V.O.F. Geothermie De Lier

LIR-GT-01
Formation Log

Weatherford®
Surface Logging Systems

Legend

Drilling Data:

BC	bit condition
BS	bit size
CB	core bit
CBR	core bit re-run
CR	core
CSG	casing
DC	depth correction
DIR	directional survey
DS	deviation survey
DST	drill stem test
LC	lost circulation
LCM	lost circ material
MM	mud motor
NB	new bit
PO	pump output
PP	pump pressure
RPM	rotary speed
RR	re-run bit
SPM	pump strokes
SPP	stand pipe pressure
TRQ	torque
TVD	true vertical depth
WLL	wireline log
WOB	weight on bit

Mud Data:

CL	chlorides
FC	filter cake
FV	funnel viscosity
LAT	lagged after trip
MW	mud weight
NR	no reading
pH	mud pH
PV	plastic viscosity
WL	water loss
YP	yield point

Operator: WEP
Well: LIR-GT-01
Location: De Lier GT1
Country: Netherlands
UWID: W0090FB1DDC6DN5TLMY
Elevation GL: -1.90
KB: 6.70
Drilling Rig: KCA T-49
Spud Date: 20/05/2014
Print Date: 22/08/2014
Scale: 1:500

Notes:

Surface coordinates
E= 79087.72 m; N= 443732.33 m

Target coordinates
E= 78922.60 m; N= 444532.40 m

Engineering


Bit Trip


Wireline Log


Side Wall Core


Dummy Trip


Casing


Plug Back


Mud Loss


Directional Drill


Perforated Interval

HoleData:

17 ½" hole, 135.0 m, 1080.3 m MDRT
12 ¼" hole , 1080.3 m, 2565.1 m MDRT
8 ½" hole, 2565.1 m, 2897.0 m MDRT

MudData:

17 ½" hole drilled with
1.05 - 1.15 sg KCl Glycol Polymer WBM

12 ¼" hole drilled with
1.14 - 1.20 sg KCl Glycol Polymer WBM

8 ½" hole drilled with
1.09 sg Drillcarb WBM

CasingData:

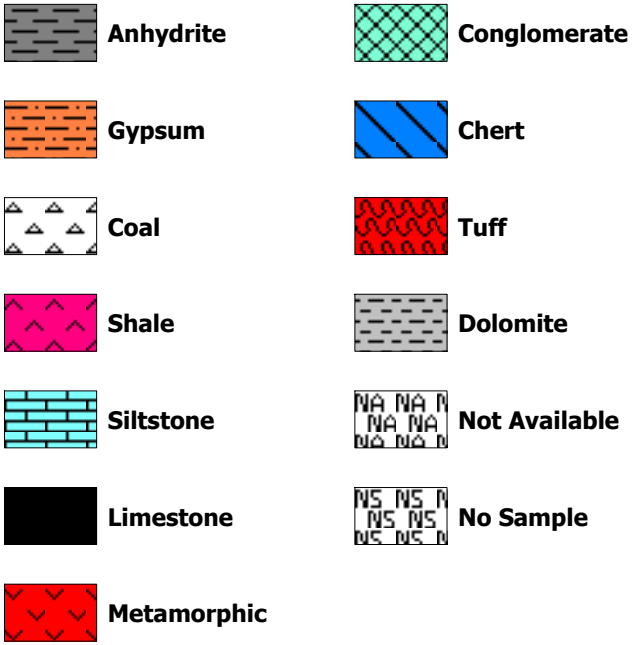
23" conductor, surface, 135.0 m MDRT,
13 ⅜ " casing, surface, 1028.7 m MDRT,
9 ⅝" liner, 924.9 m, 2552.9 m MDRT,
6 ⅝" liner, 2499.4 m, 2881.0 m MDRT,

Personnel:

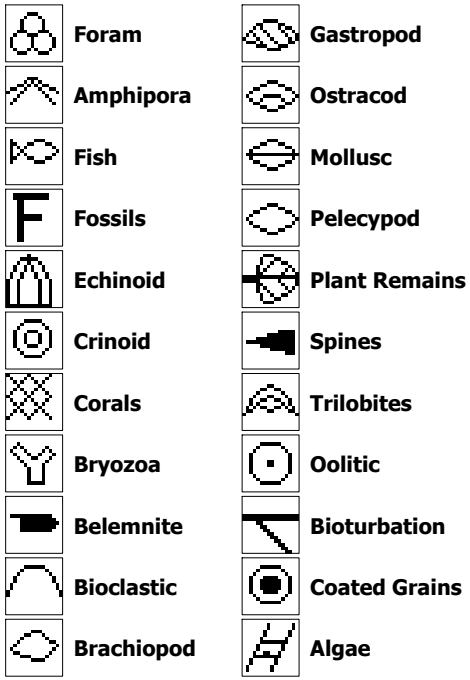
DE: Christopher Smale, Polly Miles
Miles Stephenson, Sergio Boccola, Karol Rudnicki

ML: Ralph Krauze, Abdul Rabim, Lucy Peaker
Luke Edwards, Kyle Walker-Verkuil, Keith Mearns

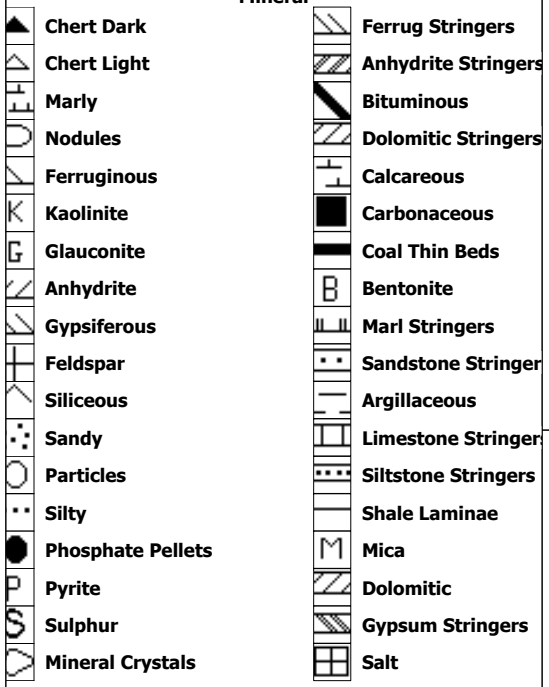
Lithology



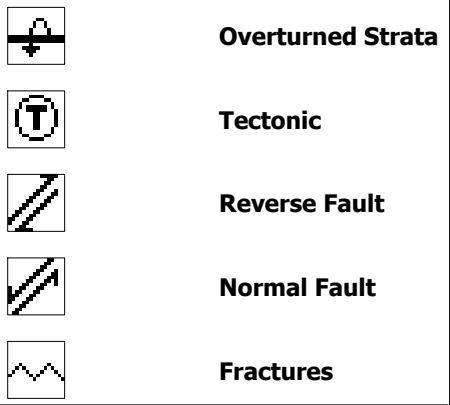
Fossil



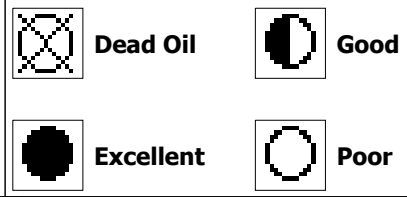
Mineral



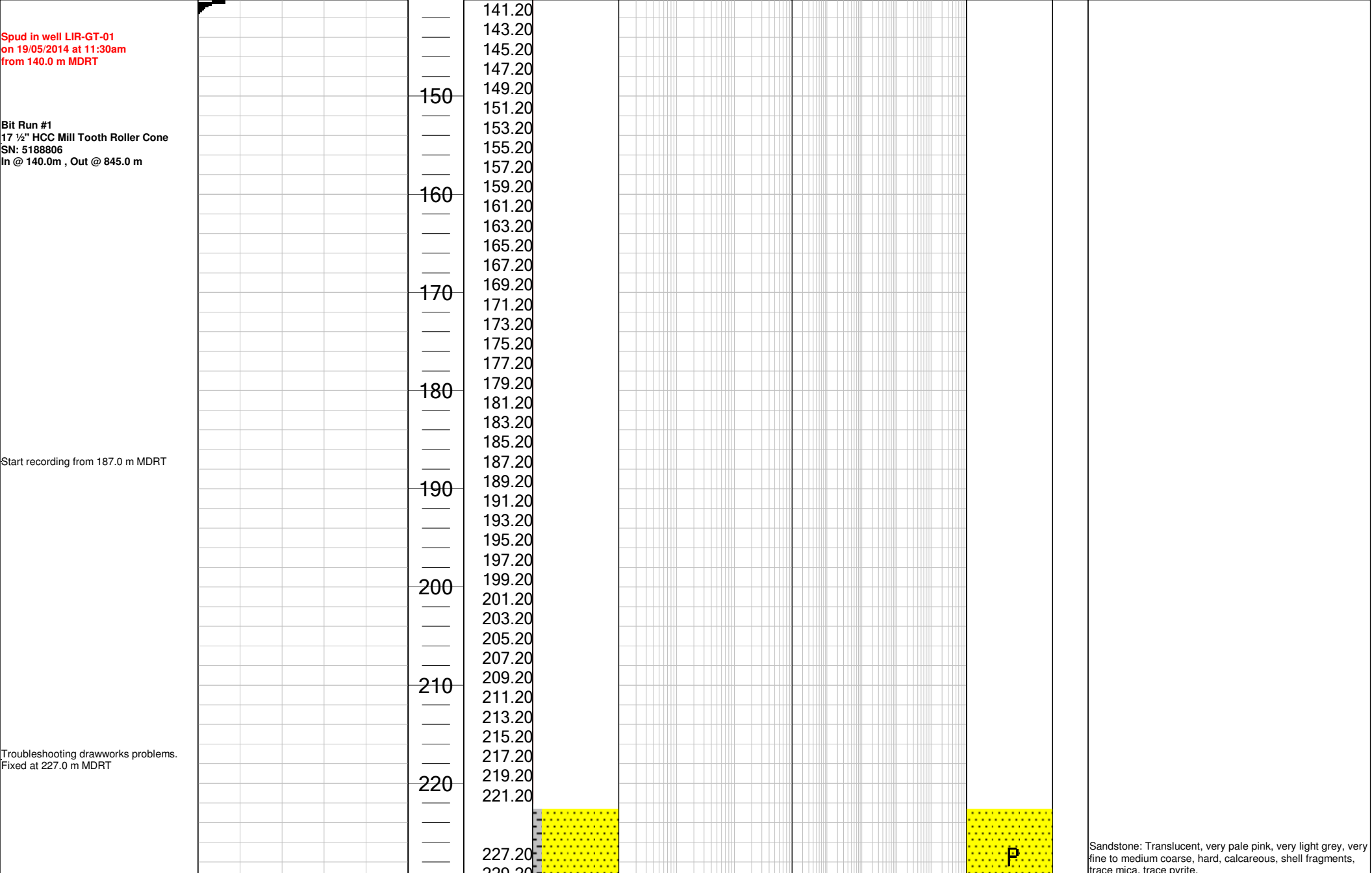
Geological



Oil Show



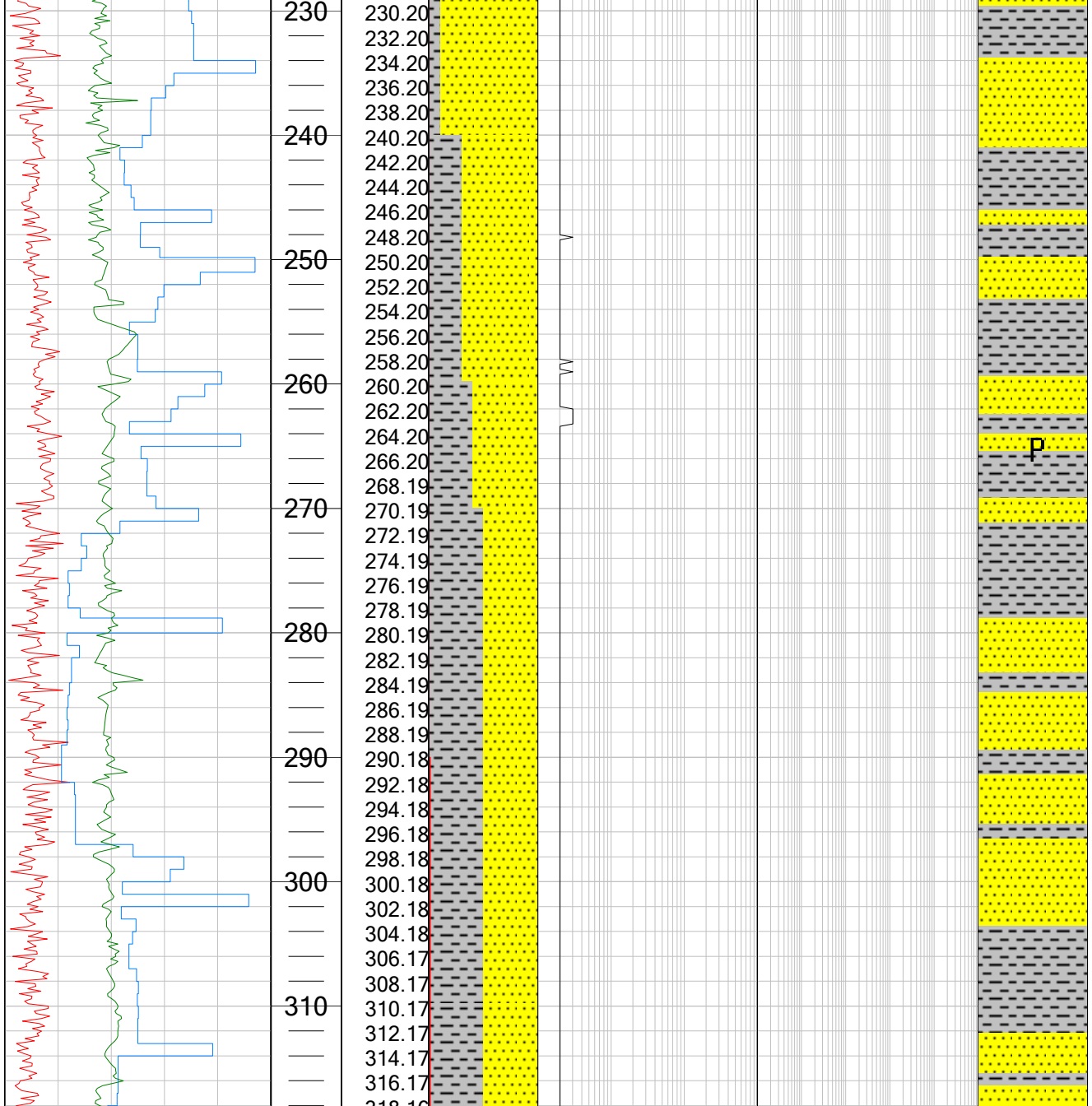
Depth Comment	WOB 0 tons 50 / ROP Average 50 m/hr 0 / Gamma 0 350	Depth	TVD	Percentage Lithology / Remaining Sieved Sample % 100 0	Total Hydrocarbons MLS 0.01 % 10 / Total Gas Out 0.01 % 10	C1 Out 1 ppm 100000	C2 Out 1 ppm 100000	C3 Out 1 ppm 100000	iC4 Out 1 ppm 100000	nC4 Out 1 ppm 100000	iC5 Out 1 ppm 100000	nC5 Out 1 ppm 100000	CO2 Out 0.000001 ppm 0.1	Interpreted Lithology	Fluoresence	Lithology Comment


Spud in well LIR-GT-01
on 19/05/2014 at 11:30am
from 140.0 m MDRT
Bit Run #1
17 ½" HCC Mill Tooth Roller Cone
SN: 5188806
In @ 140.0m , Out @ 845.0 m
Start recording from 187.0 m MDRT
Troubleshooting drawworks problems.
Fixed at 227.0 m MDRT
141.20
143.20
145.20
147.20
149.20
150
151.20
153.20
155.20
157.20
159.20
160
161.20
163.20
165.20
167.20
169.20
170
171.20
173.20
175.20
177.20
179.20
180
181.20
183.20
185.20
187.20
189.20
190
191.20
193.20
195.20
197.20
199.20
200
201.20
203.20
205.20
207.20
209.20
210
211.20
213.20
215.20
217.20
219.20
220
221.20
227.20
P
Sandstone: Translucent, very pale pink, very light grey, very fine to medium coarse, hard, calcareous, shell fragments, trace mica, trace pyrite.

Midnight depth on 20.05.2014:
232.0 m MDRT

MW: 1.12 sg
PV: 35 cP
YP: 50 lbf/100ft2
pH: 11

MWD Survey @ 307.0 m MDRT
Azi: 353.88°, inc: 2.59°
TVD: 307.0 m

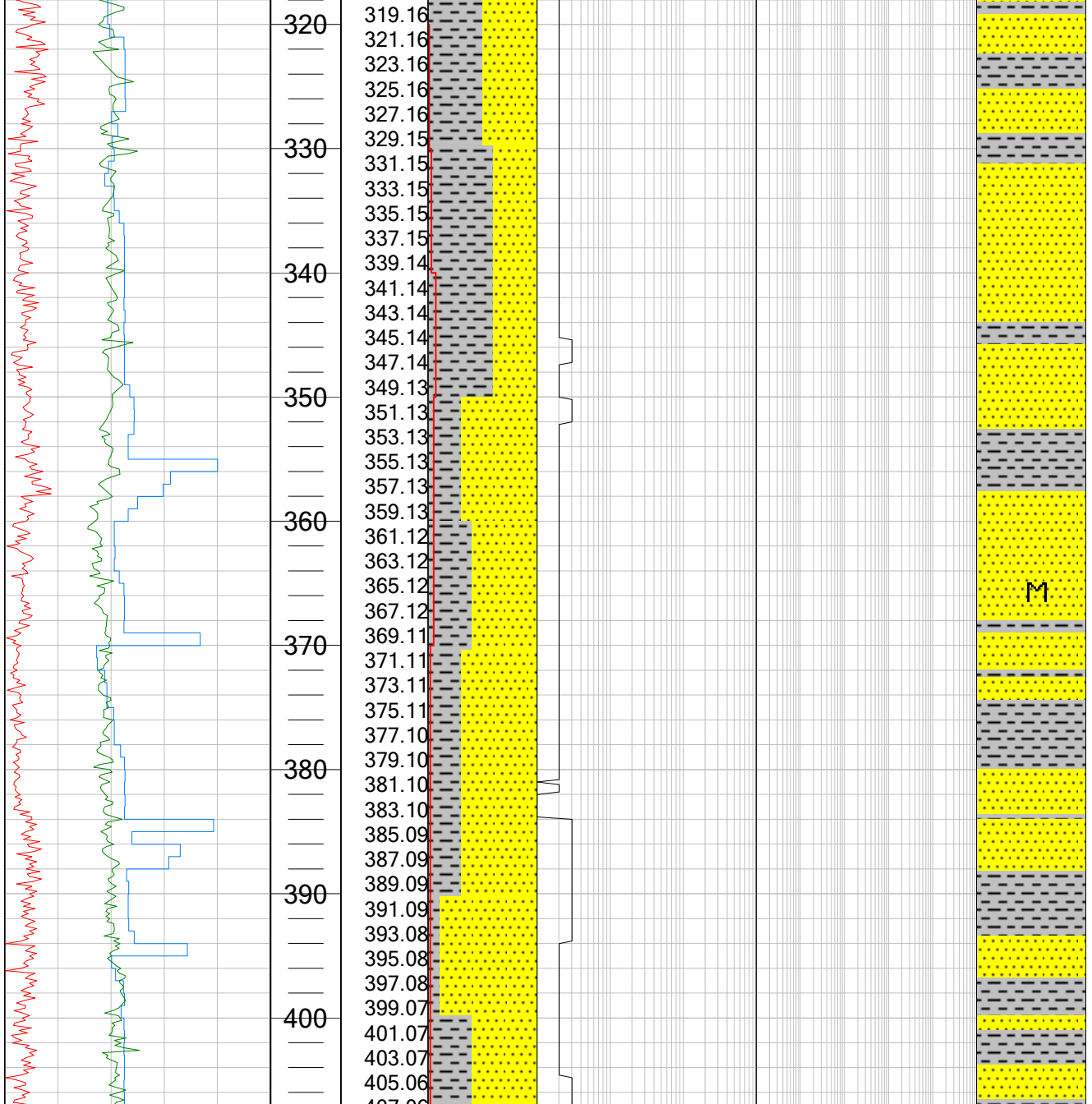


Claystone: Grey to dark grey, silty, soft, shell fragments.

Top of OOSTERHOUT FM
@ 250.0 m MDRT, 250.0 m TVD

Sandstone: Medium grey, dark grey, coarse, hard, sub-rounded, sub-spherical, shell fragments, trace pyrite.

Claystone: Medium grey, silty, soft, sticky, quartz rich, lithic fragments.



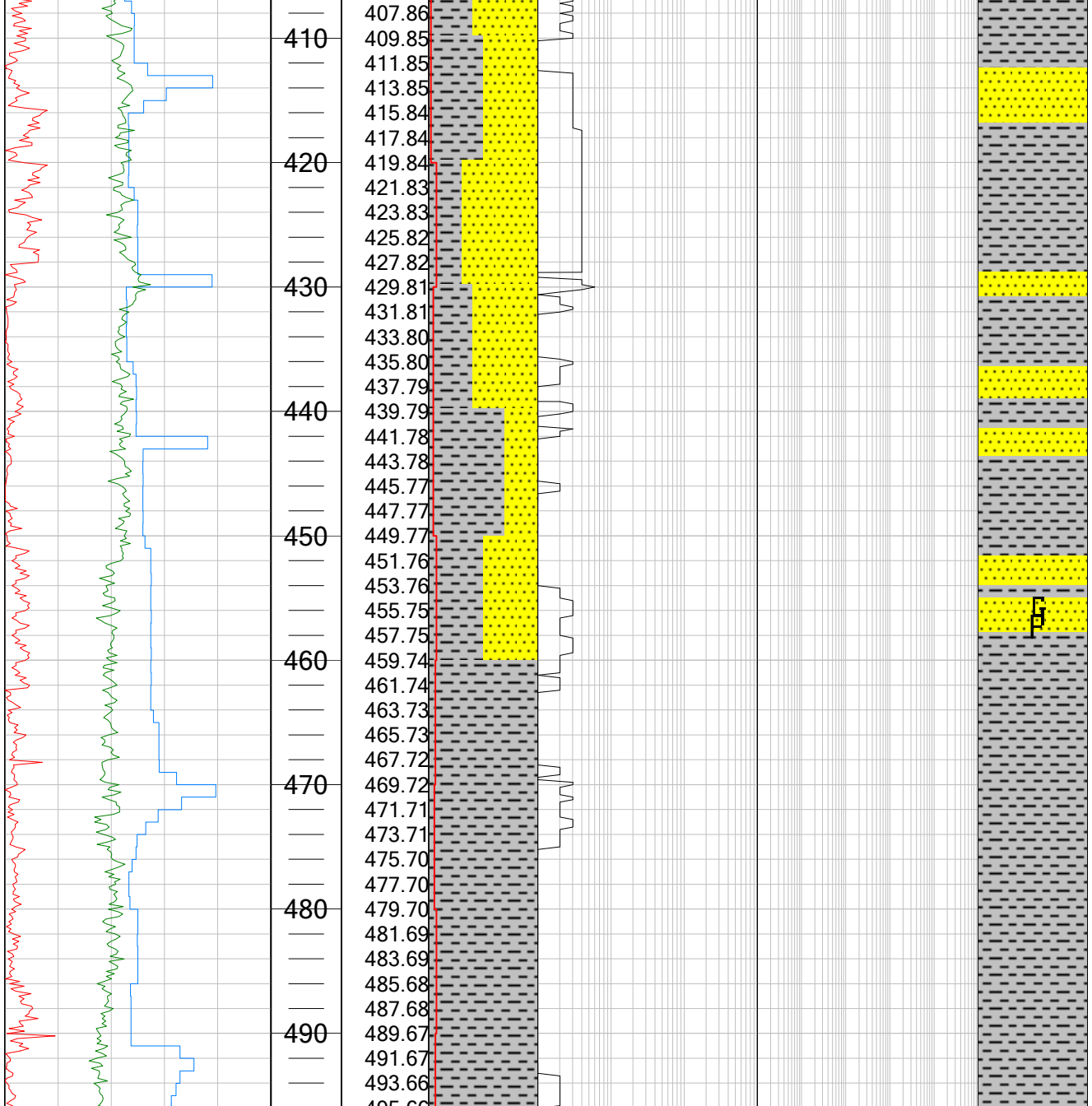
SPP: 79 bar
WOB: 4 tons
F/In: 2590 l/min

MWD Survey @ 364.0 m MDRT
Azi: 350.05, inc 2.70°
TVD: 363.9 m

Sandstone: Light olive grey, unconsolidated, quartz rich, sub-angular to sub-rounded, coarse to very fine, moderately sorted, grain supported matrix, lithic fragments, trace mica.

Top of BREDA FM
@ 387.0 m MDRT, 387.0 m TVD

Sandstone: Quartz rich, unconsolidated, very fine to course



MWD Survey @ 421.0 m MDRT
Azi: 349.97°, inc 3.83°
TVD: 420.83 m

MWD Survey @ 479.0 m MDRT
Azi: 347.90°, inc 3.76°
TVD: 478.70 m

grained, sub-angular to sub-rounded, sub-spherical, moderately to poorly sorted grain supported lithic fragments.

Claystone: Light olive grey to olive grey, soft, sticky, occasionally silty.

Top of RUPEL FM
@ 432.0 m MDRT, 432.0 m TVD

Claystone: Light olive grey to olive grey, soft, sticky.

Top of DONGEN FM / ASSE MBR
@ 452.0 m MDRT, 452.0 m TVD

Sandstone: Loose quartz, very fine to fine grained, trace pyrite, trace glauconite.

Claystone: Light brown to greenish/blue grey, soft, sticky, sub-blocky to blocky, silty.

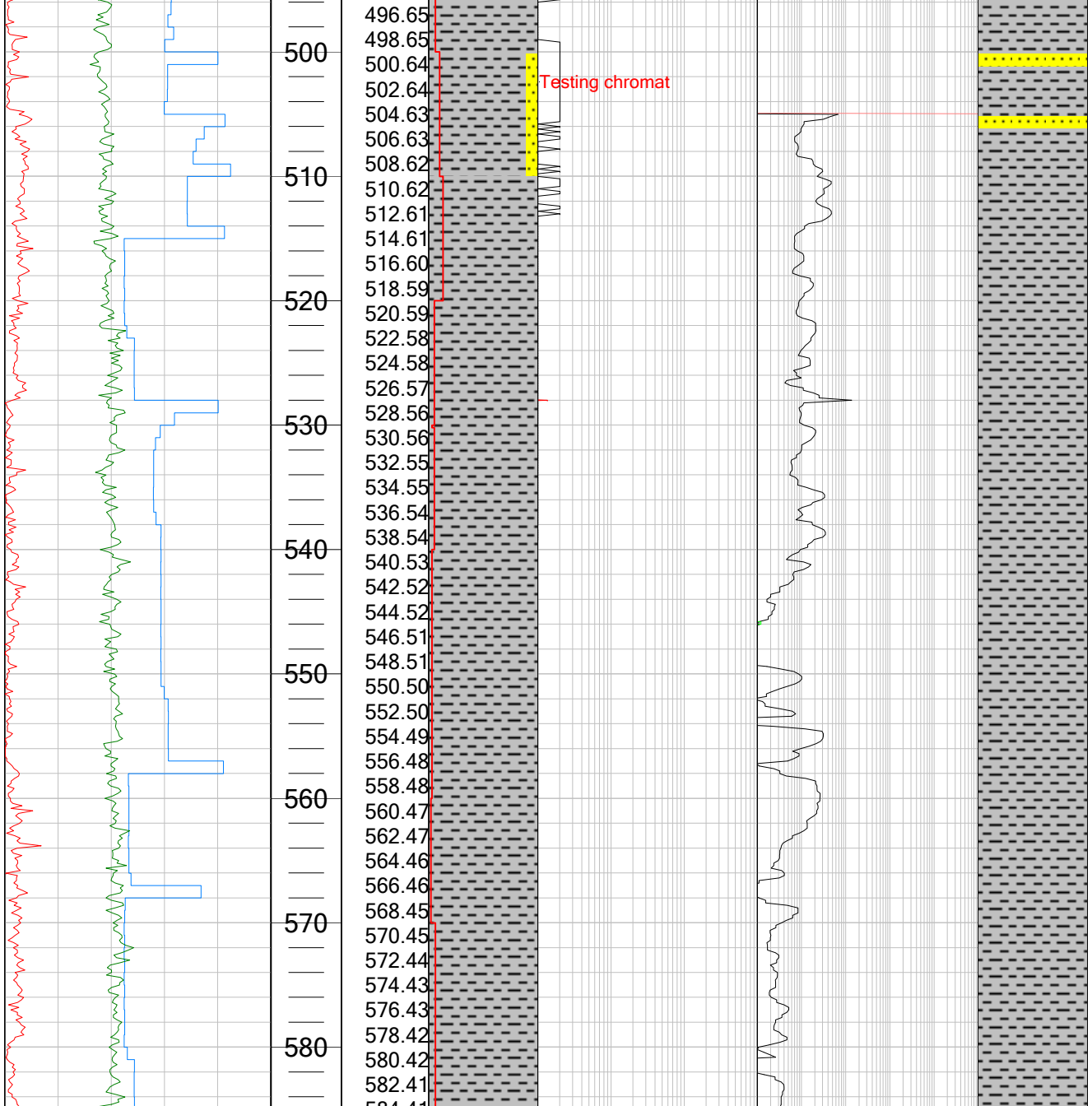
Top of BRUSSEL SANDS MBR
@ 486.0 m MDRT, 486.0 m TVD

MW: 1.12 sg
PV: 35 cP
YP: 45 lbf/100ft2
pH: 10.6

Midnight depth on 21.05.2014:
527.0 m MDRT

SPP: 107 bar
RPM MM: 118
WOB: 2.6 tons
F/in: 2949 l/min

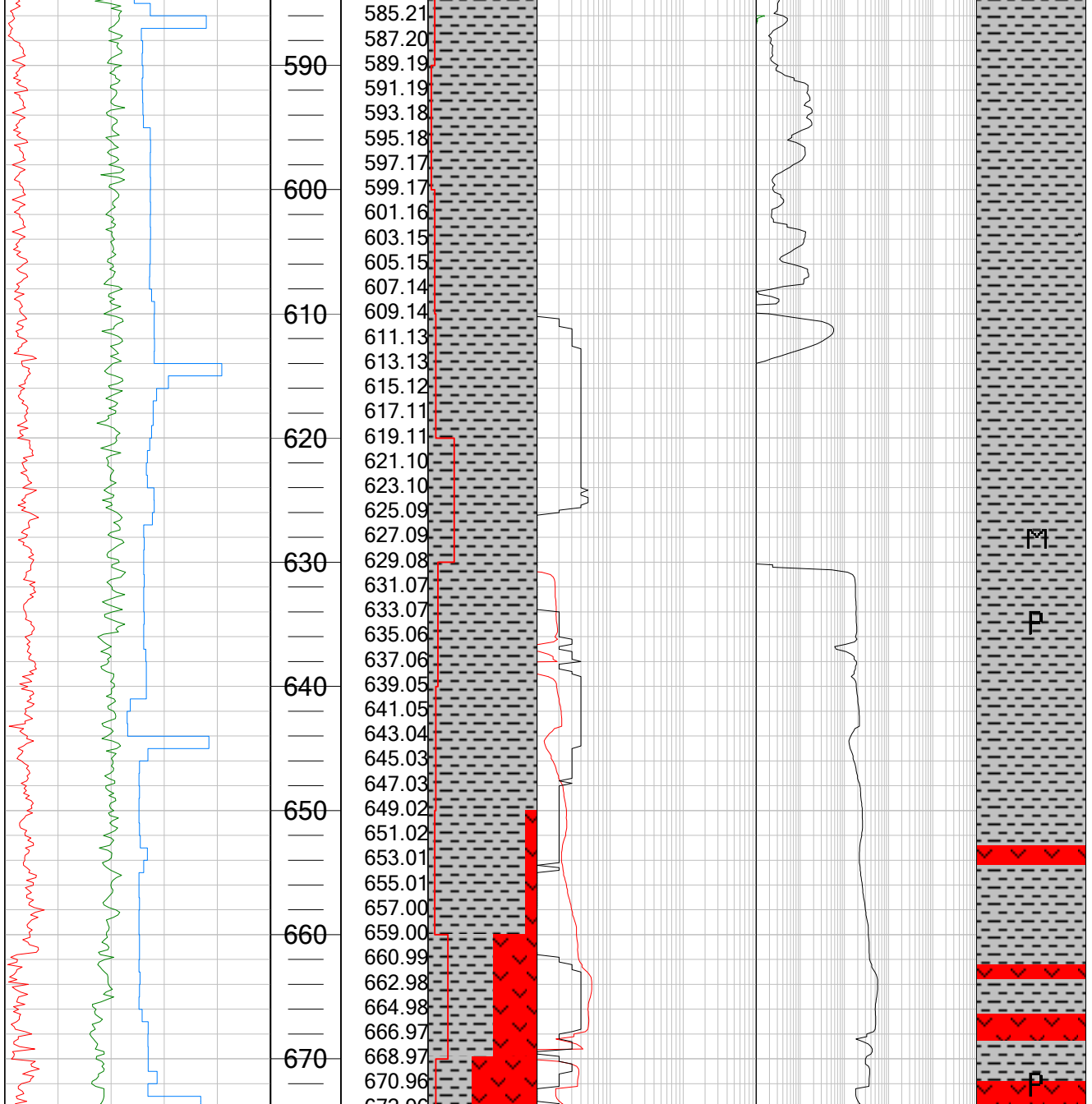
MWD Survey @ 566.0 m MDRT
Azi: 347.04°, inc 4.22°
TVD: 565.46 m



Top of LEPER MBR
@ 505.0 m MDRT, 505.0 m TVD

Claystone: Light grey to grey, occasionally light brown, light green, soft, amorphous.

Claystone: Light bluish grey to grey, occasionally light brown, light green, soft, amorphous to sub-blocky, sticky.



MW: 1.10 sg
PV: 24 cP
YP: 40 lbf/100ft2
pH: 9.8

MWD Survey @ 624.0 m MDRT
Azi: 348.27, inc 4.47°
TVD: 623.3 m

SPP: 165
WOB: 3.6 tons
F/In: 3512 l/min

Claystone: Light bluish grey to light grey, occasionally greenish grey, soft, amorphous,

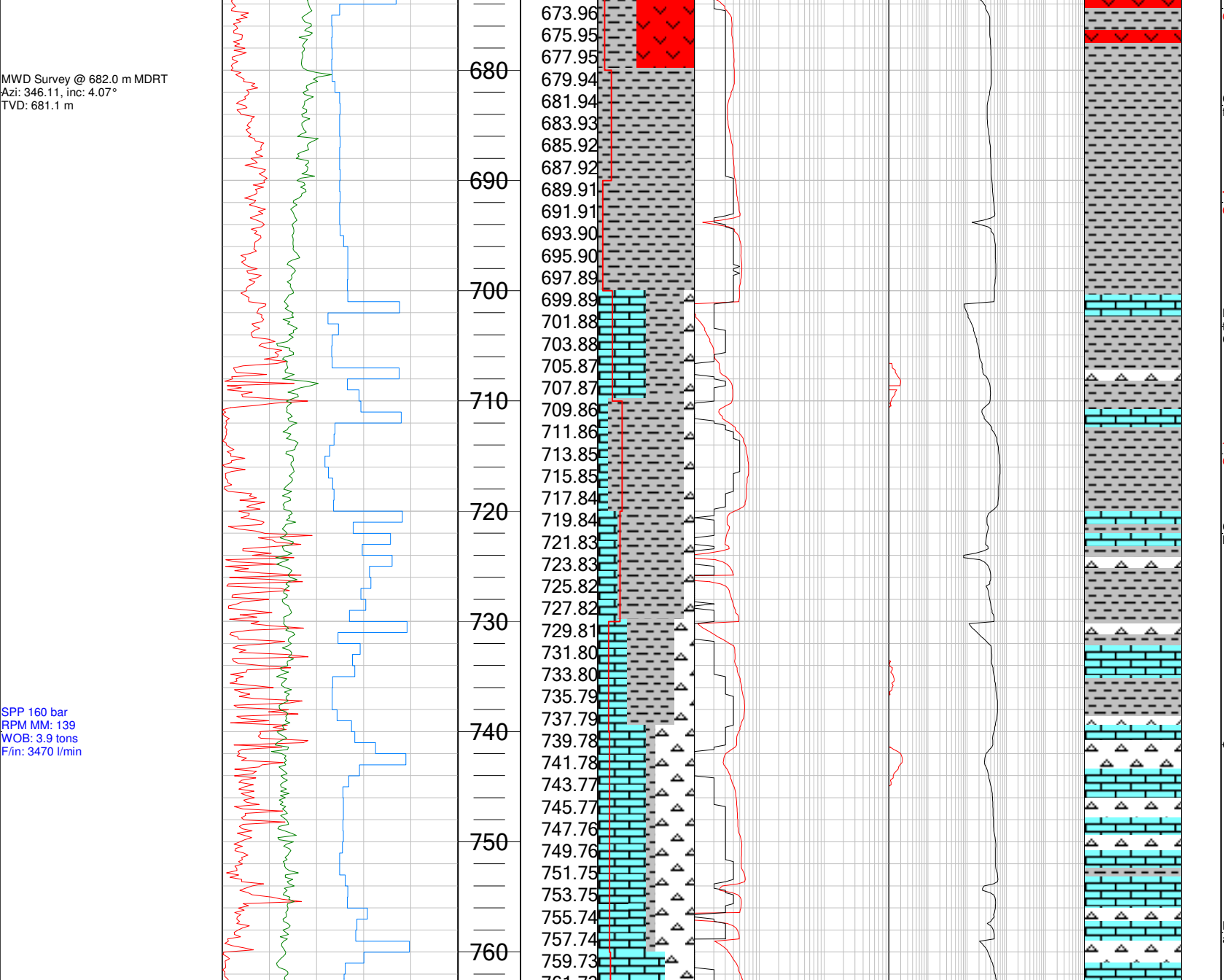
Claystone: Olive grey to brownish grey, amorphous to sub-blocky, soft, trace mica, trace pyrite

Claystone: Olive grey, occasionally reddish brown, soft to firm, sub-blocky, argillaceous, earthy, olive grey silty.

Tuff: Medium bluish grey, soft to firm, argillaceous, sub-blocky, very fine black crystals, sub-euhedral, trace pyrite, trace greyish orange very fine grained sandstone.

Top of BASEL DONGEN TUFFITE MBR @ 667.0 m MDRT, 666.0 m TVD

Top of LANDEN FM


MWD Survey @ 682.0 m MDRT
Azi: 346.11, inc: 4.07°
TVD: 681.1 m
SPP 160 bar
RPM MM: 139
WOB: 3.9 tons
F/in: 3470 l/min
673.96
675.95
677.95
679.94
681.94
683.93
685.92
687.92
689.91
691.91
693.90
695.90
697.89
699.89
701.88
703.88
705.87
707.87
709.86
711.86
713.85
715.85
717.84
719.84
721.83
723.83
725.82
727.82
729.81
731.80
733.80
735.79
737.79
739.78
741.78
743.77
745.77
747.76
749.76
751.75
753.75
755.74
757.74
759.73
680
690
700
710
720
730
740
750
760
Top of LANDEN FM
@ 682.0 m MDRT, 681.0 m TVD
Claystone: Olive grey, occasionally reddish brown, soft to firm, sub-blocky, argillaceous, occasionally silty.
Top of EKOFISK FM
@ 692.0 m MDRT, 691.0 m TVD
Limestone: off white to white, wackestone to packstone, soft to firm, hard in parts, chalky.
Chert: White to light grey, very hard, sub-elongate, angular.
Top of OMMELANDEN FM
@ 709.0 MDRT, 708.0 TVD
Chert: Black to dark grey, occasionally light brown, very hard, elongate, angular, vitreous
Chert: White to light grey, very hard, sub-elongate, angular.
Limestone: Light yellow to white, chalky, unconsolidated, amorphous.

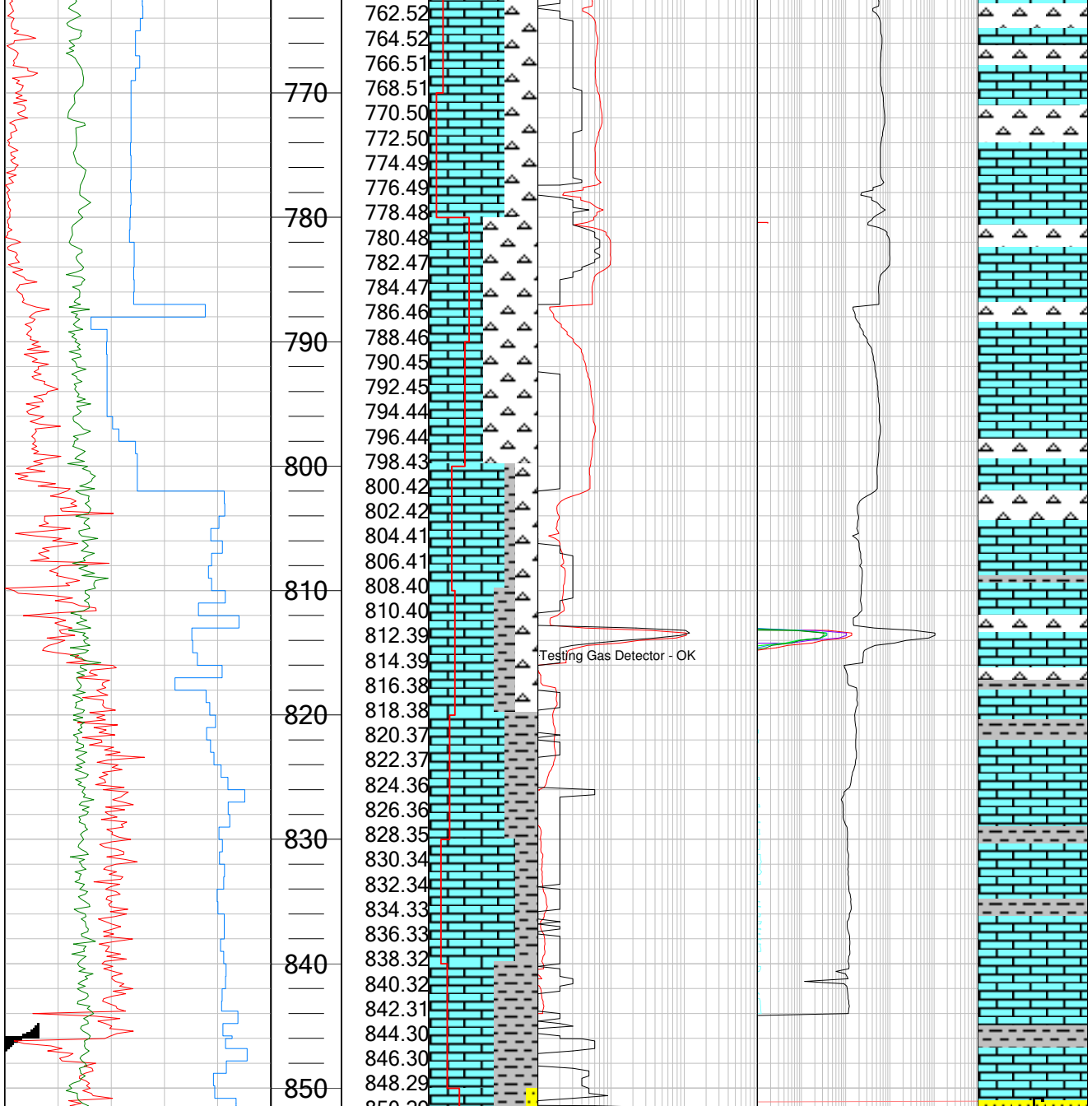
MWD Survey @ 767.0 m MDRT
Azi: 353.53, inc: 4.07°
TVD: 765.9 m

MW: 1.11 sg
PV: 16 cP
YP: 29 lbf/100ft2
pH: 9.4

MWD Survey @ 824.0 m MDRT
Azi: 351.05°, inc 4.15°
TVD: 822.77 m

Midnight depth on 22.05.2014:
843.0 m MDRT

Bit Run #2
17 ½" HCC Insert/Rollercone
SN: 5190800/EP620202
In @ 845.9 m, Out @ 1080.0 m

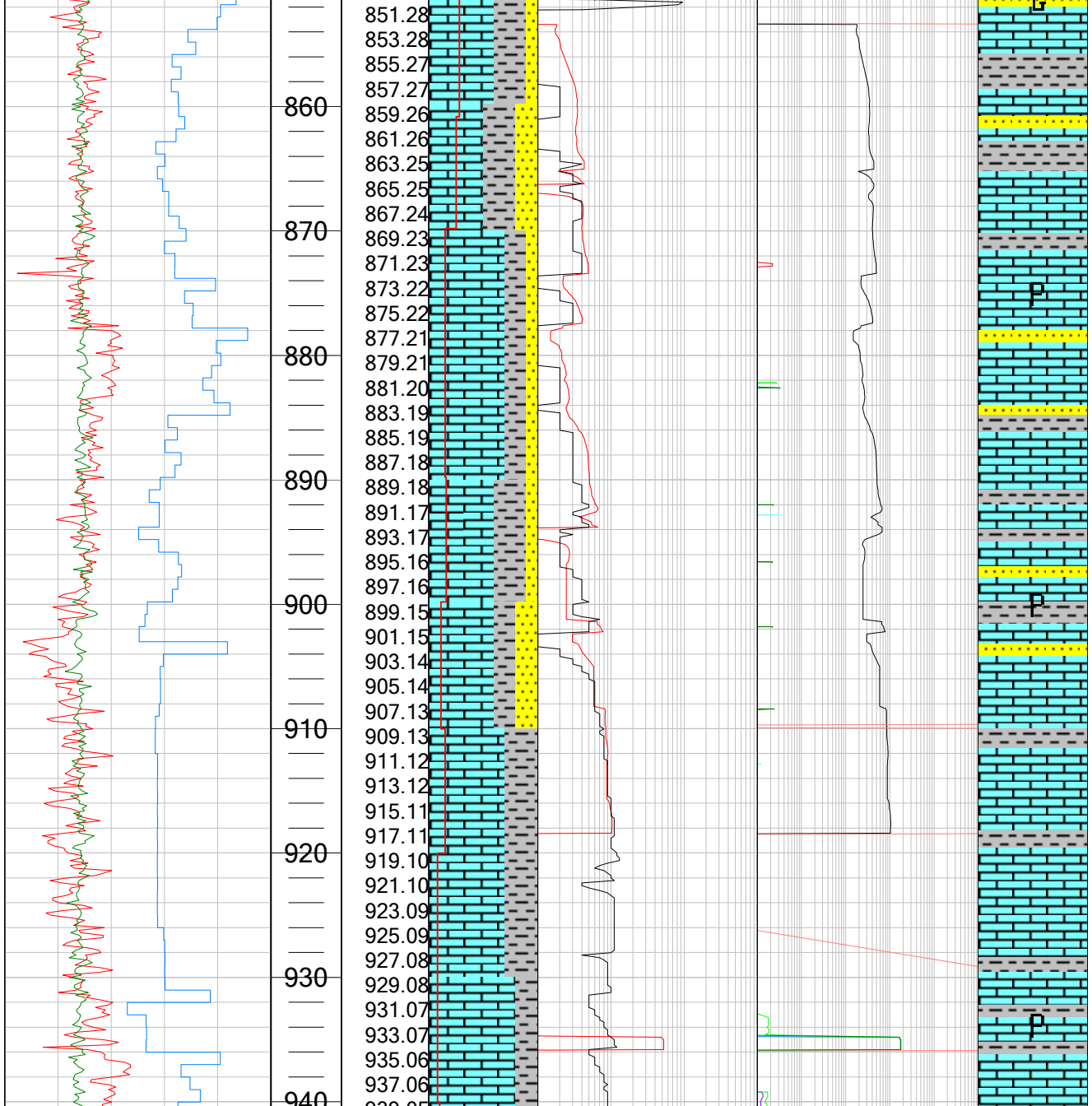


Chert: Black to dark grey, occasionally light brown, very hard, elongate, angular, vitreous

Limestone: Off white, milky, mudstone, soft, firm in places, glauconitic.

Claystone: Brownish grey to greenish grey, soft, sub-blocky to blocky, slightly calcareous.

Sandstone: White to yellow, translucent to transparent, very



MWD Survey @ 883.0 m MDRT
Azi: 348.31, Inc: 4.09°
TVD: 881.6 m

MWD Survey @ 912.0 m MDRT
Azi: 345.98, Inc: 4.22°
TVD: 910.5 m

Midnight depth on 23.05.2014:
930.0 m MDRT

SPP: 186 bar
RPM MM: 140

fine to dine, moderately to well sorted, rounded to sub-angular, loose quartz, glauconitic.

Limestone: Off white to white, light grey, wackestone to packstone, soft, firm in parts, chalky, glauconitic, nodules of pyrite.

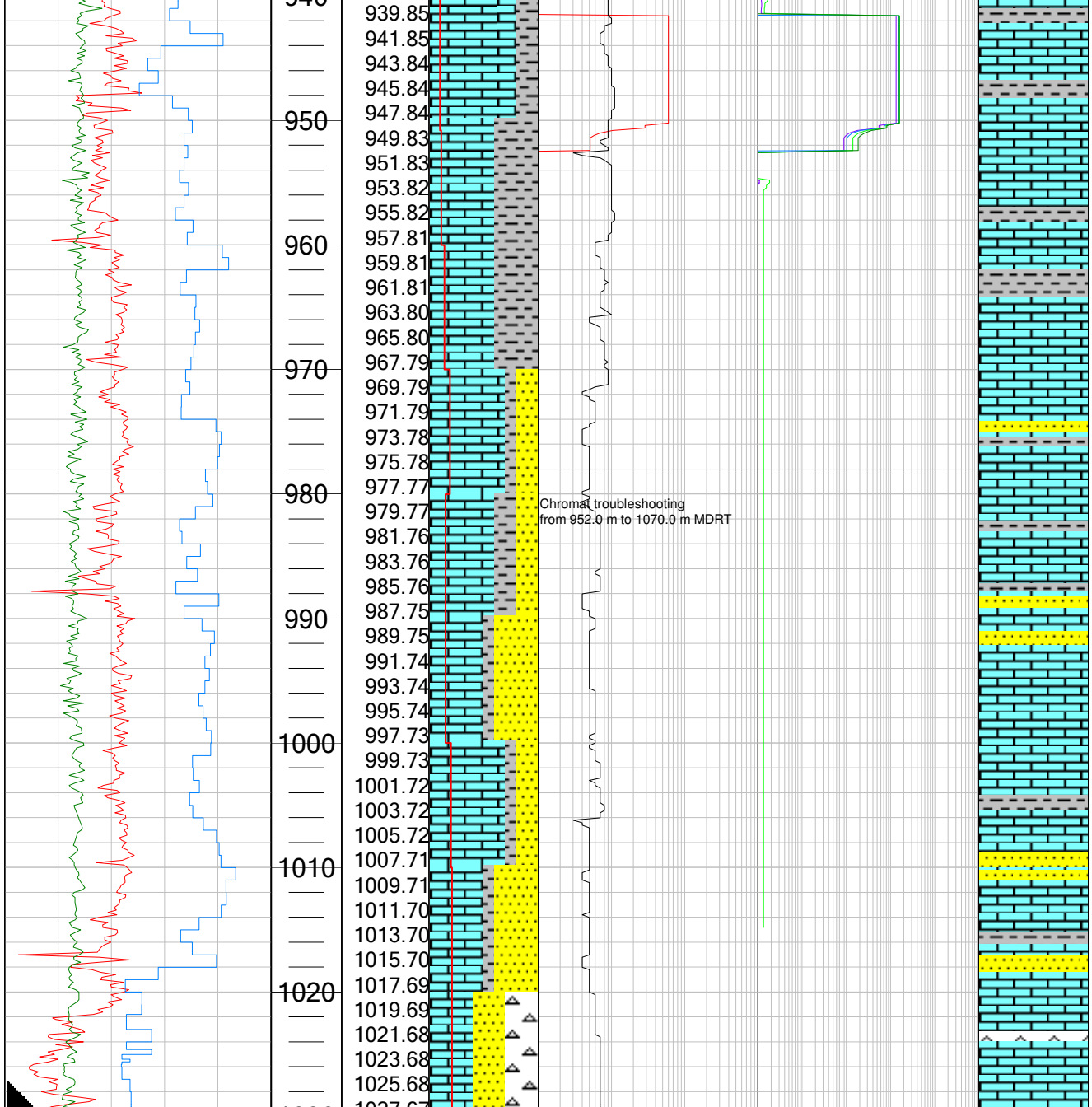
Claystone: Bluish dark grey to greenish grey, soft, amorphous, non-calcareous, trace pyrite,

Sandstone: White to translucent, Loose quartz,very fine to medium grained, trace pyrite.

Claystone: Bluish dark grey to greenish grey, soft, amorphous, non-calcareous, trace pyrite.

Limestone: Off white to light grey, packstone, glauconite, soft, chalky, trace pyrite.

WOB: 11.8 tons
F/in: 3510 l/min



MWD Survey @ 969.0 m MDRT
Azi: 340.05°, inc 3.69°
TVD: 967.4 m

MWD Survey @ 1027.0 m MDRT
Azi: 339.92°, inc 3.58°
TVD: 1025.3 m

13 ⅜" Casing set @ 1028.7 m MDRT

Claystone: Bluish dark grey to greenish grey, soft amorphous, non-calcareous, trace pyrite.

Sandstone: White to yellow, loose quartz, very fine to fine grained, well sorted.

Limestone: Off white to light grey, packstone, glauconite, soft, chalky, trace chert, trace pyrite.

Claystone: Bluish dark grey to greenish grey, soft amorphous, non-calcareous,

Sandstone: White to light grey, soft, very fine to medium grained, sub-spherical to spherical, moderately to well rounded, moderately sorted, calcareous matrix, matrix supported, poorly consolidated, translucent to off white quartz, trace pyrite

Chert: Black, white, brown to brownish grey, very hard, sub-elongate to elongate, angular.

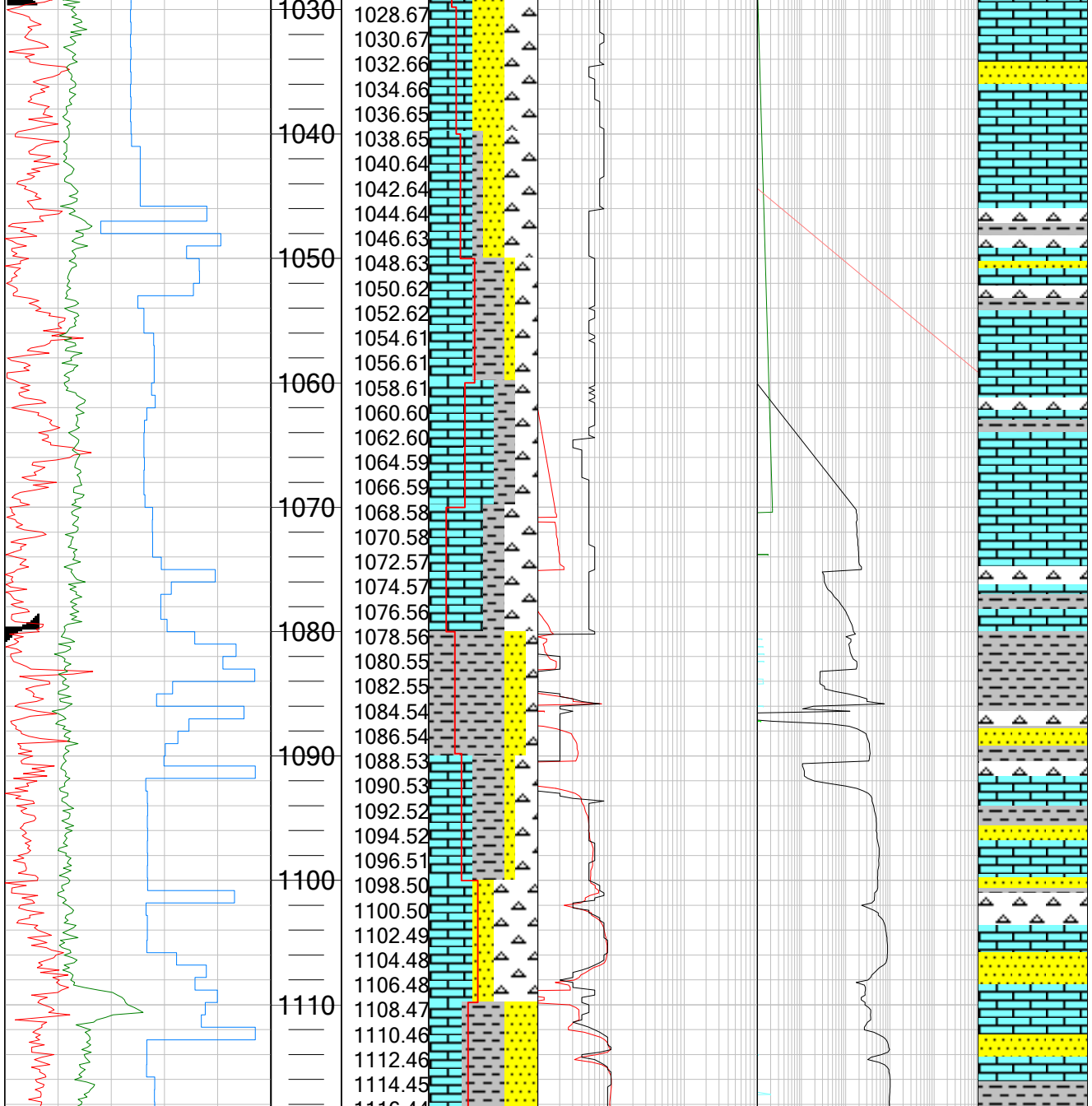
FIT to 1.46 s.g. EMW

MW: 1.18 sg
PV: 14 cP
YP: 22 lbf/100ft2
pH: 8.7

Bit Run #3
12 ¼" PDC; SN: 7147646
In @ 1080.0 m, Out @ 2565.1 m

Midnight depth on 01.06.2014:
1090.3 m MDRT

MWD Survey @ 1095.0 m MDRT
Azi: 342.55°, inc 4.26°
TVD: 1092.2 m



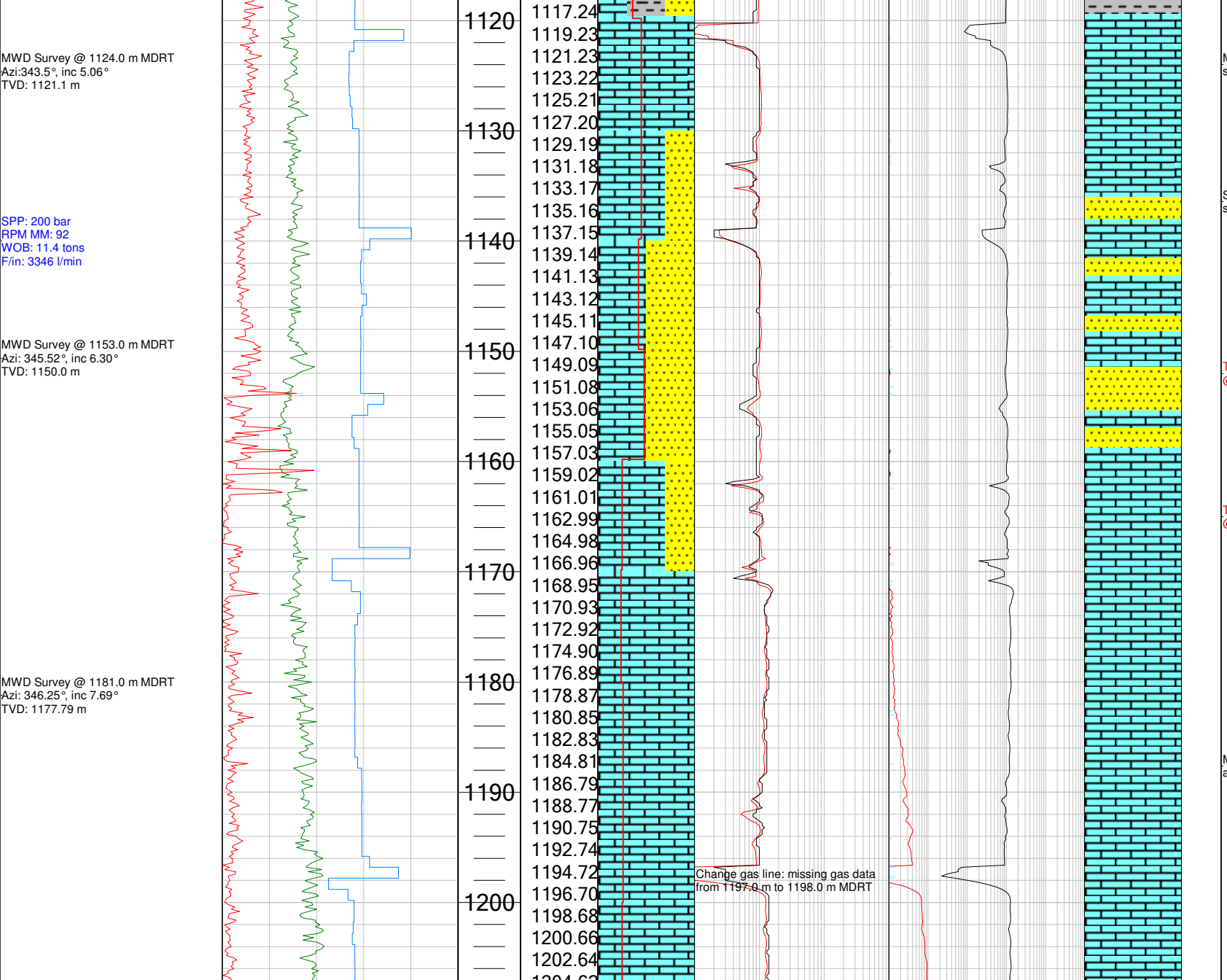
Claystone: Off white to yellowish grey, amorphous, unconsolidated, calcareous, argillaceous.

Claystone: Greenish black, firm, sub-blocky, non-calcareous.

Sandstone: Pearly to white, hard, very fine, spherical, rounded, well sorted, calcareous cement

Top of TEXEL FM / PLENUS MARL MBR
@ 1108.5 MDRT, 1106.5 TVD

Top of TEXEL MARLSTONE MBR
@ 1111.5 MDRT, 1109.0 TVD


MWD Survey @ 1124.0 m MDRT
Azi:343.5°, inc 5.06°
TVD: 1121.1 m
SPP: 200 bar
RPM MM: 92
WOB: 11.4 tons
F/in: 3346 l/min
MWD Survey @ 1153.0 m MDRT
Azi: 345.52°, inc 6.30°
TVD: 1150.0 m
MWD Survey @ 1181.0 m MDRT
Azi: 346.25°, inc 7.69°
TVD: 1177.79 m
1120
1130
1140
1150
1160
1170
1180
1190
1200
1117.24
1119.23
1121.23
1123.22
1125.21
1127.20
1129.19
1131.18
1133.17
1135.16
1137.15
1139.14
1141.13
1143.12
1145.11
1147.10
1149.09
1151.08
1153.06
1155.05
1157.03
1159.02
1161.01
1162.99
1164.98
1166.96
1168.95
1170.93
1172.92
1174.90
1176.89
1178.87
1180.85
1182.83
1184.81
1186.79
1188.77
1190.75
1192.74
1194.72
1196.70
1198.68
1200.66
1202.64
Change gas line: missing gas data
from 1197.0 m to 1198.0 m MDRT
Marl: Light to medium grey, soft, occasionally firm, sub-blocky to blocky, calcareous.
Sandstone: Pearly to off white, black, hard, very fine, sub-elongate, sub-rounded, well sorted, calcareous cement.
Top of TEXEL GREENSAND
@ 1152.0 MDRT, 1150.0 TVD
Top of HOLLAND FM / UPPER HOLLAND MARL
@ 1165.0 MDRT, 1162.0 TVD
Marl: Light to medium grey, soft, sub-blocky, occasionally amorphous, calcareous.

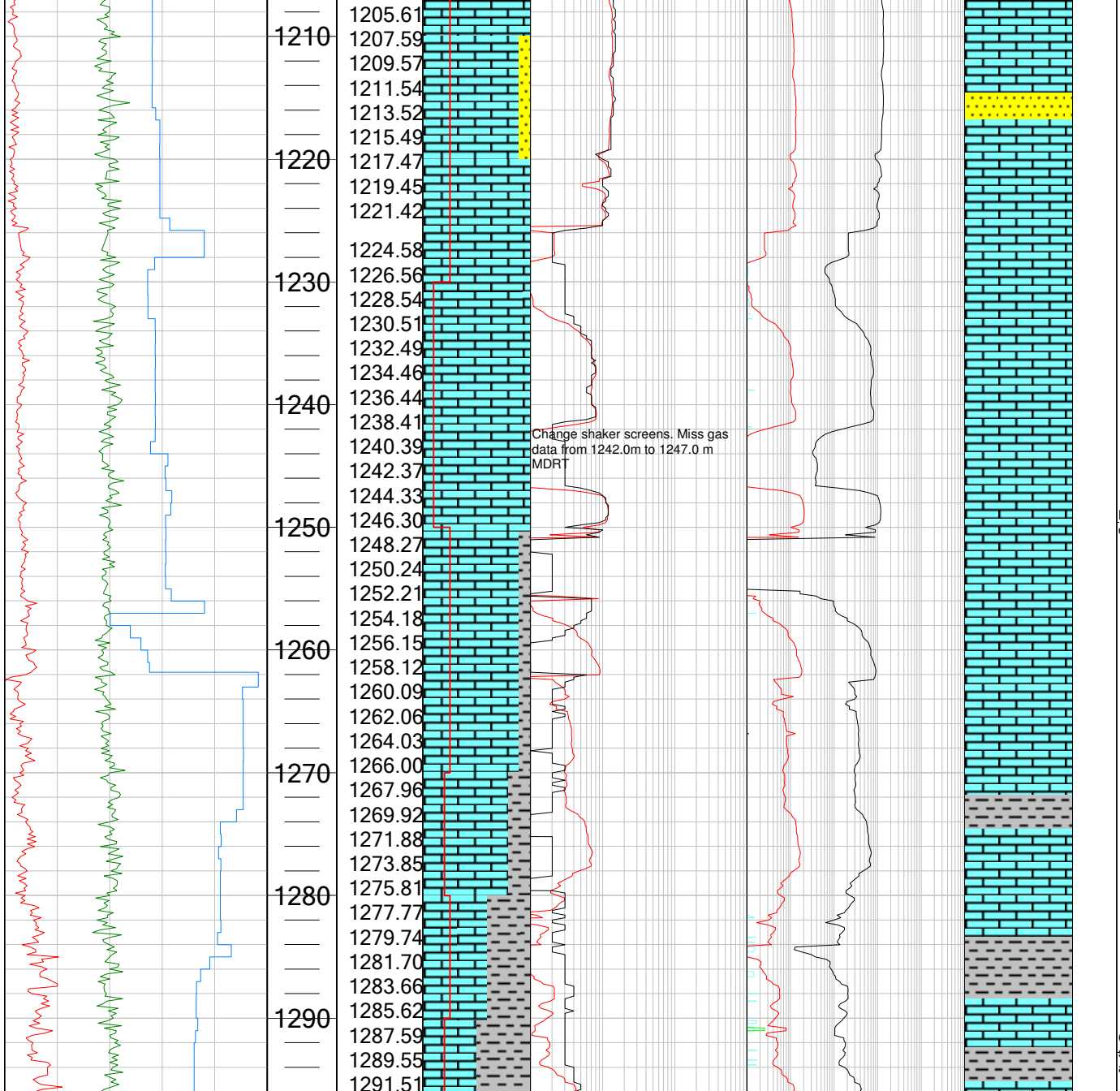
MWD Survey @ 1210.0 m MDRT
Azi: 347.1*, inc 8.22*
TVD: 1206.5 m

MWD Survey @ 1245.0 m MDRT
Azi: 348.38°, inc 9.57°
TVD: 1241.1 m

MW: 1.16 sg
PV: 26 cP
YP: 33 lbf/100ft2
pH: 9.4

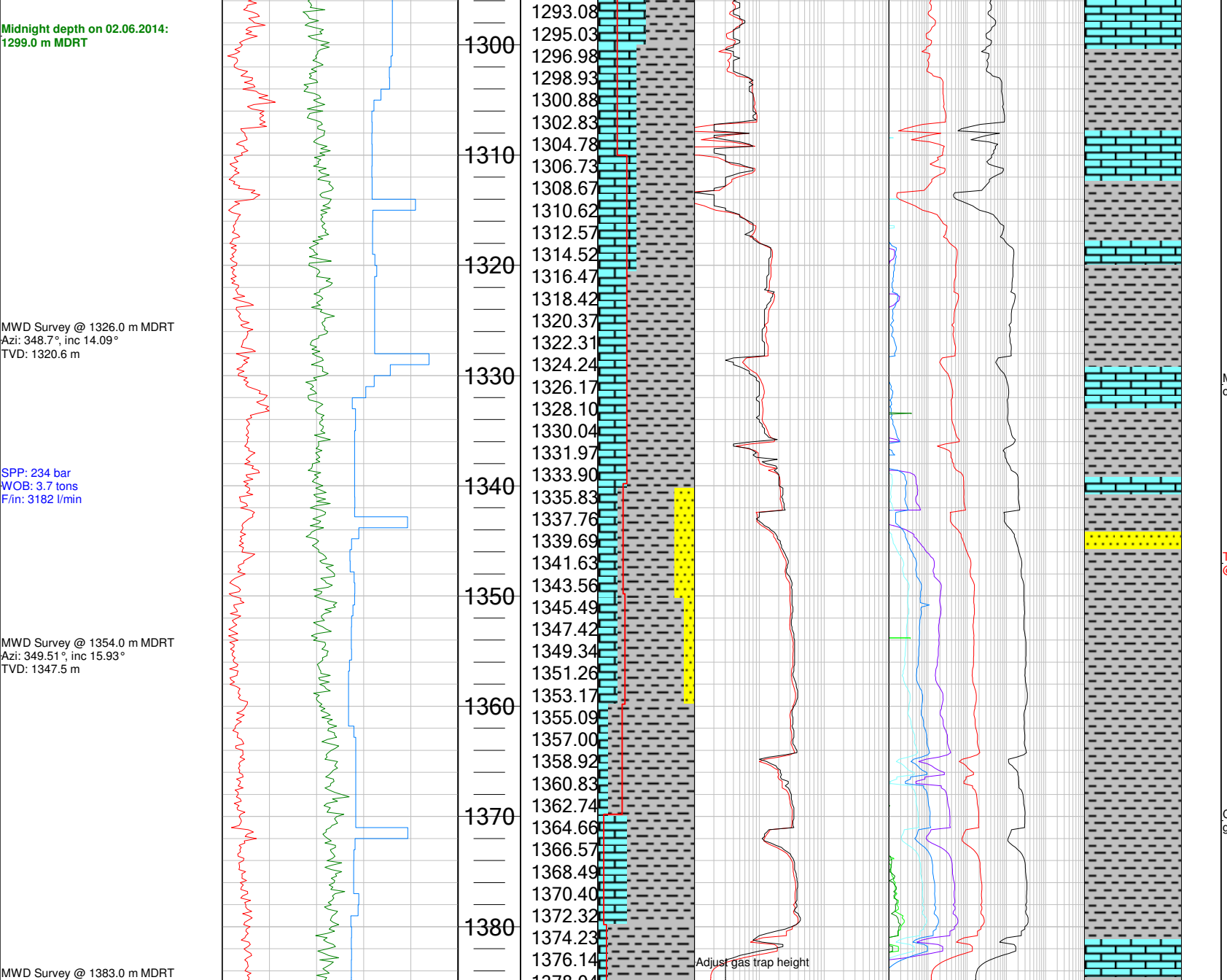
MWD Survey @ 1268.0 m MDRT
Azi: 347.9*, inc 10.39*
TVD: 1264.6 m

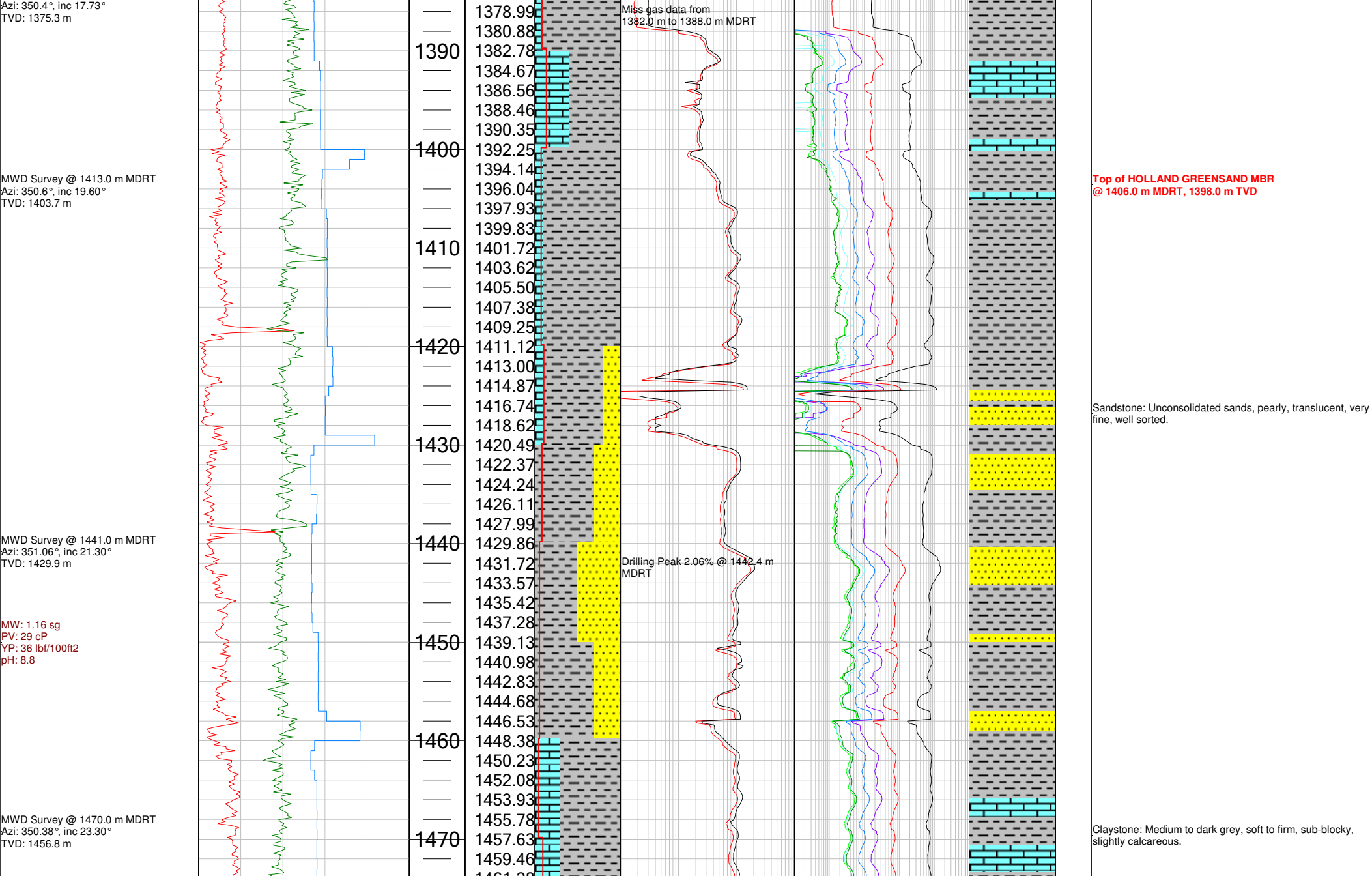
MWD Survey @ 1297.0 m MDRT
Azi: 348.78°, inc 14.09°
TVD: 1320.5 m

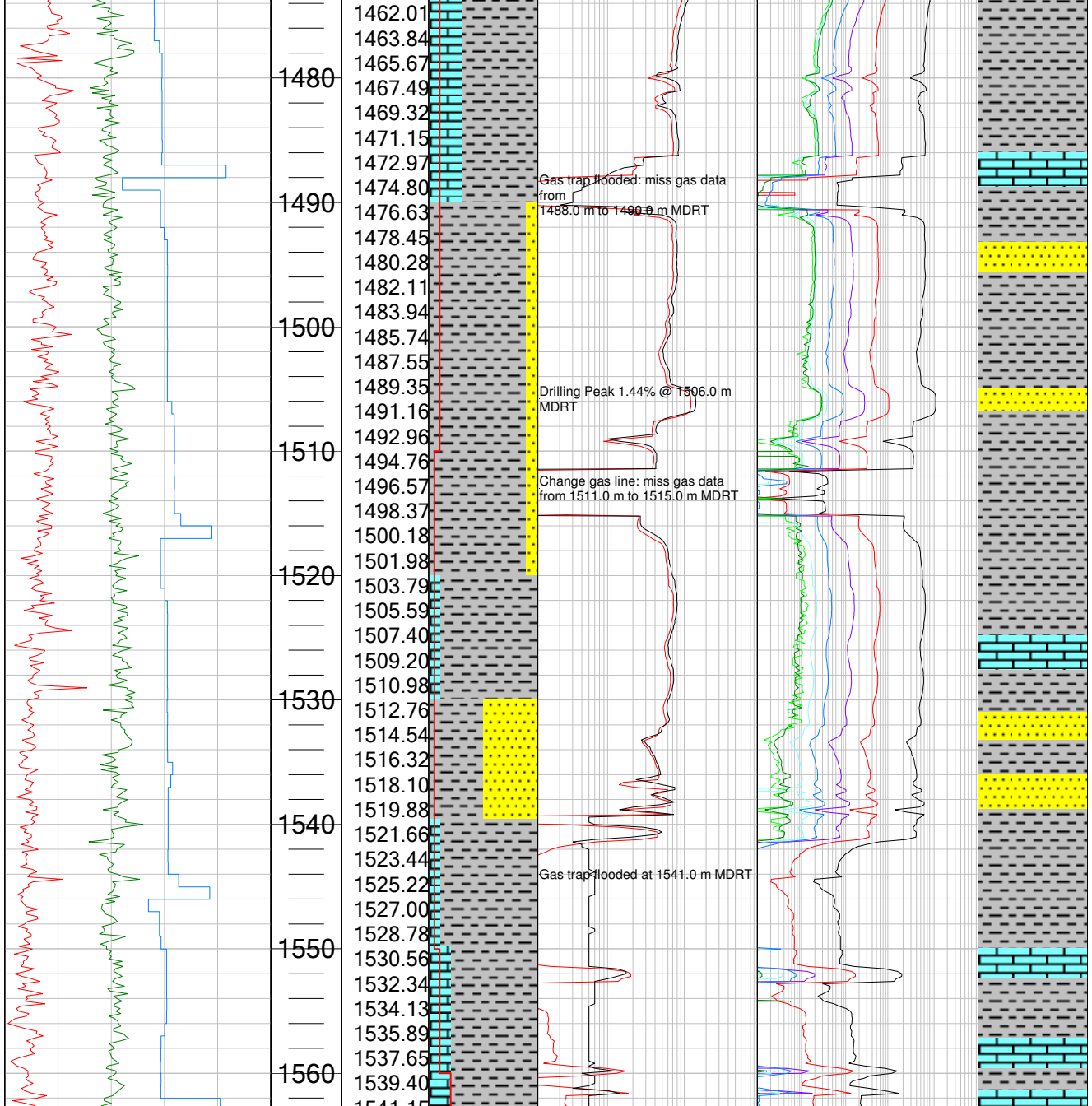


Marl: Light to medium grey, very soft, sub-blocky, calcareous.

Claystone: Grey to medium grey, soft to firm, blocky to sub-blocky, in parts grading to shale, occasionally argillaceous, calcareous.


Midnight depth on 02.06.2014:
1299.0 m MDRT
MWD Survey @ 1326.0 m MDRT
Azi: 348.7°, inc 14.09°
TVD: 1320.6 m
SPP: 234 bar
WOB: 3.7 tons
F/in: 3182 l/min
MWD Survey @ 1354.0 m MDRT
Azi: 349.51°, inc 15.93°
TVD: 1347.5 m
MWD Survey @ 1383.0 m MDRT
1293.08
1295.03
1296.98
1298.93
1300.88
1302.83
1304.78
1306.73
1308.67
1310.62
1312.57
1314.52
1316.47
1318.42
1320.37
1322.31
1324.24
1326.17
1328.10
1330.04
1331.97
1333.90
1335.83
1337.76
1339.69
1341.63
1343.56
1345.49
1347.42
1349.34
1351.26
1353.17
1355.09
1357.00
1358.92
1360.83
1362.74
1364.66
1366.57
1368.49
1370.40
1372.32
1374.23
1376.14
1300
1310
1320
1330
1340
1350
1360
1370
1380
Adjust gas trap height
Marl: Light to medium grey, soft to firm, sub-blocky, very calcareous.
Top of MIDDLE HOLLAND CLAYSTONE MBR
@ 1347.0 MDRT, 1341.0 TVD
Claystone: Grey to medium dark grey, occasionally dark grey, soft to firm, sub-blocky to blocky, calcareous.


Azi: 350.4°, inc 17.73°
TVD: 1375.3 m
MWD Survey @ 1413.0 m MDRT
Azi: 350.6°, inc 19.60°
TVD: 1403.7 m
MWD Survey @ 1441.0 m MDRT
Azi: 351.06°, inc 21.30°
TVD: 1429.9 m
MW: 1.16 sg
PV: 29 cP
YP: 36 lbf/100ft2
pH: 8.8
MWD Survey @ 1470.0 m MDRT
Azi: 350.38°, inc 23.30°
TVD: 1456.8 m
1390
1400
1410
1420
1430
1440
1450
1460
1470
1378.99
1380.88
1382.78
1384.67
1386.56
1388.46
1390.35
1392.25
1394.14
1396.04
1397.93
1399.83
1401.72
1403.62
1405.50
1407.38
1409.25
1411.12
1413.00
1414.87
1416.74
1418.62
1420.49
1422.37
1424.24
1426.11
1427.99
1429.86
1431.72
1433.57
1435.42
1437.28
1439.13
1440.98
1442.83
1444.68
1446.53
1448.38
1450.23
1452.08
1453.93
1455.78
1457.63
1459.46
Miss gas data from
1382.0 m to 1388.0 m MDRT
Drilling Peak 2.06% @ 1442.4 m
MDRT
Top of HOLLAND GREENSAND MBR
@ 1406.0 m MDRT, 1398.0 m TVD
Sandstone: Unconsolidated sands, pearly, translucent, very fine, well sorted.
Claystone: Medium to dark grey, soft to firm, sub-blocky, slightly calcareous.



MWD Survey @ 1499.0 m MDRT
Azi: 349.73°, inc 24.73°
TVD: 1483.2 m

MWD Survey @ 1527.0 m MDRT
Azi: 349.12°, inc 26.35°
TVD: 1508.5 m

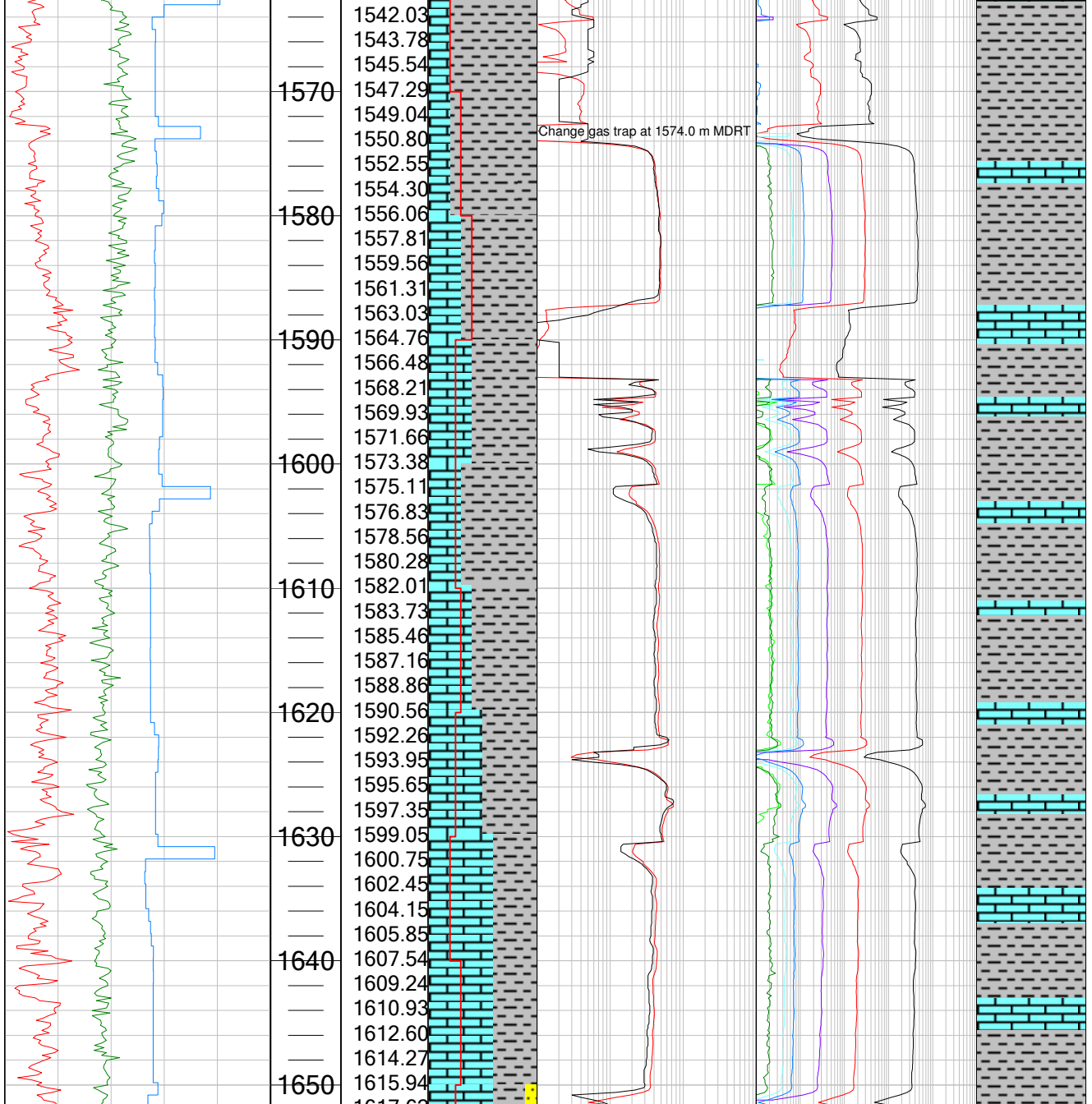
SPP: 299 bar
WOB: 5.5 tons
F/in: 3513 l/min

MWD Survey @ 1556.0 m MDRT
Azi: 348.7°, inc 27.88°
TVD: 1535.2 m

Sandstone: Pearly to off white, translucent, very fine, very well sorted, loose, unconsolidated sands.

Claystone: Medium to dark grey, soft to firm, sub-blocky, slightly calcareous.

Claystone: Light grey to medium dark grey, soft to firm, in parts amorphous, sub-blocky, slightly calcareous.



Top of LOWER HOLLAND MARL MBR @ 1563.0 m MDRT, 1542.0 m TVD

MWD Survey @ 1585.0 m MDRT
Azi: 347.69°, inc 29.63°
TVD: 1559.7 m

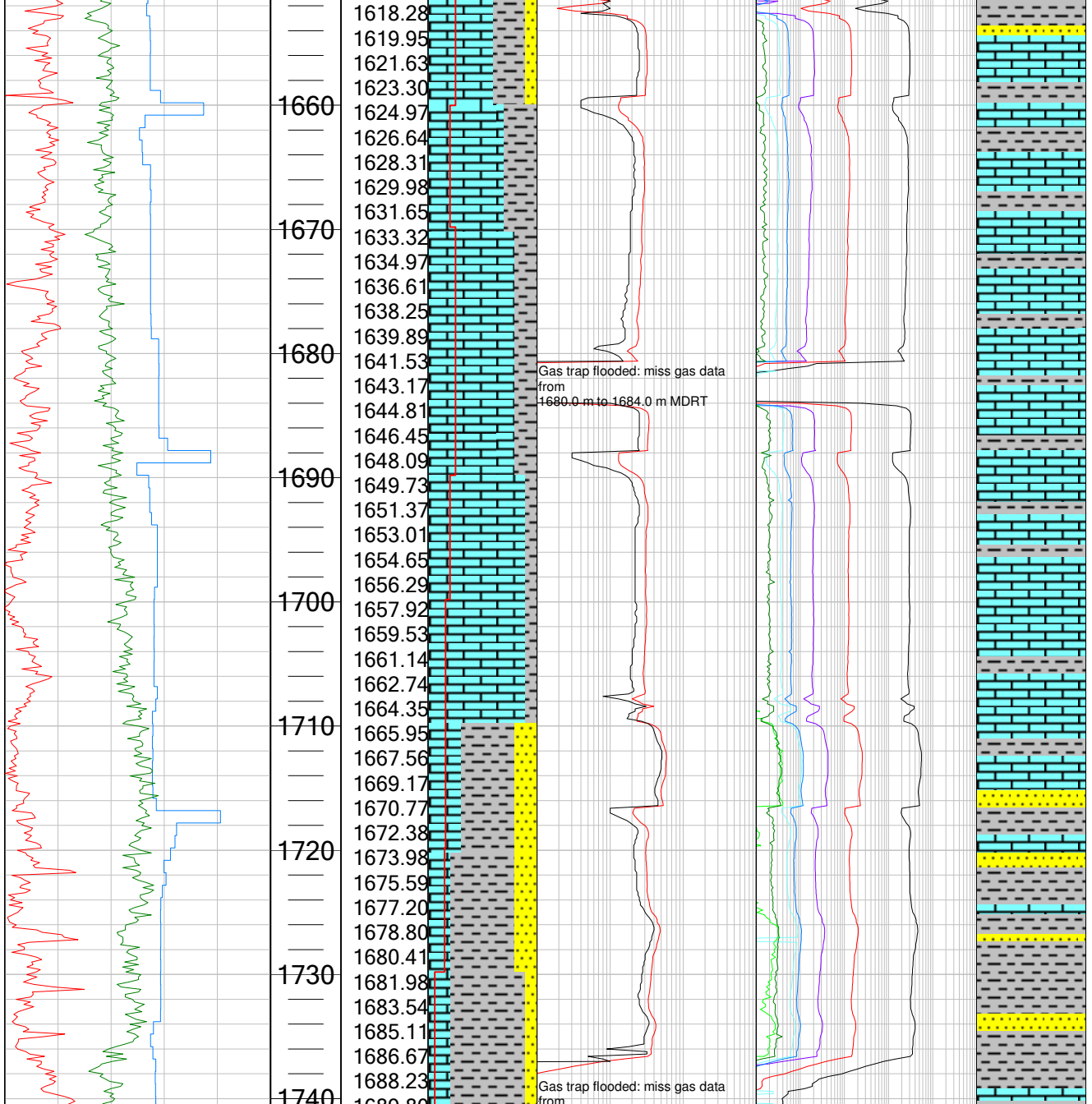
Claystone: Medium grey to dark grey, firm, in parts moderately hard, in parts fissile, sub-blocky, bituminous.

Marl: Light to medium grey, soft to firm, sub-blocky, calcareous.

MW: 1.17 sg
PV: 34 cP
YP: 38 lbf/100ft2
pH: 8.4

Claystone: Medium grey to dark grey, firm, in parts moderately hard, in parts fissile, sub-blocky, calcareous.

MWD Survey @ 1643.0.0 m MDRT
Azi: 348.44°, inc 32.56°
TVD: 1610.26 m



Midnight depth on 03.06.2014:
1648.0 m MDRT

MWD Survey @ 1671.0 m MDRT
Azi: 349.33° Inc 34.09°
TVD: 1633.7 m

MWD Survey @ 1700 m MDRT
Azi: 349.32 inc 35.71
TVD: 1657.4 m

MWD Survey @ 1729.0 m MDRT
Azi: 349.36°, inc 37.44°
TVD: 1680.7 m

SPP: 315 bar, F/In: 3505 l/min

Sandstone: Greenish grey to dark grey, black, hard, very fine, argillaceous, sub-rounded, well sorted, glauconitic.

Marl: Light to medium grey, soft to firm, sub-blocky, calcareous.

Claystone: Medium grey to dark grey, firm, in parts moderately hard, in parts fissile, sub-blocky, calcareous.

Sandstone: Greenish grey to dark grey, black, hard, very fine, argillaceous, sub-rounded, well sorted, glauconitic, lignitic.

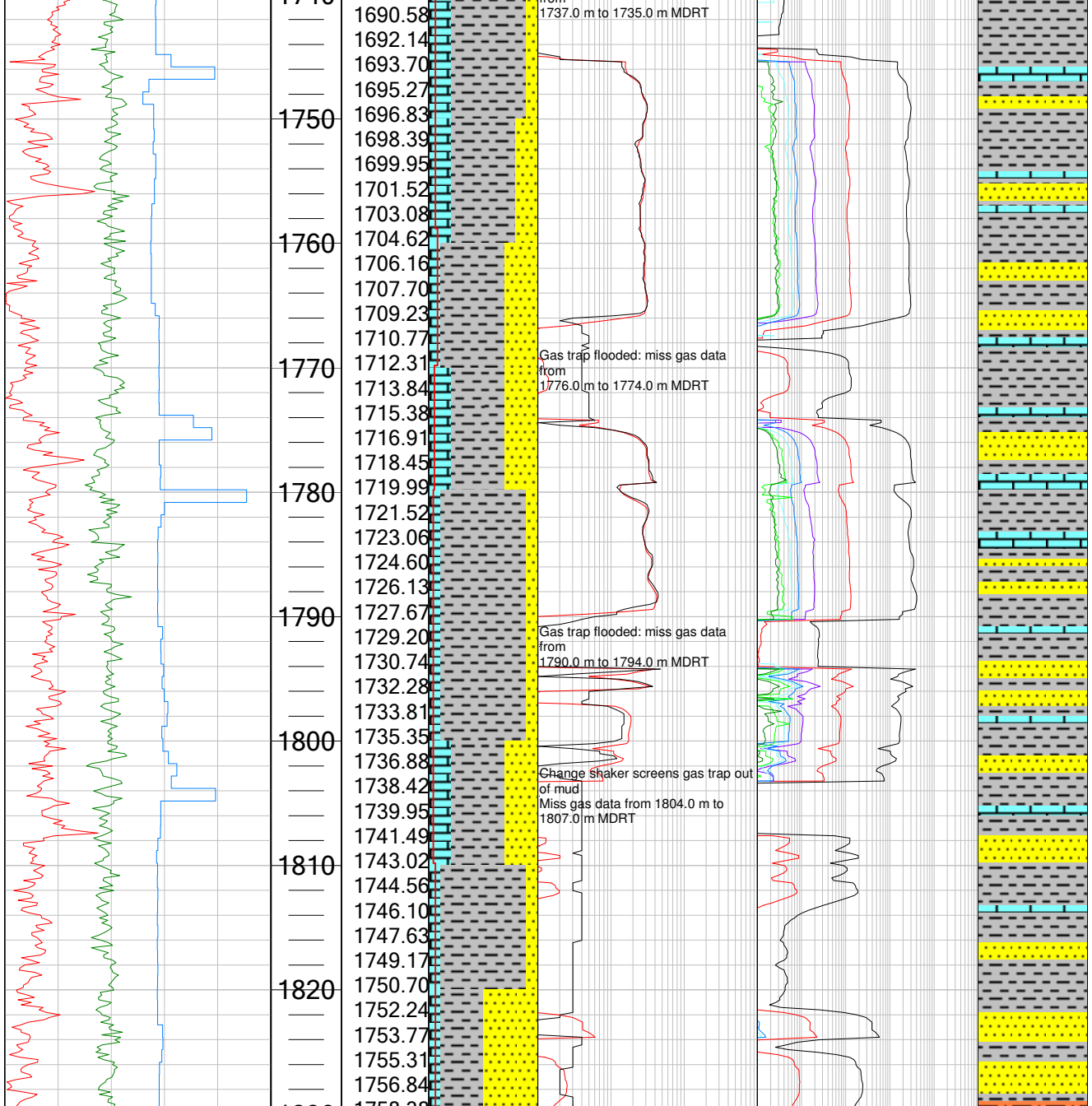
Top of VLIELAND SANDSTONE FM / DE LIER SANDSTONE MBR @ 1736.0 m MDRT, 1686.0 m TVD

Trd: 13 KNm, WOB: 5.8 tons

MWD Survey @ 1758.0 m MDRT
Azi: 347.08°, inc 39.76°
TVD: 1703.4 m

MWD Survey @ 1786.0 m MDRT
Azi: 345.01°, inc 39.76°
TVD: 1724.9 m

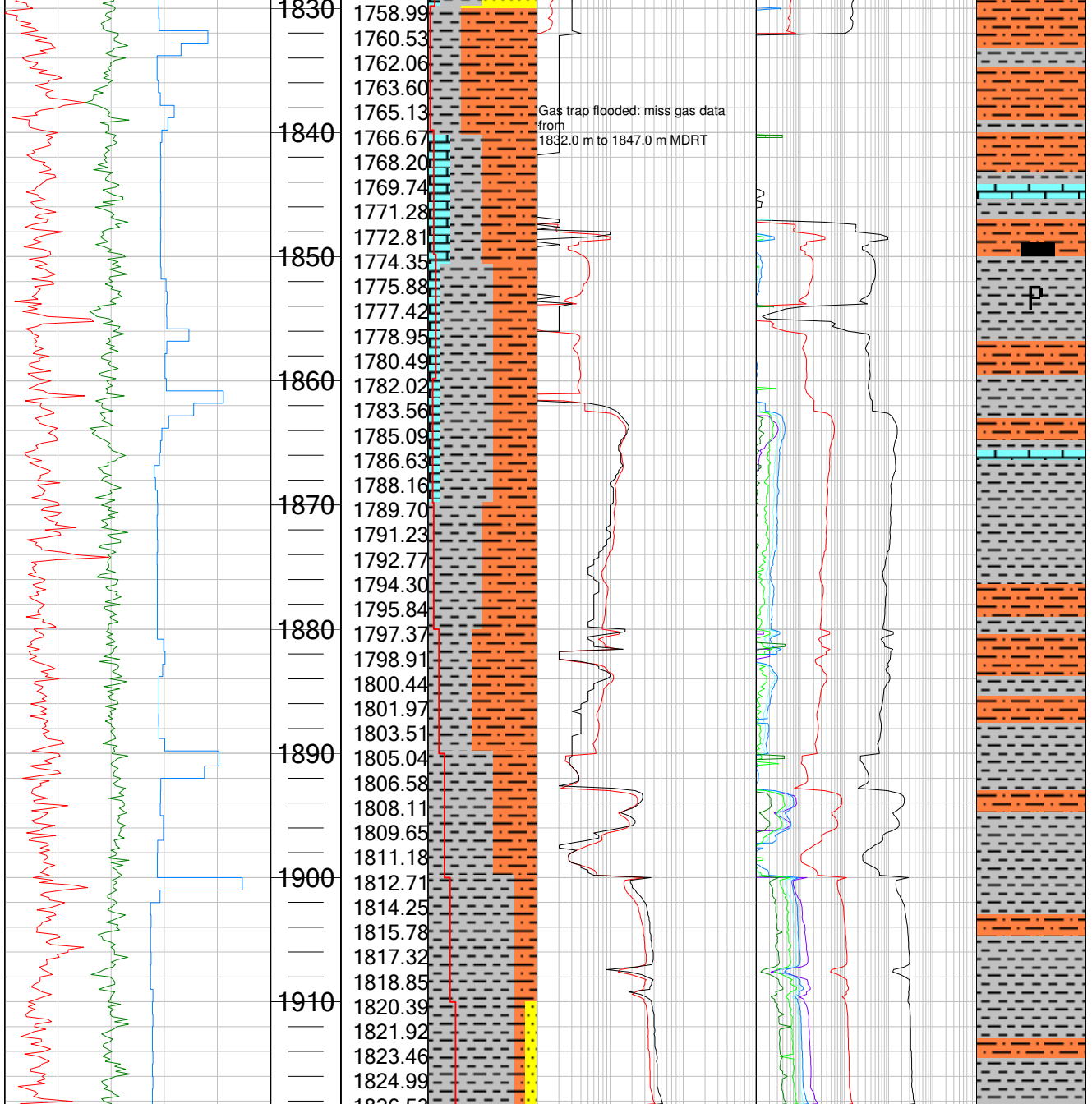
MWD Survey @ 1815.0 m MDRT
Azi: 345.59°, inc 39.84°
TVD: 1746..3 m



Claystone: Light to medium grey, soft,. amorphous, very sticky, sandy, calcareous.

Sandstone: Light brown, light grey, hard, very fine to silty, sub-elongate, sub-rounded, moderately sorted, good siliceous cement.

Sandstone: Light to medium brown, firm to hard, occasionally very hard, very fine to silty, sub-elongate, sub-rounded, well sorted, good siliceous cement.



Top of VLIELAND CLAY MBR
@ 1838.0 m MDRT, 1765.0 m TVD

MWD Survey @ 1844.0 m MDRT
Azi: 345.76°, inc 39.87°
TVD: 1768.6 m

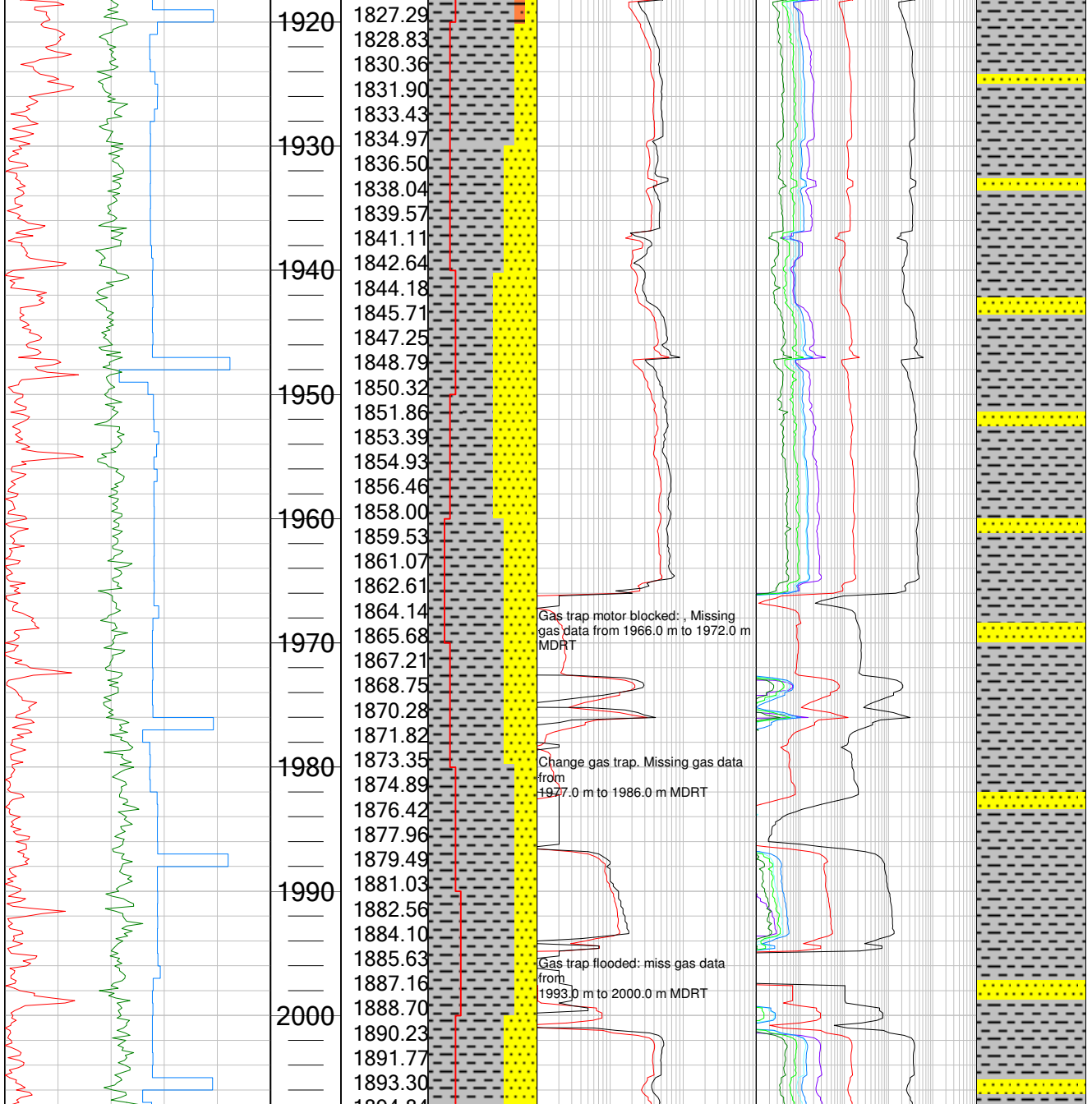
MW: 1.18sg
PV: 34 cP
YP: 39 lbf/100ft2
pH: 8.4

Siltstone: Light brown, firm, silty to very fine, sub-elongate, sub-rounded, well sorted, trace lignite, trace pyrite.

MWD Survey @ 1873.0 m MDRT
Azi: 345.73°, inc 39.85°
TVD: 1790.8 m

MWD Survey @ 1902.0 m MDRT
Azi: 346.81°, inc 39.95°
TVD: 1813.1 m

Claystone: Light grey to medium grey, soft, amorphous, silty, occasionally sandy, sticky, slightly calcareous.



MWD Survey @ 1931.0 m MDRT
Azi: 347.15°, inc 39.83°
TVD: 1835.3 m

SPP: 329 bar, F/In: 3422 l/min
Trq: 17 KNm, WOB: 6.4 tons

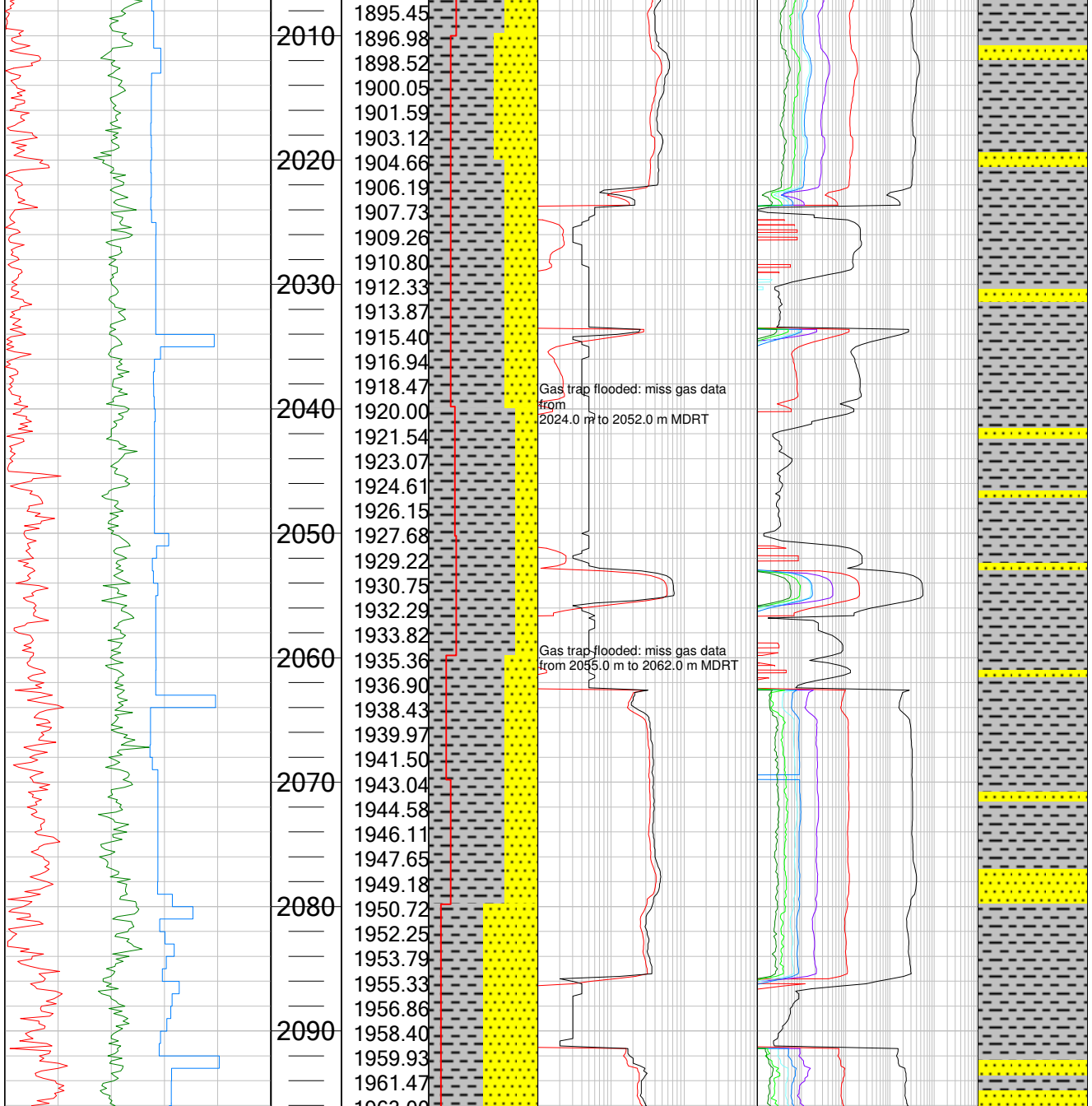
MWD Survey @ 1960.0 m MDRT
Azi: 347.2 °, inc 39.85°
TVD: 1858.5 m

MWD Survey @ 1988.0 m MDRT
Azi: 348.84°, inc 39.87°
TVD: 1879.1 m

Midnight depth on 04.06.2014: 2002.0 m MDRT

Sandstone: Greenish grey to dark grey, in parts brownish grey, friable, occasionally hard, very fine to medium grain, sub-angular to sub-rounded, moderately sorted, hi glauconitic and lignitic.

Claystone: Light grey to medium grey, soft, amorphous, silty, occasionally sandy, sticky, slightly calcareous.



MWD Survey @ 2017.0 m MDRT
Azi: 349.09°, inc 39.94°
TVD: 1901.3 m

MWD Survey @ 2046.0 m MDRT
Azi: 349.6°, inc 39.81°
TVD: 1923.6 m

MW: 1.20 sg
PV: 31 cP
YP: 32 lbf/100ft2
pH: 8.1

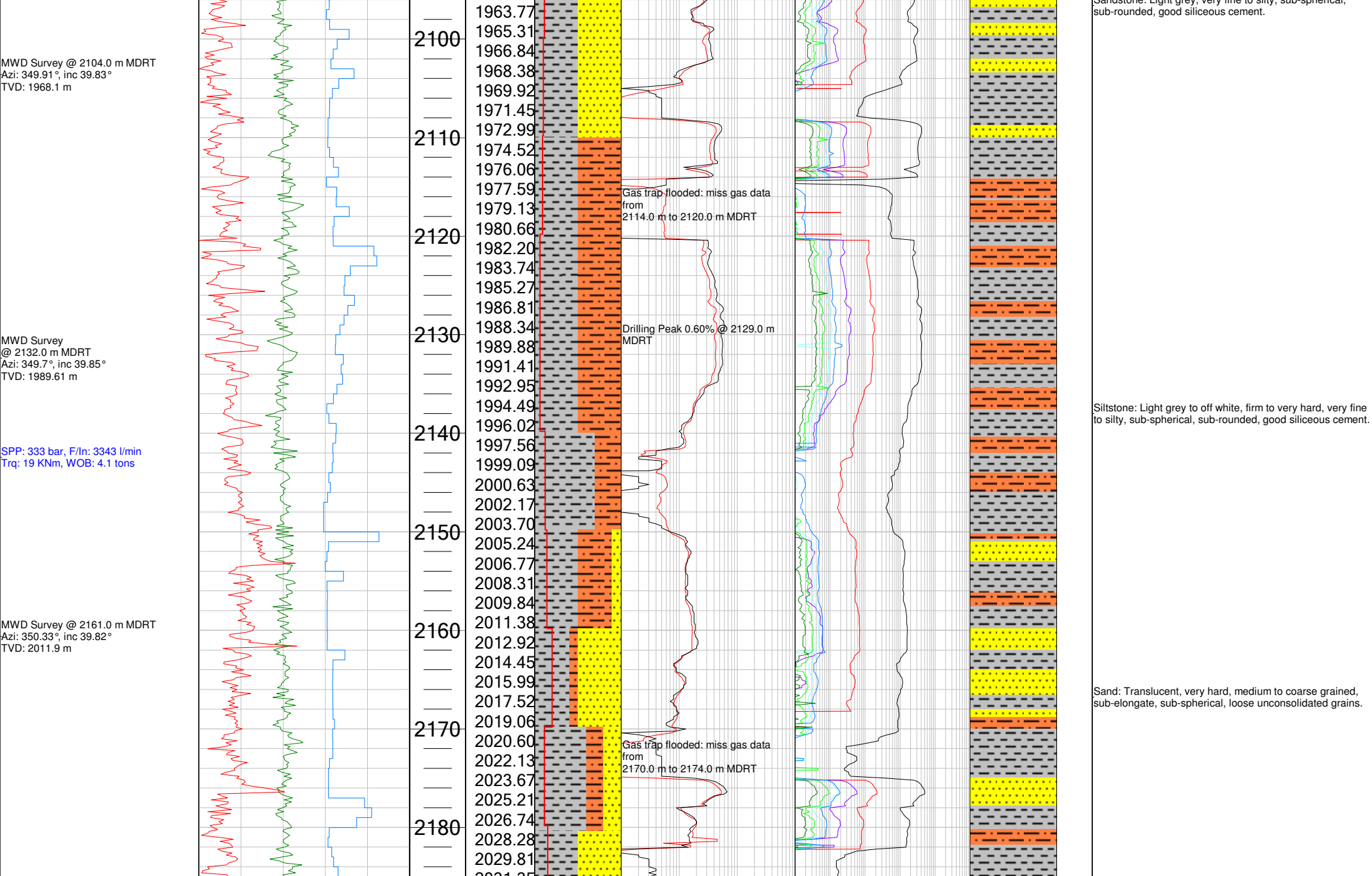
MWD Survey @ 2075.0 m MDRT
Azi: 349.5°, inc 39.85°
TVD: 1945.6 m

Sandstone: Greenish grey to dark grey, soft, occasionally hard, very fine to medium grain, sub-rounded, moderately sorted, glauconitic and lignitic.

Claystone: Light grey to medium grey, soft, amorphous, silty, occasionally sandy, sticky, slightly calcareous.

Top of BERKEL SANDSTONE MBR @ 2084.0 m MDRT, 1954.0 m TVD

Sandstone: Light grey, very fine to silty, sub spherical

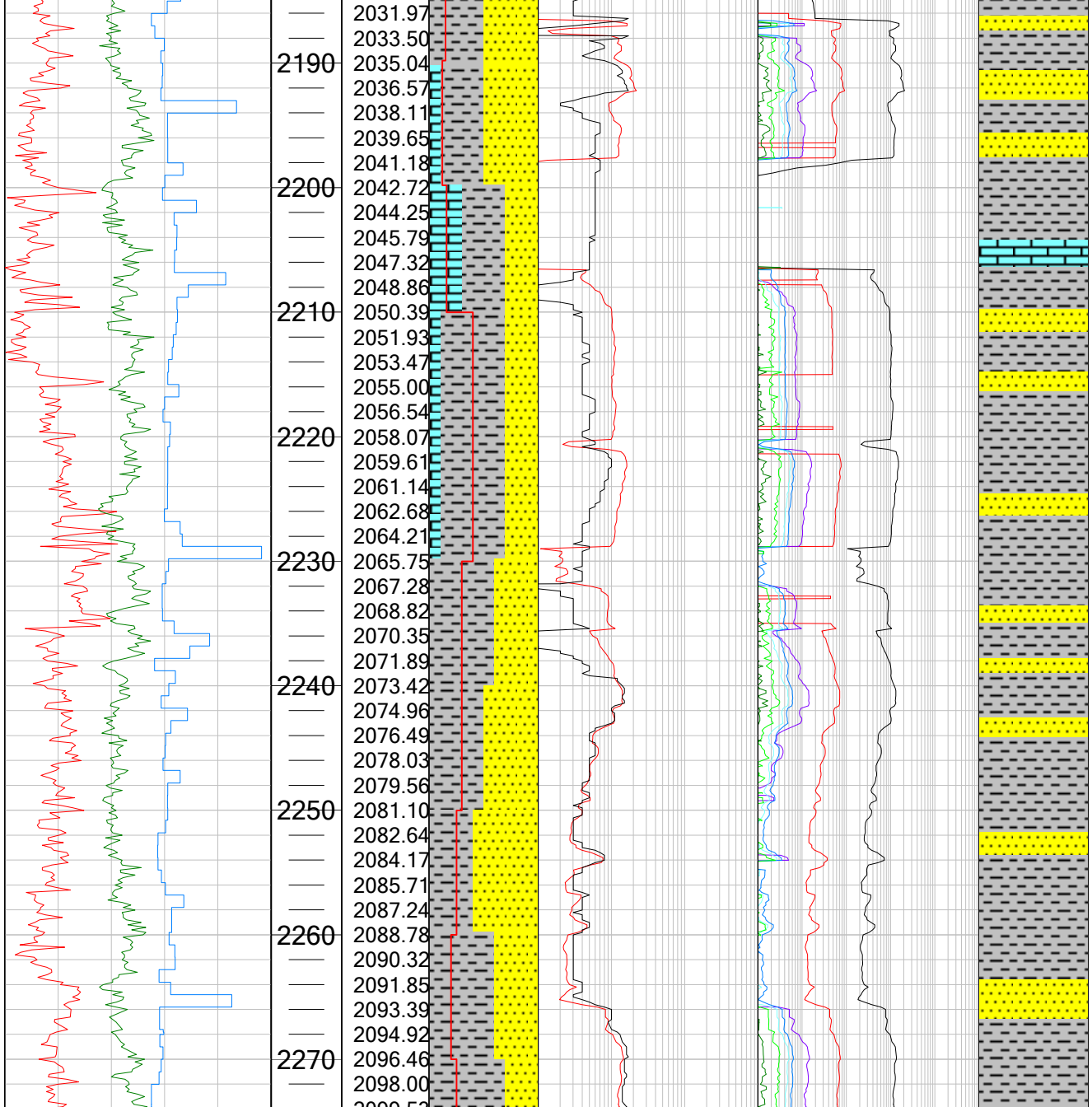

MWD Survey @ 2104.0 m MDRT
Azi: 349.91°, inc 39.83°
TVD: 1968.1 m
MWD Survey
@ 2132.0 m MDRT
Azi: 349.7°, inc 39.85°
TVD: 1989.61 m
SPP: 333 bar, F/In: 3343 l/min
Trq: 19 KNm, WOB: 4.1 tons
MWD Survey @ 2161.0 m MDRT
Azi: 350.33°, inc 39.82°
TVD: 2011.9 m
2100
2110
2120
2130
2140
2150
2160
2170
2180
1963.77
1965.31
1966.84
1968.38
1969.92
1971.45
1972.99
1974.52
1976.06
1977.59
1979.13
1980.66
1982.20
1983.74
1985.27
1986.81
1988.34
1989.88
1991.41
1992.95
1994.49
1996.02
1997.56
1999.09
2000.63
2002.17
2003.70
2005.24
2006.77
2008.31
2009.84
2011.38
2012.92
2014.45
2015.99
2017.52
2019.06
2020.60
2022.13
2023.67
2025.21
2026.74
2028.28
2029.81
Gas trap flooded: miss gas data from
2114.0 m to 2120.0 m MDRT
Drilling Peak 0.60% @ 2129.0 m MDRT
Gas trap flooded: miss gas data from
2170.0 m to 2174.0 m MDRT
Sandstone: Light grey, very fine to silty, sub-spherical, sub-rounded, good siliceous cement.
Siltstone: Light grey to off white, firm to very hard, very fine to silty, sub-spherical, sub-rounded, good siliceous cement.
Sand: Translucent, very hard, medium to coarse grained, sub-elongate, sub-spherical, loose unconsolidated grains.

MWD Survey @ 2190.0 m MDRT
Azi: 348.73°, inc 39.81°
TVD: 2034.2 m

MWD Survey @ 2219.0 m MDRT
Azi: *348.23°, inc 39.87°
TVD: 2057.3 m

MWD Survey @ 2248. m MDRT
Azi: 248.25°, inc 39.86°
TVD: 2080.9 m

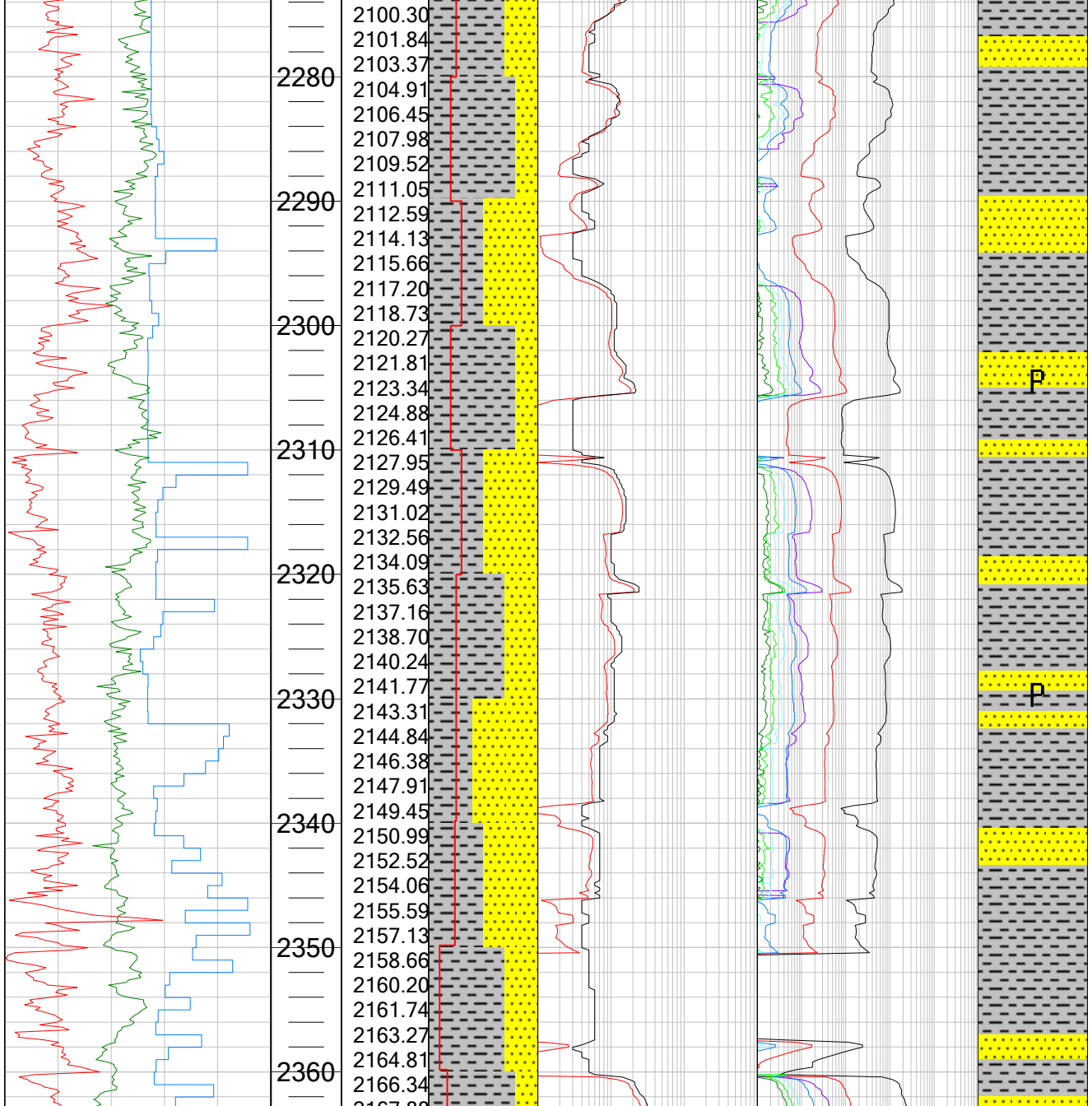
MW: 1.20sg
PV: 25 cP
YP: 21 lbf/100ft2
pH: 8.7



Top of BERKEL SAND/CLAYSTONE MBR @ 2195.5 m MDRT, 2036.0 m TVD

Sandstone: Light grey to beige, firm to hard, very fine to very coarse, sub-elongate, angular to sub-rounded, poorly sorted, good siliceous cement.

Claystone: Brownish grey, medium to dark grey, firm, moderately hard in parts, silty, sub-blocky, slightly, non calcareous.



MWD Survey @ 2277.0 m MDRT
Azi: 348.90°, inc 39.79°
TVD: 2101.8 m

MWD Survey @ 2305.0 m MDRT
Azi: 349.47°, inc 39.85°
TVD: 2126.9 m

Midnight depth on 05.06.2014:
2307.0 m MDRT

MWD Survey @ 2334.0 m MDRT
Azi: 348.23°, inc .93 83°
TVD: 2149.1 m

SPP: 333 bar, F/In: 3323 l/min
Trq: 20 KNm, WOB: 8.9 tons

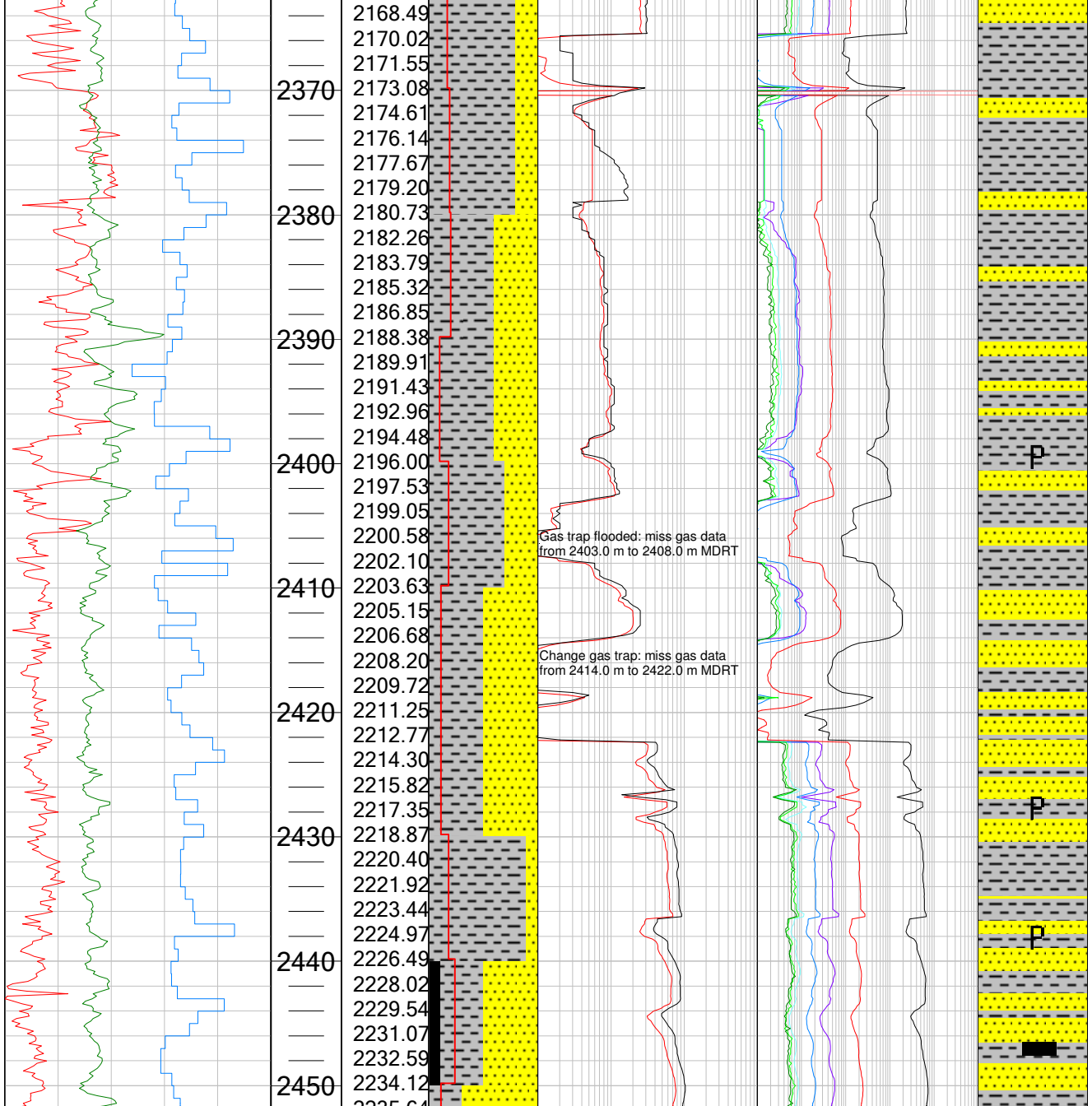
MWD Survey @ 2362.0 m MDRT
Azi: 348.22°, inc 39.48°
TVD: 2170.6 m

Sandstone: Light grey to beige, greenish grey to dark grey, firm to hard, fine to coarse grain, sub-angular to sub-rounded, elongate to spherical, poorly sorted, siliceous cement, glauconitic and lignitic.

Claystone: Dark grey to greyish black, firm, silty, occasionally fissile, sub-blocky, sideritic.

Sandstone: Light grey to beige, firm to hard, very fine to coarse, sub-elongate to sub-spherical, sub-angular to sub-rounded, poorly sorted, good siliceous cement.

Top of RIJSWIJK SANDSTONE MBR @ 2357.0 m MDRT, 2163.0 m TVD



MWD Survey @ 2391.0 m MDRT
Azi: 348.79°, inc 40.34°
TVD: 2189.3 m

MWD Survey @ 2420.0 m MDRT
Azi: 348.08°, inc 40.34°
TVD: 2211.4 m

Sandstone: Light grey to beige, firm to hard, very fine to coarse, poorly sorted, sub-elongate to sub-spherical, sub-rounded to sub-angular, some pyritized.

MWD Survey @ 2449.0 m MDRT
Azi: 346.89°, inc 40.34°
TVD: 2233.5 m

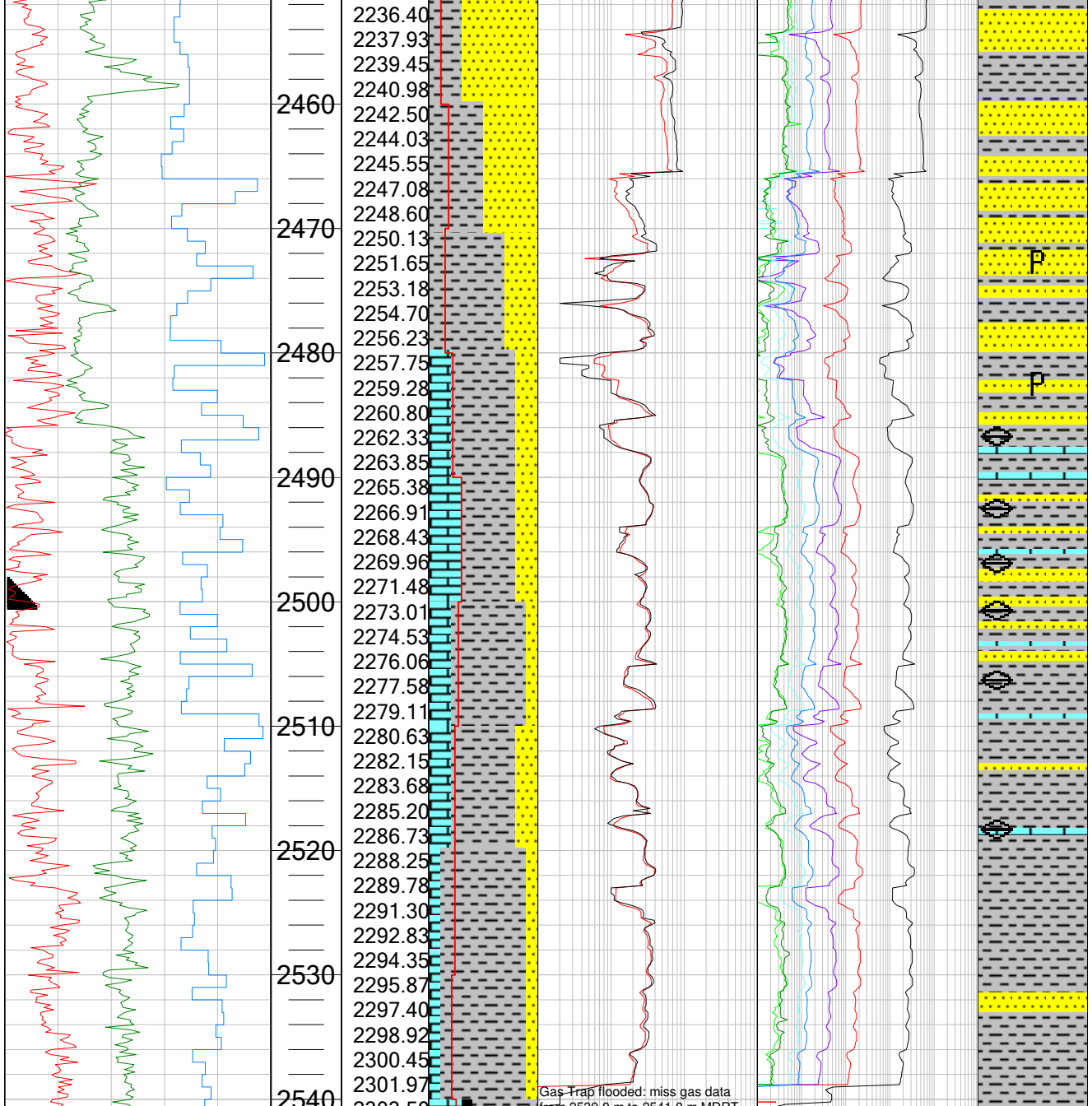
MW: 1.19sg
PV: 23 cP
YP: 27 lbf/100ft2
pH: 8.7

MWD Survey @ 2478.0 m MDRT
Azi: 348.52°, inc 40.29°
TVD: 225.6 m

Midnight depth on 06.06.2014:
2493.0 m MDRT

6 ⅝" Liner set @ 2499.4 m MDRT, shoe depth 2881.0 m MDRT

SPP: 307 bar, F/In: 3273 l/min



Claystone: Medium grey to dark grey, brownish grey, firm, silty, sub blocky, in parts splintery, slightly calcareous.

Top of RODENRIJIS CLAYSTONE MBR @ 2486.0 m MDRT, 2261.5 m TVD

Limestone: White, off white, light grey, soft to firm, amorphous, sub blocky, chalky, mollusc shell.

Claystone: Medium to dark grey, brown, firm, amorphous to

Trq: 23 KNm, WOB: 7.6 tons

9 ⅝" Casing set @ 2552.9 m MDRT

FIT to 1.37 s.g. EMW

Bit Run #5
8 ½" PDC; SN: 7500353
In @ 2565.1 m, Out @ 2897.0 m MDRT

Midnight depth on 24.06.2014:
2568.0 m MDRT

MWD Survey @ 2595.0 m MDRT
Azi: 350.68°, inc 40.97°
TVD: 2344.5 m

MWD Survey @ 2623.0 m MDRT
Azi: 350.79 °, inc 40.84°
TVD: 2365.2 m

2550
2560
2570
2580
2590
2600
2610
2620

2304.11
2305.63
2307.16
2308.68
2310.21
2311.73
2313.25
2314.77
2316.29
2317.81
2319.33
2320.86
2322.38
2323.89
2325.40
2326.92
2328.43
2329.94
2331.45
2332.97
2334.48
2335.99
2337.51
2339.02
2340.53
2342.04
2343.56
2345.07
2346.58
2348.09
2349.60
2351.12
2352.63
2354.14
2355.65
2357.16
2358.67
2360.18
2361.70
2363.21
2364.72
2366.23
2367.75
2369.26

from 2539.0 m to 2541.0 m MDRT

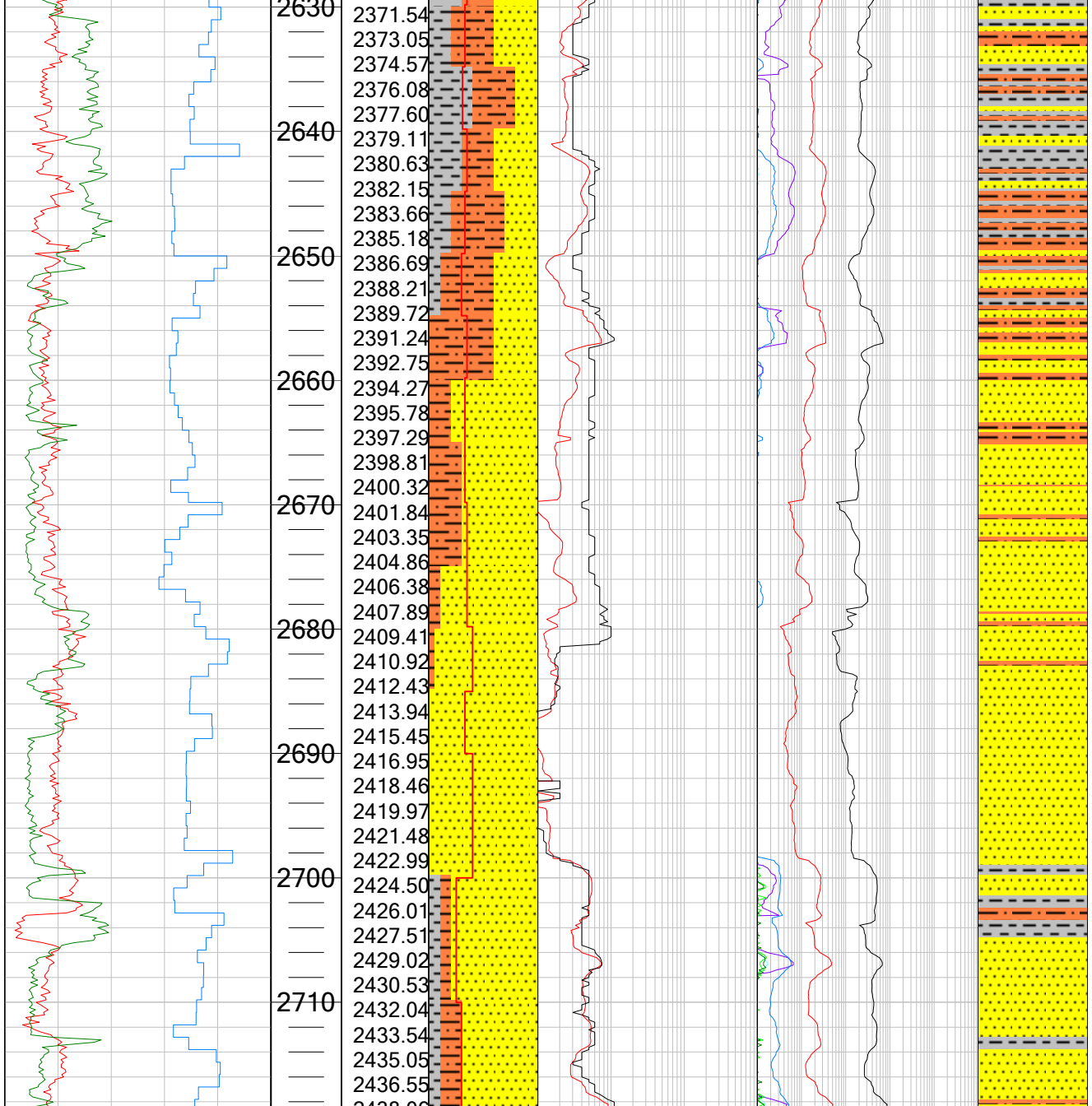
Drilling peak: 0.33% @ 2575.0 m MDRT

P
P
P

sub-blocky, occasionally fissile, trace pyrite, abundant siderite

Siltstone: Off white, beige, light to medium grey, firm to hard, very fine to fine, translucent, good siliceous cement.

Sandstone: Off-white, translucent, firm to hard, v. fine to fine, sub-spherical, well to moderately sorted, poor to moderate calcareous cement



MWD Survey @ 2653.0 m MDRT
Azi: 351.18 °, inc 40.62°
TVD: 2388.5 m

MW: 1.09 sg
PV: 11 cP
YP: 18 lbf/100ft2
pH: 10.5

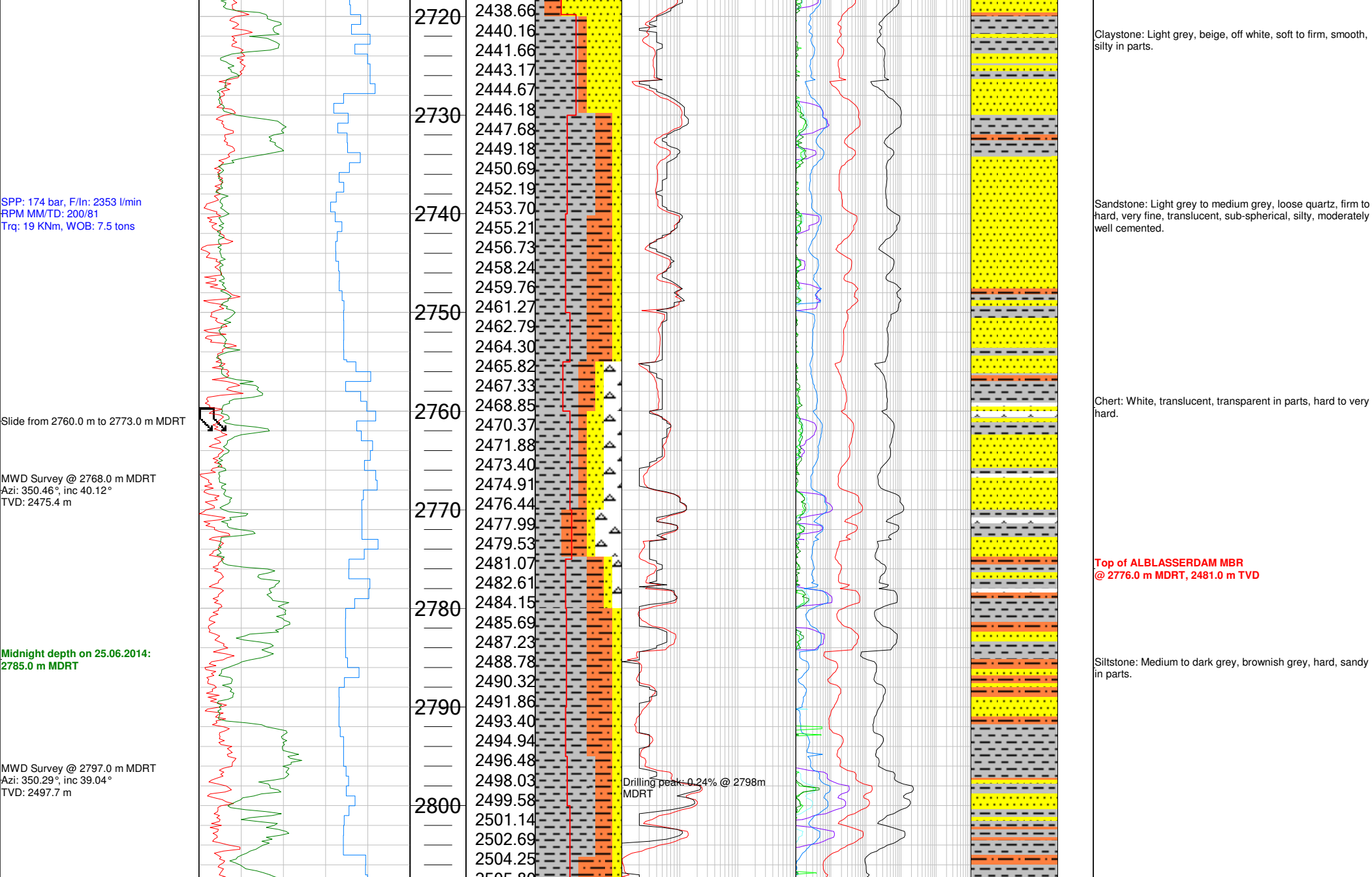
MWD Survey @ 2682.0 m MDRT
Azi: 351.49 °, inc 40.96°
TVD: 2410.47 m

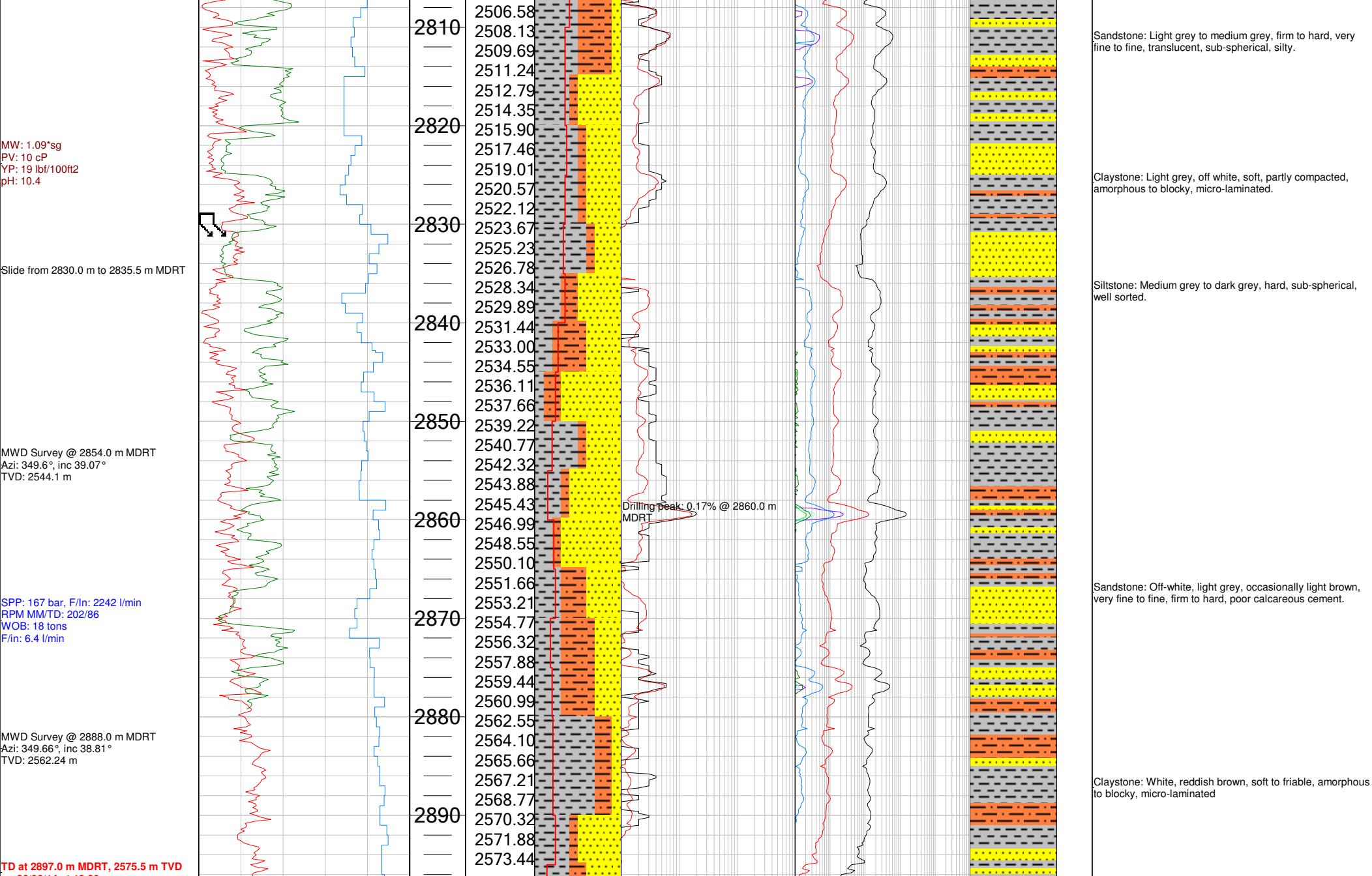
MWD Survey @ 2710.0 m MDRT
Azi: 351.13 °, inc 41.11°
TVD: 2431.5 m

Claystone: Medium to dark grey, brownish grey, firm, sub blocky, silty.

Top of Delft Sandstone FM
@ 2651.0 m MDRT, 2387.0 m TVD

Sandstone: Off white, light grey, translucent, firm to hard, very fine to medium grain, sub spherical, calcareous cement, moderately to well sorted.


2720
2730
2740
2750
2760
2770
2780
2790
2800
2438.66
2440.16
2441.66
2443.17
2444.67
2446.18
2447.68
2449.18
2450.69
2452.19
2453.70
2455.21
2456.73
2458.24
2459.76
2461.27
2462.79
2464.30
2465.82
2467.33
2468.85
2470.37
2471.88
2473.40
2474.91
2476.44
2477.99
2479.53
2481.07
2482.61
2484.15
2485.69
2487.23
2488.78
2490.32
2491.86
2493.40
2494.94
2496.48
2498.03
2499.58
2501.14
2502.69
2504.25
SPP: 174 bar, F/In: 2353 l/min
RPM MM/TD: 200/81
Trq: 19 KNm, WOB: 7.5 tons
Slide from 2760.0 m to 2773.0 m MDRT
MWD Survey @ 2768.0 m MDRT
Azi: 350.46°, inc 40.12°
TVD: 2475.4 m
Midnight depth on 25.06.2014:
2785.0 m MDRT
MWD Survey @ 2797.0 m MDRT
Azi: 350.29°, inc 39.04°
TVD: 2497.7 m
Drilling peak: 0.24% @ 2798m MDRT
Claystone: Light grey, beige, off white, soft to firm, smooth, silty in parts.
Sandstone: Light grey to medium grey, loose quartz, firm to hard, very fine, translucent, sub-spherical, silty, moderately well cemented.
Chert: White, translucent, transparent in parts, hard to very hard.
Top of ALBLASSERDAM MBR
@ 2776.0 m MDRT, 2481.0 m TVD
Siltstone: Medium to dark grey, brownish grey, hard, sandy in parts.


2506.58
2508.13
2509.69
2511.24
2512.79
2514.35
2515.90
2517.46
2519.01
2520.57
2522.12
2523.67
2525.23
2526.78
2528.34
2529.89
2531.44
2533.00
2534.55
2536.11
2537.66
2539.22
2540.77
2542.32
2543.88
2545.43
2546.99
2548.55
2550.10
2551.66
2553.21
2554.77
2556.32
2557.88
2559.44
2560.99
2562.55
2564.10
2565.66
2567.21
2568.77
2570.32
2571.88
2573.44
2810
2820
2830
2840
2850
2860
2870
2880
2890
Drilling peak: 0.17% @ 2860.0 m MDRT
MW: 1.09*sg
PV: 10 cP
YP: 19 lbf/100ft2
pH: 10.4
Slide from 2830.0 m to 2835.5 m MDRT
MWD Survey @ 2854.0 m MDRT
Azi: 349.6°, inc 39.07°
TVD: 2544.1 m
SPP: 167 bar, F/In: 2242 l/min
RPM MM/TD: 202/86
WOB: 18 tons
F/in: 6.4 l/min
MWD Survey @ 2888.0 m MDRT
Azi: 349.66°, inc 38.81°
TVD: 2562.24 m
TD at 2897.0 m MDRT, 2575.5 m TVD
Sandstone: Light grey to medium grey, firm to hard, very fine to fine, translucent, sub-spherical, silty.
Claystone: Light grey, off white, soft, partly compacted, amorphous to blocky, micro-laminated.
Siltstone: Medium grey to dark grey, hard, sub-spherical, well sorted.
Sandstone: Off-white, light grey, occasionally light brown, very fine to fine, firm to hard, poor calcareous cement.
Claystone: White, reddish brown, soft to friable, amorphous to blocky, micro-laminated

on 26/06/14 at 13.30