

**KERR-MCGEE OIL & GAS  
ONSHORE LP**  
**HEIN 2-1**  
**WATTENBERG**  
**WELD**  
**CO**

**COMPANY KERR-MCGEE OIL & GAS ONSHORE LP**  
**WELL HEIN 2-1**  
**FIELD WATTENBERG**  
**COUNTY WELD**  
**STATE CO**

COMPANY  
WELL  
FIELD  
COUNTY  
STATE

API No. 05123350760000  
Location SHL: 1923' FNL & 1857' FEL SWNE  
BHL: 633' FNL & 2065' FEL NWNE ESTIMATED  
LAT: 40 08 21 149 Deg  
LONG: -104 83 86 226 Deg  
Sect. 1 Twp. 1N Rge. 67W

Other Services:  
RWCH  
IDT  
ACRT  
Elev.: K.B. 4911.0 ft  
D.F. 4911.0 ft  
G.L. 4896.0 ft

Permanent Datum GL  
Log measured from KB  
Drilling measured from KB  
Elev. 4896.0 ft  
15.0 ft above perm. Datum  
D.F. 4911.0 ft  
G.L. 4896.0 ft

|                          |                         |                |     |
|--------------------------|-------------------------|----------------|-----|
| Date                     | 14-Apr-12               | Run No.        | ONE |
| Depth - Driller          | 8245.00 ft              |                |     |
| Depth - Logger           | 7796.0 ft               |                |     |
| Bottom - Logged Interval | 7766 ft                 |                |     |
| Top - Logged Interval    | CSG                     |                |     |
| Casing - Driller         | 8.625 in @ 943.0 ft     |                | @   |
| Casing - Logger          | 937.0 ft                |                | @   |
| Bit Size                 | 7.875 in                |                | @   |
| Type Fluid in Hole       | WATER BASED MUD         |                |     |
| Density                  | 8.4 ppq                 | 26.00 s/qt     |     |
| PH                       | 8.00 pH                 | 0.0 cphn       |     |
| Source of Sample         | MUD CELL                |                |     |
| Rm @ Meas. Temperature   | 1.060 ohmm @ 76.60 degF |                | @   |
| Rmf @ Meas. Temperature  | 0.92 ohmm @ 75.00 degF  |                | @   |
| Rmc @ Meas. Temperature  | 0.972 ohmm @ 75.00 degF |                | @   |
| Source Rmf               | CHART                   | CHART          |     |
| Rm @ BHT                 | 0.43 ohmm @ 198.0 degF  |                | @   |
| Time Since Circulation   | 7.0 hr                  |                |     |
| Time on Bottom           | 14-Apr-12 06:03         |                |     |
| Max. Rec. Temperature    | 198.0 degF @ 7796.0 ft  |                | @   |
| Equipment                | 10800785 BRIGHTON       |                |     |
| Recorded By              | A. ZWALI                | J. PINKETT     |     |
| Witnessed By             | BEN BENJAMIN            | ROBIN BRACKMAN |     |

Fold here

|   |            |                                |  |   |                 |               |                 |
|---|------------|--------------------------------|--|---|-----------------|---------------|-----------------|
| Service Ticket No.: N/A                 |            | API Serial No.: 05123350760000 |  | PGM Version: WL INSITE R3.4.4 (Build 2) |                 |               |                 |
| CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE |            |                                |  | RESISTIVITY SCALE CHANGES               |                 |               |                 |
| Date                                    | Sample No. |                                |  | Type Log                                | Depth           | Scale Up Hole | Scale Down Hole |
| Depth-Driller                           |            |                                |  |   |                 |               |                 |
| Type Fluid in Hole                      |            |                                |  |   |                 |               |                 |
| Density                                 | Viscosity  |                                |  |   |                 |               |                 |
| Ph                                      | Fluid Loss |                                |  |   |                 |               |                 |
| Source of Sample                        |            |                                |  | RESISTIVITY EQUIPMENT DATA              |                 |               |                 |
| Rm @ Meas. Temp                         | @          | @                              |  | Run No.                                 | Tool Type & No. | Pad Type      | Tool Pos.       |
| Rmf @ Meas. Temp.                       | @          | @                              |  | ONE                                     | ACRT            | N/A           | 1.25" S.O.      |
| Rmc @ Meas. Temp.                       | @          | @                              |  |   | E5787-S5797     |               |                 |
| Source Rmf                              | Rmc        |                                |  |   |                 |               |                 |
| Rm @ BHT                                | @          | @                              |  |   |                 |               |                 |
| Rmf @ BHT                               | @          | @                              |  |   |                 |               |                 |
| Rmc @ BHT                               | @          | @                              |  |   |                 |               |                 |
| EQUIPMENT DATA                          |            |                                |  |   |                 |               |                 |
| GAMMA                                   |            | ACOUSTIC                       |  | DENSITY                                 |                 | NEUTRON       |                 |
| Run No.                                 | ONE        | Run No.                        |  | Run No.                                 | ONE             | Run No.       | ONE             |
| Serial No.                              | 11215095   | Serial No.                     |  | Serial No.                              | M319_P123       | Serial No.    | 11277440        |
| Model No.                               | GTET       | Model No.                      |  | Model No.                               | SDLT            | Model No.     | DSNT            |
| Diameter                                | 3.625"     | No. of Cent.                   |  | Diameter                                | 4.5"            | Diameter      | 3.625"          |
| Detector Model No.                      | GTET       | Spacing                        |  | Log Type                                | GAM/GAM         | Log Type      | NEU/NEU         |
| Type                                    | SCINT      |                                |  | Source Type                             | Cs137           | Source Type   | Am 241Be        |
| Length                                  | 8"         | LSA [Y/N]                      |  | Serial No.                              | 5256GW          | Serial No.    | DSN-430         |
| Distance to Source                      | 10'        | FWDA [Y/N ]                    |  | Strength                                | 1.5 Ci          | Strength      | 15 Ci           |
| LOGGING DATA                            |            |                                |  |   |                 |               |                 |
| GENERAL                                 |            | GAMMA                          |  | ACOUSTIC                                |                 | DENSITY       |                 |
|   |            |                                |  |   |                 | NEUTRON       |                 |

| Run No.  | Depth |     | Speed<br>ft/min | Scale |     | Scale |   | Matrix | Scale |   | Matrix | Scale |   | Matrix |
|--|-------|-----|-----------------|-------|-----|-------|---|--------|-------|---|--------|-------|---|--------|
|  | From  | To  |                 | L     | R   | L     | R |        | L     | R |        | L     | R |        |
| ONE  | TD    | CSG | REC             | 0     | 200 |       |   |        | 20    | 0 | 2.71   | 20    | 0 | LIME   |
| DIRECTIONAL INFORMATION  |       |     |                 |       |     |       |   |        |       |   |        |       |   |        |
| Maximum Deviation @ KOP @  |       |     |                 |       |     |       |   |        |       |   |        |       |   |        |
| Remarks: RWCH/GTET/DSNT/SDLT/DT/ACRT RAN IN COMBINATION  |       |     |                 |       |     |       |   |        |       |   |        |       |   |        |
| ANNULAR HOLE VOLUME CALCULATED FOR 4.5-INCH CASING   |       |     |                 |       |     |       |   |        |       |   |        |       |   |        |
| TENSION PULLS, WASHOUTS, AND BOREHOLE RUGOSITY AFFECT TOOL RESPONSE  |       |     |                 |       |     |       |   |        |       |   |        |       |   |        |
| CREW: N. GOULD, L. SMITH RIG: XTREME 11  |       |     |                 |       |     |       |   |        |       |   |        |       |   |        |
| THANK YOU FOR USING HALLIBURTON ENERGY SERVICES - BRIGHTON, CO - (303) 825-4346  |       |     |                 |       |     |       |   |        |       |   |        |       |   |        |
| <p>HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.</p> |       |     |                 |       |     |       |   |        |       |   |        |       |   |        |
| HALLIBURTON  |       |     |                 |       |     |       |   |        |       |   |        |       |   |        |

**HALLIBURTON**

## PARAMETERS REPORT

| Depth (ft) | Tool Name | Mnemonic | Description   | Value      | Units |
|------------|-----------|----------|---|------------|-------|
| TOP        |           |          |   |            |       |
|            | SHARED    | BS       | Bit Size  | 7.875      | in    |
|            | SHARED    | UBS      | Use Bit Size instead of Caliper for all applications. | No         |       |
|            | SHARED    | MDBS     | Mud Base  | Water      |       |
|            | SHARED    | MDWT     | Borehole Fluid Weight                                 | 8.400      | ppg   |
|            | SHARED    | WAGT     | Weighting Agent                                       | Natural    |       |
|            | SHARED    | BSAL     | Borehole salinity                                     | 500.00     | ppm   |
|            | SHARED    | FSAL     | Formation Salinity NaCl                               | 0.00       | ppm   |
|            | SHARED    | KPCT     | Percent K in Mud by Weight?                           | 0.00       | %     |
|            | SHARED    | RMUD     | Mud Resistivity                                       | 1.060      | ohm m |
|            | SHARED    | TRM      | Temperature of Mud                                    | 76.6       | degF  |
|            | SHARED    | CSD      | Logging Interval is Cased?                            | No         |       |
|            | SHARED    | ICOD     | AHV Casing OD   | 4.500      | in    |
|            | SHARED    | ST       | Surface Temperature                                   | 75.0       | degF  |
|            | SHARED    | TD       | Total Well Depth                                      | 7796.00    | ft    |
|            | SHARED    | BHT      | Bottom Hole Temperature                               | 198.0      | degF  |
|            | SHARED    | SVTM     | Navigation and Survey Master Tool                     | IDT        |       |
|            | SHARED    | AZTM     | High Res Z Accelerometer Master Tool                  | IDT        |       |
|            | SHARED    | TEMM     | Temperature Master Tool                               | NONE       |       |
|            | SHARED    | BHSM     | Borehole Size Master Tool                             | NONE       |       |
|            | GTET      | GROK     | Process Gamma Ray?                                    | Yes        |       |
|            | GTET      | GRSO     | Gamma Tool Standoff                                   | 0.000      | in    |
|            | GTET      | GEOK     | Process Gamma Ray EVR?                                | No         |       |
|            | GTET      | TPOS     | Tool Position for Gamma Ray Tools.                    | Eccentered |       |

|              |      |  |                |       |
|--------------|------|--|----------------|-------|
| DSNT         | DNOK | Process DSN?                                 | Yes            |       |
| DSNT         | DEOK | Process DSN EVR?                             | No             |       |
| DSNT         | NLIT | Neutron Lithology                            | Limestone      |       |
| DSNT         | DNSO | DSN Standoff - 0.25 in (6.35 mm) Recommended | 0.250          | in    |
| DSNT         | DNTP | Temperature Correction Type                  | None           |       |
| DSNT         | DPRS | DSN Pressure Correction Type                 | None           |       |
| DSNT         | SHCO | View More Correction Options                 | No             |       |
| DSNT         | UTVD | Use TVD for Gradient Corrections?            | No             |       |
| DSNT         | LHWT | Logging Horizontal Water Tank?               | No             |       |
| SDLT         | CLOK | Process Caliper Outputs?                     | Yes            |       |
| SDLT Pad     | DNOK | Process Density?                             | Yes            |       |
| SDLT Pad     | DNOK | Process Density EVR?                         | No             |       |
| SDLT Pad     | CB   | Logging Calibration Blocks?                  | No             |       |
| SDLT Pad     | SPVT | SDLT Pad Temperature Valid?                  | Yes            |       |
| SDLT Pad     | DTWN | Disable temperature warning                  | No             |       |
| SDLT Pad     | DMA  | Formation Density Matrix                     | 2.710          | g/cc  |
| SDLT Pad     | DFL  | Formation Density Fluid                      | 1.000          | g/cc  |
| Microlog Pad | MLOK | Process MicroLog Outputs?                    | Yes            |       |
| IDT          | WRTI | Survey Writing Interval                      | 30             | ft    |
| IDT          | SOPT | Smoothing Option                             | None           |       |
| ACRt Sonde   | RTOK | Process ACRt?                                | Yes            |       |
| ACRt Sonde   | MNSO | Minimum Tool Standoff                        | 1.25           | in    |
| ACRt Sonde   | TCS1 | Temperature Correction Source                | FP Lwr & FP Up |       |
| ACRt Sonde   | TPOS | Tool Position                                | Free Hanging   |       |
| ACRt Sonde   | RMOP | Rmud Source                                  | Mud Cell       |       |
| ACRt Sonde   | RMIN | Minimum Resistivity for MAP                  | 0.20           | ohm m |
| ACRt Sonde   | RMIN | Maximum Resistivity for MAP                  | 200.00         | ohm m |
| ACRt Sonde   | THQY | Threshold Quality                            | 0.50           |       |

BOTTOM

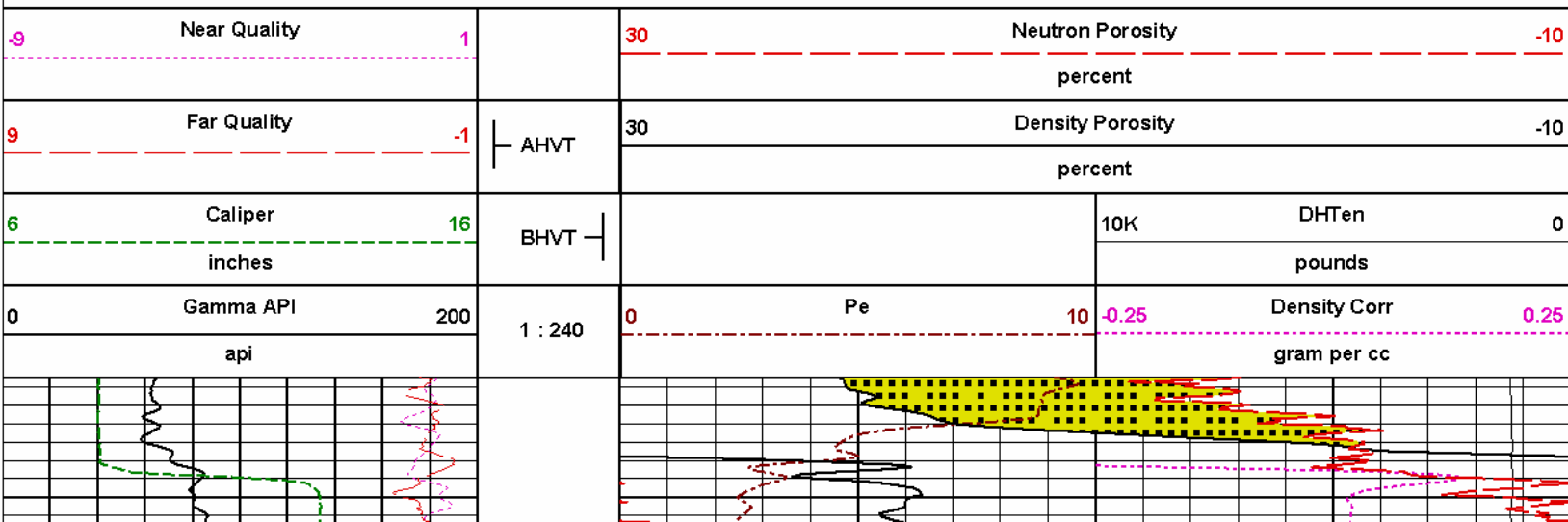
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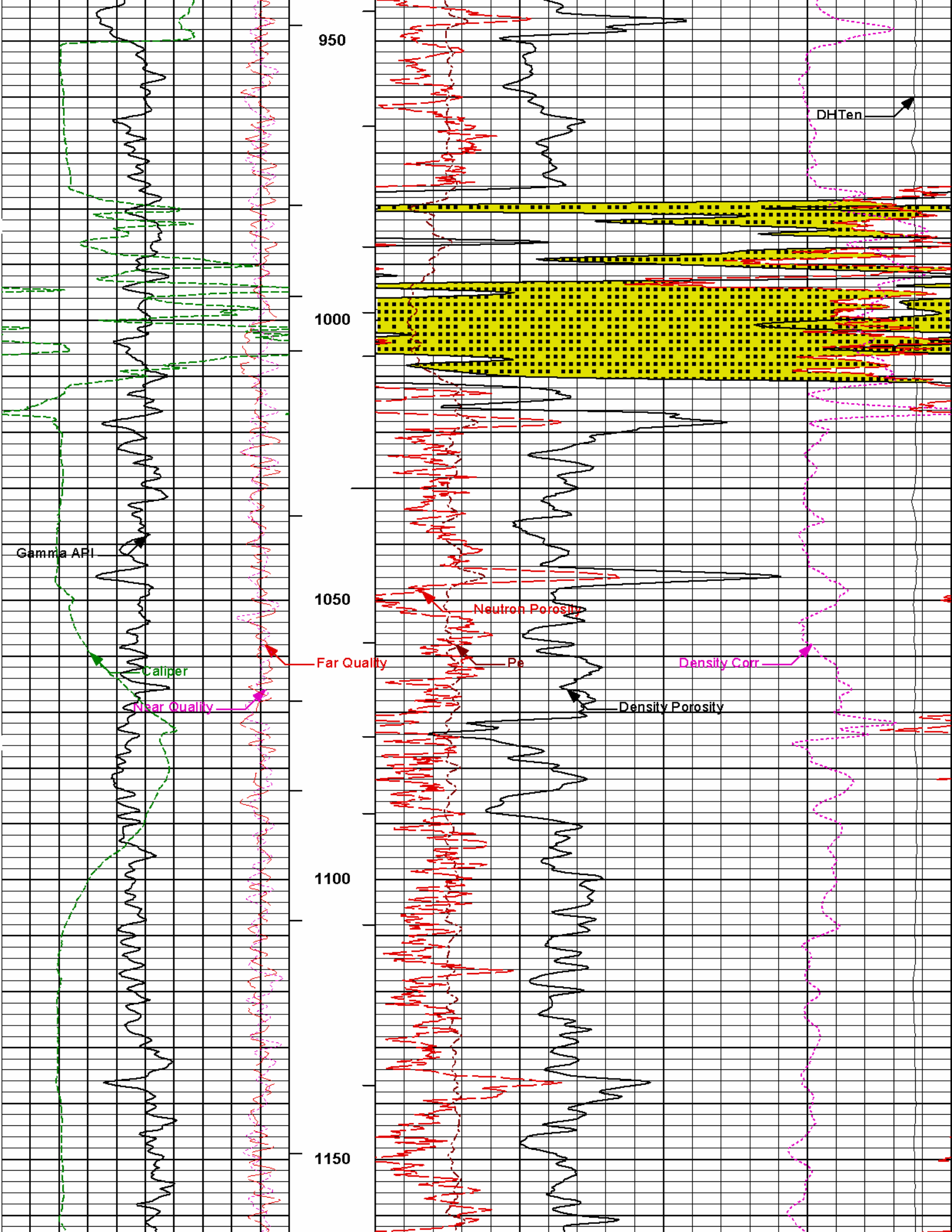
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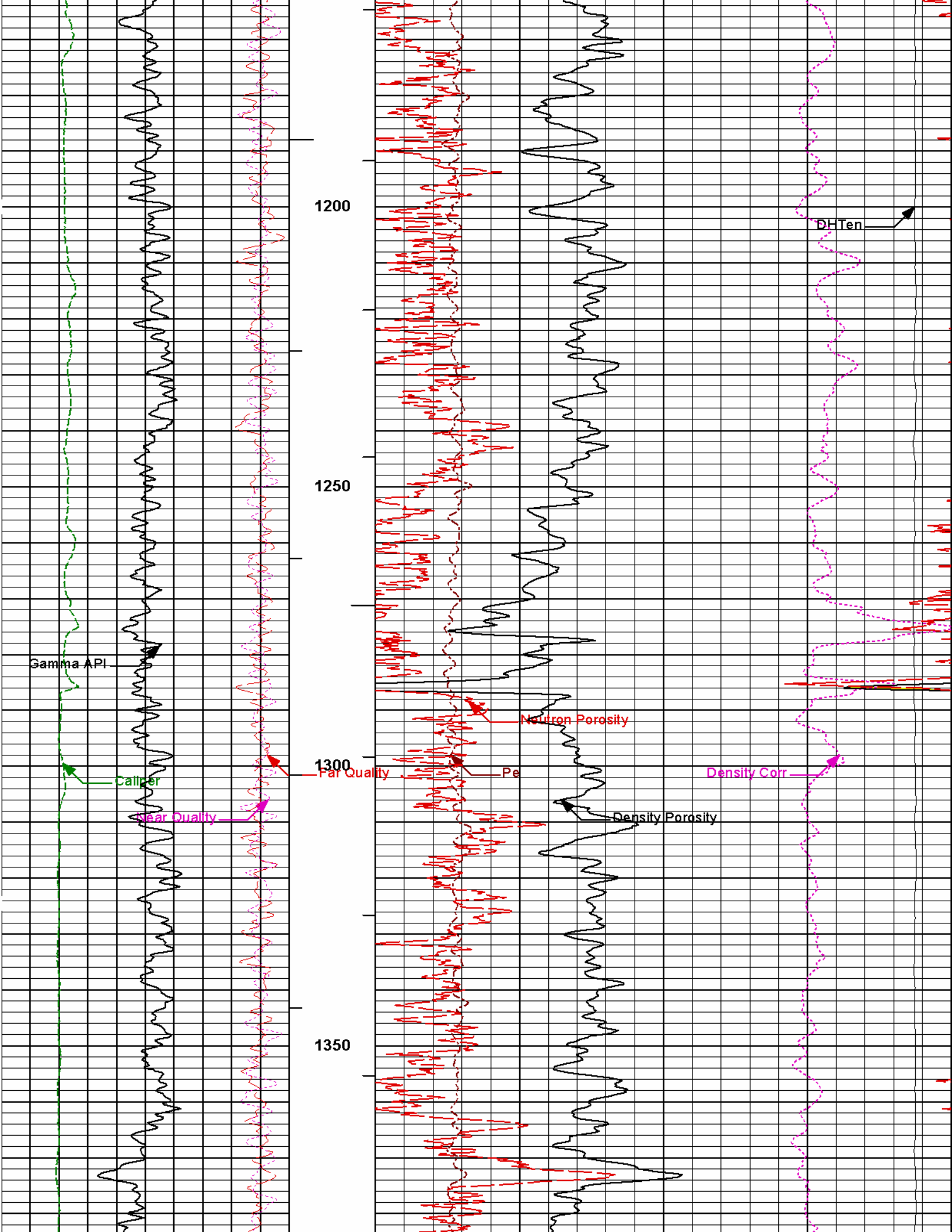
**HALLIBURTON**

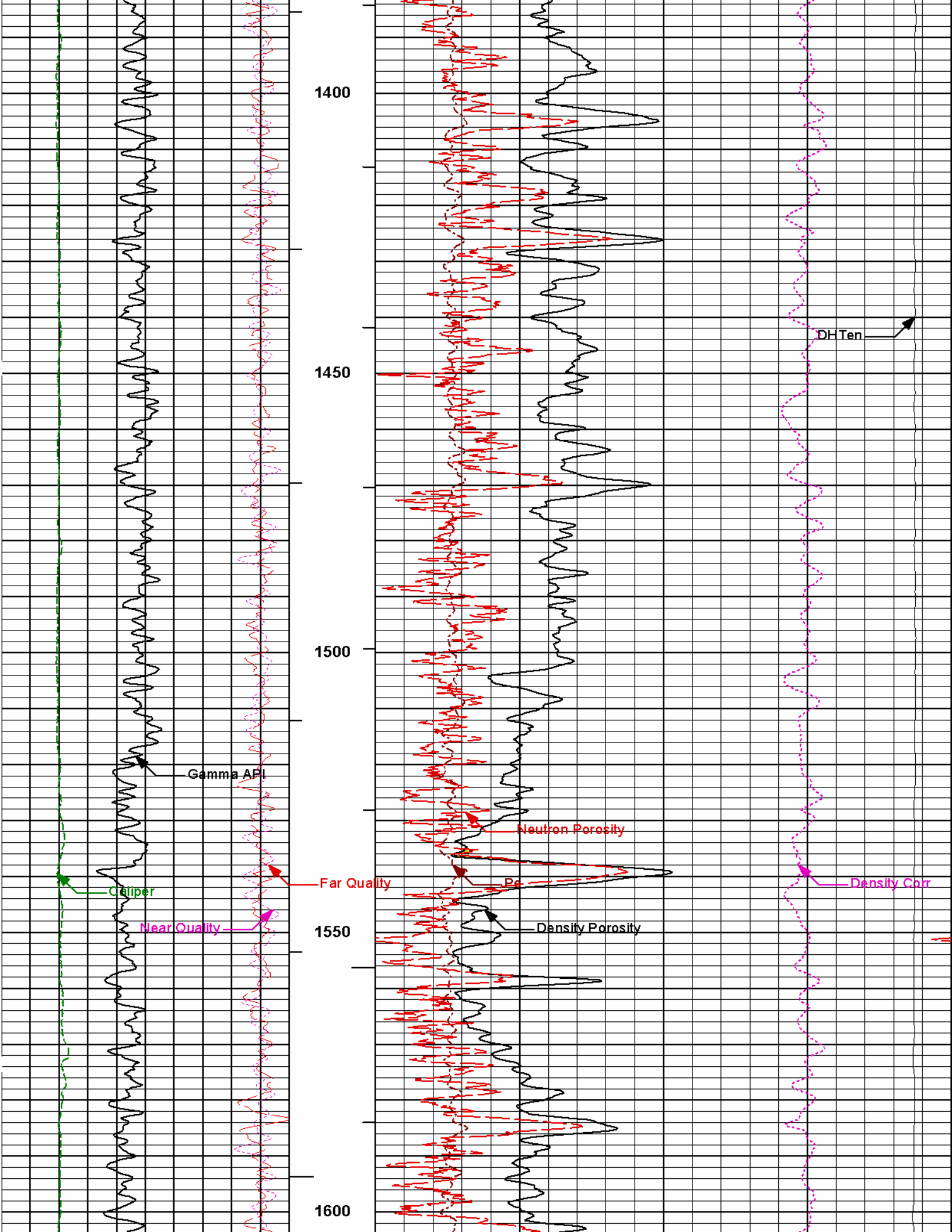
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 Plot File: \\PORO\IQ\_POROSITY\_5IN\_RM

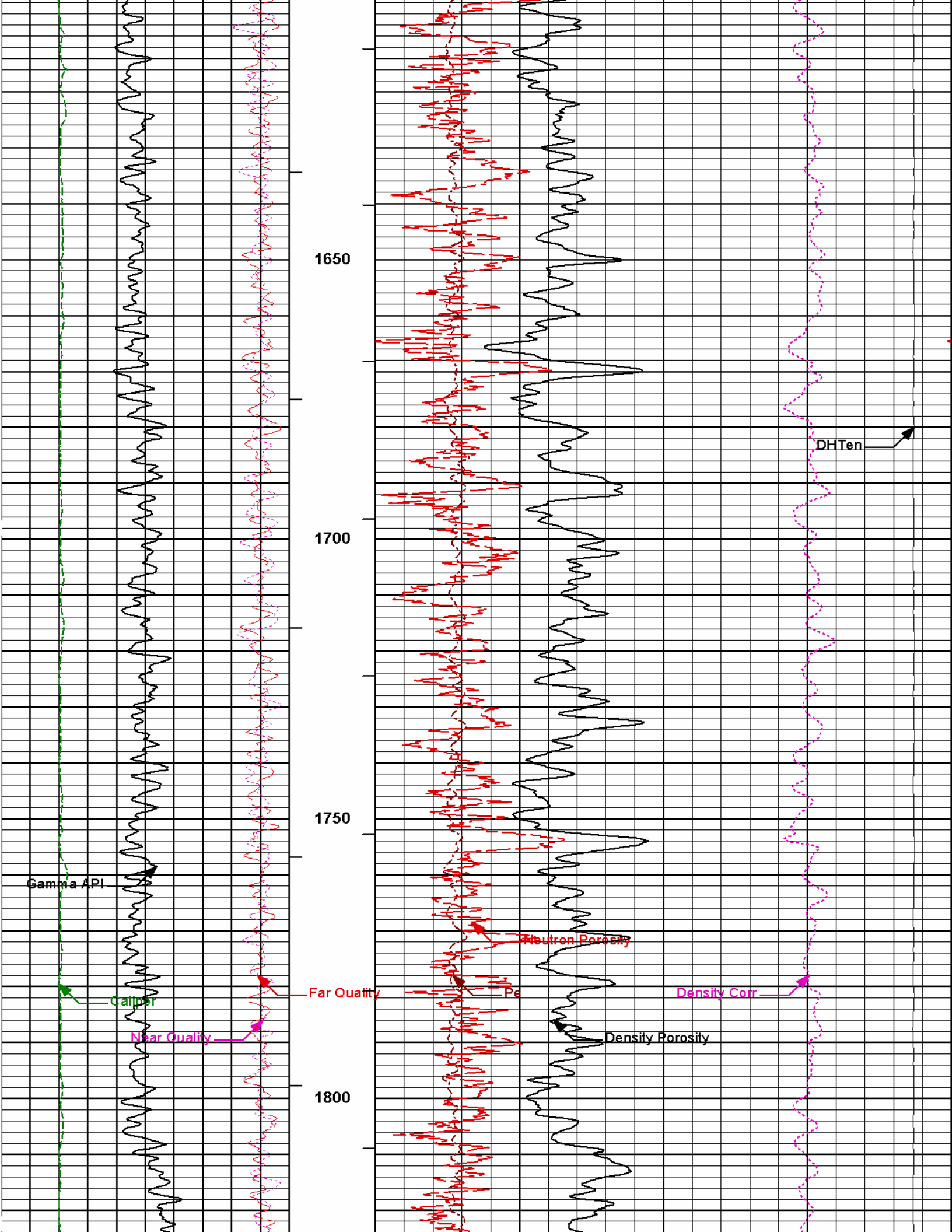
MAIN PASS 5" = 100'

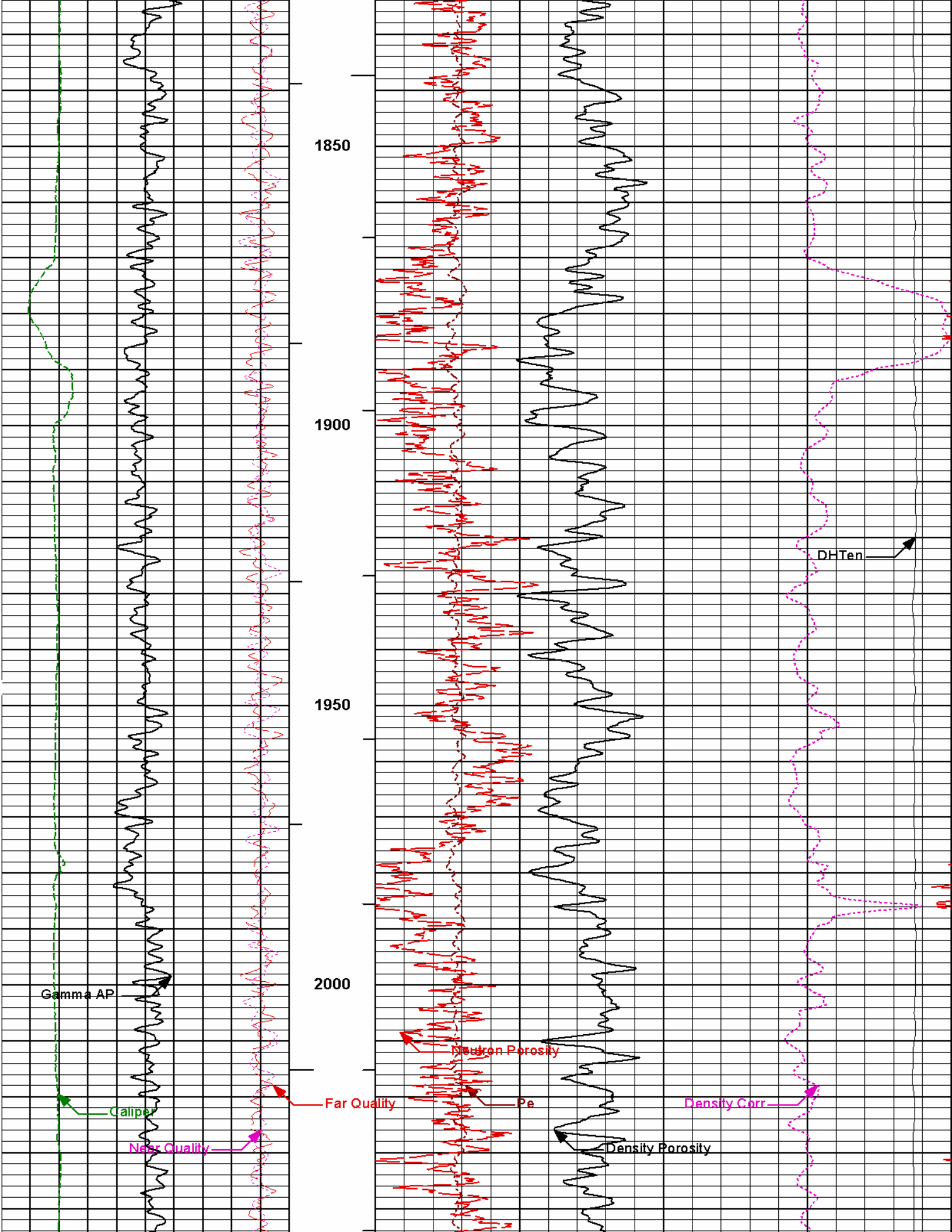


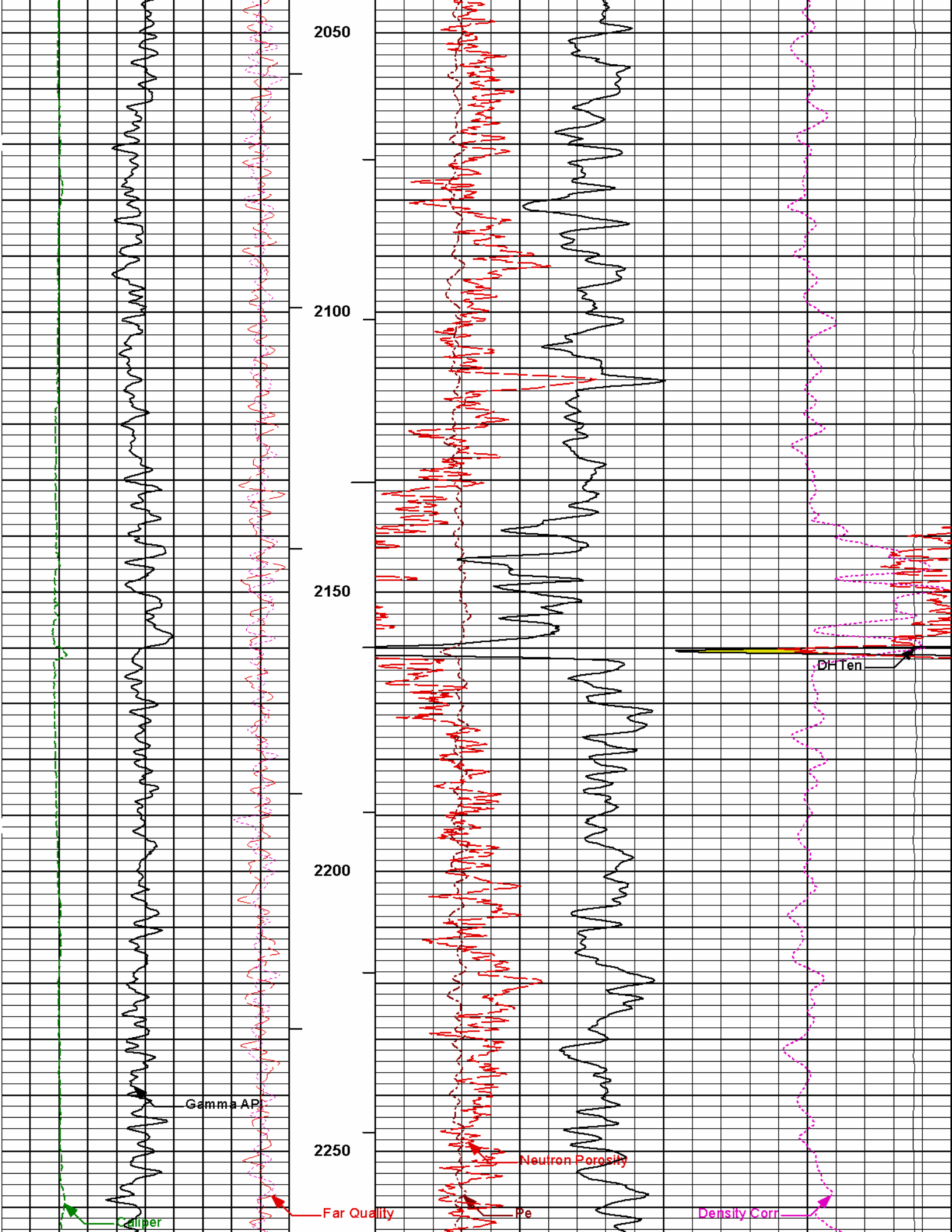












2050

2100

2150

2200

2250

Gamma AP

Neutron Porosity

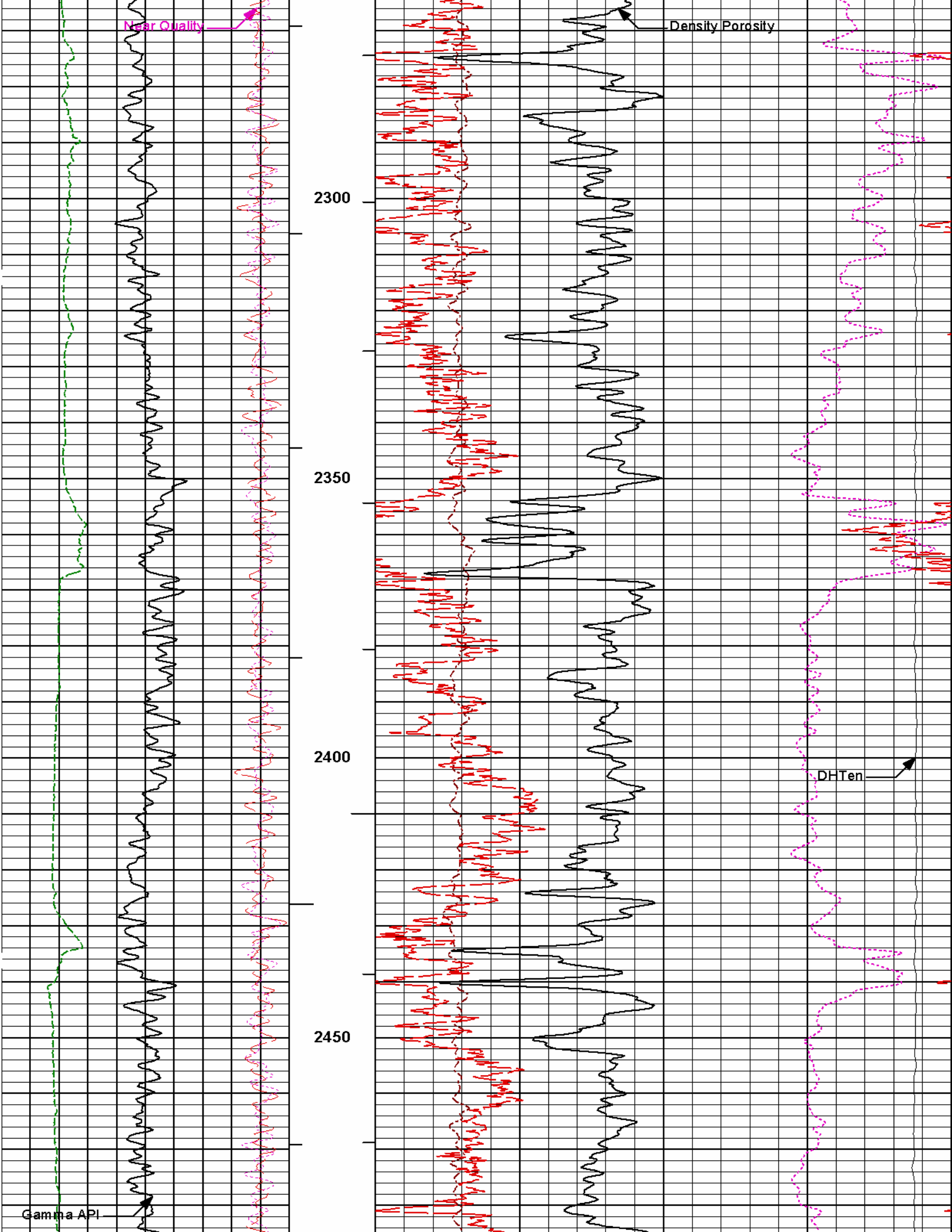
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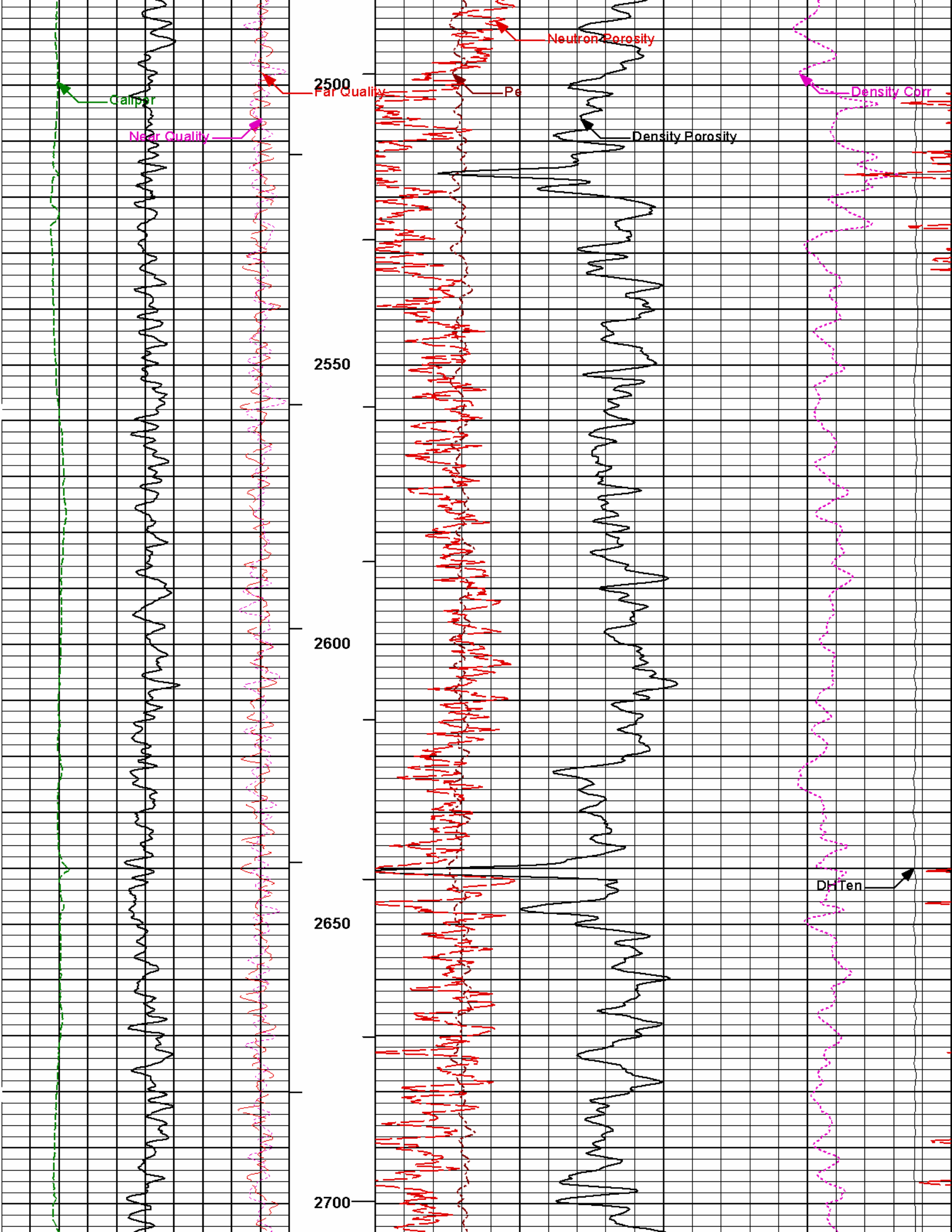
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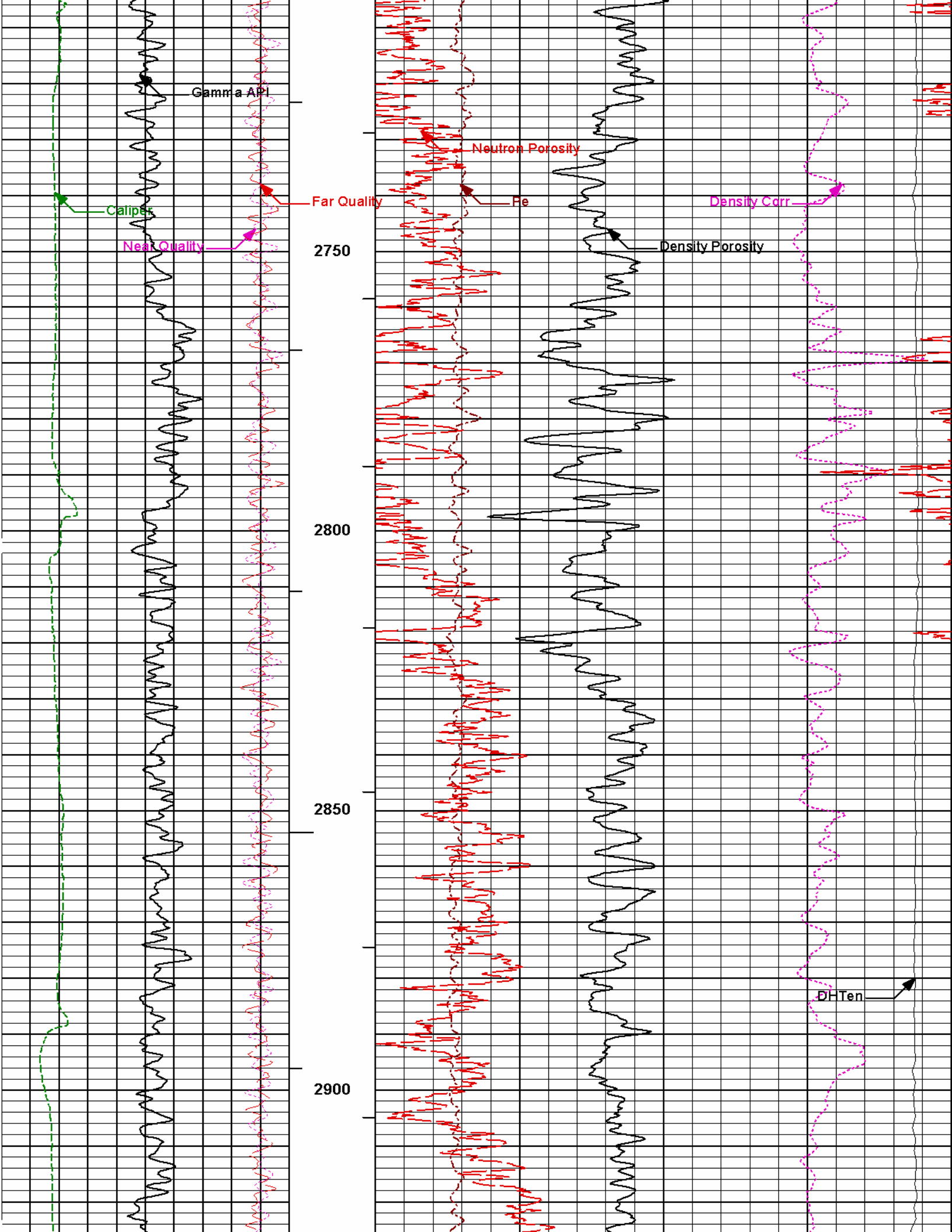
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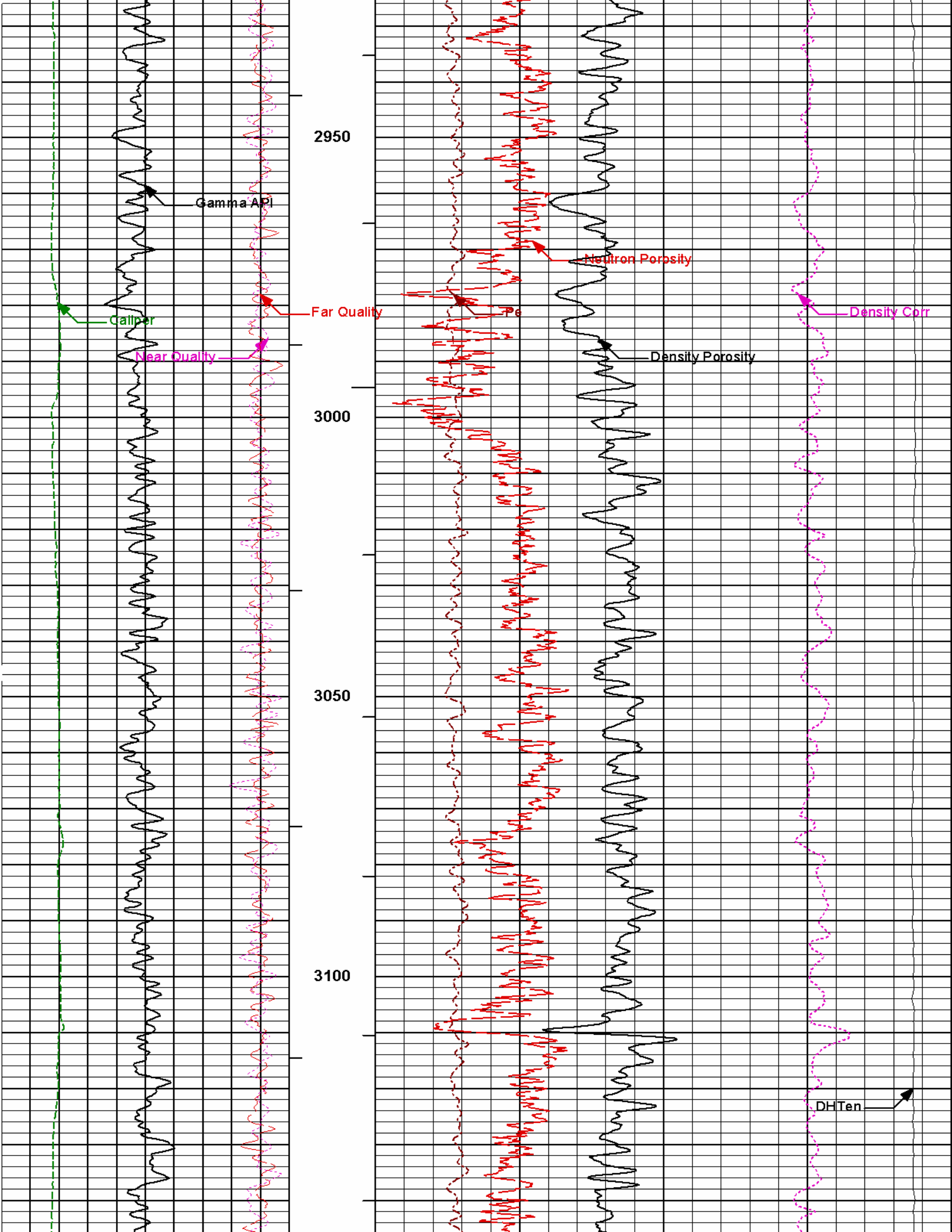
DHTen

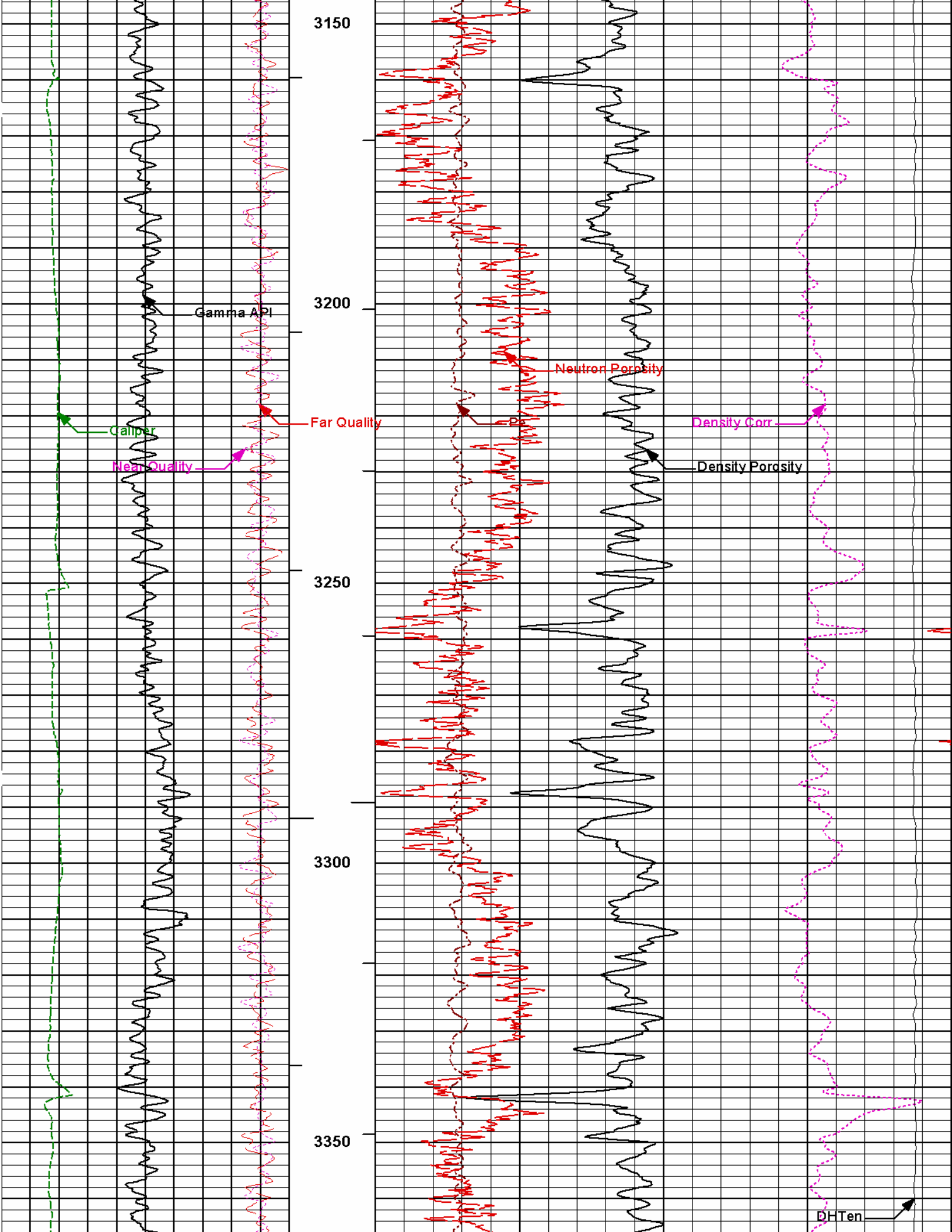
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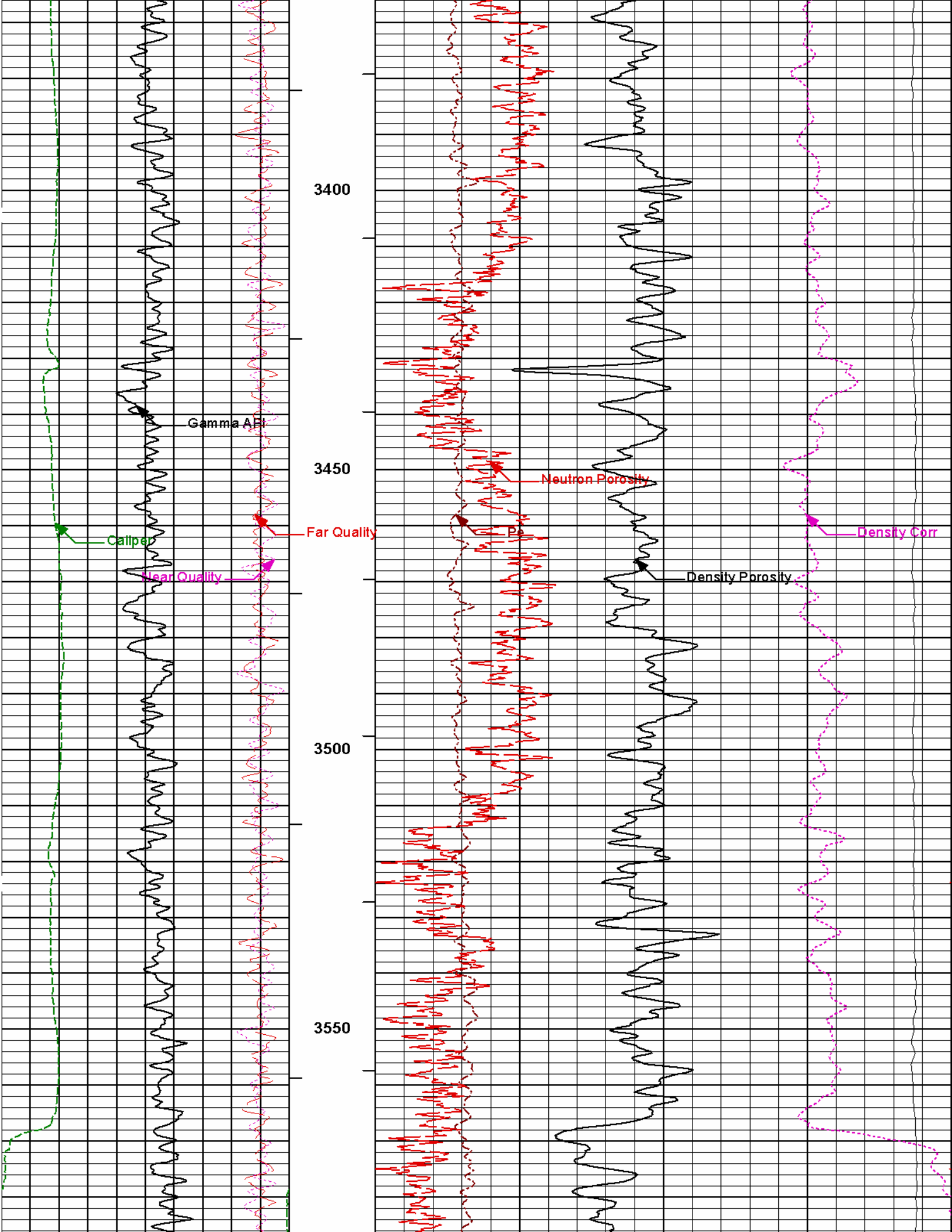


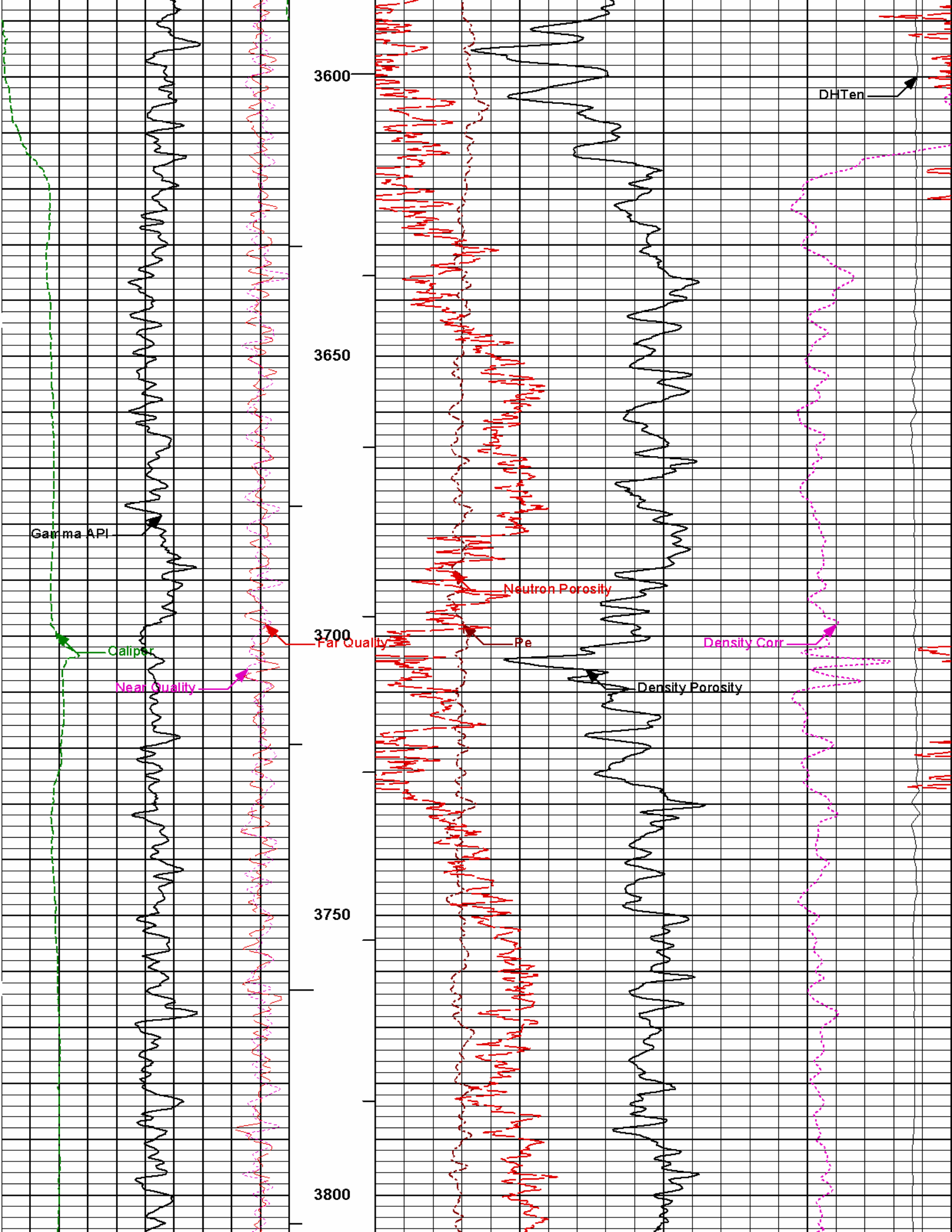


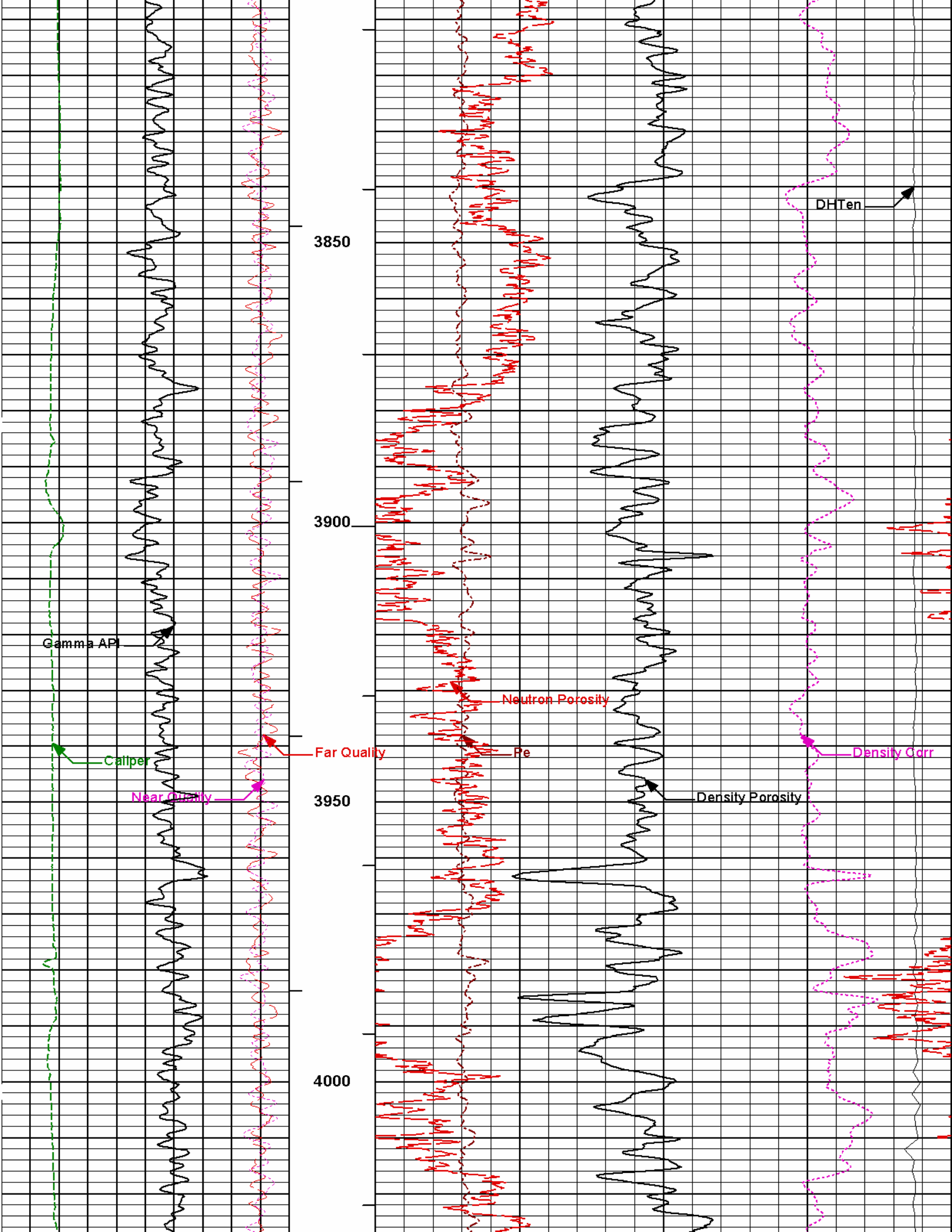


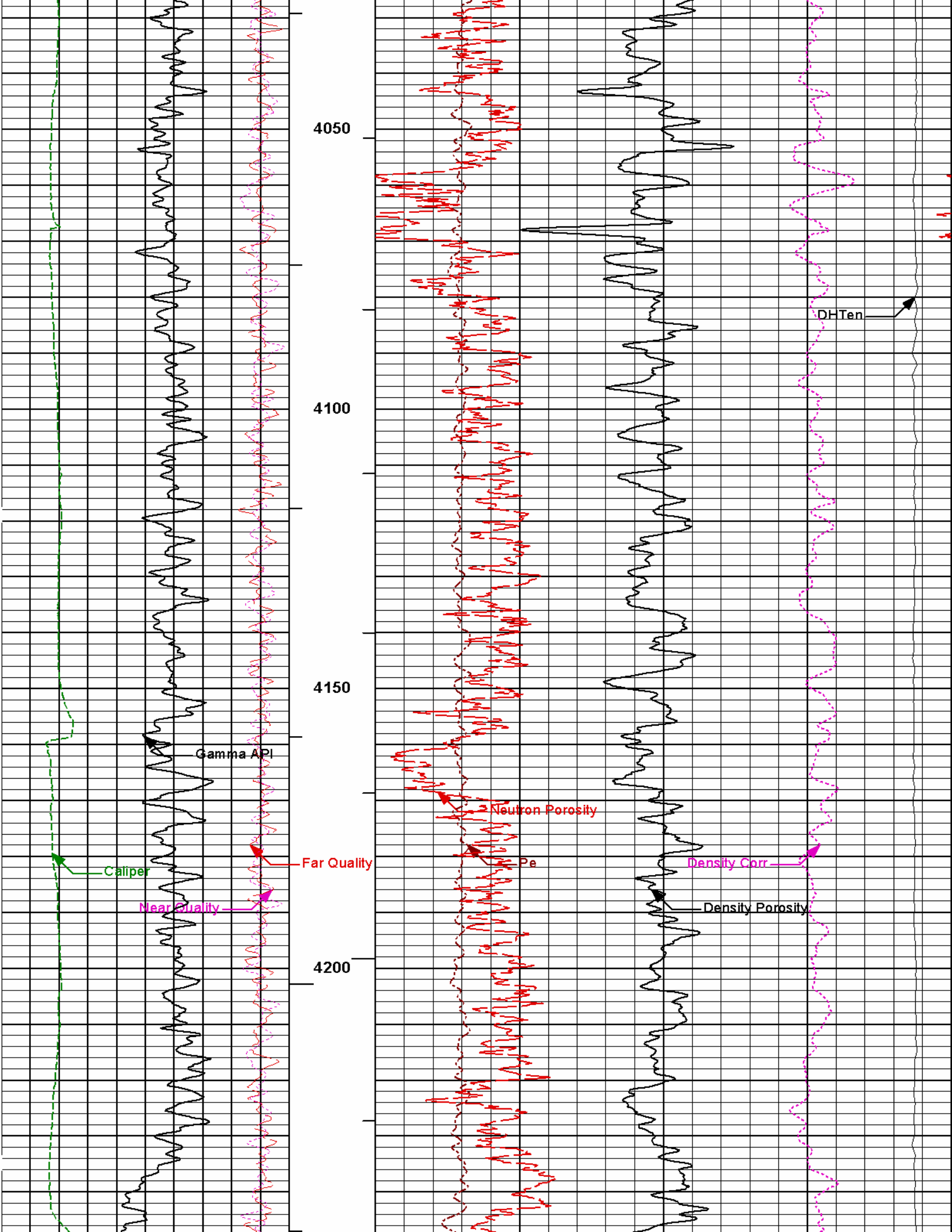


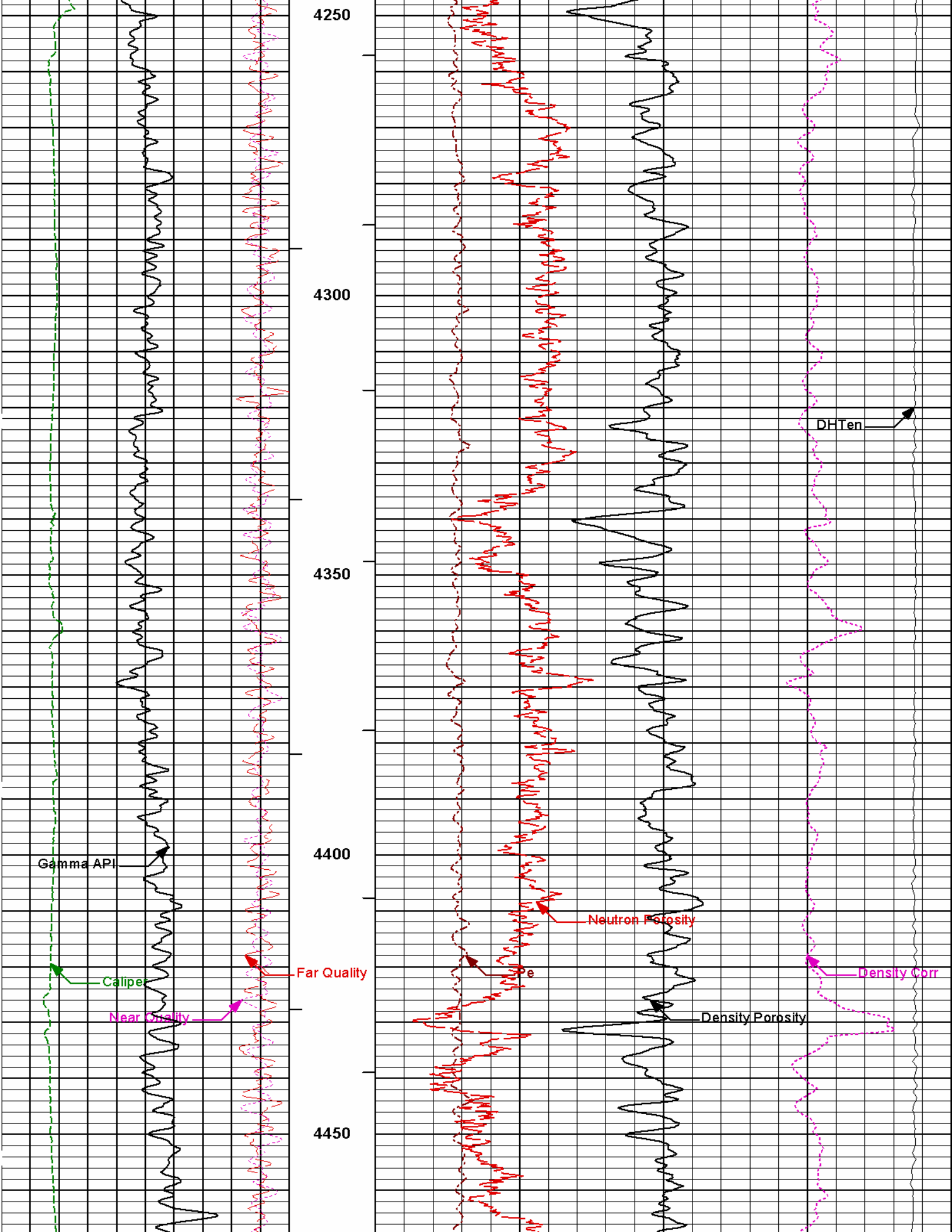


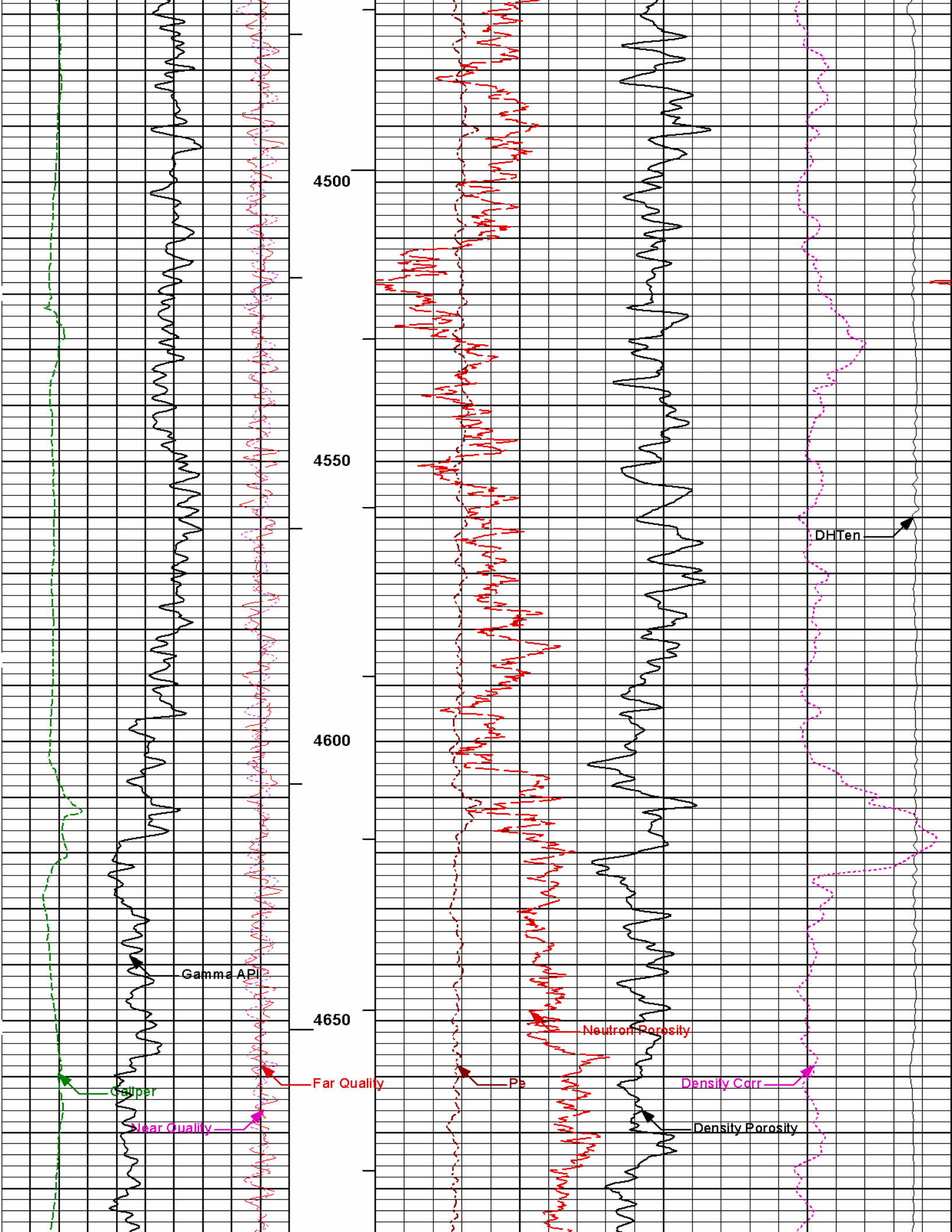


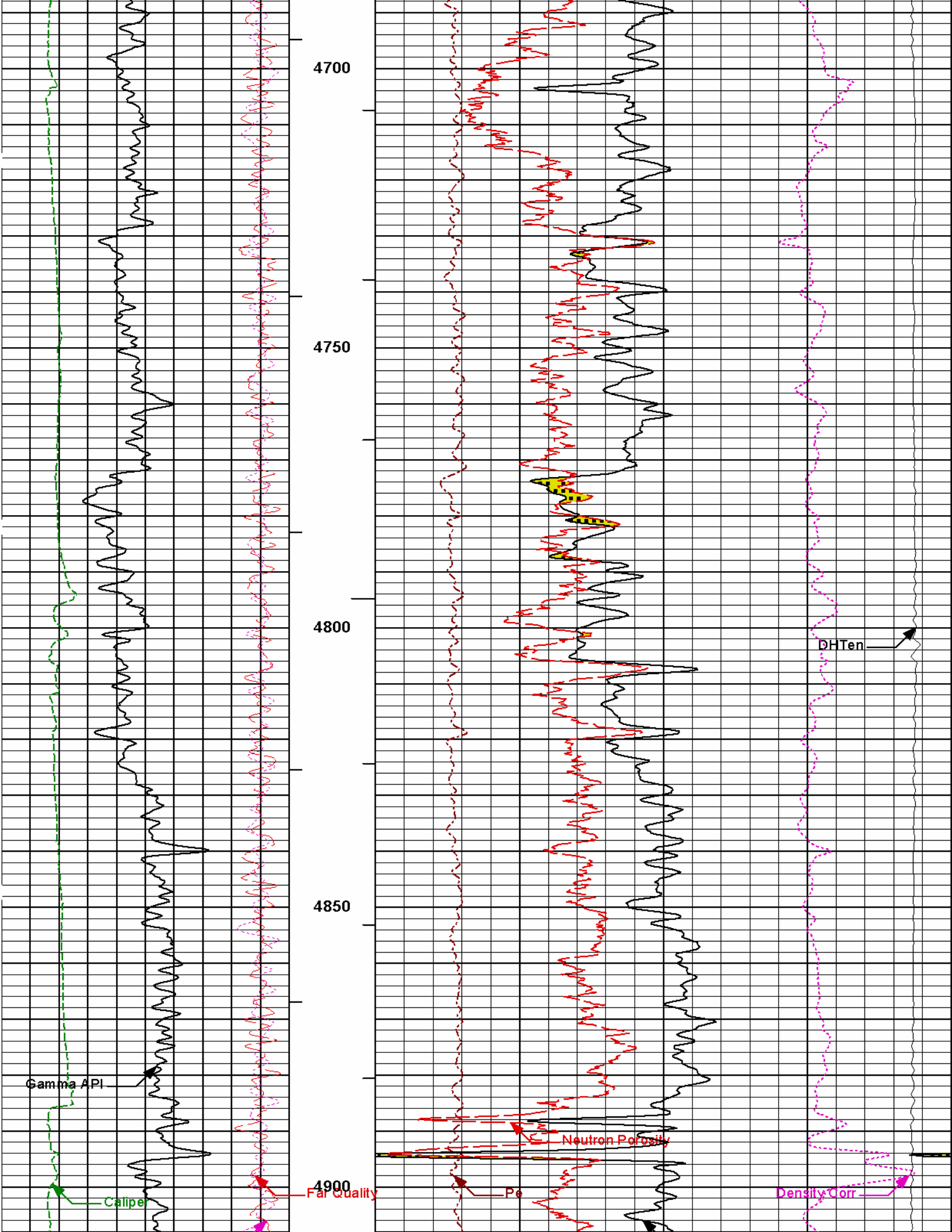












4700

4750

4800

4850

4900

Gamma API

Caliper

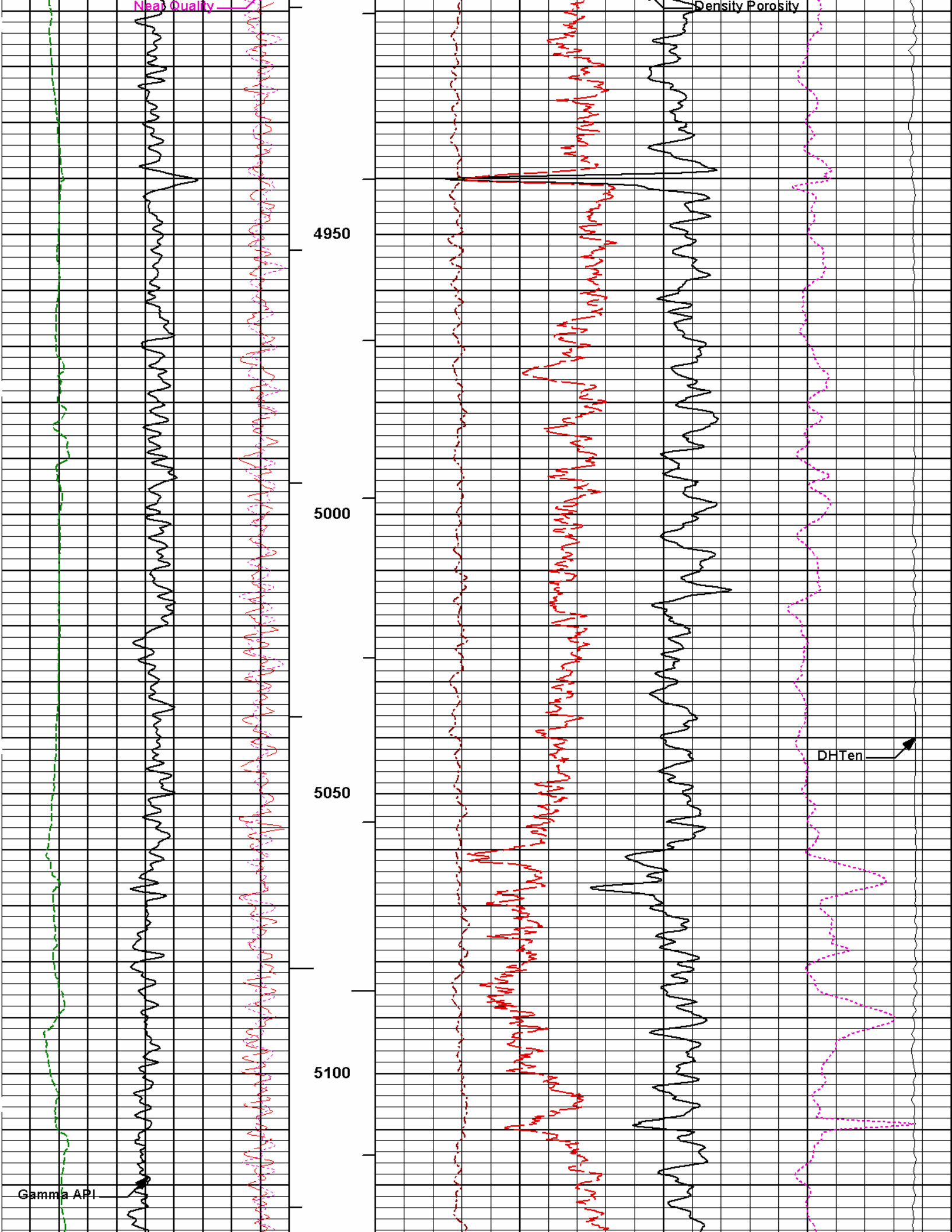
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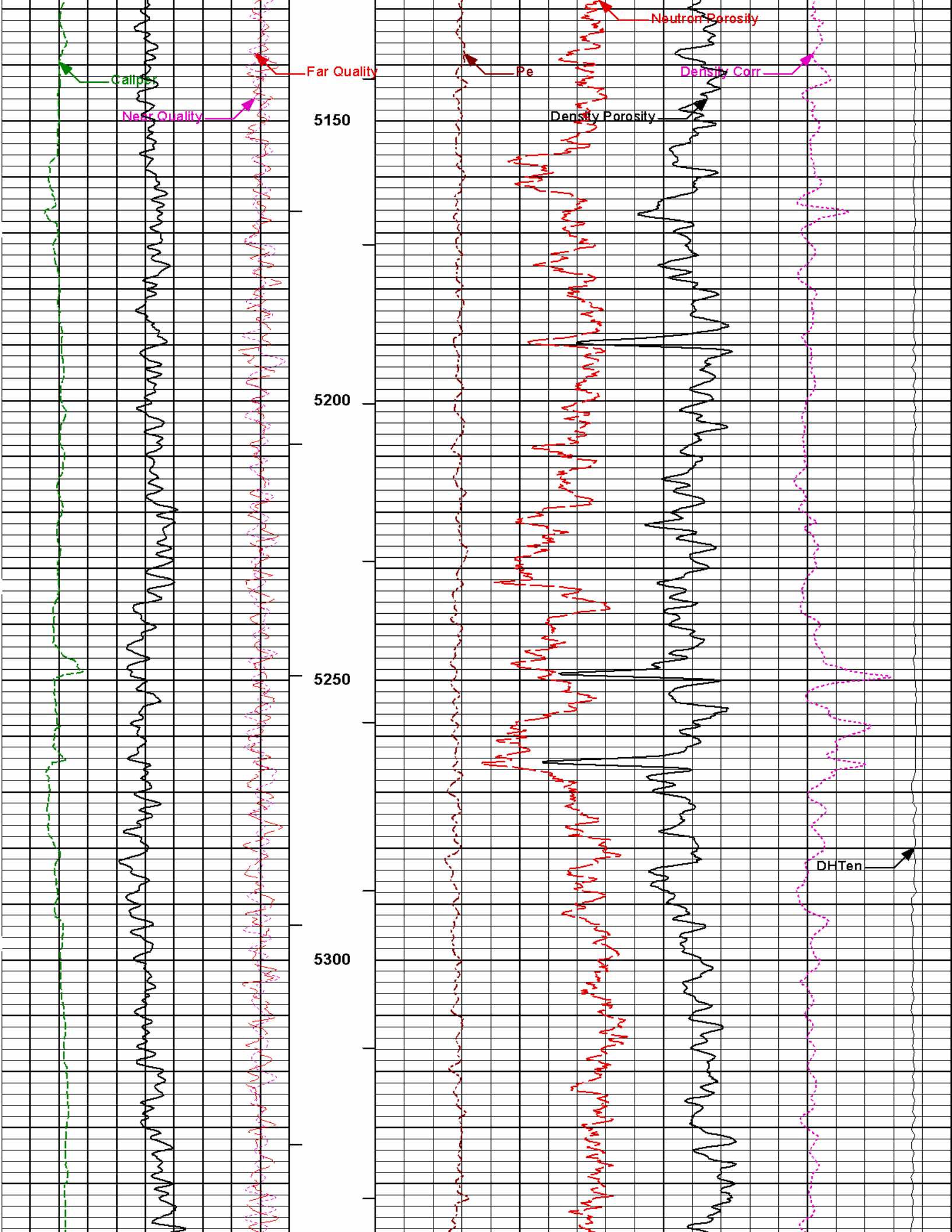
Neutron Porosity

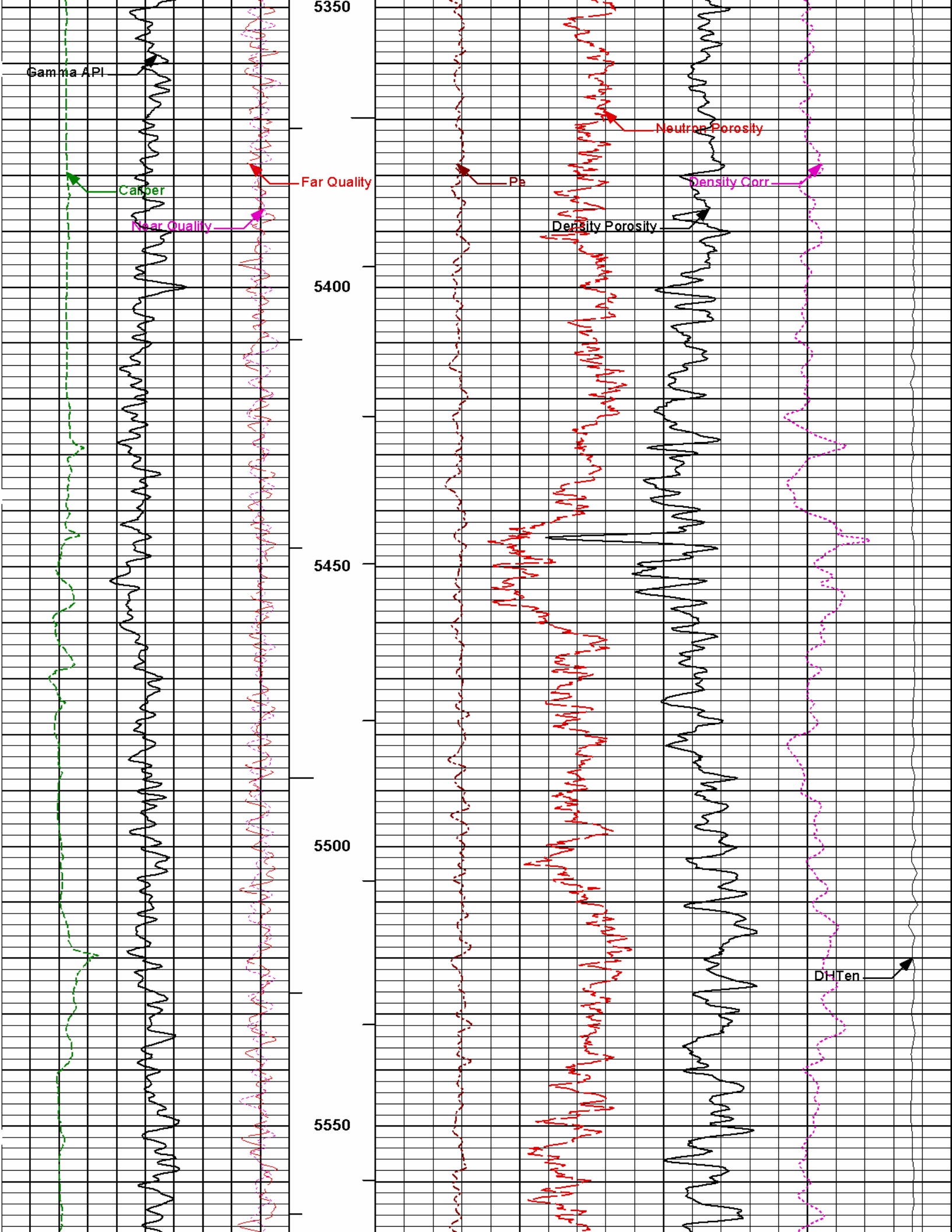
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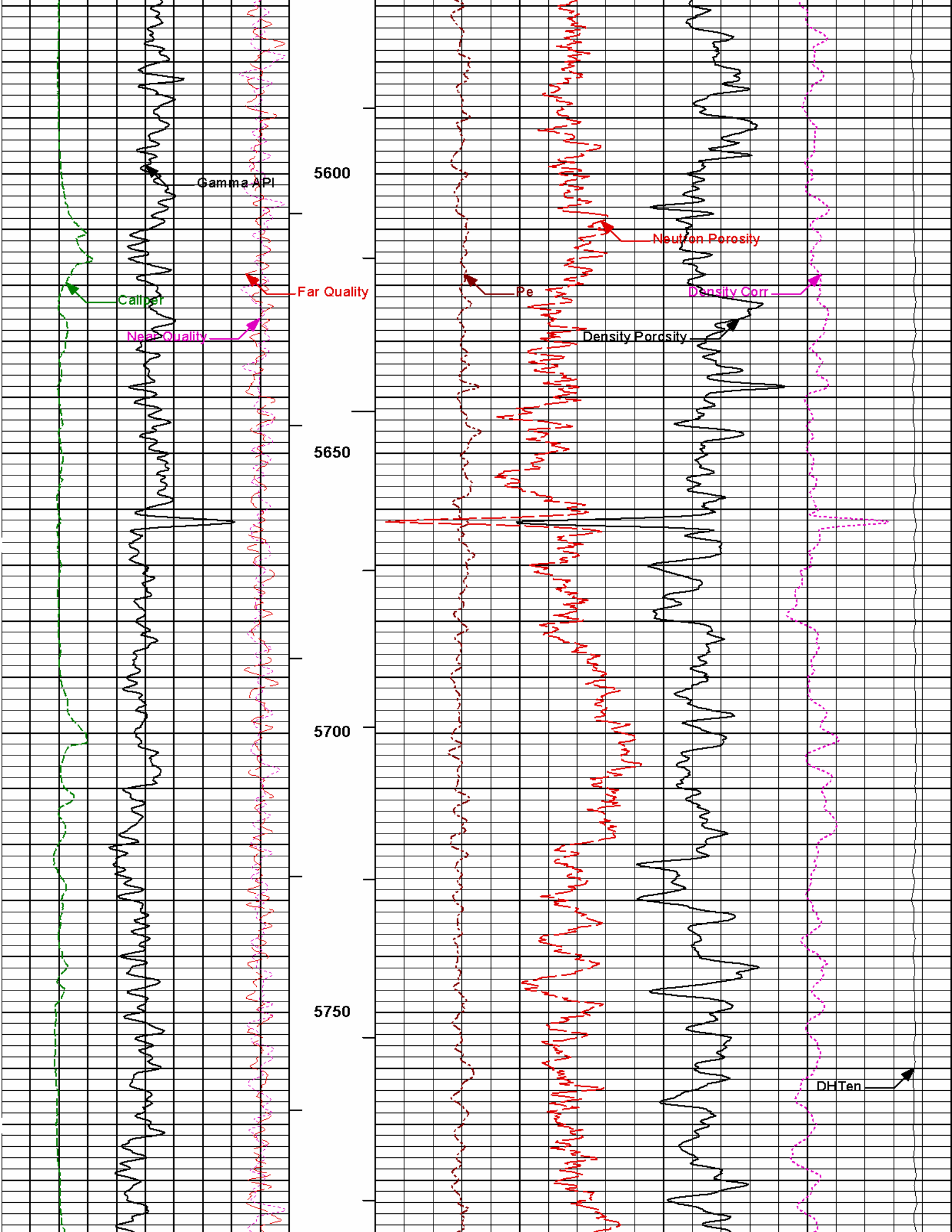
Density Corr

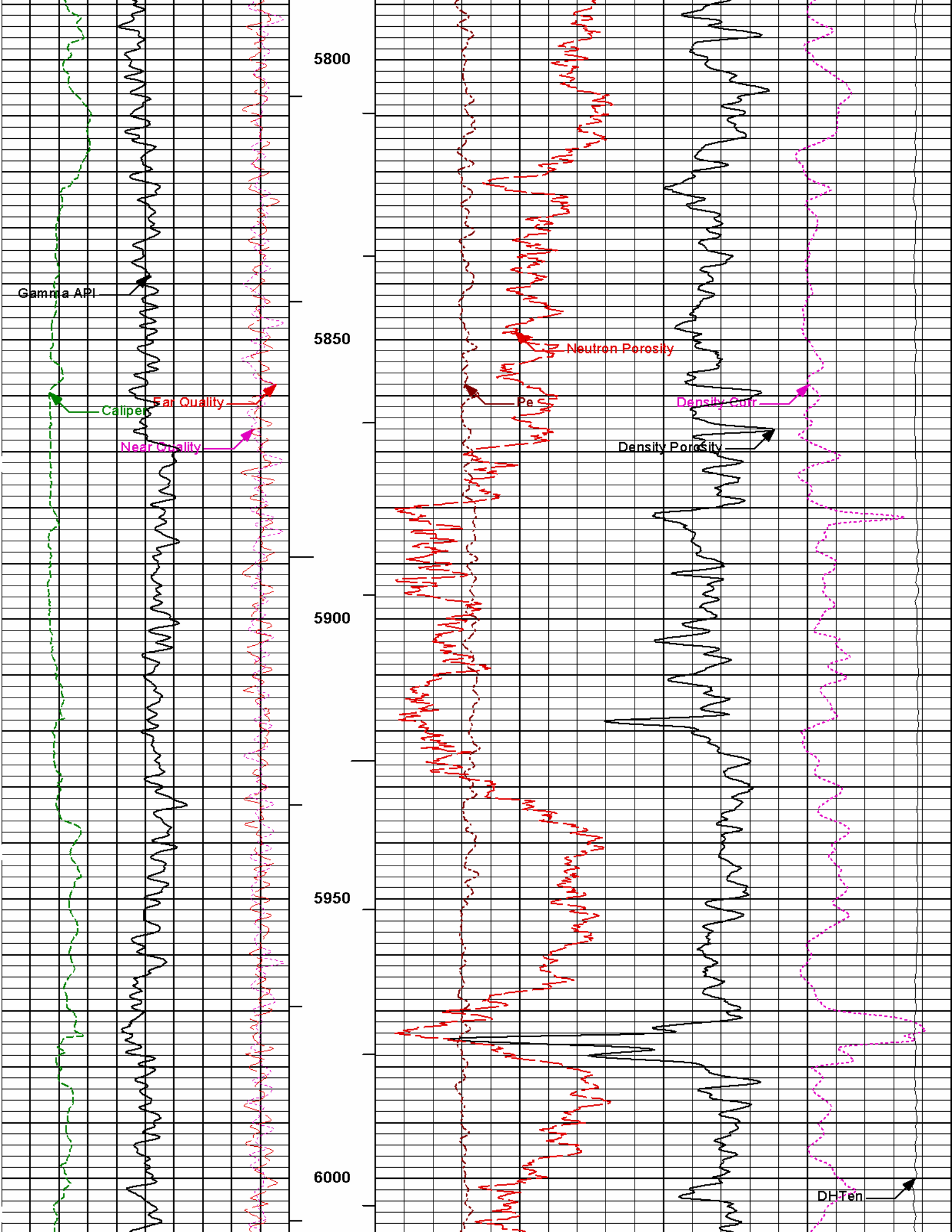
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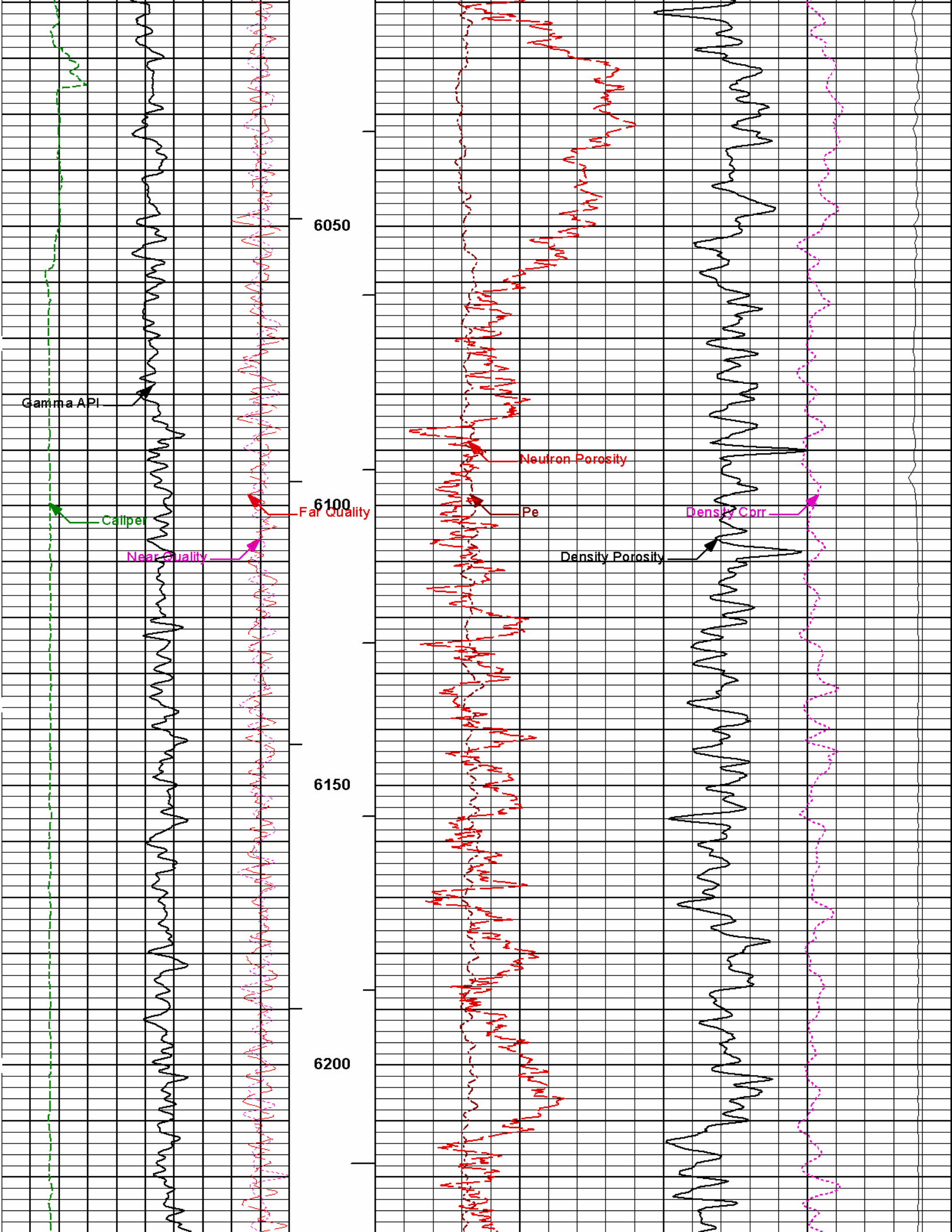


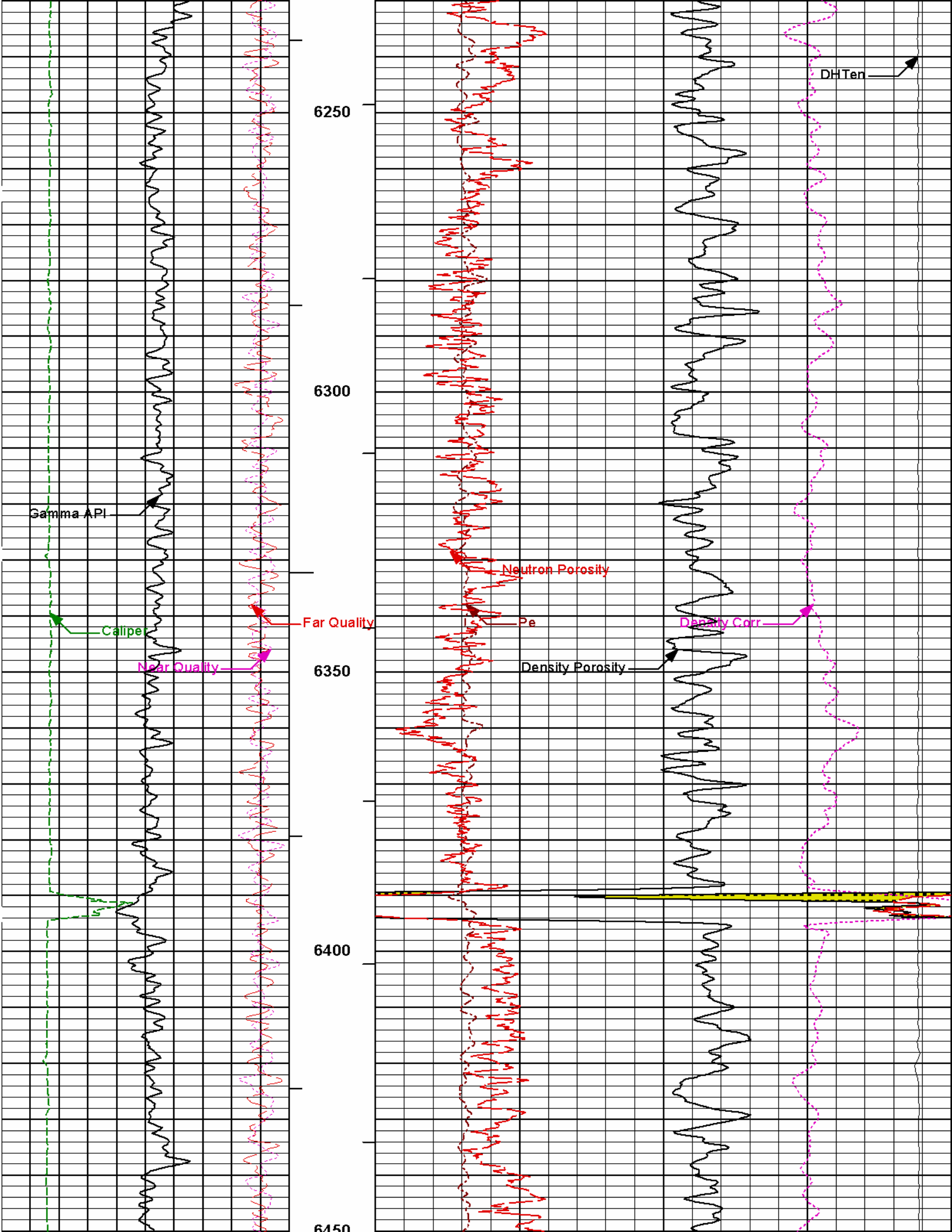


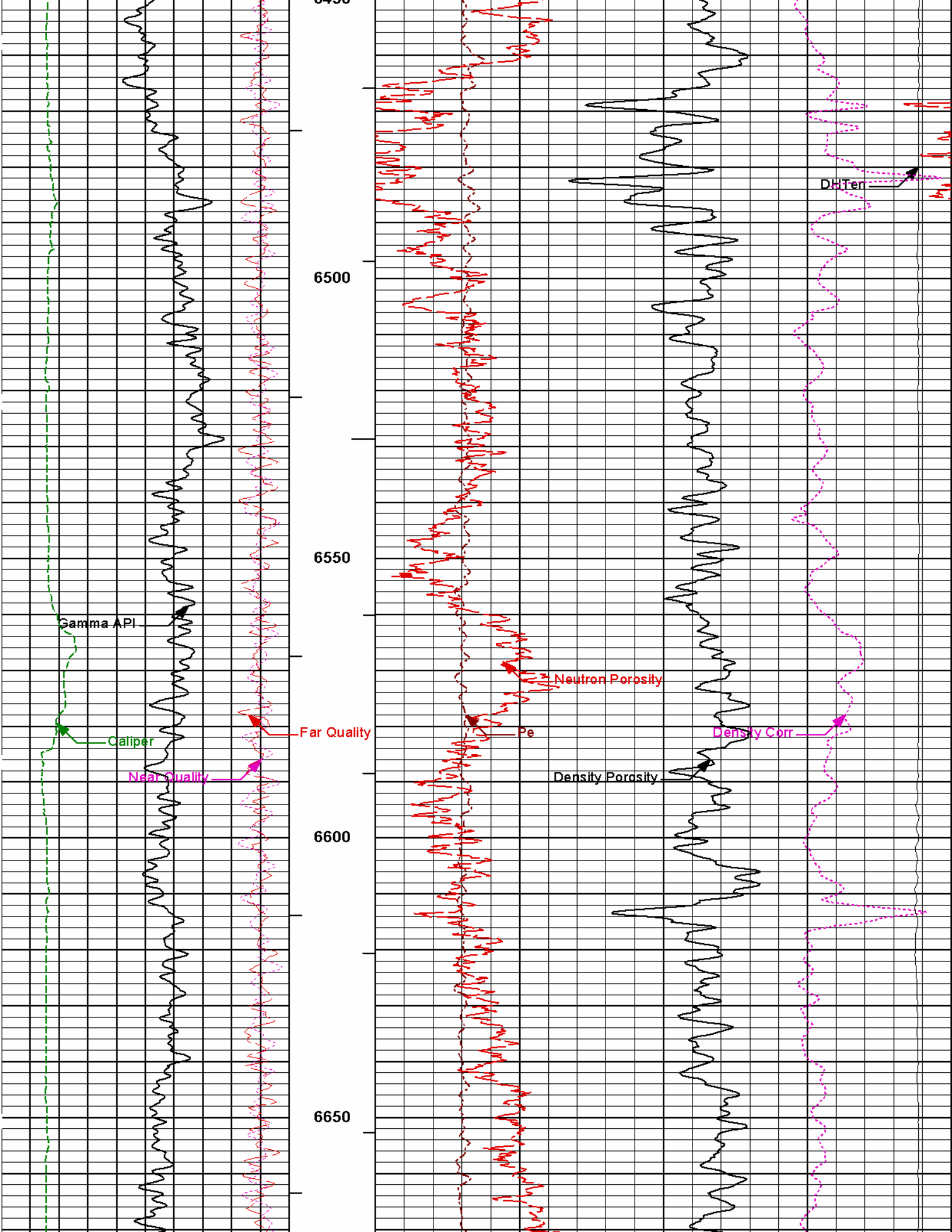


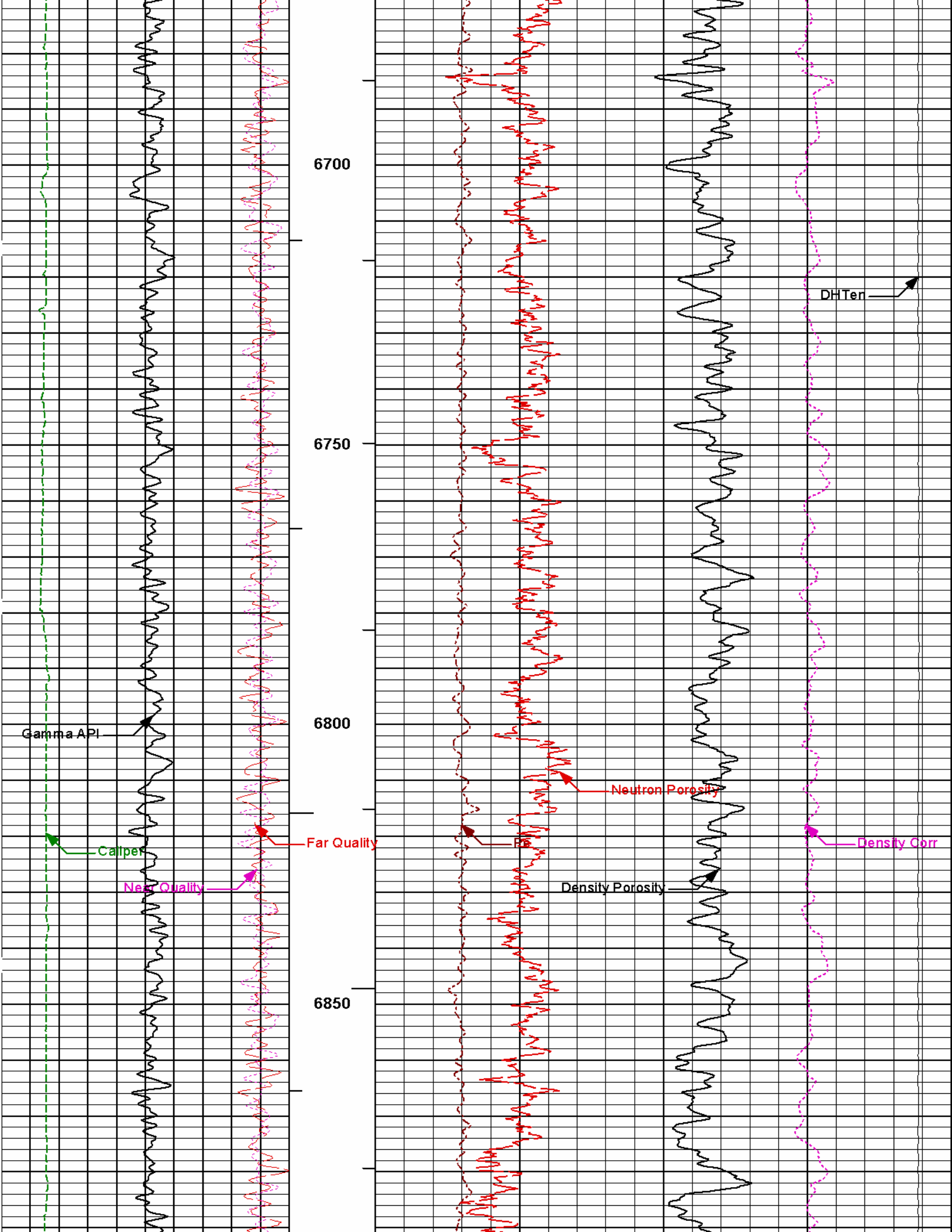


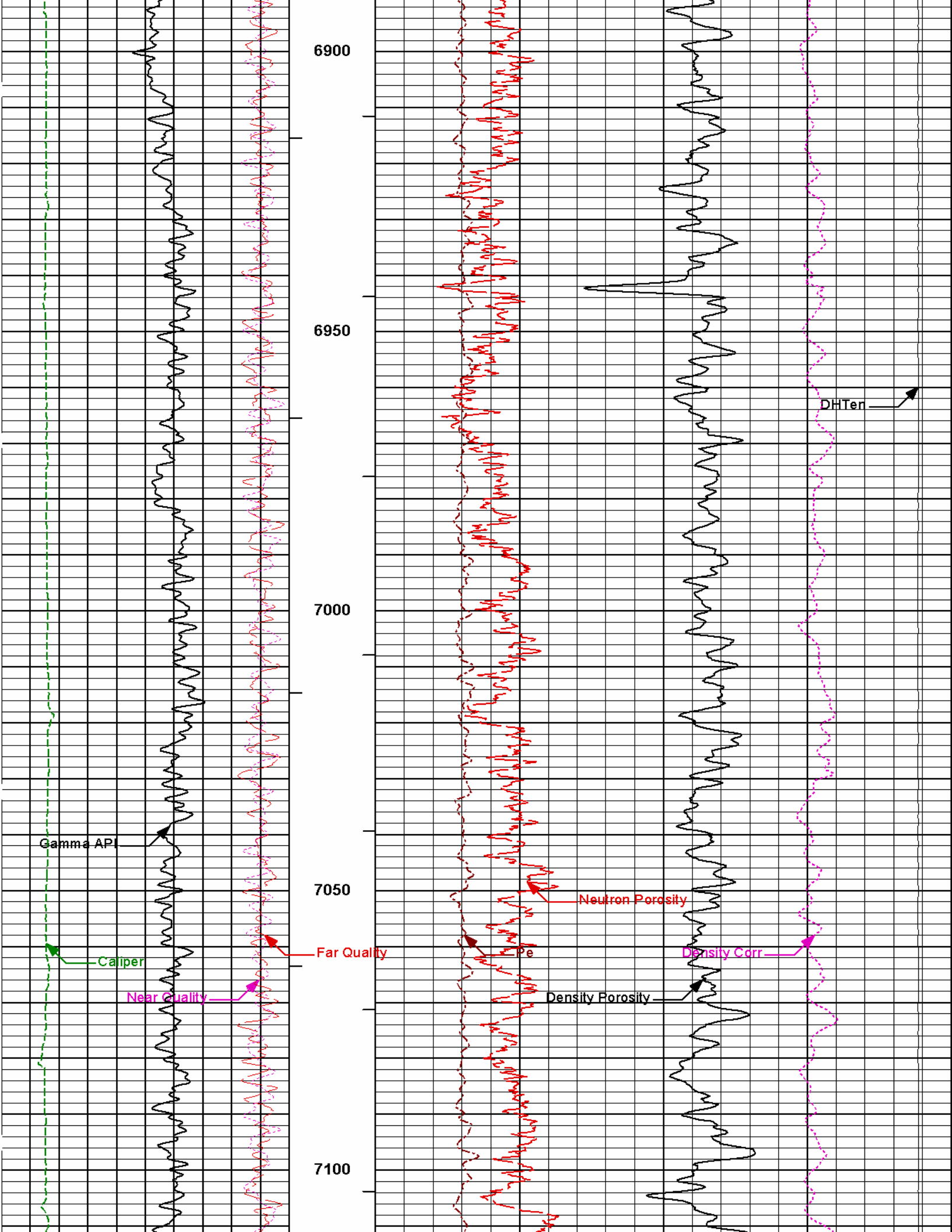


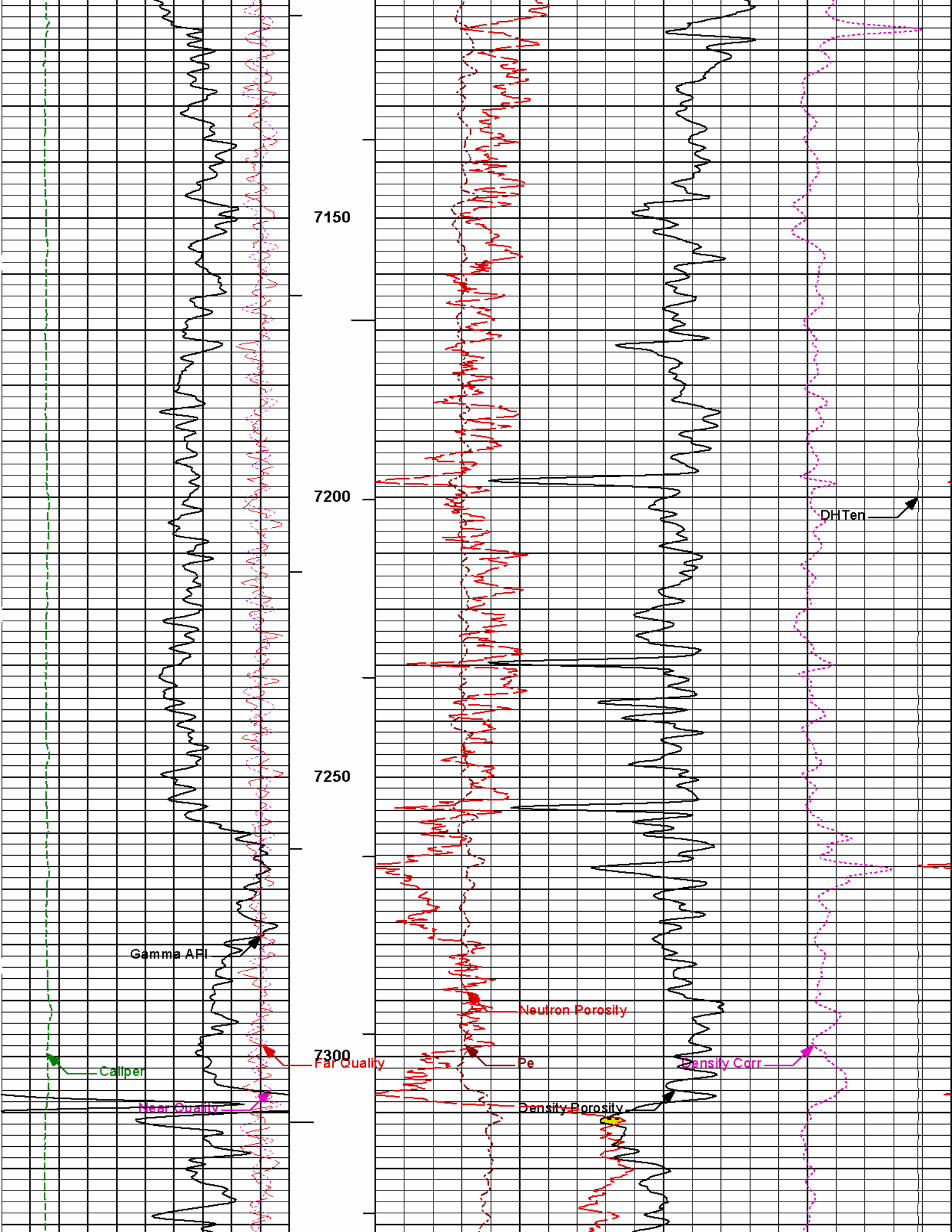


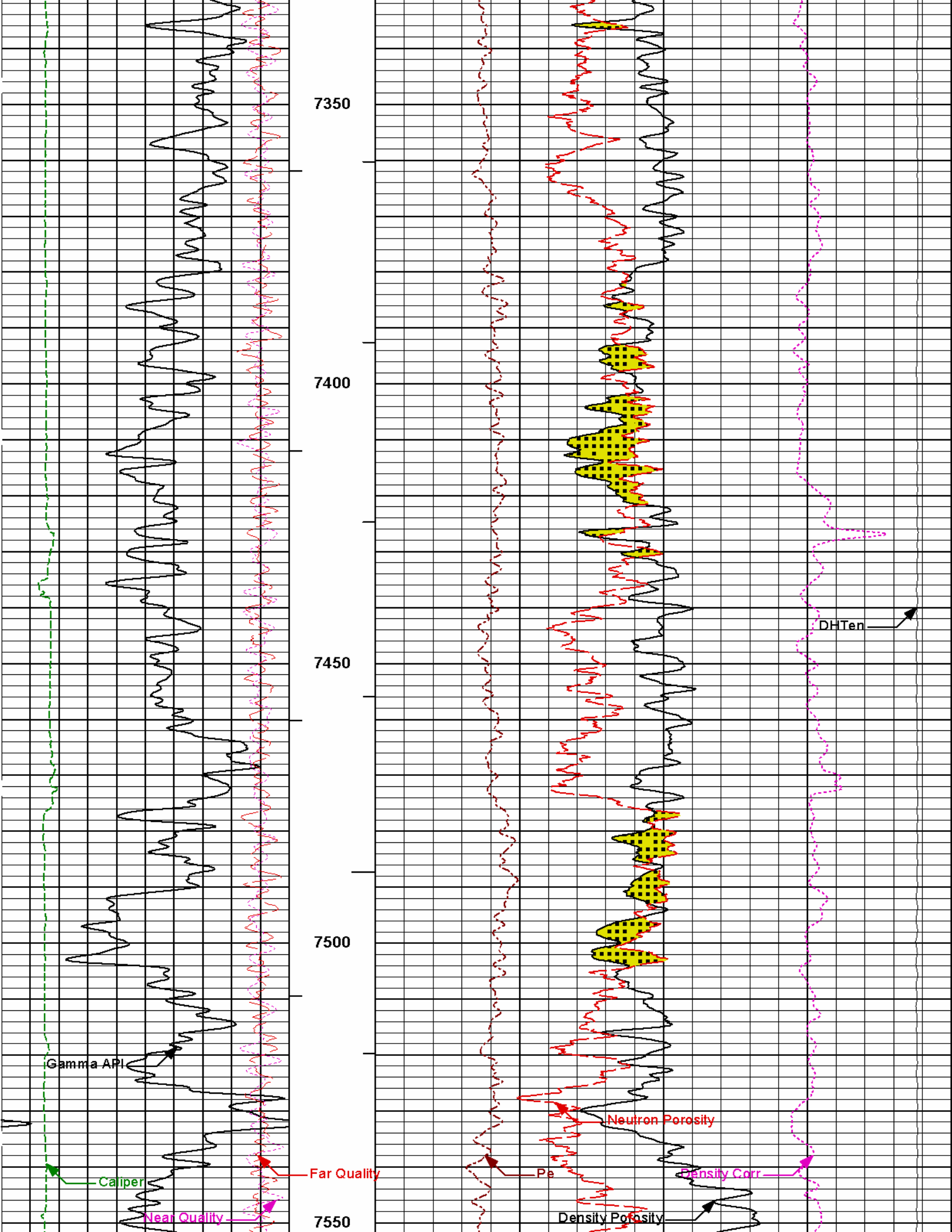


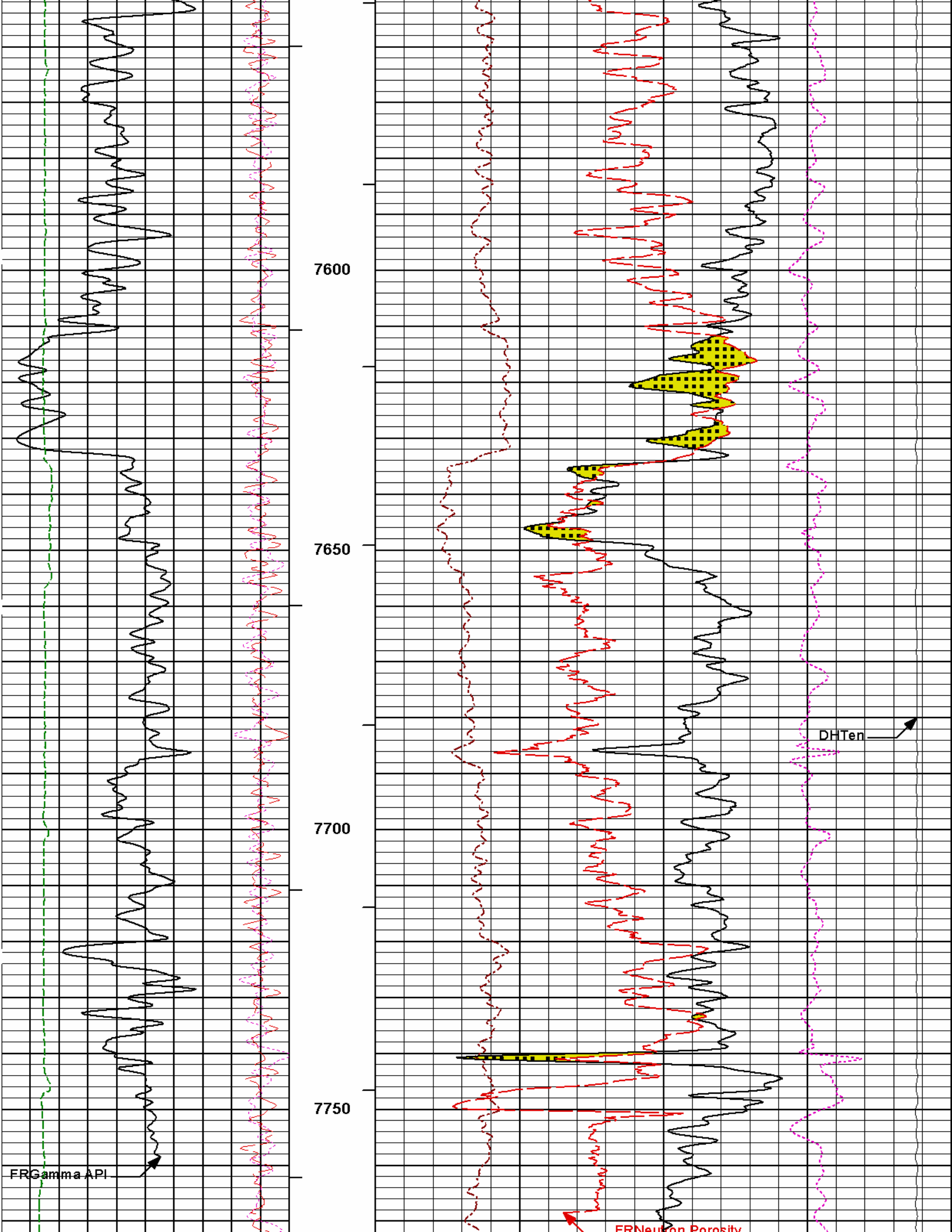


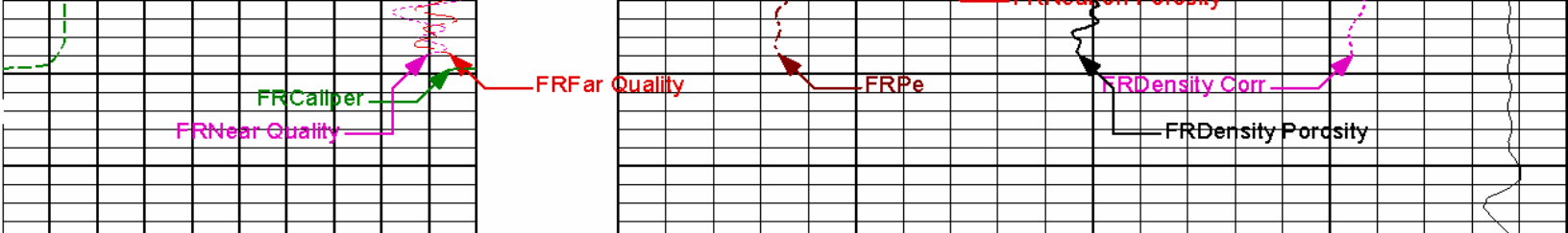












|    |              |     |         |    |                  |    |       |              |      |
|----|--------------|-----|---------|----|------------------|----|-------|--------------|------|
| 0  | Gamma API    | 200 | 1 : 240 | 0  | Pe               | 10 | -0.25 | Density Corr | 0.25 |
|    | api          |     |         |    |                  |    |       | gram per cc  |      |
| 6  | Caliper      | 16  | BHVT    |    |                  |    | 10K   | DHTen        | 0    |
|    | inches       |     |         |    |                  |    |       | pounds       |      |
| 9  | Far Quality  | -1  | AHVT    | 30 | Density Porosity |    |       |              | -10  |
|    |              |     |         |    | percent          |    |       |              |      |
| -9 | Near Quality | 1   |         | 30 | Neutron Porosity |    |       |              | -10  |
|    |              |     |         |    | percent          |    |       |              |      |

**HALLIBURTON**

Plot Time: 16-Apr-12 12:11:52  
 Plot Range: 927 ft to 7798 ft  
 Data: HEIN 2-1\Well Based\DAQ-0001-003.011  
 Plot File: \\PORO\IQ\_POROSITY\_5IN\_RM

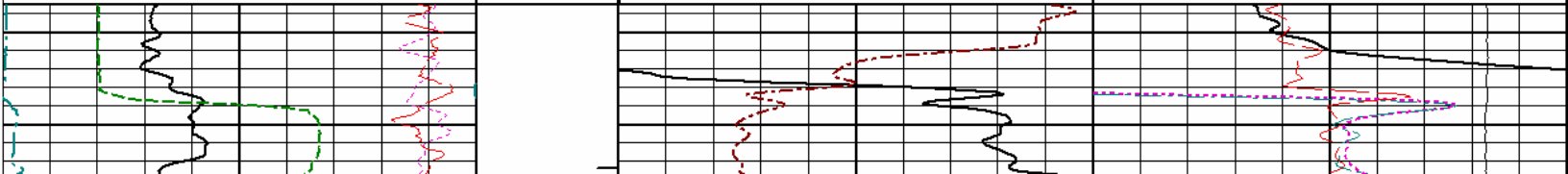
MAIN PASS 5" = 100'

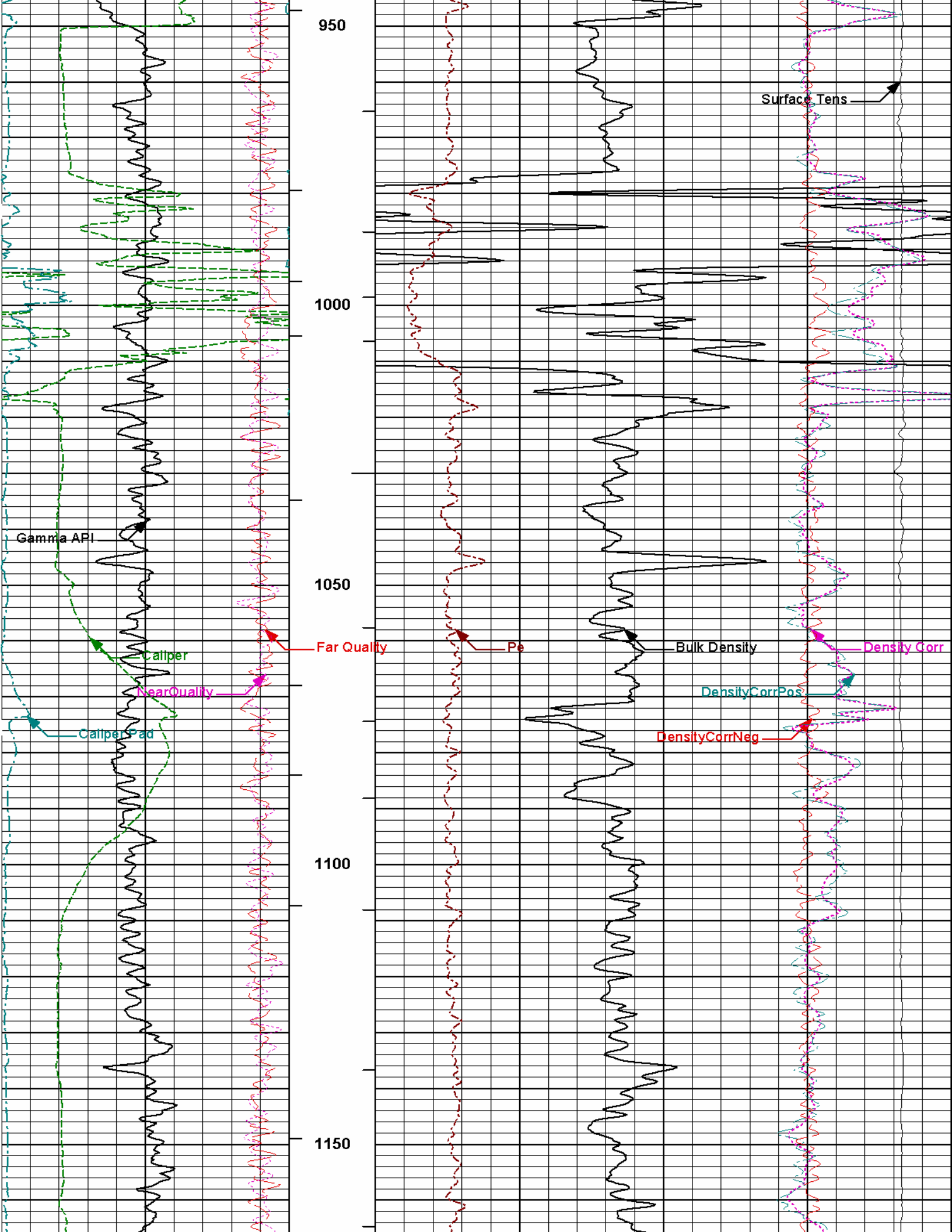
**HALLIBURTON**

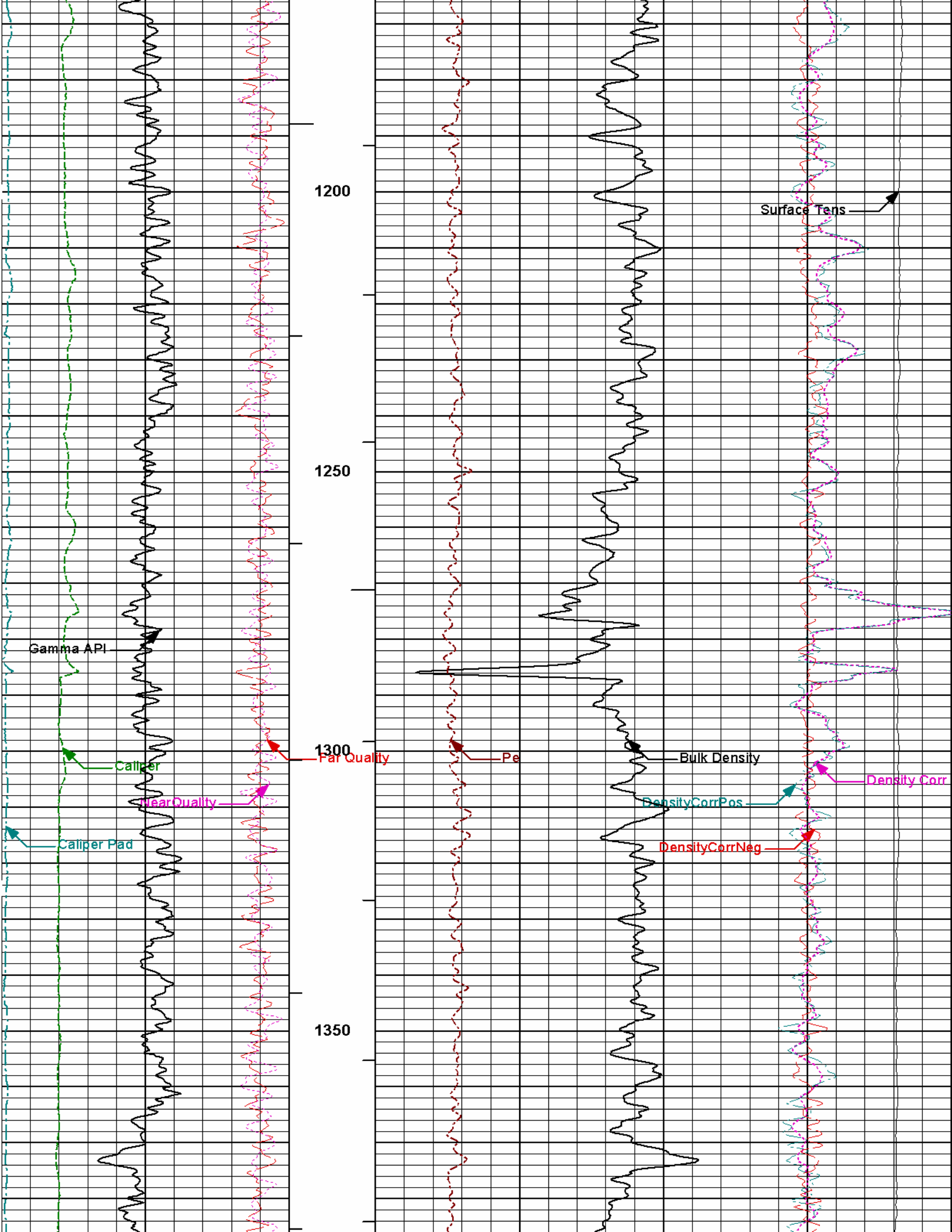
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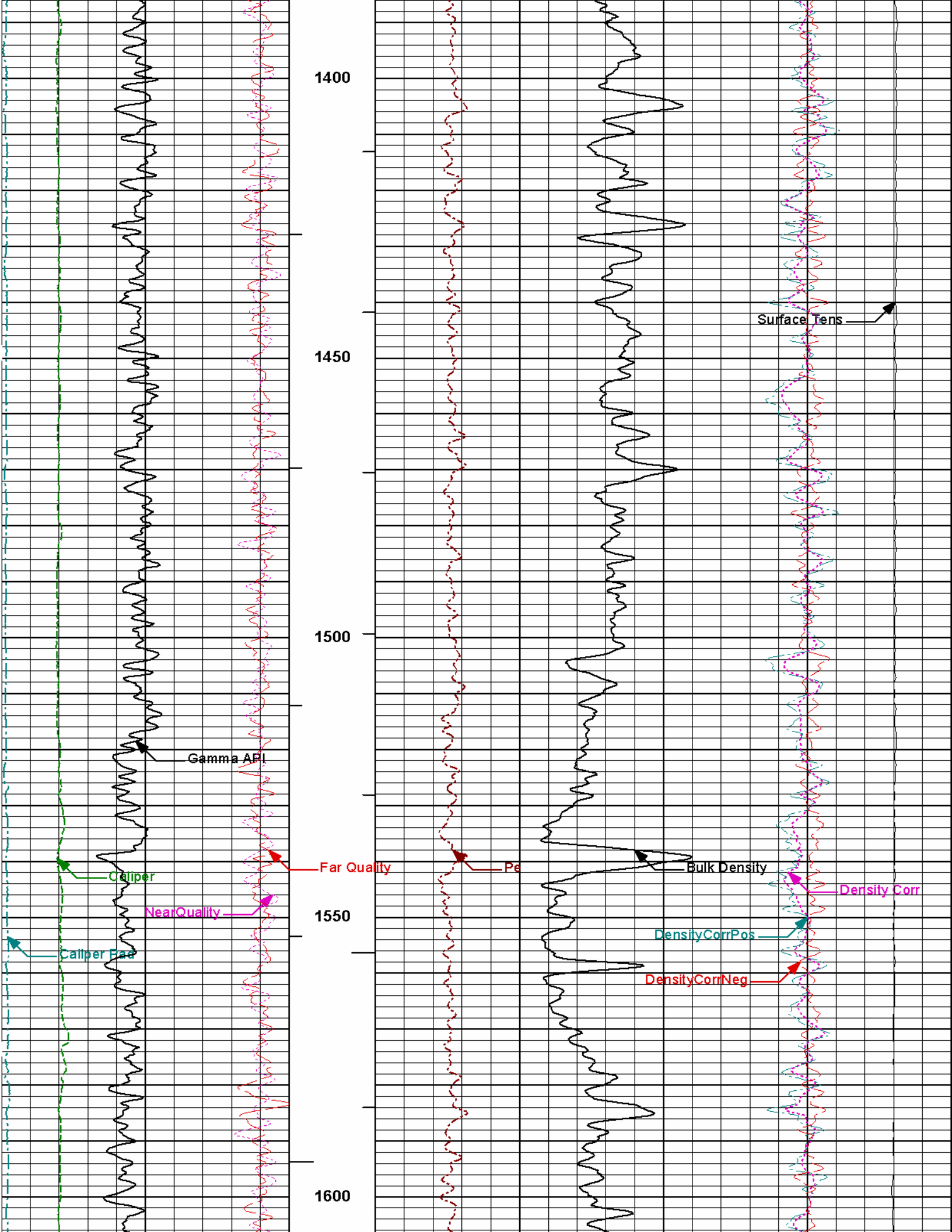
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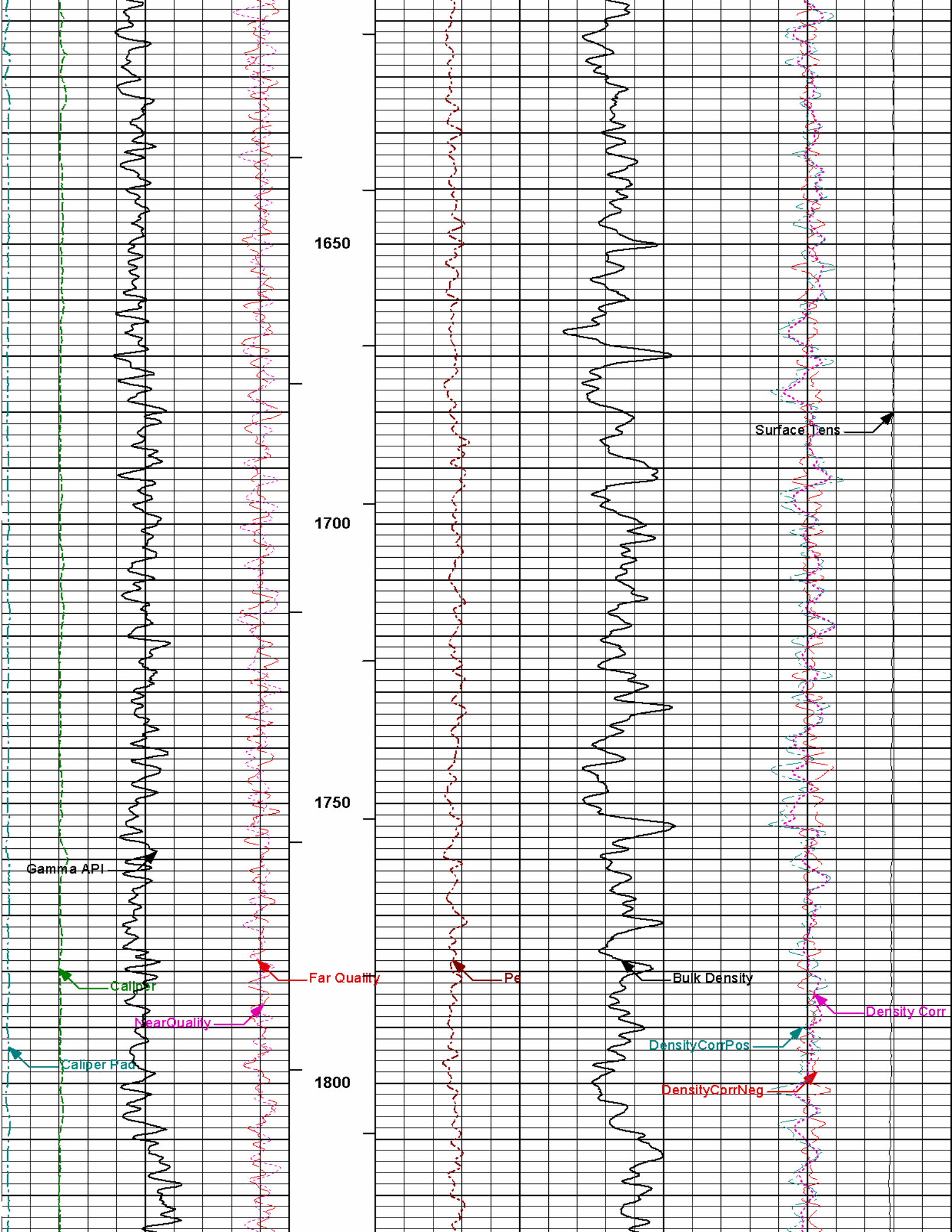
|    |             |     |         |   |              |    |       |                |      |
|----|-------------|-----|---------|---|--------------|----|-------|----------------|------|
| -9 | NearQuality | 1   |         | 2 | Bulk Density |    |       |                | 3    |
|    |             |     |         |   | gram per cc  |    |       |                |      |
| 9  | Far Quality | -1  |         |   |              |    | 10K   | Surface Tens   | 0    |
|    |             |     |         |   |              |    |       | pounds         |      |
| 0  | Caliper Pad | 10  | AHVT    |   |              |    | -0.25 | DensityCorrNeg | 0.25 |
|    | inches      |     |         |   |              |    |       | gram per cc    |      |
| 6  | Caliper     | 16  | BHVT    |   |              |    | -0.25 | DensityCorrPos | 0.25 |
|    | inches      |     |         |   |              |    |       | gram per cc    |      |
| 0  | Gamma API   | 200 | 1 : 240 | 0 | Pe           | 10 | -0.25 | Density Corr   | 0.25 |
|    | api         |     |         |   |              |    |       | gram per cc    |      |

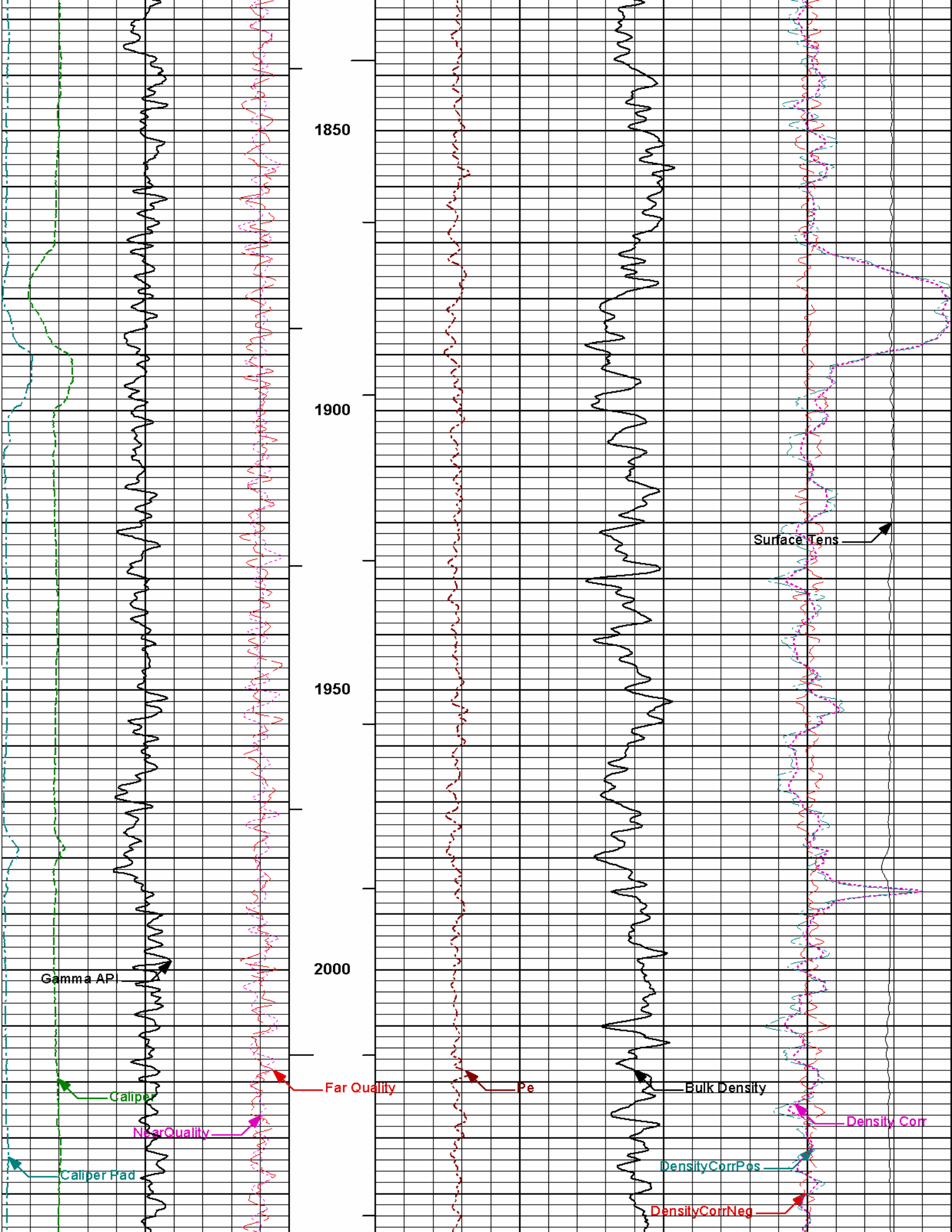


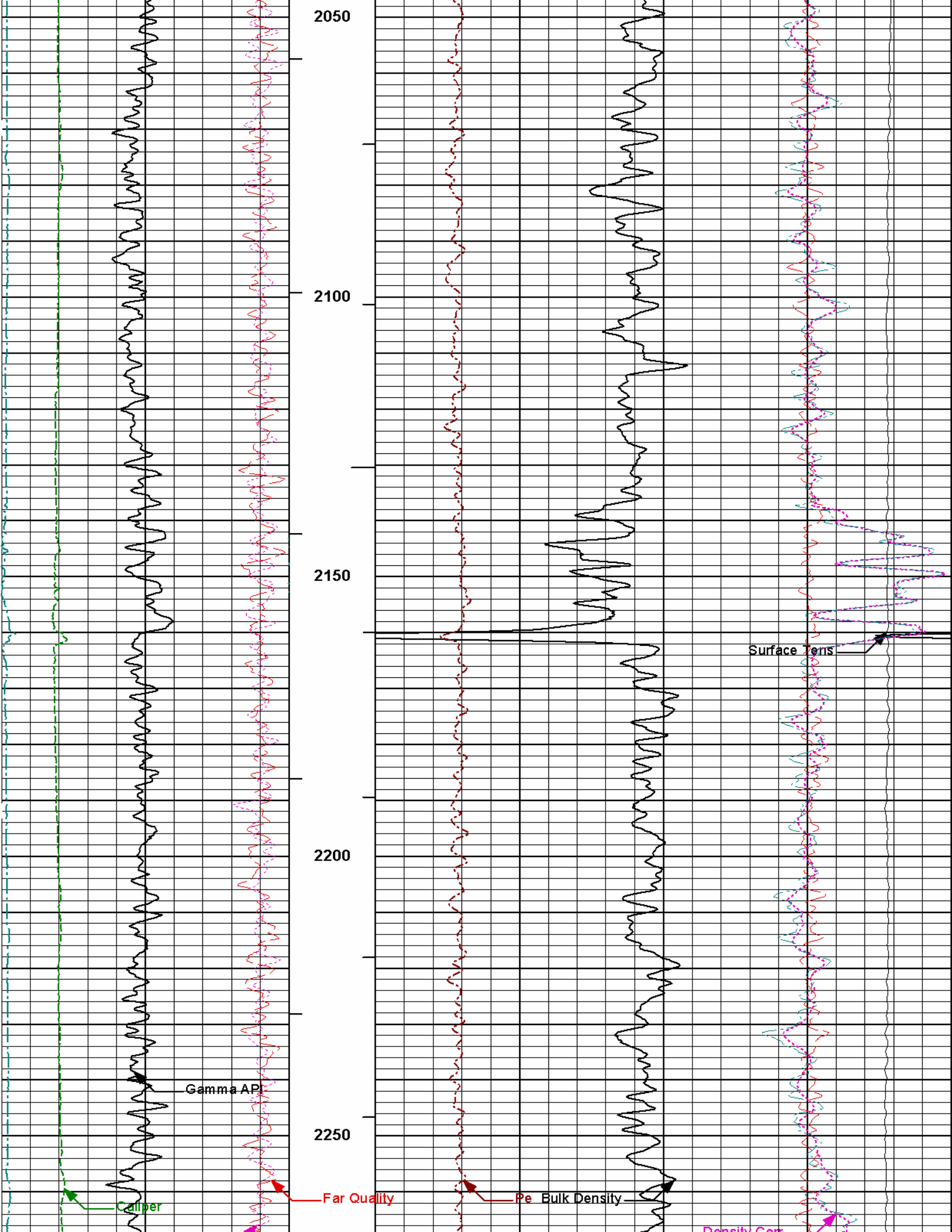


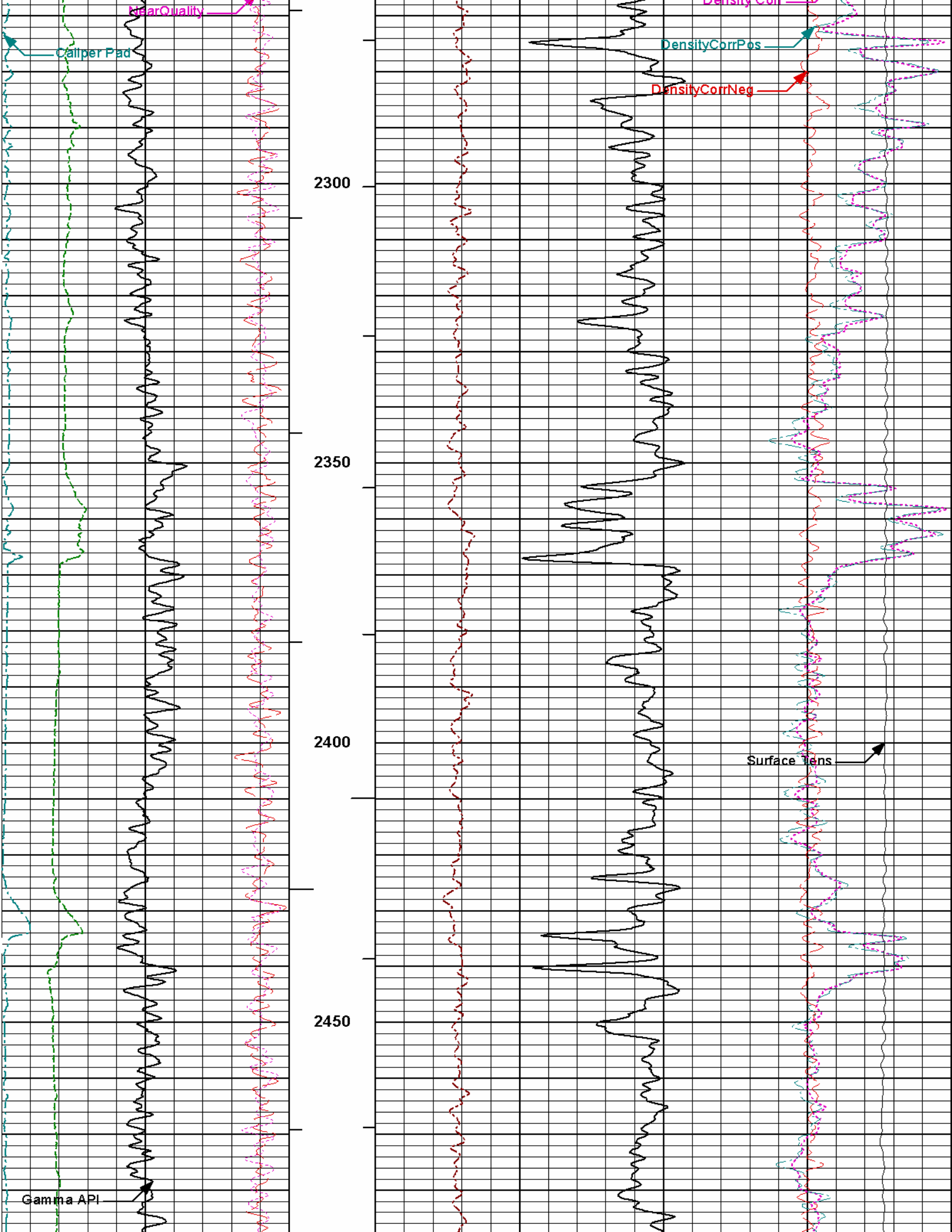


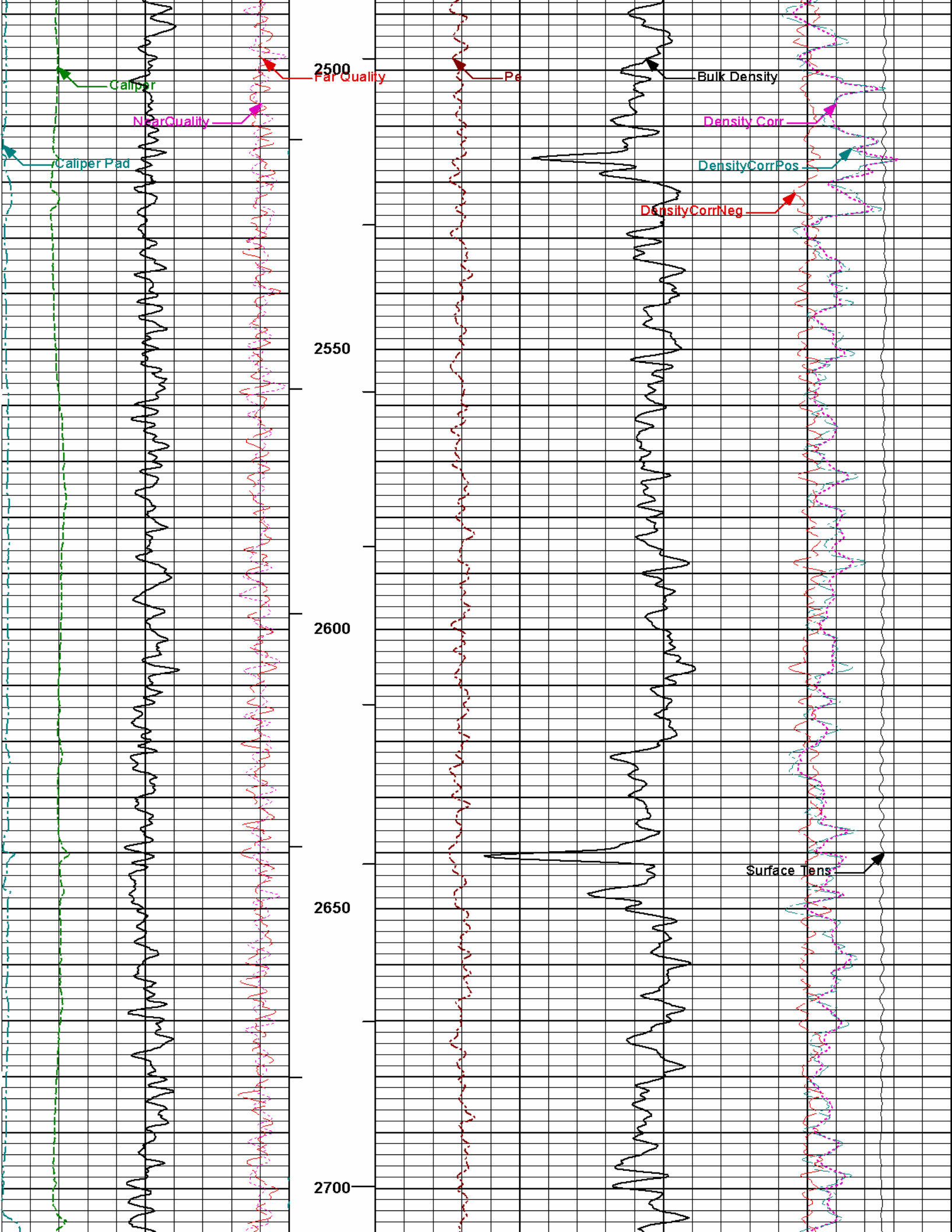


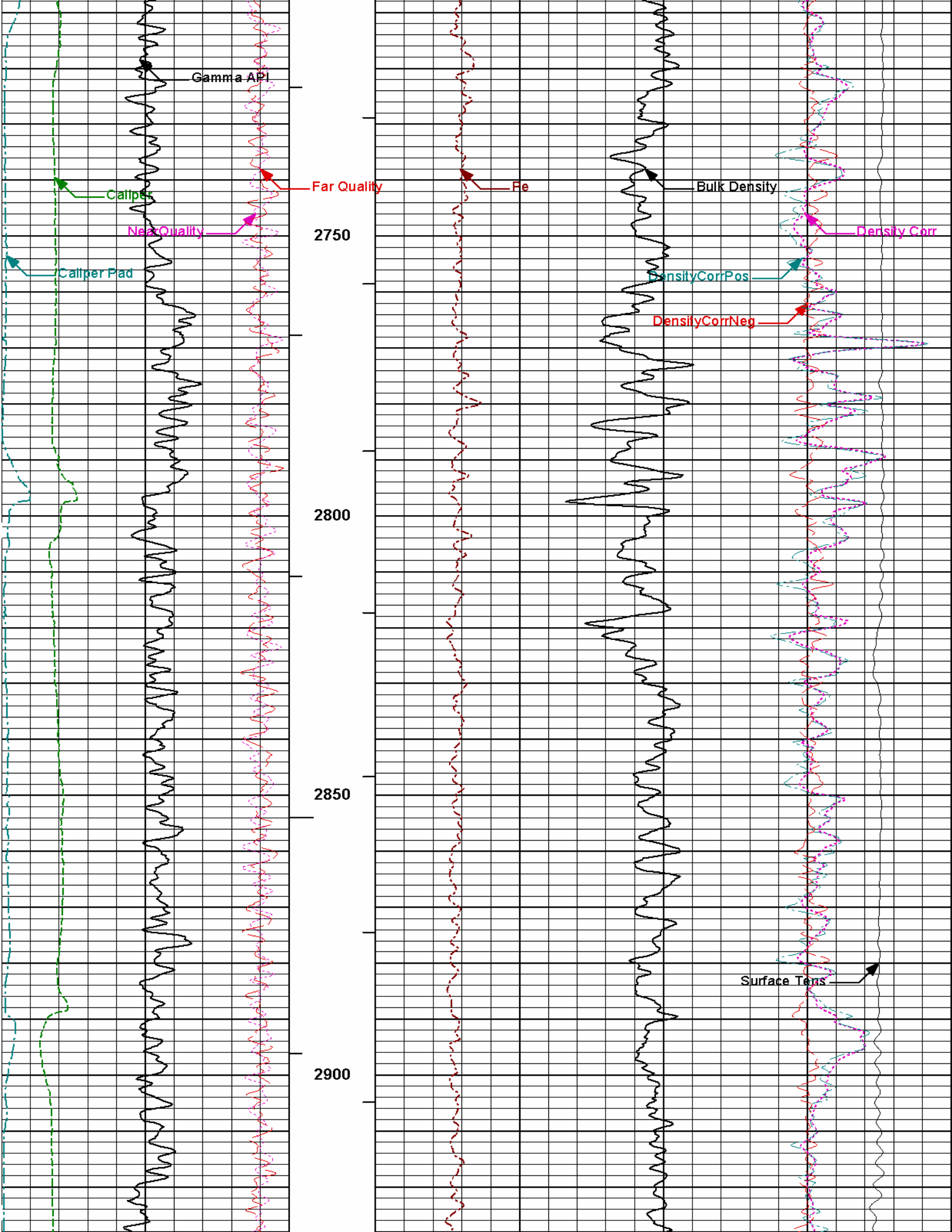


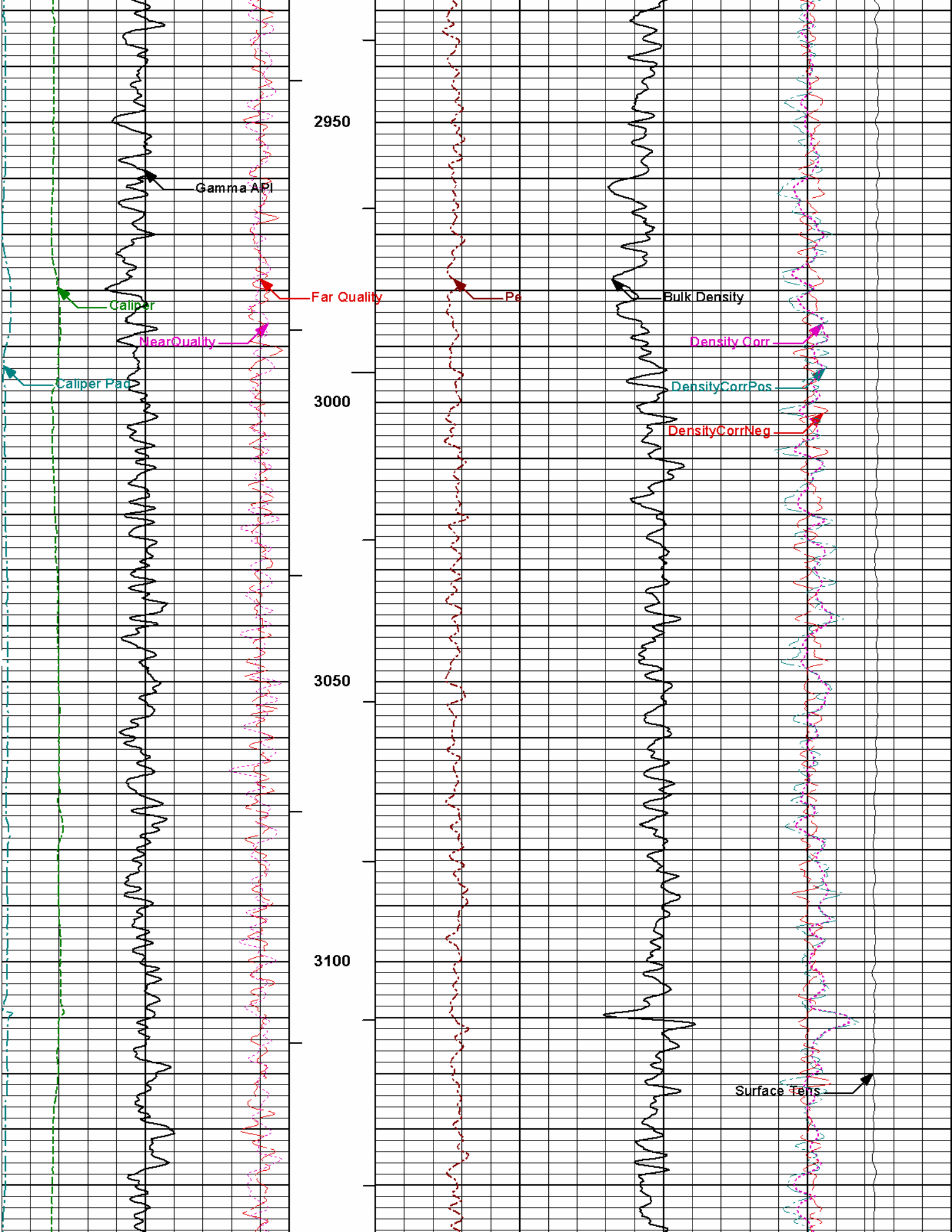


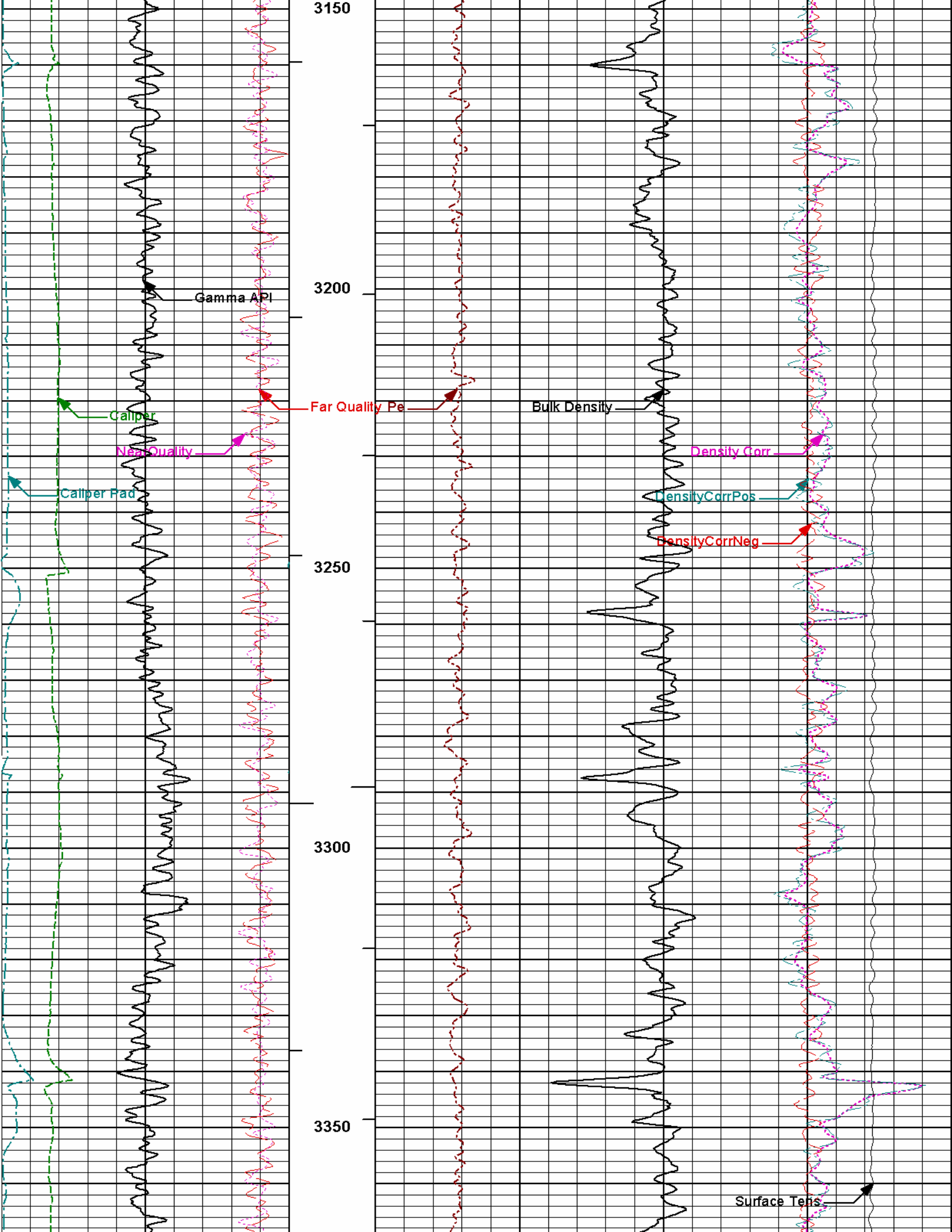


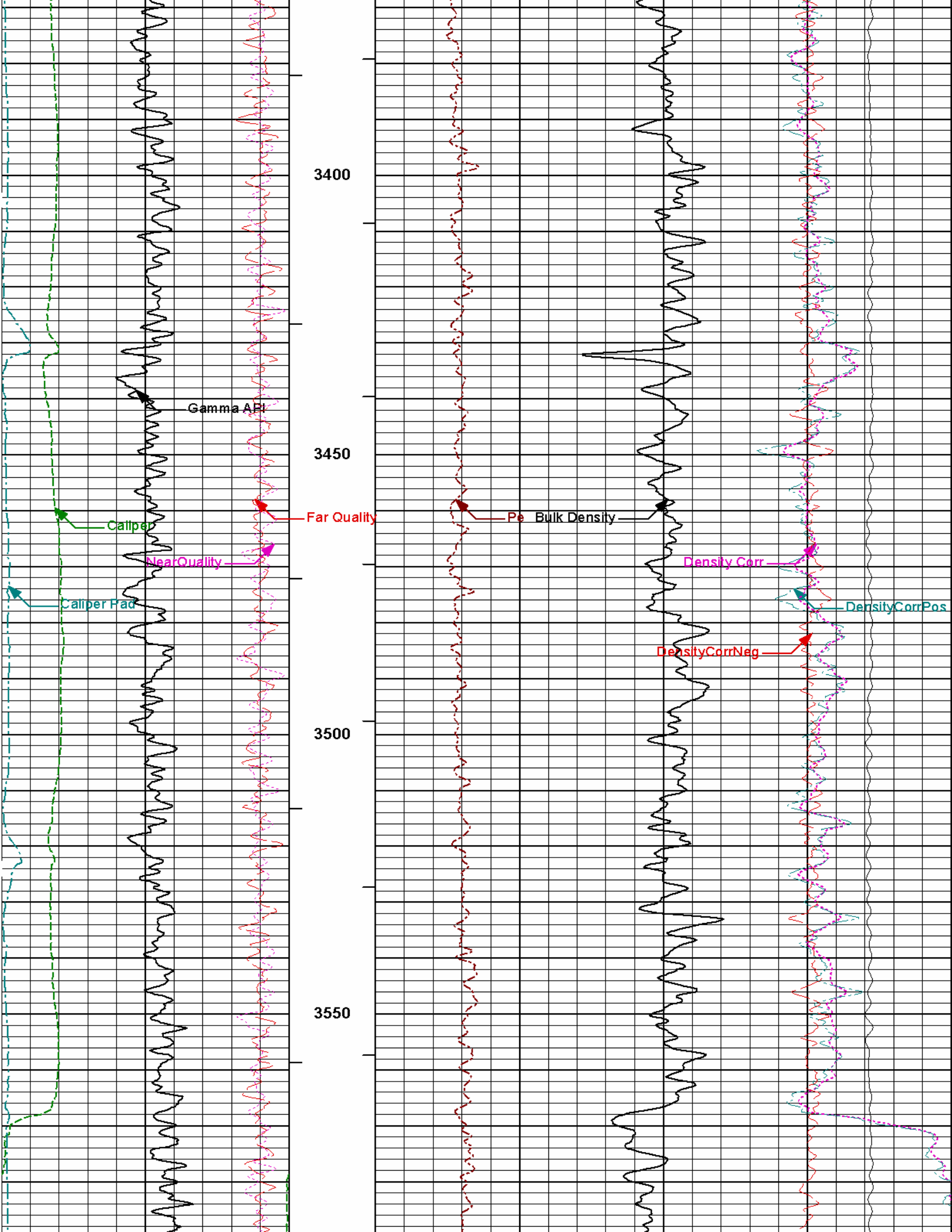


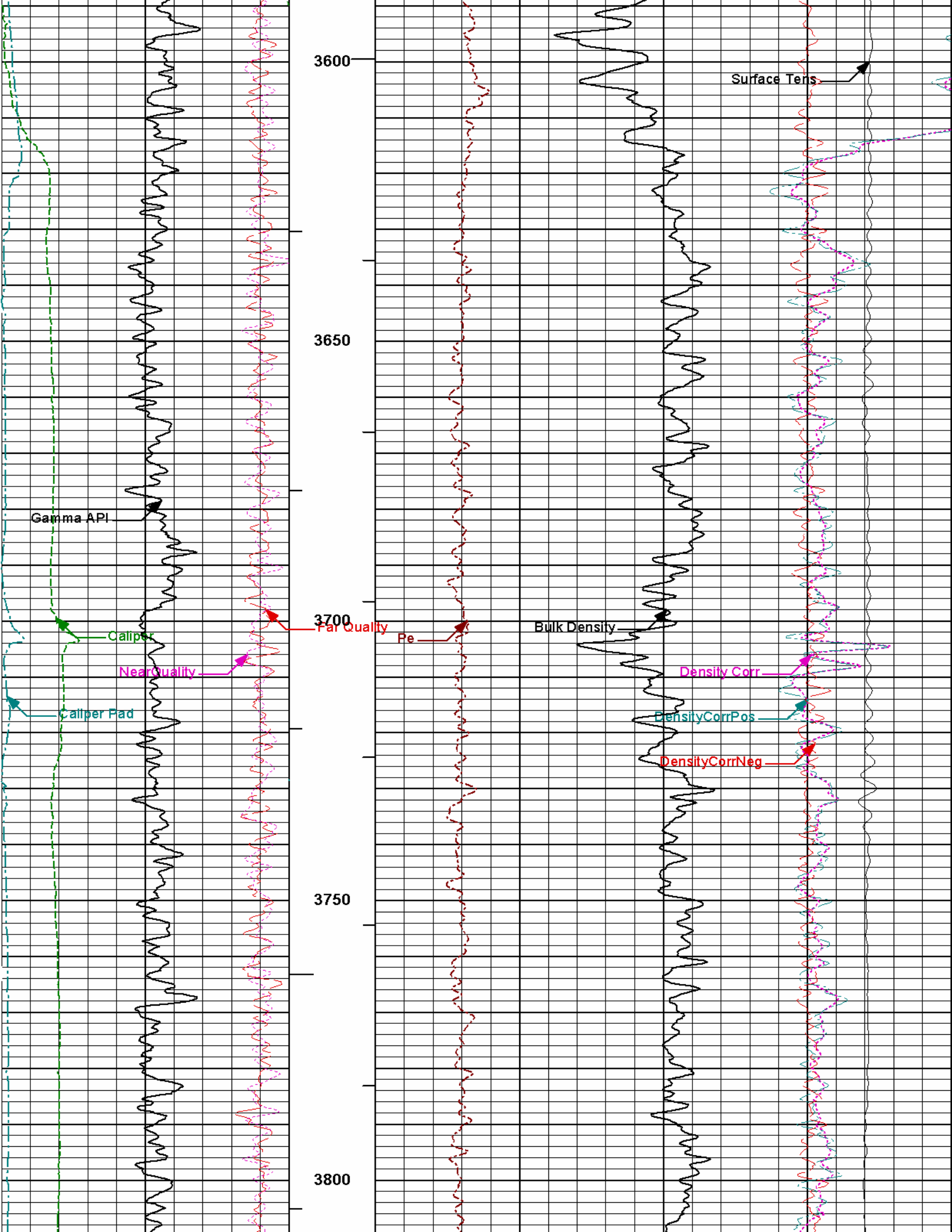


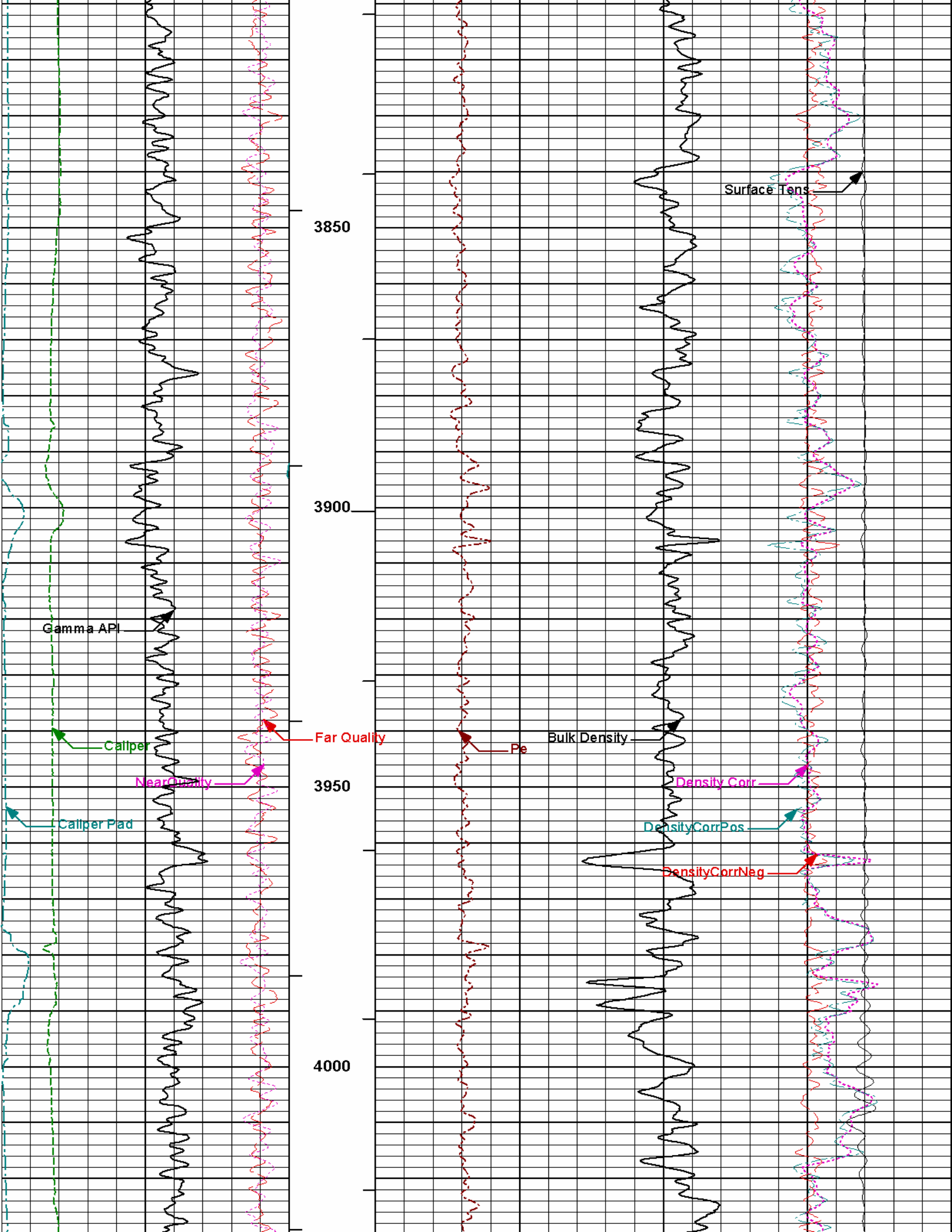


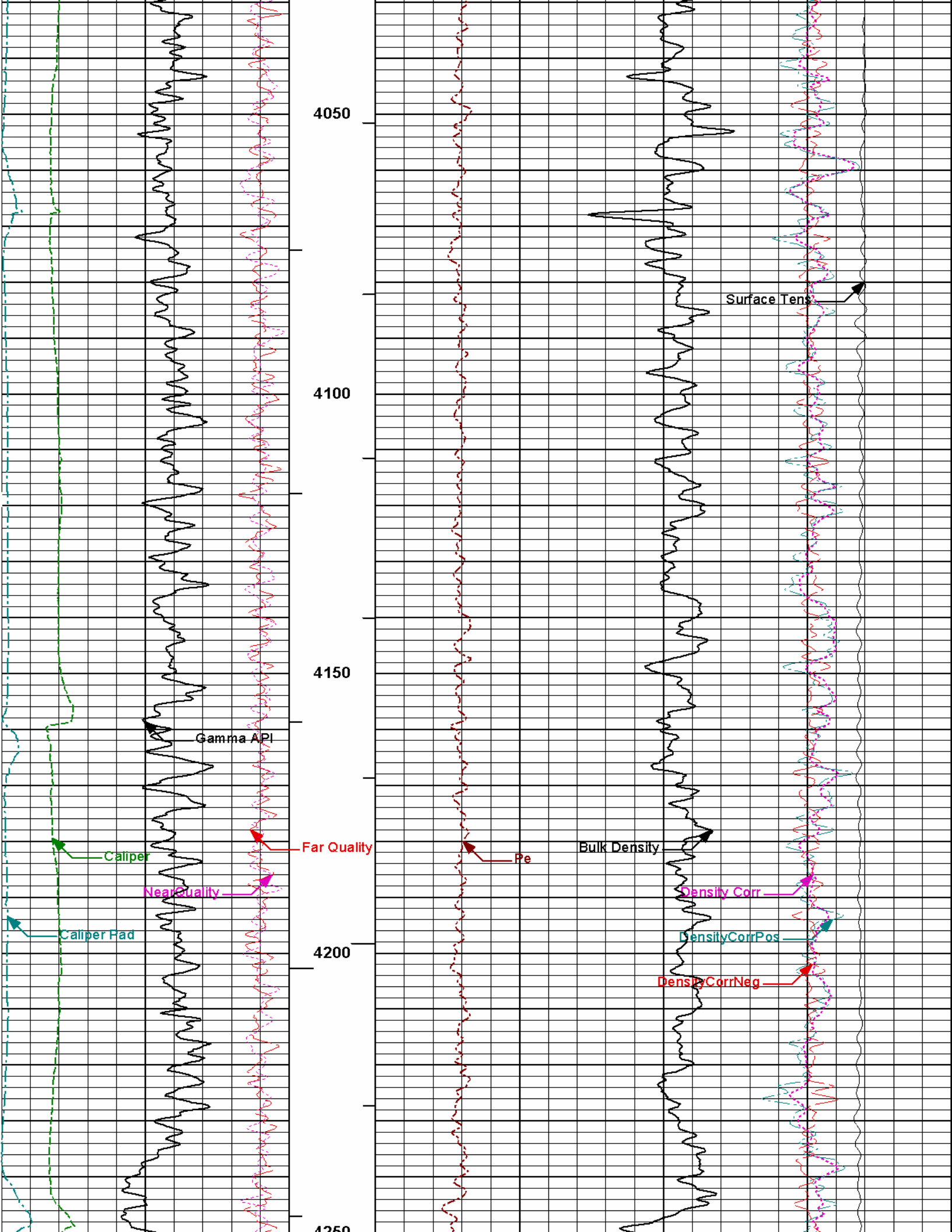


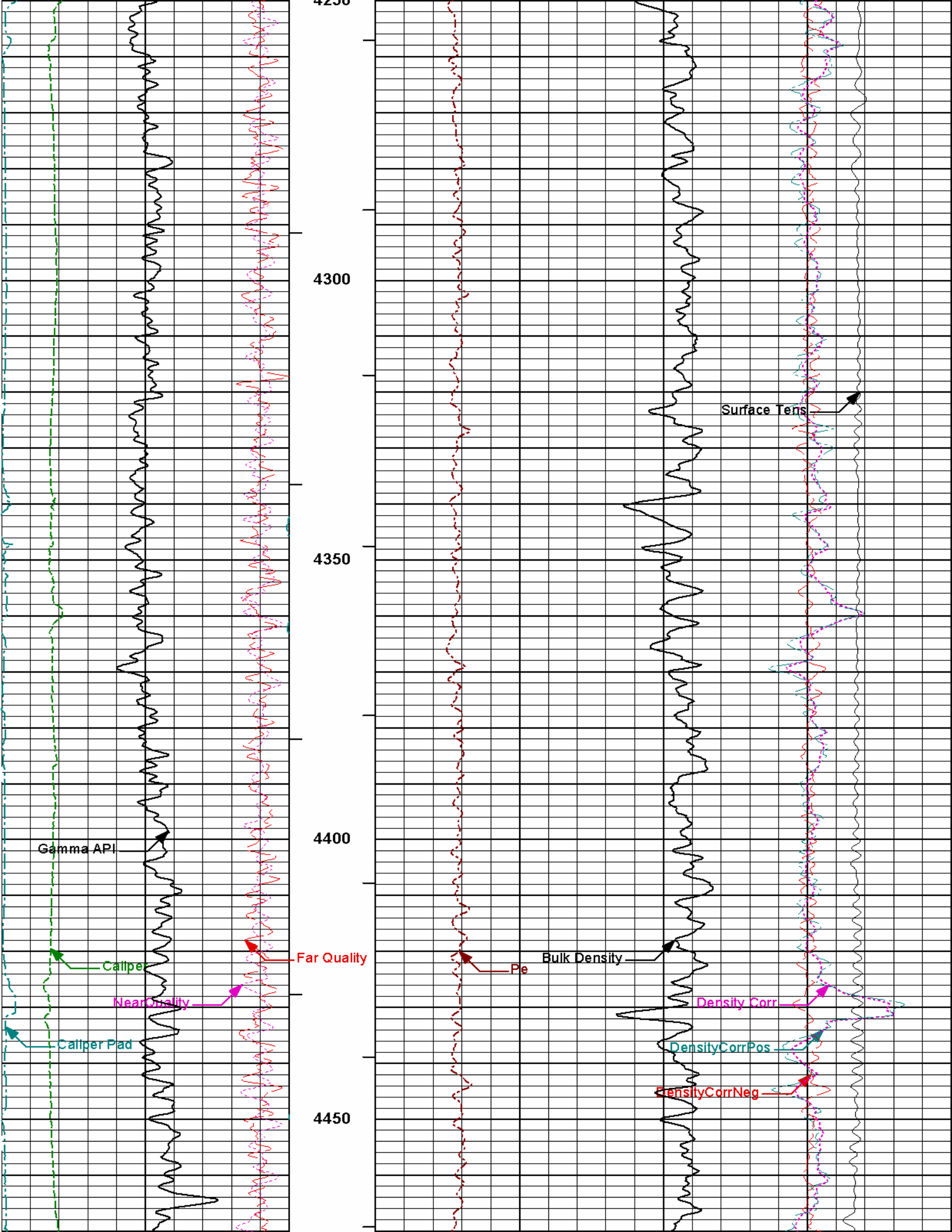


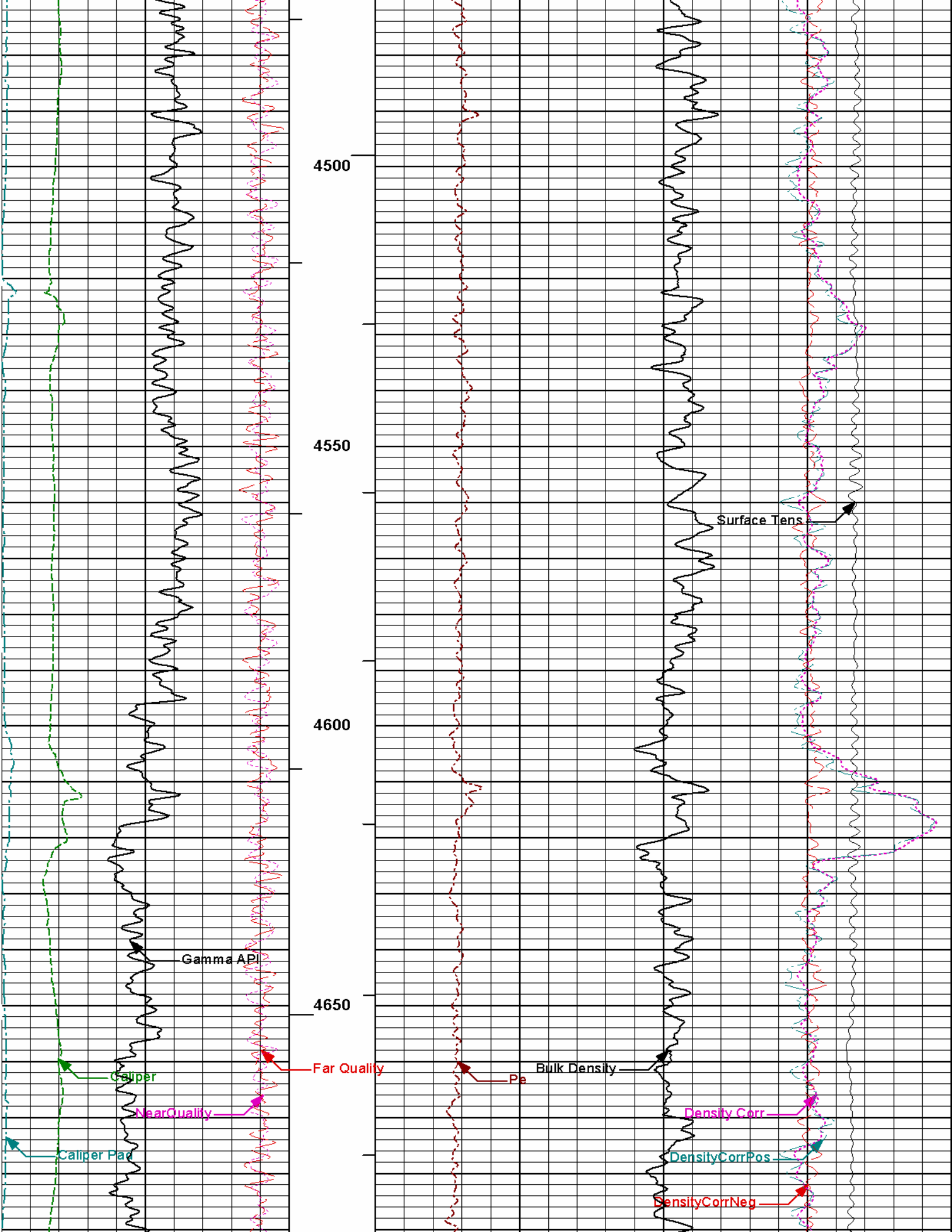


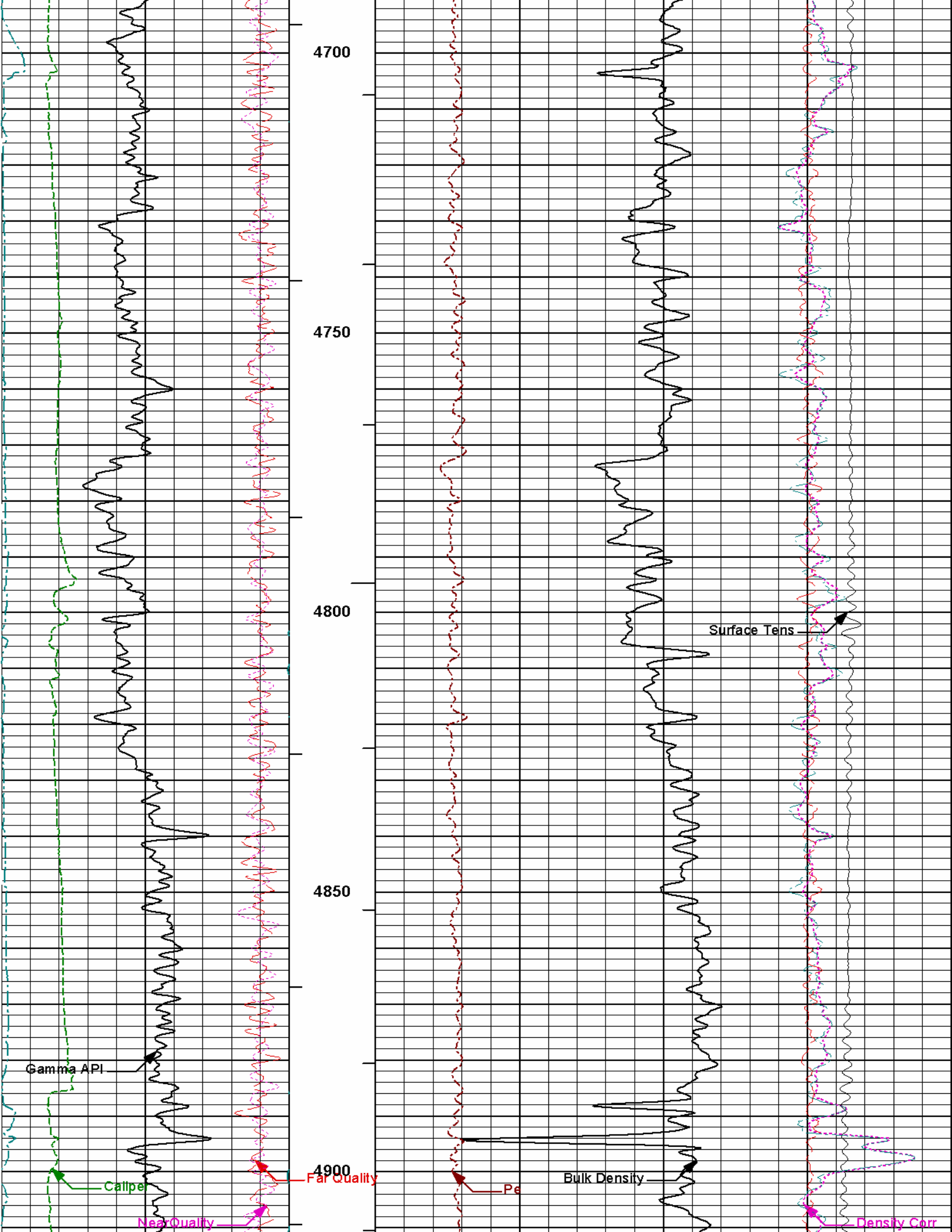


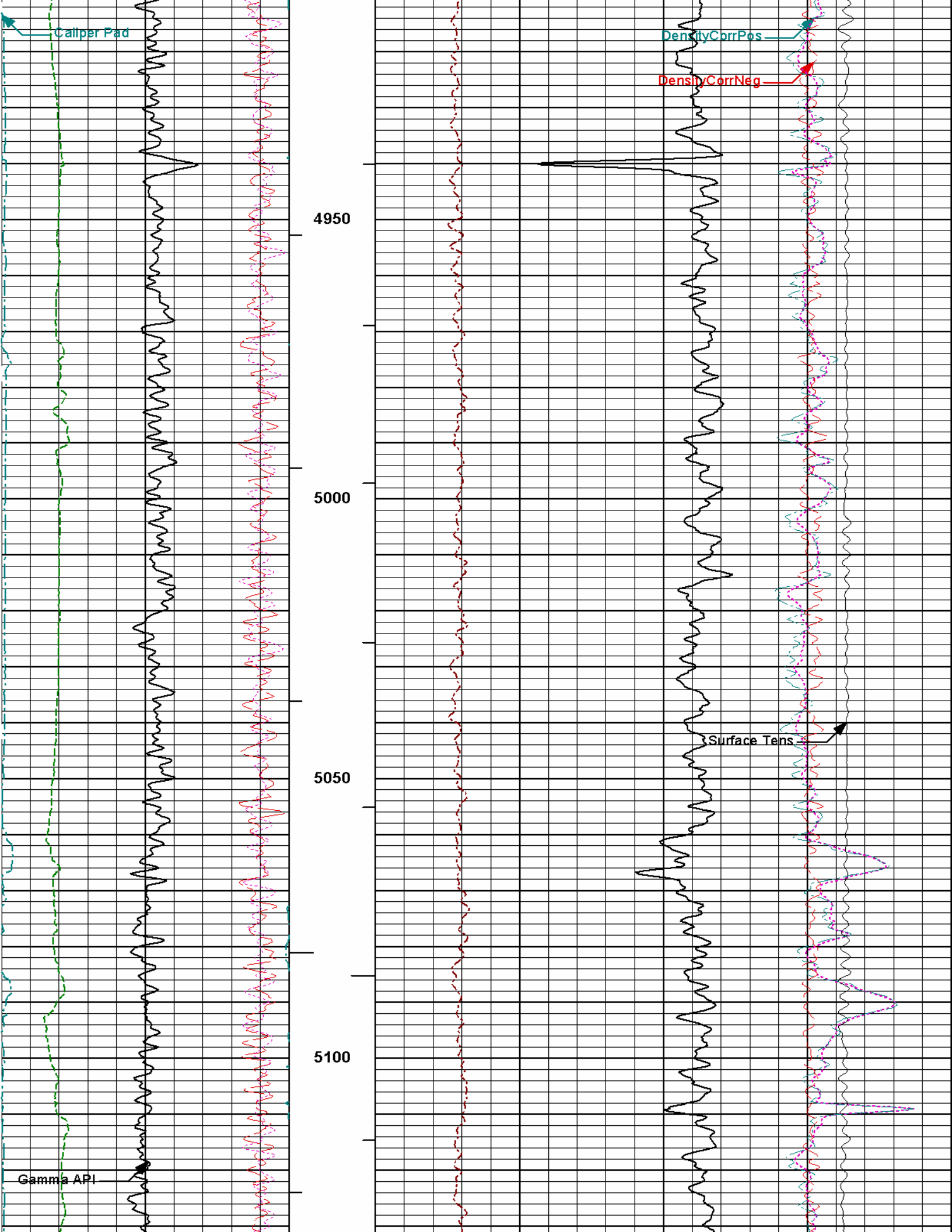


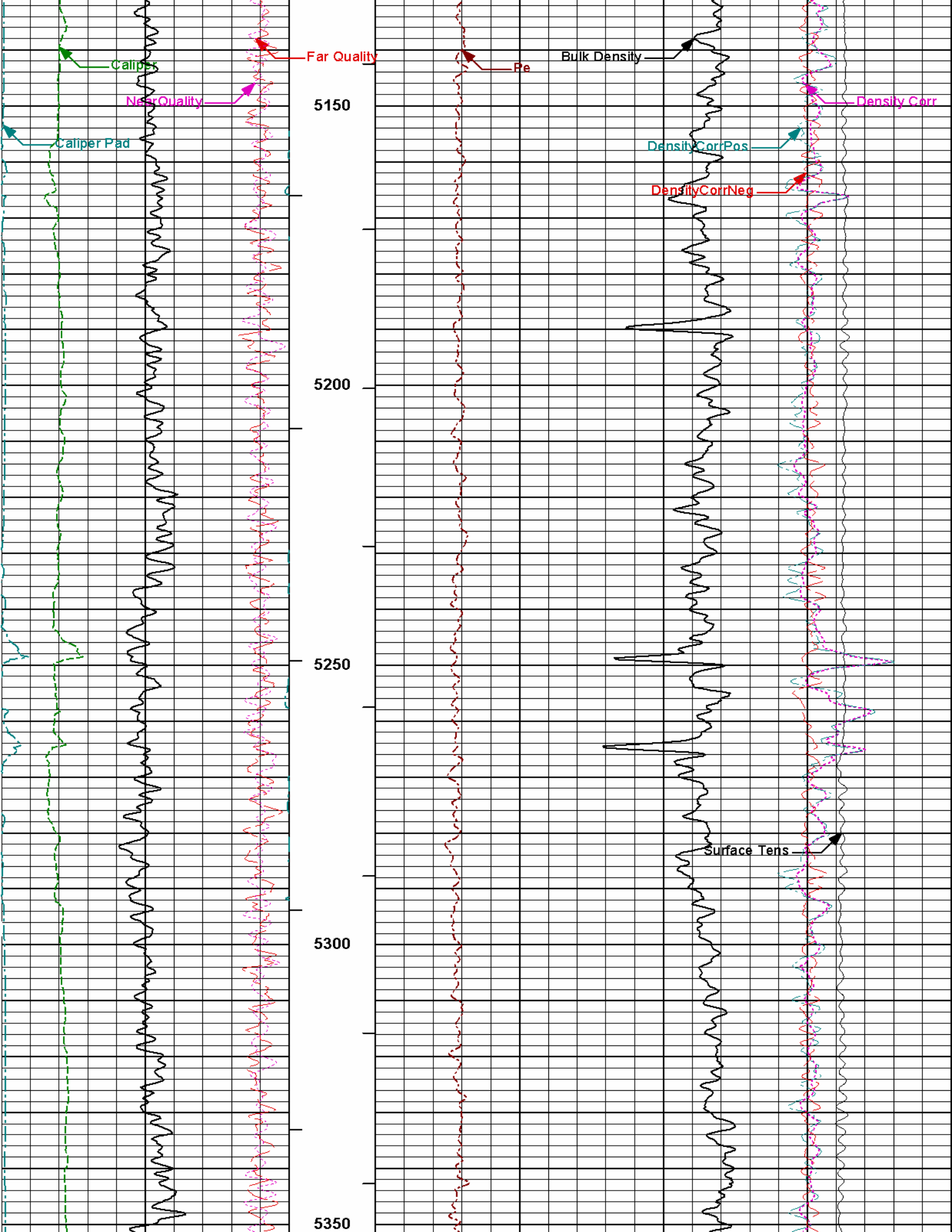


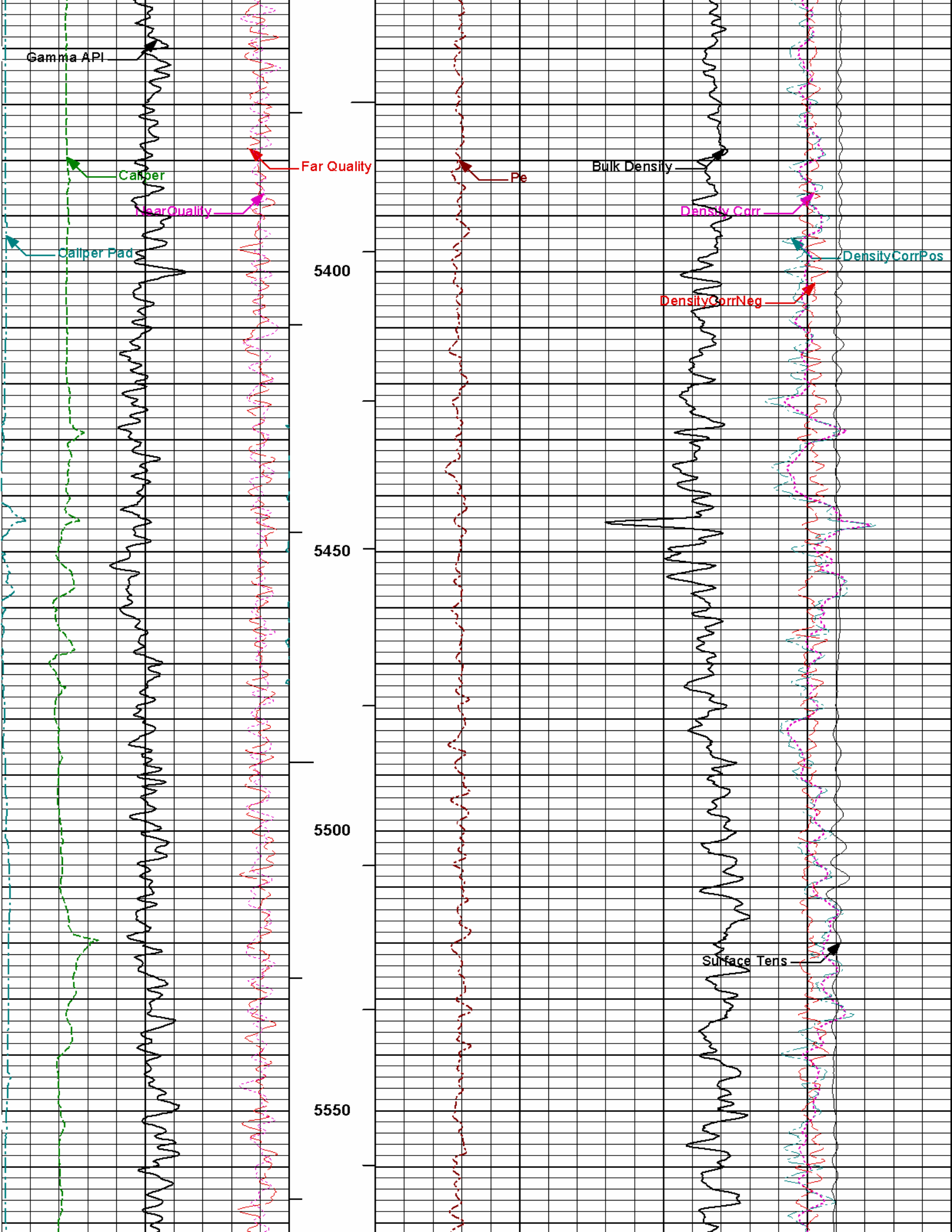


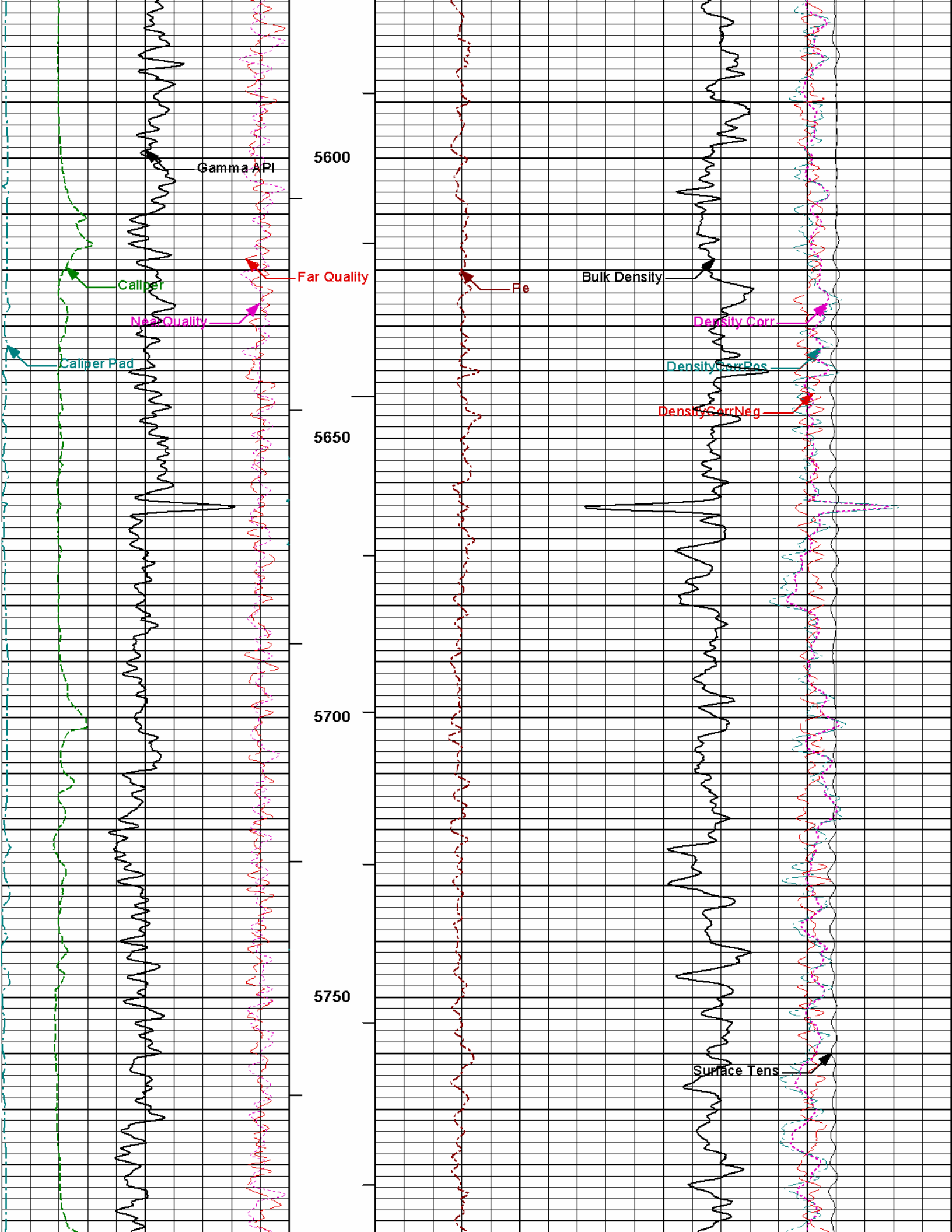


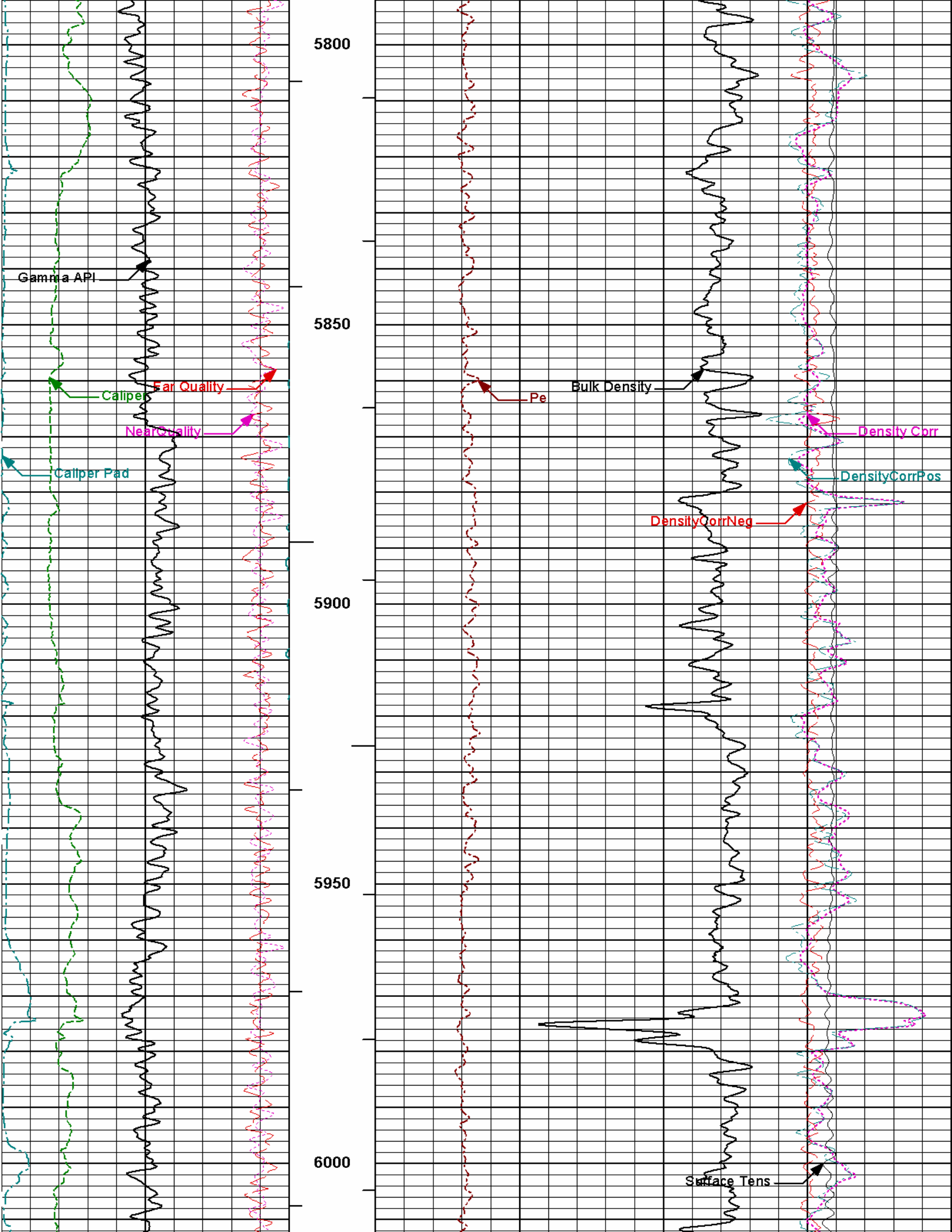


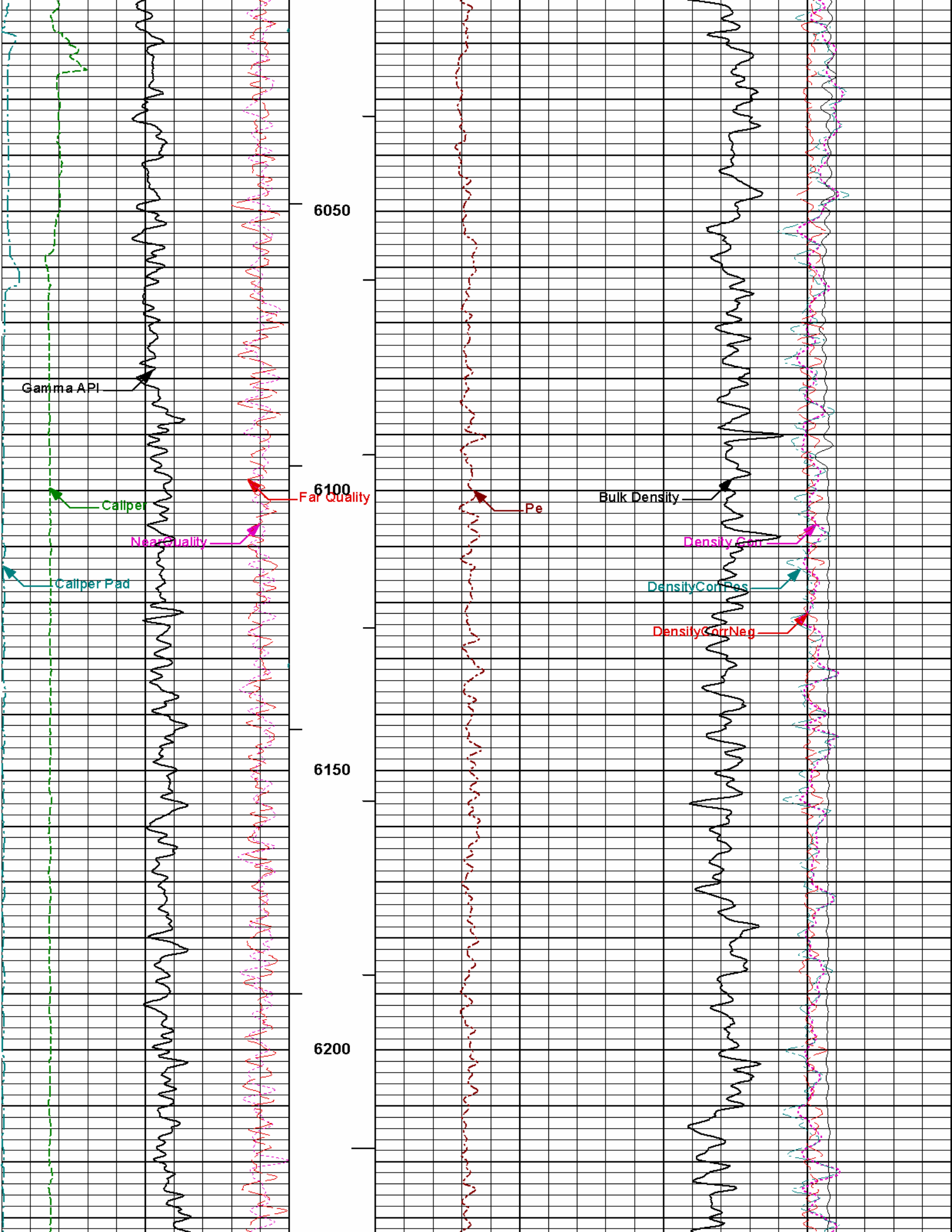


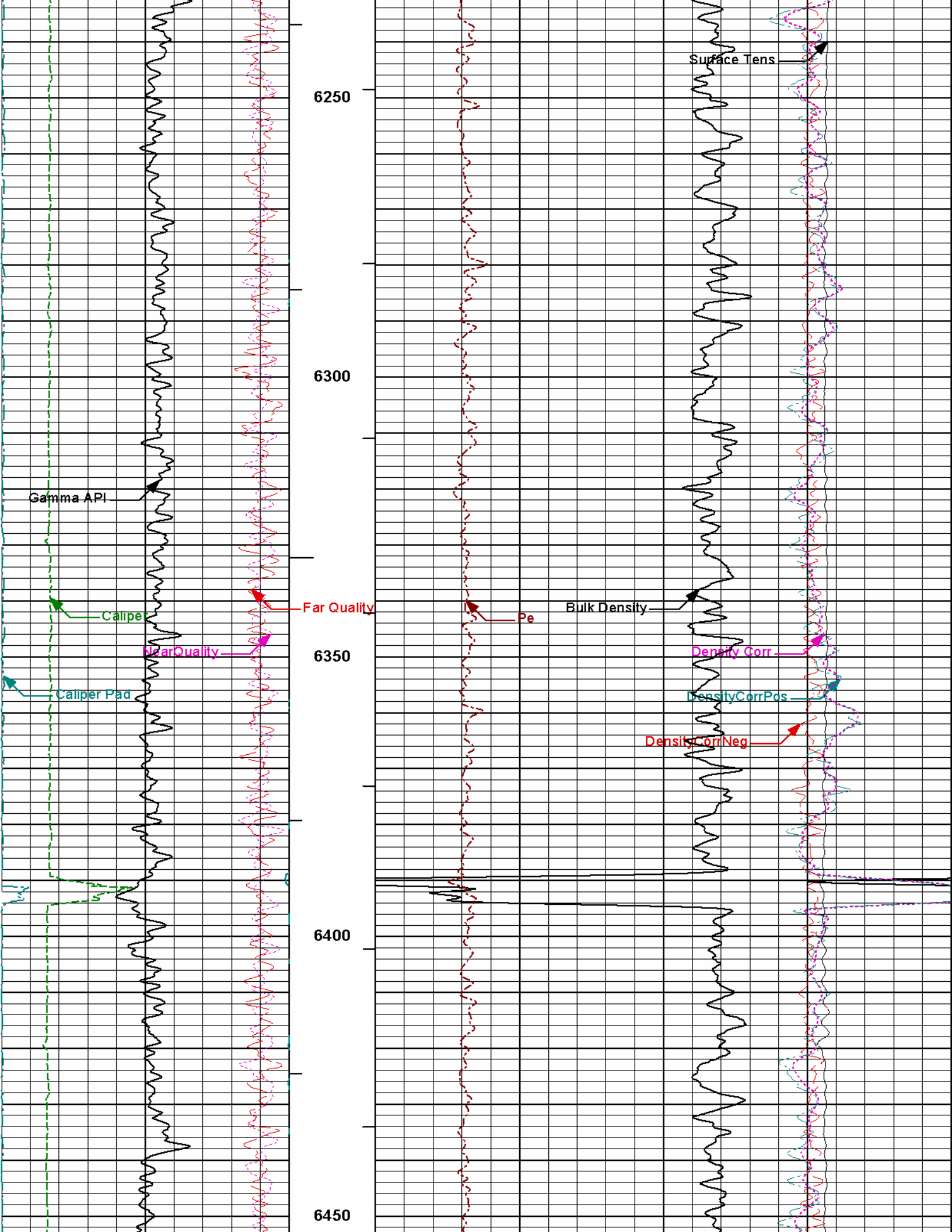


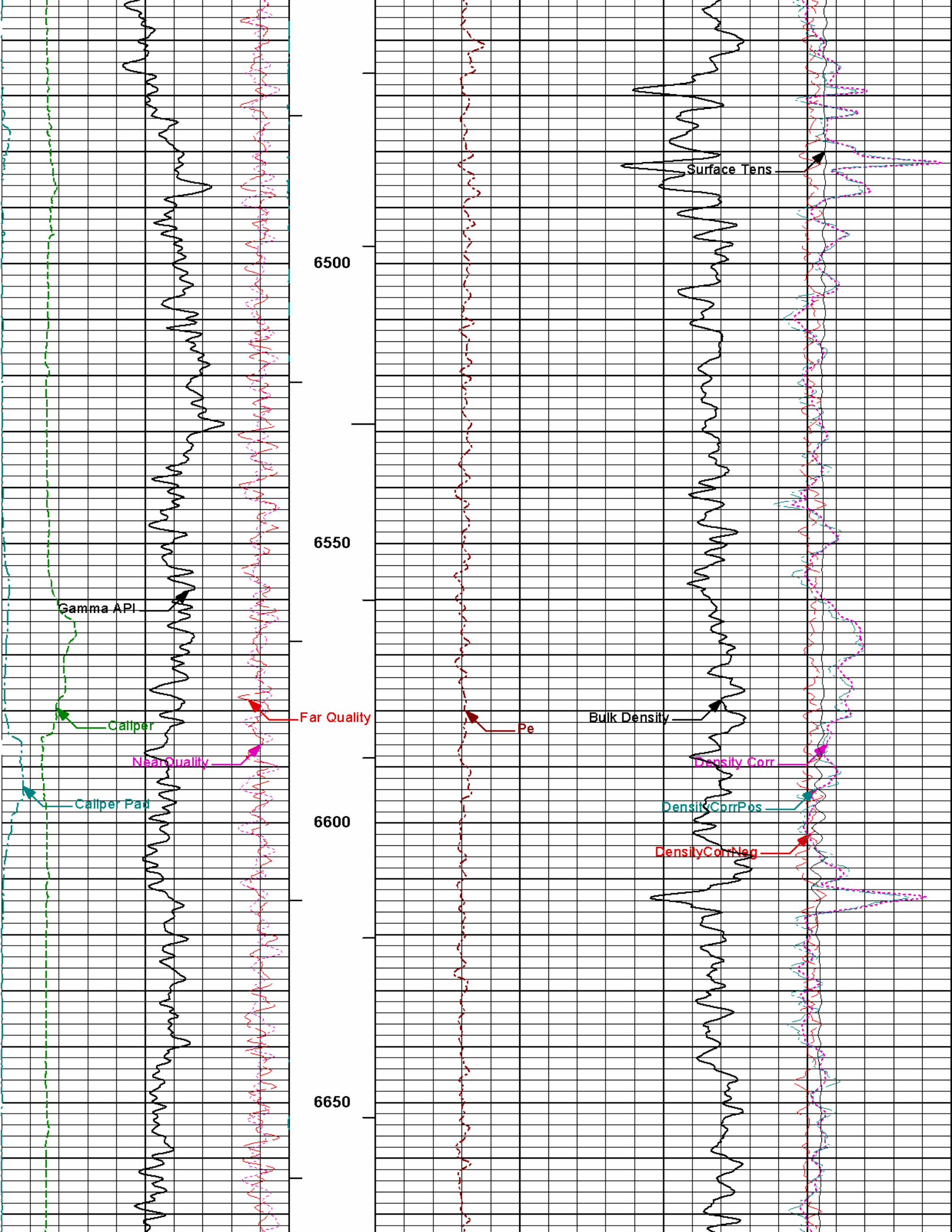


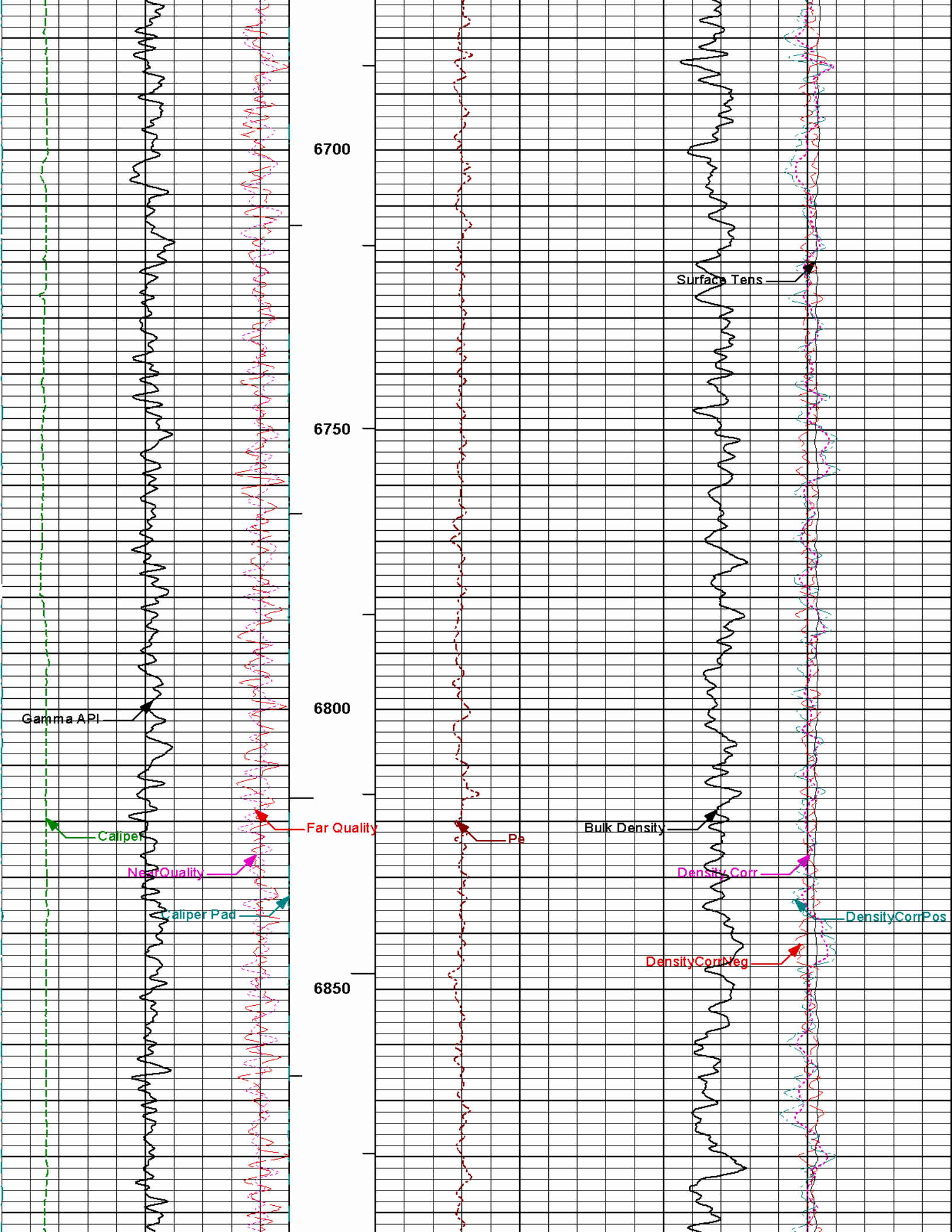


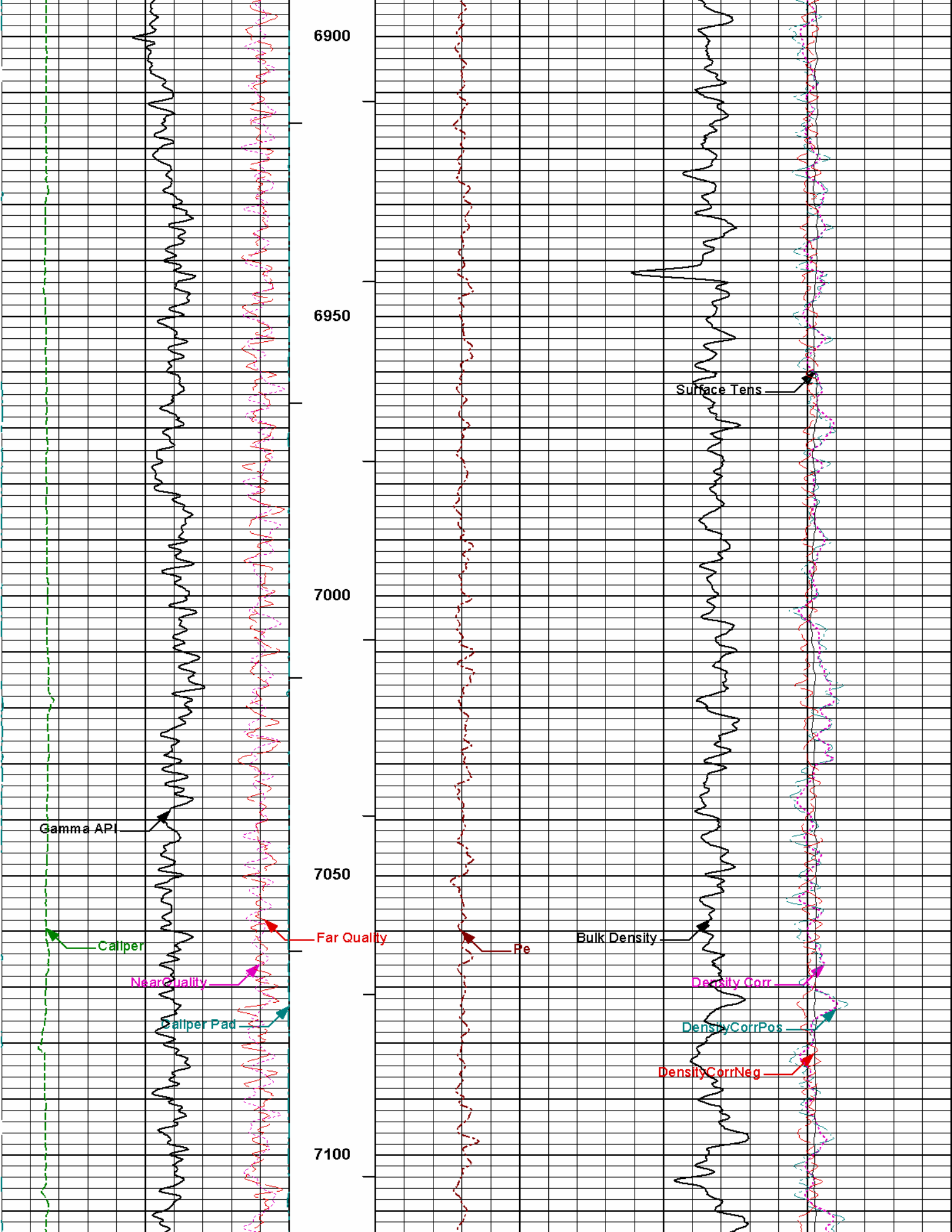


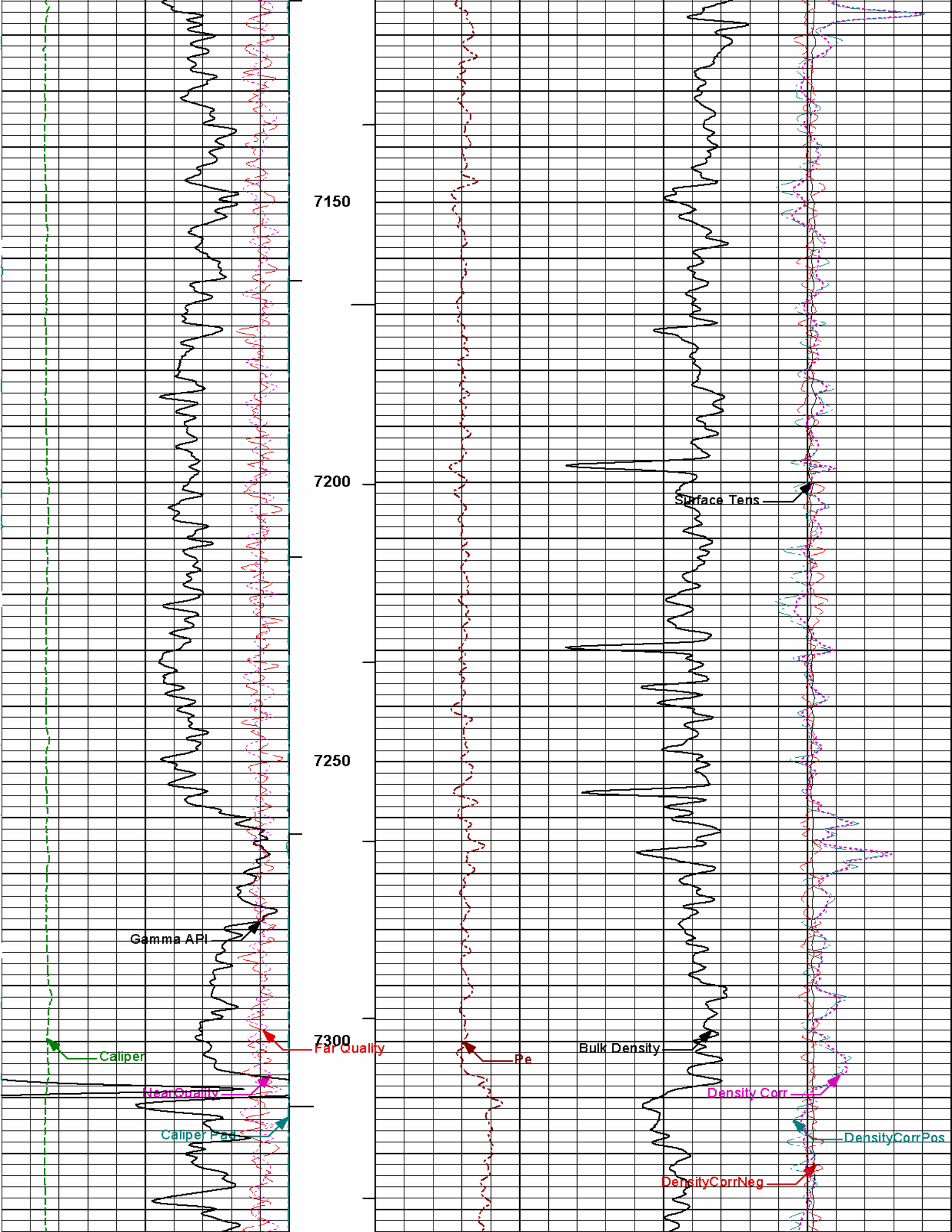


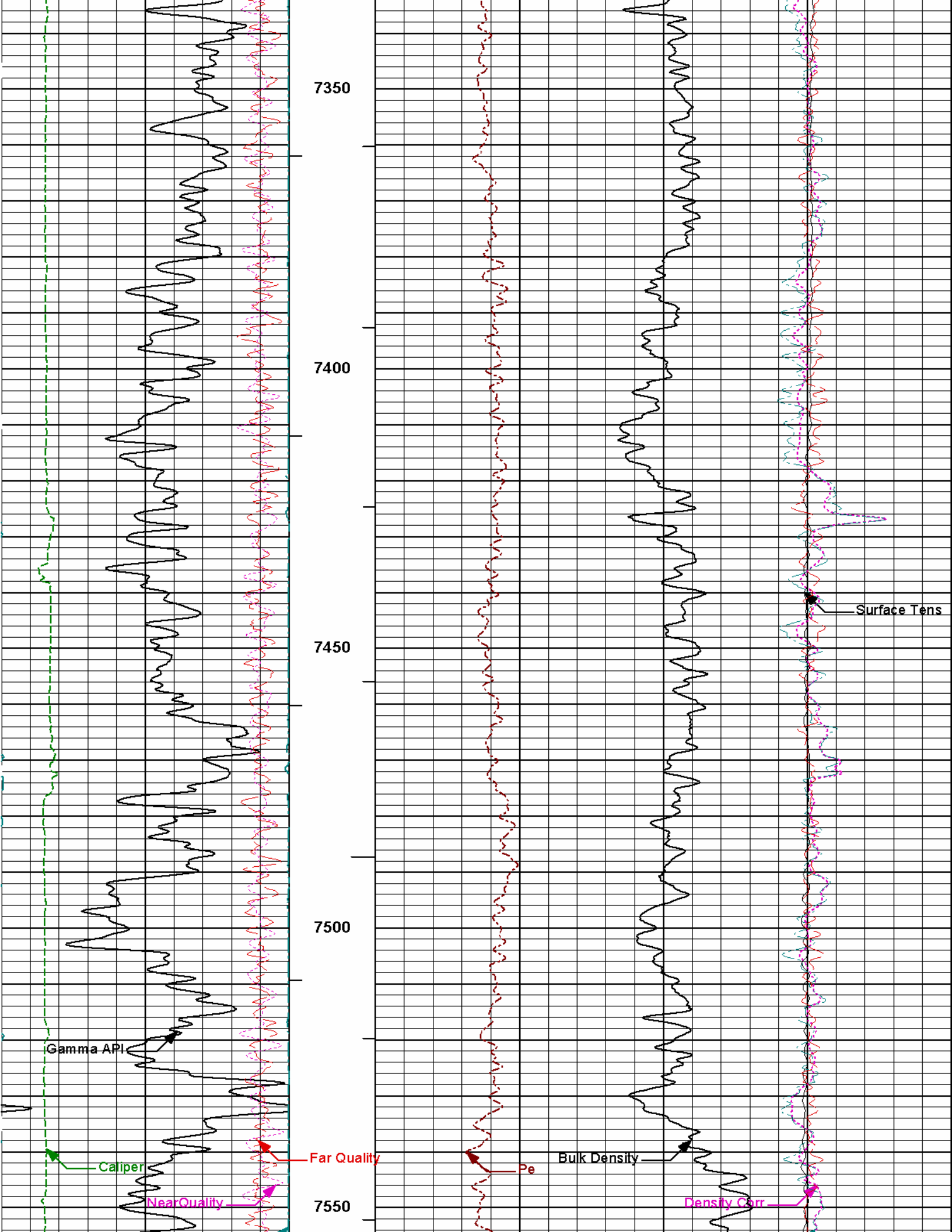


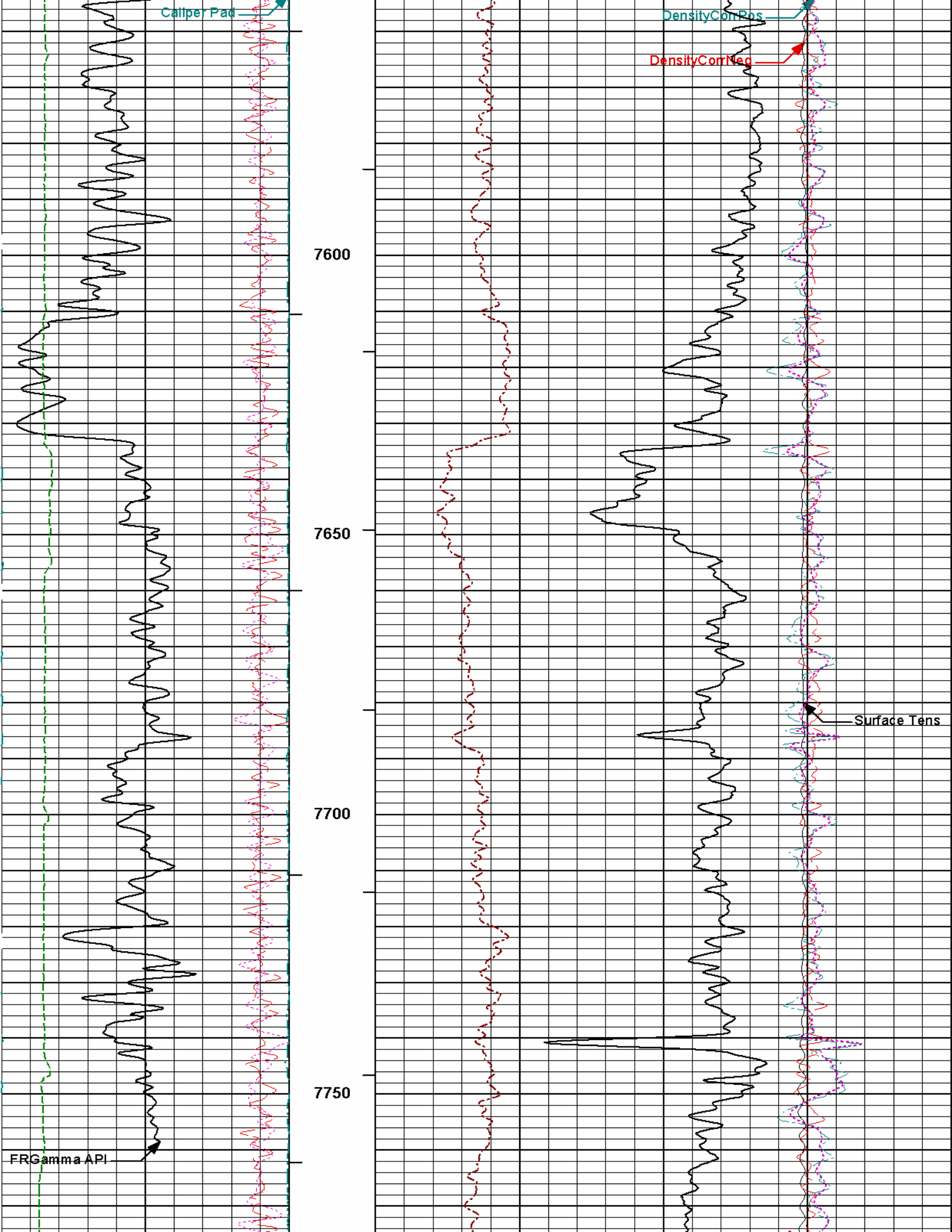


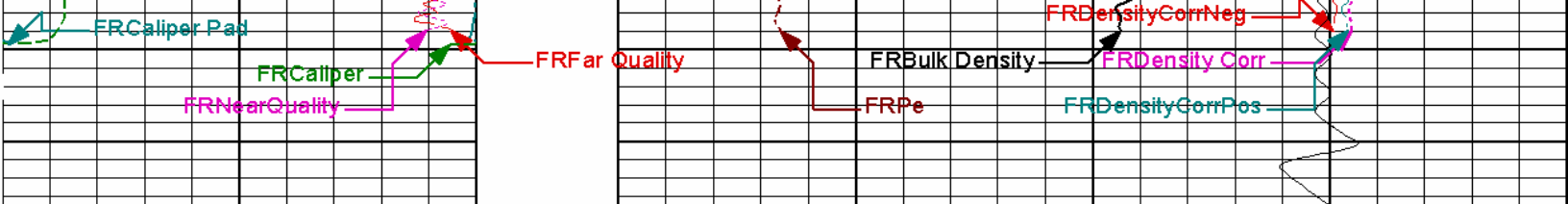












|    |             |     |         |   |              |    |       |                |      |
|----|-------------|-----|---------|---|--------------|----|-------|----------------|------|
| 0  | Gamma API   | 200 | 1 : 240 | 0 | Pe           | 10 | -0.25 | Density Corr   | 0.25 |
|    | api         |     |         |   |              |    |       | gram per cc    |      |
| 6  | Caliper     | 16  | BHVT    |   |              |    | -0.25 | DensityCorrPos | 0.25 |
|    | inches      |     |         |   |              |    |       | gram per cc    |      |
| 0  | Caliper Pad | 10  | AHVT    |   |              |    | -0.25 | DensityCorrNeg | 0.25 |
|    | inches      |     |         |   |              |    |       | gram per cc    |      |
| 9  | Far Quality | -1  |         |   |              |    | 10K   | Surface Tens   | 0    |
|    |             |     |         |   |              |    |       | pounds         |      |
| -9 | NearQuality | 1   |         | 2 | Bulk Density | 3  |       |                |      |
|    |             |     |         |   | gram per cc  |    |       |                |      |

**HALLIBURTON**

Plot Time: 16-Apr-12 12:12:00  
 Plot Range: 927 ft to 7798 ft  
 Data: HEIN 2-1Well Based\DAQ-0001-003.011\*  
 Plot File: \\POROIQ\_RHOB\_5IN\_RM

MAIN PASS 5" = 100'

**HALLIBURTON**

**CALIBRATION REPORT**

**NATURAL GAMMA RAY TOOL SHOP CALIBRATION**

|   |   |
|---|---|
| <b>Tool Name:</b> GTET - 11215095                   | <b>Reference Calibration Date:</b> 13-Apr-12 10:08:49 |
| <b>Engineer:</b> J. PINKETT                         | <b>Calibration Date:</b> 13-Apr-12 10:21:55           |
| <b>Software Version:</b> WL INSITE R3.4.4 (Build 2) | <b>Calibration Version:</b> 1                         |

Calibrator Source S/N: TB 290  
 Calibrator API Reference:230.00 api  
 Equivalent Calibrator API Reference:234.0 api

| Measurement             | Measured | Calibrated | Units |
|-------------------------|----------|------------|-------|
| Background              | 68.6     | 70.8       | api   |
| Background + Calibrator | 291.6    | 300.8      | api   |
| Calibrator              | 232.2    | 230.0      | api   |

**NATURAL GAMMA RAY TOOL FIELD CALIBRATION**

|   |   |
|---|---|
| <b>Tool Name:</b> GTET - 11215095                   | <b>Reference Calibration Date:</b> 13-Apr-12 10:21:55 |
| <b>Engineer:</b> J. PINKETT                         | <b>Calibration Date:</b> 13-Apr-12 10:25:25           |
| <b>Software Version:</b> WL INSITE R3.4.4 (Build 2) | <b>Calibration Version:</b> 1                         |

Calibrator Source S/N: TB 290  
 Calibrator API Reference:230.00 api  
 Equivalent Calibrator API Reference:234.0 api

|                           |             |              |              |
|---------------------------|-------------|--------------|--------------|
| <b>Field Verification</b> | <b>Shop</b> | <b>Field</b> | <b>Units</b> |
|---------------------------|-------------|--------------|--------------|

|                         |       |       |     |
|-------------------------|-------|-------|-----|
| Background              | 70.8  | 70.9  | api |
| Background + Calibrator | 300.8 | 300.1 | api |
| Calibrator              | 230.0 | 229.2 | api |

|             |              |                   |                  |
|-------------|--------------|-------------------|------------------|
| <b>Shop</b> | <b>Field</b> | <b>Difference</b> | <b>Tolerance</b> |
| 230.0       | 229.2        | 0.8               | +/- 9.00         |

### DUAL SPACED NEUTRON SHOP CALIBRATION

|                          |                                   |                                    |                           |
|--------------------------|-----------------------------------|------------------------------------|---------------------------|
| <b>Tool Name:</b>        | <b>DSNT - 11277440</b>            | <b>Reference Calibration Date:</b> | <b>13-Apr-12 12:27:11</b> |
| <b>Engineer:</b>         | <b>J. PINKETT</b>                 | <b>Calibration Date:</b>           | <b>13-Apr-12 12:42:50</b> |
| <b>Software Version:</b> | <b>WL INSITE R3.4.4 (Build 2)</b> | <b>Calibration Version:</b>        | <b>1</b>                  |

Logging Source S/N: DSN-430  
 Tank Serial Number: 11068236  
 Reference value assigned to Tank: 53.720  
 Snow Block S/N: 37526  
 Calibration Tank Water Temperature: 68 degF  
 Min. Tool Housing Outside Diameter: 3.625 in

### CALIBRATION CONSTANTS

| Measurement | Prev. Value | New Value | Control Limit On New Value |
|-------------|-------------|-----------|----------------------------|
| Gain:       | 1.004       | 1.002     | 0.900 - 1.100              |

### WATER TANK SUMMARY (Horizontal Water Tank)

| Measurement       | Current Reading (Previous Coef.) | Calibrated (New Coef.) | Change | Control Limit On Change |
|-------------------|----------------------------------|------------------------|--------|-------------------------|
| Porosity (decp):  | 0.2229                           | 0.2224                 | 0.0006 | +/- 0.0020              |
| Calibrated Ratio: | 10.13                            | 10.11                  | 0.020  | +/- 0.050               |

### VERIFIER

| Measurement                 | Value  | Control Limit     |
|-----------------------------|--------|-------------------|
| Snow-Block Porosity (decp): | 0.0671 | 0.02000 - 0.09000 |

### PASS/FAIL SUMMARY

|                   |        |
|-------------------|--------|
| Background Check: | Passed |
| Gain-Range Check: | Passed |
| Snow-Block Check: | Passed |

### DUAL SPACED NEUTRON FIELD CALIBRATION

|                          |                                   |                                    |                           |
|--------------------------|-----------------------------------|------------------------------------|---------------------------|
| <b>Tool Name:</b>        | <b>DSNT - 11277440</b>            | <b>Reference Calibration Date:</b> | <b>13-Apr-12 12:42:50</b> |
| <b>Engineer:</b>         | <b>J. PINKETT</b>                 | <b>Calibration Date:</b>           | <b>13-Apr-12 12:47:19</b> |
| <b>Software Version:</b> | <b>WL INSITE R3.4.4 (Build 2)</b> | <b>Calibration Version:</b>        | <b>1</b>                  |

Logging Source S/N: DSN-430  
 Snow Block S/N: 37526

### NEUTRON FIELD-CHECK SUMMARY

|                             | Shop   | Field  | Difference | Control Limit On Change |
|-----------------------------|--------|--------|------------|-------------------------|
| Snow-Block Porosity (decp): | 0.0671 | 0.0800 | 0.0129     | +/- 0.0150              |

### PASS/FAIL SUMMARY

|                        |        |
|------------------------|--------|
| Block Change Check:    | Passed |
| Snow Block Stat Check: | Passed |

**DENSITY CALIPER SHOP CALIBRATION****Tool Name:** SDLT - M319\_P123\_BLUE**Reference Calibration Date:** 13-Apr-12 10:06:31**Engineer:** J. PINKETT**Calibration Date:** 13-Apr-12 10:12:25**Software Version:** WL INSITE R3.4.4 (Build 2)**Calibration Version:** 1**CALIBRATION COEFFICIENTS**

| Measurement | Previous Value | New Value    | Control Limit On New Value |
|-------------|----------------|--------------|----------------------------|
| Pad Offset  | -2747.71       | -2760.54     | -7000.00 - -1000.00        |
| Pad Gain    | 0.0003864      | 0.0003890    | 0.000200 - 0.000600        |
| Arm Offset  | -1879.95       | -1286.22     | -5000.00 - 3000.00         |
| Arm Gain    | 0.0005413      | 0.0004847    | 0.000300 - 0.000700        |
| Arm Power   | -0.000006916   | -0.000003541 | -0.000010 - 0.000010       |

The ring diameter is computed from:  $\text{DIAMETER} = \text{PAD EXTENSION} + \text{ARM EXTENSION} + \text{TOOL DIAMETER}$ 

Tool Diameter: 4.50 in

**CALIBRATION RINGS**

| Measurement           | Current Reading (Previous Coeff.) | Calibrated (New Coeff.) | Change | Control Limit On New Value |
|-----------------------|-----------------------------------|-------------------------|--------|----------------------------|
| <b>PAD EXTENSION:</b> |                                   |                         |        |                            |
| Small Ring (in)       | 1.99                              | 2.00                    | 0.01   | +/- 0.20                   |
| Medium Ring (in)      | 3.73                              | 3.75                    | 0.02   | +/- 0.20                   |
| <b>RING DIAMETER:</b> |                                   |                         |        |                            |
| Small Ring (in)       | 6.42                              | 6.50                    | 0.08   | +/- 0.20                   |
| Medium Ring (in)      | 8.30                              | 8.25                    | -0.05  | +/- 0.20                   |
| Large Ring (in)       | 14.99                             | 15.00                   | 0.01   | +/- 0.20                   |

**PASS/FAIL SUMMARY**

Calibration-Coefficients Range Check: Passed  
 Ring-Measurement Check: Passed

**PASS/FAIL SUMMARY**

Calibration-Coefficients Range Check: Passed

**SDLT CALIPER FIELD CALIBRATION****Tool Name:** SDLT - M319\_P123\_BLUE**Reference Calibration Date:** 13-Apr-12 10:12:25**Engineer:** J. PINKETT**Calibration Date:** 13-Apr-12 10:21:39**Software Version:** WL INSITE R3.4.4 (Build 2)**Calibration Version:** 1**MEASURED CALIPER VALUES**

| Measurement   | Shop | Field | Change | Control Limit On New Value |
|---------------|------|-------|--------|----------------------------|
| Pad Extension | 3.75 | 3.68  | -0.07  | +/- 0.10                   |
| Ring Diameter | 8.25 | 8.16  | -0.09  | +/- 0.15                   |

**PASS/FAIL SUMMARY**

Pad Extension Check: Passed  
 Diameter Check: Passed

**ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION****Tool Name:** ACRT Sonde - E5787-S5797**Reference Calibration Date:** 28-Jul-11 17:33:20**Engineer:** C. BLUE**Calibration Date:** 17-Feb-12 03:46:27**Software Version:** WL INSITE R3.4.4 (Build 2)**Calibration Version:** 1**TYPICAL GAIN RANGE**

| Subarray | R12KHz |          |       | R36KHz |          |       | R72KHz |          |       |
|----------|--------|----------|-------|--------|----------|-------|--------|----------|-------|
|          | Lower  | (mmho/m) | Upper | Lower  | (mmho/m) | Upper | Lower  | (mmho/m) | Upper |
| A1 (80") | 0.95   | 1.0074   | 1.05  | 0.95   | 1.0078   | 1.05  | 0.95   | 1.0038   | 1.05  |
| A2 (50") | 0.95   | 1.0089   | 1.05  | 0.95   | 1.0116   | 1.05  | 0.95   | 1.0121   | 1.05  |
| A3 (29") | 0.95   | 1.0002   | 1.05  | 0.95   | 1.0009   | 1.05  | 0.95   | 1.0000   | 1.05  |
| A4 (17") | 0.95   | 0.9907   | 1.05  | 0.95   | 0.9889   | 1.05  | 0.95   | 0.9911   | 1.05  |
| A5 (10") | N/A    | N/A      | N/A   | 0.95   | 0.9880   | 1.05  | 0.95   | 0.9887   | 1.05  |
| A6 (6")  | N/A    | N/A      | N/A   | 0.95   | 0.9726   | 1.05  | 0.95   | 0.9728   | 1.05  |

**TYPICAL SONDE OFFSET RANGE**

| Subarray | R12KHz |          |       | R36KHz |          |       | R72KHz |          |       |
|----------|--------|----------|-------|--------|----------|-------|--------|----------|-------|
|          | Lower  | (mmho/m) | Upper | Lower  | (mmho/m) | Upper | Lower  | (mmho/m) | Upper |
| A1 (80") | -5     | -2.992   | 2     | -6     | -4.284   | -2    | -8     | -5.526   | -2    |
| A2 (50") | -7     | -1.100   | -1    | -6     | -3.385   | -2    | -7     | -4.538   | -2    |
| A3 (29") | -27    | -15.583  | -9    | -9     | -4.174   | -3    | -7     | -3.135   | -1    |
| A4 (17") | -180   | -117.008 | -60   | -45    | -35.477  | -15   | -39    | -27.073  | -13   |
| A5 (10") | N/A    | N/A      | N/A   | -150   | -90.891  | -50   | -80    | -47.397  | -10   |
| A6 (6")  | N/A    | N/A      | N/A   | 175    | 297.724  | 525   | 90     | 151.286  | 270   |

**TRANSMITTER CURRENT GAIN**

**R-MUD VERIFICATION**

| Signal | Lower | R      | Upper | Signal   | Lower (ohm-m) | Measured (ohm-m) | Upper (ohm-m) |
|--------|-------|--------|-------|----------|---------------|------------------|---------------|
| 12K    | 0.6   | 0.7906 | 1.3   | Mud Cell | 0.95          | 1.006            | 1.05          |
| 36K    | 1.0   | 1.8311 | 2.0   |          |               |                  |               |
| 72K    | 1.0   | 1.0474 | 2.0   |          |               |                  |               |

**SPECTRAL DENSITY SHOP CALIBRATION**

|   |   |
|---|---|
| <b>Tool Name:</b> SDLT Pad - M319_P123_BLUE         | <b>Reference Calibration Date:</b> 13-Apr-12 11:11:41 |
| <b>Engineer:</b> J. PINKETT                         | <b>Calibration Date:</b> 13-Apr-12 11:31:11           |
| <b>Software Version:</b> WL INSITE R3.4.4 (Build 2) | <b>Calibration Version:</b> 1                         |

|   |                    |           |
|---|--------------------|-----------|
| Logging Source S/N: 5256GW                    |                    |           |
| Aluminum Block S/N: 63066 (BRIGHTON AL BLOCK) | Density: 2.602g/cc | Pe: 3.100 |
| Magnesium Block S/N: 12345                    | Density: 1.691g/cc | Pe: 2.650 |

**DENSITY CALIBRATION SUMMARY**

| Measurement      | Previous Value | New Value | Control Limit |
|------------------|----------------|-----------|---------------|
| Near Bar Gain    | 1.0228         | 1.0144    | 0.90 - 1.10   |
| Near Dens Gain   | 0.9790         | 0.9748    | 0.90 - 1.10   |
| Near Peak Gain   | 0.9776         | 0.9545    | 0.90 - 1.10   |
| Near Lith Gain   | 0.9946         | 0.9786    | 0.90 - 1.10   |
| Far Bar Gain     | 0.9987         | 0.9960    | 0.90 - 1.10   |
| Far Dens Gain    | 0.9894         | 0.9876    | 0.90 - 1.10   |
| Far Peak Gain    | 0.9841         | 0.9840    | 0.90 - 1.10   |
| Far Lith Gain    | 0.9632         | 0.9625    | 0.90 - 1.10   |
| <hr/>            |                |           |               |
| Near Bar Offset  | -0.0287        | 0.0480    | NONE          |
| Near Dens Offset | 0.3841         | 0.4196    | NONE          |
| Near Peak Offset | 0.4723         | 0.6614    | NONE          |
| Near Lith Offset | 0.3896         | 0.5175    | NONE          |
| Far Bar Offset   | 0.0215         | 0.0450    | NONE          |
| Far Dens Offset  | 0.0839         | 0.0987    | NONE          |
| Far Peak Offset  | 0.1117         | 0.1089    | NONE          |
| Far Lith Offset  | 0.2668         | 0.2698    | NONE          |

|                      |        |        |            |
|----------------------|--------|--------|------------|
| Near Bar Background  | 824.04 | 829.45 | 700 - 1450 |
| Near Dens Background | 272.42 | 272.67 | 230 - 480  |
| Near Peak Background | 118.21 | 117.61 | 100 - 210  |
| Near Lith Background | 145.49 | 146.89 | 125 - 260  |
| Far Bar Background   | 526.67 | 528.67 | 450 - 900  |
| Far Dens Background  | 201.85 | 205.02 | 175 - 345  |
| Far Peak Background  | 79.25  | 78.80  | 70 - 140   |
| Far Lith Background  | 83.56  | 83.59  | 75 - 145   |

### CALIBRATION BLOCK SUMMARY

| Measurement      | Current Reading<br>(Previous Coef) | Calibrated<br>(New Coef) | Change | Control Limit<br>On Change |
|------------------|------------------------------------|--------------------------|--------|----------------------------|
| <b>MAGNESIUM</b> |                                    |                          |        |                            |
| Density (g/cc)   | 1.691                              | 1.691                    | -0.000 | +/- 0.015                  |
| Pe               | 2.575                              | 2.601                    | 0.026  | +/- 0.150                  |
| <b>ALUMINUM</b>  |                                    |                          |        |                            |
| Density (g/cc)   | 2.601                              | 2.602                    | 0.002  | +/- 0.01500                |
| Pe               | 3.050                              | 3.061                    | 0.011  | +/- 0.150                  |

### TOOL SUMMARY

| Measurement                | Near Detector |                | Far Detector |                |
|----------------------------|---------------|----------------|--------------|----------------|
|                            | Value         | Control Limits | Value        | Control Limits |
| <b>QUALITY</b>             |               |                |              |                |
| Background                 | 0.0009        | +/- 0.0110     | 0.0004       | +/- 0.0140     |
| Magnesium Block            | -0.0009       | +/- 0.0110     | -0.0007      | +/- 0.0140     |
| Aluminum Block             | 0.0001        | +/- 0.0110     | -0.0011      | +/- 0.0140     |
| Resolution                 | 9.48          | 6.00 - 11.50   | 9.69         | 6.00 - 11.50   |
| Internal Verifier(B+D+P+L) | 1367          | 1200 - 2700    | 896          | 800 - 1700     |

### PASS/FAIL SUMMARY

|                                |        |
|--------------------------------|--------|
| Background Quality Check:      | Passed |
| Background Range Check:        | Passed |
| Background Resolution Check:   | Passed |
| Background Verification Check: | Passed |
| Magnesium Quality Check:       | Passed |
| Aluminum Quality Check:        | Passed |
| Gains Check:                   | Passed |
| Changes in Calibration Blocks: | Passed |

### SPECTRAL DENSITY FIELD CHECK

|   |   |
|---|---|
| <b>Tool Name:</b> SDLT Pad - M319_P123_BLUE         | <b>Reference Calibration Date:</b> 13-Apr-12 11:31:11 |
| <b>Engineer:</b> J. PINKETT                         | <b>Calibration Date:</b> 13-Apr-12 11:44:44           |
| <b>Software Version:</b> WL INSITE R3.4.4 (Build 2) | <b>Calibration Version:</b> 1                         |

Pad Temperature: 68.2 degF

### DENSITY FIELD CALIBRATION SUMMARY

| Measurement        | Shop     | Field    | Change | Control Limit +/- |
|--------------------|----------|----------|--------|-------------------|
| Near (B+D+P+L) cps | 1366.622 | 1369.013 | 2.391  | 14.941            |
| Far (B+D+P+L) cps  | 896.085  | 895.065  | -1.020 | 16.289            |
| Near Resolution    | 9.48     | 9.44     | -0.040 | 0.50              |
| Far Resolution     | 9.69     | 9.88     | 0.190  | 1.00              |

**PASS/FAIL SUMMARY**

|                         |        |
|-------------------------|--------|
| Bkg Quality Check:      | Passed |
| Bkg Resolution Check:   | Passed |
| Bkg Verification Check: | Passed |

**MICRO LOG SHOP CALIBRATION**

|   |   |
|---|---|
| <b>Tool Name:</b> Microlog Pad - M319_P123_BLUE     | <b>Reference Calibration Date:</b> 13-Apr-12 11:46:20 |
| <b>Engineer:</b> J. PINKETT                         | <b>Calibration Date:</b> 13-Apr-12 11:48:38           |
| <b>Software Version:</b> WL INSITE R3.4.4 (Build 2) | <b>Calibration Version:</b> 1                         |

**CALIBRATION COEFFICIENT SUMMARY**

| Measurement          | Micro Log Normal |            | Micro Log Lateral |            | Units |
|----------------------|------------------|------------|-------------------|------------|-------|
|                      | Measured         | Calibrated | Measured          | Calibrated |       |
| Tool Zero            | -0.41            | -0.42      | -0.00             | -0.00      | ohmm  |
| Calibration Point #1 | 0.00             | 0.00       | -0.00             | 0.00       | ohmm  |
| Calibration Point #2 | 20.01            | 20.00      | 20.02             | 20.00      | ohmm  |
| Internal Reference   | 19.60            | 19.60      | 20.01             | 19.99      | ohmm  |

| Measurement          | Micro Log Normal | Micro Log Lateral | Units |
|----------------------|------------------|-------------------|-------|
|                      | Tool Value       | Tool Value        |       |
| Tool Zero            | -0.89            | 0.13              | V     |
| Calibration Point #1 | 110.27           | 1.15              | V     |
| Calibration Point #2 | 5444.82          | 6890.93           | V     |
| Internal Reference   | 5337.47          | 6888.76           | V     |

**MICRO LOG FIELD CHECK**

|   |   |
|---|---|
| <b>Tool Name:</b> Microlog Pad - M319_P123_BLUE     | <b>Reference Calibration Date:</b> 13-Apr-12 11:48:38 |
| <b>Engineer:</b> J. PINKETT                         | <b>Calibration Date:</b> 13-Apr-12 11:49:26           |
| <b>Software Version:</b> WL INSITE R3.4.4 (Build 2) | <b>Calibration Version:</b> 1                         |

| Measurement        | Micro Log Normal |       | Micro Log Lateral |       | Units |
|--------------------|------------------|-------|-------------------|-------|-------|
|                    | Shop             | Field | Shop              | Field |       |
| Tool Zero          | -0.42            | -0.42 | -0.00             | -0.00 | ohmm  |
| Internal Reference | 19.60            | 19.60 | 19.99             | 20.00 | ohmm  |

**Summary**

| Signal           | Shop  | Field | Difference | Tolerance |
|------------------|-------|-------|------------|-----------|
| Microlog Normal  | 19.60 | 19.60 | 0.00       | +/- 0.80  |
| Microlog Lateral | 19.99 | 20.00 | -0.01      | +/- 0.80  |

**CALIBRATION SUMMARY**

| Sensor                         | Shop     | Field    | Post  | Difference | Tolerance  | Units |
|--------------------------------|----------|----------|-------|------------|------------|-------|
| <b>GTET-11215095</b>           |          |          |       |            |            |       |
| Gamma Ray Calibrator           | 230.0    | 229.2    | ----- | 0.8        | +/- 9.00   | api   |
| <b>DSNT-11277440</b>           |          |          |       |            |            |       |
| Snow-Block Porosity            | 0.0671   | 0.0800   | ----- | -0.0129    | +/- 0.0150 | decp  |
| <b>SDLT-M319_P123_BLUE</b>     |          |          |       |            |            |       |
| Pad Extension                  | 3.75     | 3.68     | ----- | 0.07       | +/-0.10    | in    |
| Ring Diameter                  | 8.25     | 8.16     | ----- | 0.090      | +/-0.15    | in    |
| <b>ACRt Sonde-E5787-S5797</b>  |          |          |       |            |            |       |
| Mud Cell                       | 1.006    | -----    | ----- | 0.000      | -----      | ohm-m |
| <b>SDLT Pad-M319_P123_BLUE</b> |          |          |       |            |            |       |
| Near(B+D+P+I)                  | 1366.622 | 1369.013 | ----- | -2.391     | +/-14.941  | cps   |



ACRt Instrument-  
11585787  
50.00 lbs

∅ 3.625 in →

5.03 ft

14.55 ft

← Mud Resistivity @ 13.19 ft

← ACRt @ 9.21 ft

ACRt Sonde-E5787-  
S5797  
200.00 lbs

∅ 3.625 in →

14.22 ft

SP Ring-1  
0.00 lbs

∅ 3.625 in →

← SP @ 1.61 ft

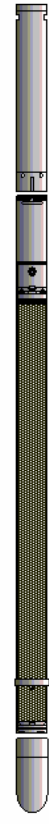
Bull Nose-01  
5.00 lbs

∅ 2.750 in →

0.33 ft

0.33 ft

0.00 ft



| Mnemonic | Tool Name   | Serial Number  | Weight (lbs) | Length (ft) | Accumulated Length (ft) | Max. Log. Speed (fpm) |
|----------|---|----------------|--------------|-------------|-------------------------|-----------------------|
| RWCH     | Releasable Wireline Cable Head                        | 11078326       | 135.00       | 6.25        | 56.19                   | 300.00                |
| GTET     | Gamma Telemetry Tool                                  | 11215095       | 165.00       | 8.52        | 47.67                   | 60.00                 |
| DSNT     | Dual Spaced Neutron                                   | 11277440       | 174.00       | 9.69        | 37.98                   | 60.00                 |
| SDLT     | Spectral Density Tool                                 | M319_P123_BLUE | 360.00       | 10.81       | 27.17                   | 60.00                 |
| SDLP     | Density Insite Pad                                    | M319_P123_BLUE | 65.00        | 2.55 *      | 29.38                   | 60.00                 |
| MICP     | Microlog Pad  | M319_P123_BLUE | 8.00         | 1.00 *      | 29.67                   | 60.00                 |
| IDT      | Insite Directional Tool                               | 10937715       | 150.00       | 7.58        | 19.58                   | 30.00                 |
| ACRt     | Array Compensated True Resistivity Instrument Section | 11585787       | 50.00        | 5.03        | 14.55                   | 300.00                |
| ACRt     | Array Compensated True Resistivity                    | E5787-S5797    | 200.00       | 14.22       | 0.33                    | 300.00                |
| SP       | SP Ring   | 1              | 0.00         | 0.25 *      | 1.61                    | 300.00                |
| BLNS     | Bull Nose   | 01             | 5.00         | 0.33        | 0.00                    | 300.00                |

**Total** **1,312.00**   **62.44**

\* Not included in Total Length and Length Accumulation.

Data: HEIN 2-1\0001 ANADARKO\_IDT\IDLE Date: 14-Apr-12 04:54:23

|         |  |       |           |
|---------|--|-------|-----------|
| COMPANY | <b>KERR-MCGEE OIL &amp; GAS ONSHORE LP</b> |       |           |
| WELL    | <b>HEIN 2-1</b>                            |       |           |
| FIELD   | <b>WATTENBERG</b>                          |       |           |
| COUNTY  | <b>WELD</b>                                | STATE | <b>CO</b> |

**HALLIBURTON**

**SPECTRAL DENSITY  
DUAL SPACED NEUTRON**