Schlumberger

Company: APACHE CANADA LTD.
Well: APACHE PARAMOUNT LAC MAUNOIR E-35
Field: NWT
Territory: NORTHWEST TERRITORIES *** MD ***

Territory: NORTHWEST TERRITORIES
Field: NWT
Location: LSD: E-35
Well: APACHE PARAMOUNT LAC MAUNOIR E-35
Company: APACHE CANADA LTD.

# DIPOLE SONIC LOG

N.E.B. COPY

LSD: E-35
UWID: 300E356720125000

Elev.: K.B. 539.3 m
G.L. 532.6 m
D.F. 539 m

LOCATION

Permanent Datum: GROUND LEVEL
Log Measured From: KELLY BUSHING
Drilling Measured From: KELLY BUSHING

Elev.: 532.6 m
6.7 m above Perm. Datum

API Serial No. 1075
Latitude 67D 14' 27.6" N
Longitude 125D 7' 15.8"

| | Run 1 | Run 2 | Run 3 | Run 4 |
|---|---|---|---|---|
| Logging Date | 9-Mar-2005 | | | |
| Run Number | ONE | | | |
| Depth Driller | 1011 m | | | |
| Schlumberger Depth | 1010.7 m | | | |
| Bottom Log Interval | 994.9 m | | | |
| Top Log Interval | 0 m | | | |
| Casing Driller Size @ Depth | 244.500 mm @ 452 m | | @ | @ |
| Casing Schlumberger | 451.5 m | | | |
| Bit Size | 216.000 mm | | | |
| Type Fluid In Hole | SALT MUD | | | |
| MUD Density / Viscosity | 1270 kg/m3 / 53 s | | | |
| MUD Fluid Loss / PH | 10 cm3 / 8.5 | | | |
| MUD Source Of Sample | FLOWLINE | | | |
| RM @ Measured Temperature | 0.061 ohm.m @ 20 degC | @ | @ | @ |
| RMF @ Measured Temperature | 0.056 ohm.m @ 15 degC | @ | @ | @ |
| RMC @ Measured Temperature | 0.070 ohm.m @ 20 degC | @ | @ | @ |
| Source RMF / RMC | MUD PRESS / MUD PRESS | | | |
| RM @ MRT / RMF @ MRT | 0.076 @ 12 / 0.061 @ 12 | @ / @ | @ / @ | @ / @ |
| Maximum Recorded Temperatures | 12 degC | | | |
| Circulation Stopped / Time | 9-Mar-2005 / 2:30 | | | |
| Logger On Bottom / Time | 9-Mar-2005 / 10:30 | | | |
| Unit Number / Location | 3052 / NORMAN WELLS | | | |
| Recorded By | MICHEL LAPOINTE | | | |
| Witnessed By | ROBERT REID | | | |

# DEPTH SUMMARY LISTING

Date Created: 9-MAR-2005 12:12:14

## Depth System Equipment

| Depth Measuring Device | | Tension Device | | Logging Cable | |
|---|---|---|---|---|---|
| Type: | IDW-B | Type: | CMTD-B/A | Type: | 7-39P-LXS |
| Serial Number: | 1976 | Serial Number: | 1 | Serial Number: | 3052 |
| Calibration Date: | 29-DEC-2004 | Calibration Date: | 11-DEC-2004 | Length: | 3999.89 M |
| Calibrator Serial Number: | 4 | Calibrator Serial Number: | 78130 | Conveyance Method: | Wireline |
| Calibration Cable Type: | 7-39P-LXS | Calibration Gain: | 0.99 | Rig Type: | LAND |
| Wheel Correction 1: | -2 | Calibration Offset: | -690.00 | | |
| Wheel Correction 2: | -2 | | | | |

## Depth Control Parameters

| | |
|---|---|
| Log Sequence: | First Log In the Well |
| Rig Up Length At Surface: | 0.00 M |
| Rig Up Length At Bottom: | 0.00 M |
| Rig Up Length Correction: | 0.00 M |
| Stretch Correction: | 0.70 M |
| Tool Zero Check At Surface: | 0.10 M |

## Depth Control Remarks

1.
2. PRIMARY DEPTH MEASUREMENT = IDW
3.
4. ALL LOGS CORRELATED TO DOWNLOG
5.
6.



| OTHER SERVICES1 | OTHER SERVICES2 |
|---|---|
| OS1: FMI IMAGER | OS1: |
| OS2: DIPOLE SONIC | OS2: |
| OS3: EMS CEMENT VOLUME | OS3: |
| OS4: | OS4: |
| OS5: | OS5: |

| REMARKS: RUN NUMBER 1 | REMARKS: RUN NUMBER 2 |
|---|---|
| DSI run with two CMEZ's and two 25.4 mm standoffs for centralization. | |
| Cement volume computed using EMS calipers, assuming a future casing diameter of 177.8 mm. | |
| DSI and GR logged to surface. | |
| PRINTS: 2 FIELD | |
| RIG: AKITA 51 | |
| CREW: R. PROSSER | |

| RUN 1 | | | RUN 2 | | |
|---|---|---|---|---|---|
| SERVICE ORDER #: | 10829928 | | SERVICE ORDER #: | | |
| PROGRAM VERSION: | 12C0-301 | | PROGRAM VERSION: | | |
| FLUID LEVEL: | | | FLUID LEVEL: | | |
| LOGGED INTERVAL | START | STOP | LOGGED INTERVAL | START | STOP |

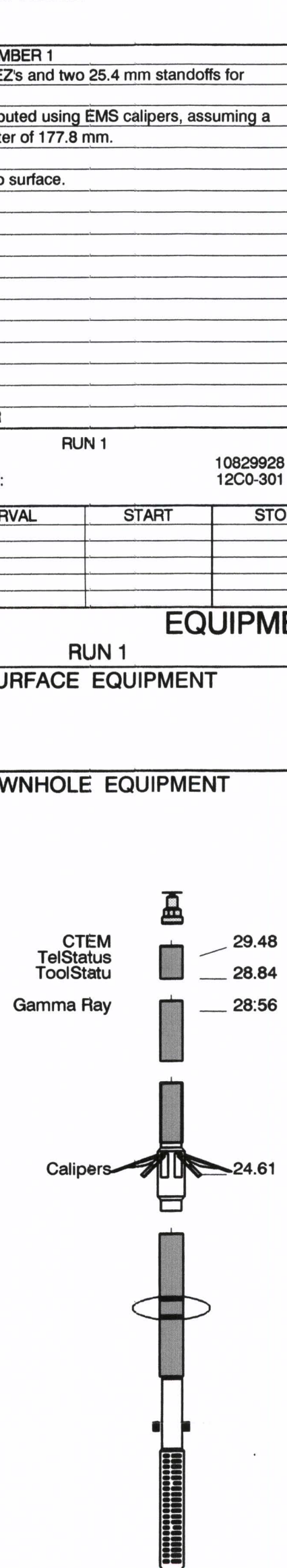
# EQUIPMENT DESCRIPTION

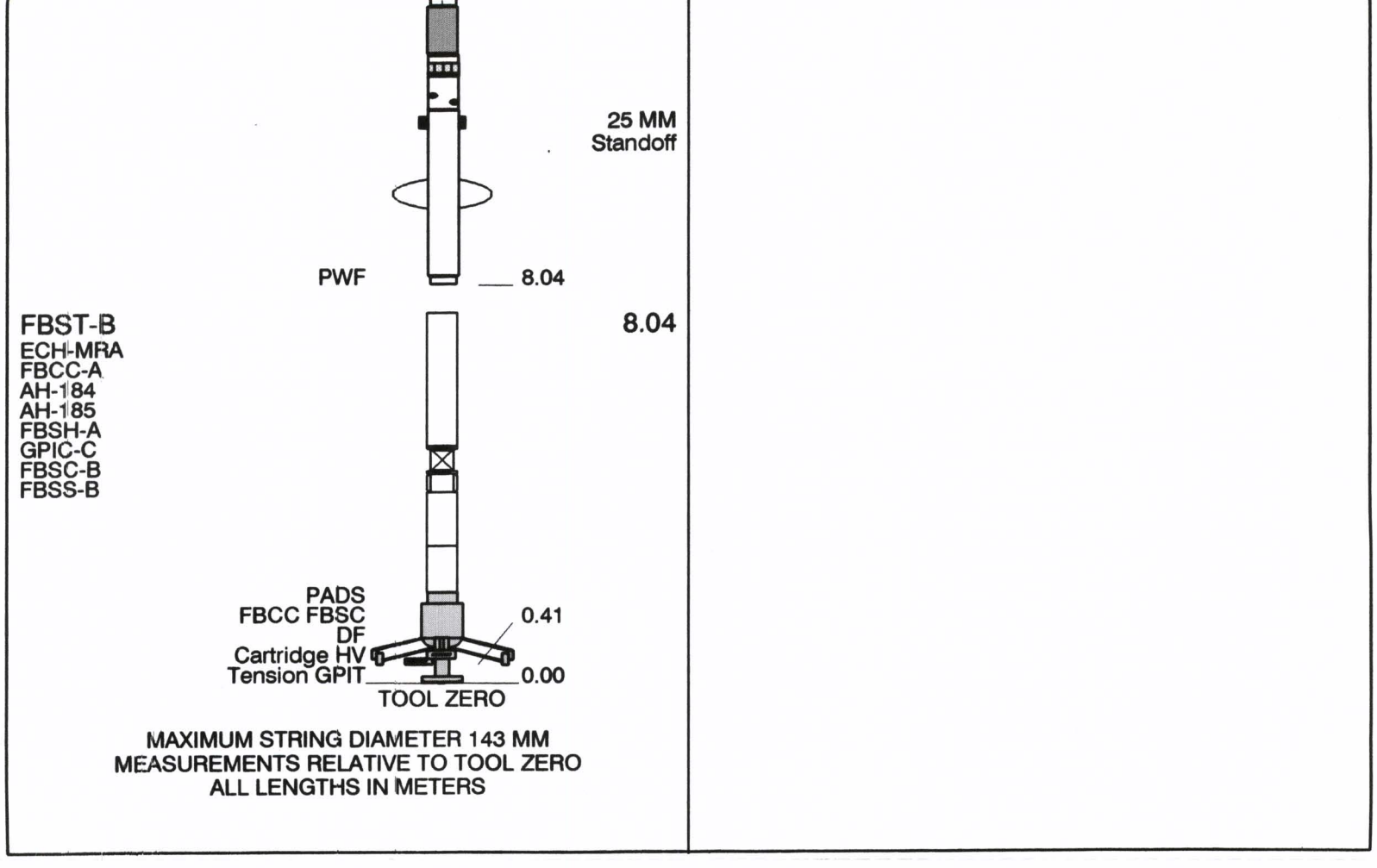
RUN 1 | RUN 2

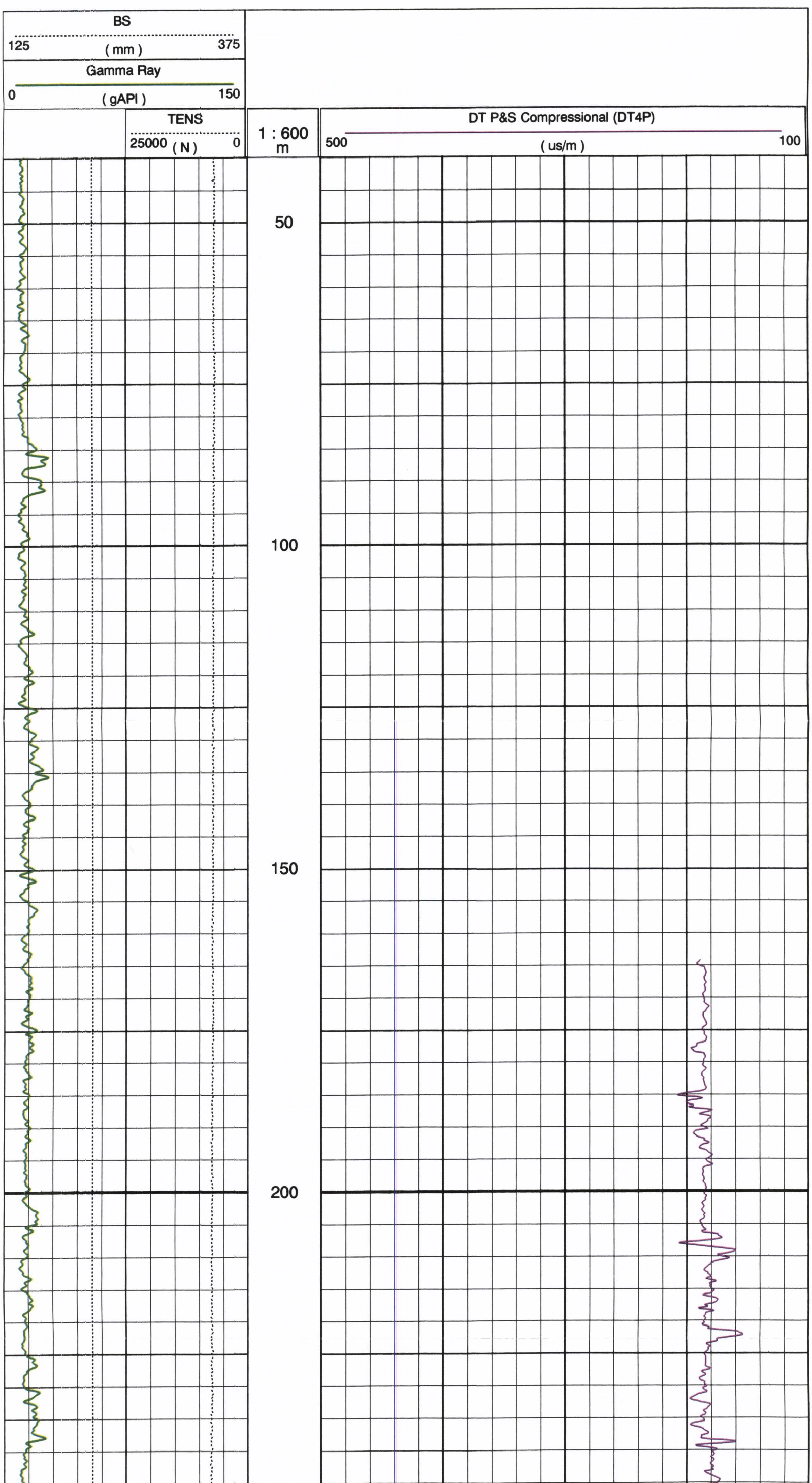
## SURFACE EQUIPMENT

GSR-U/Y
WITM (DTS)-A

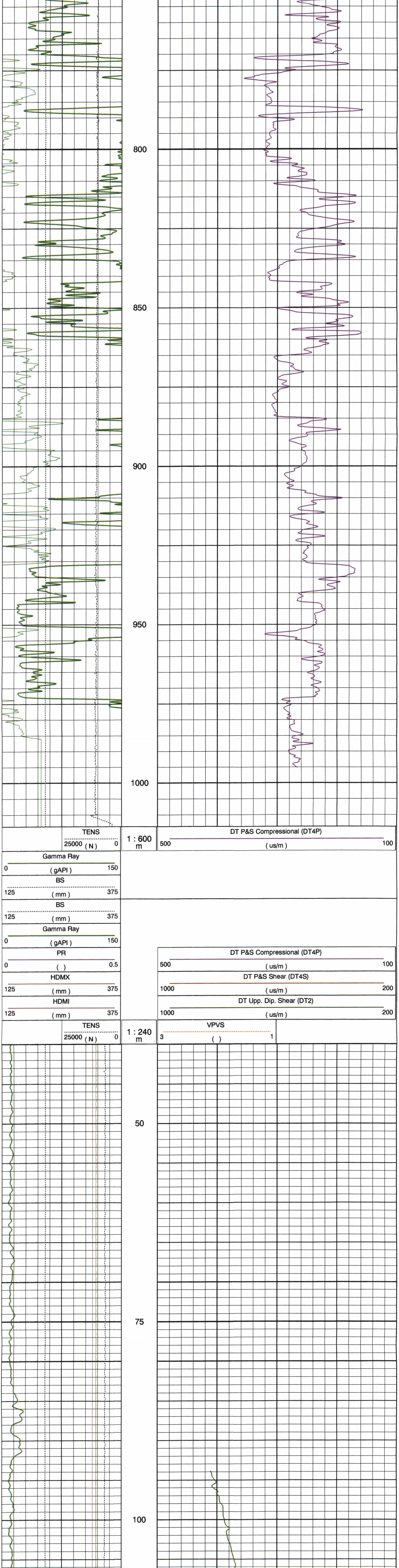
## DOWNHOLE EQUIPMENT

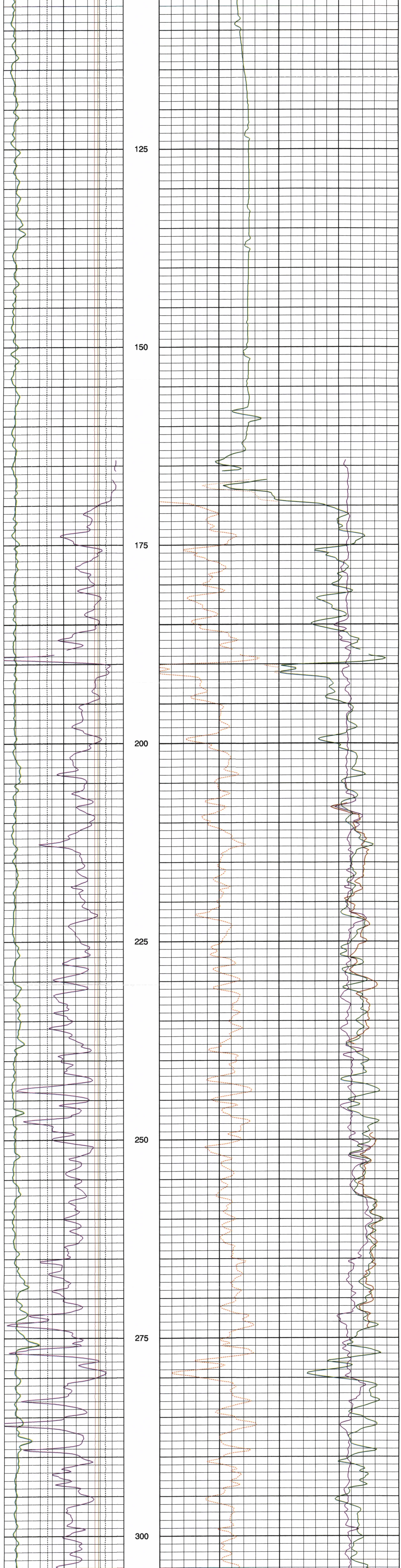


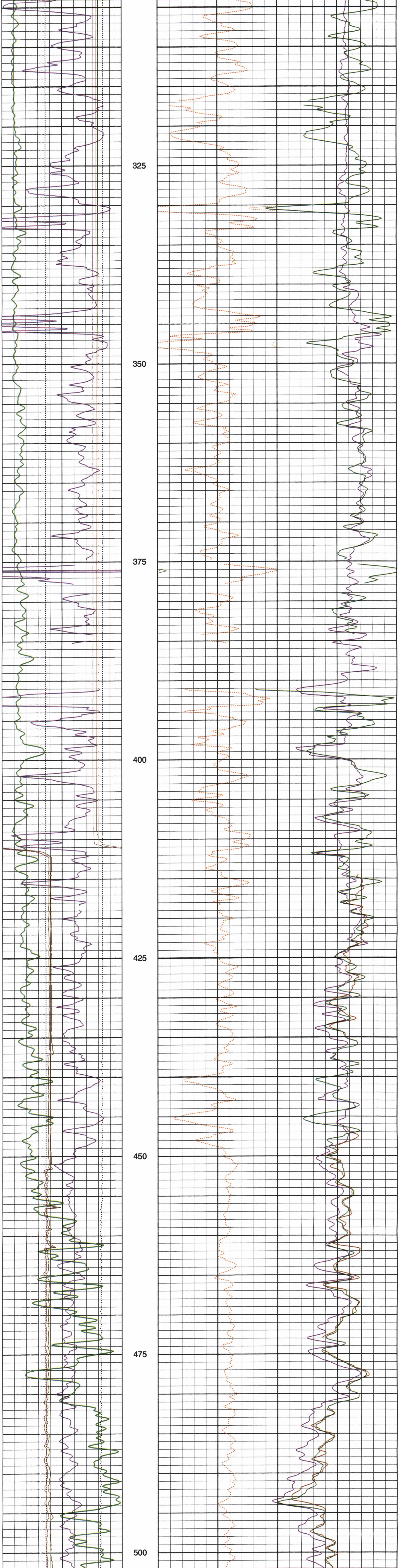

25 MM
Standoff
PWF
8.04
FBST-B
ECH-MRA
FBCC-A
AH-184
AH-185
FBSH-A
GPIC-C
FBSC-B
FBSS-B
8.04
PADS
FBCC FBSC
DF
Cartridge HV
Tension GPIT
0.41
0.00
TOOL ZERO
MAXIMUM STRING DIAMETER 143 MM
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN METERS


BS
125
( mm )
375
Gamma Ray
0
( gAPI )
150
TENS
25000
( N )
0
1 : 600
m
DT P&S Compressional (DT4P)
500
( us/m )
100
50
100
150
200
250

300
350
400
450
500
550
600
650
700
750


800
850
900
950
1000
TENS
25000 ( N ) 0
1 : 600
m
DT P&S Compressional (DT4P)
500 ( us/m ) 100
Gamma Ray
0 ( gAPI ) 150
BS
125 ( mm ) 375
BS
125 ( mm ) 375
Gamma Ray
0 ( gAPI ) 150
PR
0 ( ) 0.5
HDMX
125 ( mm ) 375
HDMI
125 ( mm ) 375
DT P&S Compressional (DT4P)
500 ( us/m ) 100
DT P&S Shear (DT4S)
1000 ( us/m ) 200
DT Upp. Dip. Shear (DT2)
1000 ( us/m ) 200
TENS
25000 ( N ) 0
1 : 240
m
VPVS
3 ( ) 1
50
75
100


125
150
175
200
225
250
275
300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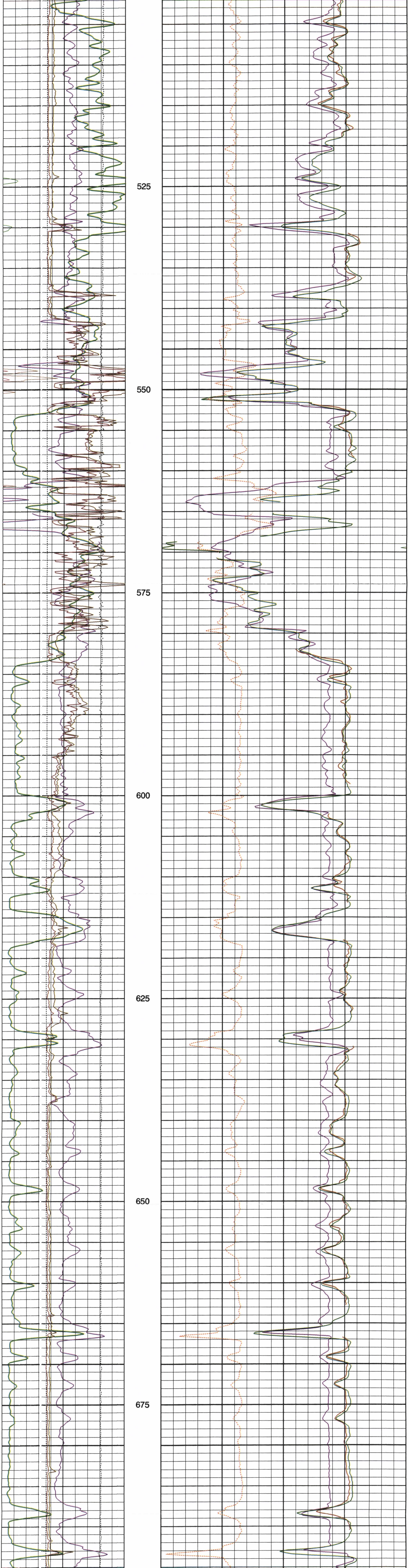
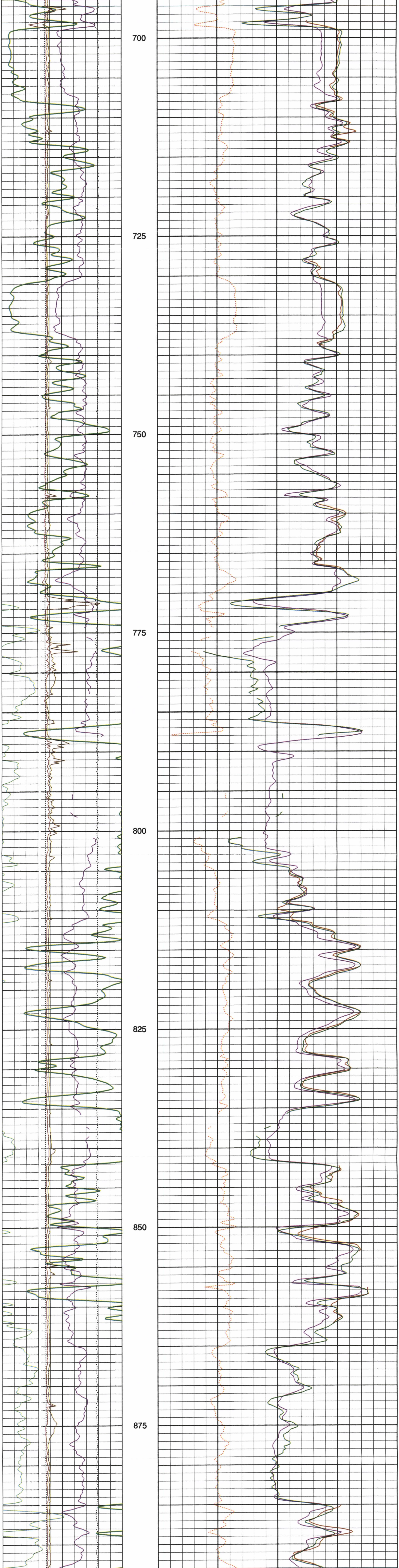
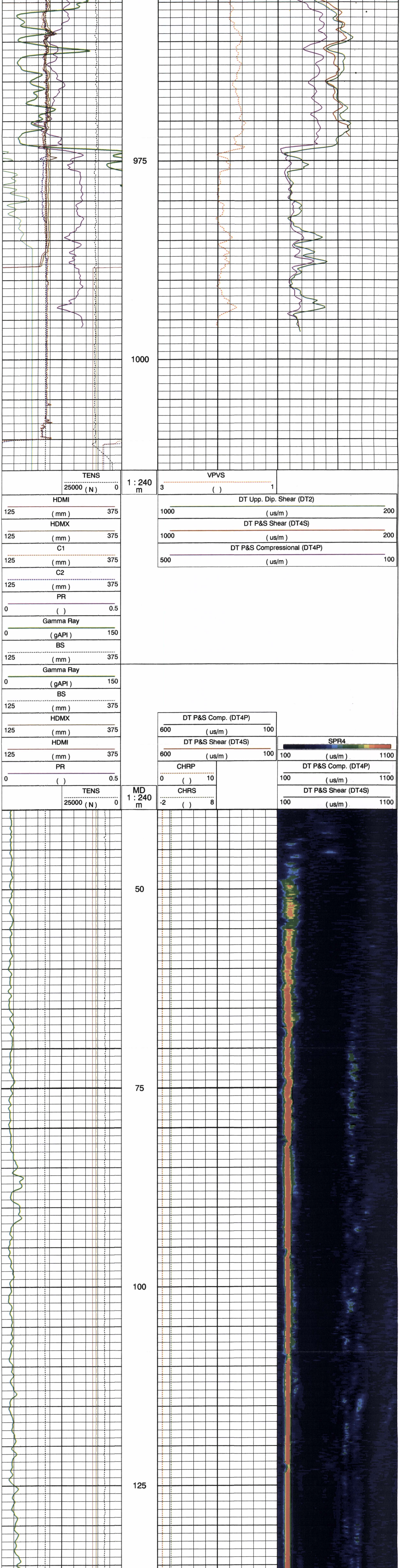
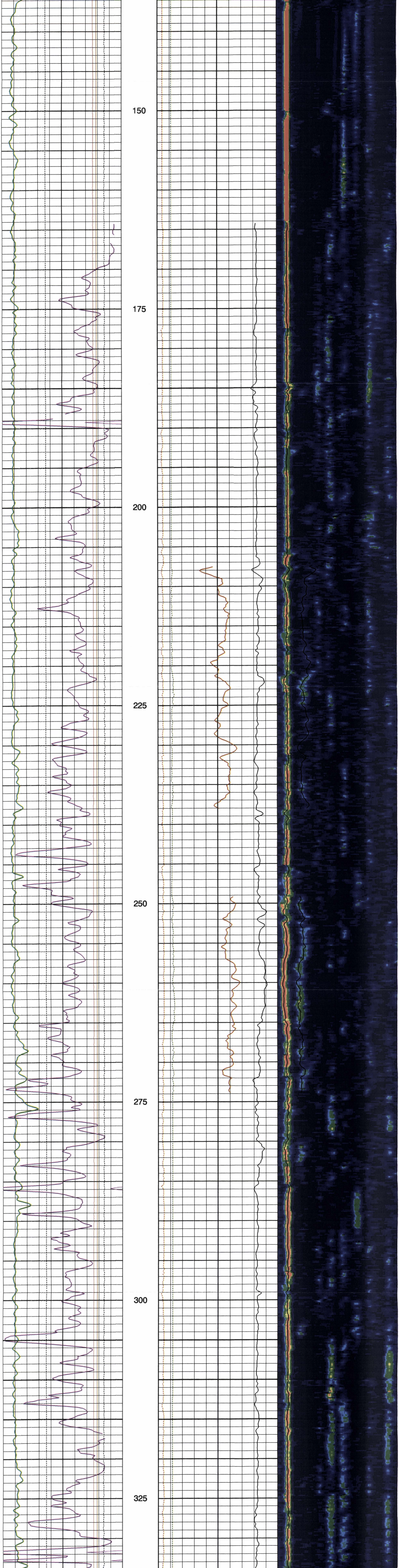
350
375
400
425
450
475
500


525
550
575
600
625
650
675


700
725
750
775
800
825
850
875

900
925
950
975
1000
TENS
25000 ( N ) 0
1 : 240
m
VPVS
3 ( ) 1
HDMI
125 ( mm ) 375
HDMX
125 ( mm ) 375
PR
0 ( ) 0.5
Gamma Ray
0 ( gAPI ) 150
BS
125 ( mm ) 375
DT Upp. Dip. Shear (DT2)
1000 ( us/m ) 200
DT P&S Shear (DT4S)
1000 ( us/m ) 200
DT P&S Compressional (DT4P)
500 ( us/m ) 100
C2
125 ( mm ) 375
C1
125 ( mm ) 375
925
950


975
1000
TENS
25000 ( N ) 0
1 : 240
m
VPVS
3 ( ) 1
HDMI
125 ( mm ) 375
HDMX
125 ( mm ) 375
C1
125 ( mm ) 375
C2
125 ( mm ) 375
PR
0 ( ) 0.5
Gamma Ray
0 ( gAPI ) 150
BS
125 ( mm ) 375
DT Upp. Dip. Shear (DT2)
1000 ( us/m ) 200
DT P&S Shear (DT4S)
1000 ( us/m ) 200
DT P&S Compressional (DT4P)
500 ( us/m ) 100
Gamma Ray
0 ( gAPI ) 150
BS
125 ( mm ) 375
HDMX
125 ( mm ) 375
HDMI
125 ( mm ) 375
PR
0 ( ) 0.5
DT P&S Comp. (DT4P)
600 ( us/m ) 100
DT P&S Shear (DT4S)
600 ( us/m ) 100
CHRP
0 ( ) 10
CHRS
-2 ( ) 8
SPR4
100 ( us/m ) 1100
DT P&S Comp. (DT4P)
100 ( us/m ) 1100
DT P&S Shear (DT4S)
100 ( us/m ) 1100
TENS
25000 ( N ) 0
MD
1 : 240
m
50
75
100
125


150
175
200
225
250
275
300
325

350
375
400
425
450
475
500
525

550
575
600
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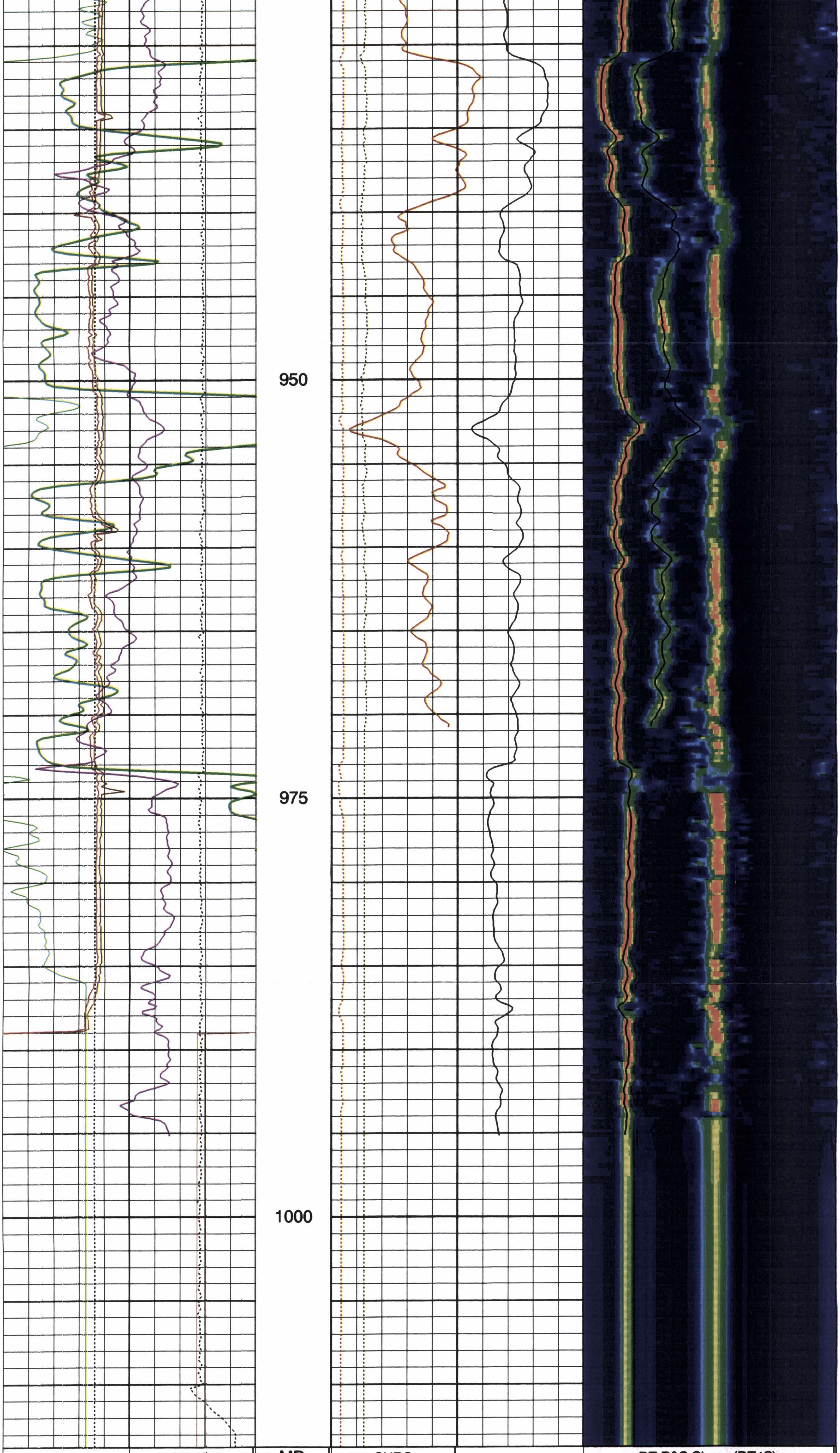
800
825
850
875
900
925



TENS
25000 ( N ) 0

PR
0 ( ) 0.5

HDMI
125 ( mm ) 375

HDMX
125 ( mm ) 375

BS
125 ( mm ) 375

Gamma Ray
0 ( gAPI ) 150

MD
1 : 240
m

CHRS
-2 ( ) 8

CHRP
0 ( ) 10

DT P&S Shear (DT4S)
600 ( us/m ) 100

DT P&S Comp. (DT4P)
600 ( us/m ) 100

DT P&S Shear (DT4S)
100 ( us/m ) 1100

DT P&S Comp. (DT4P)
100 ( us/m ) 1100

SPR4
100 ( us/m ) 1100

GR
0 ( gAPI ) 150

Bit Size (BS)
125 ( mm ) 375

TENS .BASIC
25000 ( N ) 0

MD
1 : 240
m

DT Upp. Dip. Shear (DT2)
1100 ( us/m ) 100

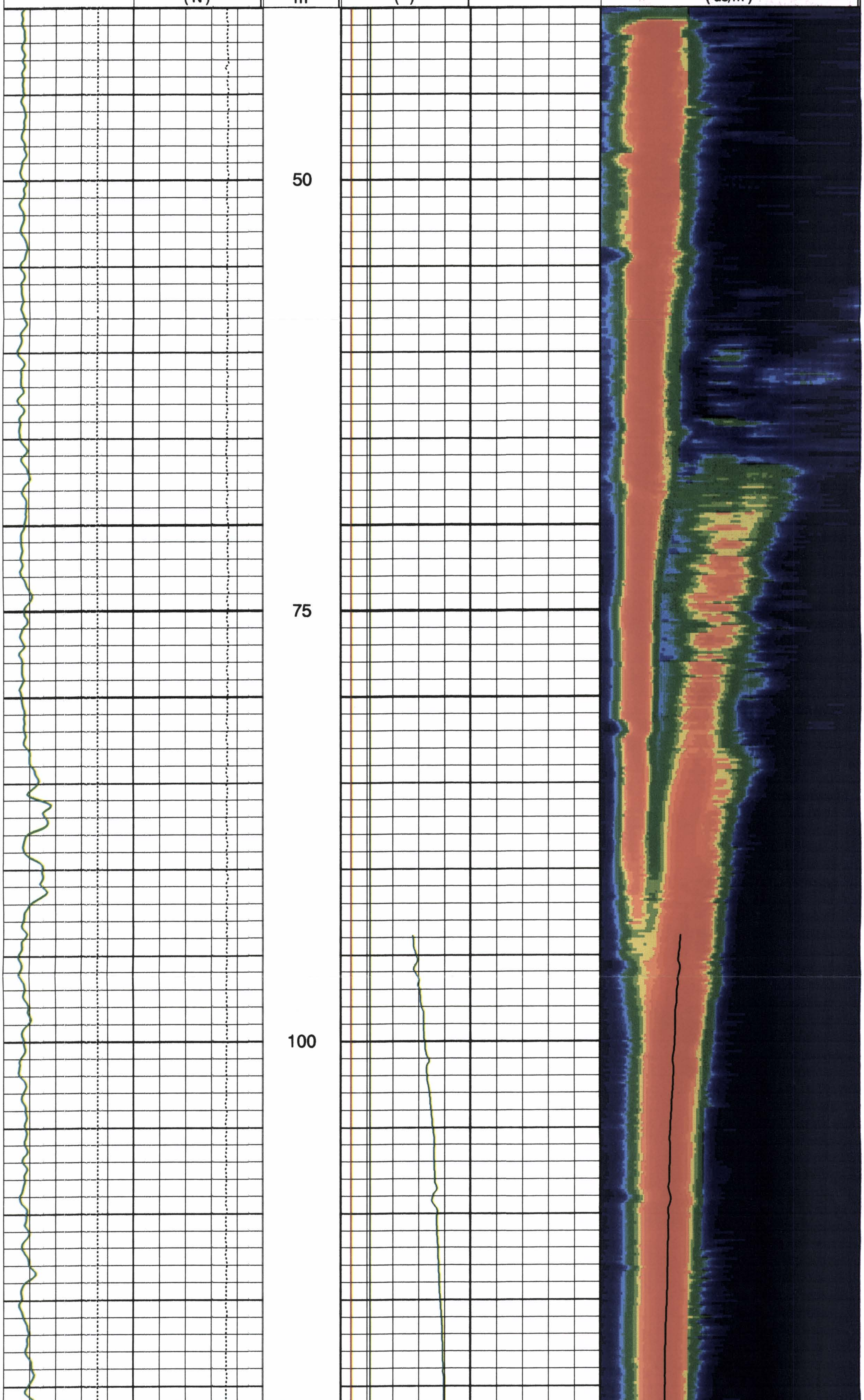
DT P&S Comp. (DT4P)
1100 ( us/m ) 100

CHRP
0 ( ) 10

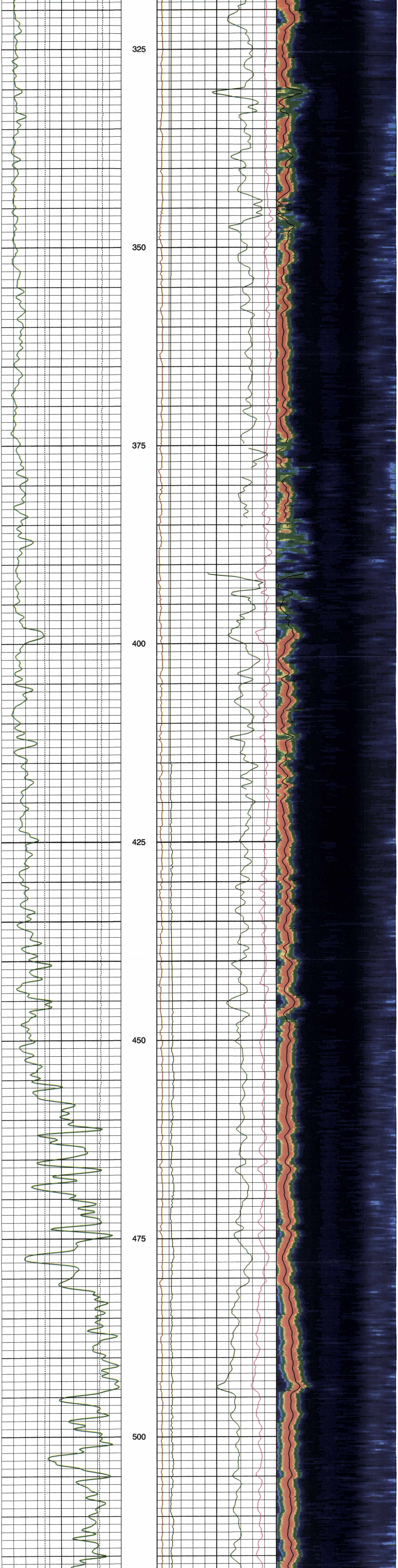
CHRS
-2 ( ) 8

SPR2
200 ( us/m ) 2200

DT upp. Dip. Shear (DT2)
200 ( us/m ) 2200



125
150
175
200
225
250
275
300


325
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425
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500

525
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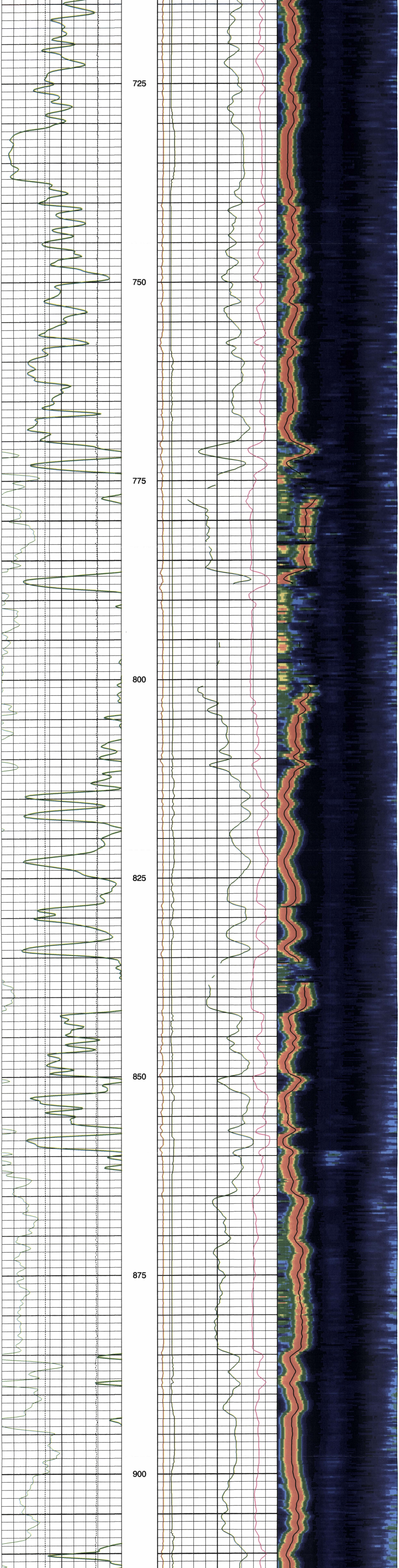
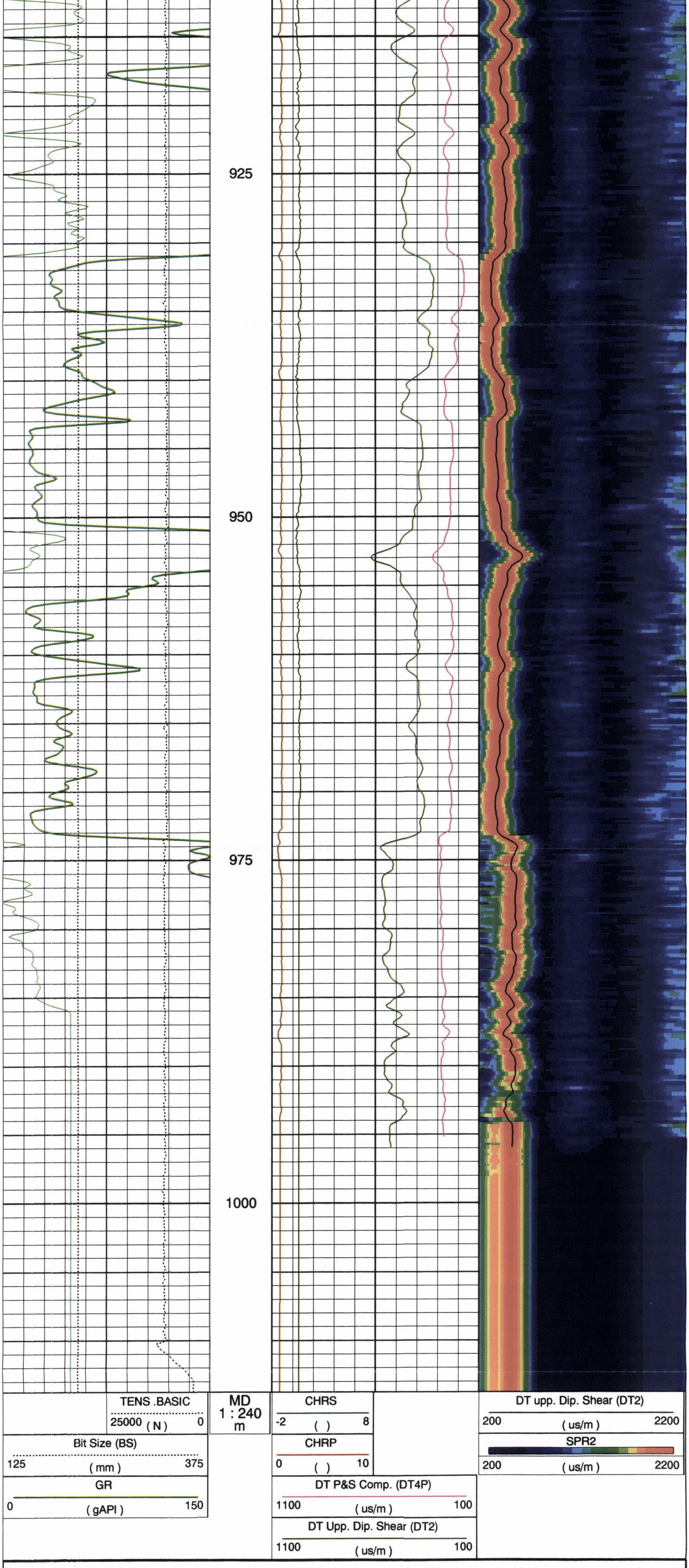
600
625
650
675
700


725
750
775
800
825
850
875
900




## Parameters

| DLIS Name | Description | Value | |
|---|---|---|---|
| | **DSST-B: Dipole Shear Imager - B** | | |
| ITTS | Integrated Transit Time Source | DTCO | |
| RX1G | Receiver 1 Geometry | 7468 | MM |
| RX2G | Receiver 2 Geometry | 7620 | MM |
| RX3G | Receiver 3 Geometry | 7772 | MM |
| RX4G | Receiver 4 Geometry | 7925 | MM |
| RX5G | Receiver 5 Geometry | 8077 | MM |
| RX6G | Receiver 6 Geometry | 8230 | MM |
| RX7G | Receiver 7 Geometry | 8382 | MM |
| RX8G | Receiver 8 Geometry | 8534 | MM |
| | **EMS-B: Environment Measurement Sonde** | | |
| ECOF | EMS Caliper Offset | 50.8 | MM |
| EFC | EMS Fixed Caliper Operation | OFF | |
| FCD | Future Casing (Outer) Diameter | 177.8 | MM |
| HVCS | Integrated Hole Volume Caliper Selection | EMS_Calipers | |
| | **HOLEV: Integrated Hole/Cement Volume** | | |
| FCD | Future Casing (Outer) Diameter | 177.8 | MM |
| HVCS | Integrated Hole Volume Caliper Selection | EMS_Calipers | |
| | **STI: Stuck Tool Indicator** | | |
| LBFR | Trigger for MAXIS First Reading Label | TDL | |
| STKT | STI Stuck Threshold | 1.524 | M |
| TDD | Total Depth - Driller | 1011.00 | M |
| TDL | Total Depth - Logger | 1010.70 | M |
| | **System and Miscellaneous** | | |
| BS | Bit Size | 216.000 | MM |
| DO | Depth Offset for Playback | 0.0 | M |
| DORL | Depth Offset for Repeat Analysis | 0.0 | M |
| PP | Playback Processing | NORMAL | |
| TD | Total Depth | 987 | M |

Calibration and Check Summary

| Measurement | Nominal | Master | Before | After | Change | Limit | Units |
|---|---|---|---|---|---|---|---|
| Full-Bore Scanner - B Wellsite Calibration - Caliper Calibration | | | | | | | |
| Before: 5-Mar-2005 14:09 | | | | | | | |
| Caliper 1 Small Jig | 203.2 | N/A | 205.8 | N/A | N/A | N/A | MM |
| Caliper 2 Small Jig | 203.2 | N/A | 199.5 | N/A | N/A | N/A | MM |
| Caliper 1 Large Jig | 304.8 | N/A | 297.8 | N/A | N/A | N/A | MM |
| Caliper 2 Large Jig | 304.8 | N/A | 293.5 | N/A | N/A | N/A | MM |
| Full-Bore Scanner - B Wellsite Calibration - CROUZET ACCELEROMETER PROM HAS BEEN READ CORRECTLY | | | | | | | |
| Before: 9-Mar-2005 9:26 | | | | | | | |
| TEMPERATURE REFERENCE : | N/A | N/A | 20 | N/A | N/A | N/A | DEGC |
| YEAR OF CALIBRATION : | N/A | N/A | 95 | N/A | N/A | N/A | |
| MONTH OF CALIBRATION : | N/A | N/A | 3 | N/A | N/A | N/A | |
| SERIAL NUMBER : | N/A | N/A | 513 | N/A | N/A | N/A | |
| Full-Bore Scanner - B Wellsite Calibration - CROUZET MAGNETOMETER PROM HAS BEEN READ CORRECTLY | | | | | | | |
| Before: 9-Mar-2005 9:26 | | | | | | | |
| TEMPERATURE REFERENCE : | N/A | N/A | 21 | N/A | N/A | N/A | DEGC |
| YEAR OF CALIBRATION : | N/A | N/A | 3 | N/A | N/A | N/A | |
| MONTH OF CALIBRATION : | N/A | N/A | 1 | N/A | N/A | N/A | |
| SERIAL NUMBER : | N/A | N/A | 368 | N/A | N/A | N/A | |
| Environment Measurement Sonde Wellsite Calibration - EMS Caliper Calibration | | | | | | | |
| Before: 22-Feb-2005 11:50 | | | | | | | |
| Radius 1 Short Radius | 101.6 | N/A | 95.99 | N/A | N/A | 5.080 | MM |
| Radius 1 Long Radius | 203.2 | N/A | 200.3 | N/A | N/A | 5.080 | MM |
| Radius 2 Short Radius | 101.6 | N/A | 84.78 | N/A | N/A | 5.080 | MM |
| Radius 2 Long Radius | 203.2 | N/A | 189.6 | N/A | N/A | 5.080 | MM |
| Radius 3 Short Radius | 101.6 | N/A | 82.86 | N/A | N/A | 5.080 | MM |
| Radius 3 Long Radius | 203.2 | N/A | 187.3 | N/A | N/A | 5.080 | MM |
| Radius 4 Short Radius | 101.6 | N/A | 81.48 | N/A | N/A | 5.080 | MM |
| Radius 4 Long Radius | 203.2 | N/A | 186.9 | N/A | N/A | 5.080 | MM |
| Radius 5 Short Radius | 101.6 | N/A | 87.25 | N/A | N/A | 5.080 | MM |
| Radius 5 Long Radius | 203.2 | N/A | 192.9 | N/A | N/A | 5.080 | MM |
| Radius 6 Short Radius | 101.6 | N/A | 80.38 | N/A | N/A | 5.080 | MM |
| Radius 6 Long Radius | 203.2 | N/A | 185.3 | N/A | N/A | 5.080 | MM |
| Scintillation Gamma-Ray - N Wellsite Calibration - Detector Calibration | | | | | | | |
| Before: 28-Feb-2005 12:40 | | | | | | | |
| Gamma Ray (Jig - Bkg) | 159.3 | N/A | 159.3 | N/A | N/A | 14.48 | GAPI |
| Gamma Ray (Calibrated) | 166.0 | N/A | 166.0 | N/A | N/A | 15.00 | GAPI |

Full-Bore Scanner - B / Equipment Identification

| | |
|---|---|
| Primary Equipment: | |
| FullBore Scanner Sonde | FBSS - B |
| FullBore Scanner Sonde Upper part | FBSH - A |
| FullBore Scanner Sonde Cartridge | FBSC - B |
| GPIT Cartridge - C | GPIC - C |
| Insulating Sub | AH - 185 |
| Flex Joint | AH - 184 |
| FullBore Scanner Control Cartridge | FBCC - A |
| Auxiliary Equipment: | |
| Electronics Cartridge Housing | ECH - MRA |

Full-Bore Scanner - B Wellsite Calibration

Caliper Calibration

| Phase | Caliper 1 Small Jig MM | Value | Phase | Caliper 2 Small Jig MM | Value |
|---|---|---|---|---|---|
| Before | | 205.8 | Before | | 199.5 |
| | 172.7 (Minimum) / 203.2 (Nominal) / 233.7 (Maximum) | | | 172.7 (Minimum) / 203.2 (Nominal) / 233.7 (Maximum) | |
| Phase | Caliper 1 Large Jig MM | Value | Phase | Caliper 2 Large Jig MM | Value |
| Before | | 297.8 | Before | | 293.5 |
| | 259.1 (Minimum) / 304.8 (Nominal) / 350.5 (Maximum) | | | 259.1 (Minimum) / 304.8 (Nominal) / 350.5 (Maximum) | |

Before: 5-Mar-2005 14:09

Environment Measurement Sonde / Equipment Identification

| | | |
|---|---|---|
| Primary Equipment: | | |
| EMS Mechanical | EMM - B | 8001 |
| EMS Cartridge | EMC - B | 8003 |
| Auxiliary Equipment: | | |
| Electronics Cartridge Housing | ECH - KH | 8005 |

Environment Measurement Sonde Wellsite Calibration

EMS Caliper Calibration

| Phase | Radius 1 Short Radius MM | Value | Phase | Radius 1 Long Radius MM | Value |
|---|---|---|---|---|---|
| Before | | 95.99 | Before | | 200.3 |
| | 76.20 (Minimum) / 101.6 (Nominal) / 127.0 (Maximum) | | | 177.8 (Minimum) / 203.2 (Nominal) / 228.6 (Maximum) | |
| Phase | Radius 2 Short Radius MM | Value | Phase | Radius 2 Long Radius MM | Value |
| Before | | 84.78 | Before | | 189.6 |
| | 76.20 (Minimum) / 101.6 (Nominal) / 127.0 (Maximum) | | | 177.8 (Minimum) / 203.2 (Nominal) / 228.6 (Maximum) | |
| Phase | Radius 3 Short Radius MM | Value | Phase | Radius 3 Long Radius MM | Value |
| Before | | 82.86 | Before | | 187.3 |
| | 76.20 (Minimum) / 101.6 (Nominal) / 127.0 (Maximum) | | | 177.8 (Minimum) / 203.2 (Nominal) / 228.6 (Maximum) | |
| Phase | Radius 4 Short Radius MM | Value | Phase | Radius 4 Long Radius MM | Value |
| Before | | 81.48 | Before | | 186.9 |
| | 76.20 (Minimum) / 101.6 (Nominal) / 127.0 (Maximum) | | | 177.8 (Minimum) / 203.2 (Nominal) / 228.6 (Maximum) | |
| Phase | Radius 5 Short Radius MM | Value | Phase | Radius 5 Long Radius MM | Value |
| Before | | 87.25 | Before | | 192.9 |
| | 76.20 (Minimum) / 101.6 (Nominal) / 127.0 (Maximum) | | | 177.8 (Minimum) / 203.2 (Nominal) / 228.6 (Maximum) | |
| Phase | Radius 6 Short Radius MM | Value | Phase | Radius 6 Long Radius MM | Value |
| Before | | 80.38 | Before | | 185.3 |
| | 76.20 (Minimum) / 101.6 (Nominal) / 127.0 (Maximum) | | | 177.8 (Minimum) / 203.2 (Nominal) / 228.6 (Maximum) | |

Before: 22-Feb-2005 11:50

Scintillation Gamma-Ray - N / Equipment Identification

| | | |
|---|---|---|
| Primary Equipment: | | |
| Scintillation Gamma Cartridge | SGC - TB | 9591 |
| Scintillation Gamma Detector | SGD - TAA | |
| Auxiliary Equipment: | | |
| Scintillation Gamma Housing | SGH - K | 2453 |
| Gamma Source Radioactive | GSR - U/Y | |

Scintillation Gamma-Ray - N Wellsite Calibration

Detector Calibration

| Phase | Gamma Ray Background GAPI | Value | Phase | Gamma Ray (Jig - Bkg) GAPI | Value | Phase | Gamma Ray (Calibrated) GAPI | Value |
|---|---|---|---|---|---|---|---|---|
| Before | | 20.58 | Before | | 159.3 | Before | | 166.0 |
| | 0 (Minimum) / 30.00 (Nominal) / 120.0 (Maximum) | | | 144.8 (Minimum) / 159.3 (Nominal) / 173.8 (Maximum) | | | 151.0 (Minimum) / 166.0 (Nominal) / 181.0 (Maximum) | |

Before: 28-Feb-2005 12:40

Company: APACHE CANADA LTD.

Schlumberger

Well: APACHE PARAMOUNT LAC MAUNOIR E-35

Field: NWT

Territory: NORTHWEST TERRITORIES

*** MD ***

DIPOLE SONIC LOG