Geothermal Production Well

Trias Westland NLW-GT-03 & -S1

Final Well Report

July / August 2020

TRIAS WESTLAND

GEO SERVICE GmbH

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PART 1

1.1 Preface

On behalf of the Trias Westland B.V., the mud logging service was performed by the company GeoService GmbH. This report was prepared on-site by the mud logging staff and is not a revision of any geological field report prepared by a wellsite geologist.

1.2 Introducing

The geothermal well NLW-GT-03 is drilled onshore, located at the Lange Broekweg 70a in 2671 DW Naaldwjik. The target reservoir represents the Delft Sandstone of the Nieuwerkerk Formation (Schieland Group). Due to less thickness of this aquifer examined from the previously drilled NLW-GT-04, sandstone layers of the Alblasserdam Member of the same formation situated below are secondarily addressed. Perforation of the potential reservoir horizons follows during a separated well intervention. The concession for the geothermal exploration was granted to Trias Westland B.V.

The borehole is intersecting rock formations from the Quaternary down to Lower Cretaceous, more specifically into the Ablasserdam Member of the Nieuwerkerk Formation below the reservoir, reaching final depth of 2600 m (2494 m TVD). The Delft Sandstone was encountered from 2377 m MD (2289.5 m TVD) to 2456 m MD (2363 m TVD) depth.

1.3 Objectives

The well NLW-GT-03 represents the production well of a doublet geothermal system. The injector well NLW-GT-04 was drilled previously. Both wells are located next to the active doublet system of NLW-GT-01/02, drilled in 2017 / 2018. Upon completion of this project, perforation of the aquifer will follow after rig demobilisation. The delivered warm water will be used for heating greenhouses. The project is an innovative contribution for saving exhaustible raw materials by using renewable energy.

1.4 Well data

Well name	Trias Westland NLW-GT-03/ NLW-GT-03-S1
Well code	NLW-GT-03
Well type	Geothermal Production Well
Concession	Trias Westland
Operator	Well Engineering Partners
Contractor	Trias Westland B.V.
Surface coordinates	x: 76,169 m; y: 445,215 m
Target formation	Primary: Delft Sandstone (Lower Cretaceous) Secondary: Sandstones of the Alblasserdam Member (Lower Cretaceous)
Drilling contractor	Drilltec GUT GmbH
Drilling rig	VDD 370.2 Vario-Rig
Reference depth	Rig Floor
Surface elevation (Ground level)	-0.9 m NAP
Spud date	11th July 2020
Date total depth reached	21st August 2020
Total depth:	2600 m MD; (2494 m TVD)

1.5 Service Companies

Wireline log	n/a
Mud engineering	Halliburton (Baroid)
Directional drilling	NEXT Drilling Services
Cementing	Fangmann
Formation & Mud logging	GeoService GmbH

1.5 Duties and responsibilities

	Jobs are done	Description	
1.	Sample recovery (according to the lag time)		
1.1.1	**NLW-GT-03**: 10 m intervals from 140 to 890 m; 5 m intervals from 895 to 920 m; 10 m intervals from 930 to 1240 m; 5 m intervals from 1245 to 1280 m; 10 m intervals from 1290 to 2400 m; 5 m intervals in reservoir section from 2405 m to 2550 m.	Sample preparation: washing and drying, separated in coarse and fine fraction. Sample processing: lithological description and documentation. Calcimetry from 2400 m to the depth 2550 m,.Storage of dry samples in glass sample tubes (2x).	CL OP
		Storage of 2x 0,5 kg unwashed samples in plastic sample bags. Storage of additional unwashed samples in plastic bags.	CL OP
1.1.2	NLW-GT-03-S1: 2 to 5 m intervals from 1460 to 1490 m; 10 m intervals from 1500 to 2380 m; 5 m intervals in reservoir section from 2385 m to 2600 m TD.	Sample preparation: washing and drying, separated in coarse and fine fraction. Sample processing: lithological description and documentation. Calcimetry from 2380 m to the final depth 2600 m,. Storage of dry samples in glass sample tubes (2x).	
		Storage of 2x 0,5 kg unwashed samples in plastic sample bags. Storage of additional unwashed samples in plastic bags.	
2.	Interpretation	Lithological analysis and stratigraphic field definition of the recovered samples. Interpretation in consideration with the drilling parameters. Continuous graphical result documentation in form of a Litholog.	CL OP
3.	Update	Update of any data and variable which may influence the drilling parameters (for example: Lag time, BHA, pipe tally, length above table, weight on bit), using Ms Controller, GeoTally and GeoWellPower software.	
4.	Measurement	All technical parameters are rig provided and transferred to mudlogging PC-system as external data. Additionally, own sensors for hydrocarbon gas detection and analyses and environmental gas sensors for H2S and Methane.	
5.	Sensors - maintenance and care	Gas trap, HC-total gas. External Data	
6.	Geological daily report	Daily at 00:00 am, midnight depth.	OP

	Jobs are done	Description	
7.	Survey Data record	Directional drilling data.	OP
8.	Final Well Report	Summary of all available information collected until the End of well logging.	OP

CL = Client (Trias Westland B.V.); OP = Operator (Drilltec GUT GmbH); MD = Measured depth.

2.1 Stratigraphic Profile NLW-GT-03

Stratigraphic profile based on sample description, gamma ray data and rate of penetration. GeoService GmbH started monitoring and sampling the well at 140(MD).

Period	Epoch	Group	Formation	Member	Top Depth [m] (MD)	Top Depth [m] (TVD)
Quaternary	Holocene - Pleistocene	Upper North Sea Group	"Diverse"	-	8.7	8.7
	Early Pleistocene		Maassluis	-	113	113
Tertiary	Pliocene		Oosterhout	-	320	320
	Miocene		Breda	-	419	419
	Oligocene/Eocene *(Rupelian to Chattian)*	Middle North Sea Group	Rupel	Rupel Clay	450	450
	Middle to Late Eocene *(Lutetian - Bartonian)*	Lower North Sea Group	Dongen	Asse	497	497
	Early - Middle Eocene *(Ypresian - Lutetian)*			Brussel Sand	509	509
	Early Eocene *(Ypresian)*			Ieper	550	550
	Late Paleocene (*Thanetian*)		Landen	Landen Clay	700	700
	Late Paleocene *(Danian)*	Chalk	Ekofisk	-	737	737
Cretaceous	Upper Cretaceous - *(Turonian - Maastrichtian)*		Ommelanden	-	769	769

Period	Epoch	Group	Formation	Member	Top Depth [m] (MD)	Top Depth [m] (TVD)
	Cenomanian		Texel	Plenus Marl	1193.5	1193.5
				Texel Greensand	1196	1196
	Lower Cretaceous *(Late Albian)*	Rijnland	Holland	Upper Holland Marl	1260,5	1260,4
	Late Aptian - Early Albian			Middle Holland Claystone	1424	1422
	Early Albian			Holland Greensand	1506	1499,1
	Early Aptian			Lower Holland Marl	1642,5	1620,8
	Late Barremian - Early Aptian		Vlieland Sandstone	De Lier Sandstone	1781	1742,7
	Late Barremian			Vlieland Clay	1941	1881,4
	Late Hauterivian - Mid Barremian			Berkel Clastics	2240	2143,4
	Hauterivian			Rijswijk Sandstone	2265	2165
	Late Valanginian - Early Hauterivian	Schieland	Nieuwerkerk	Rodenrijs Claystone	2311	2204,5
	Valanginian			Delft Sandstone	2391	2272,9
	Ryazanian - Valanginian			Alblasserdam	2473,5	2343,5
Final Depth					2550	2409,7

2.2 Stratigraphic Profile NLW-GT-02-S1

Period	Epoch	Group	Formation	Member	Top Depth [m] (MD)	Top Depth [m] (TVD)
Cretaceous	*Late Aptian - Early Albian*	Rijnland	Holland	Middle Holland Claystone	1424	1422
				Kick off sidetrack @ 1467 m MD		
	Early Albian			Holland Greensand	1497	1491
	Early Aptian			Lower Holland Marl	1636	1622
	Late Barremian - Early Aptian		Vlieland Sandstone	De Lier Sandstone	1775	1746
	Late Barremian			Vlieland Clay	1953	1905
	Late Hauterivian - Mid Barremian			Berkel Clastics	2200	2125
	Hauterivian			Rijswijk Sandstone	2252	2173
	Late Valanginian - Early Hauterivian	Schieland	Nieuwerkerk	Rodenrijs Claystone	2301.5	2219
	Valanginian			Delft Sandstone	2377	2289.5
	Ryazanian - Valanginian			Alblasserdam	2456	2363
Final Depth					2600	2493.7

2.3 Summary of cutting description NLW-GT-03

Description is lag time corrected and based upon cuttings and rate of penetration (ROP)
GeoService GmbH starts sampling the well in 140 m (MD).

Top [m MD]	**Base** [m MD]	Description
(133)	200	**Sand**, light grey to light brownish grey, fine to medium grained, moderately to well sorted, silty, unconsolidated; quartz grains milky translucent to colourless clear, occasionally light grey-green, orange-brown and pale reddish shaded, angular to subangular, rounded to subrounded. Acc.: mica, glauconite (dark green to black), shell fragments. Some content of cement in the first sample near conductor shoe, later decreasingly (off white to whitish grey, very calcareous) and some mud additives.
200	260	**Sand**, light grey, also light brownish grey, fine grained, well sorted, increasingly silty, micaceous, slightly glauconitic, unconsolidated; quartz grains milky translucent to colourless clear, occasionally light yellow and pale red, orange. **Silt**, light brownish grey, micromicaceous, unconsolidated. Acc.: mica, glauconite, abundant shell fragments, foraminifers, coaly detritus, wood fragments.
260	310	**Sand**, light grey to light brownish grey, generally fine grained and well sorted, mainly as previously described. Furthermore some **Silt**, light brownish grey, occasionally ochre, micromicaceous, unconsolidated to firm, partly argillaceous and occ grading to very silty Clay. Acc.: mica flakes, dark green to black glauconite, pyrite, abundant shell fragments, sponge needles, sea urchins, foraminifers.
310	320	**Sand**, light grey, fine grained, well sorted, silty, slightly glauconitic, unconsolidated; quartz grains milky to clear. Moreover some **Silt**, pale greenish grey and pale brownish grey, crumbly, partially grading to very silty Claystone. Acc.: decreasingly shell fragments, mica, glauconite, pyrite, fossil remains.
320	410	**Argillaceous Marl**, light grey to light brownish grey, very sandy, silty, generally soft, partly sticky, occ grading to **Marly Clay** and **Silt**. Additionally alternating abundant **Sand**, light grey, fine grained, rarely medium grained, commonly well sorted, micaceous, slightly glauconitic. Acc.: mica, glauconite, pyrite, foraminifers, rarely shell fragments and wooden fossil fragments, also some coal detritus.
410	450	**Calcareous** to **argillaceous marl**, grey to green-grey and brown, sandy, silty, glauconitic, micaceous, friable to firm; fine grained sand as before, with greensand, fine to medium grained, marly; to the bottom increasingly claystone, brown grey, sandy, silty, micaceous, firm. Acc.: pyrite aggregates, glauconite, mica, foraminifers, rarely coal detritus.

Top [m MD]	**Base** [m MD]	Description
450	460	**Argillaceous Marlstone**, light brown, light brownish grey, silty, micaceous, firm. Additionally claystone, light greenish grey, silty, sandy, glauconitic, firm to moderately hard, with low amount of fine grained sand and greensand; quartz grains milky translucent to colourless clear, subangular in argillaceous matrix. Acc.: pyrite aggregates, glauconite, mica, rarely foraminifers.
460	490	**Claystone**, grey-green, brown, sandy, silty, glauconitic, firm; with decreasing amount of fine grained, **glauconitic sand**, quartz grains milky to clear, subangular, well sorted. Acc.: mica, glauconite, pyrite, foraminifers.
490	560	**Claystone**, light grey, to the bottom light brownish grey, silty, occasionally slight sandy with very fine grained sand, firm to moderately hard. Acc.: mica, glauconite, pyrite, foraminifers.
560	682	**Claystone**, light to medium brownish grey to greyish brown, at the top of interval in places rarely also very pale greenish grey shaded (if wet an later decreasingly), silty, commonly non calcareous, generally homogeneous, mainly firm to moderately hard, blocky. Sectionwise occasionally low amount of **Siltstone**, light grey, fine sandy, occ weak calcareous. Acc.: mica, pyrite, very rarely traces glauconite, occ. foraminifers.
682	720	**Claystone**, generally light to medium grey, just in traces at top and later decreasingly very pale brown shaded, occ silty, firm to moderately hard, micromicaceous, non to rarely weak calcareous. Additionally low percentage of **Marlstone**, light grey, firm. Moreover in the upper part occasionally some **Sandstone**, milled to loose quartz grains, colourless clear to light greyish translucent.
720	737	**Claystone**, light to medium grey, also light brown, silty, slightly micromicaceous and occasionally calcareous, firm to moderately hard. Abundant marlstone, light grey to grey white, friable to firm. Acc.: pyrite, mica.
737	770	**Limestone**, cream white, microcrystalline, predominantly arenitic and slightly glauconitic, also micritic, marly, blocky, splintery, moderately hard to hard; in layers abundant flintstone, brownish grey to dark grey, partly translucent, splintery, sharp edged, very hard. Subordinated claystone, light to dark grey, brownish grey, silty, micromicaceous, splintery, hard. Acc.: pyrite, calcite, fossil debris (foraminifers, echinoderms, inoceramus fragments).
770	817	**Limestone**, white to off white, microcrystalline, micritic, blocky, moderately hard. Increasing amount of **Chalk**, white, off white, occasionally cream white, micritic, porous, crumbly, friable, brittle; abundant flintstone, light to dark grey, brownish grey, translucent, splintery, sharp edged, very hard. Subordinated some claystone, light brownish grey, occasional silty, micromicaceous, firm to moderately hard. Acc.: pyrite, fossil debris.

Top [m MD]	**Base** [m MD]	Description
817	868	**Chalk**, white, off white, micritic, crumbly, friable, as previously described. Additionally abundant **Chert**, light to dark grey, milky translucent and opaque light brownish, generally splintery fragments, very hard. Decreasingly versus depth some **Limestone**, grey white, brownish white to light brown, dolomitic, micro- to fine crystalline, splintery, hard. Acc.: pyrite, rarely glauconite, foraminifers and fossil debris.
868	880	**Glauconitic Sandstone**, completely milled to loose grains, pale greenish grey and towards bottom also light brownish grey, fine to medium grained, occasionally coarse grained, poorly sorted; quartz grains milky translucent to colourless clear, subangular to subrounded, glauconite pale to dark green and blackish, in a friable, chalky to marly matrix. Moreover still some content of **Chert**, as described above. Acc.: pyrite, fossil debris (foraminifers, echinoderms, sponge needles, bryozoa, rarely fish & shark teeth).
880	900	**Sandstone**, grey white, fine to medium grained (subangular to subrounded), occasionally coarse grained (rounded to subrounded), poorly sorted; quartz grains (as previously described), hard cemented in a calcareous and partly calcitic matrix, hard, partly milled to loose grains. Acc.: calcite, glauconite, pyrite, fossil debris (foraminifers, echinoderms, sponge needles, bryozoa, fish & shark teeth).
900	960	**Chalk**, as previously described, rarely marly, occasionally with flintstone/chert, dark grey, somewhat light brown, very hard. Decreasing amount of **cement** from drilling 20” casing shoe track. Acc.: abundant pyrite and loose quartz grains (milky, yellowish, coarse grained, rounded to subrounded), less glauconite (dark green), euhedral calcite.
960	1040	**Chalk**, grey white, micritic, marly, occasionally sandy, dissolution seams (enrichment of pyrite and sheet silicates), porous, streaky, milled with abundant fossil debris, creme white (inoceramus fragments, foraminifers, echinoderms); subordinated (calcareous) marlstone, light grey, light brownish grey, silty, firm. Acc.: pyrite (often euhedral, partly fragmented crystals), glauconite, occasionally loose coarse and fine grained quartz (as before).
1040	1060	**Chalk**, as described before, micritic and microcrystalline, abundant fossil fragments. Marlstone, as before, somewhat grey to dark grey, enriched in pyrite. Subordinated euhedral calcite crystals (rhombohedral) and calcite crystal fragments, mainly translucent to milky, 1 to 3 mm in size (abundant in sample 1040 m, 1050 m).
1060	1100	**Chalk**, light grey, white to off-white, micritic, arenitic, marly, laminated with dissolution seams. To the bottom marlstone, light to dark grey, silty, partly laminated, moderately hard. Subordinated sandstone, loose grains, very fine to coarse grained, translucent, milky, yellowish, subrounded to subangular. Acc.: pyrite (as before), glauconite (dark green, fine and medium grained), calcite, fossil fragments (shells, ostracods, foraminifers, spines of sea urchins).

Top [m MD]	**Base** [m MD]	Description
1100	1180	**Chalk**, off white, grey white, streaky grey, micritic, partly arenitic, marly, porous, crumbly, friable; increasing content of chert, light grey to light brownish grey, white to translucent, splintery, sharp edged, very hard; subordinated marlstone, light to dark grey, brownish grey, silty, platy, occasionally laminated, firm. Acc.: pyrite, fossil debris (inoceramus fragments, foraminifers).
1180	1190	**Chalk** and **chert**, as before, with euhedral calcite and fragments of calcite crystals (apparent in sample 1190 m, as described for sample 1040 m and 1050 m), also mud additives (< 10 %)
1190	1220	**Sandstone**, light grey, very fine to fine grained, somewhat medium grained, strong silty, glauconitic, quartz grains milky, translucent, subangular to subrounded in silty matrix, partly calcareous; abundant glauconite, green, dark green, very fine, fine to medium grained, glauconite grain size decreases. **Siltstone** light to medium grey, micaceous, glauconitic, sandy, firm to moderately hard. Subordinated chert and chalk, as described before. Acc.: mica, glauconite (dark green, fine to medium grained).
1220	1230	Alternating beds of **sandstone** and **siltstone**, as described before. Sandstone, predominant very fine to fine grained; silty matrix, calcareous to marly. Subordinated marlstone, medium to dark grey, partly calcareous, firm, slaty cleavage, micaceous, silty to sandy.
1230	1255	**Glauconitic sandstone**, light grey, predominant fine grained, partly medium grained, decreasing grain size downward, translucent to milky quartz, subrounded to subangular; varying amount of glauconite, very fine to fine grained glauconite, dark green, green; marly to calcareous matrix, silty, hard. Subordinated medium grained sandstone, brownish-yellowish milky quartz, angular to subangular, grain-supported, glauconitic, matrix quartzitic, hard to very hard. Acc.: mica, pyrite, glauconite, fossiliferous.
1255	1270	**Siltstone** to fine grained **sandstone**, as described before. Increasing amount of **marlstone**, light to medium grey (calcareous), somewhat dark grey (argillaceous), silty to sandy, micaceous, firm. Acc. pyrite, glauconite (dark green to black), euhedral calcite (0.5 to 1.5 mm), chert (cavings).
1270	1300	**Marlstone**, light grey to grey, brownish grey, as described before; also calcareous marlstone to marly limestone, off-white, light grey - white, laminated, chalky, friable to firm. Also **siltstone** (as described before) and **mud additives**. Acc.: foraminifers, glauconite, pyrite, euhedral calcite, loose rounded calcite and quartz grains.
1300	1420	**Marlstone**, predominant greenish grey, grey, less light grey marlstone, calcareous, silty to sandy, increasing amount of glauconite, silty to very fine grained, dark green. Subordinated siltstone to sandstone, loose quartz grains, very fine to fine grained, occasionally medium grained, translucent to milky, subrounded to subangular, milled. Acc.: pyrite, glauconite (fine grained, dark green).

Top [m MD]	**Base** [m MD]	Description
1420	1440	**Calcareous** and **argillaceous marlstone**, greenish medium grey (dark grey), silty to sandy, friable to firm, abundant glauconite, very fine to medium grained, dark green. **Glauconitic sandstone**, loose quartz grains, translucent (milky), very fine to fine grained, silty, subangular to angular. Acc.: pyrite, glauconite, fossil fragments.
1440	1470	**Claystone**, dark grey (medium grey), somewhat marly, silty, firm, sericitic, content increases. Glauconitic sandstone and less marlstone, as described before, varying glauconite content (very fine to fine grained).
1470	1490	Successions as described before, also brown **sandstone**, yellowish brown, fine grained quartz, predominant subangular, well sorted, marly, partly quartzitic, hard to very hard.
1490	1510	**Claystone**, as described before, partly very silty and sandy. Increasing content of sandstone**,** loose quartz grains, translucent, milky, yellowish, very fine to fine grained, rarely medium grained, subrounded to subangular, well sorted, glauconitic. Acc.: pyrite, glauconite, mud additives.
1510	1560	Alternate bedding of **Claystone**, dark grey, firm to hard, silty, very sandy, micromicaceous, slightly calcareous and **Sandstone**, light grey, very fine grained, partly glauconitic, pyritic, firm. Quartz grains clear, milky, yellowish. Acc.: pyrite, glauconite
1560	1590	**Claystone**, dark and medium grey, firm to hard, silty, very sandy, micromicaceous, slightly calcareous. Acc.: pyrite, glauconite, mud additives.
1590	1639	Alternating beds of predominant **claystone** and **marlstone**. Claystone, as described before, increasingly marly. Marlstone, medium grey, very silty and sandy, micaceous, partly argillaceous, friable, firm. Subordinated sandstone, loose very to fine grained quartz, translucent, milky, yellowish, subrounded to angular. Acc.: pyrite, glauconite, mud additives.
1639	1686	Increasing amount of **marlstone**, light grey to greenish grey, as described before; occasionally calcareous marlstone, yellowish light brown, off-white to grey, laminated, silt to sandy, somewhat glauconitic (very fine grained), friable. Claystone, as before, subordinated light grey, firm, fosile.
1686	1778	**Calcareous** and **argillaceous marlstone**, light and medium grey, greenish grey, laminated, micromicaceous, silty to sandy, friable to firm. Subordinated claystone, as described before, often dark grey, slaty cleavage. Acc.: pyrite, loose quartz grains (very fine to fine grained, translucent to milky, predominant subangular), mud additives.

Top [m MD]	**Base** [m MD]	Description
1778	1849	**Claystone (to argillaceous marlstone)**, grey, light grey to medium grey, dark grey, blocky, calcareous, micromicaceous, silty, sandy, firm. **Sandstone**, light grey to brownish grey, very fine grained, argillaceous, glauconitic, firm; mostly milled to translucent or milky quartz grains, well sorted, angular to subrounded, rarely round. Acc.: pyrite, glauconite, mud additives.
1849	1890	**Sandstone**, predominant grey, light and dark grey, greenish grey, partly loose quartz grains, very fine to fine grained, very silty, quartz light grey, dark grey, translucent to milky, mainly subangular, predominant matrix-supported fabric, argillaceous to marly, micaceous, some glauconite, firm to hard. Subordinated sandstone, brown, light brown to dark reddish brown, very fine to fine grained quartz, reddish brown, yellowish brown-red, subangular to angular; predominant grain-supported, yellowish marly to calcareous matrix; medium hard to very hard. **Claystone** and somewhat **argillaceous marlstone**, as described before. Acc.: pyrite, mud additives.
1890	1973	**Claystone** with horizons of sandstone (as described before). Claystone, partly argillaceous marlstone, medium to dark grey, greenish grey, laminated, very silty to sandy, micaceous, often friable (to firm). Acc.: abundant light mica flakes, pyrite, loose quartz grains (as before), fragments of clay ironstone (yellowish brown), mud additives.
1973	2070	**Sandstone** light grey, seldom brownish grey, fine grained, argillaceous, glauconitic, firm: mostly milled to translucent or milky quartz grains, well sorted, angular to subangular, rarely subrounded, marly to calcareous matrix **Claystone** grey to dark grey, blocky, calcareous, micaceous, silty, sandy, hard. Acc.: pyrite, glauconite, fragments of clay ironstone, mud additives.
2070	2105	**Sandstone**, as described before. **Claystone**, light grey to dark grey, as described before, and **calcareous claystone** to marlstone, light grey, off-white, laminated, dissolution seams enriched in opaque phases incl. coal and pyrite, very silty to sandy, micaceous, friable to hard. Acc.: shell fragments, glauconite (fine grained, dark green), pyrite.
2105	2160	Lithology as previously described, increasingly calcareous, abundant **coal** in calcareous claystone to marlstone, coal fragments < 2.5. mm in size, black, shiny, partly blocky, soft to friable.
2160	2270	**Sandstone**, light grey, occasionally medium to dark grey or brown, quartz very fine to finegrained, translucent, milky, grey, subangular to angular, well sorted, predominant marly matrix, silty, micaceous, some glauconitic, fine lignitic matter. Gradual transitions from marly sandstone to very sandy and silty calcareous claystone, as described before, less coal fragments.

Top [m MD]	**Base** [m MD]	Description
2270	2306	**Sandstone**, light grey, also yellowish white, fine grained, argillaceous, micaceous, firm; mostly milled to translucent or milky, seldom grey, quartz grains, well sorted, angular to subrounded, calcareous matrix and **Claystone**, grey to dark grey, blocky, glauconitic, micromicaceous, silty, sandy, friable to moderately hard. Acc. glauconite and pyrite.
2306	2315	**Sandstone**, light grey to medium grey, fine to medium grained, argillaceous, micromicaceous, soft; mostly milled to milky, seldom translucent, quartz grains, fairly sorted, angular to subangular, calcareous matrix and **Claystone** as described before.
2315	2360	**Claystone**, grey to dark grey, crumbly, blocky, slightly calcareous, micromicaceous, silty, firm to hard. Acc.: pyrite.
2360	2405	**Claystone**, turns more dark grey, as described before and **Sandstone**, light grey to grey, seldom off white, seldom light brown, fine grained, argillaceous, micaceous, firm; partly milled to translucent or milky, seldom ochre, quartz grains, poorly sorted, angular to subangular, calcareous matrix. Acc.: pyrite, shall fragments.
2405	2455	**Sandstone**, light grey to medium grey, quartz grains milky white to translucent, fine to course grained, subangular to subrounded, moderately sorted. Acc.: **Coal/Lignite**, black, glossy, brittle.
2455	(2550)	**Claystone**, grey to dark grey, partly red to reddish brown, blocky, crumbly, micromicaceous, silty, firm and **Sandstone**, off white, light grey, seldom light brown, fine grained, micromicaceous, soft; mostly milled to translucent or milky, partly red or light brown, quartz grains, moderately sorted, angular to subangular. Acc.: pyrite.
		Final depth: 2550 m MD

2.4 Summary of Cutting Descriptions NLW-GT-03-S1

Description is lag time corrected and based upon cuttings and rate of penetration (ROP)
GeoService GmbH starts sampling the sidetrack in 1460 m (MD).

Top [m MD]	**Base** [m MD]	Description
1467		**Start Kick off sidetrack NLW-GT-03-S1**
1467	1476	**Cement**, grey, light grey, besides **Claystone**, dark grey (medium grey), somewhat marly, silty, sandy, mica, glauconitic, firm, as well as something fine loose quartz grains, isolated Pyrite.
1476	1497	**Claystone**, medium to dark grey, sandy, silty, slightly calcareous, partly pyritic, platy, firm to hard; subordinated sandstone, light grey, brownish grey, fine grained, well sorted; quartz grains milky to clear, occasionally pale yellow, subangular, in a silty matrix, firm to hard. Acc.: pyrite, glauconite, mica
1497	1560	Alternate bedding of **Sandstone** (partly drilled to loose quartz grains) , grey to light grey, very fine to fine grained, partly glauconitic and calcareous, pyritic, firm. Quartz grains clear, milky, yellowish. Acc.: pyrite, glauconite and Claystone, dark grey, firm to hard, silty, very sandy, micromicaceous, slightly partly calcareous.
1560	1636	**Claystone**, dark and medium grey, silty, very sandy, micromicaceous, firm to hard, partly calcareous. From sample 1580 m increased clay ironstone ?, light brown, very hard. Acc.: pyrite, glauconite.
1636	1680	**Marlstone**, light and medium grey, silty to sandy, with alternating content of carbonate, partly micromicaceous, friable to firm. Subordinated claystone, as described before, medium to dark grey, hard, decreasing to the bottom. Acc.: pyrite, loose quartz grains, glauconite, mica.
1680	1775	**Marlstone**, light grey, with lower content of carbonate, partly argillaceous marlstone, silty, pyritic, more homogenous, friable to firm. Acc.: pyrite, mica.
1775	1880	**Claystone**, grey to light grey, very silty to sandy, marly, micaceous, firm, alternation of bedded **Sandstone** (mostly milled), light grey to whit grey, very fine to fine grained, argillaceous, glauconitic, partly moderate calcareous, firm to moderately hard. Acc.: pyrite
1880	1953	**Claystone**, grey to light grey, strong silty and sandy, micaceous, firm to medium hard. Besides Sandstone (mostly drilled), also as fine layers, light grey, also brownish, very fine to fine grained, argillaceous, glauconitic, firm to medium hard. Acc.: pyrite, fragments of clay ironstone, medium brownish.

Top [m MD]	**Base** [m MD]	Description
1953	2060	**Claystone**, light grey, strong silty with transitions to **siltstone**, micaceous, sandy, friable to firm; occasionally medium to dark grey , firm to hard; subordinated sand(-stone), very fine grained, well sorted, milky subangular quartz grains, predominantly as component of clay-/siltstone and to the bottom increasingly in thin bedded, intercalated layers; predominantly milled to loose grains. Acc.: mica, pyrite.
2060	2140	**Claystone**, grey to light grey, occasionally dark grey, strong silty and sandy, slightly calcareous, micaceous, partly with very fine lignitic and coal inclusion, firm to medium firm, with transition to Siltstone/Sandstone in fine layers, grey to light grey, rare white grey, rarely glauconitic and with coal tinsel, firm to medium hard.
2140	2200	**Alternate bedding: Sandstone**, light grey, partly medium to dark grey or brownish grey, very fine to fine grained, quartz grains clear to milky translucent, grey, subangular to angular, well sorted, in silty matrix, micaceous, occasionally glauconitic. Gradual transitions from silty sandstone to very sandy and silty calcareous **claystone**, as described before. Acc.: mica, pyrite, coal detritus.
2200	2252	**Alternate bedding**: **Sandstone**, light grey to grey white, partly brown grey, occasionally medium grey, very fine to fine grained, occasionally also coarse quarz grains, moderately sorted sorted, in silty, non calcareous matrix, hard; **claystone**, light to medium grey, strong silty, micaceous, sandy, friable to firm. Acc.: mica, pyrite, coal detritus.
2252	2301,5	**Sandstone** (mostly milled), light grey to white grey, also yellowish, predominant very fine to medium grained, quartz, translucent, milky, grey, subangular to angular, well sorted, micaceous, argillaceous, some glauconitic, fine lignitic matter, moderate porous and locally loose medium to coarse quartz grains. Besides **claystone**, light to medium grey, strong silty, micaceous, sandy, friable to firm. Acc.: mica, pyrite, coal detritus
2301,5	2330	**Claystone**, medium to dark grey, also light grey, occasionally brownish grey, silty, sandy, micromicaceous, slightly calcareous, platy to crumbly, firm to moderately hard. Subordinated sandstone, as previously described. Acc.: coal, mica, limestone, rarely pyrite, traces of siderite.
2330	2377	**Claystone**, medium to dark grey, also light grey, occasionally brownish grey as before. Alternating with Sandstone, light grey , off white grey, very fine to fine grained, subrounded to subangular, well sorted, argillaceous and calcareous cemented, firm to moderately hard. Acc.: coal, mica, limestone, rarely pyrite, traces of siderite
2377	2456	**Sandstone** (mostly drilled), light grey to white grey, also medium grey, quartz grains milky white to translucent, fine to course grained, subangular to subrounded, moderately sorted. Acc.: **Coal/Lignite**, black, glossy, brittle.

Top [m MD]	**Base** [m MD]	Description
2456	2507,5	**Claystone**, light grey to dark grey, partly red to reddish brown, blocky, crumbly, micromicaceous, silty, firm and **Sandstone**, off white, light grey, seldom light brown, fine to medium grained, also coarse grained, micromicaceous, soft; mostly milled to translucent or milky, partly red or light brown, quartz grains, moderately sorted, angular to subangular. Acc.: pyrite.
2507,5	(2600)	**Sandstone**, off-white,light grey, silty, milled to rockflour and loose quartz grains, fine to coarse grained, subangular to rounded, poorly sorted, transparent colourless clear and translucent to opaque greyish. Intercalated sections of **Claystone**, medium to dark grey, increasingly reddish brown, silty, sandy, micromicaceous, firm to hard. Acc.: mica, pyrite.
		Final depth: 2600 m MD

PART 3

3.1 Borehole Data NLW-GT-03

Rotary table	8.6 m above ground level
Ground level	- 0.9 m NAP
Total depth	2550 m MD

3.2 Borehole Data NLW-GT-03-S1

Rotary table	8.6 m above ground level
Ground level	- 0.9 m NAP
Total depth	2600 m MD

3.3 Hole Sections

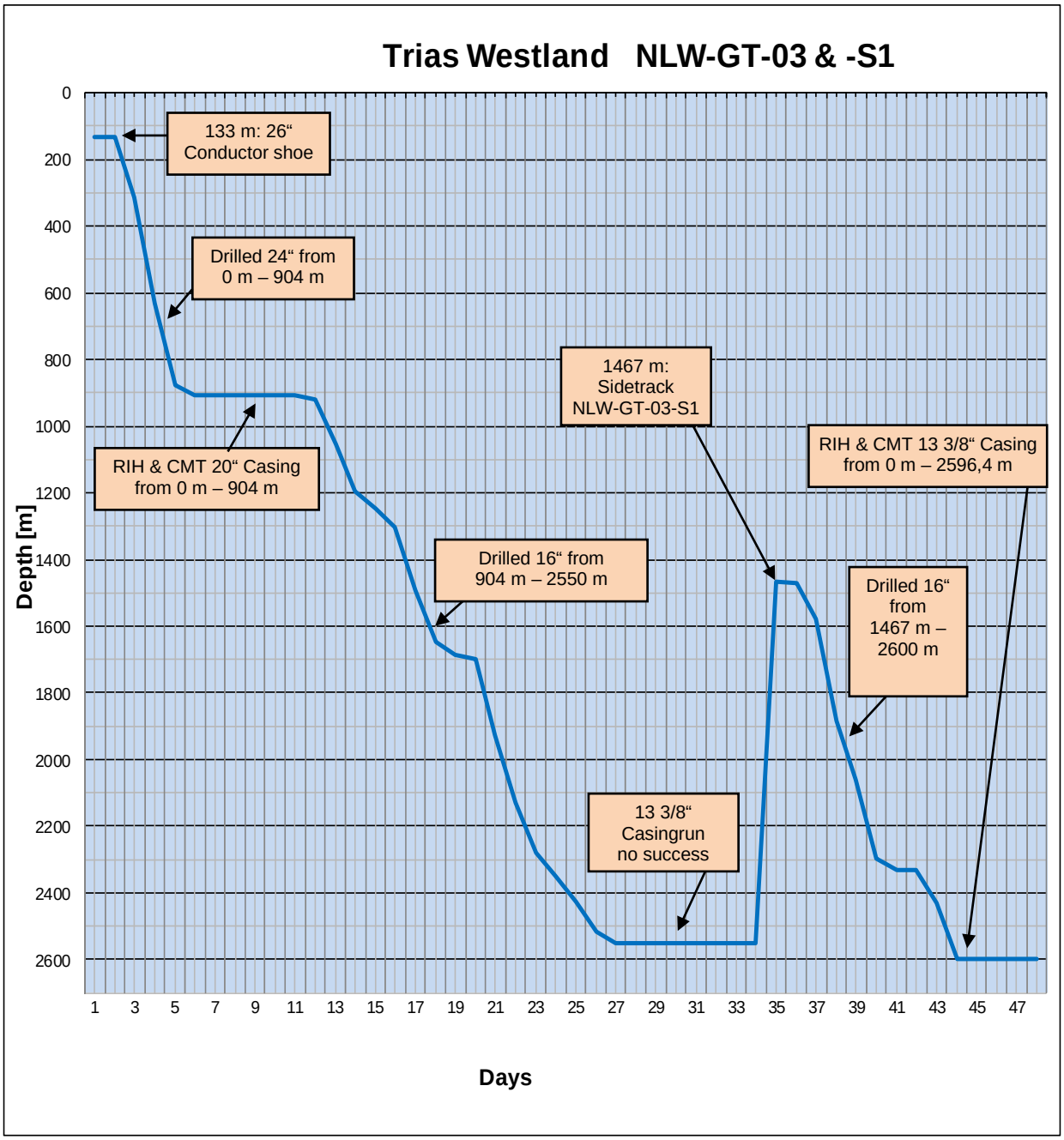
Bit diameter	Up to Depth [MD]
24.0”	904.0 m
16.0”	2600

3.4 Casing Profile

Casing OD / ID	Depth Shoe [MD]	Depth Head [MD]
Conductor 26” / 25”	133.0 m	0.0 m (GL)
Casing 20”/18.73”	904.0 m	0.0 m (GL)
Casing 13 3/8“/	2596.39 m	0.0 m (GL)

MD = Measured depth

3.5 Drilling Rate Curve



3.6 Directional drilling data (Survey data) NLW-GT-03

Depth	Incl	Azi	TVD	North	East	Vertsec	Closure	DLS	Totazi	Totdev
m	°	°	m	m	m	m	m	°/30m	°	m
163,60	0,10	39,10	163,60	0,11	0,09	0,02	0,14	0,018	39,10	0,14
220,00	0,10	95,40	220,00	0,14	0,17	0,07	0,22	0,050	49,68	0,22
308,40	0,00	35,30	308,40	0,14	0,25	0,13	0,28	0,034	60,96	0,28
321,40	0,10	236,90	321,40	0,13	0,24	0,13	0,27	0,231	61,13	0,27
346,90	0,10	250,20	346,90	0,11	0,20	0,11	0,23	0,027	60,65	0,23
359,80	0,10	324,50	359,80	0,12	0,18	0,09	0,22	0,281	57,17	0,22
385,60	0,10	151,40	385,60	0,12	0,18	0,09	0,21	0,232	57,16	0,21
398,40	0,20	163,20	398,40	0,08	0,19	0,12	0,21	0,244	66,19	0,21
411,10	0,20	156,20	411,10	0,04	0,21	0,15	0,21	0,058	78,33	0,21
433,10	0,20	207,70	433,10	-0,03	0,20	0,19	0,20	0,237	97,49	0,20
436,60	0,10	232,70	436,60	-0,03	0,20	0,19	0,20	1,005	99,74	0,20
449,30	0,10	254,80	449,30	-0,04	0,18	0,17	0,18	0,091	103,73	0,18
462,30	0,00	108,40	462,30	-0,05	0,17	0,17	0,17	0,231	105,54	0,17
487,90	0,10	330,20	487,90	-0,03	0,16	0,15	0,16	0,117	99,86	0,16
501,30	0,10	291,80	501,30	-0,01	0,14	0,12	0,14	0,147	95,19	0,14
513,50	0,00	354,30	513,50	-0,01	0,13	0,11	0,13	0,246	93,84	0,13
526,30	0,10	38,50	526,30	0,00	0,14	0,12	0,14	0,234	89,99	0,14
539,30	0,10	270,20	539,30	0,01	0,13	0,11	0,13	0,415	86,14	0,13
552,20	0,10	304,00	552,20	0,02	0,11	0,09	0,11	0,135	82,23	0,11
565,00	0,10	44,60	565,00	0,03	0,11	0,08	0,11	0,361	75,06	0,11
578,70	0,10	156,60	578,70	0,03	0,12	0,09	0,13	0,363	77,67	0,13
590,50	0,10	357,10	590,50	0,03	0,13	0,09	0,13	0,500	77,65	0,13
603,30	0,10	318,60	603,30	0,05	0,12	0,08	0,13	0,155	68,33	0,13
616,10	0,10	352,30	616,10	0,07	0,11	0,06	0,13	0,136	58,80	0,13
628,90	0,20	48,90	628,90	0,09	0,13	0,06	0,16	0,392	53,62	0,16
641,70	0,20	62,80	641,70	0,12	0,16	0,07	0,20	0,113	54,11	0,20
654,50	0,10	161,80	654,50	0,12	0,19	0,09	0,22	0,556	57,77	0,22
667,40	0,20	134,80	667,40	0,09	0,21	0,12	0,22	0,279	66,20	0,22
680,20	0,20	130,10	680,20	0,06	0,24	0,17	0,25	0,038	75,77	0,25
693,10	0,20	91,00	693,10	0,05	0,28	0,21	0,28	0,311	80,70	0,28
705,90	0,20	61,10	705,90	0,06	0,32	0,24	0,32	0,242	80,08	0,32
757,10	0,50	76,80	757,10	0,09	0,48	0,36	0,49	0,555	79,81	0,49
769,70	0,30	128,50	769,70	0,08	0,56	0,43	0,56	0,935	82,04	0,56
782,50	0,40	133,40	782,50	0,03	0,62	0,51	0,62	0,244	87,55	0,62
795,50	0,40	162,70	795,50	-0,05	0,66	0,59	0,66	0,467	94,15	0,66
808,00	0,40	163,10	808,00	-0,13	0,69	0,65	0,70	0,000	100,81	0,70
821,00	0,50	145,20	821,00	-0,22	0,73	0,74	0,77	0,395	106,79	0,77
833,80	0,40	170,40	833,80	-0,31	0,77	0,82	0,83	0,514	111,93	0,83
846,60	0,30	163,60	846,60	-0,39	0,79	0,87	0,88	0,253	116,13	0,88
859,60	0,50	150,60	859,60	-0,47	0,83	0,95	0,95	0,504	119,57	0,95
872,20	0,40	152,40	872,20	-0,56	0,88	1,04	1,04	0,240	122,45	1,04
897,50	0,50	152,40	897,49	-0,73	0,97	1,21	1,21	0,119	127,14	1,21
922,30	0,70	173,00	922,29	-0,98	1,04	1,40	1,43	0,352	133,38	1,43
935,30	0,60	185,00	935,29	-1,13	1,04	1,48	1,53	0,389	137,27	1,53
948,10	0,80	178,90	948,09	-1,28	1,04	1,56	1,65	0,500	141,07	1,65

Depth	Incl	Azi	TVD	North	East	Vertsec	Closure	DLS	Totazi	Totdev
m	°	°	m	m	m	m	m	°/30m	°	m
960,30	0,70	175,40	960,29	-1,44	1,04	1,65	1,78	0,270	144,10	1,78
973,70	0,80	176,20	973,69	-1,62	1,06	1,76	1,93	0,225	146,84	1,93
986,40	0,70	187,70	986,39	-1,78	1,05	1,84	2,07	0,426	149,45	2,07
999,20	0,80	173,70	999,19	-1,95	1,05	1,93	2,21	0,488	151,66	2,21
1011,80	0,80	169,90	1011,79	-2,12	1,08	2,05	2,38	0,126	153,12	2,38
1024,60	0,70	186,10	1024,59	-2,29	1,08	2,14	2,53	0,547	154,66	2,53
1037,40	0,70	185,90	1037,38	-2,44	1,07	2,21	2,67	0,000	156,41	2,67
1050,30	0,90	189,20	1050,28	-2,62	1,04	2,29	2,82	0,477	158,31	2,82
1063,20	1,00	173,70	1063,18	-2,83	1,04	2,40	3,02	0,639	159,87	3,02
1076,50	1,00	174,10	1076,48	-3,06	1,06	2,54	3,24	0,000	160,86	3,24
1088,73	1,00	171,90	1088,71	-3,28	1,09	2,68	3,45	0,094	161,61	3,45
1101,60	0,90	178,20	1101,58	-3,49	1,11	2,81	3,66	0,337	162,37	3,66
1114,30	1,00	161,80	1114,27	-3,69	1,15	2,95	3,87	0,681	162,76	3,87
1127,40	1,00	178,20	1127,37	-3,92	1,19	3,10	4,09	0,653	163,16	4,09
1140,00	1,10	171,20	1139,97	-4,15	1,21	3,24	4,32	0,387	163,76	4,32
1152,90	1,00	166,40	1152,87	-4,38	1,25	3,41	4,55	0,310	164,03	4,55
1165,70	1,10	173,40	1165,67	-4,61	1,29	3,56	4,79	0,381	164,32	4,79
1178,50	1,30	162,70	1178,46	-4,87	1,35	3,75	5,05	0,702	164,50	5,05
1191,30	1,70	163,00	1191,26	-5,19	1,45	4,01	5,39	0,938	164,40	5,39
1204,20	1,90	164,40	1204,15	-5,58	1,56	4,31	5,79	0,476	164,35	5,79
1216,90	1,90	153,10	1216,84	-5,97	1,71	4,65	6,21	0,884	163,97	6,21
1229,60	1,90	155,60	1229,54	-6,35	1,90	5,01	6,62	0,196	163,36	6,62
1242,50	1,70	150,90	1242,43	-6,71	2,08	5,35	7,02	0,578	162,79	7,02
1253,90	2,10	156,70	1253,83	-7,05	2,24	5,67	7,40	1,167	162,35	7,40
1268,10	1,80	153,20	1268,02	-7,49	2,45	6,08	7,88	0,682	161,91	7,88
1280,40	2,00	160,40	1280,31	-7,86	2,61	6,42	8,28	0,759	161,66	8,28
1293,70	2,60	179,60	1293,60	-8,38	2,69	6,76	8,80	2,185	162,24	8,80
1306,60	3,70	200,00	1306,48	-9,07	2,54	7,01	9,42	3,614	164,32	9,42
1319,30	5,00	206,50	1319,14	-9,95	2,16	7,16	10,18	3,279	167,76	10,18
1332,20	6,10	211,90	1331,98	-11,03	1,54	7,22	11,14	2,829	172,03	11,14
1345,10	7,50	214,00	1344,79	-12,31	0,71	7,21	12,33	3,306	176,69	12,33
1357,80	8,90	215,40	1357,36	-13,80	-0,32	7,13	13,80	3,340	181,33	13,80
1370,40	10,00	215,70	1369,79	-15,48	-1,52	7,02	15,56	2,622	185,62	15,56
1383,40	11,10	217,20	1382,57	-17,40	-2,94	6,85	17,64	2,616	189,59	17,64
1396,30	12,60	218,30	1395,20	-19,49	-4,56	6,61	20,02	3,528	193,17	20,02
1409,10	13,80	219,30	1407,66	-21,77	-6,39	6,28	22,69	2,863	196,37	22,69
1434,80	16,40	219,70	1432,47	-26,93	-10,65	5,46	28,96	3,037	201,58	28,96
1447,40	17,60	220,50	1444,52	-29,75	-13,03	4,97	32,47	2,911	203,65	32,47
1460,40	19,00	220,00	1456,86	-32,86	-15,66	4,41	36,41	3,251	205,48	36,41
1473,20	20,70	219,00	1468,90	-36,22	-18,43	3,88	40,64	4,063	206,97	40,64
1484,90	22,20	218,20	1479,79	-39,56	-21,10	3,43	44,84	3,919	208,07	44,84
1498,90	23,90	215,90	1492,67	-43,94	-24,39	2,99	50,26	4,122	209,04	50,26
1511,60	25,20	215,50	1504,22	-48,22	-27,47	2,69	55,50	3,096	209,67	55,50
1524,50	26,00	215,50	1515,85	-52,76	-30,71	2,39	61,05	1,860	210,20	61,05
1537,30	26,30	215,90	1527,34	-57,34	-34,00	2,07	66,67	0,816	210,67	66,67
1550,20	26,40	215,90	1538,90	-61,98	-37,36	1,73	72,37	0,233	211,08	72,37
1563,00	26,90	216,20	1550,34	-66,62	-40,74	1,37	78,09	1,214	211,45	78,09

Depth	Incl	Azi	TVD	North	East	Vertsec	Closure	DLS	Totazi	Totdev
m	°	°	m	m	m	m	m	°/30m	°	m
1575,80	27,20	216,00	1561,74	-71,33	-44,17	1,00	83,89	0,735	211,77	83,89
1593,50	27,60	216,20	1577,46	-77,91	-48,97	0,48	92,02	0,696	212,15	92,02
1601,50	27,70	216,90	1584,54	-80,89	-51,18	0,21	95,72	1,275	212,32	95,72
1614,30	27,80	216,30	1595,87	-85,67	-54,73	-0,22	101,66	0,695	212,57	101,66
1627,20	27,80	216,10	1607,28	-90,53	-58,28	-0,61	107,67	0,217	212,77	107,67
1652,60	27,80	216,10	1629,75	-100,10	-65,26	-1,36	119,50	0,000	213,10	119,50
1665,50	27,90	216,20	1641,16	-104,97	-68,82	-1,75	125,52	0,257	213,25	125,52
1675,40	27,60	215,20	1649,92	-108,71	-71,51	-2,01	130,12	1,678	213,34	130,12
1690,80	27,80	215,30	1663,55	-114,56	-75,64	-2,36	137,28	0,400	213,44	137,28
1701,40	28,10	216,20	1672,92	-118,59	-78,54	-2,65	142,24	1,465	213,52	142,24
1714,40	28,30	216,60	1684,38	-123,53	-82,19	-3,07	148,38	0,635	213,64	148,38
1727,20	28,60	216,00	1695,63	-128,45	-85,80	-3,48	154,47	0,971	213,74	154,47
1740,10	28,90	215,80	1706,94	-133,47	-89,44	-3,86	160,67	0,733	213,83	160,67
1752,90	28,80	215,30	1718,15	-138,50	-93,03	-4,19	166,84	0,612	213,89	166,84
1765,60	28,90	214,90	1729,27	-143,51	-96,55	-4,47	172,97	0,513	213,93	172,97
1778,50	29,30	216,30	1740,55	-148,61	-100,20	-4,82	179,24	1,836	213,99	179,24
1791,40	29,70	216,30	1751,77	-153,73	-103,96	-5,25	185,59	0,930	214,07	185,59
1803,90	29,30	216,90	1762,65	-158,67	-107,63	-5,69	191,73	1,193	214,15	191,73
1816,90	29,10	218,00	1774,00	-163,71	-111,49	-6,24	198,07	1,322	214,26	198,07
1829,70	29,50	217,20	1785,16	-168,67	-115,31	-6,81	204,32	1,312	214,36	204,32
1842,50	29,80	217,50	1796,29	-173,70	-119,15	-7,35	210,64	0,784	214,45	210,64
1855,30	30,10	217,80	1807,38	-178,76	-123,06	-7,93	217,02	0,786	214,54	217,02
1868,10	30,70	218,70	1818,42	-183,85	-127,07	-8,58	223,49	1,765	214,65	223,49
1880,50	31,10	217,90	1829,06	-188,85	-131,01	-9,23	229,84	1,387	214,75	229,84
1893,50	30,60	218,10	1840,22	-194,10	-135,12	-9,87	236,50	1,178	214,84	236,50
1906,40	30,20	217,20	1851,35	-199,27	-139,11	-10,47	243,02	1,410	214,92	243,02
1919,40	30,20	217,20	1862,58	-204,48	-143,06	-11,01	249,55	0,000	214,98	249,55
1931,90	29,20	215,90	1873,44	-209,45	-146,75	-11,45	255,74	2,855	215,02	255,74
1945,00	28,90	215,20	1884,89	-214,63	-150,45	-11,80	262,11	1,038	215,03	262,11
1957,80	28,80	215,30	1896,10	-219,67	-154,01	-12,10	268,28	0,260	215,03	268,28
1970,60	28,40	214,70	1907,34	-224,69	-157,53	-12,37	274,41	1,154	215,03	274,41
1983,50	28,00	214,90	1918,71	-229,70	-161,00	-12,62	280,50	0,956	215,03	280,50
1996,20	28,30	215,30	1929,91	-234,60	-164,45	-12,90	286,50	0,837	215,03	286,50
2009,10	28,70	214,50	1941,24	-239,65	-167,97	-13,16	292,65	1,286	215,03	292,65
2021,90	28,10	213,90	1952,50	-244,68	-171,39	-13,35	298,74	1,557	215,01	298,74
2034,80	28,90	213,70	1963,84	-249,80	-174,82	-13,49	304,89	1,874	214,99	304,89
2047,50	29,20	213,70	1974,94	-254,93	-178,24	-13,63	311,06	0,709	214,96	311,06
2059,00	29,10	214,50	1984,99	-259,56	-181,38	-13,79	316,66	1,049	214,95	316,66
2073,40	29,00	213,70	1997,57	-265,35	-185,30	-13,99	323,65	0,836	214,93	323,65
2086,00	29,50	214,00	2008,57	-270,47	-188,73	-14,14	329,81	1,241	214,91	329,81
2098,60	29,70	214,80	2019,52	-275,60	-192,25	-14,35	336,03	1,054	214,90	336,03
2111,40	29,30	214,40	2030,66	-280,79	-195,82	-14,59	342,33	1,045	214,89	342,33
2124,40	28,30	213,50	2042,06	-285,99	-199,32	-14,75	348,59	2,515	214,88	348,59
2137,20	28,00	214,60	2053,34	-290,99	-202,70	-14,92	354,63	1,405	214,86	354,63
2150,10	28,30	213,70	2064,72	-296,03	-206,12	-15,10	360,72	1,209	214,85	360,72
2162,90	28,10	213,70	2076,00	-301,06	-209,48	-15,23	366,76	0,469	214,83	366,76
2175,90	28,20	213,80	2087,46	-306,16	-212,88	-15,37	372,90	0,255	214,81	372,90

Depth	Incl	Azi	TVD	North	East	Vertsec	Closure	DLS	Totazi	Totdev
m	°	°	m	m	m	m	m	°/30m	°	m
2188,70	28,60	214,80	2098,72	-311,19	-216,31	-15,57	378,98	1,457	214,80	378,98
2201,50	29,00	214,90	2109,94	-316,25	-219,84	-15,83	385,15	0,944	214,81	385,15
2214,20	29,30	214,90	2121,03	-321,32	-223,38	-16,09	391,34	0,709	214,81	391,34
2227,00	29,70	214,70	2132,17	-326,50	-226,97	-16,35	397,64	0,965	214,81	397,64
2239,90	30,10	215,10	2143,35	-331,77	-230,65	-16,62	404,07	1,039	214,81	404,07
2252,70	30,40	215,10	2154,41	-337,05	-234,36	-16,92	410,52	0,703	214,81	410,52
2265,60	30,60	214,30	2165,52	-342,43	-238,09	-17,18	417,06	1,053	214,81	417,06
2278,40	30,60	215,00	2176,54	-347,79	-241,79	-17,43	423,58	0,835	214,81	423,58
2298,30	30,90	216,10	2193,64	-356,07	-247,71	-17,98	433,75	0,961	214,83	433,75
2316,40	31,20	215,80	2209,15	-363,62	-253,19	-18,55	443,09	0,559	214,85	443,09
2339,30	31,10	216,00	2228,75	-373,22	-260,14	-19,26	454,93	0,188	214,88	454,93
2354,00	31,40	216,90	2241,31	-379,35	-264,67	-19,79	462,55	1,133	214,90	462,55
2368,00	31,40	216,40	2253,26	-385,20	-269,02	-20,33	469,85	0,558	214,93	469,85
2380,60	31,40	216,20	2264,02	-390,50	-272,91	-20,77	476,41	0,248	214,95	476,41
2406,30	31,10	216,20	2285,99	-401,25	-280,78	-21,64	489,74	0,350	214,98	489,74
2419,30	31,50	216,90	2297,10	-406,68	-284,80	-22,12	496,49	1,248	215,00	496,49
2445,00	31,20	215,90	2319,05	-417,44	-292,74	-23,05	509,86	0,701	215,04	509,86
2457,50	30,88	216,29	2329,76	-422,65	-296,54	-23,46	516,30	0,907	215,05	516,30
2470,60	30,63	217,21	2341,01	-428,02	-300,54	-23,96	523,00	1,220	215,08	523,00
2483,12	30,46	216,75	2351,80	-433,10	-304,37	-24,46	529,35	0,693	215,10	529,35
2496,20	30,42	216,53	2363,07	-438,42	-308,33	-24,94	535,98	0,272	215,12	535,98
2508,80	29,99	216,70	2373,96	-443,50	-312,11	-25,41	542,32	1,044	215,14	542,32
2521,80	29,60	216,70	2385,24	-448,68	-315,97	-25,88	548,77	0,900	215,15	548,77
2530,80	29,70	216,72	2393,07	-452,25	-318,63	-26,21	553,22	0,335	215,17	553,22

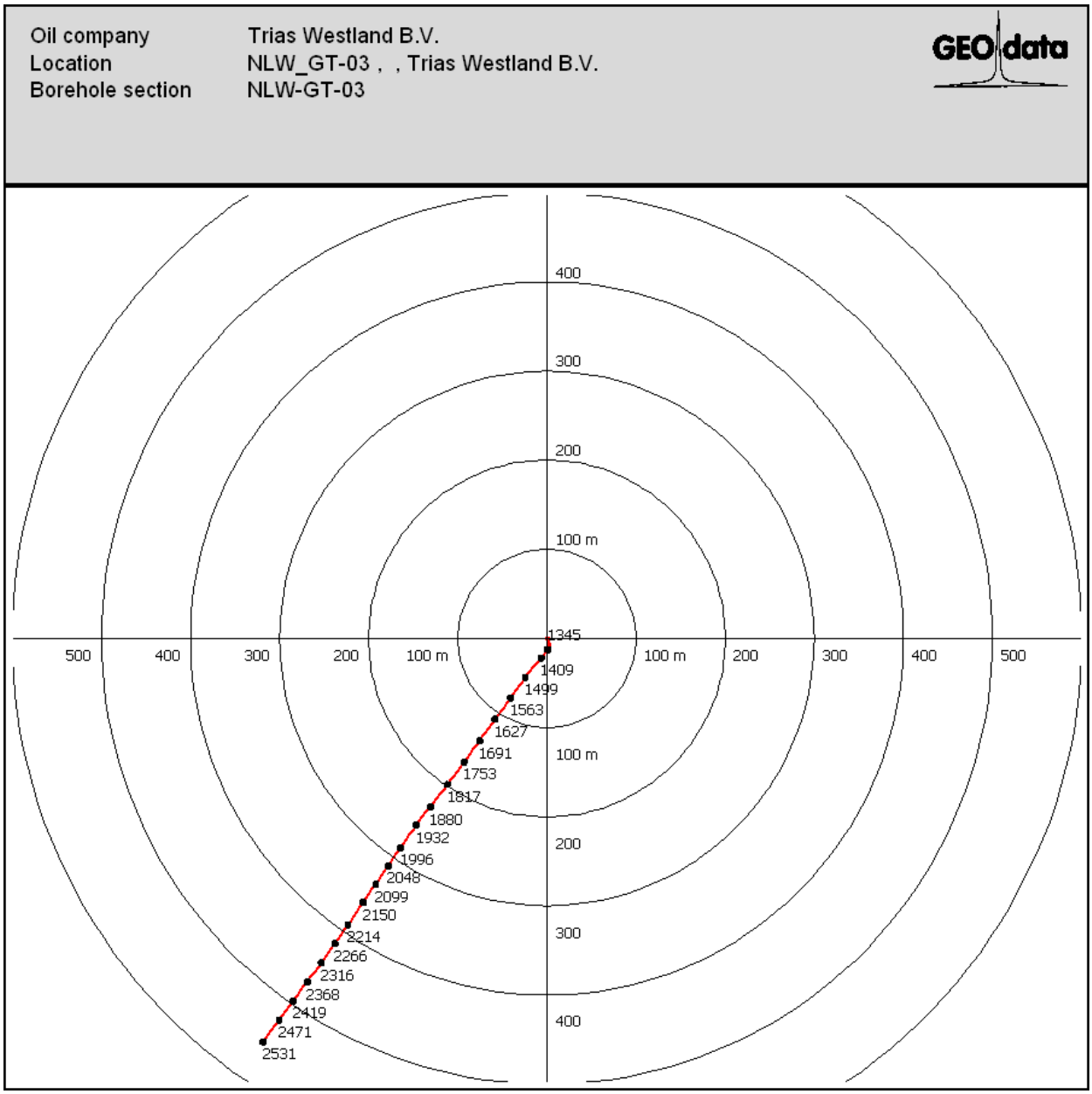
3.7 Directional drilling data (Survey data) NLW-GT-03_S1

Depth	Incl	Azi	TVD	North	East	Vertsec	Closure	DLS	Totazi	Totdev
m	°	°	m	m	m	m	m	°/30m	°	m
1472,90	16,40	220,40	1468,77	-35,77	-18,12	-35,77	40,09	6,247	206,86	40,09
1485,70	15,30	222,40	1481,08	-38,39	-20,43	-38,39	43,49	2,878	208,02	43,49
1497,70	15,10	232,00	1492,66	-40,52	-22,73	-40,52	46,46	6,305	209,29	46,46
1511,30	15,90	234,20	1505,77	-42,70	-25,63	-42,70	49,80	2,190	210,98	49,80
1524,10	17,10	235,40	1518,04	-44,80	-28,60	-44,80	53,15	2,924	212,56	53,15
1536,60	18,50	232,90	1529,94	-47,04	-31,70	-47,04	56,72	3,827	213,98	56,72
1549,50	19,80	232,90	1542,13	-49,59	-35,07	-49,59	60,74	3,023	215,27	60,74
1562,00	20,90	232,00	1553,85	-52,24	-38,52	-52,24	64,90	2,745	216,40	64,90
1575,20	21,90	230,50	1566,14	-55,25	-42,27	-55,25	69,57	2,591	217,42	69,57
1588,20	22,40	227,20	1578,18	-58,48	-45,96	-58,48	74,38	3,094	218,17	74,38
1601,00	23,00	224,40	1589,99	-61,92	-49,50	-61,92	79,28	2,896	218,64	79,28
1614,00	23,80	222,80	1601,92	-65,66	-53,06	-65,66	84,42	2,358	218,94	84,42
1626,60	24,60	221,10	1613,41	-69,50	-56,51	-69,50	89,58	2,526	219,11	89,58
1639,60	25,40	219,10	1625,19	-73,71	-60,05	-73,71	95,07	2,685	219,17	95,07
1652,30	25,80	217,80	1636,65	-78,00	-63,46	-78,00	100,56	1,629	219,13	100,56
1665,10	26,00	217,60	1648,16	-82,43	-66,88	-82,43	106,15	0,512	219,06	106,15
1678,14	26,10	217,80	1659,87	-86,96	-70,38	-86,96	111,87	0,306	218,99	111,87
1690,90	26,30	217,80	1671,32	-91,41	-73,84	-91,41	117,51	0,470	218,93	117,51
1703,70	26,30	217,50	1682,80	-95,90	-77,30	-95,90	123,18	0,312	218,87	123,18
1716,50	26,60	217,70	1694,26	-100,42	-80,78	-100,42	128,88	0,733	218,81	128,88
1729,30	26,70	217,50	1705,70	-104,97	-84,28	-104,97	134,62	0,315	218,76	134,62
1742,20	27,40	215,60	1717,19	-109,68	-87,77	-109,68	140,48	2,586	218,67	140,48
1755,10	28,10	212,70	1728,61	-114,65	-91,14	-114,65	146,46	3,537	218,48	146,46
1767,80	28,60	211,30	1739,78	-119,76	-94,34	-119,76	152,46	1,965	218,23	152,46
1780,70	28,10	210,80	1751,13	-125,01	-97,50	-125,01	158,54	1,287	217,95	158,54
1793,40	27,50	210,80	1762,37	-130,10	-100,53	-130,10	164,42	1,417	217,69	164,42
1806,40	26,80	211,70	1773,94	-135,17	-103,61	-135,17	170,31	1,873	217,47	170,31
1819,10	26,30	211,80	1785,30	-140,00	-106,59	-140,00	175,96	1,186	217,29	175,96
1831,40	26,30	211,60	1796,32	-144,64	-109,46	-144,64	181,39	0,216	217,12	181,39
1844,60	26,50	212,10	1808,15	-149,62	-112,56	-149,62	187,23	0,680	216,95	187,23
1857,40	26,80	211,80	1819,59	-154,49	-115,59	-154,49	192,95	0,771	216,80	192,95
1908,70	27,70	212,20	1865,18	-174,45	-128,04	-174,45	216,39	0,320	216,28	216,39
1921,50	27,40	211,80	1876,53	-179,47	-131,18	-179,47	222,30	0,826	216,16	222,30
1934,40	27,40	211,40	1887,98	-184,52	-134,29	-184,52	228,21	0,428	216,05	228,21
1947,20	27,40	211,30	1899,34	-189,55	-137,35	-189,55	234,09	0,108	215,93	234,09
1959,90	27,60	211,50	1910,61	-194,56	-140,41	-194,56	239,93	0,520	215,82	239,93
1972,90	27,70	211,00	1922,12	-199,72	-143,54	-199,72	245,95	0,583	215,70	245,95
1985,70	27,60	211,40	1933,46	-204,80	-146,61	-204,80	251,87	0,494	215,60	251,87
1998,30	27,50	211,70	1944,63	-209,76	-149,66	-209,76	257,68	0,407	215,51	257,68
2010,70	27,50	212,40	1955,63	-214,62	-152,70	-214,62	263,40	0,782	215,43	263,40
2024,00	27,40	212,00	1967,44	-219,81	-155,97	-219,81	269,52	0,473	215,36	269,52
2036,90	27,40	212,20	1978,89	-224,83	-159,12	-224,83	275,45	0,214	215,29	275,45
2049,80	27,30	212,10	1990,35	-229,85	-162,28	-229,85	281,36	0,256	215,22	281,36
2062,50	26,70	212,60	2001,66	-234,72	-165,36	-234,72	287,12	1,515	215,16	287,12

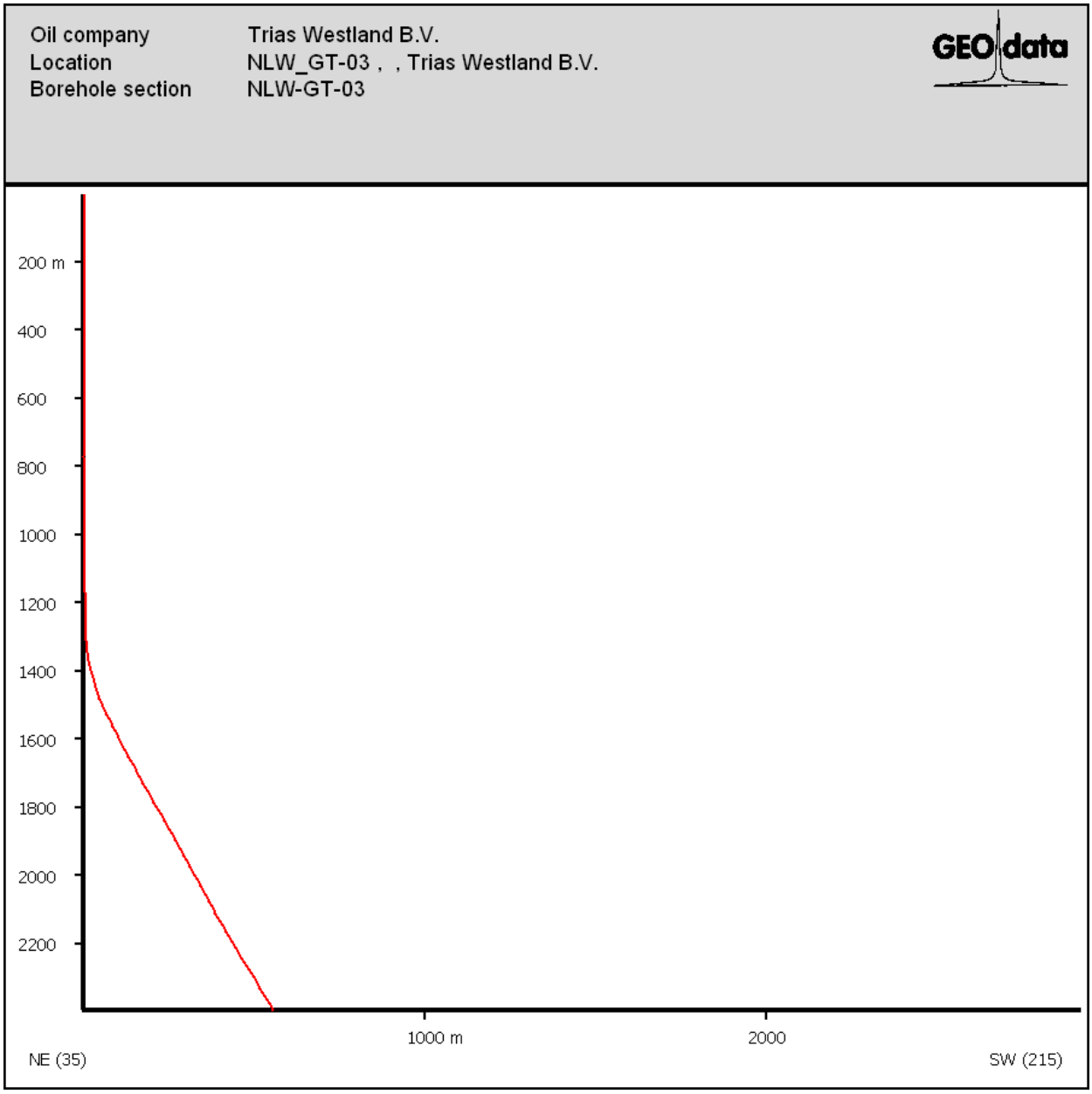
Depth	Incl	Azi	TVD	North	East	Vertsec	Closure	DLS	Totazi	Totdev
m	°	°	m	m	m	m	m	°/30m	°	m
2074,90	26,30	212,20	2012,76	-239,39	-168,33	-239,39	292,65	1,060	215,11	292,65
2088,30	26,50	212,20	2024,76	-244,44	-171,50	-244,44	298,60	0,448	215,05	298,60
2098,10	26,50	212,30	2033,53	-248,13	-173,84	-248,13	302,97	0,137	215,01	302,97
2113,80	26,60	212,30	2047,58	-254,07	-177,59	-254,07	309,98	0,191	214,95	309,98
2126,70	26,70	212,40	2059,11	-258,95	-180,68	-258,95	315,76	0,255	214,90	315,76
2139,40	26,60	212,00	2070,46	-263,77	-183,72	-263,77	321,45	0,485	214,86	321,45
2152,40	25,90	212,40	2082,12	-268,64	-186,78	-268,64	327,19	1,666	214,81	327,19
2165,10	25,30	212,30	2093,57	-273,28	-189,72	-273,28	332,67	1,421	214,77	332,67
2178,10	24,40	212,60	2105,37	-277,89	-192,65	-277,89	338,13	2,097	214,73	338,13
2190,90	23,90	212,30	2117,05	-282,30	-195,46	-282,30	343,37	1,207	214,70	343,37
2203,70	23,80	213,10	2128,75	-286,66	-198,25	-286,66	348,54	0,794	214,67	348,54
2216,50	23,70	213,00	2140,47	-290,98	-201,07	-290,98	353,69	0,253	214,64	353,69
2229,30	23,50	213,00	2152,20	-295,28	-203,86	-295,28	358,81	0,469	214,62	358,81
2241,10	23,40	213,40	2163,02	-299,21	-206,43	-299,21	363,51	0,478	214,60	363,51
2254,70	23,10	213,70	2175,52	-303,68	-209,39	-303,68	368,88	0,711	214,59	368,88
2268,40	22,60	213,10	2188,14	-308,12	-212,32	-308,12	374,19	1,208	214,57	374,19
2280,60	22,20	213,90	2199,42	-312,00	-214,89	-312,00	378,84	1,237	214,56	378,84
2293,40	21,70	213,50	2211,29	-315,98	-217,54	-315,98	383,63	1,223	214,55	383,63
2306,20	21,40	214,40	2223,20	-319,88	-220,17	-319,88	388,33	1,046	214,54	388,33
2319,10	21,00	215,90	2235,23	-323,69	-222,85	-323,69	392,99	1,567	214,55	392,99
2331,70	20,60	216,10	2247,01	-327,31	-225,48	-327,31	397,46	0,967	214,56	397,46
2344,60	20,70	215,60	2259,08	-331,00	-228,15	-331,00	402,01	0,471	214,58	402,01
2357,00	20,70	216,00	2270,68	-334,56	-230,71	-334,56	406,39	0,342	214,59	406,39

3.8 Well Path

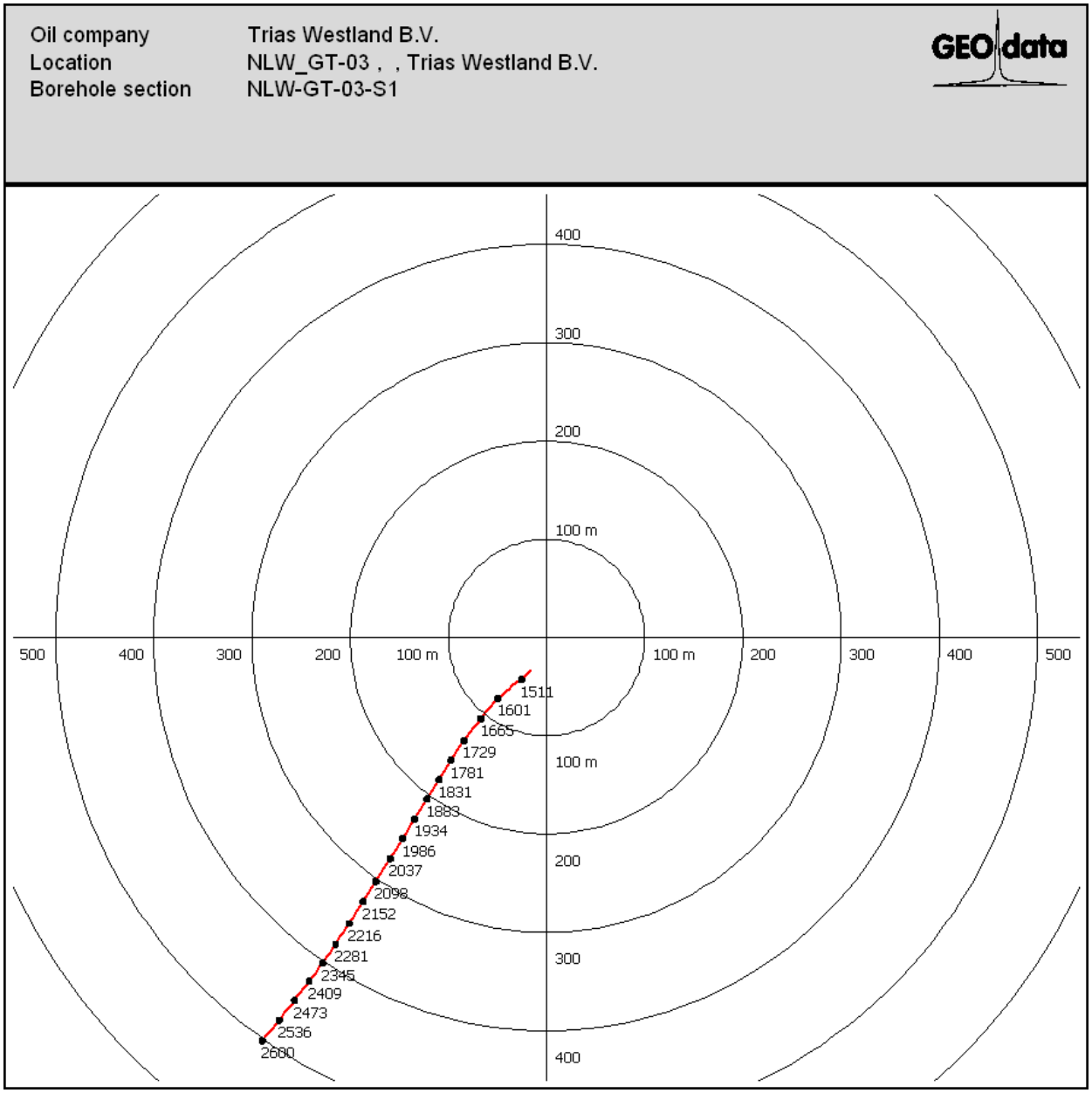
3.8.1 Horizontal Projection NLW-GT03



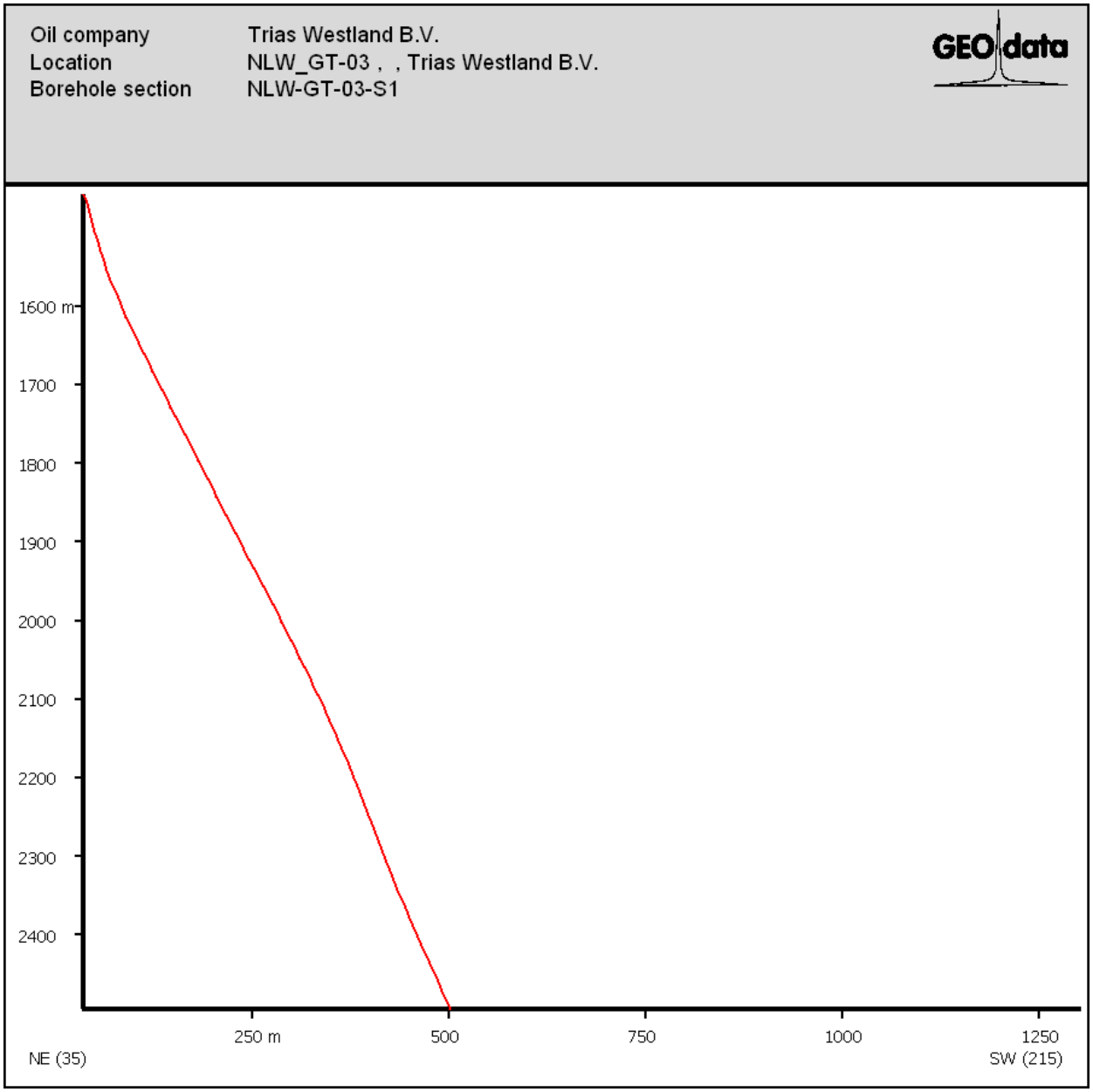
3.8.2 Vertical Projection NLW-GT03



3.8.3 Horizontal Projection NLW-GT03-S1



3.8.4 Vertical Projection NLW-GT03-S1



3.9 Bit run register NLWGT-03

Bit	Total-runs	In-date	Out-date	In-depth	Out-depth	Jets	TFA	Turbine-rev.	Modus	Bitlife		Comment / Serial Number
				[m]	[m]	[1/32"]	[in²]	[U/1000lit]		[h]	cum. [h]	
1	1	10.07.2020	15.07.2020	133	904	3x18 1x20	1,052		RD	64.7	64.7	24" Varel Rock Bit, S/N 1637217
2	1	20.07.2020	28.07.2020	904	1686	6x14	0,902	27	DD / RD	98,1	98.1	16" Varel PDC, S/N: 6024723
3	1	28.07.2020	05.08.2020	1686	2550	9x12	0,994	27	DD / RD	109,3	109,3	16" Varel PDC, S/N 60234761
4	1	06.08.2020	09.08.2020	2550	2550	9x12	0,994	27	DD / RD	/	/	16" Varel PDC, S/N 268198

3.10 Bit run register NLW-GT-03-S1

Bit	Total-runs	In-date	Out-date	In-depth	Out-depth	Jets	TFA	Turbine-rev.	Modus	Bitlife		Comment / Serial Number
				[m]	[m]	[1/32"]	[in²]	[U/1000lit]		[h]	cum. [h]	
5	1	12.08.2020	18.08.2020	1467	2333	5x11 7x10	1,00	27	DD RD	83,2	83,2	16" Smith PDC, S/N 8420
6	1	19.08.2020	22.08.2020	2333	2600	5 x11 7x10	1,00	27	DD / RD	22,5	22,5	16" NOV SKC916M-B4 PDC, S/N: 230880