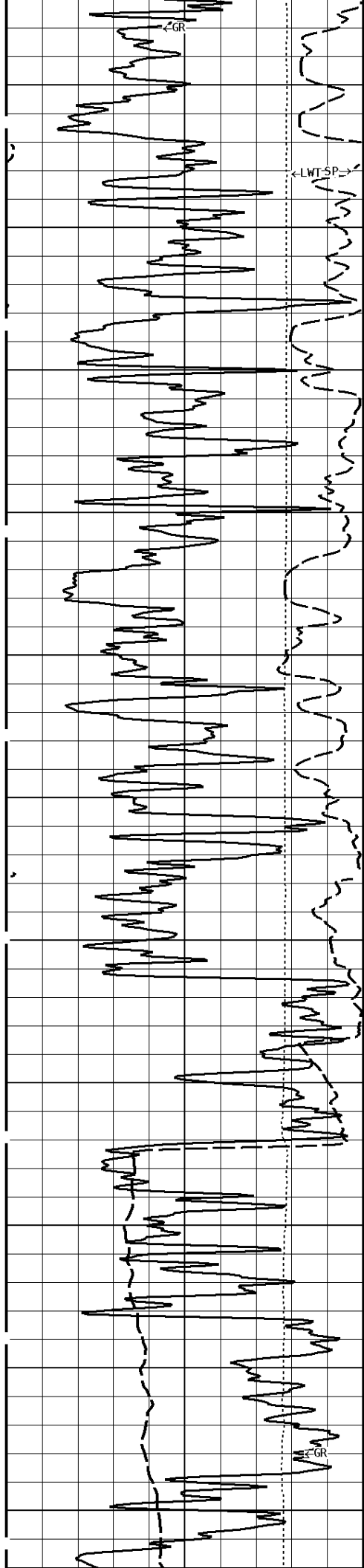
2100

2200

2300

2400





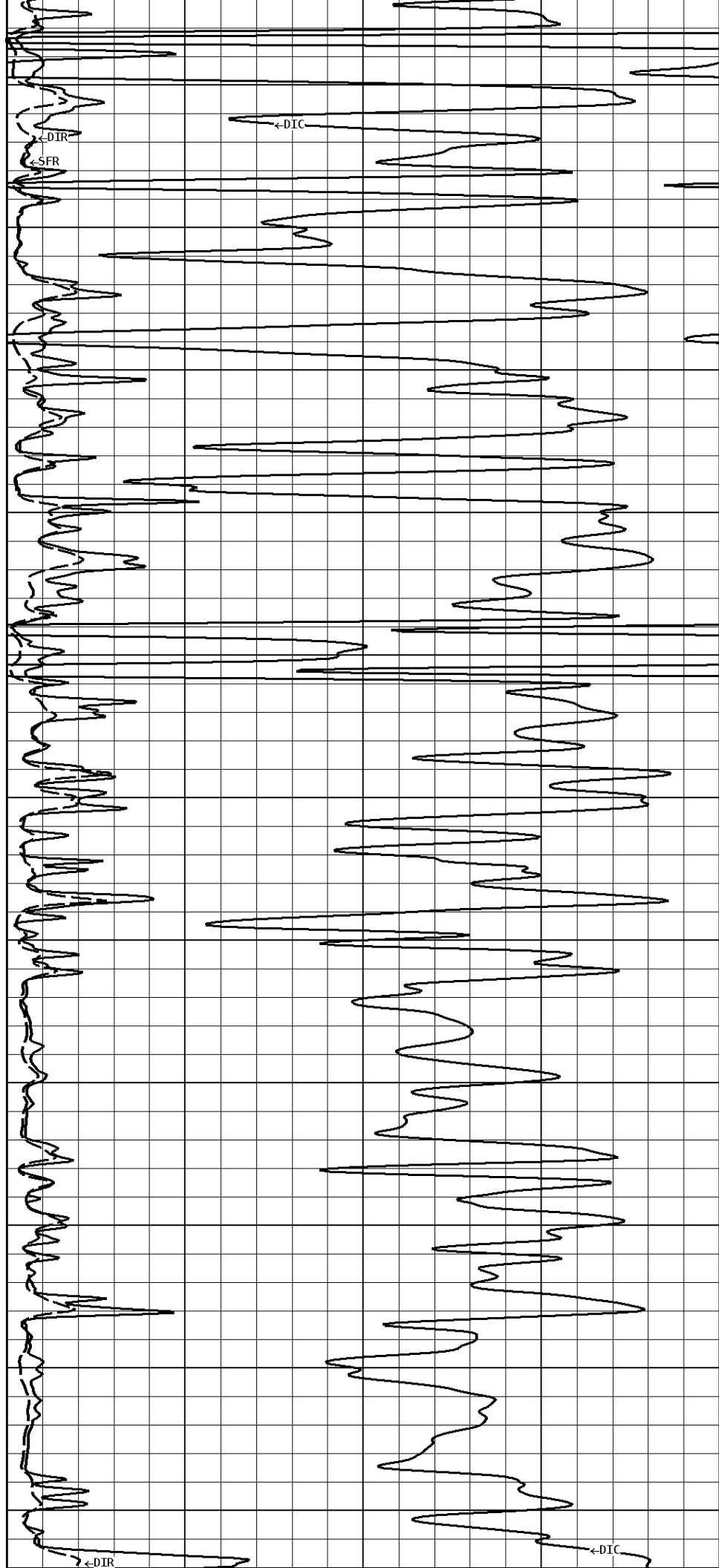
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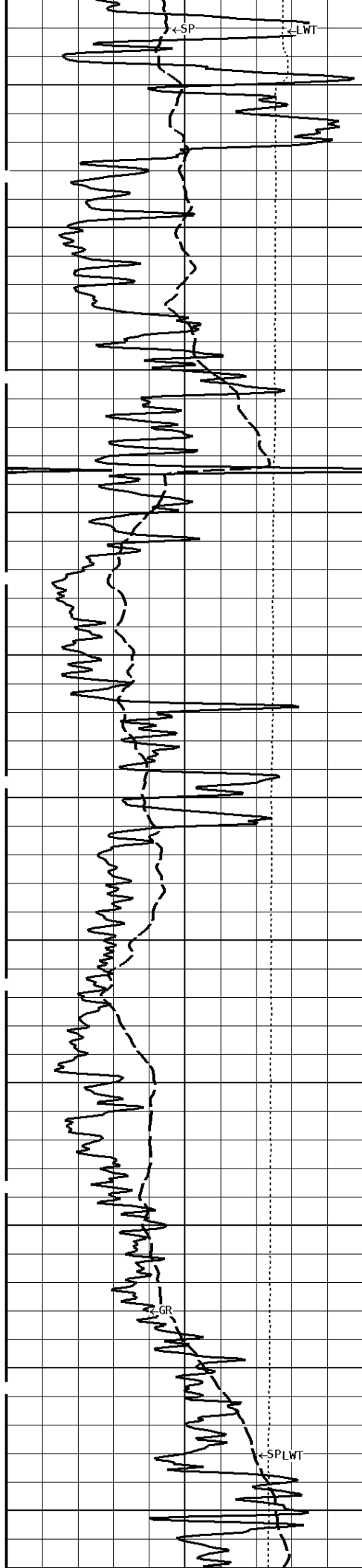
2600

2700

2800

2900





3000

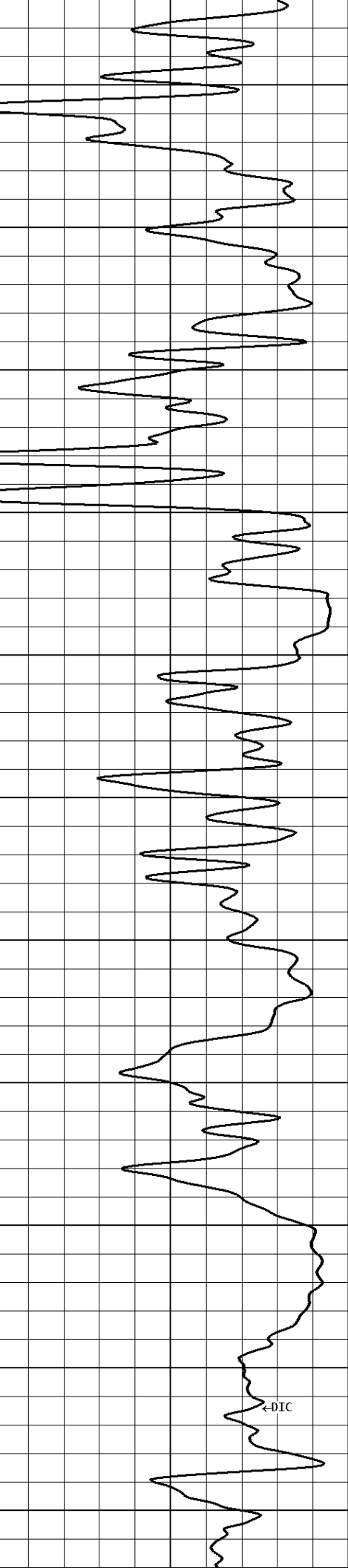
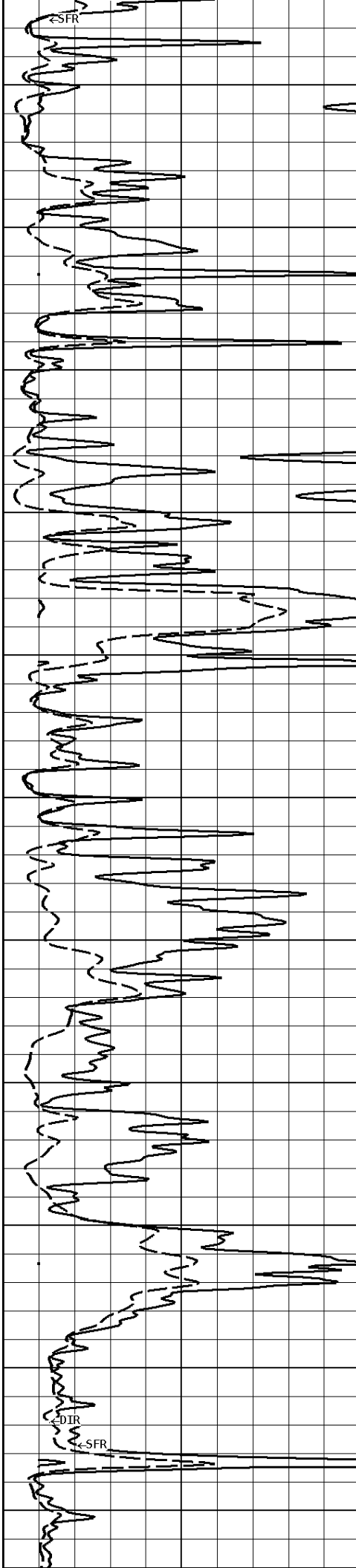
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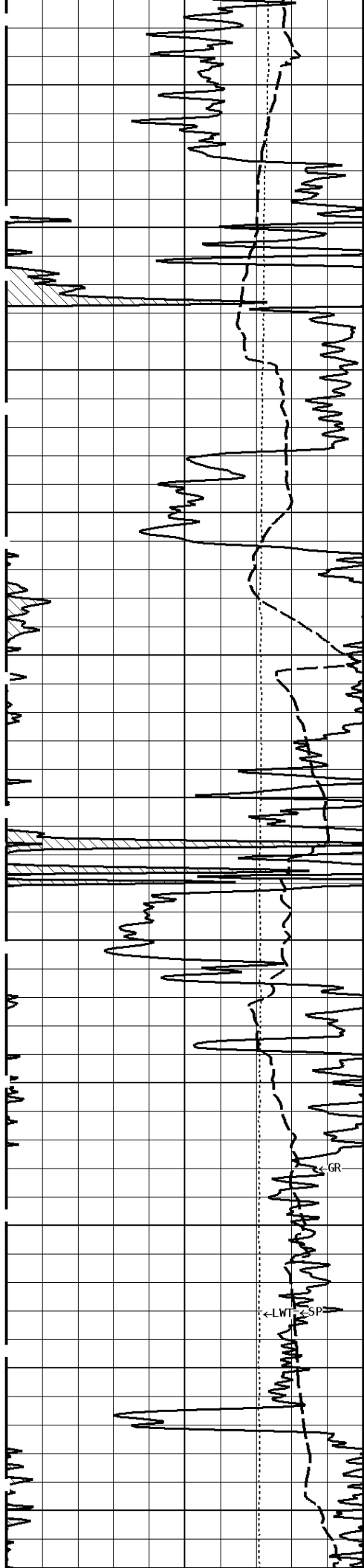
3200

3300

3400

3500





3600

3700

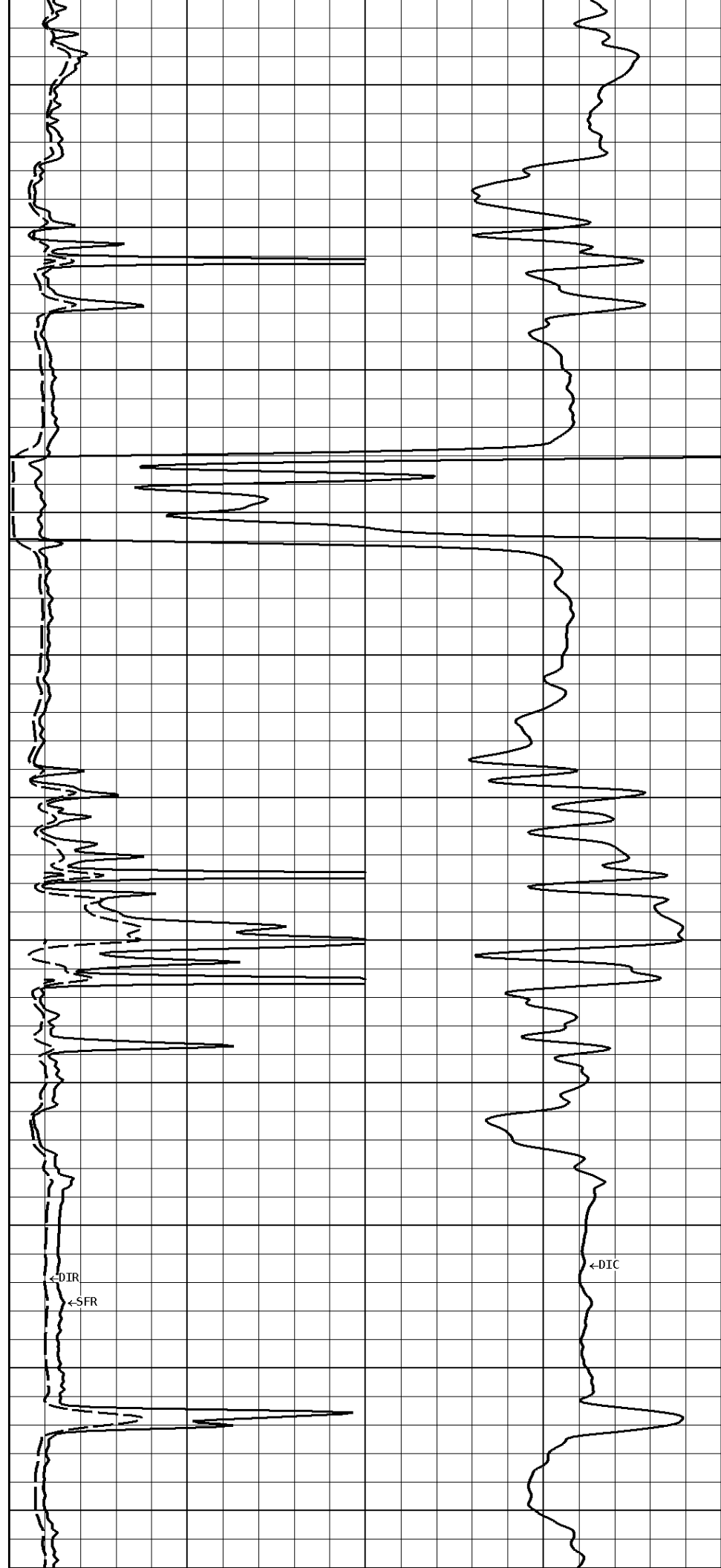
3800

3900

4000

←LWT  
←SP

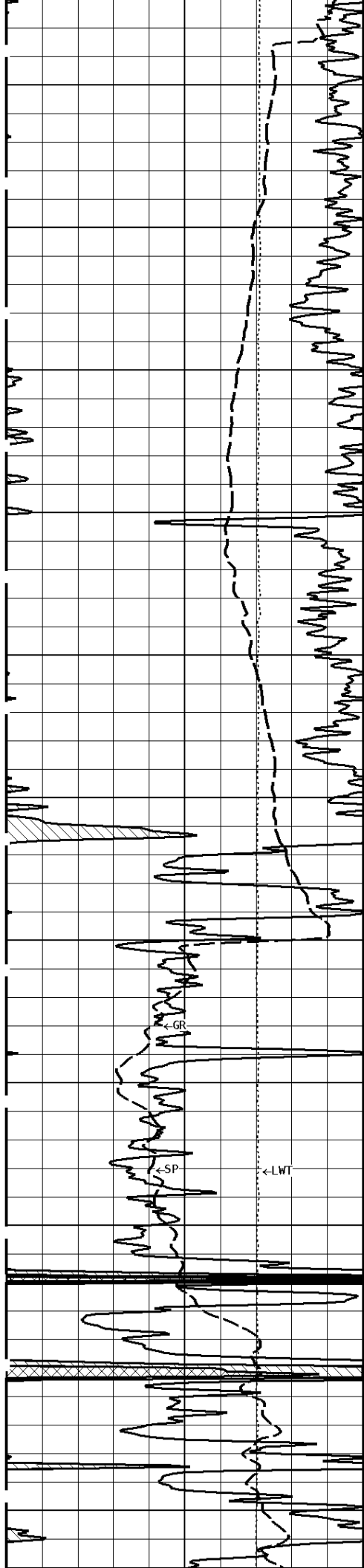
GR



←DIR

←SFR

←DIC



4100

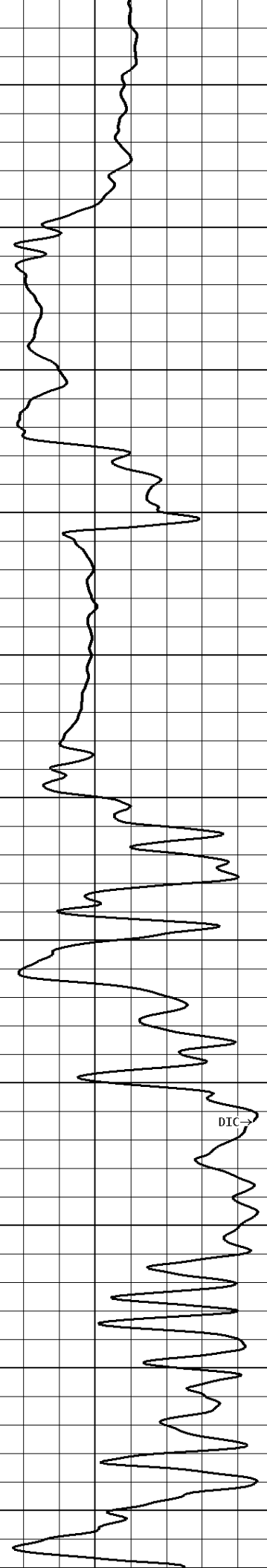
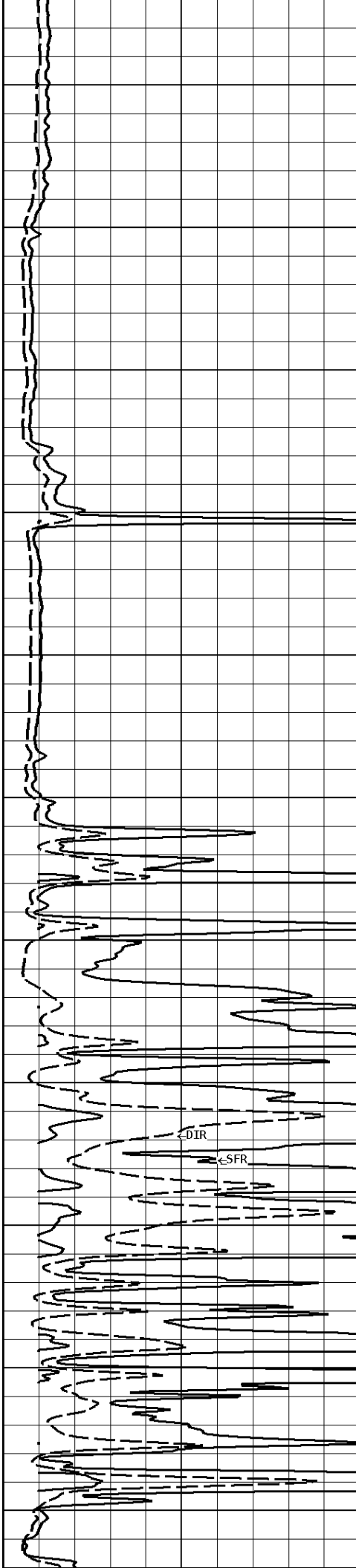
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4300

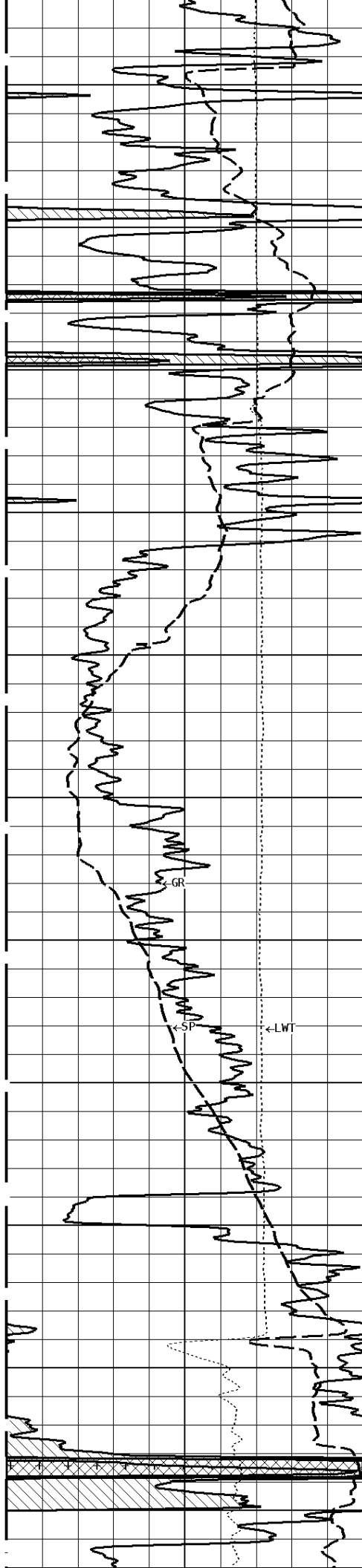
4400

4500

4600



DIR



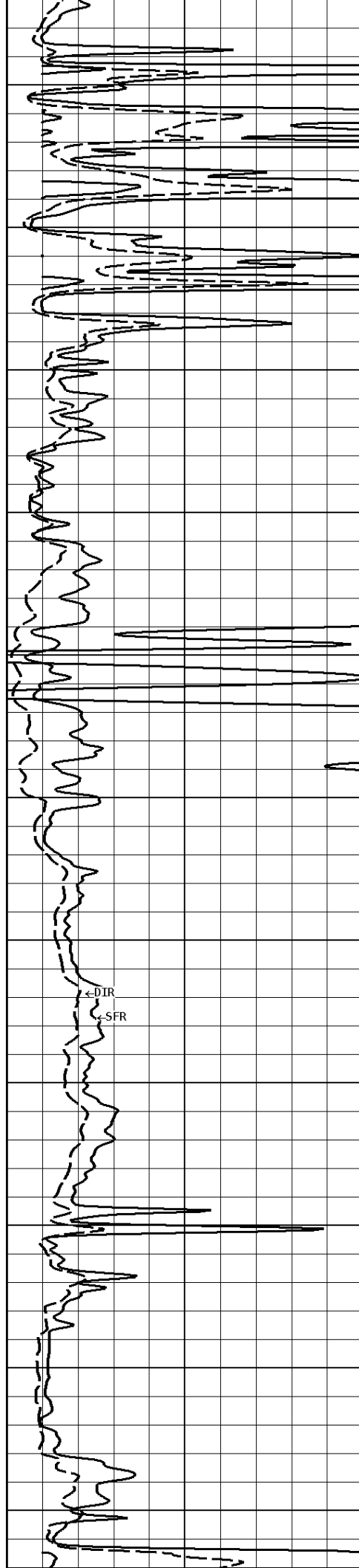
4700

4800

4900

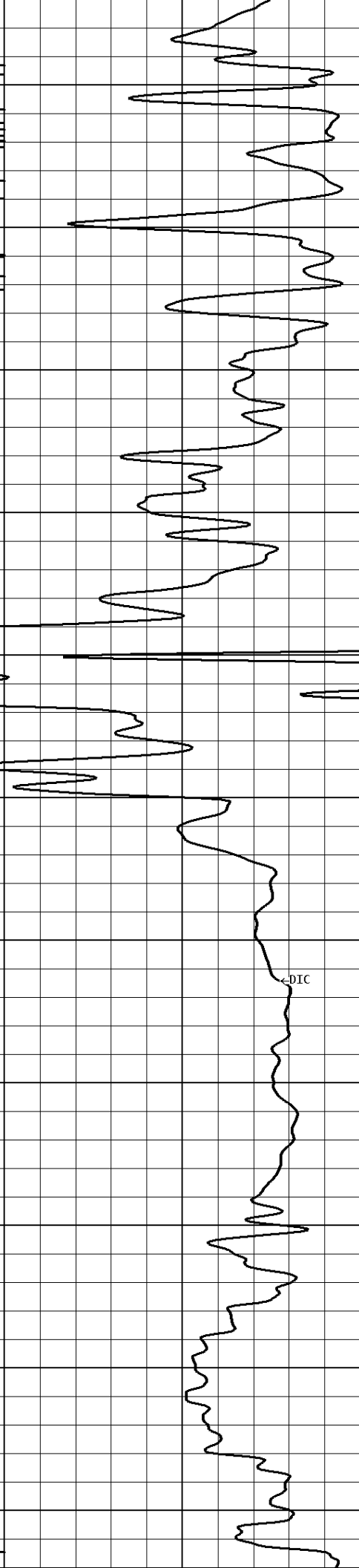
5000

5100

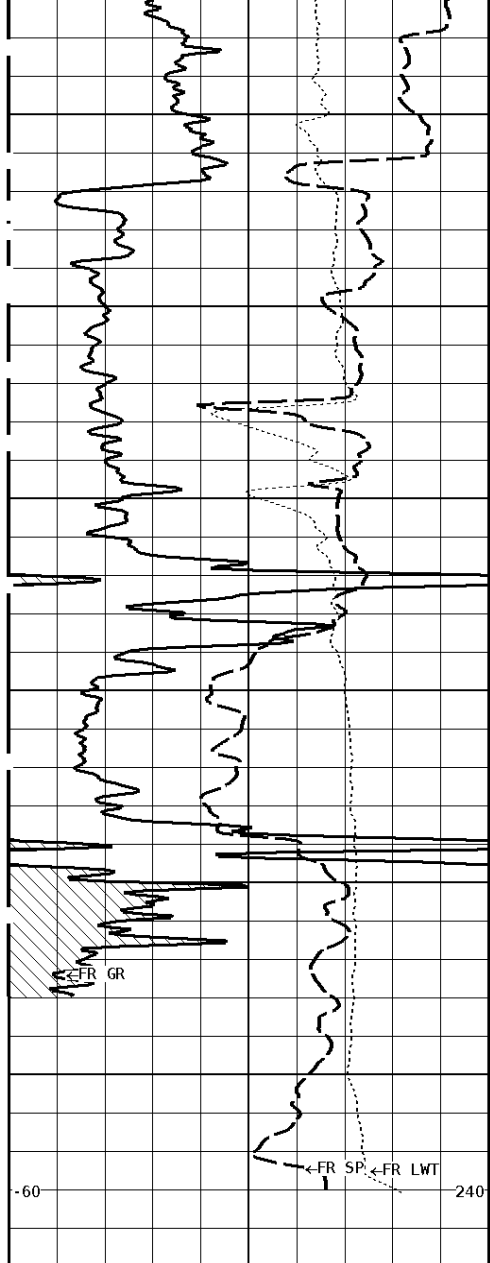


←DIR

←SFR

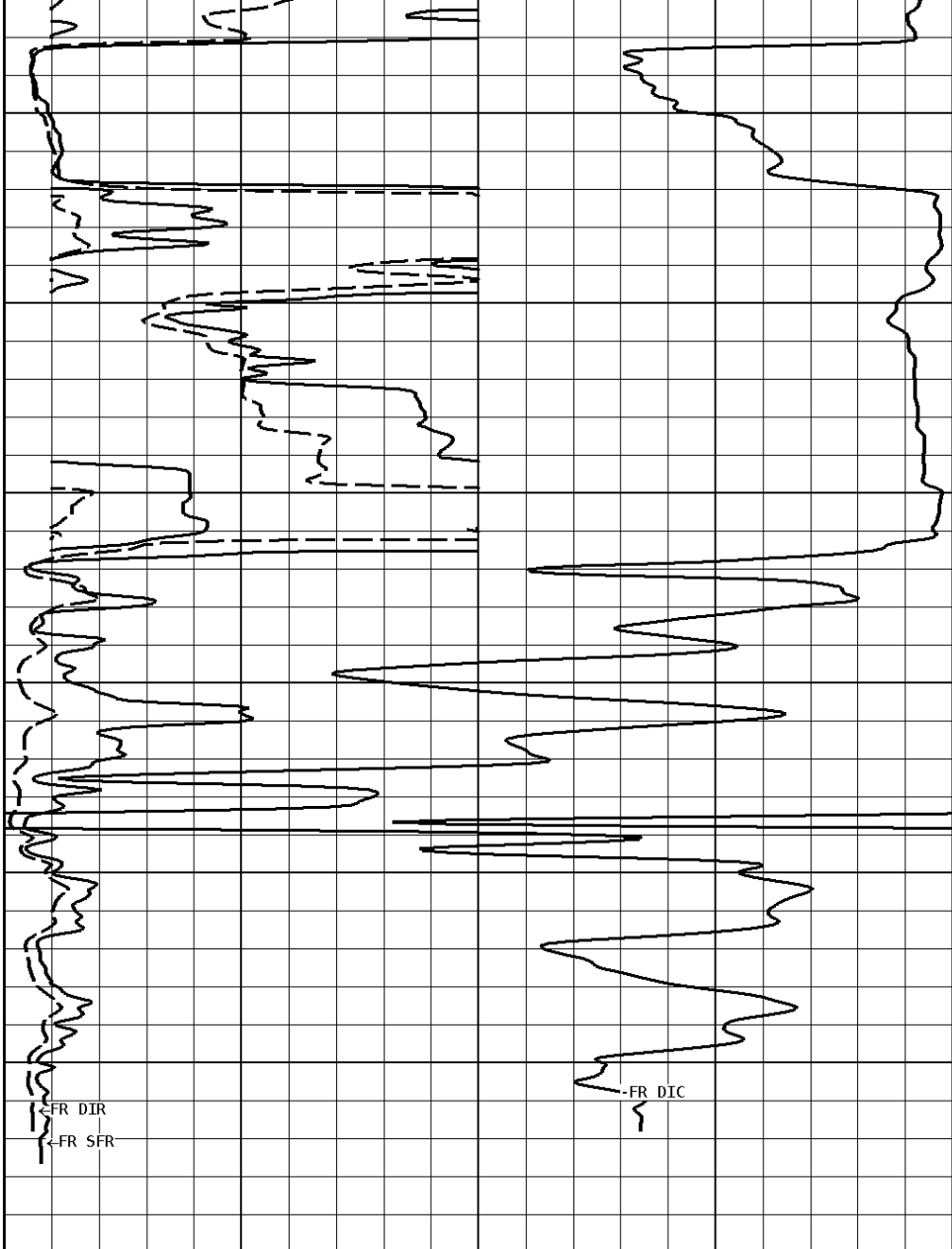


←DIC

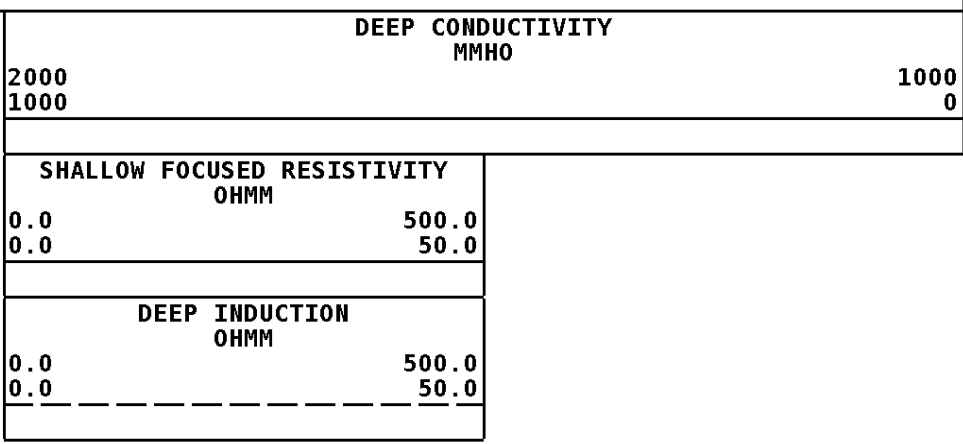
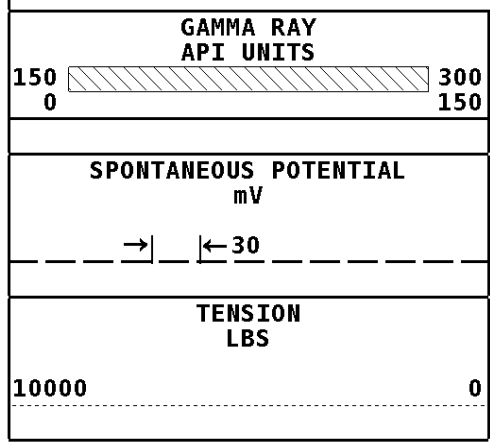


File #1.1.3

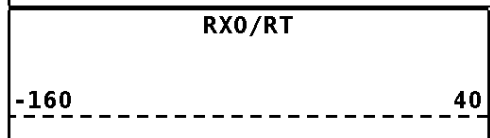
5200  
5300  
5400  
5476

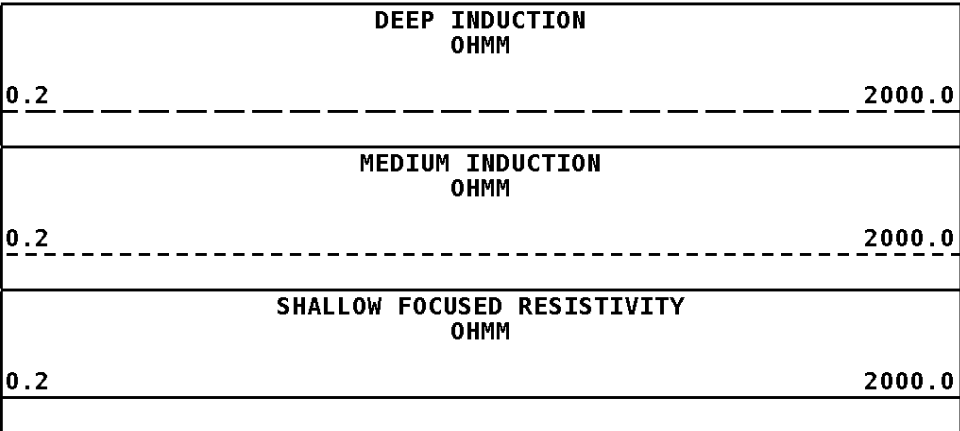
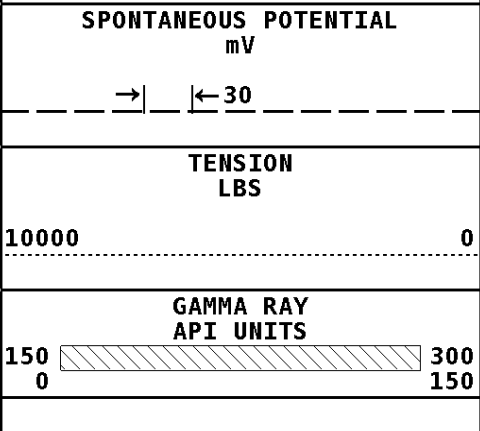


# 1:600 MAIN SECTION

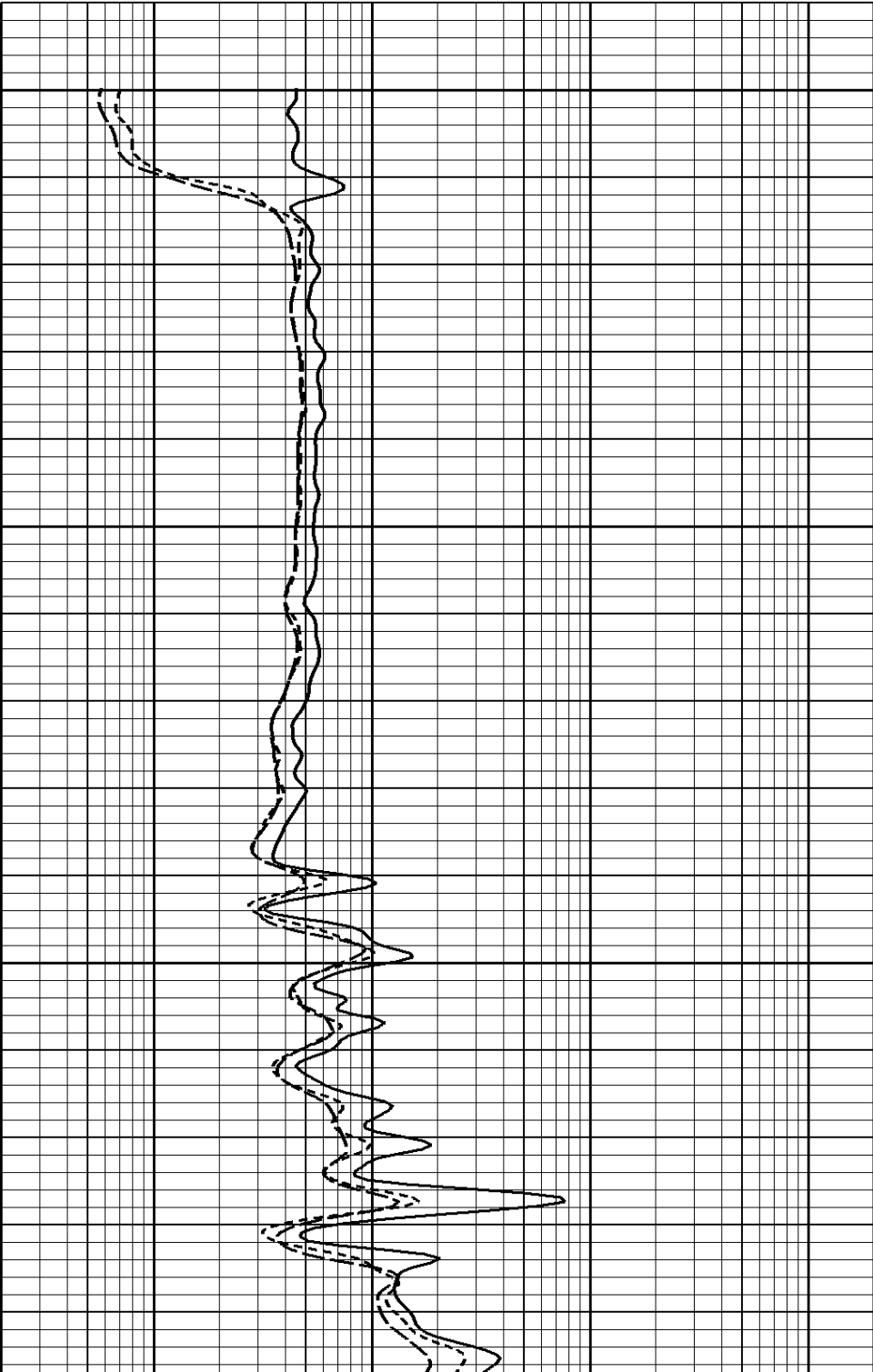
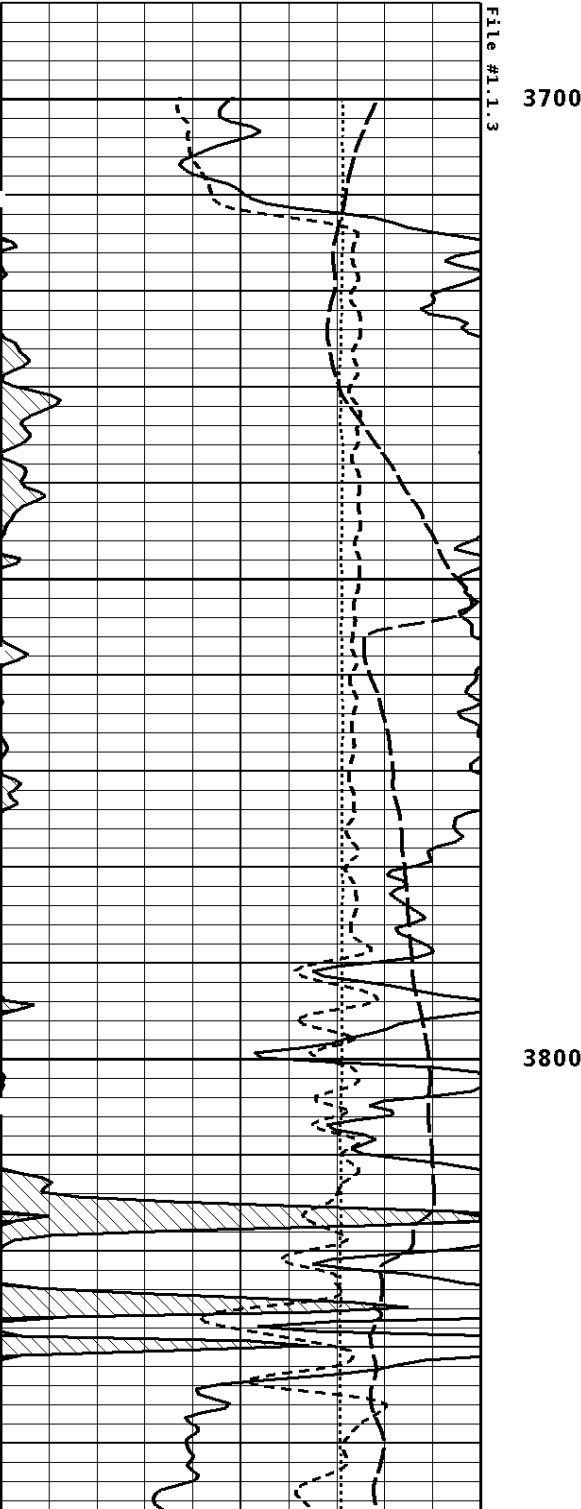


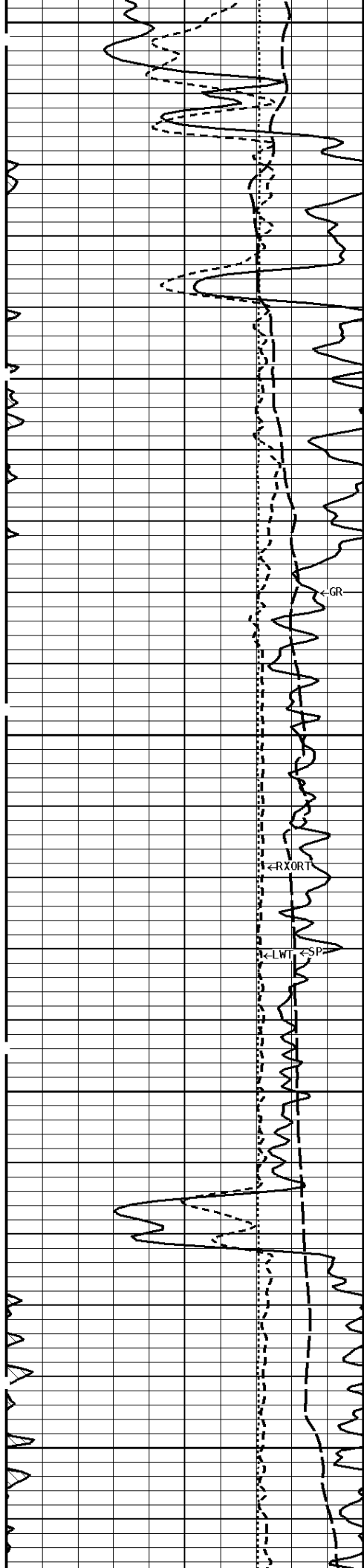
|                                                 |                                         |                 |
|-------------------------------------------------|-----------------------------------------|-----------------|
| Well File: CHIEFTAIN AHS CATTLE CO 10 JAN4 MSTK | Scale: 1:240                            | Format: DIL-240 |
| Segment: V1.D1.S3 AS FINAL MAIN                 | Acquired: 2015-01/05 01:09 3.4.0-13284  |                 |
| Reference: 0                                    | Processed: 2015-01/05 03:01 3.4.0-13284 |                 |





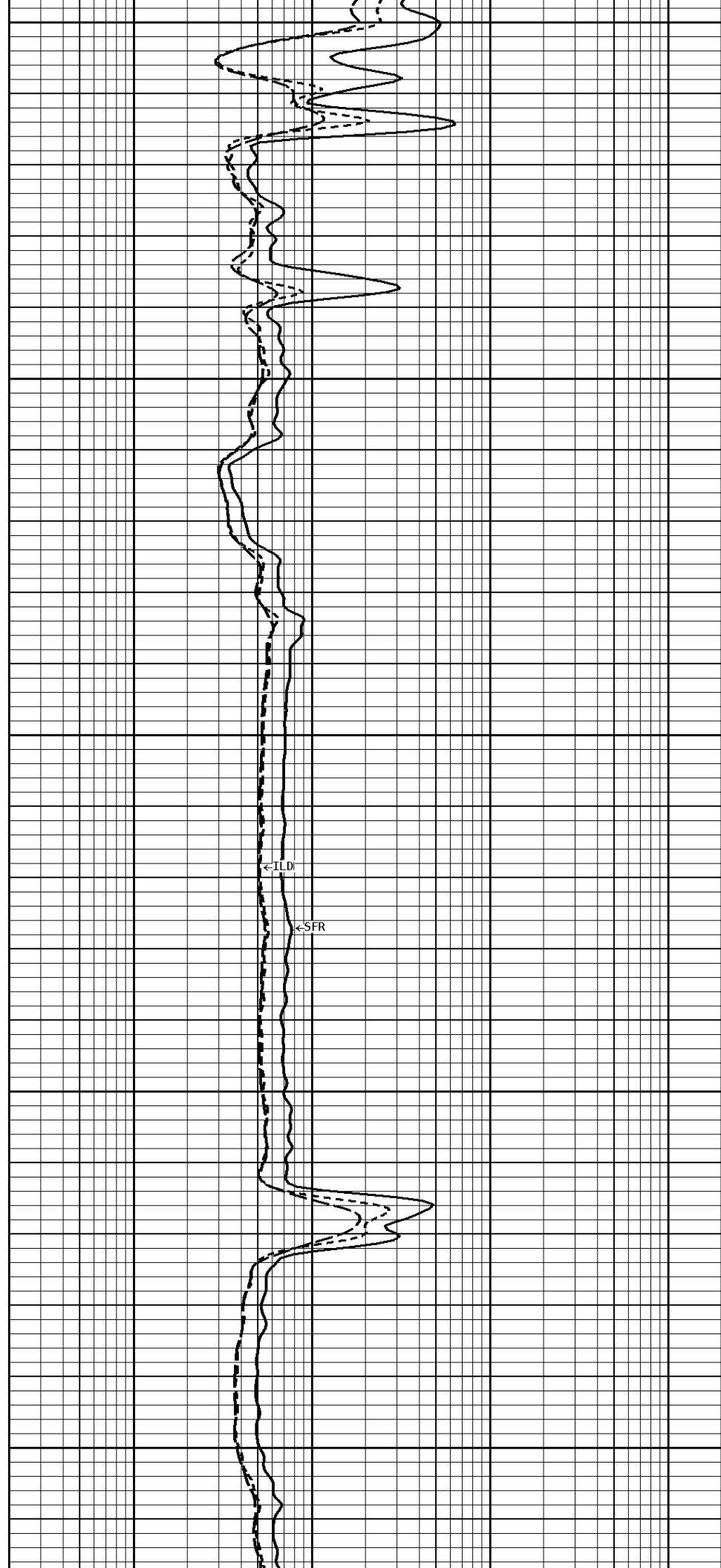
1:240 MAIN SECTION

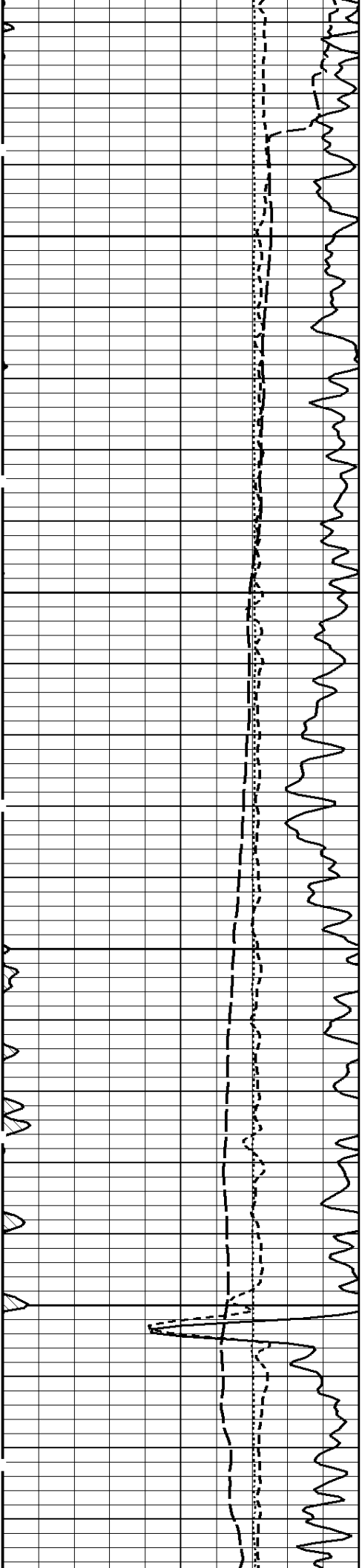




3900

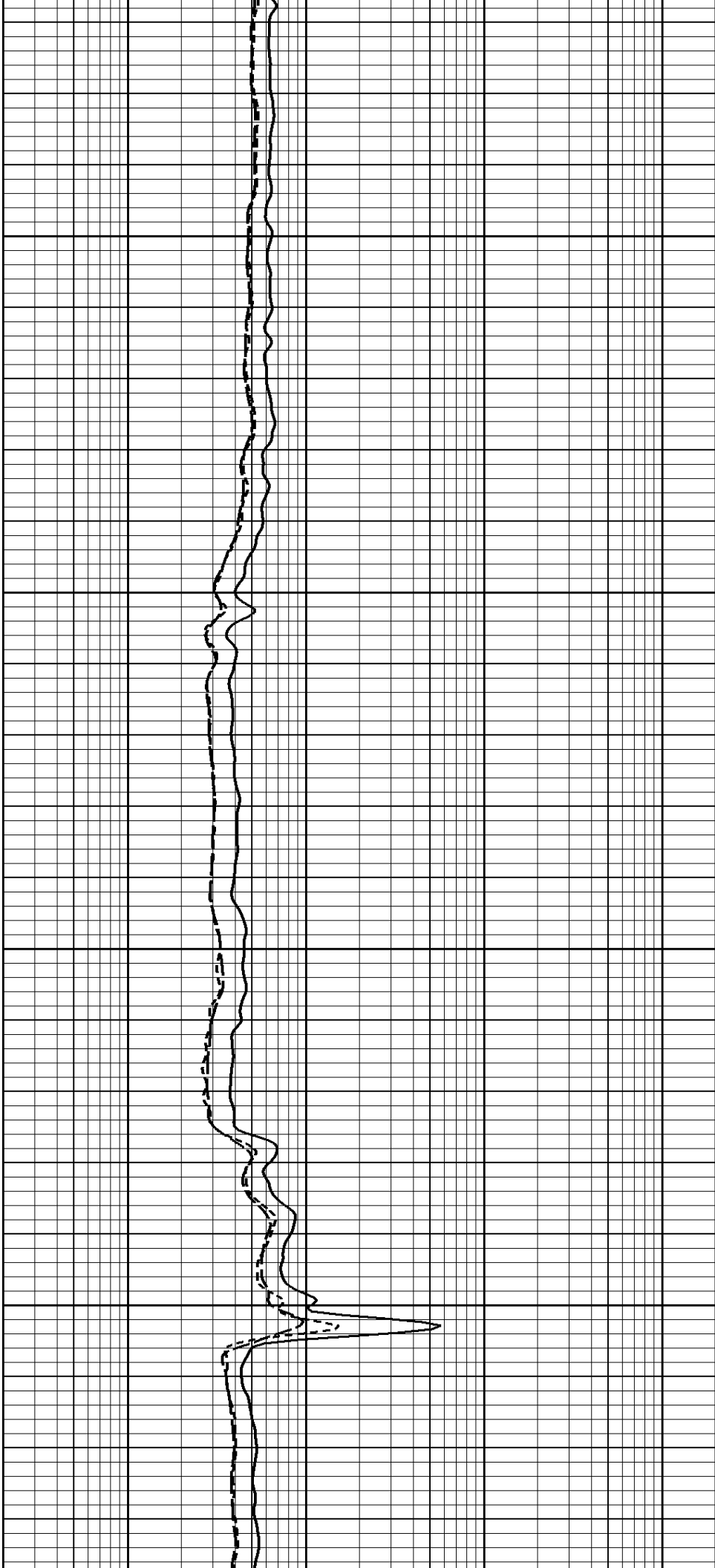
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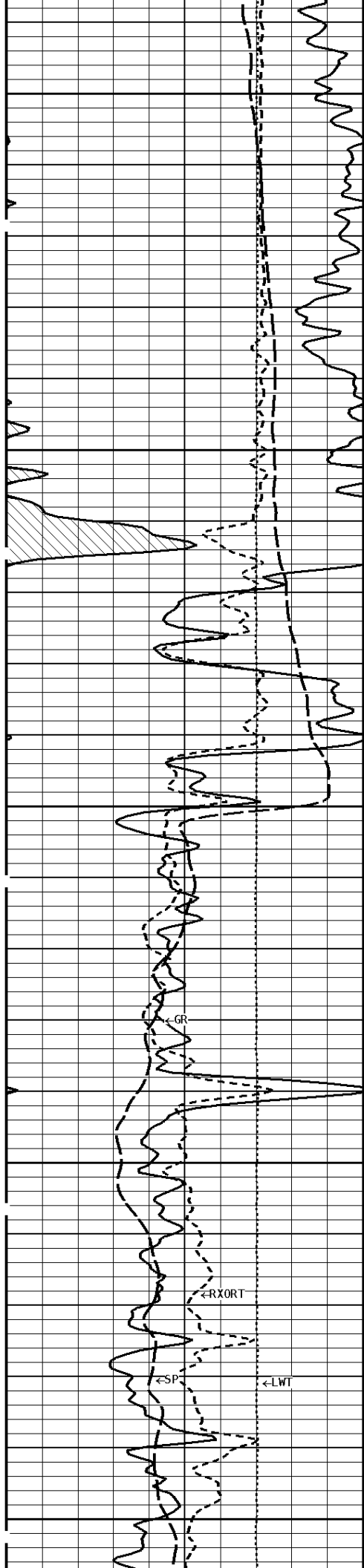




4100

4200

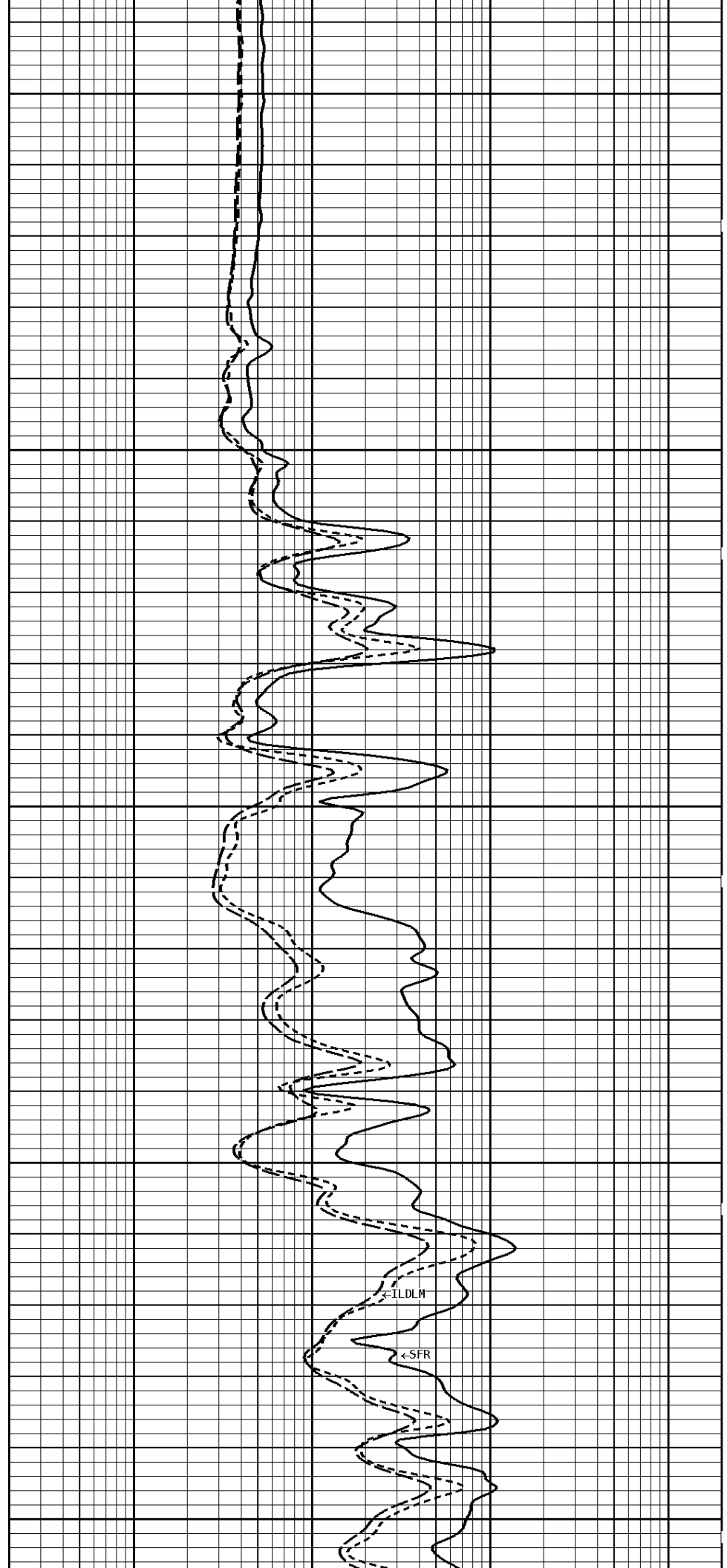




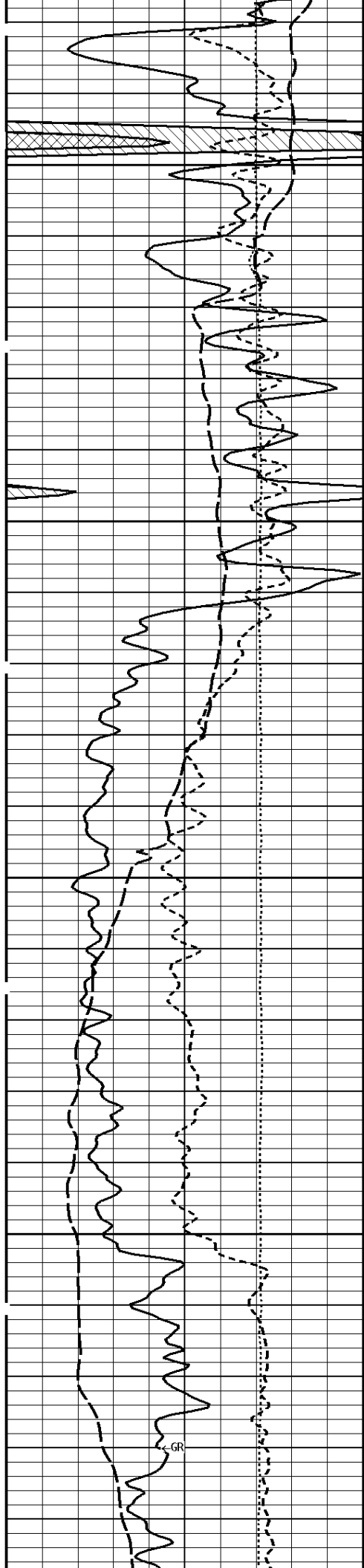
4300

4400

4500

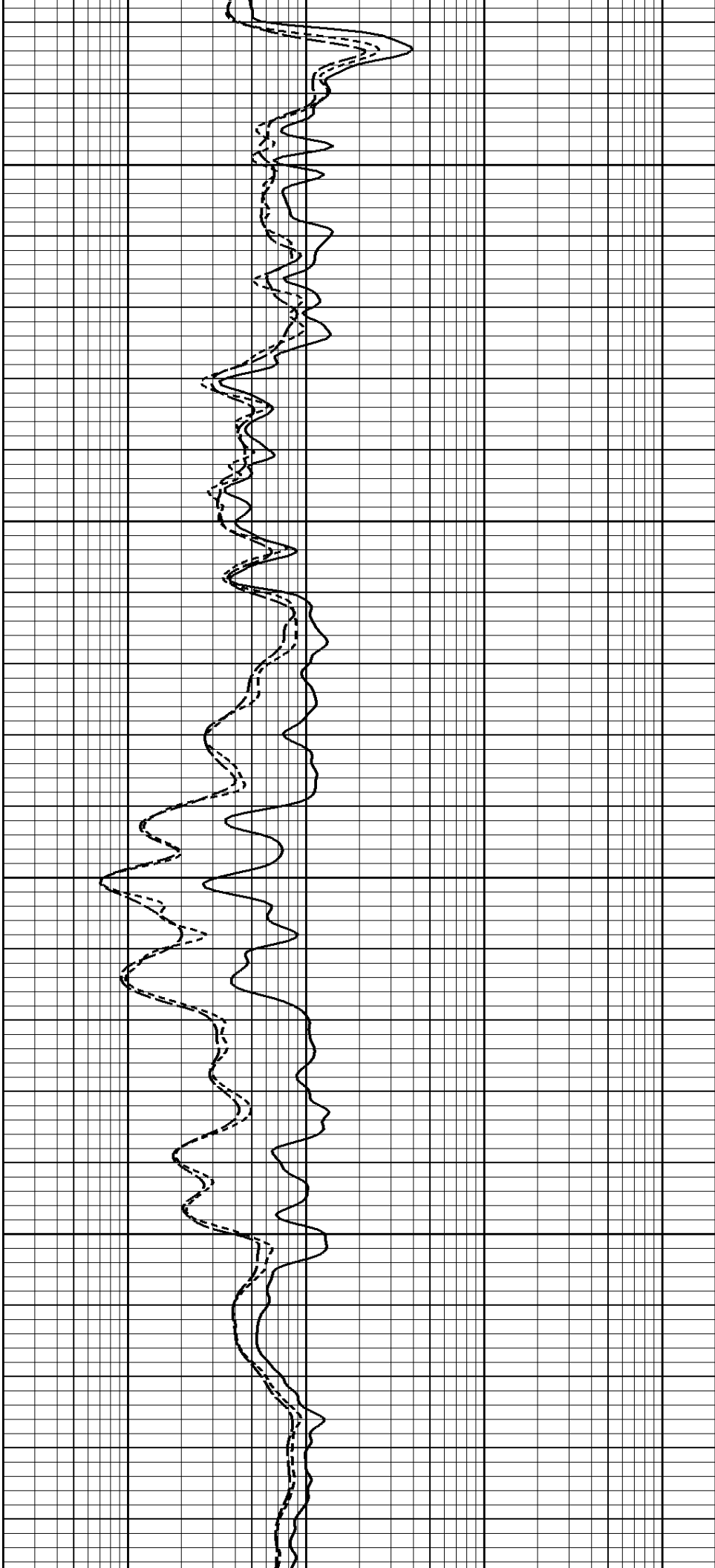


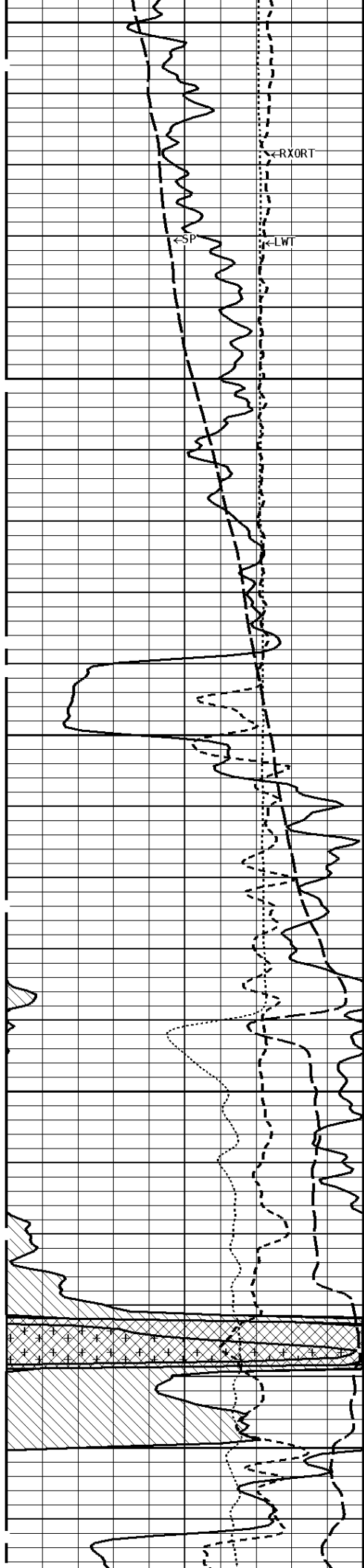




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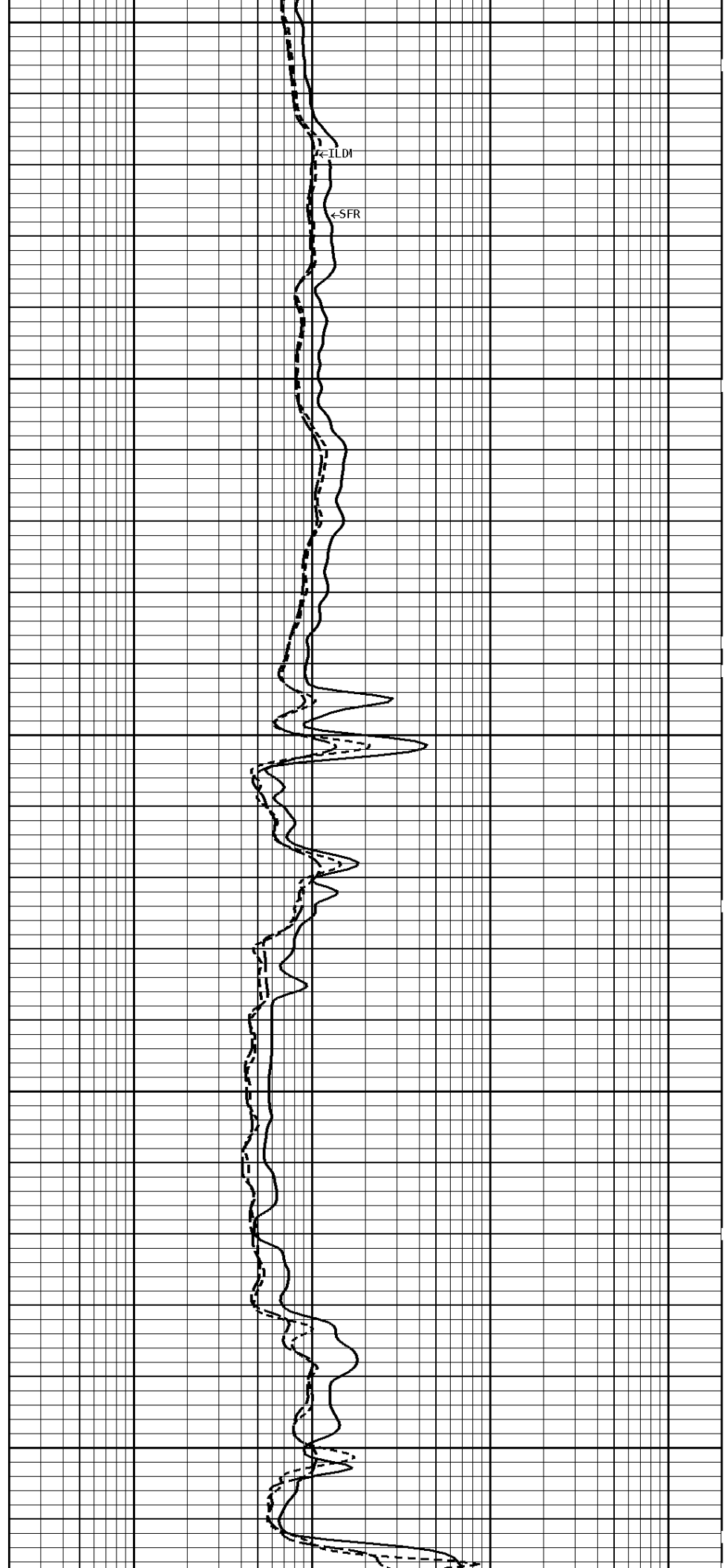
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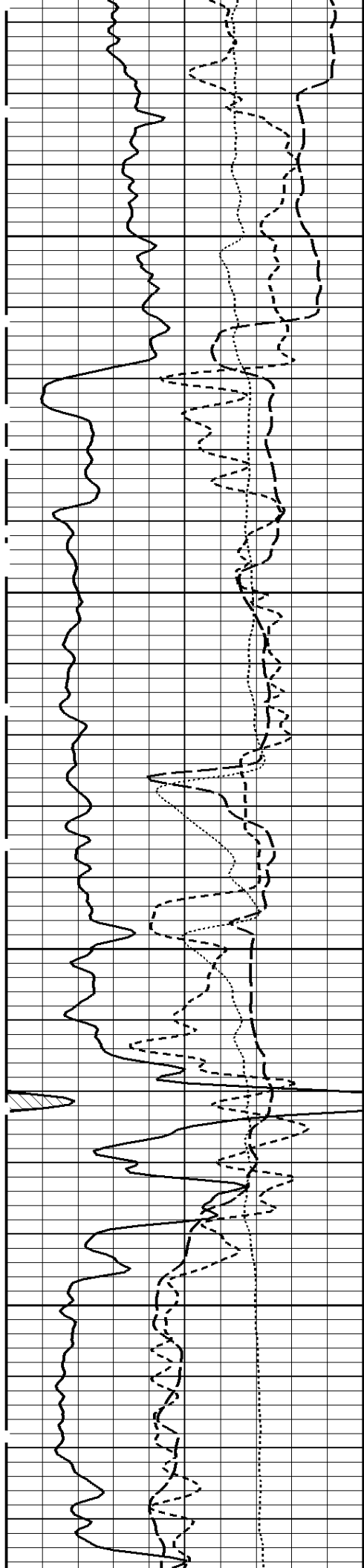




5000

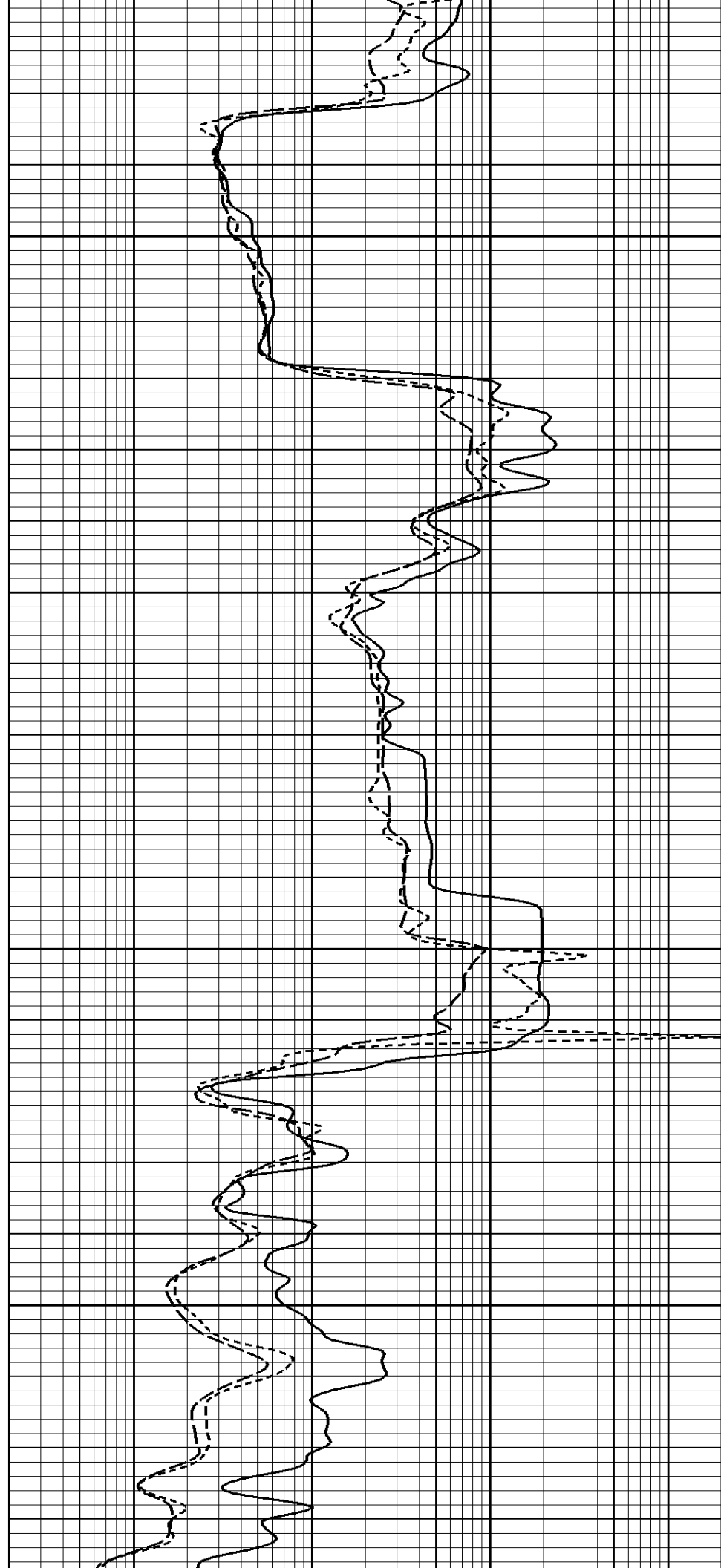
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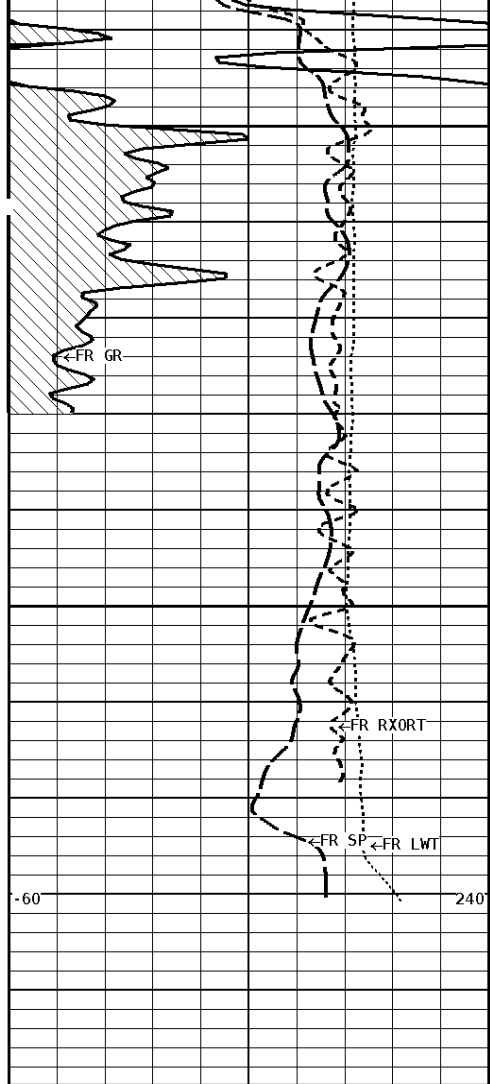




5200

5300



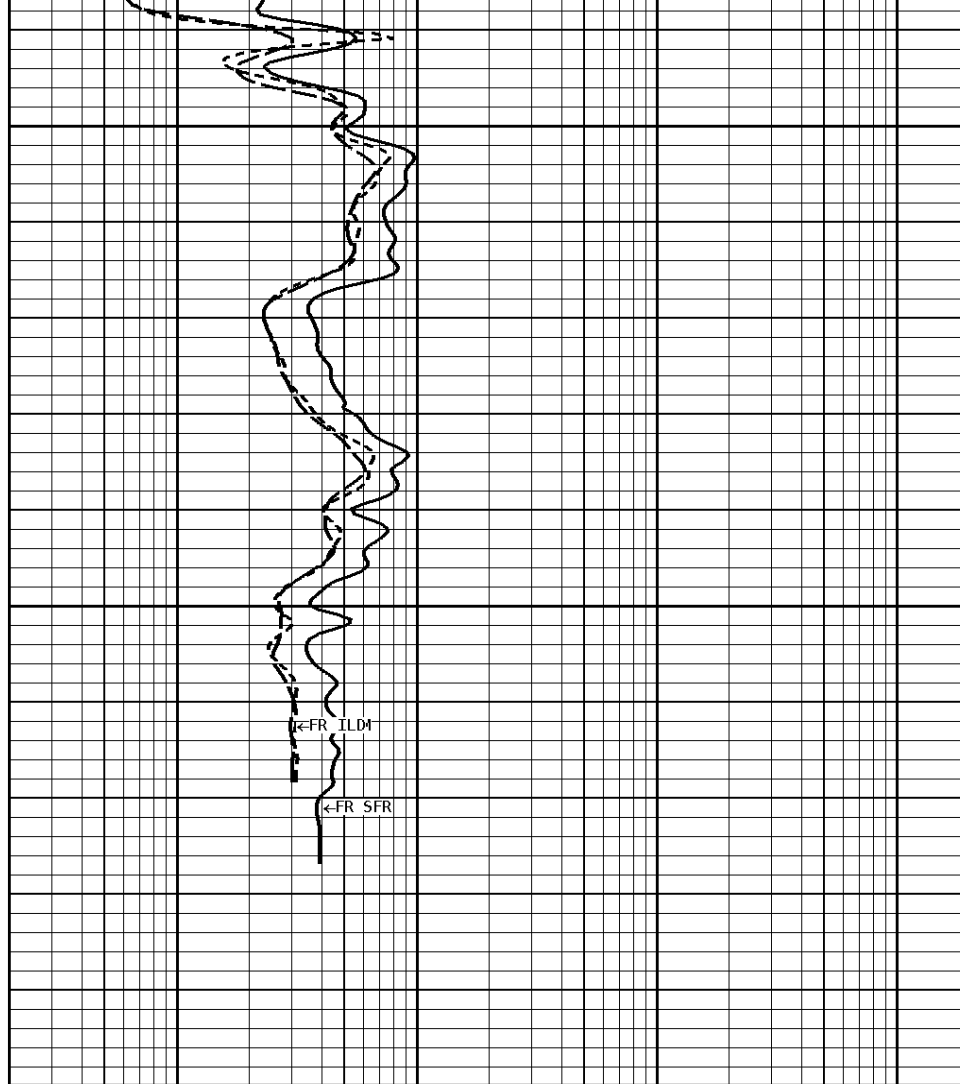


5400

5476

File #1.1.3

## 1:240 MAIN SECTION



| GAMMA RAY<br>API UNITS      |      |
|-----------------------------|------|
| 150                         | 300  |
| 0                           | 150  |
| TENSION<br>LBS              |      |
| 10000                       | 0    |
| SPONTANEOUS POTENTIAL<br>mV |      |
| →                           | ← 30 |
| RXO/RT                      |      |
| -160                        | 40   |

| SHALLOW FOCUSED RESISTIVITY<br>OHMM |        |
|-------------------------------------|--------|
| 0.2                                 | 2000.0 |
| MEDIUM INDUCTION<br>OHMM            |        |
| 0.2                                 | 2000.0 |
| DEEP INDUCTION<br>OHMM              |        |
| 0.2                                 | 2000.0 |

### \* Borehole Zone Factors \*

| Zone 1 99999.0 to 0.0 Feet |          |       |
|----------------------------|----------|-------|
| Drill Bit Size             | 7.875    | in    |
| Casing Diameter            | 5.500    | in    |
| BHT Depth                  | 5445.000 | ft    |
| Borehole Temperature       | 132.0    | degF  |
| Temperature Gradient       | 1.00     | DFHF  |
| Resistivity Of Mud         | 2.000    | ohm/m |
| Velocity of Mud            | 52.00    | ft/s  |

## \* Calibration Summary \*

| Shop Calibration<br>GRT-B |            |              |                 |                |       |  |
|---------------------------|------------|--------------|-----------------|----------------|-------|--|
| Performed : 02-Jan-2015   |            |              | Time : 13:01    |                |       |  |
| Sensor Suite : GR-GR5     |            |              | ID : GRT-BA-017 |                |       |  |
| GR                        | Background | Measured Jig | Units           | Calibrated Jig | Units |  |
|                           | 61         | 378          | CPS             | 175            | GRAPI |  |

| Shop Calibration<br>PIT-CA |          |         |                 |        |       |  |
|----------------------------|----------|---------|-----------------|--------|-------|--|
| Performed : 10-Nov-2014    |          |         | Time : 10:45    |        |       |  |
| Sensor Suite : P-IND-T     |          |         | ID : PIT-CA-062 |        |       |  |
| Medium                     |          |         |                 |        |       |  |
|                            | Measured |         | Calibrated      |        | Units |  |
|                            | R        | X       | R               | X      |       |  |
| Air                        | 130581   | 130719  | -1.4            | -1.4   | MMHOS |  |
| Zero                       | 131070   | 131071  | 25.8            | 5.1    | MMHOS |  |
| Reference                  | 253678   | 249876  | 5025.8          | 5005.1 | MMHOS |  |
| Loop                       | 131482   | 220909  | 3831.0          | 3757.5 | MMHOS |  |
| Sonde Error                |          |         | -1.0            | -15.6  | MMHOS |  |
| Cond                       |          |         | 5025.8          | 5005.1 | MMHOS |  |
| Deep                       |          |         |                 |        |       |  |
|                            | Measured |         | Calibrated      |        | Units |  |
|                            | R        | X       | R               | X      |       |  |
| Air                        | 129104   | 131422  | 1.0             | 0.9    | MMHOS |  |
| Zero                       | 131066   | 131070  | 40.8            | -16.1  | MMHOS |  |
| Reference                  | 234020   | 231481  | 2040.8          | 1983.9 | MMHOS |  |
| Loop                       | 130025   | 221327  | 1809.7          | 1773.8 | MMHOS |  |
| Sonde Error                |          |         | -8.4            | -11.7  | MMHOS |  |
| Cond                       |          |         | 2040.8          | 1983.9 | MMHOS |  |
| Temperature                |          |         |                 |        |       |  |
|                            | Measured |         | Calibrated      |        | Units |  |
|                            | Low      | High    | Low             | High   |       |  |
|                            | 16980.0  | 56920.0 | 70.0            | 350.0  | DEGF  |  |

|                         |          |           |                 |           |       |  |
|-------------------------|----------|-----------|-----------------|-----------|-------|--|
| Performed : 10-Nov-2014 |          |           | Time : 10:35    |           |       |  |
| Sensor Suite : SFL      |          |           | ID : PIT-CA-062 |           |       |  |
| Internal                |          |           |                 |           |       |  |
|                         | Measured |           | Calibrated      |           | Units |  |
|                         | Zero     | Reference | Zero            | Reference |       |  |
| Im                      | 32763.6  | 48943.6   | 0.0             | 7028.0    | uA    |  |
| Ib                      | 32767.1  | 48748.6   | 0.0             | 1750.0    | mA    |  |
| MOM1                    | 32729.9  | 57504.3   | 0.0             | 175.0     | mV    |  |
| Equivalent SFL          |          |           | 43.97           |           | OHMM  |  |

|                         |          |           |                 |           |       |  |
|-------------------------|----------|-----------|-----------------|-----------|-------|--|
| Performed : 10-Nov-2014 |          |           | Time : 10:33    |           |       |  |
| Sensor Suite : P-SP     |          |           | ID : PIT-CA-062 |           |       |  |
| Internal                |          |           |                 |           |       |  |
|                         | Measured |           | Calibrated      |           | Units |  |
|                         | Zero     | Reference | Zero            | Reference |       |  |
|                         | 32765.9  | 58978.1   | 0.0             | 1000.0    | mV    |  |

Well File: CHIEFTAIN\_AHS\_CATTLE\_CO\_10\_JAN4\_MSTK

Scale: 1:1200 Format: DIL1200

Segment: V1.D1.S3 AS FINAL MAIN

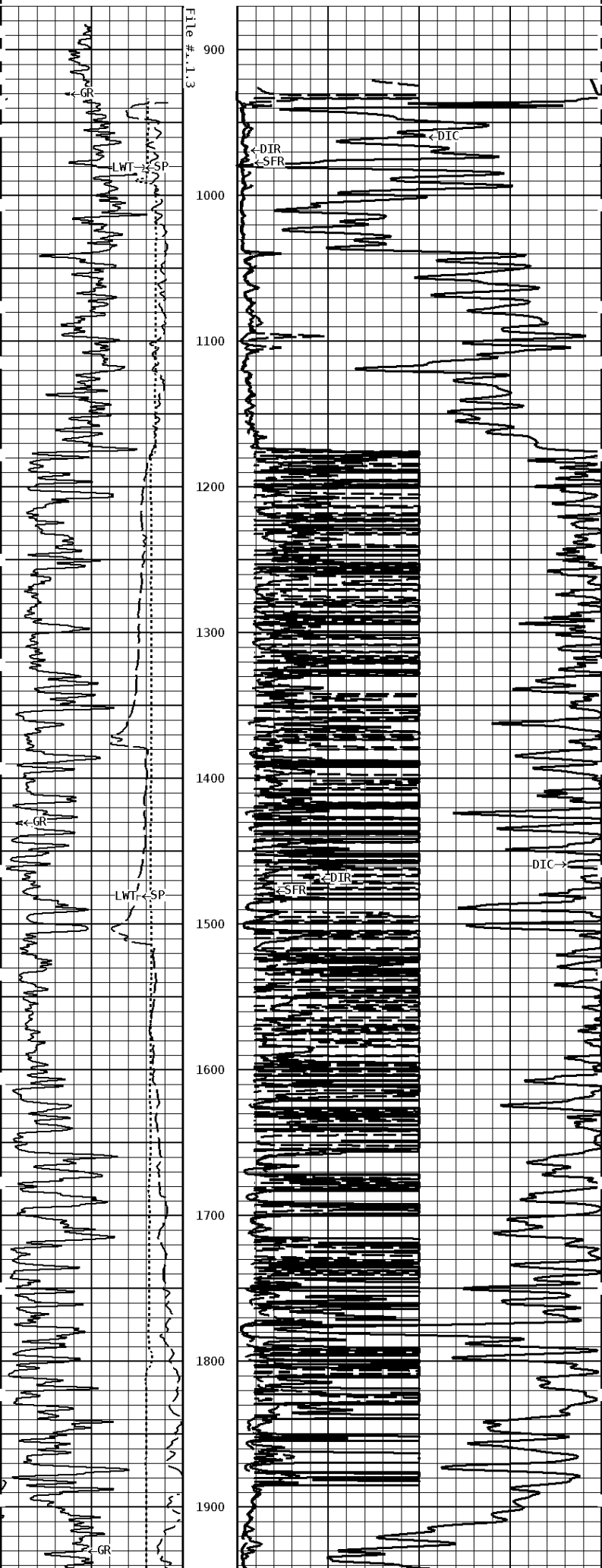
Acquired: 2015-01/05 01:09 3.4.0-13284

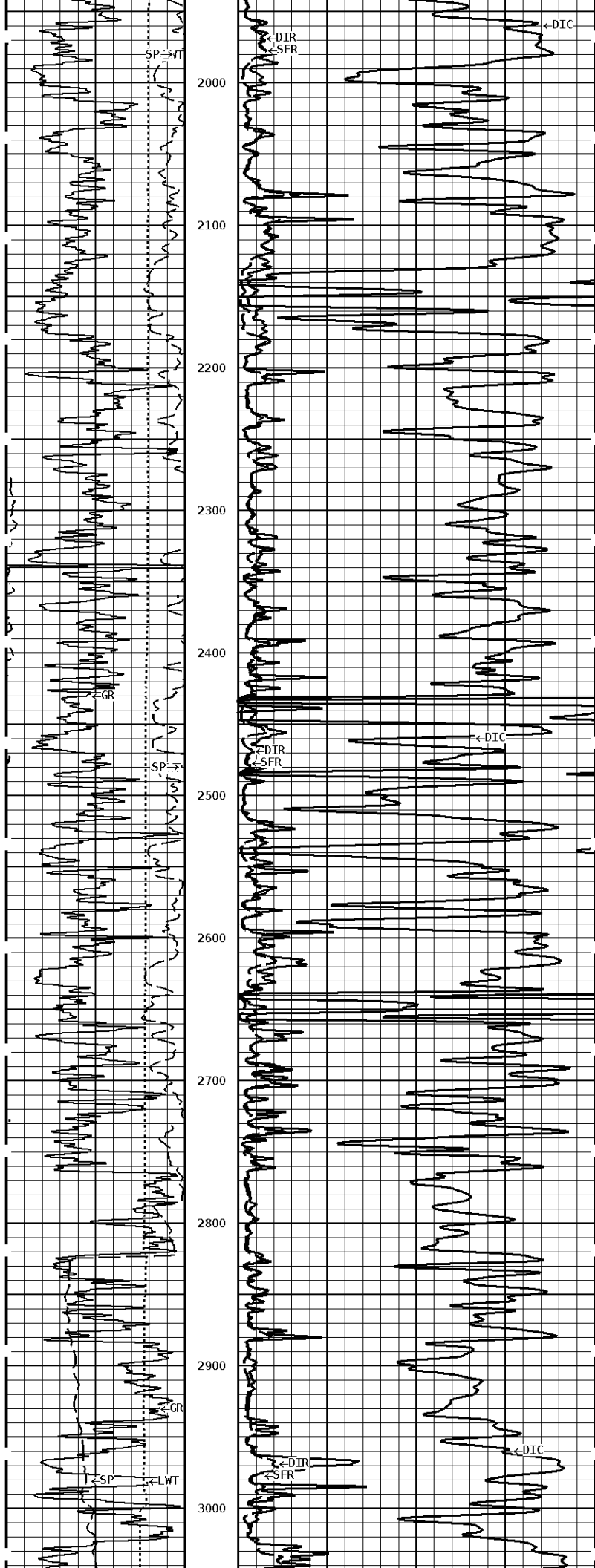
Reference: 0

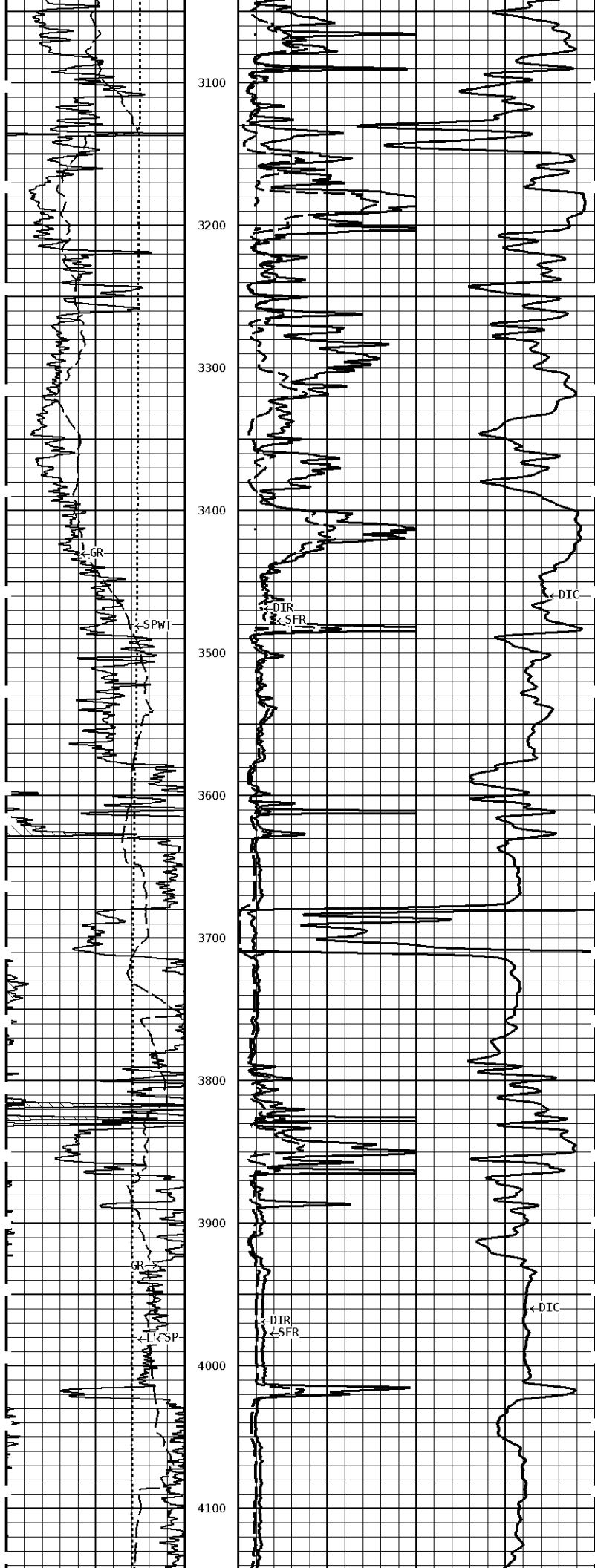
Processed: 2015-01/05 03:01 3.4.0-13284

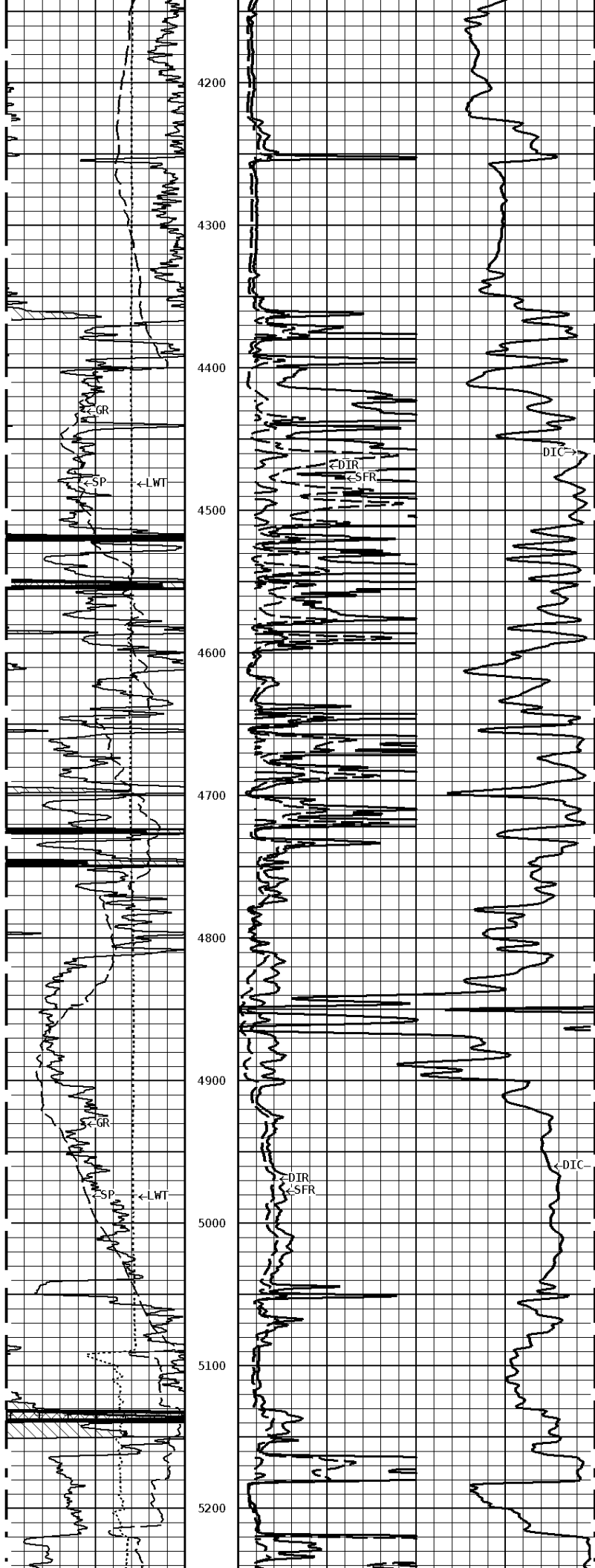
|                             |  |                           |  |
|-----------------------------|--|---------------------------|--|
| TENSION<br>LBS              |  | DEEP INDUCTION<br>OHMM    |  |
| 10000 0                     |  | 0.0 500.0<br>0.0 50.0     |  |
| SPONTANEOUS POTENTIAL<br>mV |  | SHALLOW FOCUSED<br>OHMM   |  |
| →   ← 30                    |  | 0.0 500.0<br>0.0 50.0     |  |
| GAMMA RAY<br>API UNITS      |  | DEEP CONDUCTIVITY<br>MHMO |  |
| 150 300<br>0 150            |  | 2000 1000<br>1000 0       |  |

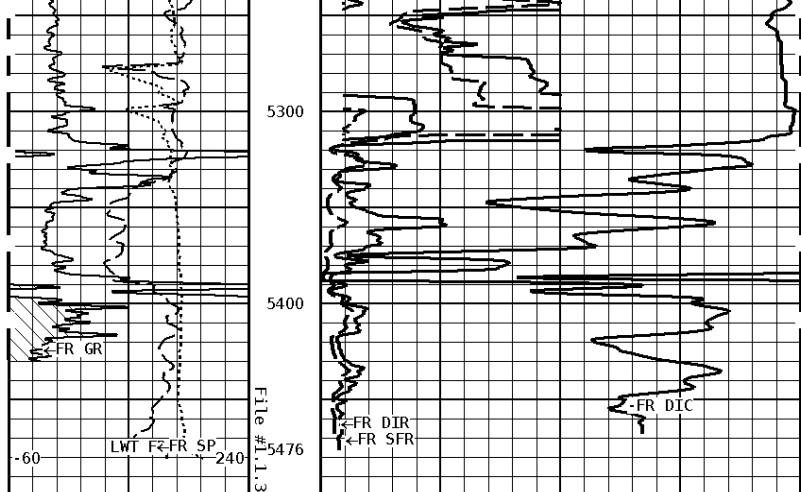
1:1200 MAIN SECTION











# 1:1200 MAIN SECTION

|                                                                   |                                                                         |
|-------------------------------------------------------------------|-------------------------------------------------------------------------|
| <p><b>GAMMA RAY</b><br/>API UNITS</p> <p>150 300</p> <p>0 150</p> | <p><b>DEEP CONDUCTIVITY</b><br/>MHMO</p> <p>2000 1000</p> <p>1000 0</p> |
| <p><b>SPONTANEOUS POTENTIAL</b><br/>mV</p> <p>→   ← 30</p>        | <p><b>SHALLOW FOCUSED</b><br/>OHMM</p> <p>0.0 500.0</p> <p>0.0 50.0</p> |
| <p><b>TENSION</b><br/>LBS</p> <p>10000 0</p>                      | <p><b>DEEP INDUCTION</b><br/>OHMM</p> <p>0.0 500.0</p> <p>0.0 50.0</p>  |



**Tucker**  
ENERGY SERVICES

Company: CHIEFTAIN OIL CO., INC.

Well: AHS CATTLE CO. #10

Location: 2490' FSL & 660' FEL

Logged: 01-04-2015

K.B. Elev: 1392.0 Ft