BRI-GT 01

Netherlands

Lithology Log, 1:1000

Mudlogging:

GEOSERVICE GmbH

Client:

Client: Aardwarmte Vierpolders
Operator: Aardwarmte Vierpolders

Project:

Borehole Section: BRI-GT 01
Well Name: BRI-GT 01

Location:

Country: Netherlands
Region or oilfield: West Netherlands Basin
Location: Vierpolders
Concession:

Coordinates:

Ordnance Survey Map:
Elev. well head / KB: 0.80 m / 6.93 m

Well Type:

Production/exploitation well

Duration:

Spud: 04.07.2015
Start depth (Tie-in) 0.00 m
Total depth: 0.00 m

Rig:

DEUTAG T 49
KCA DEUTAG Drilling GmbH

Team:

Company Man: Paul Grootscholten
Toolpusher: Jan Strijker, Roman Thiel de Gafenco
Supervisor: Peter Nutters, Karl Gollob
Wellsite geologist: Julien Smeulders

Mudlogging:

GeoService GmbH
Neues Land 19
D-49828 Georgsdorf
Germany
office@geoservice.de
Mudloggers: A.Alin; F.Hinz; F.Schamberger; M. Kramer

Service:

Fluid Services: AMC
Mud Engineers: G. Spieard, W. Hennig, A. Burk-Frölich, D. Heins

Remarks:

Print Date: 04.08.2015 06:06

Clastic sediments

Claystone, Flint, Gravel, Sand, Sandstone, Silt, Siltstone

Carbonates and Biogenic sediments

calc. Sandstone, Coal, Dolomite, Limestone, Limestone, cherty, Limestone, marly, Marl (-stone), Marl, argillaceous, Marlstone, calcareous

Artificial

Cement, No sample

Accessories

Argillaceous, Calcareous, Calcite, Carbonaceous, Chert, Conglomeratic, Dolomitic, Ferruginous, Flint, Glauconite, Laminated, Lignite, Marly, Mica (unspec.), Ooids, Particles, Pyrite, Quartz, Sandy, Silty

Fossils

Echinoids, Foraminifera, Gastropods, Ostracods, Shell fragments, Sponges

Framework

Lime-Grainstone, Fine crystalline, Grain-supported

Technical symbols

Casing shoe, Liner head, Sidewall core, (unrecovered), Hydrocarbon show, Gains, Losses, FIT or leakoff test

Vertical axis is measured depth.

GEOdata GeoWellPower

Bit	R.O.P.	Depth	T.V.D.	Lithological Composition	Gamma Ray	Litho-Stratigraphy	Lithology and accessories	Sample Descriptions, Micropaleontology, Remarks	Calcimetry and Dolomimetry (in fine fraction)	Total Gas	Hookload and W.O.B.
Date (dd/mm/yy)	R.O.P. [m/h] 10 20 30	Driller's depth in m from Rotary Table/Rig Floor 1:1000	True Vertical Depth in m from Rotary Table/Rig Floor	(fine fraction) 20 40 60 80	Gamma Ray 3; Gamma Ray 2; Gamma Ray 1 [API] 50 100 150				Total Carbonate; Dolomite; Calcite [%] 20 40 60 80	Total Gas [%] 0.001 0.01 0.1 1	MWD W.O.B.; W.O.B. [tf] 10 20 30 40; Hookload [tf] 50 100 150
02/07/2015		0 10 20 30 40 50 60 70 80 90 100 110 120 130	0 10 20 30 40 50 60 70 80 90 100 110 120 130			"Diverse" Holocene - Pleistocene; Upper North Sea Quaternary; Late P		**Sand**, fine to coarse grained with a fining upwards trend, quartz, clear and angular (fine sand), subrounded to well rounded, poorly sorted, partly with clay matrix. Acc.: Glauconite, Mica, at the top 15 m abundant microfossils. **Sand**, medium to coarse grained, Quartz, milky, yellowish, subrounded to well rounded, poorly sorted. Gravel, polymictic. Acc.: rare Glauconite, Mica, shell debris. **Silt**, grey to abundantly brownish grey, often argillaceous and calcareous, with thinly reddish streaks, brittle to soft, partly plastic, sandy (fine grained); sand, a.p.d.. **Sand**, milky, light grey, yellowish, reddish, fine-medium grained, subrounded to rounded, fairly sorted; with Quartz; glauconitic, micaceous fossiliferous, coal fragments. **Clay**, grey, brownish, plastic to friable, silty, sandy. Subordinate sand, as previously described. Acc.: Mica, coal. **Sand**, fine to medium grained, with clear to milky, yellowish and grey translucent Quartz, subangular to rounded, fairly sorted, glauconitic. Furthermore clay, grey, brownish, plastic to firm, silty, sandy. Acc.: Glauconite, mollusc shell debris (bivalves, rare gastropods) and sparse benthic foraminifers.			

17½" Roller bit, S/N 522358, IADC: 415
04/07/2015

17½" Roller bit, S/N 522358, IADC: 415

05/07/201

Incl at 238.00 m
0.10 °
AZ : 336.80 °
TOT DEV: 0.21 m
TVD : 238.00 m

Incl at 291.00 m
1.50 °
AZ : 283.21 °
TOT DEV: 0.79 m
TVD : 290.99 m

Incl at 346.00 m
2.89 °
AZ : 280.44 °
TOT DEV: 3.18 m
TVD : 345.94 m

Incl at 402.00 m
3.74 °
AZ : 276.74 °
TOT DEV: 6.59 m
TVD : 401.83 m

Incl at 459.00 m
3.59 °
AZ : 275.19 °
TOT DEV: 10.34 m
TVD : 458.71 m

Incl at 515.00 m
3.62 °
AZ : 274.12 °
TOT DEV: 13.81 m
TVD : 514.60 m

10 20 30

50 100 150

20 40 60 80

0.001 0.01 0.1

10 20 30 40

50 100 150

Glycodrill 1.07 kg/m³

Tertiary
Upper North Sea
Late Miocene - Pliocene
Oosterhout
Middle Miocene - Early Pleistocene
Maassluis
Miocene
Breda
Middle North Sea
Middle Oligocene
Rupel
Rupel Clay
Oligocene - Eocene
Rupel
Vessem Member

Sand, milky, with siltstone, grey and charcoal.

Sand, milky, with marlstone.

Sand, milky, grey.

Marlstone, grey to brownish grey.

Sand, milky, grey, seldom yellowish, partly translucent, fine to medium grained, subrounded to rounded, moderatly sorted, with intersected beds of shell debris.

Argillaceous Marlstone, brownish grey, silty, partly sandy.

Sand, milky, yellowish, fine to medium grained, fairly sorted. Argillaceous marlstone, a.p.d. and silt, light to medium grey. Acc.: Mica, Glauconite, shell debris.

Silt, sandy, light grey, unconsolidated. Sand fine grained, moderately to well sorted. Quartz grains predominantly clear, transparent to milky white; occasionally pale yellow and reddish. Frequently layers of shell fragments. Acc.: wood fragments, mica.

Sand, light grey, fine grained, well sorted, silty, micaceous, unconsolidated to moderately indurated. Quartz grains predominantly clear, transparent to milky white; occasionally pale yellow and reddish. Acc.: mica, rarely shell and wood fragments.

Silt, light grey, sandy, with fine grained, well sorted sand as previously described; moderately indurated. Acc.: mica, occasionally shell fragments.

Silt, light grey to brownish grey, argillaceous, slightly sandy and calcareous. Moderately indurated. Clay predominantly washed out from the samples. Acc.: mica, shell fragments.

Silt, medium grey to brownish grey, argillaceous, calcareous, slightly sandy, moderately indurated to firm, wet samples plastic. Acc.: mica, shell fragments.

Silt, off-white to light grey, sandy, calcareous, increasingly sandy. Sand, fine grained, white, clear to milky, well sorted. Glauconite, dark green to black.

Clay, light grey to off white, hard, very slightly calcareous. Silt, off-white to light grey, sandy, calcareous, sandy. Sand, fine grained, white, clear to milky, well sorted. Glauconite, dark green to black.

Claystone, light grey to off white, increasingly brownish to the base, silty, micaceous, firm to hard. Acc.: Pyrite, occasionally shell fragments.

Siltstone, light brownish grey, argillaceous, sandy, firm with sand, light grey, fine to medium grained, moderately sorted with clear and milky quartz grains, subrounded, strong silty and argillaceous, glauconitic; clay light brown to light brownish grey, firm. Acc.: glauconite, pyrite, rarely shell fragments.

Argillaceous marlstone, grey white, silty, sandy. Sand fine to medium grained, poorly sorted, glauconitic.

Siltstone, light brownish grey, argillaceous, sandy, friable to firm. Additionally argillaceous marlstone a.p.d..

Siltstone, light greenish grey, argillaceous, sandy, friable to firm, strongly glauconitic. Acc.: glauconite, pyrite, mica.

17½" Roller bit, S/N 5229358, IADC: 415

05/07/2015

Incl at 572.00 m
3.14 °
AZ : 275.64 °
TOT DEV: 17.23 m
TVD : 571.50 m

Incl at 628.00 m
3.25 °
AZ : 272.69 °
TOT DEV: 20.48 m
TVD : 627.40 m

Incl at 684.00 m
6.53 °
AZ : 281.90 °
TOT DEV: 25.05 m
TVD : 683.21 m

Incl at 743.00 m
10.34 °
AZ : 282.51 °
TOT DEV: 33.73 m
TVD : 741.55 m

09/07/2015

17½" Roller bit, S/N 5229358, IADC: 415

Incl at 799.00 m
16.14 °
AZ : 272.45 °
TOT DEV: 46.61 m
TVD : 796.02 m

Incl at 855.00 m
20.92 °
AZ : 277.03 °
TOT DEV: 64.22 m
TVD : 849.15 m

Incl at 911.00 m
26.87 °
AZ : 278.56 °
TOT DEV: 86.53 m
TVD : 900.48 m

Tertiary

North Sea

Asse

Dongen

Eocene

Tertiary

Lower North Sea

Early to Middle Eocene

Brussel Sand

Dongen

Tertiary

Lower North Sea

Early Eocene (Ypresian)

Ieper

Dongen

Tertiary

Lower North Sea

Claystone, brownish grey to greenish grey, silty, glauconitic, in alternate bedding with siltstone, greenish grey, argillaceous, glauconitic, slightly sandy. Acc.: fine grained sand, glauconite, mica, pyrite.

Claystone, olive-green to light brownish grey and light ochre, silty, firm to moderately hard. Acc.: glauconite.

Calcareous Sandstone, very fine grained, white, reddish white, milky, well sorted, in white calcareous matrix. Glauconite, dark green to black. Huge amount in formaminiferas, decreasing to the bottom. Claystone, a.p.d, probably cavings.

Calcareous Sandstone, very fine grained, white, reddish white, milky, well sorted, in white calcareous matrix. Glauconite, dark green to black. Lime stone, off white, reddish, splintery, very hard. Shell fragments.

Calcareous Sandstone, very fine grained, white, reddish white, milky, well sorted, in white calcareous matrix. Some claystone and limestone a.p.d. Glauconite, dark green to black. Sponge needles.

Calcareous Sandstone, very fine grained, white, reddish white, milky, well sorted, in white calcareous matrix. Increasingly argillaceous, grey, frim to brittle. Acc. pyrite and less glauconite than before. Samples possibly polluted by cavings.

Claystone, greenish grey to light grey, sandy, silty, friable to firm, occasionally moderately hard, with inntercalated layers of calcareous sandstone, light grey, fine grained, silty, argillaceous, moderately sorted. Acc.: glauconite, pyrite, shell fragments, sponge needles.

Claystone, greenish grey to light grey, sandy, silty, friable to firm, occasionally moderately hard, with interconnected layers of calcareous sandstone, light grey, fine grained, silty, argillaceous, well sorted. Acc. rarely pyrite and glauconite.

Claystone a.p.d. with calcareous sandstone a.p.d wood fragments.

Claystone, greenish grey to light grey, silty, glauconitic, moderately hard. Acc.: Fine grained sand, glauconite, pyrite.

Claystone, greenish grey to light grey, silty, moderately hard to hard with coarse cuttings > 1 cm on the shakers. Acc.: pyrite.

Glycodrill 1.10 kg/m³

10/07/2015

17½" Roller bit, S/N 5229358, IADC: 415

11/07/2015

12/07/2015

17½" Roller bit, S/N 5229358, IADC: 415

13/07/2015

Incl at 968.00 m
32.43 °
AZ : 275.98 °
TOT DEV: 114.51 m
TVD : 950.11 m

Incl at 1024.00 m
36.00 °
AZ : 278.37 °
TOT DEV: 146.38 m
TVD : 996.15 m

Incl at 1080.00 m
39.79 °
AZ : 279.70 °
TOT DEV: 181.15 m
TVD : 1040.02 m

Incl at 1137.00 m
43.75 °
AZ : 278.83 °
TOT DEV: 219.16 m
TVD : 1082.46 m

Incl at 1193.00 m
47.16 °
AZ : 277.70 °
TOT DEV: 259.31 m
TVD : 1121.49 m

Incl at 1250.00 m
48.09 °
AZ : 277.51 °
TOT DEV: 301.79 m
TVD : 1159.49 m

Incl at 1306.00 m
46.27 °
AZ : 278.44 °
TOT DEV: 342.57 m
TVD : 1197.86 m

Tertiary

Lower North Sea

Early Eocene (Ypresian)

Ieper

Dongen

Landen Clay

Landen

Late Paleocene

Basal Dc

Houthem

Paleocene

Chalk

Claystone, greenish grey, grey, increasingly brownish grey, silty, moderately hard to hard, slightly micaceous. Acc.: Pyrite.

Claystone, predominately brownish grey, subordinately greenish grey, grey, silty, moderately hard to hard, slightly micaceous. Acc.: Pyrite.

Claystone, brown grey, occasionally light greenish grey to grey, silty, blocky to platy, occasionally splintery, slightly micaceous. Marlstone, light brownisch grey, blocky to platy, hard. Acc.: Pyrite.

Marlstone, grey, light grey, brittle, silty, spotty. Claystone, light greenish grey to grey, silty, blocky to platy, occasionally splintery, slightly micaceous. Calcareous marlstone, off white, hard. Acc.: Pyrite.

Calcareous marlstone, off white, brittle to firm. Marlstone, grey, light grey, brittle, silty, spotty. Claystone, light greenish grey to grey, silty, blocky to platy, slightly micaceous. Limestone, white to yellowish white, crystalline to amorphous, brittle.

Limestone, white to yellowish white, fine crystalline, arenitic (lime-grainstone texture), porous, friable, brittle; occasionally microcrystalline, splintery, dense, hard. Marlstone, light grey to medium grey, occasionally brownish grey, silty, slightly micaceous, spotted, decreasing to the bottom. Interbedded thin layers of Claystone, light to medium grey, rarely brownish grey, platy, firm to hard . Acc.: Pyrite.

12 1/4" Insert bit, S/N 5252210 VM-C09, IADC: 437
20/07/2015

Incl at 1364.00 m
44.30 °
AZ : 279.00 °
TOT DEV: 383.52 m
TVD : 1238.92 m

12 1/4" Insert bit, S/N 5252210 VM-C09, IADC: 437

Incl at 1416.00 m
45.57 °
AZ : 280.42 °
TOT DEV: 429.18 m
TVD : 1275.78 m

Incl at 1473.00 m
48.03 °
AZ : 279.31 °
TOT DEV: 461.71 m
TVD : 1314.80 m

Limestone, white to yellowish white, fine crystalline, arenitic (lime-grainstone texture). Marlstone, light grey to medium grey. Interbedded thin layers of claystone, light to medium grey. Flint, off white to light grey, very hard, platty, splintery. Acc.: Pyrite.

Cement, grey to light grey.

Limestone, cherty, white, off-white, yellowish, micro to fine crystalline, arenitic (lime-grainstone texture), porous, friable, brittle; partly silicified, splintery, dense and hard; rarely glauconitic. Variable amounts of Flint (up to > 50 % of the sample volume but decreasing towards the base), off-white to light grey, very hard, dense, platy, splintery. Acc.: Marlstone, grey, brittle, firm, silty, sandy; rare fossil debris.

Chalk
Upper Cretaceous to early Paleocene (Turonian to Danian)
Cretaceous
Ommelanden

Incl at 1558.00 m
49.10 °
AZ : 279.55 °
TOT DEV: 525.55 m
TVD : 1370.91 m

Incl at 1614.00 m
49.05 °
AZ : 277.95 °
TOT DEV: 567.86 m
TVD : 1407.59 m

Incl at 1670.00 m
49.00 °
AZ : 277.15 °
TOT DEV: 610.12 m
TVD : 1444.32 m

Incl at 1727.00 m
49.05 °
AZ : 277.50 °
TOT DEV: 653.16 m

Limestone, cherty, white, off-white, yellowish, micro to fine crystalline, arenitic (lime-grainstone texture), porous, friable, brittle; partly silicified, splintery, dense and hard; rarely glauconitic. Variable amounts of Flint (up to > 50 % of the sample volume but decreasing towards the base), off-white to light grey, very hard, dense, platy, splintery. Acc.: Marlstone, grey, brittle, firm, silty, sandy; rare fossil debris.

Limestone, white, off-white, yellowish, micro to fine crystalline, arenitic (lime-grainstone texture), porous, friable, brittle, frequently glauconitic. Decreasing Flint, off-white to light grey, very hard, dense, platy, splintery. Occasionally marlstone, grey, silty, sandy, brittle to firm. Acc.: rare Pyrite; fossil debris.

12 1/4" Insert bit, S/N 5252210 VM-C09, IADC: 437

22/07/2015

23/07/2015

24/07/2015

TVD : 1481.68 m

Incl at 1783.00 m
48.59 °
AZ : 278.59 °
TOT DEV: 695.37 m
TVD : 1518.47 m

Incl at 1839.00 m
48.49 °
AZ : 279.09 °
TOT DEV: 737.35 m
TVD : 1555.54 m

Incl at 1896.00 m
49.05 °
AZ : 278.45 °
TOT DEV: 780.33 m
TVD : 1592.97 m

Incl at 1952.00 m
49.07 °
AZ : 278.98 °
TOT DEV: 822.63 m
TVD : 1629.67 m

Incl at 2008.00 m
49.13 °
AZ : 279.44 °
TOT DEV: 864.96 m
TVD : 1666.34 m

Incl at 2064.00 m
49.12 °
AZ : 279.49 °
TOT DEV: 907.28 m
TVD : 1703.01 m

BIT CHANGE

Incl at 2121.00 m
49.37 °
AZ : 278.71 °
TOT DEV: 950.41 m
TVD : 1740.27 m

Chalk
Upper Cretaceous to early Paleocene (Turonian to Danian)
Cretaceous
Ommelanden

Limestone, white, off-white, yellowish, micro to fine crystalline, arenitic (lime-grainstone texture), porous, friable, brittle, frequently glauconitic. Interbedded marlstone, grey to brownish grey, silty, scarcely sandy, brittle to firm, crumbly, often very calcareous. Acc.: rare Pyrite; fossil debris.

Limestone, white, off-white, yellowish, micro to fine crystalline, arenitic (lime-grainstone texture), porous, friable, brittle. Occasional interbedded marlstone, grey to brownish grey, silty, scarcely sandy, brittle to firm, crumbly, often very calcareous. Acc.: Pyrite; sparse benthic and planktonic foraminifers, ostracods, fossil debris.

25/07/2015

12 1/4" PDC bit, S/N: 7033277 Type: HCD 606, IADC: M323

26/07/2015

Incl at 2205.00 m
49.28 °
AZ : 279.04 °
TOT DEV: 1014.08 m
TVD : 1795.05 m

Incl at 2261.00 m
49.21 °
AZ : 279.36 °
TOT DEV: 1056.51 m
TVD : 1831.60 m

Incl at 2317.00 m
48.93 °
AZ : 280.26 °
TOT DEV: 1098.84 m
TVD : 1868.25 m

Incl at 2375.00 m
48.83 °
AZ : 279.33 °
TOT DEV: 1142.49 m
TVD : 1906.43 m

Incl at 2431.00 m
48.46 °
AZ : 279.59 °
TOT DEV: 1184.60 m
TVD : 1943.34 m

Incl at 2487.00 m
48.89 °
AZ : 279.07 °
TOT DEV: 1226.74 m
TVD : 1980.22 m

Chalk
Upper Cretaceous to early Paleocene (Turonian to Danian)
Cretaceous
Ommelanden
Chalk
Cretaceous
Texel Greensand
Texel
Spijkenisse Greensand
Holland
Lower Cretaceous
Rijnland
Cretaceous
Lower Holland Marl
De Lier Sandstone
Vlieland Sandstone
Rijnland
Lower Cretaceous

Marlstone, medium grey to darkish, silty, sericitic, calcareous, firm to moderatly hard, blocky, brittle, also platy and laminated. Limestone (chalk), off-white, a.p.d., partly glauconitic, sand.

Sand, clear, translucent, fine to medium grained, subrounded to rounded, fairly sorted, with abundant Glauconite, green, darkish green to greenish black, fine to medium grain size, often well rounded. Furthermore some marlstone and limestone, as described above.

Sand, a.p.d. with increasing Glauconite, nodular, coarse grained.

Clay(stone), dark grey, plastic to firm, silty, slightly carbonaceous. Fine grained sandstone, light grey, fairly sorted, moderately compacted, firm to hard, strongly glauconitic and pyritic, carbonaceous matrix. Limestone (Chalk) a.p.d..

Claystone, grey-dark grey, platy, brittle to firm, slightly silty, sericitic, partly glauconitic and sandy, calcareous. Sand, clear and milky Quartz, fine to coarse grained, splintery to subangular, poorly sorted, partly as fine to medium grained, glauconitic sandstone with calcareous matrix. Coal, black, brittle, glossy. Limestone a.p.d.. Acc.: Glauconite.

12 1/4" PDC bit, S/N: 7033277 Type: HCD 606, IADC: M323

27/07/2015

Incl at 2544.00 m
48.87 °
AZ : 278.78 °
TOT DEV: 1269.68 m
TVD : 2017.71 m

Incl at 2600.00 m
48.31 °
AZ : 280.14 °
TOT DEV: 1311.77 m
TVD : 2054.64 m

Incl at 2656.00 m
48.36 °
AZ : 280.75 °
TOT DEV: 1353.59 m
TVD : 2091.86 m

Incl at 2713.00 m
49.29 °
AZ : 279.60 °
TOT DEV: 1396.50 m
TVD : 2129.36 m

Incl at 2769.00 m
49.39 °
AZ : 279.42 °
TOT DEV: 1439.02 m
TVD : 2165.81 m

02/08/2015

Incl at 2827.00 m
48.86 °
AZ : 279.51 °
TOT DEV: 1482.77 m
TVD : 2203.88 m

Incl at 2883.00 m
48.84 °
AZ : 278.59 °
TOT DEV: 1524.96 m
TVD : 2240.71 m

8 1/2" PDC-microcore bit, S

2540 2550 2560 2570 2580 2590 2600 2610 2620 2630 2640 2650 2660 2670 2680 2690 2700 2710 2720 2730 2740 2750 2760 2770 2780 2790 2800 2810 2820 2830 2840 2850 2860 2870 2880 2890 2900 2910 2920 2930

2020 2030 2040 2050 2060 2070 2080 2090 2100 2110 2120 2130 2140 2150 2160 2170 2180 2190 2200 2210 2220 2230 2240 2250 2260 2270

Cretaceous

Triassic

Middle to Upper Triassic

Lower Triassic

Lower Germanic Trias

Triassic

one

IJsselmonde Sandstone

Upper Ke

Upper Germanic Trias

Dolomitic Keuper

Rot

Midd M

Lower Muschelkalk

Muschelkalk

U. Röt Fringe Cl

Röt

Röt Fringe

L. Röt Fring S

Basal Solling Sandstone

Solling

Hardegsen

Lower Detfurth

Detfurth

Sand, light grey, fine to medium grained Quartz, clear, milky, angular to subangular, well sorted, glauconitic. At the base coal, black, dark brown, charcoal/ lignite, brittle. Acc.: limestone, Glauconite, Pyrite.

Claystone, greenish to medium grey, slightly calcareous and micaceous, firm, flaky. Somewhat sandstone, white to off-white, fine grained, predominantly grain supported, partly mud supported.

Sand, light grey, clear and milky Quartz, fine to coarse grained, splintery to subangular, poorly sorted, partly as fine to medium grained, glauconitic sandstone with calcareous and/ or dolomitic matrix. Acc.: Coal, Glauconite, Pyrite.

Claystone, 1) green, grey, firm, glossy, platy, splintery, and 2) red, silty, micaceous, firm, crumbly, slightly calcareous and micaceous. Sand, a.p.d..

Sand, light grey, fairly sorted, with predominantly fine to medium grained Quartz, clear, milky, rarely orange, angular to subangular.

Claystone, green, grey, firm, glossy, platy, splintery, and red, silty, micaceous, firm, crumbly, slightly calcareous and micaceous (a.p.d.). Furthermore sand and sandstone a.p.d.. Acc.: Glauconitic marlstone, Glauconite (cavings).

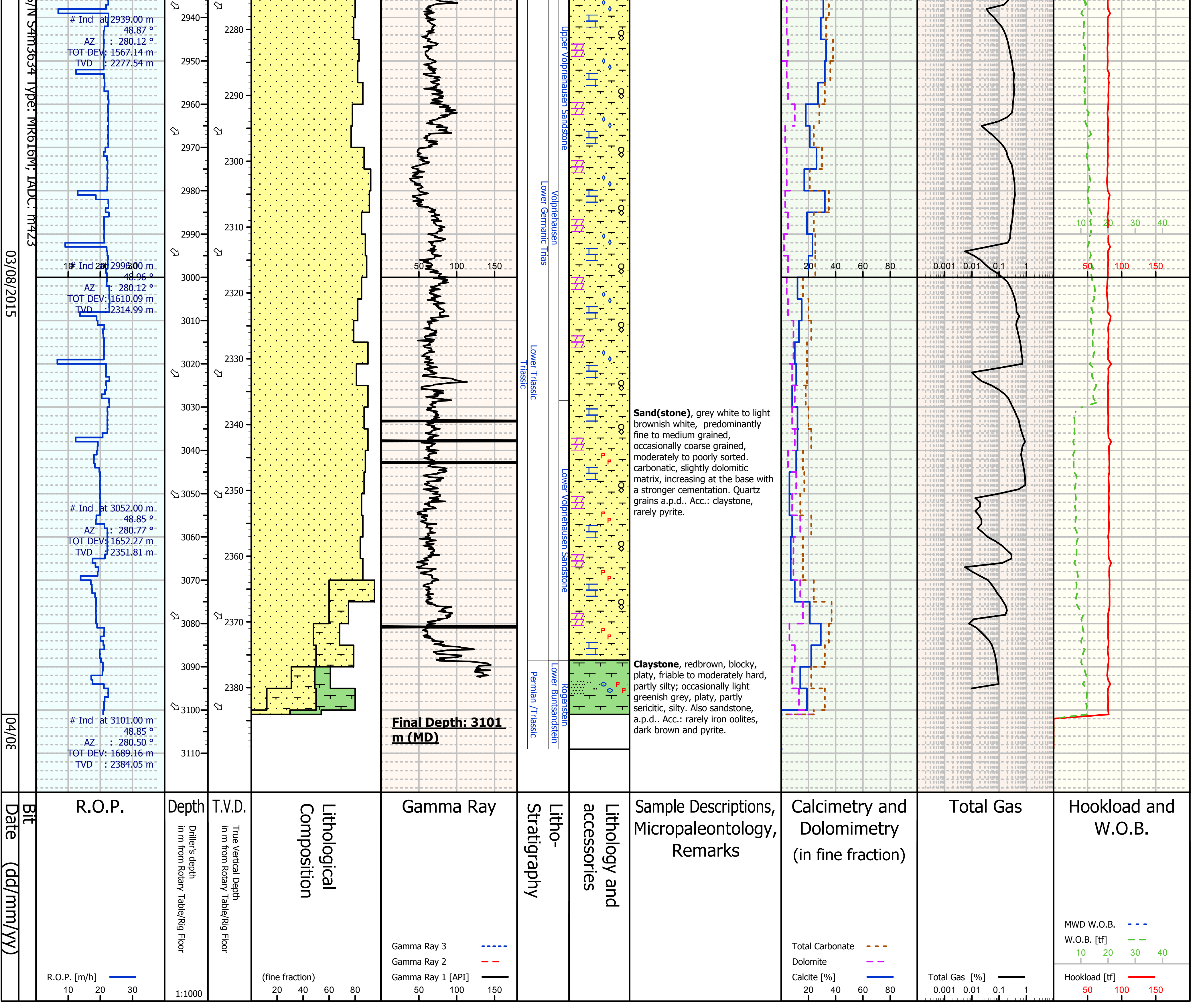
Sand, light grey, fairly sorted, with fine to medium grained Quartz, clear, milky, orange, subangular and rare coarse grained, rounded to well rounded, matt Quartz grains. Sandstone, off-white, fine to medium grained, poorly sorted, calcareous, rarely with orange hypidiomorphic Calcite. Occasional green and red claystone, a.p.d.. Acc.: Glauconitic marlstone, Glauconite (cavings from Texel and Vlieland Sandstone), Pyrite, limestone.

Samplings completely contaminated with **cement**.

Sand(stone), off white, grey white, fine grained, well sorted, carbonatic, slightly dolomitic, completely milled to loose grains without coarse fraction: quartz clear, translucent to milky white, rarely orange, pale red, subrounded to rounded. Acc.: claystone (light reddish brown), rarely glauconite, pyrite.

Sand(stone), grey white, fine grained, well sorted, with white, brittle, carbonatic matrix, also slightly dolomitic, completely milled to loose grains a.p.d. Acc.: claystone.

Sand(stone), grey white to light brownish white, predominantly fine to medium grained, moderately sorted, with intercalated layers of very fine grained, well sorted sandstone; carbonatic, slightly dolomitic matrix, decreasing to the bottom. Quartz grains clear, translucent to milky white, occasionally pale red, light orange and light yellow, subrounded to rounded. Acc.: claystone, rarely calcite in the upper part.



Incl at 2939.00 m 48.87 ° AZ : 280.12 ° TOT DEV: 1567.14 m TVD : 2277.54 m
Incl at 2996.00 m 48.96 ° AZ : 280.12 ° TOT DEV: 1610.09 m TVD : 2314.99 m
Incl at 3052.00 m 48.85 ° AZ : 280.77 ° TOT DEV: 1652.27 m TVD : 2351.81 m
Incl at 3101.00 m 48.85 ° AZ : 280.50 ° TOT DEV: 1689.16 m TVD : 2384.05 m
S/N S4m3634 Type: MK616M; IADC: m423
03/08/2015
04/08
Upper Volpriehausen Sandstone
Volpriehausen
Lower Germanic Trias
Lower Triassic
Triassic
Lower Volpriehausen Sandstone
Rogenstein
Lower Buntsandstein
Permian /Triassic
Final Depth: 3101 m (MD)
Sand(stone), grey white to light brownish white, predominantly fine to medium grained, occasionally coarse grained, moderately to poorly sorted. carbonatic, slightly dolomitic matrix, increasing at the base with a stronger cementation. Quartz grains a.p.d.. Acc.: claystone, rarely pyrite.
Claystone, redbrown, blocky, platy, friable to moderately hard, partly silty; occasionally light greenish grey, platy, partly sericitic, silty. Also sandstone, a.p.d.. Acc.: rarely iron oolites, dark brown and pyrite.
Date (dd/mm/yy)
Bit
R.O.P.
R.O.P. [m/h]
Depth
Driller's depth in m from Rotary Table/Rig Floor
1:1000
T.V.D.
True Vertical Depth in m from Rotary Table/Rig Floor
Lithological Composition
(fine fraction)
Gamma Ray
Gamma Ray 3
Gamma Ray 2
Gamma Ray 1 [API]
Litho-Stratigraphy
Lithology and accessories
Sample Descriptions, Micropaleontology, Remarks
Calcimetry and Dolomimetry (in fine fraction)
Total Carbonate
Dolomite
Calcite [%]
Total Gas
Total Gas [%]
Hookload and W.O.B.
MWD W.O.B.
W.O.B. [tf]
Hookload [tf]