

**Company:** Lamont Doherty  
**Well:** ODP Leg 207 Site 1257A  
**Field:** Demarara Rise  
**Country:** Venezuela **Ocean:** Atlantic

|                                                     |                |                                                                                                                                                            |                                                                                                     |
|-----------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <b>Phasor Induction</b><br><b>Natural Gamma Ray</b> |                | 9.4538 Deg North, 54.342 Deg West<br><br>Permanent Datum: _____ MSL _____<br>Log Measured From: _____ DES _____<br>Drilling Measured From: _____ DES _____ | Elev.: K.B. 11.3 m<br>G.L. -2962 m<br>D.F. 11 m<br><br>Elev.: 0 m _____<br>11.3 m above Perm. Datum |
|                                                     | LOCATION       |                                                                                                                                                            |                                                                                                     |
|                                                     | API Serial No. | Max. Hole Devi.                                                                                                                                            | Longitude      Latitude                                                                             |

|                             |                      |  |
|-----------------------------|----------------------|--|
| Logging Date                | 18-Jan-2003          |  |
| Run Number                  | 1                    |  |
| Depth Driller               | 3246 m               |  |
| Schlumberger Depth          | 3249 m               |  |
| Bottom Log Interval         | 3234 m               |  |
| Top Log Interval            | 2962 m               |  |
| Casing Driller Size @ Depth | 0.000 in @ 3032 m    |  |
| Casing Schlumberger         | 3036 m               |  |
| Bit Size                    | 11.438 in            |  |
| Type Fluid In Hole          | Sepiolite Salt Water |  |

|                               |           |                        |                 |           |
|-------------------------------|-----------|------------------------|-----------------|-----------|
| MUD                           |           | Density                | Viscosity       | 1.1 g/cm3 |
| Fluid Loss                    |           | PH                     |                 |           |
| Source Of Sample              |           | Mudpit                 |                 |           |
| RM @ Measured Temperature     |           | 0.258 ohm.m            | @               | 32 degC   |
| RMF @ Measured Temperature    |           | @                      | @               |           |
| RMC @ Measured Temperature    |           | @                      | @               |           |
| Source RMF                    | RMC       |                        |                 |           |
| RM @ MRT                      | RMF @ MRT | 0.415 @ 12             | @               | 12 @ 12   |
| Maximum Recorded Temperatures |           | 12 degC                |                 |           |
| Circulation Stopped           | Time      |                        |                 |           |
| Logger On Bottom              | Time      | 18-Jan-2003            |                 | 18:53     |
| Unit Number                   | Location  | 99                     | Houston, TX ODP |           |
| Recorded By                   |           | K. Swain               |                 |           |
| Witnessed By                  |           | B. Rea, F. Heidersdorf |                 |           |

|                             |  |  |       |       |  |
|-----------------------------|--|--|-------|-------|--|
| Logging Date                |  |  | Run 1 | Run 2 |  |
| Run Number                  |  |  |       |       |  |
| Depth Driller               |  |  |       |       |  |
| Schlumberger Depth          |  |  |       |       |  |
| Bottom Log Interval         |  |  |       |       |  |
| Top Log Interval            |  |  |       |       |  |
| Casing Driller Size @ Depth |  |  |       |       |  |
| Casing Schlumberger         |  |  |       |       |  |
| Bit Size                    |  |  |       |       |  |
| Type Fluid In Hole          |  |  |       |       |  |

|                               |           |         |           |  |
|-------------------------------|-----------|---------|-----------|--|
| MUD                           |           | Density | Viscosity |  |
| Fluid Loss                    |           | PH      |           |  |
| Source Of Sample              |           |         |           |  |
| RM @ Measured Temperature     |           |         | @         |  |
| RMF @ Measured Temperature    |           |         | @         |  |
| RMC @ Measured Temperature    |           |         | @         |  |
| Source RMF                    | RMC       |         |           |  |
| RM @ MRT                      | RMF @ MRT | @       | @         |  |
| Maximum Recorded Temperatures |           |         |           |  |
| Circulation Stopped           | Time      |         |           |  |
| Logger On Bottom              | Time      |         |           |  |
| Unit Number                   | Location  |         |           |  |
| Recorded By                   |           |         |           |  |
| Witnessed By                  |           |         |           |  |

**DISCLAIMER**  
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**OTHER SERVICES1**  
 OS1: FMS/LSS  
 OS2: DITE  
 OS3: WST  
 OS4:  
 OS5:

**OTHER SERVICES2**  
 OS1:  
 OS2:  
 OS3:  
 OS4:  
 OS5:

**REMARKS: RUN NUMBER 1**  
 Hole cored with APS/XCB, 11 7/16 bit.  
 Sea Floor at:2962 mbrf.  
 Log measured in meters below rig floor.  
 Lamont TAP tool run at bottom of DITE for temperature/pressure data.  
 Wireline heave compensator used on all runs.  
 Sepiolite mud was used to displace the hole.  
 Driller TD= 3246 mbrf.  
 Schlumberger TD= 3249 mbrf.  
 Drill pipe Schlumberger= 3036mbrf.  
 See Lamont TAP tool for bottom hole temperature.

**REMARKS: RUN NUMBER 2**

**RUN 1**  
 SERVICE ORDER #:  
 PROGRAM VERSION: 10C0-306  
 FLUID LEVEL:

**RUN 2**  
 SERVICE ORDER #:  
 PROGRAM VERSION:  
 FLUID LEVEL:

| LOGGED INTERVAL | START | STOP |
|-----------------|-------|------|
|                 |       |      |
|                 |       |      |
|                 |       |      |
|                 |       |      |



| LOGGED INTERVAL | START | STOP |
|-----------------|-------|------|
|                 |       |      |
|                 |       |      |
|                 |       |      |
|                 |       |      |

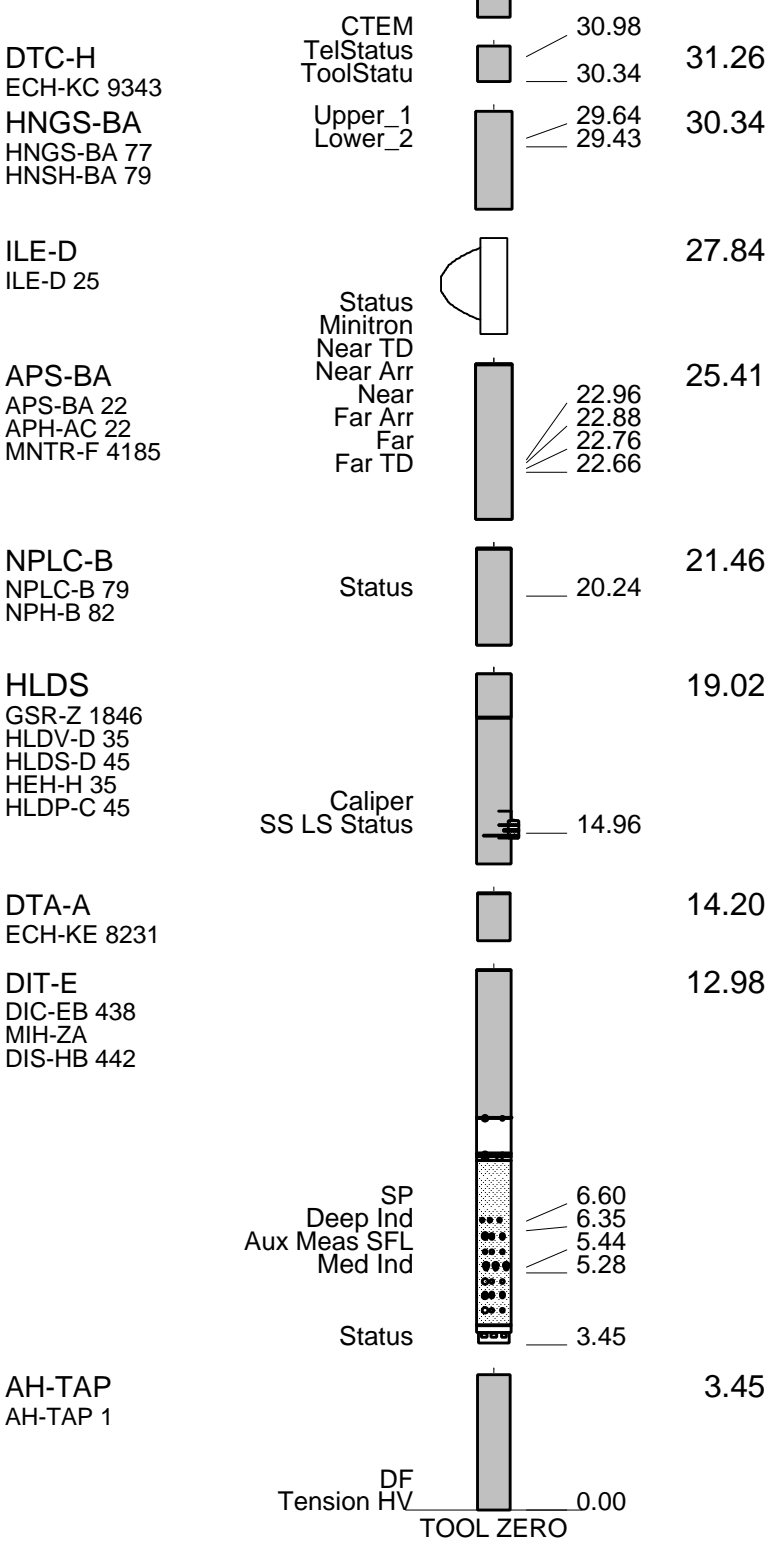
**EQUIPMENT DESCRIPTION**

**RUN 1**  
**SURFACE EQUIPMENT**  
 SFT-281 24  
 SFT-178 4722  
 GSR-U 135  
 WITM (DTS)-A

**RUN 2**

**DOWNHOLE EQUIPMENT**

|        |                                                                                     |       |
|--------|-------------------------------------------------------------------------------------|-------|
| LEH-QT |  | 37.79 |
| AH-MGT |  | 36.90 |



TOOL ZERO

MAXIMUM STRING DIAMETER 3.88 IN  
 MEASUREMENTS RELATIVE TO TOOL ZERO  
 ALL LENGTHS IN METERS

## Output DLIS Files

|         |                       |       |          |                   |          |          |
|---------|-----------------------|-------|----------|-------------------|----------|----------|
| DEFAULT | PI_LDL_APS_NGS_011LUP | FN:13 | PRODUCER | 18-Jan-2003 18:53 | 3250.7 M | 2941.3 M |
| REDUCE  | PI_LDL_APS_NGS_011LUP | FN:14 | PRODUCER | 18-Jan-2003 18:53 | 3250.7 M | 2941.3 M |

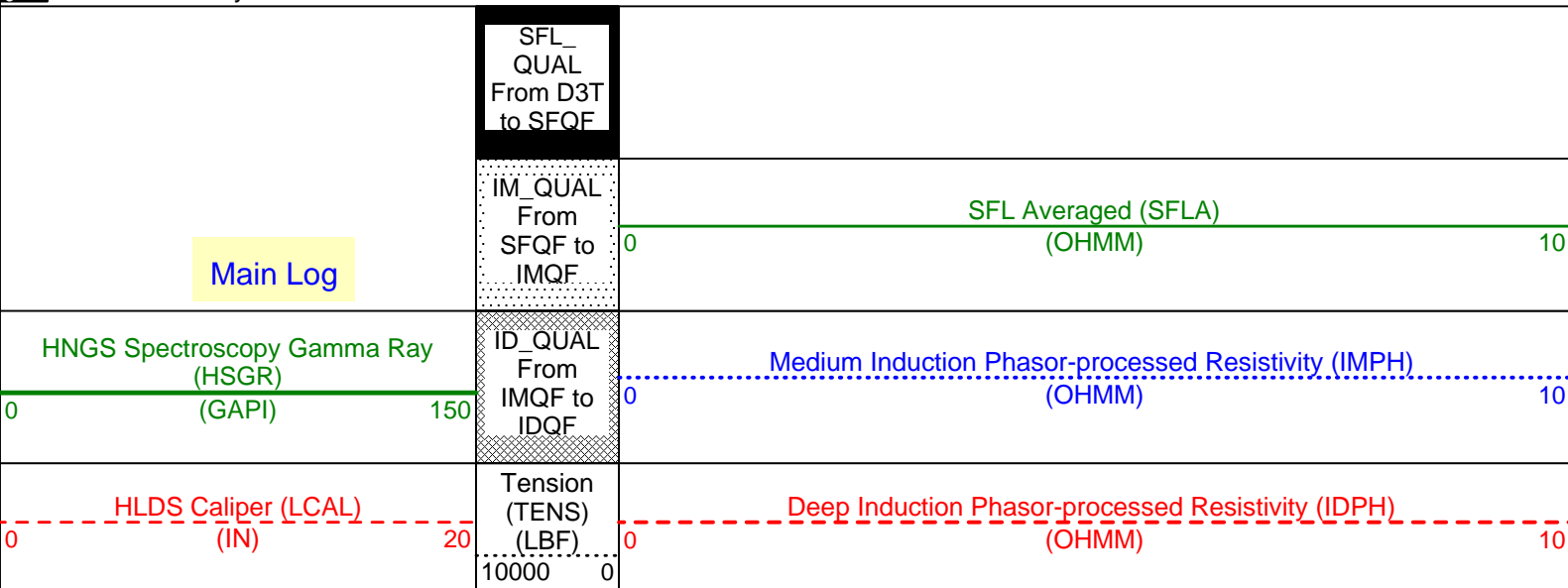
## OP System Version: 10C0-306

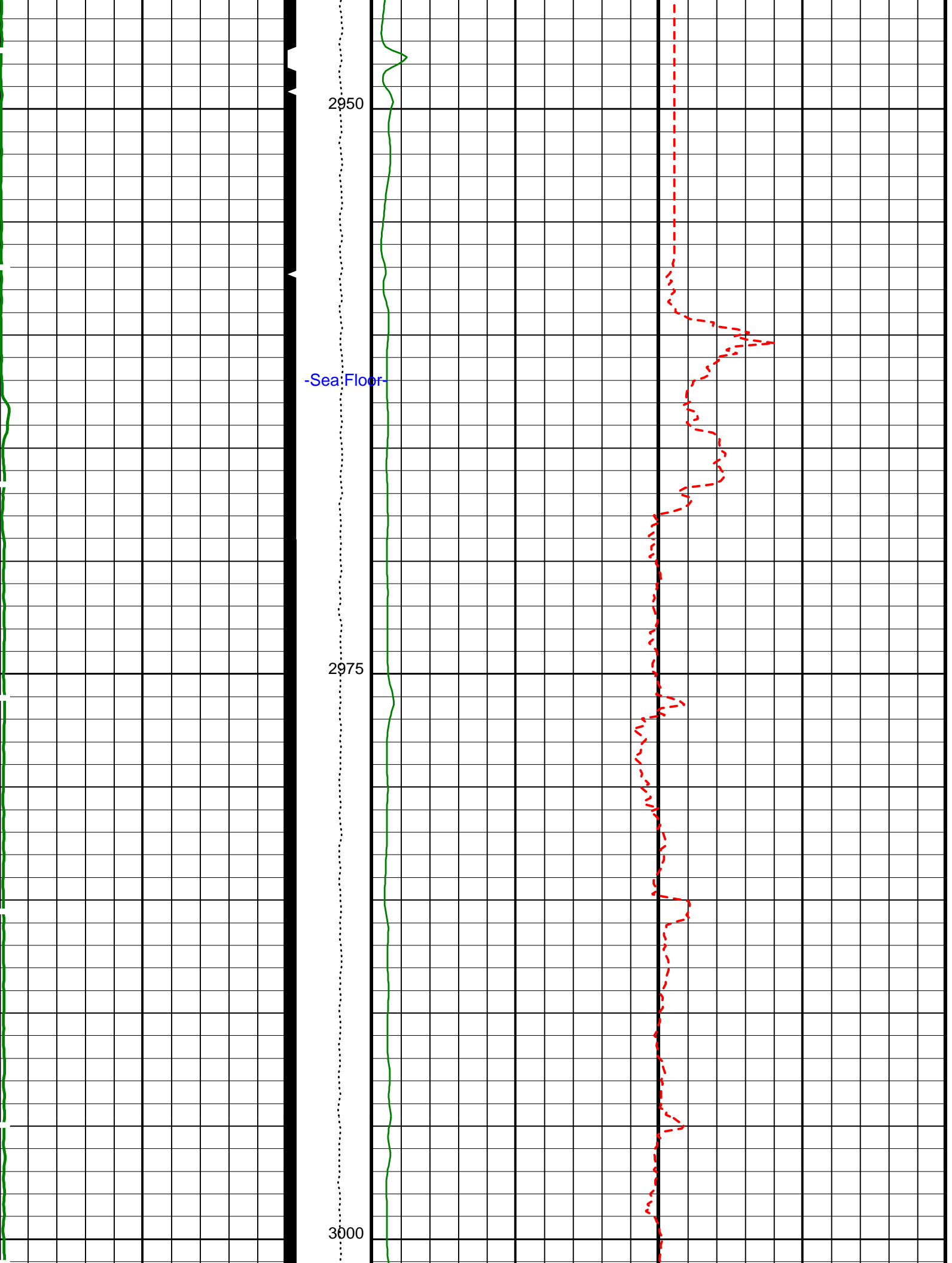
MCM

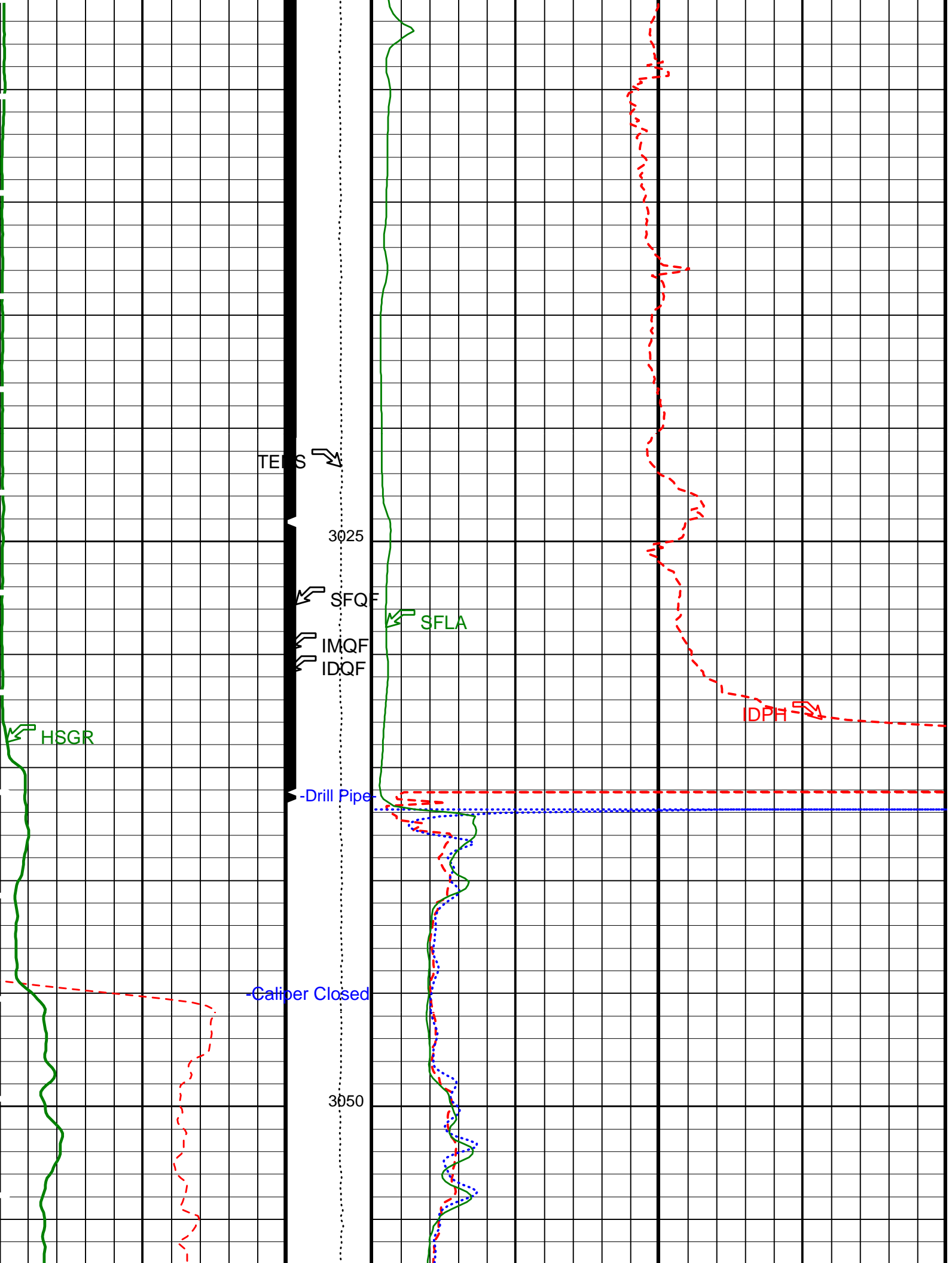
|        |                 |         |                 |
|--------|-----------------|---------|-----------------|
| DIT-E  | 10C0-306        | DTA-A   | 10C0-306        |
| HLDS   | SPC-2277-NUCL_b | NPLC-B  | OP10-KP1        |
| APS-BA | SPC-2277-NUCL_b | HNGS-BA | SPC-2277-NUCL_b |
| DTC-H  | 10C0-306        |         |                 |

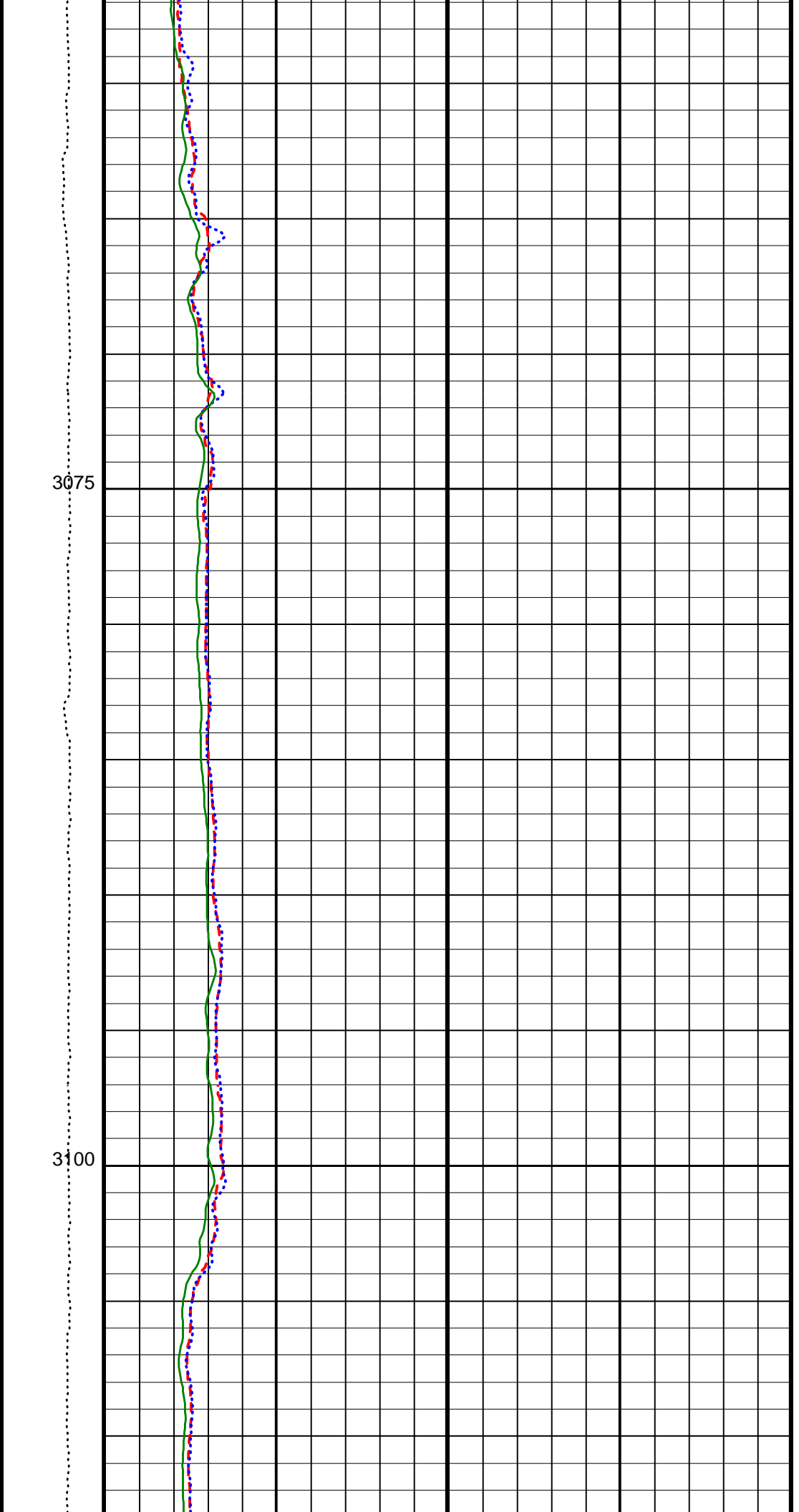
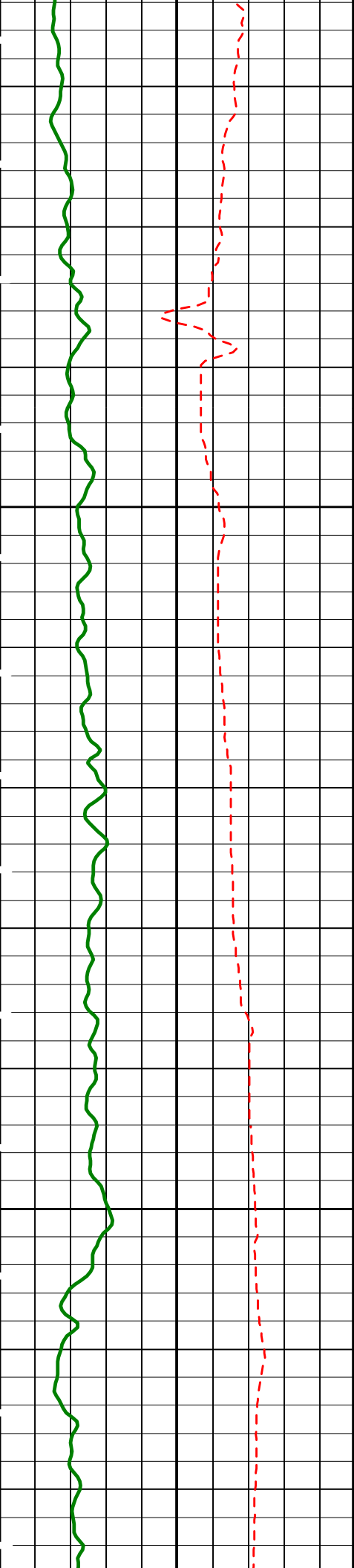
### PIP SUMMARY

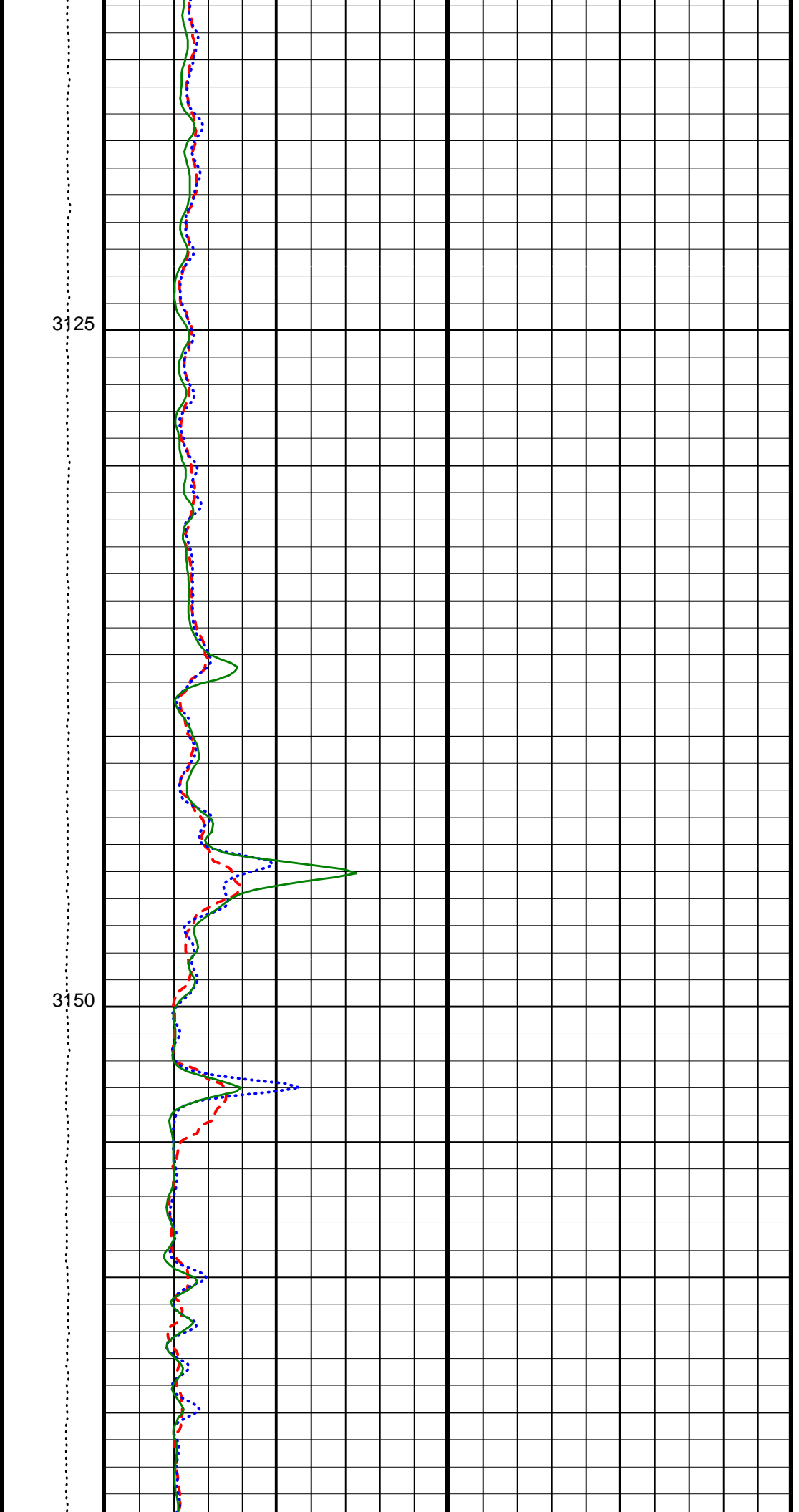
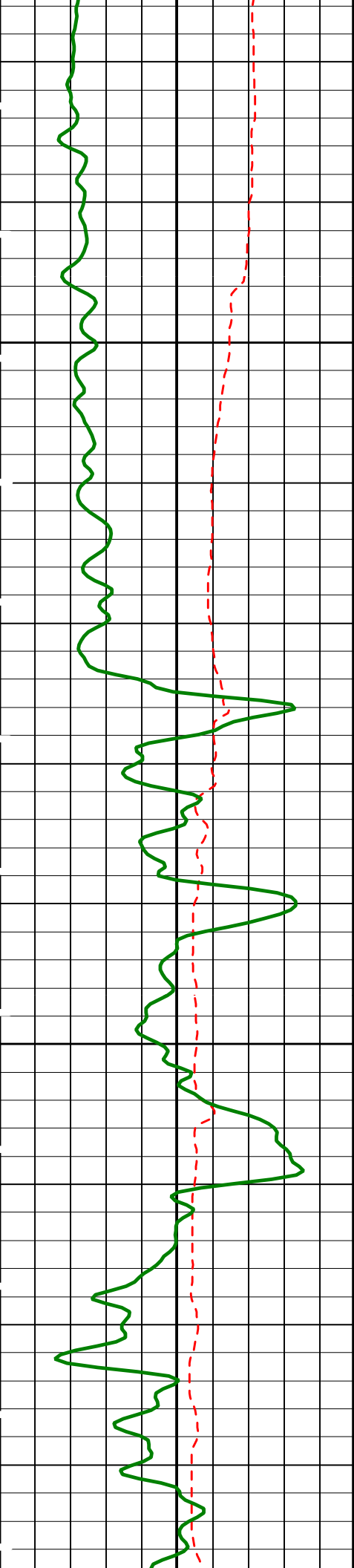
Time Mark Every 60 S



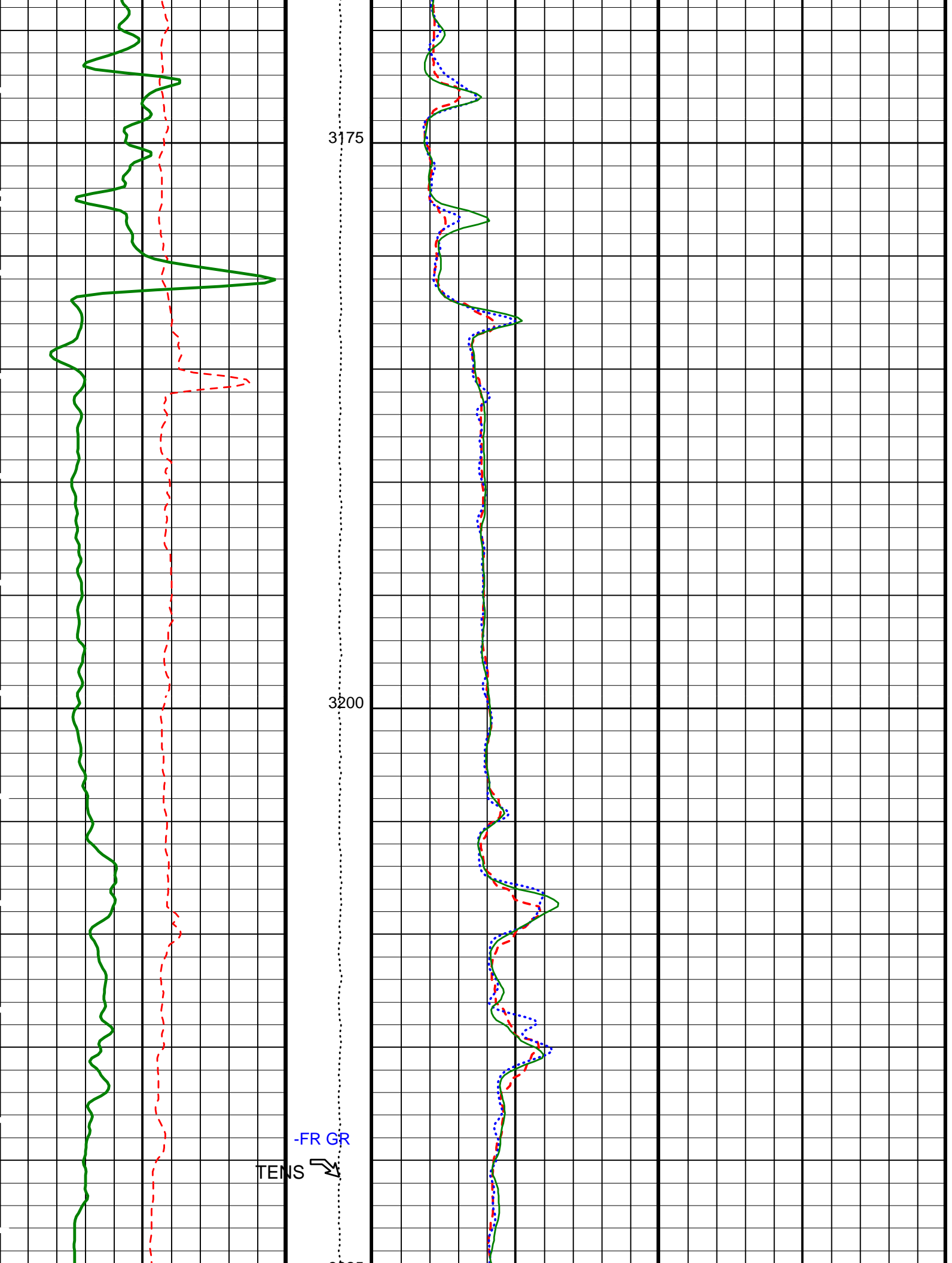


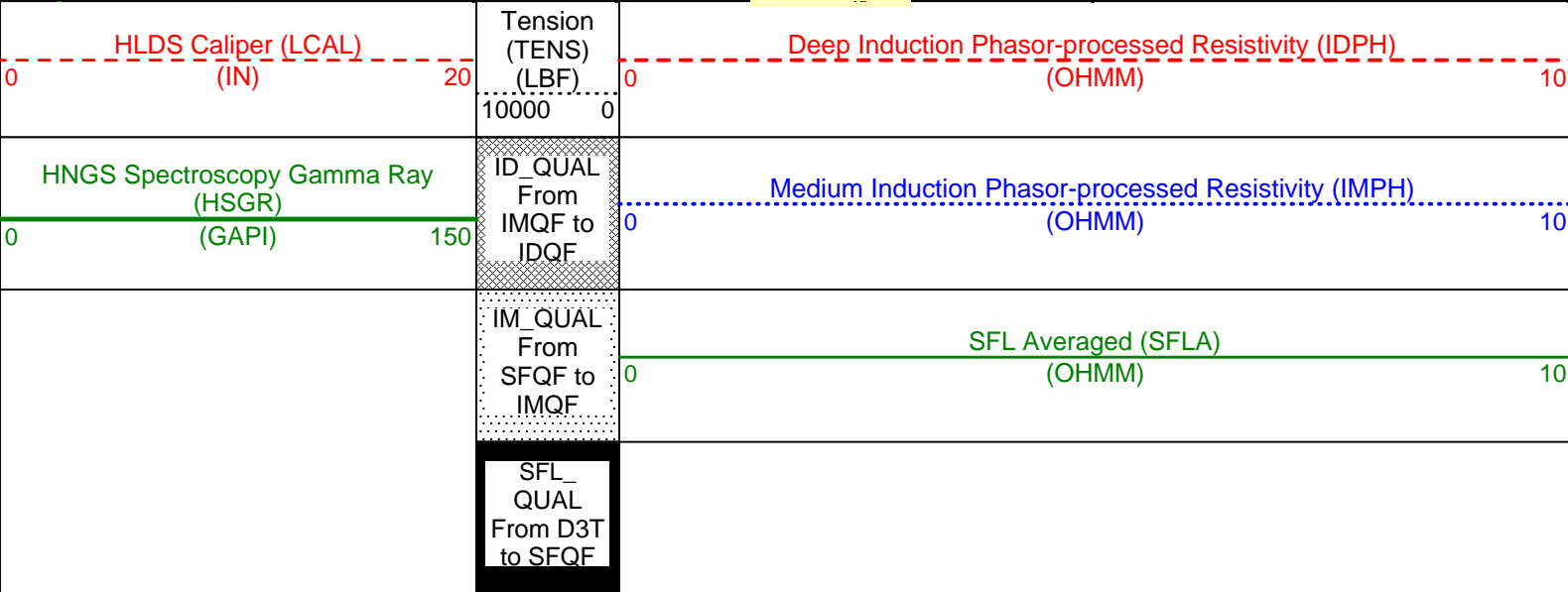
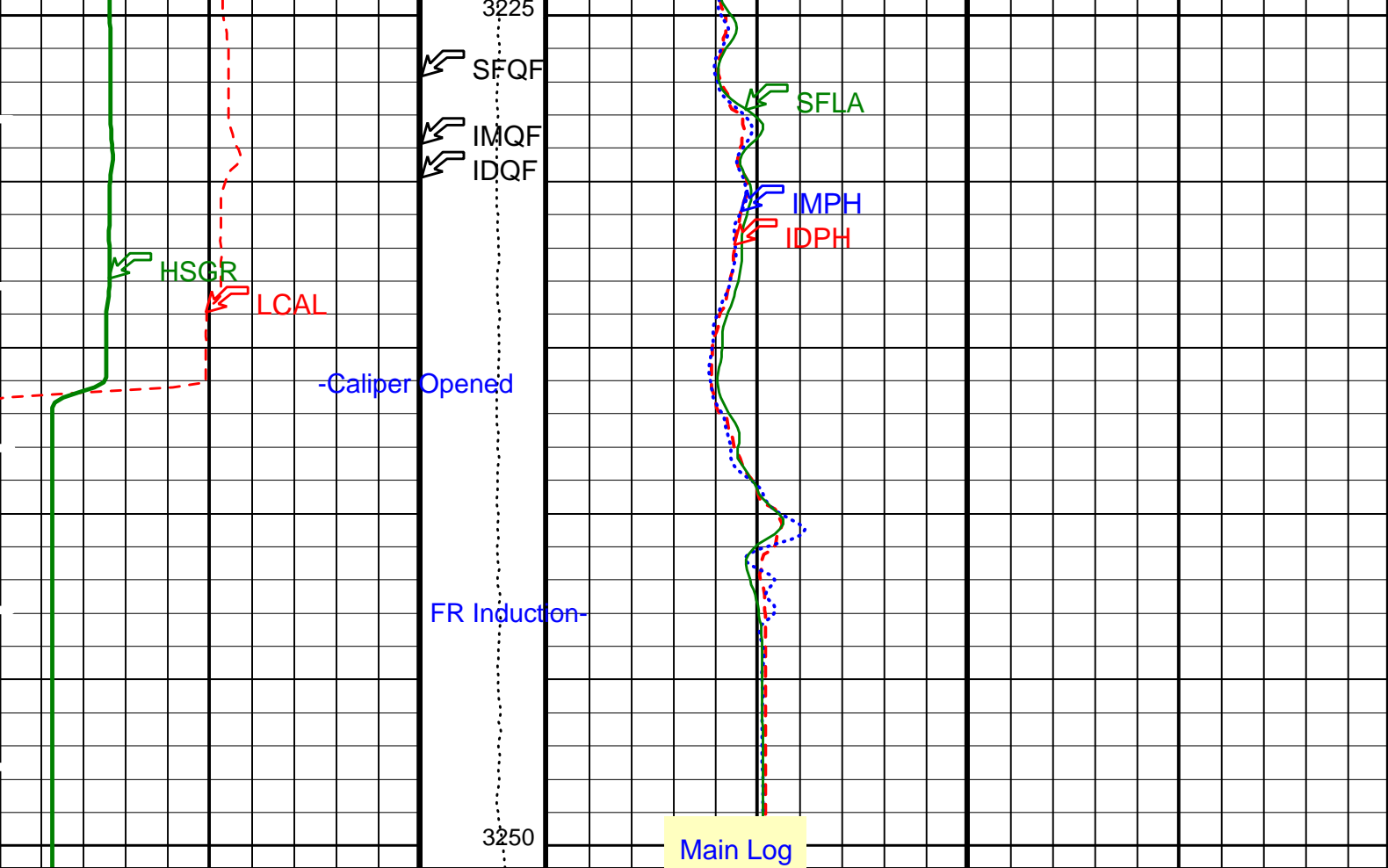












PIP SUMMARY  
 Time Mark Every 60 S

| Parameters                |                                                   |                 |
|---------------------------|---------------------------------------------------|-----------------|
| DLIS Name                 | Description                                       | Value           |
| DIT-E: Dual Induction - E |                                                   |                 |
| BHS                       | Borehole Status                                   | OPEN            |
| BHT                       | Bottom Hole Temperature (used in calculations)    | 100 DEG         |
| DGF2                      | Deep 20 kHz Gain Factor                           | 1.00789         |
| DPH2                      | Deep 20 kHz Phase Shift                           | -0.152394 DEG   |
| DRE2                      | Deep Real 20 kHz Sonde Error Correction           | 16.357 MM/M     |
| DSR2                      | Deep Sigma Reference (20 kHz)                     | 1843 MM/M       |
| DXE2                      | Deep Quad 20 kHz Sonde Error Correction           | 64.6326 MM/M    |
| GCSE                      | Generalized Caliper Selection                     | LCAL            |
| GDEV                      | Average Angular Deviation of Borehole from Normal | 0 DEG           |
| GGRD                      | Geothermal Gradient                               | 0.018227 DC/M   |
| GTSE                      | Generalized Temperature Selection                 | LINEAR_ESTIMATE |

|                                          |                                                        |                 |      |
|------------------------------------------|--------------------------------------------------------|-----------------|------|
| IFRS                                     | DIT-E Induction Frequency Selector                     | 20              |      |
| IPHA                                     | DIT-E Phasor Processing Mode                           | ALL             |      |
| IPRO                                     | DIT-E Induction Processing Selector                    | PHASOR          |      |
| ITEN                                     | DIT-E Temperature Enable                               | ENABLE          |      |
| MGF2                                     | Medium 20 kHz Gain Factor                              | 1.02964         |      |
| MPH2                                     | Medium 20 kHz Phase Shift                              | -0.933067       | DEG  |
| MRE2                                     | Medium Real 20 kHz Sonde Error Correction              | -1.78642        | MM/M |
| MSR2                                     | Medium Sigma Reference (20 kHz)                        | 3250            | MM/M |
| MXE2                                     | Medium Quad 20 kHz Sonde Error Correction              | -34.2041        | MM/M |
| SFCR                                     | SFL Channel Ratio                                      | 1000            |      |
| SHT                                      | Surface Hole Temperature                               | 20              | DEGC |
| APS-BA: Accelerator-Porosity Tool        |                                                        |                 |      |
| BHS                                      | Borehole Status                                        | OPEN            |      |
| BHT                                      | Bottom Hole Temperature (used in calculations)         | 100             | DEGC |
| GCSE                                     | Generalized Caliper Selection                          | LCAL            |      |
| GDEV                                     | Average Angular Deviation of Borehole from Normal      | 0               | DEG  |
| GGRD                                     | Geothermal Gradient                                    | 0.018227        | DC/M |
| GTSE                                     | Generalized Temperature Selection                      | LINEAR_ESTIMATE |      |
| SHT                                      | Surface Hole Temperature                               | 20              | DEGC |
| HNGS-BA: Hostile Natural Gamma Ray Sonde |                                                        |                 |      |
| BAR1                                     | HNGS Detector 1 Barite Constant                        | 1               |      |
| BAR2                                     | HNGS Detector 2 Barite Constant                        | 1               |      |
| BHK                                      | HNGS Borehole Potassium Correction Concentration       | 0               |      |
| BHS                                      | Borehole Status                                        | OPEN            |      |
| BHT                                      | Bottom Hole Temperature (used in calculations)         | 100             | DEGC |
| CSD1                                     | Inner Casing Outer Diameter                            | 0               | IN   |
| CSD2                                     | Outer Casing Outer Diameter                            | 0               | IN   |
| CSW1                                     | Inner Casing Weight                                    | 0               | LB/F |
| CSW2                                     | Outer Casing Weight                                    | 0               | LB/F |
| DBCC                                     | HNGS Barite Constant Correction Flag                   | NONE            |      |
| GCSE                                     | Generalized Caliper Selection                          | LCAL            |      |
| GDEV                                     | Average Angular Deviation of Borehole from Normal      | 0               | DEG  |
| GGRD                                     | Geothermal Gradient                                    | 0.018227        | DC/M |
| GTSE                                     | Generalized Temperature Selection                      | LINEAR_ESTIMATE |      |
| H1P                                      | HNGS Detector 1 Allow/Disallow In Processing           | ALLOW           |      |
| H2P                                      | HNGS Detector 2 Allow/Disallow In Processing           | ALLOW           |      |
| HABK                                     | HNGS Borehole Potassium Running Average                | -0.000331568    |      |
| HALF                                     | HNGS Alpha Filter Length                               | 60              | IN   |
| HCRB                                     | HNGS Apply Borehole Potassium Correction               | NONE            |      |
| HMWM                                     | Mud Weighting Material                                 | NATU            |      |
| HNPE                                     | HNGS Processing Enable                                 | YES             |      |
| S1BI                                     | HNGS Detector 1 Calibration Bismuth Count Rate         | -999.25         | CPS  |
| S2BI                                     | HNGS Detector 2 Calibration Bismuth Count Rate         | -999.25         | CPS  |
| SGRC                                     | HNGS Standard Gamma-Ray Correction Flag                | YES             |      |
| SHT                                      | Surface Hole Temperature                               | 20              | DEGC |
| TPOS                                     | Tool Position                                          | ECCE            |      |
| VBA1                                     | HNGS Detector 1 Variable Barite Factor Running Average | 0.734507        |      |
| VBA2                                     | HNGS Detector 2 Variable Barite Factor Running Average | 0.776573        |      |
| System and Miscellaneous                 |                                                        |                 |      |
| BS                                       | Bit Size                                               | 11.438          | IN   |
| DFD                                      | Drilling Fluid Density                                 | 1.10            | G/C3 |
| TD                                       | Total Depth                                            | -50000          | M    |

Format: DITE\_LinPhasor    Vertical Scale: 1:200    Graphics File Created: 18-Jan-2003 18:53

### OP System Version: 10C0-306

MCM

|        |                 |         |                 |
|--------|-----------------|---------|-----------------|
| DIT-E  | 10C0-306        | DTA-A   | 10C0-306        |
| HLDS   | SPC-2277-NUCL_b | NPLC-B  | OP10-KP1        |
| APS-BA | SPC-2277-NUCL_b | HNGS-BA | SPC-2277-NUCL_b |
| DTC-H  | 10C0-306        |         |                 |

### Output DLIS Files

|         |                       |       |          |                   |
|---------|-----------------------|-------|----------|-------------------|
| DEFAULT | PI_LDL_APS_NGS_011LUP | FN:13 | PRODUCER | 18-Jan-2003 18:53 |
| REDUCE  | PI_LDL_APS_NGS_011LUP | FN:14 | PRODUCER | 18-Jan-2003 18:53 |

### Output DLIS Files

|         |                       |       |          |                   |          |          |
|---------|-----------------------|-------|----------|-------------------|----------|----------|
| DEFAULT | PI_LDL_APS_NGS_012LUP | FN:15 | PRODUCER | 18-Jan-2003 20:20 | 3248.4 M | 3023.3 M |
| REDUCE  | PI_LDL_APS_NGS_012LUP | FN:16 | PRODUCER | 18-Jan-2003 20:20 | 3248.4 M | 3023.3 M |

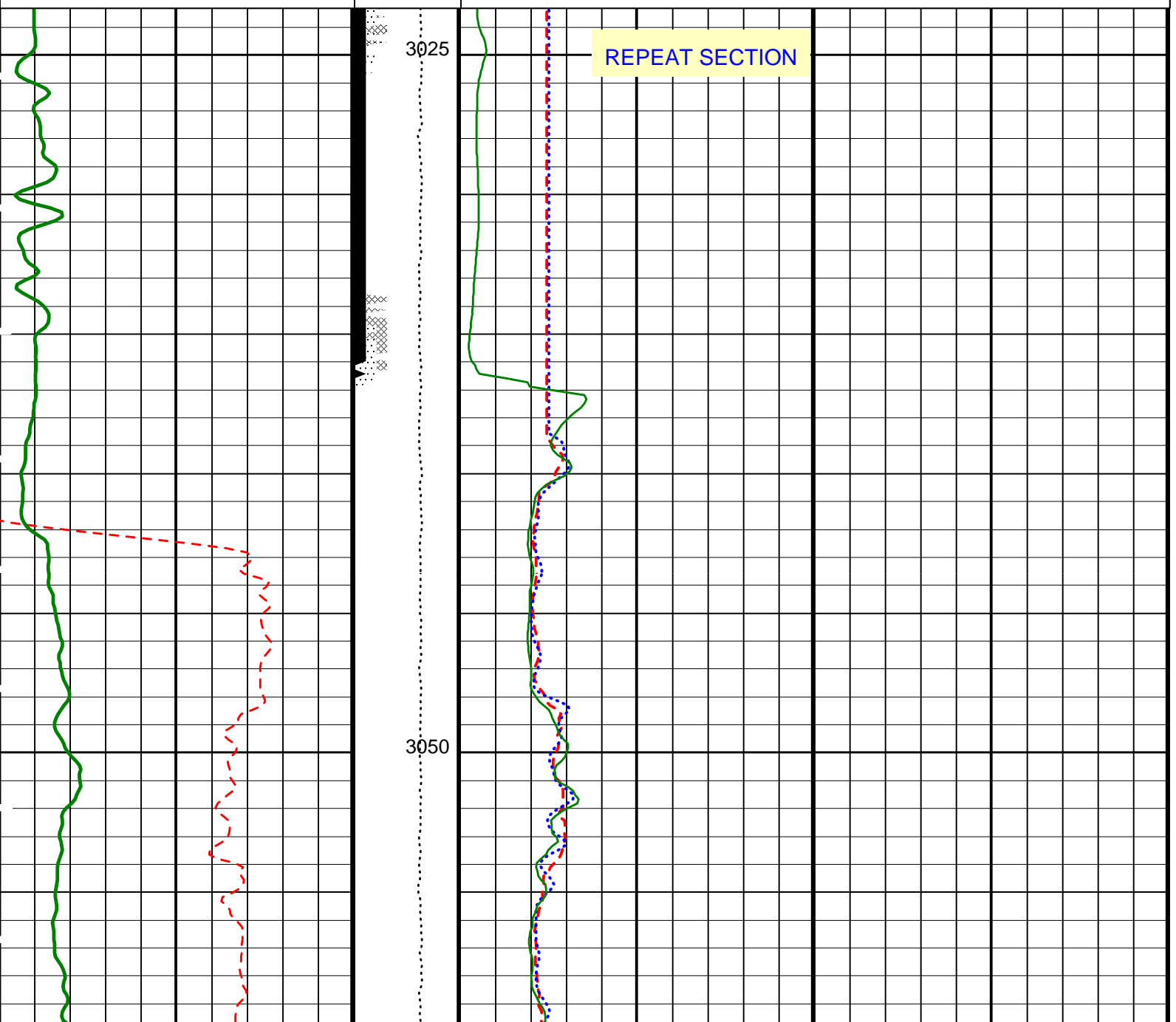
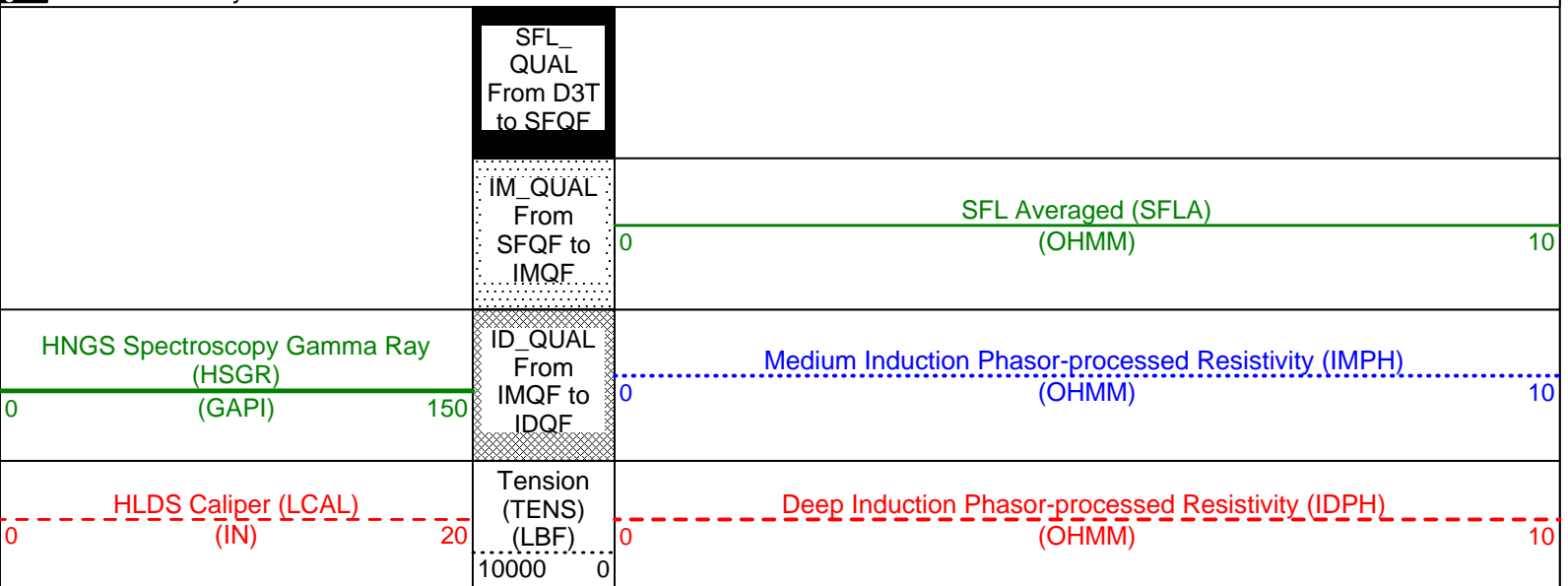
### OP System Version: 10C0-306

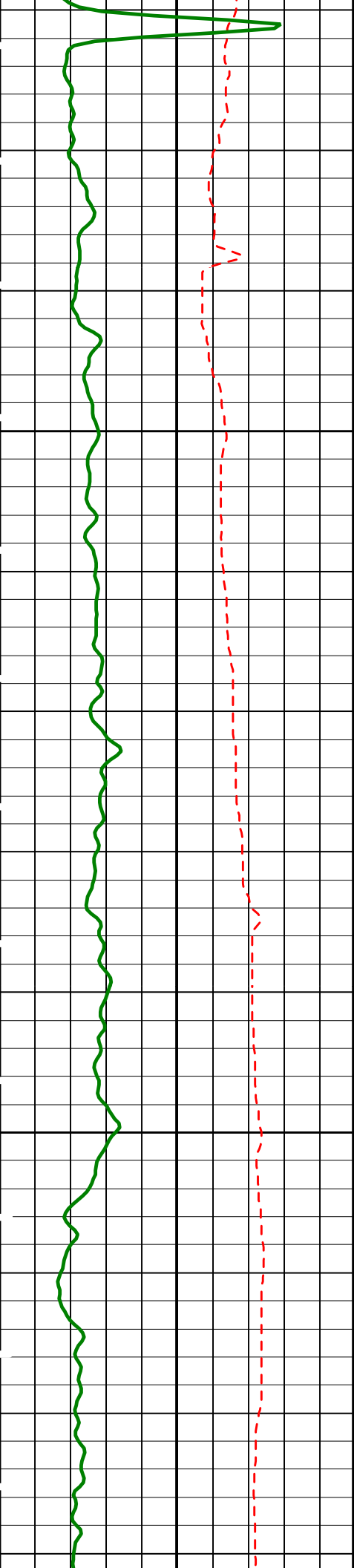
MCM

|       |                 |        |          |
|-------|-----------------|--------|----------|
| DIT-E | 10C0-306        | DTA-A  | 10C0-306 |
| HLDS  | SPC-2277-NUCL_b | NPLC-B | OP10-KP1 |

PIP SUMMARY

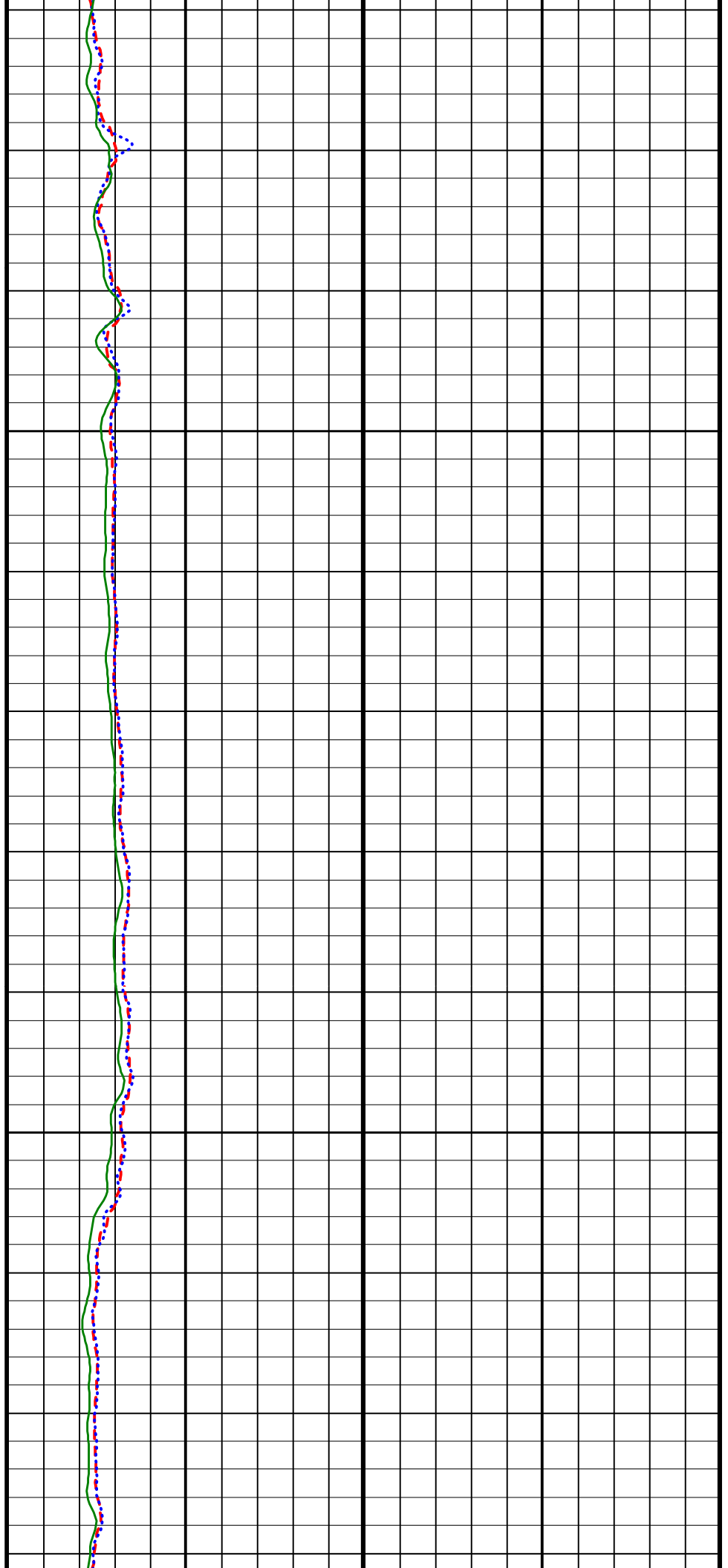
Time Mark Every 60 S

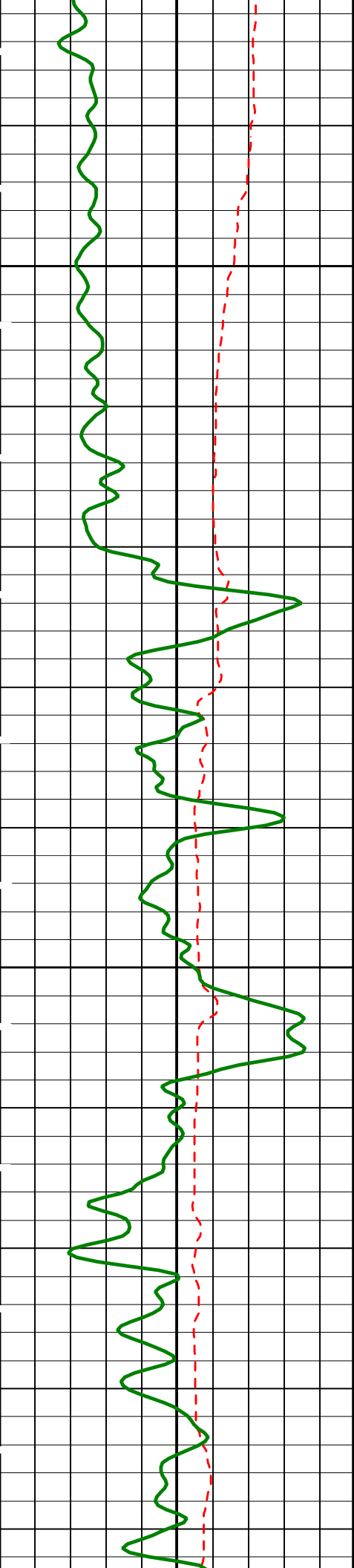




3075

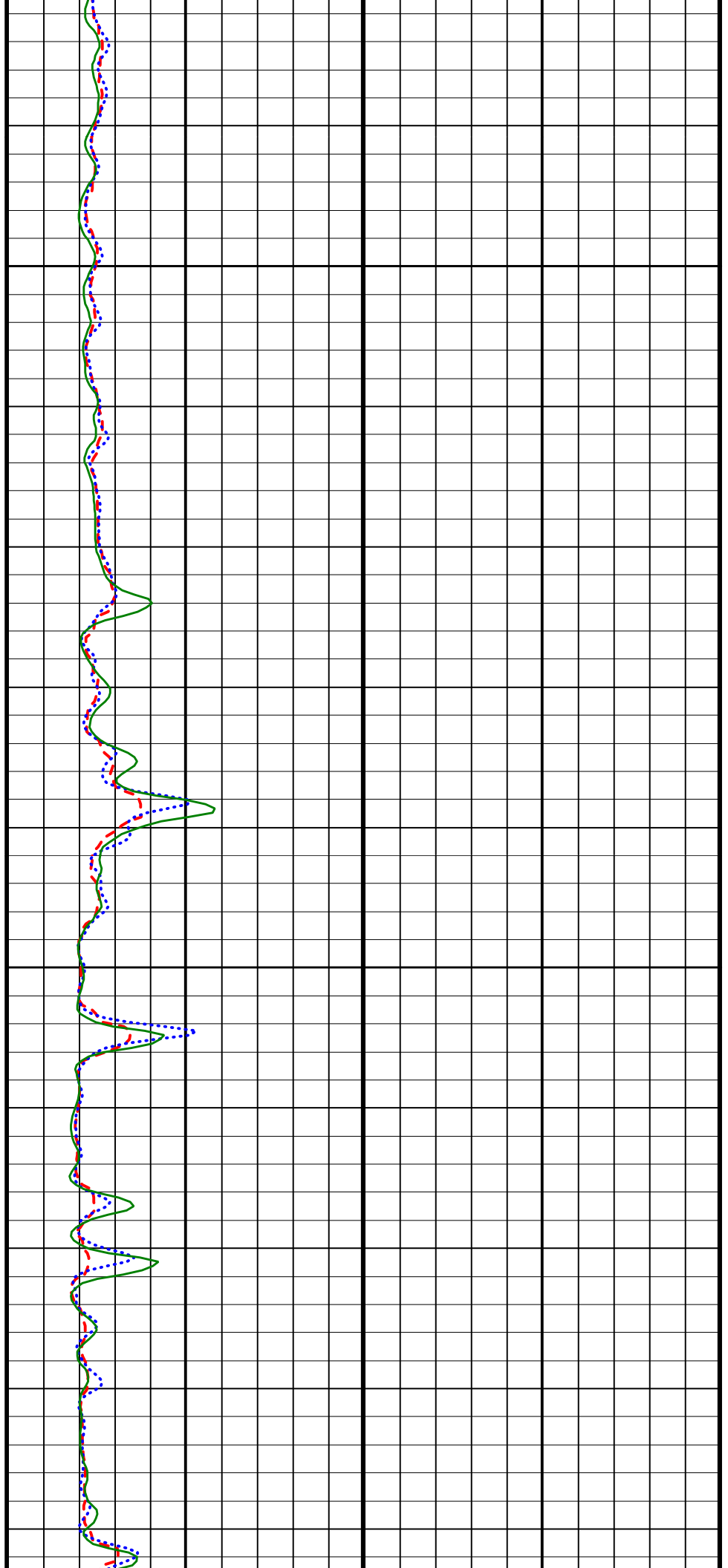
3100

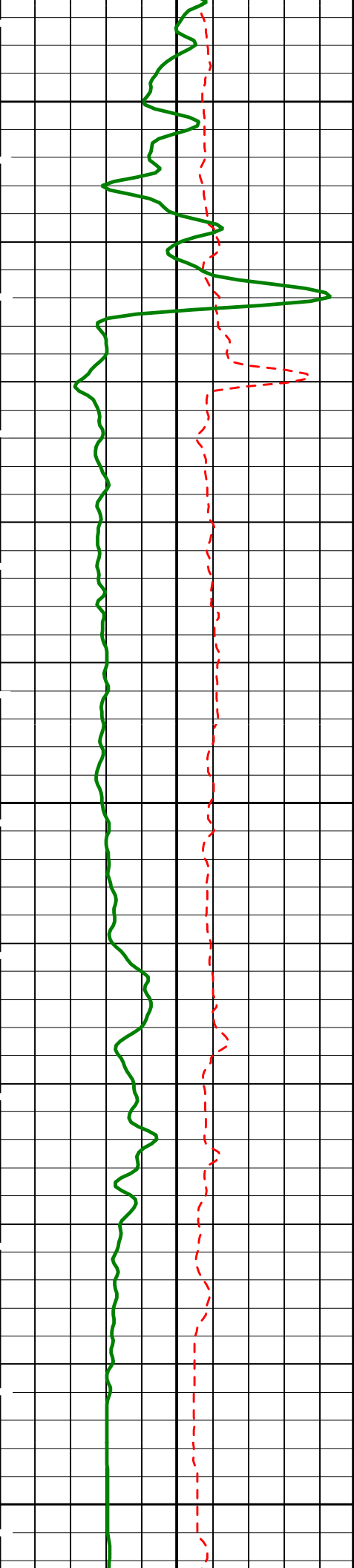




3125

3150

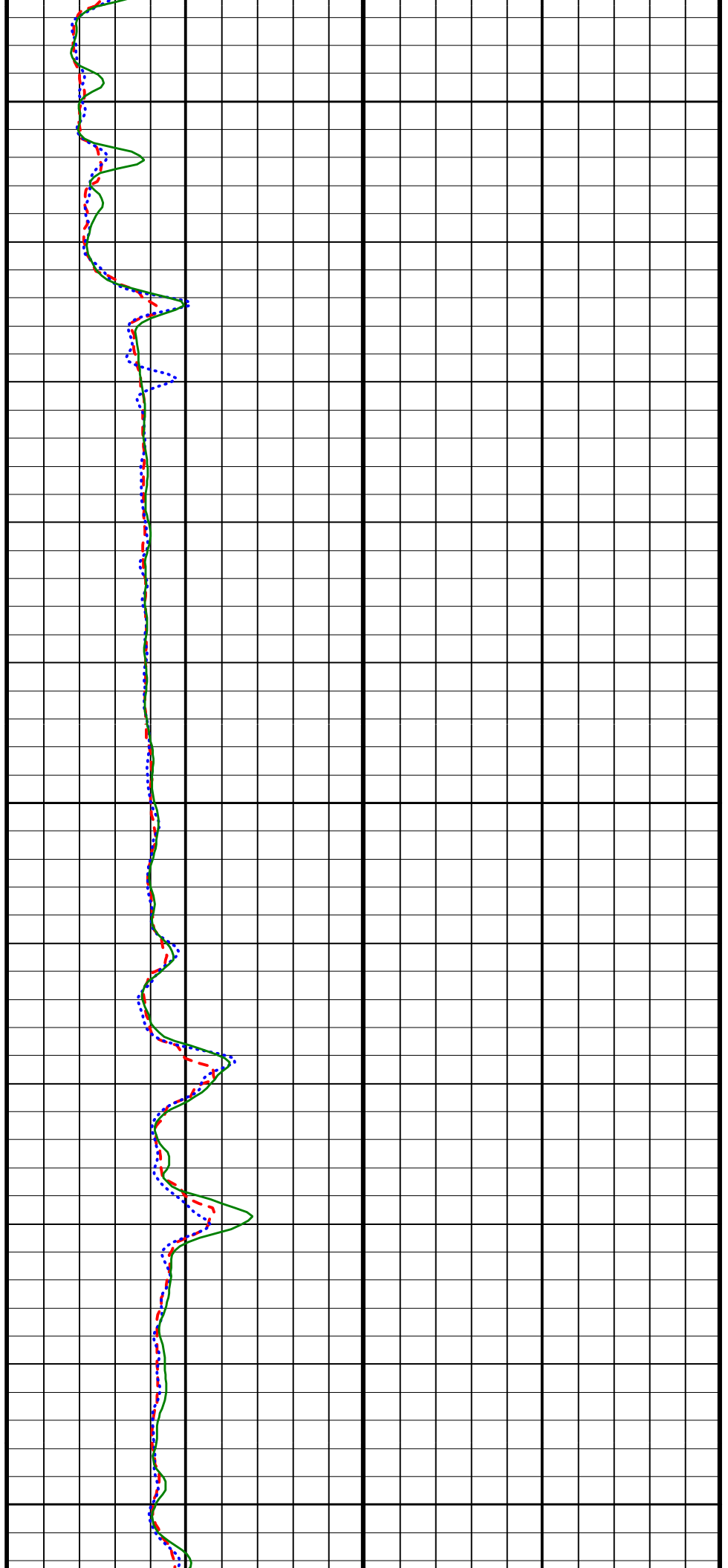


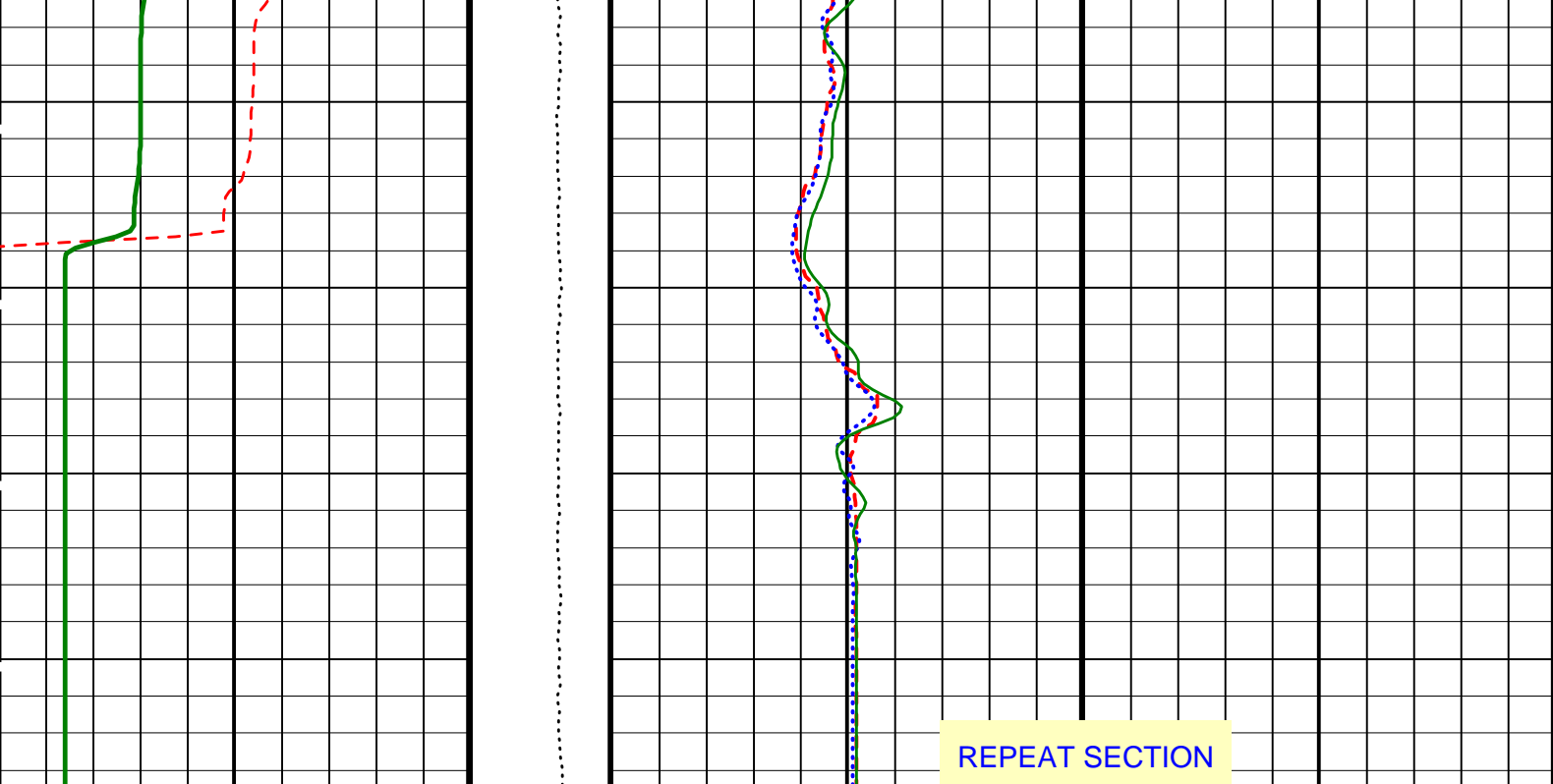


3175

3200

3225





|                                                 |                                    |                                                                |
|-------------------------------------------------|------------------------------------|----------------------------------------------------------------|
| HLDS Caliper (LCAL)<br>(IN)                     | Tension<br>(TENS)<br>(LBF)         | Deep Induction Phasor-processed Resistivity (IDPH)<br>(OHMM)   |
| 0 20                                            | 0 10000                            | 0 10                                                           |
| HNGS Spectroscopy Gamma Ray<br>(HSGR)<br>(GAPI) | ID_QUAL<br>From<br>IMQF to<br>IDQF | Medium Induction Phasor-processed Resistivity (IMPH)<br>(OHMM) |
| 0 150                                           |                                    | 0 10                                                           |
|                                                 | IM_QUAL<br>From<br>SFQF to<br>IMQF | SFL Averaged (SFLA)<br>(OHMM)                                  |
|                                                 |                                    | 0 10                                                           |
|                                                 | SFL_QUAL<br>From D3T<br>to SFQF    |                                                                |

PIP SUMMARY

Time Mark Every 60 S

Parameters

| DLIS Name                 | Description                                       | Value           |
|---------------------------|---------------------------------------------------|-----------------|
| DIT-E: Dual Induction - E |                                                   |                 |
| BHS                       | Borehole Status                                   | OPEN            |
| BHT                       | Bottom Hole Temperature (used in calculations)    | 100 DEG         |
| DGF2                      | Deep 20 kHz Gain Factor                           | 1.00789         |
| DPH2                      | Deep 20 kHz Phase Shift                           | -0.152394 DEG   |
| DRE2                      | Deep Real 20 kHz Sonde Error Correction           | 16.357 MM/M     |
| DSR2                      | Deep Sigma Reference (20 kHz)                     | 1843 MM/M       |
| DXE2                      | Deep Quad 20 kHz Sonde Error Correction           | 64.6326 MM/M    |
| GCSE                      | Generalized Caliper Selection                     | LCAL            |
| GDEV                      | Average Angular Deviation of Borehole from Normal | 0 DEG           |
| GGRD                      | Geothermal Gradient                               | 0.018227 DC/M   |
| GTSE                      | Generalized Temperature Selection                 | LINEAR_ESTIMATE |
| IFRS                      | DIT-E Induction Frequency Selector                | 20              |
| IPHA                      | DIT-E Phasor Processing Mode                      | ALL             |
| IPRO                      | DIT-E Induction Processing Selector               | PHASOR          |
| ITEN                      | DIT-E Temperature Enable                          | ENABLE          |
| MGF2                      | Medium 20 kHz Gain Factor                         | 1.02964         |
| MPH2                      | Medium 20 kHz Phase Shift                         | -0.933067 DEG   |
| MRE2                      | Medium Real 20 kHz Sonde Error Correction         | -1.78642 MM/M   |
| MSR2                      | Medium Sigma Reference (20 kHz)                   | 3250 MM/M       |



|                                          |                                                        |                 |      |
|------------------------------------------|--------------------------------------------------------|-----------------|------|
| MXE2                                     | Medium Quad 20 kHz Sonde Error Correction              | -34.2041        | MM/M |
| SFCR                                     | SFL Channel Ratio                                      | 1000            |      |
| SHT                                      | Surface Hole Temperature                               | 20              | DEGC |
| APS-BA: Accelerator-Porosity Tool        |                                                        |                 |      |
| BHS                                      | Borehole Status                                        | OPEN            |      |
| BHT                                      | Bottom Hole Temperature (used in calculations)         | 100             | DEGC |
| GCSE                                     | Generalized Caliper Selection                          | LCAL            |      |
| GDEV                                     | Average Angular Deviation of Borehole from Normal      | 0               | DEG  |
| GGRD                                     | Geothermal Gradient                                    | 0.018227        | DC/M |
| GTSE                                     | Generalized Temperature Selection                      | LINEAR_ESTIMATE |      |
| SHT                                      | Surface Hole Temperature                               | 20              | DEGC |
| HNGS-BA: Hostile Natural Gamma Ray Sonde |                                                        |                 |      |
| BAR1                                     | HNGS Detector 1 Barite Constant                        | 1               |      |
| BAR2                                     | HNGS Detector 2 Barite Constant                        | 1               |      |
| BHK                                      | HNGS Borehole Potassium Correction Concentration       | 0               |      |
| BHS                                      | Borehole Status                                        | OPEN            |      |
| BHT                                      | Bottom Hole Temperature (used in calculations)         | 100             | DEGC |
| CSD1                                     | Inner Casing Outer Diameter                            | 0               | IN   |
| CSD2                                     | Outer Casing Outer Diameter                            | 0               | IN   |
| CSW1                                     | Inner Casing Weight                                    | 0               | LB/F |
| CSW2                                     | Outer Casing Weight                                    | 0               | LB/F |
| DBCC                                     | HNGS Barite Constant Correction Flag                   | NONE            |      |
| GCSE                                     | Generalized Caliper Selection                          | LCAL            |      |
| GDEV                                     | Average Angular Deviation of Borehole from Normal      | 0               | DEG  |
| GGRD                                     | Geothermal Gradient                                    | 0.018227        | DC/M |
| GTSE                                     | Generalized Temperature Selection                      | LINEAR_ESTIMATE |      |
| H1P                                      | HNGS Detector 1 Allow/Disallow In Processing           | ALLOW           |      |
| H2P                                      | HNGS Detector 2 Allow/Disallow In Processing           | ALLOW           |      |
| HABK                                     | HNGS Borehole Potassium Running Average                | -0.0178137      |      |
| HALF                                     | HNGS Alpha Filter Length                               | 60              | IN   |
| HCRB                                     | HNGS Apply Borehole Potassium Correction               | NONE            |      |
| HMWM                                     | Mud Weighting Material                                 | NATU            |      |
| HNPE                                     | HNGS Processing Enable                                 | YES             |      |
| S1BI                                     | HNGS Detector 1 Calibration Bismuth Count Rate         | -999.25         | CPS  |
| S2BI                                     | HNGS Detector 2 Calibration Bismuth Count Rate         | -999.25         | CPS  |
| SGRC                                     | HNGS Standard Gamma-Ray Correction Flag                | YES             |      |
| SHT                                      | Surface Hole Temperature                               | 20              | DEGC |
| TPOS                                     | Tool Position                                          | ECCE            |      |
| VBA1                                     | HNGS Detector 1 Variable Barite Factor Running Average | 0.96088         |      |
| VBA2                                     | HNGS Detector 2 Variable Barite Factor Running Average | 0.5297          |      |
| System and Miscellaneous                 |                                                        |                 |      |
| BS                                       | Bit Size                                               | 11.438          | IN   |
| DFD                                      | Drilling Fluid Density                                 | 1.10            | G/C3 |
| TD                                       | Total Depth                                            | -50000          | M    |

Format: DITE\_LinPhasor    Vertical Scale: 1:200    Graphics File Created: 18-Jan-2003 20:21

### OP System Version: 10C0-306 MCM

|        |                 |         |                 |
|--------|-----------------|---------|-----------------|
| DIT-E  | 10C0-306        | DTA-A   | 10C0-306        |
| HLDS   | SPC-2277-NUCL_b | NPLC-B  | OP10-KP1        |
| APS-BA | SPC-2277-NUCL_b | HNGS-BA | SPC-2277-NUCL_b |
| DTC-H  | 10C0-306        |         |                 |

### Output DLIS Files

|         |                       |       |          |                   |
|---------|-----------------------|-------|----------|-------------------|
| DEFAULT | PI_LDL_APS_NGS_012LUP | FN:15 | PRODUCER | 18-Jan-2003 20:20 |
| REDUCE  | PI_LDL_APS_NGS_012LUP | FN:16 | PRODUCER | 18-Jan-2003 20:20 |

### Calibration and Check Summary

| Measurement                                                                       | Nominal | Master | Before | After | Change   | Limit   | Units |
|-----------------------------------------------------------------------------------|---------|--------|--------|-------|----------|---------|-------|
| Hostile Litho-Density Sonde Wellsite Calibration - Background Measurement         |         |        |        |       |          |         |       |
| Master: 13-Dec-2002 14:00    Before: 15-Jan-2003 11:10    After: 19-Jan-2003 2:14 |         |        |        |       |          |         |       |
| SS Cs Resolution Bkg                                                              | 9.000   | 8.065  | 8.135  | 8.044 | -0.09056 | 1.800   | %     |
| LS Cs Resolution Bkg                                                              | 9.000   | 8.249  | 8.108  | 8.124 | 0.01535  | 1.800   | %     |
| LSW1 Background                                                                   | 100.0   | 86.88  | 86.46  | 86.16 | -0.2965  | 0.03000 | CPS   |
| LSW2 Background                                                                   | 100.0   | 82.90  | 80.84  | 81.32 | 0.4762   | 0.03000 | CPS   |
| LSW3 Background                                                                   | 200.0   | 182.1  | 179.4  | 180.0 | 0.5779   | 0.03000 | CPS   |
| LSW4 Background                                                                   | 250.0   | 221.9  | 216.6  | 220.1 | 3.541    | 0.03000 | CPS   |
| LSW5 Background                                                                   | 600.0   | 510.1  | 505.1  | 504.0 | -1.098   | 0.03000 | CPS   |
| SSW1 Background                                                                   | 100.0   | 96.14  | 98.01  | 96.03 | -1.977   | 0.03000 | CPS   |
| SSW2 Background                                                                   | 200.0   | 176.7  | 177.3  | 173.7 | -3.596   | 0.03000 | CPS   |
| SSW3 Background                                                                   | 500.0   | 478.2  | 477.6  | 477.4 | -0.1395  | 0.03000 | CPS   |

|                                                                                          |        |        |        |       |          |         |      |
|------------------------------------------------------------------------------------------|--------|--------|--------|-------|----------|---------|------|
| SSW4 Background                                                                          | 270.0  | 244.2  | 244.0  | 242.2 | -1.773   | 0.03000 | CPS  |
| SSW5 Background                                                                          | 200.0  | 177.5  | 175.7  | 176.8 | 1.105    | 0.03000 | CPS  |
| Hostile Litho-Density Sonde Wellsite Calibration - Aluminum Measurement                  |        |        |        |       |          |         |      |
| Master: 13-Dec-2002 15:15                                                                |        |        |        |       |          |         |      |
| LSW1 Aluminum                                                                            | 600.0  | 580.8  | N/A    | N/A   | N/A      | N/A     | CPS  |
| LSW2 Aluminum                                                                            | 900.0  | 822.1  | N/A    | N/A   | N/A      | N/A     | CPS  |
| LSW3 Aluminum                                                                            | 1100   | 985.4  | N/A    | N/A   | N/A      | N/A     | CPS  |
| LSW4 Aluminum                                                                            | 580.0  | 489.2  | N/A    | N/A   | N/A      | N/A     | CPS  |
| LSW5 Aluminum                                                                            | 570.0  | 453.3  | N/A    | N/A   | N/A      | N/A     | CPS  |
| SSW1 Aluminum                                                                            | 2800   | 2597   | N/A    | N/A   | N/A      | N/A     | CPS  |
| SSW2 Aluminum                                                                            | 8000   | 7087   | N/A    | N/A   | N/A      | N/A     | CPS  |
| SSW3 Aluminum                                                                            | 11600  | 9849   | N/A    | N/A   | N/A      | N/A     | CPS  |
| SSW4 Aluminum                                                                            | 5000   | 4127   | N/A    | N/A   | N/A      | N/A     | CPS  |
| SSW5 Aluminum                                                                            | 660.0  | 537.2  | N/A    | N/A   | N/A      | N/A     | CPS  |
| Hostile Litho-Density Sonde Wellsite Calibration - Lithology Measurement                 |        |        |        |       |          |         |      |
| Master: 13-Dec-2002 15:11                                                                |        |        |        |       |          |         |      |
| LSW1 Iron                                                                                | 400.0  | 401.7  | N/A    | N/A   | N/A      | N/A     | CPS  |
| LSW2 Iron                                                                                | 730.0  | 683.6  | N/A    | N/A   | N/A      | N/A     | CPS  |
| LSW3 Iron                                                                                | 1000   | 900.2  | N/A    | N/A   | N/A      | N/A     | CPS  |
| LSW4 Iron                                                                                | 520.0  | 465.6  | N/A    | N/A   | N/A      | N/A     | CPS  |
| LSW5 Iron                                                                                | 470.0  | 434.8  | N/A    | N/A   | N/A      | N/A     | CPS  |
| SSW1 Iron                                                                                | 2100   | 1961   | N/A    | N/A   | N/A      | N/A     | CPS  |
| SSW2 Iron                                                                                | 6800   | 6103   | N/A    | N/A   | N/A      | N/A     | CPS  |
| SSW3 Iron                                                                                | 10800  | 9305   | N/A    | N/A   | N/A      | N/A     | CPS  |
| SSW4 Iron                                                                                | 4600   | 3921   | N/A    | N/A   | N/A      | N/A     | CPS  |
| SSW5 Iron                                                                                | 580.0  | 502.8  | N/A    | N/A   | N/A      | N/A     | CPS  |
| Hostile Litho-Density Sonde Wellsite Calibration - Caliper Calibration                   |        |        |        |       |          |         |      |
| Before: 15-Jan-2003 11:25                                                                |        |        |        |       |          |         |      |
| HLDS Caliper Small Ring                                                                  | 15.00  | N/A    | 18.20  | N/A   | N/A      | N/A     | IN   |
| HLDS Caliper Large Ring                                                                  | 17.50  | N/A    | 20.31  | N/A   | N/A      | N/A     | IN   |
| Accelerator-Porosity Tool Wellsite Calibration - Detector Background                     |        |        |        |       |          |         |      |
| Master: 28-Nov-2002 19:52 Before: 18-Jan-2003 18:09 After: 19-Jan-2003 0:35              |        |        |        |       |          |         |      |
| Near Det Bkg Cntrate                                                                     | 30.00  | 32.65  | 61.25  | 31.59 | -29.66   | N/A     | CPS  |
| Far Det Bkg Cntrate                                                                      | 30.00  | 31.56  | 38.09  | 33.02 | -5.071   | N/A     | CPS  |
| Array-1 Det Bkg Cntrate                                                                  | 30.00  | 29.11  | 38.78  | 28.71 | -10.07   | N/A     | CPS  |
| Array-2 Det Bkg Cntrate                                                                  | 30.00  | 29.96  | 40.03  | 29.94 | -10.09   | N/A     | CPS  |
| Array Therm Det Bkg Cntrate                                                              | 30.00  | 32.97  | 41.48  | 32.50 | -8.981   | N/A     | CPS  |
| Accelerator-Porosity Tool Wellsite Calibration - Calibration Ratios                      |        |        |        |       |          |         |      |
| Master: 28-Nov-2002 19:53                                                                |        |        |        |       |          |         |      |
| Near/Far Calibration Ratio                                                               | 0.9250 | 0.8869 | N/A    | N/A   | N/A      | N/A     |      |
| Near/Array Calibration Ratio                                                             | 1.030  | 1.051  | N/A    | N/A   | N/A      | N/A     |      |
| Near/Array Cal Ratio Up/Down                                                             | 1.000  | 1.002  | N/A    | N/A   | N/A      | N/A     |      |
| Accelerator-Porosity Tool Wellsite Calibration - Tank Check                              |        |        |        |       |          |         |      |
| Master: 28-Nov-2002 19:54                                                                |        |        |        |       |          |         |      |
| Array-1 Standoff Porosity                                                                | 11.75  | 11.90  | N/A    | N/A   | N/A      | N/A     | PU   |
| Array-2 Standoff Porosity                                                                | 11.75  | 11.44  | N/A    | N/A   | N/A      | N/A     | PU   |
| Average Slowing Down Time                                                                | 6.000  | 5.850  | N/A    | N/A   | N/A      | N/A     | US   |
| Array-1 SDT Ratio Up/Down                                                                | 1.000  | 0.9966 | N/A    | N/A   | N/A      | N/A     |      |
| Array-2 SDT Ratio Up/Down                                                                | 1.000  | 0.9889 | N/A    | N/A   | N/A      | N/A     |      |
| Sigma Formation                                                                          | 27.50  | 27.81  | N/A    | N/A   | N/A      | N/A     | CU   |
| Hostile Natural Gamma Ray Sonde Wellsite Calibration - Detector 1 Check                  |        |        |        |       |          |         |      |
| Master: 15-Jan-2003 16:08 Before: 15-Jan-2003 16:17 After: 19-Jan-2003 2:15              |        |        |        |       |          |         |      |
| Na 511 Peak Loc                                                                          | 40.00  | 40.59  | 40.72  | 40.70 | -0.02711 | 1.000   |      |
| Na 511 Peak Res                                                                          | 15.50  | 17.05  | 17.42  | 16.61 | -0.8152  | 2.000   | %    |
| High Voltage                                                                             | 1150   | 1212   | 1212   | 1215  | 2.189    | 30.00   | V    |
| Na 1785 Peak Loc                                                                         | 142.6  | 145.6  | 145.3  | 145.8 | 0.5008   | 7.000   |      |
| Na 1785 Peak Res                                                                         | 8.500  | 9.037  | 9.666  | 9.711 | 0.04524  | 2.000   | %    |
| Temperature                                                                              | 15.50  | 32.69  | 32.84  | 29.54 | -3.307   | N/A     | DEGC |
| Na Count Rate                                                                            | 45.00  | 44.80  | 43.98  | 43.51 | -0.4779  | 8.000   | CPS  |
| Hostile Natural Gamma Ray Sonde Wellsite Calibration - Detector 2 Check                  |        |        |        |       |          |         |      |
| Master: 15-Jan-2003 16:08 Before: 15-Jan-2003 16:17 After: 19-Jan-2003 2:15              |        |        |        |       |          |         |      |
| Na 511 Peak Loc                                                                          | 40.00  | 40.55  | 40.57  | 40.61 | 0.03738  | 1.000   |      |
| Na 511 Peak Res                                                                          | 15.50  | 16.60  | 16.91  | 17.25 | 0.3423   | 2.000   | %    |
| High Voltage                                                                             | 1150   | 1239   | 1239   | 1242  | 2.449    | 30.00   | V    |
| Na 1785 Peak Loc                                                                         | 142.6  | 144.7  | 144.4  | 144.4 | 0.07025  | 7.000   |      |
| Na 1785 Peak Res                                                                         | 8.500  | 9.925  | 9.708  | 9.893 | 0.1852   | 2.000   | %    |
| Temperature                                                                              | 15.50  | 32.80  | 32.89  | 29.63 | -3.265   | N/A     | DEGC |
| Na Count Rate                                                                            | 45.00  | 44.45  | 43.98  | 43.50 | -0.4887  | 8.000   | CPS  |
| Hostile Natural Gamma Ray Sonde Wellsite Calibration - Ratio Of Detector 1 To Detector 2 |        |        |        |       |          |         |      |
| Master: 15-Jan-2003 16:08 Before: 15-Jan-2003 16:17 After: 19-Jan-2003 2:15              |        |        |        |       |          |         |      |
| Coincidence Count Rate Ratio                                                             | 1.000  | 1.008  | 1.0000 | 1.001 | 0.001407 | 0.05000 |      |
| Hostile Natural Gamma Ray Sonde Master Calibration - Detector 1 Calibration              |        |        |        |       |          |         |      |

Master: 15-Jan-2003 16:01

|                       |       |        |    |    |    |     |
|-----------------------|-------|--------|----|----|----|-----|
| Na 511 Peak Set Point | 40.00 | 41.00  | -- | -- | -- | --  |
| Th Peak Loc           | 209.6 | 209.3  | -- | -- | -- | --  |
| Th Peak Res           | 7.000 | 8.207  | -- | -- | -- | --  |
| Background Count Rate | 142.5 | 23.15  | -- | -- | -- | %   |
| Gain Ratio            | 1.000 | 0.9810 | -- | -- | -- | CPS |

Hostile Natural Gamma Ray Sonde Master Calibration - Detector 2 Calibration

Master: 15-Jan-2003 16:01

|                       |       |        |    |    |    |     |
|-----------------------|-------|--------|----|----|----|-----|
| Na 511 Peak Set Point | 40.00 | 41.00  | -- | -- | -- | --  |
| Th Peak Loc           | 209.6 | 209.3  | -- | -- | -- | --  |
| Th Peak Res           | 7.000 | 7.848  | -- | -- | -- | --  |
| Background Count Rate | 142.5 | 21.80  | -- | -- | -- | %   |
| Gain Ratio            | 1.000 | 0.9821 | -- | -- | -- | CPS |

Accelerator-Porosity Tool - Detector Plateau Settings :

|                                |        |
|--------------------------------|--------|
| Near Detector Plateau Setting  | 1728 V |
| Far Detector Plateau Setting   | 2073 V |
| Array Detector Plateau Setting | 1958 V |

Dual Induction - E / Equipment Identification

|                          |          |     |  |
|--------------------------|----------|-----|--|
| Primary Equipment:       |          |     |  |
| Dual Induction Sonde     | DIS - HB | 442 |  |
| Dual Induction Cartridge | DIC - EB | 438 |  |
| Auxiliary Equipment:     |          |     |  |
| Mass Isolated Housing    | MIH - ZA |     |  |

Dual Induction - E Wellsite Calibration

Induction Electronics (10 kHz)

| Phase  | ID Elect Real Offset 10 kHz | MM/M            | Value           | Phase  | ID Elect Real Gain 10 kHz | Value            | Phase           | ID Elect Phase 10 kHz DEG | Value           |                 |
|--------|-----------------------------|-----------------|-----------------|--------|---------------------------|------------------|-----------------|---------------------------|-----------------|-----------------|
| Before |                             |                 | 37.75           | Before |                           | 0.9757           | Before          |                           | 10.92           |                 |
|        | -262.8 (Minimum)            | 37.15 (Nominal) | 337.2 (Maximum) |        | 0.8294 (Minimum)          | 0.9794 (Nominal) | 1.171 (Maximum) | 0.6325 (Minimum)          | 10.63 (Nominal) | 20.63 (Maximum) |
| Phase  | ID Elect Quad Offset 10 kHz | MM/M            | Value           | Phase  | ID Elect Quad Gain 10 kHz | Value            | Phase           | IM Elect Phase 10 kHz DEG | Value           |                 |
| Before |                             |                 | 23.35           | Before |                           | 0.9643           | Before          |                           | 13.55           |                 |
|        | -277.5 (Minimum)            | 22.53 (Nominal) | 322.5 (Maximum) |        | 0.8193 (Minimum)          | 0.9693 (Nominal) | 1.157 (Maximum) | 3.310 (Minimum)           | 13.31 (Nominal) | 23.31 (Maximum) |
| Phase  | IM Elect Real Offset 10 kHz | MM/M            | Value           | Phase  | IM Elect Real Gain 10 kHz | Value            |                 |                           |                 |                 |
| Before |                             |                 | 97.69           | Before |                           | 0.9506           |                 |                           |                 |                 |
|        | -453.5 (Minimum)            | 96.54 (Nominal) | 646.5 (Maximum) |        | 0.8074 (Minimum)          | 0.9574 (Nominal) |                 |                           |                 | 1.140 (Maximum) |
| Phase  | IM Elect Quad Offset 10 kHz | MM/M            | Value           | Phase  | IM Elect Quad Gain 10 kHz | Value            |                 |                           |                 |                 |
| Before |                             |                 | 96.41           | Before |                           | 0.9483           |                 |                           |                 |                 |
|        | -454.8 (Minimum)            | 95.18 (Nominal) | 645.2 (Maximum) |        | 0.8055 (Minimum)          | 0.9555 (Nominal) | 1.137 (Maximum) |                           |                 |                 |

Before: 15-Jan-2003 15:40

Dual Induction - E Wellsite Calibration

Induction Electronics (20 kHz)

| Phase  | ID Elect Real Offset 20 kHz | MM/M            | Value           | Phase  | ID Elect Real Gain 20 kHz | Value            | Phase           | ID Elect Phase 20 kHz DEG | Value           |                 |
|--------|-----------------------------|-----------------|-----------------|--------|---------------------------|------------------|-----------------|---------------------------|-----------------|-----------------|
| Before |                             |                 | 14.96           | Before |                           | 1.007            | Before          |                           | 9.501           |                 |
|        | -110.3 (Minimum)            | 14.68 (Nominal) | 139.7 (Maximum) |        | 0.8551 (Minimum)          | 1.005 (Nominal)  | 1.207 (Maximum) | -5.718 (Minimum)          | 9.282 (Nominal) | 24.28 (Maximum) |
| Phase  | ID Elect Quad Offset 20 kHz | MM/M            | Value           | Phase  | ID Elect Quad Gain 20 kHz | Value            | Phase           | IM Elect Phase 20 kHz DEG | Value           |                 |
| Before |                             |                 | 9.431           | Before |                           | 0.9950           | Before          |                           | 12.55           |                 |
|        | -115.9 (Minimum)            | 9.089 (Nominal) | 134.1 (Maximum) |        | 0.8445 (Minimum)          | 0.9945 (Nominal) | 1.192 (Maximum) | -2.653 (Minimum)          | 12.35 (Nominal) | 27.35 (Maximum) |
| Phase  | IM Elect Real Offset 20 kHz | MM/M            | Value           | Phase  | IM Elect Real Gain 20 kHz | Value            |                 |                           |                 |                 |
| Before |                             |                 | 40.85           | Before |                           | 1.012            |                 |                           |                 |                 |
|        | -184.7 (Minimum)            | 40.31 (Nominal) | 265.3 (Maximum) |        | 0.8587 (Minimum)          | 1.009 (Nominal)  |                 |                           |                 | 1.212 (Maximum) |
| Phase  | IM Elect Quad Offset 20 kHz | MM/M            | Value           | Phase  | IM Elect Quad Gain 20 kHz | Value            |                 |                           |                 |                 |

|        |                     |                    |                    |       |        |                     |                    |                    |       |
|--------|---------------------|--------------------|--------------------|-------|--------|---------------------|--------------------|--------------------|-------|
| Before | -185.2<br>(Minimum) | 39.80<br>(Nominal) | 264.8<br>(Maximum) | 40.40 | Before | 0.8566<br>(Minimum) | 1.007<br>(Nominal) | 1.209<br>(Maximum) | 1.009 |
|--------|---------------------|--------------------|--------------------|-------|--------|---------------------|--------------------|--------------------|-------|

Before: 15-Jan-2003 15:41

| Dual Induction - E Wellsite Calibration |                             |                    |                    |        |                           |                     |                    |                           |                    |                    |
|-----------------------------------------|-----------------------------|--------------------|--------------------|--------|---------------------------|---------------------|--------------------|---------------------------|--------------------|--------------------|
| Induction Electronics (40 kHz)          |                             |                    |                    |        |                           |                     |                    |                           |                    |                    |
| Phase                                   | ID Elect Real Offset 40 kHz | MM/M               | Value              | Phase  | ID Elect Real Gain 40 kHz | Value               | Phase              | ID Elect Phase 40 kHz DEG | Value              |                    |
| Before                                  |                             |                    | 9.829              | Before |                           | 0.9926              | Before             |                           | 29.37              |                    |
|                                         | -75.43<br>(Minimum)         | 9.570<br>(Nominal) | 94.57<br>(Maximum) |        | 0.8395<br>(Minimum)       | 0.9895<br>(Nominal) | 1.185<br>(Maximum) | 9.068<br>(Minimum)        | 29.07<br>(Nominal) | 49.07<br>(Maximum) |
| Phase                                   | ID Elect Quad Offset 40 kHz | MM/M               | Value              | Phase  | ID Elect Quad Gain 40 kHz | Value               | Phase              | IM Elect Phase 40 kHz DEG | Value              |                    |
| Before                                  |                             |                    | 6.156              | Before |                           | 0.9797              | Before             |                           | 33.01              |                    |
|                                         | -79.10<br>(Minimum)         | 5.897<br>(Nominal) | 90.90<br>(Maximum) |        | 0.8281<br>(Minimum)       | 0.9781<br>(Nominal) | 1.169<br>(Maximum) | 12.68<br>(Minimum)        | 32.68<br>(Nominal) | 52.68<br>(Maximum) |
| Phase                                   | IM Elect Real Offset 40 kHz | MM/M               | Value              | Phase  | IM Elect Real Gain 40 kHz | Value               |                    |                           |                    |                    |
| Before                                  |                             |                    | 26.65              | Before |                           | 1.027               |                    |                           |                    |                    |
|                                         | -103.8<br>(Minimum)         | 26.19<br>(Nominal) | 156.2<br>(Maximum) |        | 0.8673<br>(Minimum)       | 1.017<br>(Nominal)  | 1.224<br>(Maximum) |                           |                    |                    |
| Phase                                   | IM Elect Quad Offset 40 kHz | MM/M               | Value              | Phase  | IM Elect Quad Gain 40 kHz | Value               |                    |                           |                    |                    |
| Before                                  |                             |                    | 26.47              | Before |                           | 1.024               |                    |                           |                    |                    |
|                                         | -104.1<br>(Minimum)         | 25.92<br>(Nominal) | 155.9<br>(Maximum) |        | 0.8649<br>(Minimum)       | 1.015<br>(Nominal)  | 1.221<br>(Maximum) |                           |                    |                    |

Before: 15-Jan-2003 15:42

| Dual Induction - E Wellsite Calibration |                       |                |                     |                     |                    |                    |
|-----------------------------------------|-----------------------|----------------|---------------------|---------------------|--------------------|--------------------|
| SFL Electronics                         |                       |                |                     |                     |                    |                    |
| Phase                                   | SFL Voltage Offset MV | Value          | Phase               | SFL Voltage Gain    | Value              |                    |
| Before                                  |                       | 1.294          | Before              |                     | 1.021              |                    |
|                                         | -15.00<br>(Minimum)   | 0<br>(Nominal) | 15.00<br>(Maximum)  | 0.8500<br>(Minimum) | 1.000<br>(Nominal) | 1.200<br>(Maximum) |
| Phase                                   | SFL Current Offset MA | Value          | Phase               | SFL Current Gain    | Value              |                    |
| Before                                  |                       | 0.004236       | Before              |                     | 0.9971             |                    |
|                                         | -0.6000<br>(Minimum)  | 0<br>(Nominal) | 0.6000<br>(Maximum) | 0.8500<br>(Minimum) | 1.000<br>(Nominal) | 1.200<br>(Maximum) |

Before: 15-Jan-2003 15:43

| Dual Induction - E Wellsite Calibration                                                                                         |                    |                |                     |        |                      |                |                    |                   |                |                      |  |
|---------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|---------------------|--------|----------------------|----------------|--------------------|-------------------|----------------|----------------------|--|
| Electronics Calibration Changes Files/Depth Intervals: 9: 3093.0 - 3216.9 10: 0.0 - 0.0 11: 3250.7 - 2941.3 12: 3248.4 - 3023.3 |                    |                |                     |        |                      |                |                    |                   |                |                      |  |
| Phase                                                                                                                           | ID (R > 27 OHM-M)  | MM/M           | Value               | Phase  | ID (R < 27 OHM-M) %  | Value          | Phase              | SFL (R < 1 OHM-M) | OHMM           | Value                |  |
| After                                                                                                                           |                    |                | EXCEEDS LIMIT       | 2.615  | After                |                | 0.0003052          | After             |                | 0.0006137            |  |
|                                                                                                                                 | 0<br>(Minimum)     | 0<br>(Nominal) | 0.7500<br>(Maximum) |        | 0<br>(Minimum)       | 0<br>(Nominal) | 2.000<br>(Maximum) | 0<br>(Minimum)    | 0<br>(Nominal) | 0.02000<br>(Maximum) |  |
| Phase                                                                                                                           | IM (R > 27 OHM-M)  | MM/M           | Value               | Phase  | IM (R < 27 OHM-M) %  | Value          |                    |                   |                |                      |  |
| After                                                                                                                           |                    |                | EXCEEDS LIMIT       | 0.9396 | After                |                | 0.0003463          |                   |                |                      |  |
|                                                                                                                                 | 0<br>(Minimum)     | 0<br>(Nominal) | 0.7500<br>(Maximum) |        | 0<br>(Minimum)       | 0<br>(Nominal) | 2.000<br>(Maximum) |                   |                |                      |  |
| Phase                                                                                                                           | SFL (R > 27 OHM-M) | MM/M           | Value               | Phase  | SFL (R < 27 OHM-M) % | Value          |                    |                   |                |                      |  |
| After                                                                                                                           |                    |                | 0.01186             | After  |                      | 0.0004555      |                    |                   |                |                      |  |
|                                                                                                                                 | 0<br>(Minimum)     | 0<br>(Nominal) | 0.7500<br>(Maximum) |        | 0<br>(Minimum)       | 0<br>(Nominal) | 2.000<br>(Maximum) |                   |                |                      |  |

After: 18-Jan-2003 21:30

| Dual Induction - E Master Calibration                                          |                           |                    |                    |                           |                    |                    |                           |                    |                    |
|--------------------------------------------------------------------------------|---------------------------|--------------------|--------------------|---------------------------|--------------------|--------------------|---------------------------|--------------------|--------------------|
| Test Loop Calibration: Calibration of Internal Reference to Test Loop Standard |                           |                    |                    |                           |                    |                    |                           |                    |                    |
| Phase                                                                          | Deep 10 kHz Gain Factor   | Value              | Phase              | Deep 20 kHz Gain Factor   | Value              | Phase              | Deep 40 kHz Gain Factor   | Value              |                    |
| Master                                                                         |                           | 0.9956             | Master             |                           | 1.008              | Master             |                           | 1.026              |                    |
|                                                                                | 0.9000<br>(Minimum)       | 1.000<br>(Nominal) | 1.100<br>(Maximum) | 0.9000<br>(Minimum)       | 1.000<br>(Nominal) | 1.100<br>(Maximum) | 0.9000<br>(Minimum)       | 1.000<br>(Nominal) | 1.100<br>(Maximum) |
| Phase                                                                          | Medium 10 kHz Gain Factor | Value              | Phase              | Medium 20 kHz Gain Factor | Value              | Phase              | Medium 40 kHz Gain Factor | Value              |                    |
| Master                                                                         |                           | 1.022              | Master             |                           | 1.030              | Master             |                           | 1.061              |                    |
|                                                                                | 0.9000<br>(Minimum)       | 1.000<br>(Nominal) | 1.100<br>(Maximum) | 0.9000<br>(Minimum)       | 1.000<br>(Nominal) | 1.100<br>(Maximum) | 0.9000<br>(Minimum)       | 1.000<br>(Nominal) | 1.100<br>(Maximum) |
| Phase                                                                          | Deep 10 kHz Phase Shift   | Value              | Phase              | Deep 20 kHz Phase Shift   | Value              | Phase              | Deep 40 kHz Phase Shift   | Value              |                    |
| Master                                                                         |                           | 0.1143             | Master             |                           | -0.1524            | Master             |                           | -1.426             |                    |

|        |                           |                |                    |         |        |                           |                     |                    |         |        |                           |                     |                    |        |
|--------|---------------------------|----------------|--------------------|---------|--------|---------------------------|---------------------|--------------------|---------|--------|---------------------------|---------------------|--------------------|--------|
| Master | -1.500<br>(Minimum)       | 0<br>(Nominal) | 1.500<br>(Maximum) | 0.1140  | Master | -2.000<br>(Minimum)       | 0<br>(Nominal)      | 2.000<br>(Maximum) | 0.1924  | Master | -4.000<br>(Minimum)       | -1.000<br>(Nominal) | 2.000<br>(Maximum) | 1.420  |
| Phase  | Medium 10 kHz Phase Shift |                |                    | Value   | Phase  | Medium 20 kHz Phase Shift |                     |                    | Value   | Phase  | Medium 40 kHz Phase Shift |                     |                    | Value  |
| Master |                           |                |                    | -0.2558 | Master |                           |                     |                    | -0.9331 | Master |                           |                     |                    | -2.461 |
|        | -1.500<br>(Minimum)       | 0<br>(Nominal) | 1.500<br>(Maximum) |         |        | -3.000<br>(Minimum)       | -1.000<br>(Nominal) | 1.000<br>(Maximum) |         |        | -5.000<br>(Minimum)       | -2.000<br>(Nominal) | 1.000<br>(Maximum) |        |

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| Dual Induction - E Master Calibration                                                                         |                               |                |                    |        |        |                               |                |                    |        |        |                               |                |                    |        |
|---------------------------------------------------------------------------------------------------------------|-------------------------------|----------------|--------------------|--------|--------|-------------------------------|----------------|--------------------|--------|--------|-------------------------------|----------------|--------------------|--------|
| Sonde Error Corrections: Correction for sonde response in zero conductivity environment. (Normalized to 25C). |                               |                |                    |        |        |                               |                |                    |        |        |                               |                |                    |        |
| Phase                                                                                                         | Real Deep 10 kHz S.E. Corr.   |                |                    | Value  | Phase  | Real Deep 20 kHz S.E. Corr.   |                |                    | Value  | Phase  | Real Deep 40 kHz S.E. Corr.   |                |                    | Value  |
| Master                                                                                                        |                               |                |                    | 44.95  | Master |                               |                |                    | 16.36  | Master |                               |                |                    | 4.690  |
|                                                                                                               | -50.00<br>(Minimum)           | 0<br>(Nominal) | 125.0<br>(Maximum) |        |        | -30.00<br>(Minimum)           | 0<br>(Nominal) | 30.00<br>(Maximum) |        |        | -15.00<br>(Minimum)           | 0<br>(Nominal) | 15.00<br>(Maximum) |        |
| Phase                                                                                                         | Quad Deep 10 kHz S.E. Corr.   |                |                    | Value  | Phase  | Quad Deep 20 kHz S.E. Corr.   |                |                    | Value  | Phase  | Quad Deep 40 kHz S.E. Corr.   |                |                    | Value  |
| Master                                                                                                        |                               |                |                    | 108.9  | Master |                               |                |                    | 64.63  | Master |                               |                |                    | 46.10  |
|                                                                                                               | -250.0<br>(Minimum)           | 0<br>(Nominal) | 350.0<br>(Maximum) |        |        | -125.0<br>(Minimum)           | 0<br>(Nominal) | 200.0<br>(Maximum) |        |        | -75.00<br>(Minimum)           | 0<br>(Nominal) | 125.0<br>(Maximum) |        |
| Phase                                                                                                         | Real Medium 10 kHz S.E. Corr. |                |                    | Value  | Phase  | Real Medium 20 kHz S.E. Corr. |                |                    | Value  | Phase  | Real Medium 40 kHz S.E. Corr. |                |                    | Value  |
| Master                                                                                                        |                               |                |                    | 20.73  | Master |                               |                |                    | -1.786 | Master |                               |                |                    | -10.46 |
|                                                                                                               | -50.00<br>(Minimum)           | 0<br>(Nominal) | 140.0<br>(Maximum) |        |        | -50.00<br>(Minimum)           | 0<br>(Nominal) | 50.00<br>(Maximum) |        |        | -30.00<br>(Minimum)           | 0<br>(Nominal) | 30.00<br>(Maximum) |        |
| Phase                                                                                                         | Quad Medium 10 kHz S.E. Corr. |                |                    | Value  | Phase  | Quad Medium 20 kHz S.E. Corr. |                |                    | Value  | Phase  | Quad Medium 40 kHz S.E. Corr. |                |                    | Value  |
| Master                                                                                                        |                               |                |                    | -105.8 | Master |                               |                |                    | -34.20 | Master |                               |                |                    | 11.45  |
|                                                                                                               | -1300<br>(Minimum)            | 0<br>(Nominal) | 1300<br>(Maximum)  |        |        | -650.0<br>(Minimum)           | 0<br>(Nominal) | 650.0<br>(Maximum) |        |        | -350.0<br>(Minimum)           | 0<br>(Nominal) | 350.0<br>(Maximum) |        |

Master: Calibration out of date 5-Oct-2001 18:22

### Hostile Litho-Density Sonde / Equipment Identification

**Primary Equipment:**

|                                    |          |      |
|------------------------------------|----------|------|
| Hostile Litho Density Sonde        | HLDS - D | 45   |
| Hostile Litho Density High Voltage | HLDV - D | 35   |
| Gamma Source Radioactive           | GSR - Z  | 1846 |

**Auxiliary Equipment:**

|                                          |          |    |
|------------------------------------------|----------|----|
| Hostile Litho Density Pad                | HLDP - C | 45 |
| Hostile Litho Density High Voltage Housi | HEH - H  | 35 |

### Nuclear Porosity Lithology Cartridge - B / Equipment Identification

**Primary Equipment:**

|                |          |    |
|----------------|----------|----|
| NPLC Cartridge | NPLC - B | 79 |
|----------------|----------|----|

**Auxiliary Equipment:**

|              |         |    |
|--------------|---------|----|
| NPLC Housing | NPH - B | 82 |
|--------------|---------|----|

### Accelerator-Porosity Tool / Equipment Identification

**Primary Equipment:**

|                            |          |      |
|----------------------------|----------|------|
| Accelerator-Porosity Sonde | APS - BA | 22   |
| APS Minitron               | MNTR - F | 4185 |

**Auxiliary Equipment:**

|                                 |           |      |
|---------------------------------|-----------|------|
| Accelerator-Porosity Housing    | APH - AC  | 22   |
| APS Calibration Water Tank      | SFT - 178 | 4722 |
| APS Aluminium Calibrator Sleeve | SFT - 281 | 24   |

### Hostile Natural Gamma Ray Sonde / Equipment Identification

**Primary Equipment:**

|            |           |    |
|------------|-----------|----|
| HNGS Sonde | HNGS - BA | 77 |
|------------|-----------|----|

**Auxiliary Equipment:**

| Hostile Natural Gamma Ray Sonde Wellsite Calibration |                                                 |       |                           |                                                 |       |                         |                                                  |       |  |
|------------------------------------------------------|-------------------------------------------------|-------|---------------------------|-------------------------------------------------|-------|-------------------------|--------------------------------------------------|-------|--|
| Detector 1 Check                                     |                                                 |       |                           |                                                 |       |                         |                                                  |       |  |
| Phase                                                | Na 511 Peak Loc                                 | Value | Phase                     | Na 511 Peak Res %                               | Value | Phase                   | High Voltage V                                   | Value |  |
| Master                                               |                                                 | 40.59 | Master                    |                                                 | 17.05 | Master                  |                                                  | 1212  |  |
| Before                                               |                                                 | 40.72 | Before                    |                                                 | 17.42 | Before                  |                                                  | 1212  |  |
| After                                                |                                                 | 40.70 | After                     |                                                 | 16.61 | After                   |                                                  | 1215  |  |
|                                                      | 37.50 (Minimum) 40.00 (Nominal) 42.50 (Maximum) |       |                           | 12.00 (Minimum) 15.50 (Nominal) 19.00 (Maximum) |       |                         | 900.0 (Minimum) 1150 (Nominal) 1600 (Maximum)    |       |  |
| Phase                                                | Na 1785 Peak Loc                                | Value | Phase                     | Na 1785 Peak Res %                              | Value | Phase                   | Temperature DEGC                                 | Value |  |
| Master                                               |                                                 | 145.6 | Master                    |                                                 | 9.037 | Master                  |                                                  | 32.69 |  |
| Before                                               |                                                 | 145.3 | Before                    |                                                 | 9.666 | Before                  |                                                  | 32.84 |  |
| After                                                |                                                 | 145.8 | After                     |                                                 | 9.711 | After                   |                                                  | 29.54 |  |
|                                                      | 135.0 (Minimum) 142.6 (Nominal) 150.3 (Maximum) |       |                           | 7.000 (Minimum) 8.500 (Nominal) 11.00 (Maximum) |       |                         | -28.89 (Minimum) 15.50 (Nominal) 60.00 (Maximum) |       |  |
| Phase                                                | Na Count Rate CPS                               | Value |                           |                                                 |       |                         |                                                  |       |  |
| Master                                               |                                                 | 44.80 |                           |                                                 |       |                         |                                                  |       |  |
| Before                                               |                                                 | 43.98 |                           |                                                 |       |                         |                                                  |       |  |
| After                                                |                                                 | 43.51 |                           |                                                 |       |                         |                                                  |       |  |
|                                                      | 10.00 (Minimum) 45.00 (Nominal) 100.0 (Maximum) |       |                           |                                                 |       |                         |                                                  |       |  |
| Master: 15-Jan-2003 16:08                            |                                                 |       | Before: 15-Jan-2003 16:17 |                                                 |       | After: 19-Jan-2003 2:15 |                                                  |       |  |

| Hostile Natural Gamma Ray Sonde Wellsite Calibration |                                                 |       |                           |                                                 |       |                         |                                                  |       |  |
|------------------------------------------------------|-------------------------------------------------|-------|---------------------------|-------------------------------------------------|-------|-------------------------|--------------------------------------------------|-------|--|
| Detector 2 Check                                     |                                                 |       |                           |                                                 |       |                         |                                                  |       |  |
| Phase                                                | Na 511 Peak Loc                                 | Value | Phase                     | Na 511 Peak Res %                               | Value | Phase                   | High Voltage V                                   | Value |  |
| Master                                               |                                                 | 40.55 | Master                    |                                                 | 16.60 | Master                  |                                                  | 1239  |  |
| Before                                               |                                                 | 40.57 | Before                    |                                                 | 16.91 | Before                  |                                                  | 1239  |  |
| After                                                |                                                 | 40.61 | After                     |                                                 | 17.25 | After                   |                                                  | 1242  |  |
|                                                      | 37.50 (Minimum) 40.00 (Nominal) 42.50 (Maximum) |       |                           | 12.00 (Minimum) 15.50 (Nominal) 19.00 (Maximum) |       |                         | 900.0 (Minimum) 1150 (Nominal) 1600 (Maximum)    |       |  |
| Phase                                                | Na 1785 Peak Loc                                | Value | Phase                     | Na 1785 Peak Res %                              | Value | Phase                   | Temperature DEGC                                 | Value |  |
| Master                                               |                                                 | 144.7 | Master                    |                                                 | 9.925 | Master                  |                                                  | 32.80 |  |
| Before                                               |                                                 | 144.4 | Before                    |                                                 | 9.708 | Before                  |                                                  | 32.89 |  |
| After                                                |                                                 | 144.4 | After                     |                                                 | 9.893 | After                   |                                                  | 29.63 |  |
|                                                      | 135.0 (Minimum) 142.6 (Nominal) 150.3 (Maximum) |       |                           | 7.000 (Minimum) 8.500 (Nominal) 11.00 (Maximum) |       |                         | -28.89 (Minimum) 15.50 (Nominal) 60.00 (Maximum) |       |  |
| Phase                                                | Na Count Rate CPS                               | Value |                           |                                                 |       |                         |                                                  |       |  |
| Master                                               |                                                 | 44.45 |                           |                                                 |       |                         |                                                  |       |  |
| Before                                               |                                                 | 43.98 |                           |                                                 |       |                         |                                                  |       |  |
| After                                                |                                                 | 43.50 |                           |                                                 |       |                         |                                                  |       |  |
|                                                      | 10.00 (Minimum) 45.00 (Nominal) 100.0 (Maximum) |       |                           |                                                 |       |                         |                                                  |       |  |
| Master: 15-Jan-2003 16:08                            |                                                 |       | Before: 15-Jan-2003 16:17 |                                                 |       | After: 19-Jan-2003 2:15 |                                                  |       |  |

| Hostile Natural Gamma Ray Sonde Wellsite Calibration |                                                  |        |
|------------------------------------------------------|--------------------------------------------------|--------|
| Ratio Of Detector 1 To Detector 2                    |                                                  |        |
| Phase                                                | Coincidence Count Rate Ratio                     | Value  |
| Master                                               |                                                  | 1.008  |
| Before                                               |                                                  | 1.0000 |
| After                                                |                                                  | 1.001  |
|                                                      | 0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum) |        |
| Master: 15-Jan-2003 16:08                            |                                                  |        |
| Before: 15-Jan-2003 16:17                            |                                                  |        |

| Hostile Natural Gamma Ray Sonde Master Calibration |                           |                    |                    |        |                     |                    |                    |        |                    |                    |                    |
|----------------------------------------------------|---------------------------|--------------------|--------------------|--------|---------------------|--------------------|--------------------|--------|--------------------|--------------------|--------------------|
| Detector 1 Calibration                             |                           |                    |                    |        |                     |                    |                    |        |                    |                    |                    |
| Phase                                              | Na 511 Peak Set Point     |                    | Value              | Phase  | Th Peak Loc         |                    | Value              | Phase  | Th Peak Res %      |                    | Value              |
| Master                                             |                           |                    | 41.00              | Master |                     |                    | 209.3              | Master |                    |                    | 8.207              |
|                                                    | 38.00<br>(Minimum)        | 40.00<br>(Nominal) | 42.00<br>(Maximum) |        | 201.0<br>(Minimum)  | 209.6<br>(Nominal) | 218.3<br>(Maximum) |        | 5.000<br>(Minimum) | 7.000<br>(Nominal) | 9.000<br>(Maximum) |
| Phase                                              | Background Count Rate CPS |                    | Value              | Phase  | Gain Ratio          |                    | Value              |        |                    |                    |                    |
| Master                                             |                           |                    | 23.15              | Master |                     |                    | 0.9810             |        |                    |                    |                    |
|                                                    | 20.00<br>(Minimum)        | 142.5<br>(Nominal) | 265.0<br>(Maximum) |        | 0.9400<br>(Minimum) | 1.000<br>(Nominal) | 1.060<br>(Maximum) |        |                    |                    |                    |

Master: 15-Jan-2003 16:01

| Hostile Natural Gamma Ray Sonde Master Calibration |                           |                    |                    |        |                     |                    |                    |        |                    |                    |                    |
|----------------------------------------------------|---------------------------|--------------------|--------------------|--------|---------------------|--------------------|--------------------|--------|--------------------|--------------------|--------------------|
| Detector 2 Calibration                             |                           |                    |                    |        |                     |                    |                    |        |                    |                    |                    |
| Phase                                              | Na 511 Peak Set Point     |                    | Value              | Phase  | Th Peak Loc         |                    | Value              | Phase  | Th Peak Res %      |                    | Value              |
| Master                                             |                           |                    | 41.00              | Master |                     |                    | 209.3              | Master |                    |                    | 7.848              |
|                                                    | 38.00<br>(Minimum)        | 40.00<br>(Nominal) | 42.00<br>(Maximum) |        | 201.0<br>(Minimum)  | 209.6<br>(Nominal) | 218.3<br>(Maximum) |        | 5.000<br>(Minimum) | 7.000<br>(Nominal) | 9.000<br>(Maximum) |
| Phase                                              | Background Count Rate CPS |                    | Value              | Phase  | Gain Ratio          |                    | Value              |        |                    |                    |                    |
| Master                                             |                           |                    | 21.80              | Master |                     |                    | 0.9821             |        |                    |                    |                    |
|                                                    | 20.00<br>(Minimum)        | 142.5<br>(Nominal) | 265.0<br>(Maximum) |        | 0.9400<br>(Minimum) | 1.000<br>(Nominal) | 1.060<br>(Maximum) |        |                    |                    |                    |

Master: 15-Jan-2003 16:01

Company: Lamont Doherty

**Schlumberger**

Well: ODP Leg 207 Site 1257A

Field: Demarara Rise

Country: Venezuela

Ocean: Atlantic

Phasor Induction  
Natural Gamma Ray